

**CITY OF
BLOOMINGTON
CITY COUNCIL -
REGULAR SESSION
MEETING
NOVEMBER 14, 2022**



COMPONENTS OF THE COUNCIL AGENDA

RECOGNITION AND PROCLAMATION

This portion of the meeting recognizes individuals, groups, or institutions publically, as well as those receiving a proclamation, or declaring a day or event.

PUBLIC COMMENT

Each regular City Council meeting shall have a public comment period not to exceed 30 minutes. Every speaker is entitled to speak for up to 3 minutes. To be considered for public comment, please complete a public comment card at least 5 minutes prior to the start of the meeting. The Mayor will randomly draw from the cards submitted. Public comment is a time to give comment. It is not a question and answer period and the City Council does not respond to public comments. Speakers who engage in threatening or disorderly behavior will have their time ceased.

CONSENT AGENDA

All items under the Consent Agenda are considered to be routine in nature and will be enacted by one motion. There will be no separate discussion of these items unless a Council Member, City Manager or Corporation Counsel so requests; in which event, the item will be removed from the Consent Agenda and considered in the Regular Agenda, which typically begins with Item No. 8.

The City's Boards and Commissions hold Public Hearings prior to some Council agenda items appearing on the Council's Meeting Agenda. Persons who wish to address the Council should provide new information that is pertinent to the issue before them.

PUBLIC HEARING

Items that require receiving public testimony will be placed on the agenda and noticed as a Public Hearing. Individuals have an opportunity to provide public testimony on those items that impact the community and/or residence.

REGULAR AGENDA

All items that provide the Council an opportunity to receive a presentation, ask questions of City Staff, seek additional information, or deliberate prior to making a decision will be placed on the Regular Agenda.

MAYOR AND COUNCIL MEMBERS

Mayor - Mboka Mwilambwe

City Council Members

Ward 1 - Grant Walch
Ward 2 - Donna Boelen
Ward 3 - Sheila Montney
Ward 4 - Julie Emig
Ward 5 - Nick Becker
Ward 6 - De Urban
Ward 7 - Mollie Ward
Ward 8 - Jeff Crabill
Ward 9 - Tom Crumpler

City Manager - Tim Gleason

Deputy City Manager - Billy Tyus

CITY LOGO DESIGN RATIONALE

The **CHEVRON** Represents:
Service, Rank, and Authority
Growth and Diversity
A Friendly and Safe Community
A Positive, Upward Movement and
Commitment to Excellence!

MISSION, VISION, AND VALUE STATEMENT

MISSION

To Lead, Serve and Uplift the
City of Bloomington

VISION

A Jewel of the Midwest Cities

VALUES

Service-Centered,
Results-Driven,
Inclusive

STRATEGIC PLAN GOALS

- Financially Sound City Providing Quality Basic Services
- Upgrade City Infrastructure and Facilities Grow the Local Economy
- Strong Neighborhoods
- Great Place - Livable, Sustainable City
- Prosperous Downtown Bloomington



**CITY COUNCIL - REGULAR SESSION MEETING AGENDA
GOVERNMENT CENTER CHAMBERS, 4TH FLOOR, ROOM #400
115 E. WASHINGTON STREET, BLOOMINGTON, IL 61701
MONDAY, NOVEMBER 14, 2022, 6:00 PM**

- 1. Call to Order**
- 2. Pledge of Allegiance to the Flag**
- 3. Remain Standing for a Moment of Silent Prayer and/or Reflection**
- 4. Roll Call**
- 5. Public Comment**

Individuals wishing to provide emailed public comment must email comments to publiccomment@cityblm.org at least 15 minutes before the start of the meeting. Individuals wishing to speak in-person or remotely may register at www.cityblm.org/register at least 5 minutes before the start of the meeting for in-person public comment and at least 15 minutes before the start of the meeting for remote public comment.

6. Recognition/Appointments

- A. Presentation of the Winners of the 2022 City of Bloomington Beautification Awards, as requested by the Citizen's Beautification Committee. *(Recommended Motion: Presentation only.)*

7. Consent Agenda

Items listed on the Consent Agenda are approved with one motion; Items pulled by Council from the Consent Agenda for discussion are listed and voted on separately.

- A. Consideration and action to approve Bills and Payroll in the amount of \$16,919,792.47, as requested by the Finance Department. *(Recommended Motion: The proposed Bills and Payroll be approved.)*
- B. Consideration and action to approve the Purchase of Professional Services and Hardware from Sentinel Technologies for Switch Replacement in the Government Center in the amount of \$77,993, as requested by the Information Technology Department. *(Recommended Motion: The proposed Purchase be approved.)*
- C. Consideration and action to approve an Agreement with Bailey Edward Design Inc. for design and construction document preparation for a new elevator in City Hall, in an amount not to exceed \$85,000, as requested by the Public Works Department. *(Recommended Motion: The proposed Agreement be approved.)*
- D. Consideration and action to approve an Agreement with Technical Solutions & Services, Inc., for improvements to the Police Department Building Automation

System (RFP #2023-11), in the amount of \$203,800, as requested by the Public Works Department and the Police Department. *(Recommended Motion: The proposed Agreement be approved.)*

- E. Consideration and action to approve the 2022 Supportive Housing and Continuum of Care Grant Agreement (IL1772L5T122100) in the amount of \$56,700 with the United States Department of Housing and Urban Development, as requested by the Economic & Community Development Department. *(Recommended Motion: The proposed Agreement be approved.)*
- F. Consideration and action on 1) an Ordinance Amending the Budget Ordinance for the Fiscal Year Ending April 30, 2023, to Utilize Fund Balance and Increase the Water Fund budget by \$540,800, and 2) an Ordinance Authorizing a Construction Agreement Between the City of Bloomington and Wm. Masters, Inc., for Fort Jesse Generator and Electrical Improvements (Bid # 2023-09), in the amount of \$1,540,800, as requested by the Public Works Department. *(Recommended Motion: The proposed Ordinances be approved.)*
- G. Consideration and action to approve an Agreement with Donoghue & Associates, Inc., for Fort Jesse Generator and Electrical Improvements Construction Observation, in the amount of \$76,800, as requested by the Public Works Department. *(Recommended Motion: The proposed Agreement be approved.)*
- H. Consideration and action on an Ordinance Amending the Budget Ordinance for the Fiscal Year Ending April 30, 2023, to increase the Community Development Block Grant (CDBG) budget by \$159,584.00, as requested by the Economic & Community Development Department. *(Recommended Motion: The proposed Ordinance be approved.)*
- I. Consideration and action on an Ordinance Approving the Final Plat of The Villas at Prairie Vista P.U.D. (Planned Unit Development), as requested by the Public Works Department. *(Recommended Motion: The proposed Ordinance be approved.)*
- J. Consideration and action on an Ordinance Amending Section 30 of Chapter 1 of the City Code regarding the Schedule of Fees, as requested by the Fire Department. *(Recommended Motion: The proposed Ordinance be approved.)*
- K. Consideration and action on a Resolution to Authorize a Change Order and the First Amendment to the Agreement for a Time Extension of 175 Days for the Contract Between the City of Bloomington and G.A. Rich & Sons, Inc., for the Settled Water Improvements Project, as requested by the Public Works Department. *(Recommended Motion: The proposed Resolution be approved.)*
- L. Consideration and action on an Application from Sport & Bait Lounge Tavern, Inc., d/b/a Sport & Bait Lounge Tavern, located at 304 N. Morris Ave., requesting an approval of a change of ownership for their Class TAPS (Tavern, All Types of Alcohol, Packaged and Sunday Sales) Liquor License, as requested by the City Clerk Department. *(Recommended Motion: The proposed Change of Ownership be approved.)*

8. Regular Agenda

- A. Presentation of the FY2022 Annual Comprehensive Financial Report, delivered by

the audit firm of Baker Tilly Virchow Krause LLP, as requested by the Finance Department. *(Recommended Motion: Presentation only.) (Presentation by Scott Rathbun, Finance Director, and Michael Malatt, Partner at Baker Tilly, 10 minutes; and City Council Discussion, 5 minutes.)*

9. City Manager's Discussion

10. Mayor's Discussion

11. Council Member's Discussion

12. Executive Session

13. Adjournment

Individuals with disabilities planning to attend the meeting who require reasonable accommodations to observe and/or participate, or who have questions about the accessibility of the meeting, should contact the City's ADA Coordinator at 309-434-2468 or mhurt@cityblm.org.



RECOGNITION/APPOINTMENTS ITEM NO. 6.A

FOR COUNCIL: November 14, 2022

WARD IMPACTED: City-Wide Impact

SUBJECT: Presentation of the Winners of the 2022 City of Bloomington Beautification Awards, as requested by the Citizen's Beautification Committee.

RECOMMENDED MOTION: Presentation only.

STRATEGIC PLAN LINK:

Goal 5. Great Place - Livable, Sustainable City

STRATEGIC PLAN SIGNIFICANCE:

Objective 5b. City decisions consistent with plans and policies

BACKGROUND: Each year the Citizen's Beautification Committee recognizes beautiful properties within the City by presenting the persons or businesses responsible for said work and improvements an award. This year's Committee will recognize five properties.

COMMUNITY GROUPS/INTERESTED PERSONS CONTACTED: N/A

FINANCIAL IMPACT: N/A

AMERICAN RESCUE PLAN FUNDING IMPACT: N/A

COMMUNITY DEVELOPMENT IMPACT: This request meets the following goals and objectives of the Bloomington Comprehensive Plan 2035: N/A

Respectfully submitted for consideration.

Prepared by: Ashley Lara, Records & Licensing Specialist

ATTACHMENTS:

[ADMIN 1B RECIPIENTS Annual Beautification Rewards 11142022](#)

2022 Bloomington Beautification Award Winners



304 W. Wood St.



2909 Coventry Ct



416 N. Linden St.



*Catalyst Construction
216 E. Grove St.*



*Copy Shoppe (Business)
302 E. Washington St.*



CONSENT AGENDA ITEM NO. 7.A

FOR COUNCIL: November 14, 2022

WARD IMPACTED: City-Wide Impact

SUBJECT: Consideration and action to approve Bills and Payroll in the amount of \$16,919,792.47, as requested by the Finance Department.

RECOMMENDED MOTION: The proposed Bills and Payroll be approved.

STRATEGIC PLAN LINK:

Goal 1. Financially Sound City Providing Quality Basic Services

STRATEGIC PLAN SIGNIFICANCE:

Objective 1d. City services delivered in the most cost-effective, efficient manner

BACKGROUND: Bills and Payroll are filed in the City Clerk's Department. The full Bills and Payroll Report is now housed under Finance documents on the City website, available at <https://www.cityblm.org/bills>.

COMMUNITY GROUPS/INTERESTED PERSONS CONTACTED: N/A

FINANCIAL IMPACT: Total disbursements to be approved \$16,919,792.47 (Payroll total \$5,485,043.75, Accounts Payable total \$11,085,393.15, Bank Transfers total \$218,367.26 and Procurement Card Purchases total \$130,988.31).

AMERICAN RESCUE PLAN FUNDING IMPACT: N/A

COMMUNITY DEVELOPMENT IMPACT: This request meets the following goals and objectives of the Bloomington Comprehensive Plan 2035: N/A

Respectfully submitted for consideration.

Prepared by: Sheryl McDaniel, Accountant

ATTACHMENTS:

[FIN 1B Council Finance Summary Report](#)

CITY OF BLOOMINGTON FINANCE REPORT

PAYROLL

Date	Gross Pay	Employer Contribution	Totals
10/27/2022	\$ 2,187,859.27	\$ 557,631.48	\$ 2,745,490.75
11/4/2022	\$ 2,180,817.59	\$ 553,373.74	\$ 2,734,191.33

10/26/2022	\$ 4,980.65	\$ 381.02	\$ 5,361.67
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Off Cycle Adjustments

PAYROLL TOTAL	\$ 5,485,043.75
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ACCOUNTS PAYABLE (WIRES)

Date	Bank	Total
11/14/2022	AP General	\$ 9,765,735.18
	AP JMScott	\$ -
11/14/2022	AP Comm Devel	\$ 32,703.42
11/14/2022	AP IHDA	\$ 74,133.00
11/14/2022	AP Library	\$ 60,936.73
	AP MFT	\$ -
10/25/22-10/31/22	Out of Cycle	\$ 1,151,884.82
10/3/22-11/2/22	AP Bank Transfers	\$ 218,367.26
	AP TOTAL	\$ 11,303,760.41

PCARDS

Date Range	
9/2/22-10/3/22	\$130,988.31

PCARD TOTAL	\$130,988.31
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GRAND TOTAL	\$ 16,919,792.47
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Respectfully,

F Scott Rathbun
Director of Finance



CONSENT AGENDA ITEM NO. 7.B

FOR COUNCIL: November 14, 2022

WARD IMPACTED: City-Wide Impact

SUBJECT: Consideration and action to approve the Purchase of Professional Services and Hardware from Sentinel Technologies for Switch Replacement in the Government Center in the amount of \$77,993, as requested by the Information Technology Department.

RECOMMENDED MOTION: The proposed Purchase be approved.

STRATEGIC PLAN LINK:

Goal 1. Financially Sound City Providing Quality Basic Services

STRATEGIC PLAN SIGNIFICANCE:

Objective 1d. City services delivered in the most cost-effective, efficient manner

BACKGROUND: Sentinel Technologies designed and implemented the City's existing core networking and firewall environment. Since implementation, they have also been engaged supporting and maintaining the environment and have assisted in modifying the environment in support of various projects. They have an intimate knowledge and understanding of the City's current core networking and firewall environment. The City has an on-going capital investment with Sentinel and it would be costly to bring in a new firm that would have to go through the learning curve and allow time for internal personnel to be trained.

The core network switches serve as the gateway for all other network connectivity in the Government Center for the City. They provide primary routing and data switching to ensure proper performance for all devices and the connection to the main data center. The existing core network switches are beyond end of life and are beginning to experience failures and other performance issues.

COMMUNITY GROUPS/INTERESTED PERSONS CONTACTED: N/A

FINANCIAL IMPACT: If approved, the purchase will be coded to Information Technology-Capital Outlay Office and Computer Equipment account (10011610-72120). Stakeholders can locate this in the FY 2023 Budget Books titled "Budget Overview & General Fund" on page 165 and Other Funds & Capital Improvement" on page 96.

AMERICAN RESCUE PLAN FUNDING IMPACT: N/A

COMMUNITY DEVELOPMENT IMPACT: This request meets the following goals and objectives of the Bloomington Comprehensive Plan 2035: N/A

Respectfully submitted for consideration.

Prepared by: Megan Horath, Administrative Assistant

ATTACHMENTS:

IT 1B LSJF Sentinel GC Switch Upgrade

IT 1C Quote Sentinel Government Center Switches R4

LIMITED SOURCE JUSTIFICATION

(Requester completes Section A & B)

SECTION A –LIMITED SOURCE PURCHASE:

Complete if a purchase is \$5,000 or over and due to reasons of previous capital investment, improved public service, long-term operational need, security, patents, copyrights, critical need for responsiveness, proximity, Federal, State, or other regulations, necessary replacement parts and/or compatibility, warranty, this procurement justifies a limited source exemption.

Vendor Name & #: 613

Sentinel Technologies, Inc

Amount: \$ 77,993.00**Date:** 10/25/2022**Description of item/services:**

Professional services and hardware for Government Center switch replacement

Justification:

Sentinel Technologies designed and implemented the City's existing core networking and firewall environment. Since implementation, they have also been engaged to support and maintain the environment and have assisted in modifying the environment in support of various projects. They have an intimate knowledge and understanding of the City's current core networking and firewall environment.

SECTION B - REQUESTER CERTIFICATION: By submitting this request, I attest that the above justification/information is accurate and complete to the best of my knowledge and that I have no personal or business interests relative to this request.

Craig McBeath



10/25/2022 | 9:38 AM CDT

(Name & Signature of Department Director or Designee **Approving**)**Date****SECTION C –TO BE COMPLETED BY THE PROCUREMENT OFFICE:**

Based on the information provided in Section A and attached supporting documents,

I concur ☒ / do not concur ☐ (see below) with the purchase to be a Limited Source.Do not concur for the following reason(s):

Click or tap here to enter text.

Carla Murillo



10/25/2022 | 9:39 AM CDT

(Name & Signature of Purchasing Agent or Designee)

Date



City of Bloomington Government Center Switch Project

Presented By:

Bill Venvertloh
Senior Sales Executive
Sentinel Technologies, Inc.
(217) 471-5107
bvenvert@sentinel.com

Architect:

Paul Mccracken
Solutions Architect
Sentinel Technologies, Inc.
(309) 503-5036
pmccracken@sentinel.com

Hardware and Software

	Extended Price
Government Center Switches	\$ 70,928.00
Hardware and Software Total	\$ 70,928.00

Solution Maintenance & Support

	Extended Price
Sentinel HANS™ 1Yr	\$ 6,990.00
Maintenance & Support Total	\$ 6,990.00

Total Project - Project Total Cost is based on the combined purchase of all Hardware/Software, Professional Services and Solution Maintenance from Sentinel as detailed in the attached Bill of Materials. Unbundling or materially reducing any of these essential elements of the solution may result in modifications to the cost of the remaining elements.

	Extended Price
Hardware and Software	\$ 70,928.00
Solution Maintenance & Support	\$ 6,990.00
Project Total	\$ 77,918.00

***Quote is valid until 11/20/2022**

Plus applicable tax, shipping & handling

Government Center Switches				
Description	Qty	Unit Price	Ext Price	Special Notes
2 - C9300 Switches				
Catalyst 9300 48-port data only, Network Essentials	2	\$ 4,382.00	\$ 8,764.00	
C9300 Network Essentials, 48-port license	2	\$ -	\$ -	
Cisco Catalyst 9300 XE 17.5 UNIVERSAL UNIVERSAL	2	\$ -	\$ -	
350W AC 80+ platinum Config 1 Power Supply	2	\$ -	\$ -	
350W AC 80+ platinum Config 1 Secondary Power Supply	2	\$ 448.00	\$ 896.00	
North America AC Type A Power Cable	4	\$ -	\$ -	
No SSD Card Selected	2	\$ 69.00	\$ 138.00	
50CM Type 1 Stacking Cable	2	\$ 66.00	\$ 132.00	
Catalyst Stack Power Cable 30 CM	2	\$ -	\$ -	
Catalyst 9300 8 x 10GE Network Module	2	\$ 1,403.00	\$ 2,806.00	
Network Plug-n-Play Connect for zero-touch device deployment	2	\$ -	\$ -	
C9300 DNA Essentials, 48-Port Term Licenses	2	\$ -	\$ -	
C9300 DNA Essentials, 48-Port, 3 Year Term License	2	\$ 617.00	\$ 1,234.00	36 Months
2 - C9500 Switches		\$ -	\$ -	
Catalyst 9500 48-port 10G bundle, Network Advantage	2	\$ 18,054.00	\$ 36,108.00	
Network Plug-n-Play Connect for zero-touch device deployment	2	\$ -	\$ -	
Prime Infrastructure Lifecycle & Assurance Term - Smart Lic	6	\$ -	\$ -	
PI Dev Lic for Lifecycle & Assurance Term 3Y	6	\$ -	\$ -	36 Months
950W AC Config 4 Power Supply front to back cooling	2	\$ -	\$ -	
Cisco Catalyst 9500 XE 17.3 UNIVERSAL	2	\$ -	\$ -	
C9500 Network Stack, Advantage	2	\$ -	\$ -	
Cisco Catalyst 9500 8 x 10GE Network Module	2	\$ 2,322.00	\$ 4,644.00	
950W AC Config 4 Power Supply front to back cooling	2	\$ 1,445.00	\$ 2,890.00	
North America AC Type A Power Cable	4	\$ -	\$ -	
C9500 DNA Advantage, Term licenses	2	\$ -	\$ -	
DNA Advantage 3 Year License	2	\$ 6,658.00	\$ 13,316.00	36 Months
Hardware and Software Sub-Total:			\$70,928.00	



City of Bloomington

Sentinel HANS™ 1Yr					
Description	Qty	Unit Price	Ext Price	Special Notes	
HANS™-GLD-SNTC-8X5XNBD Catalyst 9300 48-port data only, Network	2	\$ 712.00	\$ 1,424.00	12 Months	
HANS™-GLD-SNTC-8X5XNBD Catalyst 9500 48-port 10G bundle, Networ	2	\$ 2,783.00	\$ 5,566.00	12 Months	
Maintenance & Support Sub-Total:				\$6,990.00	



CONSENT AGENDA ITEM NO. 7.C

FOR COUNCIL: November 14, 2022

WARD IMPACTED: City-Wide Impact

SUBJECT: Consideration and action to approve an Agreement with Bailey Edward Design Inc. for design and construction document preparation for a new elevator in City Hall, in an amount not to exceed \$85,000, as requested by the Public Works Department.

RECOMMENDED MOTION: The proposed Agreement be approved.

STRATEGIC PLAN LINK:

Goal 1. Financially Sound City Providing Quality Basic Services

Goal 2. Upgrade City Infrastructure and Facilities

STRATEGIC PLAN SIGNIFICANCE:

Objective 1d. City services delivered in the most cost-effective, efficient manner

Objective 2d. Well-designed, well maintained City facilities emphasizing productivity and customer service

BACKGROUND: The existing elevator in City Hall was installed in 1983 to address Americans with Disabilities Act (ADA) guidelines at that time. Since its installation, multiple updates to ADA requirements have been enacted, and the elevator is not compliant with current ADA standards. In 2021, Bailey Edward performed a preliminary evaluation to determine if the elevator could be brought into compliance with current ADA standards. The preliminary evaluation looked promising, but a more detailed investigation was needed. In June, during the annual elevator inspection, testing, and certification process, the hydraulic cylinder that raises and lowers the passenger cab failed, and the elevator was immediately taken out of service by the Office of the State Fire Marshall.

The approximate cost to replace the failed cylinder is \$122,000. Given this substantial expense, the age of the elevator, and ADA compliance issues, Facilities Division staff requested budget estimates to replace the elevator with one that is fully compliant with current ADA standards. The estimates varied, based on elevator type and manufacturer, but full replacement is expected to cost between \$190,000 and \$250,000. Based on the cost difference between replacing the failed cylinder and constructing a new elevator, staff recommended full replacement and requested a proposal from Bailey Edward to assist with elevator design, construction document preparation, and construction assistance. Bailey Edward's proposal in an amount not to exceed \$85,000 is attached.

Through Request for Qualifications (RFQ) 2022-25 (Resolution 2022-13), the City Council approved a list of prequalified vendors for Architectural and Engineering Services. RFQ 2022-25 established ten categories of professional services and identified qualified vendors to provide services in each category by project cost. For each category, small projects cost less than \$50,000, and large projects cost \$50,000 or more. City staff reviewed the six selected firms under the Architectural (Large) category, which is the key service for the

project as described above and determined Bailey Edward to be the most qualified firm to do the work that best meets the City's needs. Based on Bailey Edward's selection under RFQ 2022 -25 and their experience, Bailey Edward was asked to submit a proposal for scope and fees associated with the City Hall Elevator Replacement project. The vendor chosen for this project utilized a qualifications-based selection process, and, therefore, the City's local preference policy does not apply.

COMMUNITY GROUPS/INTERESTED PERSONS CONTACTED: N/A

FINANCIAL IMPACT: If approved, \$85,000 will be awarded for this design. Funding is included in the FY 2023 Budget. This budgeted project is listed under "ADA and Life Safety Improvements" in the FY 2023 Budget. Stakeholders can locate this in the FY 2023 Budget Book titled "Other Funds & Capital Improvement" on pages 81, 224, 246, 255, and 256. If approved a budget transfer will be processed to move \$85,000 from the Capital Improvement-Buildings account (40100100-72520) to the Capital Improvement-Architectural & Engineering Services for Capital account (40100100-70051) where the design services will be paid.

AMERICAN RESCUE PLAN FUNDING IMPACT: N/A

COMMUNITY DEVELOPMENT IMPACT: This request meets the following goals and objectives of the Bloomington Comprehensive Plan 2035: Goal UEW-1. Provide quality public infrastructure within the City to protect public health, safety and the environment, Objective UEW-1.1. Maintain the existing City operated infrastructure in good condition.

Respectfully submitted for consideration.

Prepared by: Russ Waller, Facility Manager

ATTACHMENTS:

[PW 3B City Hall Elevator Contract](#)

CITY OF BLOOMINGTON AGREEMENT WITH
Bailey Edward Design Inc.
FOR
City Hall Elevator Replacement Design

THIS AGREEMENT, dated this 8th day of November, 2022, is between the City of Bloomington, IL (hereinafter "CITY") and Bailey Edward Design Inc. (hereinafter "VENDOR"). CITY and VENDOR may hereinafter collectively be referred to as the "PARTIES" and individually as the "PARTY".

NOW THEREFORE, the PARTIES agree as follows:

Section 1. Recitals. The recitals set forth above are incorporated into this Section 1 as if specifically stated herein.

Section 2. Description of Services. VENDOR shall provide the services/work identified on Exhibit A, attached hereto and incorporated herein.

Section 3. Incorporation of Bid/RFP/RFQ & Proposal Terms. The following shall apply to this Agreement:

_____ This Agreement was not subject to a formal solicitation process by the CITY.

 X This Agreement was subject to the following procurement initiative by the CITY:
MULTI-YEAR PROFESSIONAL ARCHITECTURAL AND ENGINEERING SERVICES REQUEST FOR QUALIFICATIONS, RFQ #2022-25 (hereinafter "REQUEST"). Accordingly, the provisions of the REQUEST and the proposal submitted by VENDOR (hereinafter collectively referred to as "PROCUREMENT DOCUMENTS" and attached hereto), shall be incorporated into this Agreement and made a part thereof and shall be considered additional contractual requirements that must be met by VENDOR. In the event of a direct conflict between the provisions of this Agreement and the incorporated PROCUREMENT DOCUMENTS, the provisions of this Agreement shall prevail.

_____ This Agreement was not subject to a formal solicitation process by the CITY, but includes the other required proposal/documents attached hereto in Exhibit C.

Section 4. Payment. For the work performed by VENDOR under this Agreement, the City shall pay VENDOR one of the following:

_____ A flat fee of \$ _____ as set forth in the Payment Terms attached as Exhibit B, attached hereto and incorporated herein.

 X Fees as set forth in the Payment Terms attached as Exhibit B, attached hereto and incorporated herein not to exceed \$85,000.00.

Section 5. Requirement for Payment & Performance Bond. The following shall further apply to this Agreement:

 X This Agreement does not require the furnishment of any bonds by the VENDOR.

— This Agreement is subject to bonding requirements.

- i. It is therefore understood that the VENDOR will furnish, at no expense to the CITY, Payment and Performance Bonds to the CITY in the amount of the contract as stated in Section 4 executed by the VENDOR and at least two sureties as set forth under the Laws of the State of Illinois, as a guarantee that the VENDOR will timely and faithfully perform the work outlined herein.
- ii. Said bond shall be conditioned to save and keep harmless said CITY from any and all claims, demands, losses, suits, costs, expenses, and damages which may be brought, sustained, or recovered against said CITY by reason of any negligence, default, or failure of the said VENDOR in designing, building, constructing, or completing said improvement and its appurtenances, or any part thereof, and that said improvement when constructed shall be free from all defects and remain in good order and condition for one year from its completion and acceptance by the CITY, ordinary wear and tear, and damage resulting from accident or willful destruction excepted; which bond is attached hereto and made a part hereof.

Section 6. Default. Either PARTY shall be in default if it fails to perform all or any part of this Agreement. If either PARTY is in default, the other PARTY may terminate this contract upon giving written notice of such termination to the PARTY in default. Such notice shall be in writing and provided thirty (30) days prior to termination. The non-defaulting PARTY shall be entitled to all remedies as set forth in Section 9 herein, upon the default or violation of this Agreement.

Section 7. Termination for Cause. The CITY may, at any time, terminate this Agreement, in whole or in part, for any of the following reasons effective immediately:

- i. VENDOR is found to be in violation of any term or condition of this Agreement.
- ii. VENDOR engages in any fraudulent, felonious, grossly negligent, or other illegal acts or behavior.
- iii. VENDOR declares bankruptcy or becomes insolvent.
- iv. CITY determines, in its sole discretion, that VENDOR is no longer able to fulfill VENDOR's obligations under this Agreement or PROCUREMENT DOCUMENTS.

Upon such termination, CITY shall be entitled to all remedies laid out in Section 9, as well as reimbursement of reasonable attorney's fees and court costs.

Section 8. Force Majeure. The CITY shall not be in default of this Agreement and shall not be held liable for any losses, failure, or delay in performance of its obligations under this Agreement or any Agreement, Amendment, Exhibit, or Attachment hereto arising out of or caused, directly or indirectly, by an event of Force Majeure. Force Majeure is defined as circumstances beyond the CITY's reasonable control, including, without limitation, acts of God; earthquakes; fires; floods; wars; civil or military disturbances; acts of terrorism; sabotage; strikes; epidemics; pandemics; riots; power failures; computer failure and any such circumstances beyond its reasonable control as may cause interruption, loss or malfunction of utility, transportation, computer (hardware or software) or telephone communication service; accidents; labor disputes; acts of civil or military authority; governmental actions; or inability to obtain labor, material, equipment or transportation.

Section 9. Remedies. In the event of a default or a violation of this Agreement, the non-defaulting PARTY shall be entitled to all remedies, whether in law or equity.

Section 10. Indemnification. To the fullest extent permitted by law, VENDOR shall indemnify and hold harmless CITY, its officers, officials, agents, and employees from claims, demands, causes of action, and liabilities of every kind and nature whatsoever arising out of or in connection with VENDOR's operations performed under this Agreement, except for loss, damage, or expense arising from the sole gross negligence or willful misconduct of the CITY or the CITY's agents, servants, or independent VENDORS who are directly responsible to CITY. This indemnification shall extend to all claims occurring after this Agreement is terminated as well as while it is in force. The indemnity shall apply regardless of any concurrent negligence, whether active or passive, of the CITY or CITY's officers, officials, agents, employees, or any other persons or entities. The indemnity set forth in this section shall not be limited by insurance requirements or by any other provision of this Agreement.

Section 11. Reuse of Documents. All documents, including but not limited to, reports, drawings, specifications, and electronic media furnished by VENDOR pursuant to this Agreement are instruments of the VENDOR's services. Nothing herein, however, shall limit the CITY's right to use the documents for municipal purposes, including but not limited to the CITY's right to use documents in an unencumbered manner for purposes of remediation, remodeling, and/or construction. VENDOR further acknowledges any such documents may be subject to release under the Illinois Freedom of Information Act.

Section 12. Standard of Care. Services performed by VENDOR under this Agreement will be conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the same or similar profession currently practicing under the same or similar conditions.

Section 13. Representations of VENDOR. VENDOR hereby represents it is legally able to perform the work that is subject to the Agreement.

Section 14. Compliance with Local, State, and Federal Laws. VENDOR agrees that any and all work by VENDOR shall at all times comply with all laws, ordinances, statutes, and governmental rules, regulations and codes.

Section 15. Compliance with Prevailing Wage. The following shall apply to this Agreement:

X This Agreement is not for "public works" and therefore Prevailing Wage does not apply.

— This Agreement calls for the construction of "public works," within the meaning of the Illinois Prevailing Wage Act, 820 ILCS 130.01 et seq. (hereinafter "ACT"). The ACT requires contractors and subcontractors to pay laborers, workers, and mechanics performing services on public works projects no less than the current "prevailing rate of wages" (hourly cash wages plus an amount for fringe benefits) in the county where the work is performed. The Illinois Department of Labor (hereinafter "DEPARTMENT") publishes the prevailing wage rates on its website at <http://labor.illinois.gov/>. The DEPARTMENT revises the prevailing wage rates and the contractor/subcontractor has an obligation to check the DEPARTMENT's website for revisions to prevailing wage rates. For information regarding current prevailing wage rates, please refer to the DEPARTMENT's website. All contractors and subcontractor rendering services under this Agreement must comply with all requirements of the ACT, including but not limited to all wage requirements and notice and record keeping duties.

Section 16. Equal Opportunity Employment. During the performance of this Agreement, the VENDOR agrees as follows:

- i. The VENDOR will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The VENDOR will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The VENDOR agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- ii. The VENDOR will, in all solicitations or advertisements for employees placed by or on behalf of the VENDOR, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
- iii. The VENDOR will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the VENDOR's legal duty to furnish information.
- iv. The VENDOR will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the VENDOR's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

Section 17. Access to Records. The following access to records requirements apply to this Agreement:

- i. The VENDOR agrees to provide CITY, or any of their authorized representatives access to any books, documents, papers, and records of the VENDOR which are directly pertinent to this Agreement for the purposes of making audits, examinations, excerpts, and transcriptions.
- ii. The VENDOR agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

Section 18. Compliance with FOIA Requirements. VENDOR further explicitly agrees to furnish all records related to this Agreement and any documentation related to CITY required under the Illinois Freedom of Information Act (ILCS 140/1 et seq.) (hereinafter "FOIA") request within five (5) business days after CITY issues notice of such request to VENDOR. VENDOR agrees to not apply any costs or charge any fees to the CITY regarding the procurement of records required pursuant to a FOIA request. VENDOR agrees to defend, indemnify, and hold harmless CITY, and agrees to pay all reasonable costs connected therewith (including, but not limited to, reasonable attorney's and witness fees, filing fees, and any other expenses) for CITY to defend any and all causes, actions, causes of action, disputes, prosecutions, of conflicts arising from VENDOR actual or alleged violation of FOIA, or VENDOR failure to furnish all documentation related to a request within five (5) business days after CITY

issues notice of request. Furthermore, should VENDOR request that CITY utilize a lawful exemption under FOIA in relation to any FOIA request, thereby denying that request, VENDOR agrees to pay all costs connected therewith (such as reasonable attorney's and witness fees, filing fees, and any other expenses) to defend the denial of the request. The defense shall include, but not be limited to, challenged or appealed denials of FOIA requests to either the Illinois Attorney General or a court of competent jurisdiction. VENDOR agrees to defend, indemnify, and hold harmless CITY, and agrees to pay all costs connected therewith (such as reasonable attorney's and witness fees, filing fees, and any other expenses) to defend any denial of a FOIA request by VENDOR request to utilize a lawful exemption to CITY.

Section 19. Notices. All legal notices given in connection with this Agreement shall be made in writing and deemed complete by way of (a) hand delivery; (b) registered mail, postage prepaid; or (c) electronic mail with notice of receipt by the other PARTY at the following addresses or at such other address for a PARTY as shall be specified by like notice:

If to VENDOR:

Bailey Edward Design Inc
Attn: Robin Whitehurst
35 East Wacker Drive
Suite 2800
Chicago, IL 60601-2308

Copy to:

If to CITY:

City of Bloomington
Attn: City Manager
115 E. Washington St., Suite 103
Bloomington, IL 61701
admin@cityblm.org

Copy to:

City of Bloomington
Attn: Legal Department
115 E. Washington St., Suite 103
Bloomington, IL 61701
legal@cityblm.org

Section 20. Insurance. VENDOR shall, at a minimum, maintain insurance as required in the PROCUREMENT DOCUMENTS or as agreed upon with the City Procurement Manager. Certificates of insurance shall be provided to the CITY and CITY shall be named as additional insured under the policy(ies).

Section 21. Assignment. No PARTY may assign this Agreement, of the proceeds thereof, without prior written consent of the other PARTY.

Section 22. Changes or Modifications. This Agreement, its method of completion, its scope of work, nor its pricing may be modified or changed in any manner without the express written consent of both PARTIES via an Amendment fully executed by both PARTIES.

Section 23. Governing Law. This Agreement shall be governed by and interpreted pursuant to the laws of the State of Illinois, County of McLean.

Section 24. Joint Drafting. The PARTIES expressly agree that this Agreement was jointly drafted, and that both had the opportunity to negotiate its terms and to obtain the assistance of counsel in reviewing its terms prior to execution. Therefore, this Agreement shall be construed neither against nor in favor of either PARTY but shall be construed in a neutral manner.

Section 25. Attorney's Fees. In the event that any action is filed in relation to this Agreement, the unsuccessful PARTY in the action shall pay to the successful PARTY, in addition to all the sums that either PARTY may be called on to pay, a reasonable sum for the successful PARTY's attorney's fees (including expert witness fees).

Section 26. Paragraph Headings. The titles to the paragraphs of this agreement are solely for the convenience of the PARTIES and shall not be used to explain, modify, simplify, or aid in the interpretation of the provisions of this Agreement.

Section 27. Term. The term of this Agreement shall be:

 X Until all of the services and/or deliverables required to be provided within this Agreement are completed and accepted by CITY.

 From _____ year(s) from the date of this Agreement listed above.

 By the date state in the PROCUREMENT DOCUMENTS or no later than _____.

 This Agreement shall also be subject to the following renewal terms, if any:

Notwithstanding anything herein, the provisions in Sections 10 and 18 shall survive termination.

Section 28. Counterparts. This Agreement may be executed in any number of counterparts, including electronically, each of which shall be deemed to be an original, but all of which together shall constitute the same instrument.

IN WITNESS WHEREOF, the PARTIES hereto have executed this Space Sharing Agreement as of the date first above written.

CITY OF BLOOMINGTON

By: _____
Its City Manager

ATTEST:

By: _____
Its City Clerk

VENDOR

By: _____
Its President

By: _____
Its Principal

EXHIBIT A
DESCRIPTION OF SERVICES/WORK PROVIDED

Project Understanding

1. Overview:

The City of Bloomington Facility Management Department is requesting a proposal for professional architectural and engineering services for evaluation and design of improvements to the City Hall elevator.

2. Project Design Team:

Robin Whitehurst, Principal Todd Higginbotham, Project Manager Neil Nigos, Electrical Designer Bacon Farmer Workman, Structural Consultant Reliable Environmental Solutions, Environmental Consultant TBD, Elevator Consultant

3. Budget:

TBD

4. Schedule:

TBD

5. Documents Reviewed:

Professional Services:
BASIC SERVICES
Schematic Design
Design Development
Construction Documents

Deliverables:

City Hall Elevator Construction Documents

QUALIFICATIONS:

Respectfully Submitted, This Proposal constitutes an overview of the basic understanding and a framework from which to complete the services. Upon acceptance and agreement of the terms of this Proposal, a standard contract will be issued for execution. If, through a Notice to Proceed, the client requests Bailey Edward to begin work prior to the full execution of a contract, then the standard terms and conditions of the applicable AIA contract (B101) shall apply until a contract is fully executed. email address: rwhitehurst@baileyedward.com Robin Whitehurst, Principal Direct Phone: 312.789.4012 Two (2) total site visits during construction by either the Project Manager, Project Architect, Construction Observer or Project Engineers are included in the Basic Services. Two (2) Client and User meetings are included. The assumption is that there is no lead paint or other hazardous materials on the site. The Client is responsible for determining otherwise and coordinating any remediation.

**EXHIBIT B
PAYMENT TERMS**

Compensation:

Based upon the Project Understanding and Professional Services above and upon the Qualifications section that follows, we propose professional service fees as follows:

BASIC SERVICES FEE:

For the Basic Services defined in the Professional Services section above, we propose a fixed fee breakdown of total compensation:

Schematic Design \$9,720 18%
Design Development \$11,880 22%
Construction Documents \$15,660 29%
Bidding and Permit \$3,240 6%
Construction Administration \$13,500 25%
Total Cost of \$54,000 100%

REIMBURSABLE SERVICES:

The cost for allowable reimbursable expenses for this project is estimated to be:

Printing/Reproduction/Photography \$1,000
Elevator Consultant \$25,000
HazMat \$5,000
Total Cost of \$31,000

TOTAL BASIC SERVICES: \$54,000

TOTAL REIMBURSABLE ALLOWANCE: \$31,000

TOTAL COST: \$85,000

EXCLUSIONS:

Certification Services
Environmental Services
Interior Design
LEED Building Design
Record Drawings
Registration Services
AV Design
Warranty Phase



CONSENT AGENDA ITEM NO. 7.D

FOR COUNCIL: November 14, 2022

WARD IMPACTED: City-Wide Impact

SUBJECT: Consideration and action to approve an Agreement with Technical Solutions & Services, Inc., for improvements to the Police Department Building Automation System (RFP #2023-11), in the amount of \$203,800, as requested by the Public Works Department and the Police Department.

RECOMMENDED MOTION: The proposed Agreement be approved.

STRATEGIC PLAN LINK:

Goal 2. Upgrade City Infrastructure and Facilities

Goal 5. Great Place - Livable, Sustainable City

Goal 5. Great Place - Livable, Sustainable City

STRATEGIC PLAN SIGNIFICANCE:

Objective 2d. Well-designed, well maintained City facilities emphasizing productivity and customer service

Objective 5a. Well-planned City with necessary services and infrastructure

Objective 5c. Incorporation of "Green Sustainable" concepts into City's development and plans

BACKGROUND: The heating, ventilation and air conditioning controls, or Building Automation System (BAS), in the Police Department Administration building are original to the building's construction. The system is obsolete, and parts are no longer available. Necessary repairs involve bypassing failed components or converting automatic operation to manual operation. A complete system replacement and full evaluation is needed to ensure that mechanical components of the HVAC (Heating, Ventilation, and Air Conditioning) system are still fully functional and compatible with the new automation system.

This project involves not only construction work, but also system design, programming and troubleshooting. As such, the project was solicited as a Request for Proposals (RFP) instead of a standard bid. The RFP required potential vendors to submit their experience, qualifications, and costs to design, install, program, implement, troubleshoot, and commission a new fully functional BAS. Submitted proposals were evaluated based on (1) business qualifications, (2) employee qualifications, (3) performance history, and (4) project management experience. Cost was also considered as part of the total project evaluation.

Two proposals were received for RFP #2023-11. The submitted proposal costs are attached. Since neither vendor is local, the local preference policy has no impact.

There is a significant difference in price between the two proposals. However, staff recommends the proposal provided by Technical Solutions & Services at a higher cost because of the following exclusions, exceptions, and other limitations included in Alpha

Controls & Services submittal.

Alpha Controls Exclusions, Exceptions & Limitations

1. One-year warranty instead of three-years as required in RFP documents.
2. Fire Alarm system changes or integration required in RFP documents excluded.
3. Bonding and permits excluded but required in RFP documents.
4. Proposal only valid for 30 days.
5. Trane TechView software installation assistance not included in scope of work but required in RFP documents.
6. One year maintenance requested in RFP documents but not included in scope of work.
7. New VFD wiring to be done by others but required to be done by contractor.
8. Various exclusions, clarifications, and other limitations listed in Alphas Standard Terms & Conditions.
9. Technical Solutions & Services proposal included all RFP document items and included additional details that weren't required. A summary of their proposal follows.

Technical Solutions Proposal Summary

1. Full scope of work requested in RFP included. No exclusions, exceptions, or limitations.
2. Compliance with Niagra N4 framework included.
3. Sample graphics included.
4. All control wiring will be replaced.
5. Separate control for heating and cooling.
6. Three-year warranty and one year maintenance acknowledged.
7. Full VFD installation included.
8. Various product data provided.
9. Training and support documentation provided.
10. Other recommendations for system improvements.

Although Alpha Controls & Services provided the lowest price, the exclusions, exceptions, and limitations in their submittal do not fulfill all requirements of the request for proposals. Accepting their proposal is not in the best interest of the City.

COMMUNITY GROUPS/INTERESTED PERSONS CONTACTED: This work was advertised in *The Pantagraph* and *OPENGOV* on September 26, 2022. Pre-proposal meetings were held on September 29, 2022, at 10:00 a.m. and October 3, 2022, at 1:00 p.m.

FINANCIAL IMPACT: If approved, \$203,800.00 will be awarded to Technical Solutions & Services, Inc for this project. Funding for this project is included in the FY 2023 Budget under Capital Improvement-Buildings account (40100100-72520) with a budget of \$300,000. Stakeholders can locate this in the FY 2023 Budget Book titled "Other Funds & Capital Improvement" on pages 81, 83, 224, 246, and 252.

AMERICAN RESCUE PLAN FUNDING IMPACT: N/A

COMMUNITY DEVELOPMENT IMPACT: This request meets the following goals and objectives of the **Bloomington Comprehensive Plan 2035**: Goal UEW-1. Provide quality public infrastructure within the City to protect public health, safety and the environment, Objective UEW-1.1. Maintain the existing City operated infrastructure in good condition.

Respectfully submitted for consideration.

Prepared by: Russ Waller, Facility Manager

ATTACHMENTS:

[PW 1B Agreement 11142022](#)

[PW 1C Proposal Costs 11142022](#)

[PW 1D Procurement Documents RFP #2023-11 Police Department Administration BAS.1.pdf](#)

**CITY OF BLOOMINGTON AGREEMENT WITH
Technical Solutions & Services, Inc.**

**FOR
Police Department Administration Building Automation System Improvements**

THIS AGREEMENT, dated this ____ day of November, 2022, is between the City of Bloomington, IL (hereinafter "CITY") and Technical Solutions & Services, Inc. (hereinafter "VENDOR"). CITY and VENDOR may hereinafter collectively be referred to as the "PARTIES" and individually as the "PARTY".

NOW THEREFORE, the PARTIES agree as follows:

Section 1. Recitals. The recitals set forth above are incorporated into this Section 1 as if specifically stated herein.

Section 2. Description of Services. VENDOR shall provide the services/work identified on Exhibit A, attached hereto and incorporated herein.

Section 3. Incorporation of Bid/RFP/RFQ & Proposal Terms. The following shall apply to this Agreement:

☐

This Agreement was not subject to a formal solicitation process by the CITY.

☒

This Agreement was subject to the following procurement initiative by the CITY:

Police Department Administration Building Automation System Improvements, RFP 2023-11 (hereinafter "REQUEST").

Accordingly, the provisions of the REQUEST and the proposal submitted by VENDOR (hereinafter collectively referred to as "PROCUREMENT DOCUMENTS" and attached hereto), shall be incorporated into this Agreement and made a part thereof and shall be considered additional contractual requirements that must be met by VENDOR. In the event of a direct conflict between the provisions of this Agreement and the incorporated PROCUREMENT DOCUMENTS, the provisions of this Agreement shall prevail.

☐

This Agreement was not subject to a formal solicitation process by the CITY, but includes the other required proposal/documents attached hereto in Exhibit C.

Section 4. Payment. For the work performed by VENDOR under this Agreement, the City shall pay VENDOR one of the following:

☐

A flat fee of \$_____ as set forth in the Payment Terms attached as Exhibit B, attached hereto and incorporated herein.

☒

Fees as set forth in the Payment Terms attached as Exhibit B, attached hereto and incorporated herein not to exceed \$ 203,800.00.

Section 5. Requirement for Payment & Performance Bond. The following shall further apply to this Agreement:

☐

This Agreement is does not require the furnishment of any bonds by the VENDOR.



This Agreement is subject to bonding requirements.

- i. It is therefore understood that the VENDOR will furnish, at no expense to the CITY, Payment and Performance Bonds to the CITY in the amount of the contract as stated in Section 4 executed by the VENDOR and at least two sureties as set forth under the Laws of the State of Illinois, as a guarantee that the VENDOR will timely and faithfully perform the work outlined herein.
- ii. Said bond shall be conditioned to save and keep harmless said CITY from any and all claims, demands, losses, suits, costs, expenses, and damages which may be brought, sustained, or recovered against said CITY by reason of any negligence, default, or failure of the said VENDOR in designing, building, constructing, or completing said improvement and its appurtenances, or any part thereof, and that said improvement when constructed shall be free from all defects and remain in good order and condition for one year from its completion and acceptance by the CITY, ordinary wear and tear, and damage resulting from accident or willful destruction excepted; which bond is attached hereto and made a part hereof.

Section 6. Default. Either PARTY shall be in default if it fails to perform all or any part of this Agreement. If either PARTY is in default, the other PARTY may terminate this contract upon giving written notice of such termination to the PARTY in default. Such notice shall be in writing and provided thirty (30) days prior to termination. The non-defaulting PARTY shall be entitled to all remedies as set forth in Section 9 herein, upon the default or violation of this Agreement.

Section 7. Termination for Cause. The CITY may, at any time, terminate this Agreement, in whole or in part, for any of the following reasons effective immediately:

- i. VENDOR is found to be in violation of any term or condition of this Agreement.
- ii. VENDOR engages in any fraudulent, felonious, grossly negligent, or other illegal acts or behavior.
- iii. VENDOR declares bankruptcy or becomes insolvent.
- iv. CITY determines, in its sole discretion, that VENDOR is no longer able to fulfill VENDOR's obligations under this Agreement or PROCUREMENT DOCUMENTS.

Upon such termination, CITY shall be entitled to all remedies laid out in Section 9, as well as reimbursement of reasonable attorney's fees and court costs.

Section 8. Force Majeure. The CITY shall not be in default of this Agreement and shall not be held liable for any losses, failure, or delay in performance of its obligations under this Agreement or any Agreement, Amendment, Exhibit, or Attachment hereto arising out of or caused, directly or indirectly, by an event of Force Majeure. Force Majeure is defined as circumstances beyond the CITY's reasonable control, including, without limitation, acts of God; earthquakes; fires; floods; wars; civil or military disturbances; acts of terrorism; sabotage; strikes; epidemics; pandemics; riots; power failures; computer failure and any such circumstances beyond its reasonable control as may cause interruption, loss or malfunction of utility, transportation, computer (hardware or software) or telephone communication service; accidents; labor disputes; acts of civil or military authority; governmental actions; or inability to obtain labor, material, equipment or transportation.

Section 9. Remedies. In the event of a default or a violation of this Agreement, the non-defaulting PARTY shall be entitled to all remedies, whether in law or equity.

Section 10. Indemnification. To the fullest extent permitted by law, VENDOR shall indemnify and hold harmless CITY, its officers, officials, agents, and employees from claims, demands, causes of action, and liabilities of every kind and nature whatsoever arising out of or in connection with VENDOR's operations performed under this Agreement, except for loss, damage, or expense arising from the sole gross negligence or willful misconduct of the CITY or the CITY's agents, servants, or independent VENDORS who are directly responsible to CITY. This indemnification shall extend to all claims occurring after this Agreement is terminated as well as while it is in force. The indemnity shall apply regardless of any concurrent negligence, whether active or passive, of the CITY or CITY's officers, officials, agents, employees, or any other persons or entities. The indemnity set forth in this section shall not be limited by insurance requirements or by any other provision of this Agreement.

Section 11. Reuse of Documents. All documents, including but not limited to, reports, drawings, specifications, and electronic media furnished by VENDOR pursuant to this Agreement are instruments of the VENDOR's services. Nothing herein, however, shall limit the CITY's right to use the documents for municipal purposes, including but not limited to the CITY's right to use documents in an unencumbered manner for purposes of remediation, remodeling, and/or construction. VENDOR further acknowledges any such documents may be subject to release under the Illinois Freedom of Information Act.

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- iv. The VENDOR will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the VENDOR's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

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issues notice of request. Furthermore, should VENDOR request that CITY utilize a lawful exemption under FOIA in relation to any FOIA request, thereby denying that request, VENDOR agrees to pay all costs connected therewith (such as reasonable attorney's and witness fees, filing fees, and any other expenses) to defend the denial of the request. The defense shall include, but not be limited to, challenged or appealed denials of FOIA requests to either the Illinois Attorney General or a court of competent jurisdiction. VENDOR agrees to defend, indemnify, and hold harmless CITY, and agrees to pay all costs connected therewith (such as reasonable attorney's and witness fees, filing fees, and any other expenses) to defend any denial of a FOIA request by VENDOR request to utilize a lawful exemption to CITY.

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If to VENDOR:

Technical Solutions & Services, Inc.
Attn: William J. Schulz
140 Thunderbird Lane
East Peoria, IL 61611

Copy to:

If to CITY:

City of Bloomington
Attn: City Manager
115 E. Washington St., Suite 103
Bloomington, IL 61701
admin@cityblm.org

Copy to:

City of Bloomington
Attn: Legal Department
115 E. Washington St., Suite 103
Bloomington, IL 61701
legal@cityblm.org

Section 20. Insurance. VENDOR shall, at a minimum, maintain insurance as required in the PROCUREMENT DOCUMENTS or as agreed upon with the City Procurement Manager. Certificates of insurance shall be provided to the CITY and CITY shall be named as additional insured under the policy(ies).

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- ☐ Until all of the services and/or deliverables required to be provided within this Agreement are completed and accepted by CITY.
- ☐ From _____ year(s) from the date of this Agreement listed above.
- ☒ By the date state in the PROCUREMENT DOCUMENTS or no later than April 30, 2023.
- ☐ This Agreement shall also be subject to the following renewal terms, if any:
_____.

Notwithstanding anything herein, the provisions in Sections 10 and 18 shall survive termination.

Section 28. Counterparts. This Agreement may be executed in any number of counterparts, including electronically, each of which shall be deemed to be an original, but all of which together shall constitute the same instrument.

IN WITNESS WHEREOF, the PARTIES hereto have executed this Space Sharing Agreement as of the date first above written.

CITY OF BLOOMINGTON

By: _____
Its City Manager

ATTEST:

By: _____
Its City Clerk

VENDOR

By: _____
Its VP

By: _____
Its VP

EXHIBIT A
DESCRIPTION OF SERVICES/WORK PROVIDED

INCLUDED IN BASE PRICE – NO ALTERNATES

TSS shall provide labor and material to complete the following work:

1. **BAS**
 - a. Provide, install, and program a new Tridium network manager. The network manager shall communicate to new system controllers via the BACnet protocol. Custom graphics will be developed to represent all controlled systems and they shall reside in the network manager.
 - b. All BACnet communication wiring shall be replaced in its entirety.
2. **AHU1 & AHU2**
 - a. Provide, install, and program new dedicated Distech controllers for each unit.
 - b. As a minimum, we shall provide the same data points that currently exist.
 - c. Provide and replace all existing unit temperature sensors and return air humidity sensors.
 - d. Provide and replace all existing unit pressure sensors.
 - e. Provide and replace the existing controller enclosures.
3. **VAV Units**
 - a. Provide, install, and program new dedicated Distech controllers for each unit.
 - b. Provide and replace the existing room thermostats.
 - c. All FinTube units associated with a VAV shall be integrated to the new controllers.
 - d. Currently, the existing units do not have a supply air sensor. We shall install supply air sensors on all units.
4. **Heating/Cooling Systems**
 - a. Provide, install, and program new dedicated Distech controllers for each system.
 - b. As a minimum, we shall provide the same data points that currently exist.
 - c. Provide and replace all existing temperature sensors.
 - d. Provide and replace all existing pump current sensors.
 - e. Provide, install, and program a new outside air temperature sensor and humidity sensor.
 - f. Rework all existing wiring at the boilers.
 - g. Fabricate and install new boiler on/off override panel.
5. **Parking Garage**
 - a. Provide, install, and program a new Distech controller to replicate the existing controller serving Unit Heaters 1 - 6.
 - b. Provide, install, and program temperature sensors for alarming purposes in three(3) stairwells, Rm003 & Rm005.
 - c. Replace all CO sensors. The CO sensors are hardwired to activate exhaust fans without any DDC control. This work shall remain as-is.
6. **Unit Heaters 7 -20**
 - a. To replicate the existing control sequence of operation, we shall provide, install, and program new Distech controllers for each unit. A new space temperature sensor shall be installed and programmed for alarming purposes.
 - b. In addition to the existing conditions, for each unit heater and exhaust fan, fan current sensors shall installed and programmed for alarming purposes.
 - c. Associated exhaust fans shall control as-is through the new controllers.
7. **Stand alone FinTube units and HC-1**
 - a. To replicate the existing control sequence of operation, we shall provide, install, and program new Distech controllers for each unit.
8. **Radio and Dispatch areas**
 - a. Temperature sensors shall be installed and connected to the BAS for alarming purposes.
 - b. Conduit and wiring shall be routed to the areas for future BAS integrations.
9. **Trane TechView software**
 - a. We shall install the required communication wiring from the Trane chiller to the Owner provided BAS computer and assist the Owner with the TechView software installation.

ALTERNATE 1

1. **AHU1 & AHU2**
 - For each unit supply fan, we shall provide and install a Variable Speed Drive.

CLARIFICATIONS

1. The original Johnson Controls drawings indicate several systems that utilize hardwire, non-DDC wiring to control miscellaneous equipment. These systems shall remain as-is.
2. The new BAS shall have a minimum 3-year warranty for defects and failure of all components and a one-year workmanship warranty. In addition, one year of maintenance shall be provided for the new BAS.
3. We acknowledge addendums 1, 2 & 3.

EXHIBIT B
PAYMENT TERMS

BASE PRICE = One Hundred Ninety-Seven Thousand.....No/100(\$197,000) DOLLARS
ALTERNATE 1 PRICE = Six Thousand Eight Hundred.....No/100(\$6,800) DOLLARS
TOTAL PRICE = Two Hundred Three Thousand Eight Hundred.....No/100(\$203,800) DOLLARS

EXHIBIT C
OTHER REQUIRED PROPOSAL/DOCUMENTS

Police Department Administration Building Automation System Improvements, RFP#2023-11 Original Solicitation Document, Addenda and Entire Proposal submitted by Technical Solutions & Services, Inc. are incorporated by reference.

BLOOMINGTON POLICE DEPARTMENT ADMINISTRATION BUILDING AUTOMATION SYSTEM IMPROVEMENT (RFP 2023-11)

				Alpha C & S		Technical Solutions & Services	
Line Item	Description	Quantity	Unit	Unit Cost	Total	Unit Cost	Total
1	BAS Upgrade in accordance with	1	LS	\$125,291.40	\$125,291.40	\$197,000.00	\$197,000.00
2	Alternate A1 - VFD Replacement	2	Each	\$4,791.50	\$9,583.00	\$3,400.00	\$6,800.00
	Total				\$134,874.40		\$203,800.00



REQUEST FOR PROPOSAL

2023-11

POLICE DEPARTMENT ADMINISTRATION BUILDING AUTOMATION SYSTEM IMPROVEMENTS

City of Bloomington
115 East Washington Street, Suite 403
Bloomington, IL 61701

RELEASE DATE: September 26, 2022

DEADLINE FOR QUESTIONS: October 6, 2022

RESPONSE DEADLINE: October 10, 2022, 2:00 pm

RESPONSES MUST BE SUBMITTED ELECTRONICALLY TO:

<https://secure.procurenow.com/portal/cityblm>

City of Bloomington
REQUEST FOR PROPOSAL
Police Department Administration Building Automation System
Improvements

I.	Legal Notice
II.	Introduction.....
III.	Instruction to Offerors
IV.	Scope of Work
V.	Pricing Proposal
VI.	Evaluation Criteria
VII.	Insurance Requirements
VIII.	Terms and Conditions
IX.	Vendor Questionnaire.....

Attachments:

A - BAS Improvement

B - JCI Police Dept. Plans_Problem Notes

C - RFP #2023-11 Pre-Proposal Meeting Attendance 9.29.22

D - RFP #2023-11 Pre-Proposal Meeting Attendance 10.3.22

1. LEGAL NOTICE

1.1. Request for Proposal - City of Bloomington, Illinois

Sealed proposals will be received via the City's e-Procurement Portal, [Procurenow](https://secure.procurenow.com/portal/cityblm) (<https://secure.procurenow.com/portal/cityblm>), until Monday, October 10, 2022 at 2:00 pm Central time, for the following:

RFP #2023-11

Police Department Administration Building Automation System Improvements

A non-mandatory pre-bid meeting will be held on Thursday, September 29, 2022 at 10:00 am central time, at:

Police Department - 305 S. East St, Bloomington, IL

It is highly suggested that interested parties attend.

Proposal documents are to be obtained from the City's e-Procurement Portal. Offerors shall create a FREE account with ProcureNow by signing up at <https://secure.procurenow.com/signup>. Once account registration has been completed, browse back to <https://secure.procurenow.com/portal/cityblm>, click on "Submit Response", and follow the instructions to submit the electronic proposal. Only Offerors following the project, with an active account, are eligible for the contract award.

The City of Bloomington reserves the right to reject any and all proposals and to waive technicalities. The award will not be based solely on the "low proposal." The award will be based on the criteria for selection contained within this document.

The successful offeror will be required to provide Performance Bond and Payment Bonds in the amount equal to 100% of the contract price, within ten (10) business days after the proposal award.

The City of Bloomington requires all Offerors doing business with the City not to discriminate on the basis of race, age, color, religion, gender, ancestry, national origin, marital status, mental or physical disability unrelated to ability, familial status or sexual orientation.

Contractors shall not pay less than the prevailing rates of wages to all laborers, workmen, and mechanics performing work under this contract, and shall comply with the requirements of the Illinois Prevailing Wage Act (820 ILCS 130/1-12) including Public Act 100-1177 effective June 1, 2019.

Misty Shafer, Senior Procurement Specialist

Monday, September 26, 2022, Bloomington, Illinois

2. INTRODUCTION

2.1. Summary

The City of Bloomington, Illinois ("City") is accepting sealed proposals for 2023-11, Police Department Administration Building Automation System Improvements to be submitted via the City's e-Procurement Portal, ProcureNow until Monday, October 10, 2022, 2:00 pm CST.

2.2. Background

The City of Bloomington, incorporated in 1856, is a home rule unit of government under the 1970 Illinois Constitution. The City of Bloomington is located in the heart of Central Illinois, approximately 125 miles southwest of Chicago, 155 miles northeast of St. Louis and 64 miles northeast of Springfield, the State Capital. The City of Bloomington is the County Seat of McLean County, the largest county in Illinois (approximately 762,240 acres). The results of the 2010 Census shows the City now has a population of 76,610 citizens. The economic strength of the City of Bloomington metropolitan area is well diversified with no single dominating industry.

2.3. Contact Information

Russel Waller

Director of Facilities

109 E. Olive

Bloomington, IL 61701

Email: rwaller@cityblm.org

Phone: [\(309\) 434-2492](tel:(309)434-2492)

Department:

Facilities Management

2.4. Timeline

The following projected timetable should be used as a working guide for planning purposes. The City reserves the right to adjust this timetable as required during the course of this statement process.

RFP Released	September 26, 2022
Pre-Proposal Meeting/Site Visit (Non-Mandatory)	September 29, 2022, 10:00am Police Department - 305 S. East St, Bloomington, IL
Questions Due to City	October 6, 2022, 4:00pm
Response from City	October 7, 2022, 4:00pm

Proposals Due	October 10, 2022, 2:00pm
Proposal Opening	October 10, 2022, 2:00pm
Anticipated Award Date	October 24, 2022

3. INSTRUCTION TO OFFERORS

3.1. Bid Submission

Offerors are required to submit sealed proposals via the City's e-Procurement Portal, until Monday, October 10, 2022, 2:00 pm CST.

3.2. Definition

- A. "City" shall mean the City of Bloomington, Illinois.
- B. "Requests for Proposals" (RFP) is a method of procurement permitting discussions with responsive, responsible offerors and revisions to proposals prior to award of contract. Proposals will be opened and evaluated in private. Award will be based on the criteria set forth herein.

3.3. Pre-Proposal Meeting

A non-mandatory pre-proposal meeting will be held on Thursday, September 29, 2022, commencing promptly at 10:00 am, and will be held:

Police Department - 305 S. East St, Bloomington, IL

The purpose of the pre-proposal meeting is to allow an open forum for discussion and questioning with City staff regarding the RFP with all prospective proposals having an equal opportunity to hear and participate. Oral questions will receive oral responses, neither of which will be official, nor become part of the RFP. Only written responses to written questions will be considered official, and will be included as part of the RFP.

All prospective offerors are strongly encouraged to attend.

3.4. Questions

All questions related to this RFP shall be submitted in writing through the ProcureNow Question/Answer Tab via the City's e-Procurement portal, on or before, Thursday, October 6, 2022 by 4:00 pm. Please include the section title for each question, if applicable, in order to ensure that questions asked are responded to correctly. All questions submitted and answers provided shall be electronically distributed to offerors following this solicitation on the City's e-Procurement Portal.

3.5. Addenda

Any addenda shall be posted on the City's e-Procurement Portal. Addenda notifications will be emailed to all persons on record as following this RFP. Failure of any offeror to receive any such addenda or interpretation shall not relieve such offeror from any obligation under their proposal as submitted. All addenda so issued shall become part of the contract documents.

3.6. Withdrawal of Proposal

Proposals may be withdrawn through the City's e-Procurement Portal, the responding firm may "unsubmit" their bid in ProcureNow. After withdrawing a previously submitted proposal, the responding firm may submit another bid at any time up to the deadline for submitting bids prior to the bid opening.

Except as otherwise provided by regulation, all decisions to permit the correction or withdrawal of proposals following the proposal opening, or to cancel awards or contracts based on proposal mistakes, will be submitted in writing and will be supported by a written determination made by the Procurement Manager. The request shall then be forwarded to the City's legal staff for final recommendation.

3.7. Rejection of Bids

The City of Bloomington reserves the right to reject any and all bids and to waive technicalities and to accept that bid which is to be considered to be in the best interest of the City. Any such decision shall be considered final.

3.8. Bid Opening

Telephone/Fax/Verbal Offers Will Not Be Accepted.

Bids shall be publicly opened and read at the time and date set. It is the responsibility of the Bidders/Consultants/Contractors to see that the bid is submitted in the City's e-Procurement Portal, by the specified time and date. Bids received after the time and date will not be accepted.

3.9. City's Rights

The City of Bloomington reserves the right to reject any and all proposals and to waive technicalities, and to accept that proposal which is to be considered in the best interest of the City. Any such decision shall be considered final. Proposals shall be opened in private so as to avoid disclosure of contents to competing offerors.

The Evaluation Committee may conduct discussions with any offeror who submits an acceptable or potentially acceptable proposal. Offerors shall be accorded fair and equal treatment with respect to any opportunity for discussion and revision of proposals. During the course of such discussions, the Evaluation Committee shall not disclose any information derived from one proposal to any other offeror.

The City of Bloomington reserves the right to negotiate specifications, terms and conditions, which may be necessary or appropriate to the accomplishment of the purpose of this RFP. The City may require the RFP and the offeror's proposal be incorporated in full or in part as Contract Documents. This implies that the RFP and all responses, supplemental information, and other submissions provided by the offeror during discussions or negotiations may be held by the City as contractually binding on the successful offeror.

When the Evaluation Committee determines an offeror's proposal to be unacceptable, such offeror shall not be afforded an additional opportunity to supplement its proposal.

The City of Bloomington will not be liable in any way for any costs incurred by respondents in replying to this RFP.

4. SCOPE OF WORK

4.1. [Improvements to the Bloomington Police Department Administration Building Automation System](#)

See attached plans and specifications.

POLICE DEPARTMENT ADMINISTRATION BUILDING AUTOMATION SYSTEM

I. GENERAL BUILDING INFORMATION

The Police Department Administration building is a multi-level structure containing general office space, meeting areas, storage areas, mechanical & electrical rooms and vehicle parking areas. The facility was built in 1996.

II. EXISTING BUILDING AUTOMATION SYSTEM

The existing Building Automation System (BAS) is a Johnson Controls Metasys System which was installed when the facility was initially constructed. A few minor upgrades to the BAS have been performed since the building became operational. Record drawings for the original BAS system are attached.

III. EXISTING CONTROL COMPONENTS

The existing control components include automated dampers, valves, variable frequency drives, thermostats and various sensors, including occupancy, temperature, pressure, etc.

IV. EXISTING HVAC COMPONENTS

The existing primary HVAC components include chillers, a cooling tower, boilers, hot water heating pumps, air handling units and exhaust fans.

V. REQUIRED AUTOMATION

The City of Bloomington is requesting proposals from Qualified Providers to design, install, calibrate, activate and train City staff on an upgraded Building Automation System or improvements to the existing system. The work must be based on the following specification with no exceptions.

A. BAS UPGRADE SCOPE OF WORK (OPTION A)

1. Furnish all labor, materials and equipment necessary for a complete and operating Building Automation System (BAS) upgrade and integration, utilizing Open Protocol Direct Digital Controls only. The intent is to provide a system that is open in protocol throughout the facility and based upon the Niagara N4 Framework.
2. Any proposed system architecture must fully support a multi-vendor environment and be able to integrate third party systems via existing vendor protocols including, as a minimum, LonTalk, BACnet, and Modbus.
3. System architecture shall provide secure Web access using a standard web browser from any computer on the owner's LAN that has proper credentials and password information.
4. All control devices furnished must be programmable directly from the Niagara N4 Workbench upon completion of this project. The use of configurable or programmable controllers that require additional software tools for post-installation maintenance are not acceptable.

POLICE DEPARTMENT ADMINISTRATION BUILDING AUTOMATION SYSTEM

5. Any control vendor that must provide additional BMS server software shall be unacceptable. Only systems that utilize the Niagara N4 Framework meet the requirements of this RFP.
6. The BAS server shall host all graphic files for the control system. All graphics and navigation schemes for this project shall be custom generated to match the existing mechanical equipment and building layout. Generic “cut and paste” graphics will not be acceptable.
7. OPEN NIC STATEMENTS - All Niagara N4 software licenses shall have the following NiCS: “accept.station.in=*”; “accept.station.out=*” and “accept.wb.in=*” and “accept.wb.out=*”. All open NIC statements shall follow Niagara Open NIC specifications; systems not meeting these fully open standards are not acceptable.

OPEN, INTEROPERABLE, INTEGRATED ARCHITECTURE (OPTION A)

8. Responders must provide a system based on a peer-to-peer networked, stand-alone, distributed control system utilizing industry standard open protocol communication providing the end user with one open, interoperable system.
9. The supplied system software shall employ object-oriented technology (OOT) for representation of all data and control devices within the system. In addition, adherence to industry standards including ANSI/ASHRAE™ Standard 135, BACnet and LonMark to assure interoperability between all system components is required.
10. A hierarchical topology is required to assure reasonable system response times and to manage the flow and sharing of data without unduly burdening the customer’s internal Intranet network. Systems employing a flat single tiered architecture shall not be acceptable. Maximum acceptable response time from any alarm occurrence (at the point of origin) to the point of annunciation shall not exceed 10 seconds for network connected user interfaces. Maximum acceptable response time from any alarm occurrence (at the point of origin) to the point of annunciation shall not exceed 60 seconds for remote or dial-up connected user interfaces.
11. All components and controllers supplied shall be true “peer-to-peer” communicating devices. Components or controllers requiring “polling” by a host to pass data are not acceptable.

B. BAS IMPROVEMENT SCOPE OF WORK (OPTION B)

1. In lieu of providing the BAS upgrade described in the previous sections (OPTION A), an alternate proposal may be submitted. This alternate proposal (OPTIONB) shall accomplish all other requirements included in this request by making improvements to the existing BAS.
2. The proposal shall be clearly identified as BAS IMPROVEMENT (OPTION B).

POLICE DEPARTMENT ADMINISTRATION BUILDING AUTOMATION SYSTEM

3. All labor, materials and equipment necessary for a complete and operating improvement of the existing BAS shall be included.

C. SOFTWARE OWNERSHIP (OPTIONS A & B)

The City of Bloomington shall have full ownership and full access rights for all network management, operating system server, graphics, engineering designs and programming software required for the ongoing maintenance and operation of the Building Automation System.

D. OTHER INFRASTRUCTURE IMPROVEMENTS (OPTIONS A & B)

1. Some existing sensors or control equipment are damaged or not functional. These items are listed in the attached Table 1. These items need to be repaired or replaced and incorporated into the fully functional BAS for the facility.

2. Some equipment is currently not included in the existing BAS. This equipment is listed in the attached Table 2. The table also identifies equipment that will not be included in the BAS improvements project and equipment that need to be added to the BAS as part of the project.

3. The BAS upgrade or improvements need to include all required fire system interaction or override for compliance with applicable codes.

4. All new electrical circuits must be in existing or new conduit and comply with applicable codes.

5. All new fire alarm circuits must be in existing or new conduit and comply with applicable codes.

VI. SCHEDULE

A. BAS improvements or upgrades shall be scheduled and performed such that minimal disruption to the operation of the facility occurs.

B. Complete implementation of the BAS improvement or upgrade shall be completed no later than April 30, 2023. The completion date may be extended at the sole discretion of City Facility Management staff. The contractor shall request the extension in writing at least 15 days prior to the completion date and provide an explanation why the extension is necessary.

VII. SUBMITTAL REQUIREMENTS

A. Submittals shall include the following sections with relevant documentation. Additional information can be provided. The City of Bloomington reserves the right to reject any response that is not formatted as described.

1. Cover Letter
2. Table Contents
3. Proposal with Cost Based on Services Requested
4. Executive Overview
5. Company Overview

POLICE DEPARTMENT ADMINISTRATION BUILDING AUTOMATION SYSTEM

6. Company's Commitment to Process
7. Individual Team Member's Resumes
8. Sole Source Open Architecture Capabilities
9. Project Management Plan
10. Location of Office and Service Personnel Responsible of the Project
11. References with Similar Scopes of Work
12. Equipment, Maintenance, Training & Support

VIII. EVALUATION CRITERIA

- A. Respondents Business Qualifications (40%)
 1. Ability to be the first party and sole source provider of the requested Building Automation System improvement or upgrade.
 2. Years of Experience in Building Automation System field.
 3. Location of Qualified Providers Office, to provide timely service.
 4. Ability to provide a sole source Open Architecture Building Automation System, without the use of proprietary software or hardware.
- B. Respondents Employee Qualifications (20%)
 1. Experience of employees to perform their specified duties.
 2. Years of experience providing their specified duties.
 3. Location of employees to provide timely service.
- C. Performance History (30%)
 1. Experience with design, installation, and maintenance, monitoring and training for customers with similar scopes of work.
 2. Sole source responsibility for design, installation, and maintenance, monitoring and training for projects with similar scopes of work.
 3. References of prior customers with similar scopes of work.
- D. Project Management Experience (10%)
 1. Ability to provide in-house Project Management services for the desired design, installation, maintenance, monitoring and training of a Building Automation System improvement or upgrade.
 2. Methods used to determine cost associated with the desired scope of work.
 3. Ability to provide local resources to insure a timely project with desired results.

IX. RIGHTS & RESPONSIBILITIES

The City of Bloomington reserves the right to reject any and all responses received from this RFP. Late responses will not be accepted. The City of Bloomington is not responsible for any cost incurred by any person or company that issues a response to this RFP.

POLICE DEPARTMENT ADMINISTRATION BUILDING AUTOMATION SYSTEM IMPROVEMENTS

RFP # 2023-11

TABLE 1 - EXISTING DAMAGED OR NON-FUNCTIONAL CONTROL EQUIPMENT

CONTROL EQUIPMENT	LOCATION	CURRENT CONDITION	DESIRED CONDITION
Exhaust Fans	Parking Garage	Controls or Programming not functional. Fans currently operate 24/7/365.	Fans should be controlled by CO sensors.
Boilers	Mechanical Room	Originally the 4 Boilers were controlled by a Weil-McLean Boiler control and the building automation system only sent an on/off command. The Weil-McLean control was scrapped and a basic Johnson Control system was put in its place. It is not in an electrical box, but sitting on top of abandoned Weil-McLean box. Wiring is not code compliant. Outside air temp sensor was ran with non-plenum thermostat wire and is going up through the existing mechanical room exhaust fan hood and the wire comes out of a vent on the side of the exhaust fan into a LB fitting with the sensor inside. Also, we currently do not have any status and temp sensors going to BAS to notify us when a boiler goes down. It has to be manually assessed in person.	Replace the current controls for all 4 boilers to full automation, with graphics, override controls, etc. All work shall be done in conformance with applicable codes.
Fin Tube Coils	Throughout Building	Currently all fin tube radiant heaters are controlled through the nearest VAV box controller. Every fin tube heater in the building does not function automatically with a change in room temperature. It has become standard operation to manually override all fin tube valves through the corresponding VAV in order to turn them off and on. Some VAV box controllers are not operational at all, and staff must manually turn on/off valves to these tubes each spring and fall.	Repair, replace or add VAV box controllers that are not functional. Update programming for VAV and fin tube control based on temperature and schedule.
Rooftop Chiller	Roof	There are currently no alarm interlocks into the BAS indicating when the Chiller has gone into alarm. It requires someone to go onto the roof and access the control panel on the Chiller to find out if the system has any faults, alarms or lockouts present.	The new automation system needs to be tied into the chiller control system so the building operator can view chiller alarm status without going to roof on a daily/weekly basis. An indicator of alarm on the BAS system will help in more timely response to a failed component in the system before the entire chiller is down.
VAV's	Throughout Building	The individual operation and controls of the VAV boxes are not functioning when changes are made. It's as if the points and programming links in the background were not set up properly so making changes does nothing on several points on many if not all VAV controller user interface BAS pages. It is difficult to control the airflow in heating and cooling seasons with limited functional control of listed features on respective VAV control pages. Also, zone setpoint is out of service on VR-6 and VR-19.	Repair, replace or add VAV box controllers and update programming to address this issue.
VAV's	2nd Floor	VAV boxes are uninsulated and when building humidity is high, condensation would form on the sheet metal causing rusting along with condensation dripping onto the ceiling tile. Many ceiling tile were replaced over the years because of this problem.	Situation has been improved, if not completely corrected, with changes made to the dehumidification programming of the building. Issue should be investigated after all BAS improvements are complete and VAV boxes should be insulated as needed under the alternate bid item.

POLICE DEPARTMENT ADMINISTRATION BUILDING AUTOMATION SYSTEM IMPROVEMENTS

RFP # 2023-11

TABLE 1 - EXISTING DAMAGED OR NON-FUNCTIONAL CONTROL EQUIPMENT

CONTROL EQUIPMENT	LOCATION	CURRENT CONDITION	DESIRED CONDITION
BAS Graphics	Throughout Building	Non graphics based system.	The new system shall be graphics based to assist in the visual understanding of the operation of the entire system by the building operator. Status of operation of components, inlet and outlet temps of piping and air flow devices, etc. broke down by component and floor level for quick reference in the automation system.
OA/Humidity Sensor	Mechanical Room & Building Exterior	Original OA/Humidity sensor for the system was previously located in the OA inlet air duct on the South side of the building. This never allowed the system to accurately function as the sun had a significant effect on the sensor causing it to read high during the daytime, and the humidity sensor did not get consistent outside airflow causing it to give unreliable results. Johnson Controls installed a new OA/Humidity Sensor on the Northeast corner of the building and abandoned the original in duct sensor. We were able to increase energy savings utilizing greater OA cooling vs. mechanical along with limiting OA air into the building when outside humidity high limiting the need for excessive dehumidification operation. At this time our dehumidification programming was adjusted and has been functioning better than ever.	Maintain current configuration, but replace sensors as needed.

POLICE DEPARTMENT ADMINISTRATION BUILDING AUTOMATION SYSTEM IMPROVEMENTS
RFP # 2023-11

TABLE 2 - EQUIPMENT CURRENTLY NOT ON BAS

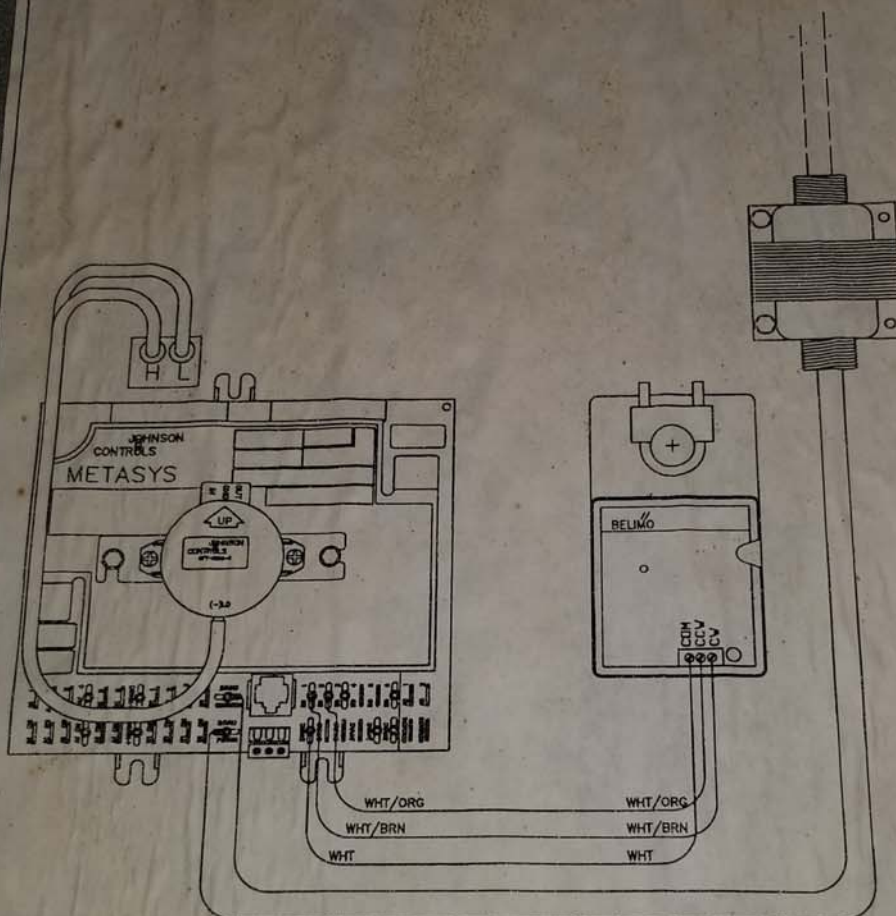
EQUIPMENT	LOCATION	ISSUE / PROBLEM	ADD TO BAS
Future Controls	Dispatch	Add conduit, wiring and box to control future AC system	No
Future Controls	Radio Room	Add conduit, wiring and box to control future AC system	No
Temp Sensor	Radio Room	There is a stand-alone ductless split air conditioning system that is used to cool the radio control room. This system is not a part of the BAS. At minimum, a temperature sensor shall be installed and monitored on the new BAS and an alarm alert be sent when the room temperature gets above desired temp, indicating the cooling system is not working. This would allow quicker notification/response time for repairs or other arrangements to keep the equipment cool so that it does not overheat and go offline or worse.	Yes
Future Controls	LL-2 elevator rooms, generator room, water service room, all emergency stairwells and lobby entrances with unit heaters	We have had several instances where the heater would stop working and the pipes would freeze and burst in these areas. It would be beneficial, at minimum, to have a temperature sensor in these rooms in order to monitor temperature. An alarm in the BAS when the room temp falls outside of an acceptable range would be an early alert for potential freeze issues. Secondly, a full automation with status of these components could be but on the automation for remote testing of operational function to ensure proper operation in a more proactive manner.	Yes



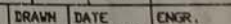




SHEET 1
1 OF
SHEETS



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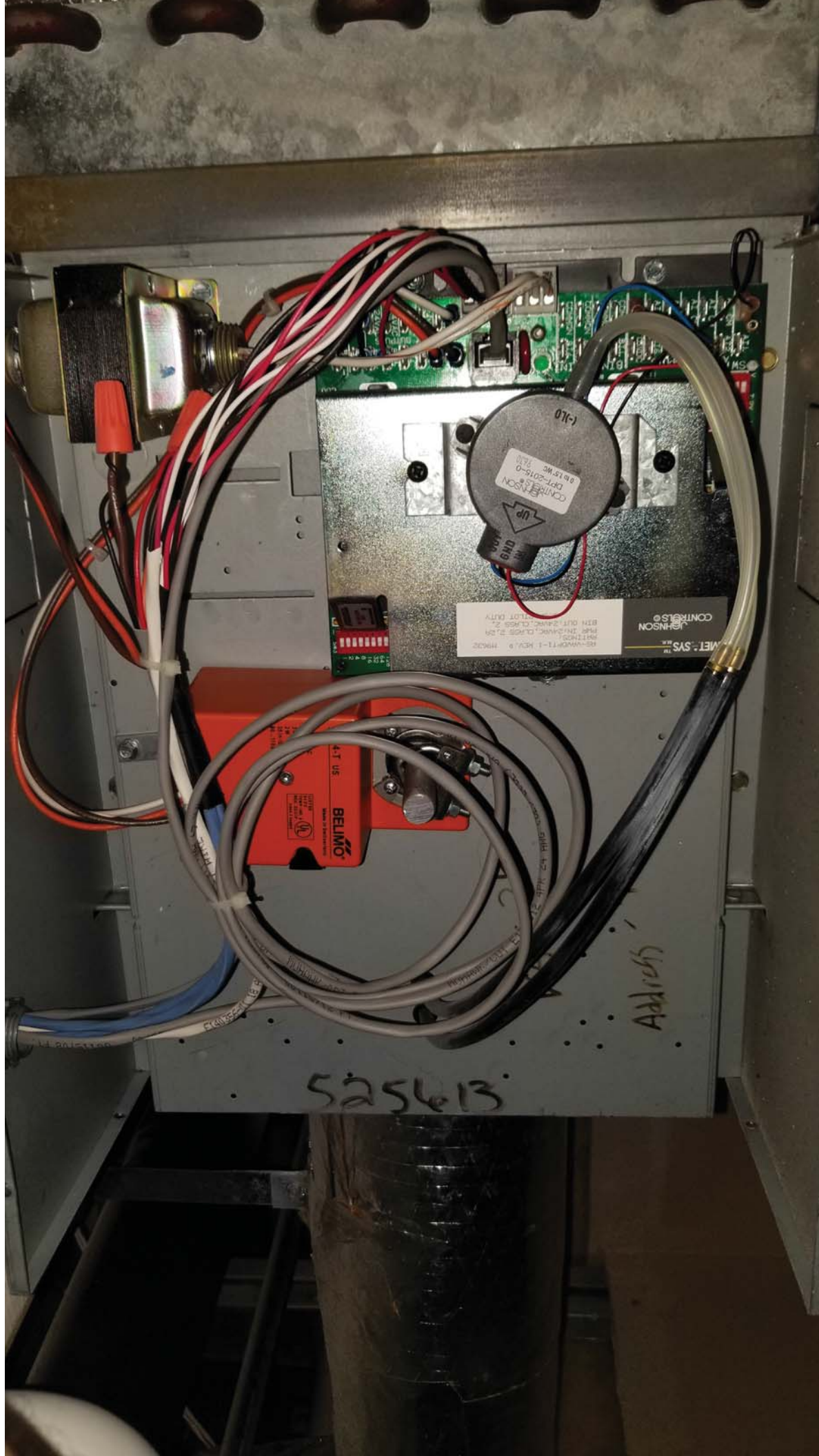


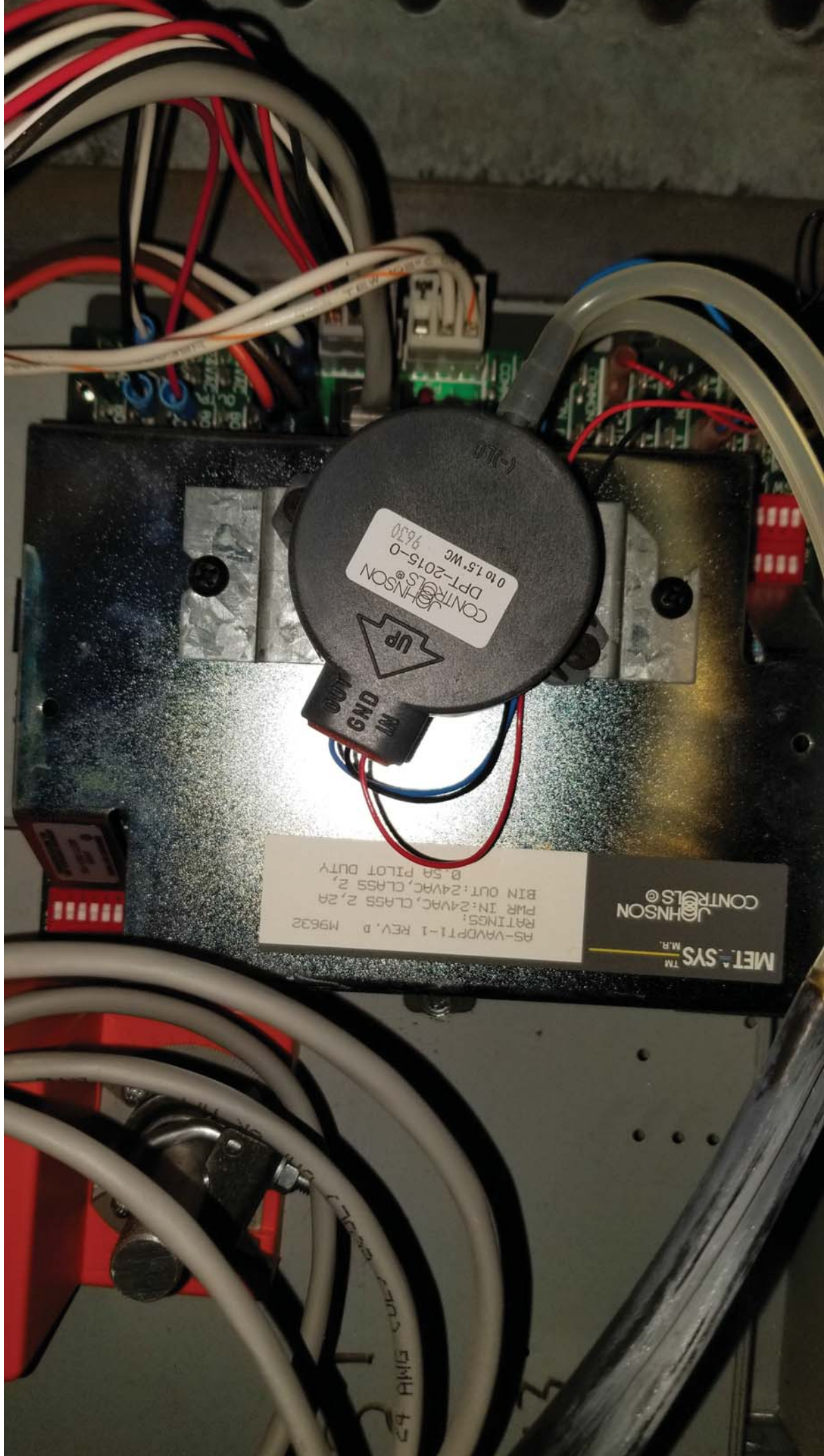
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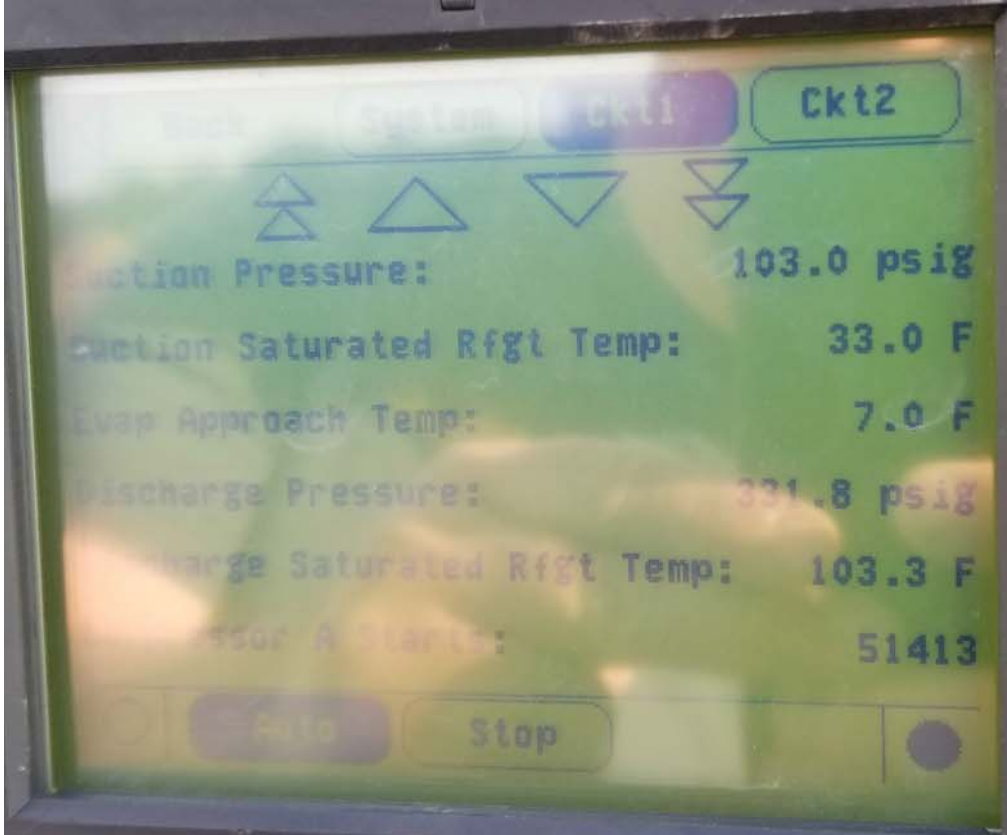
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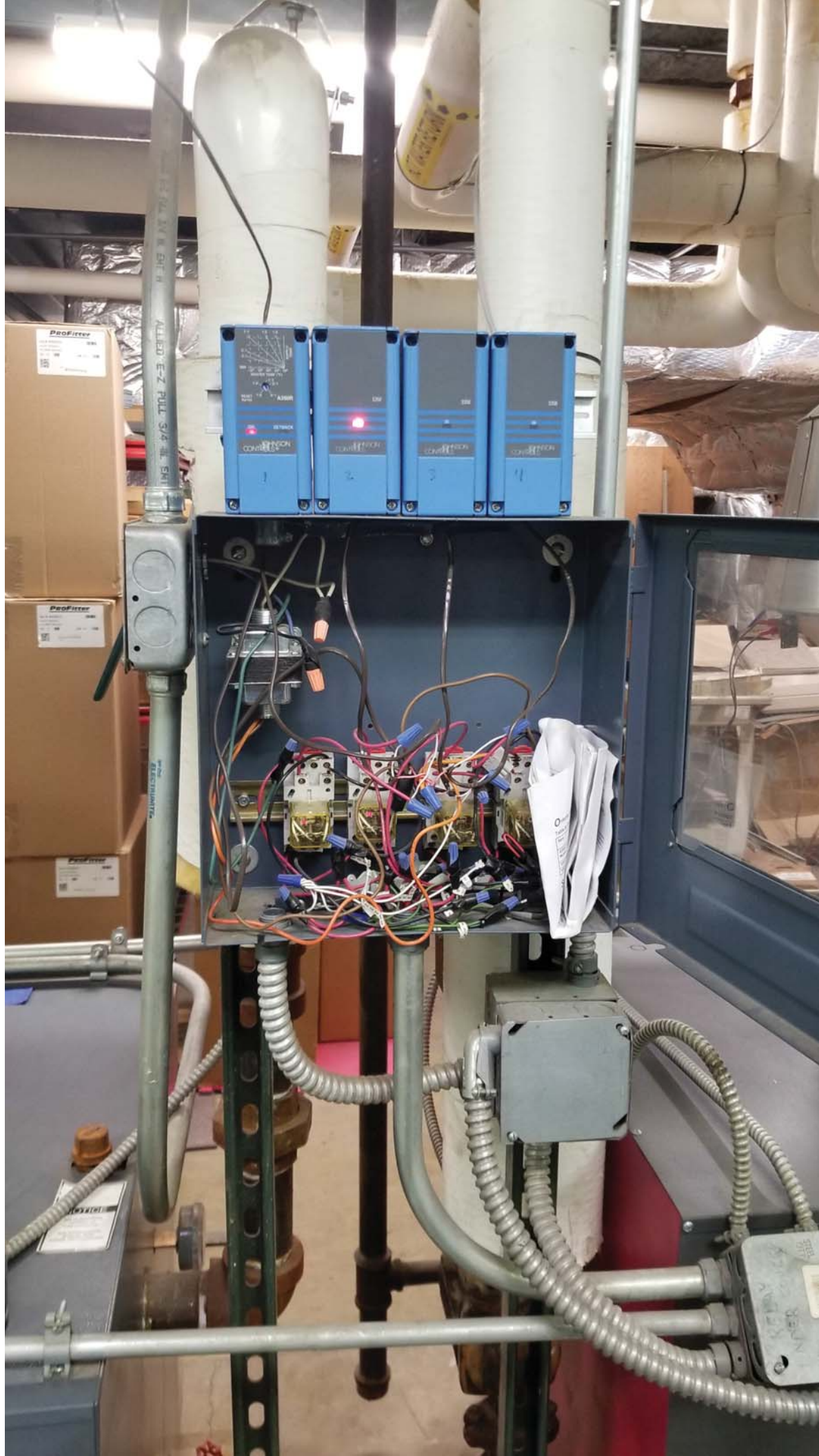




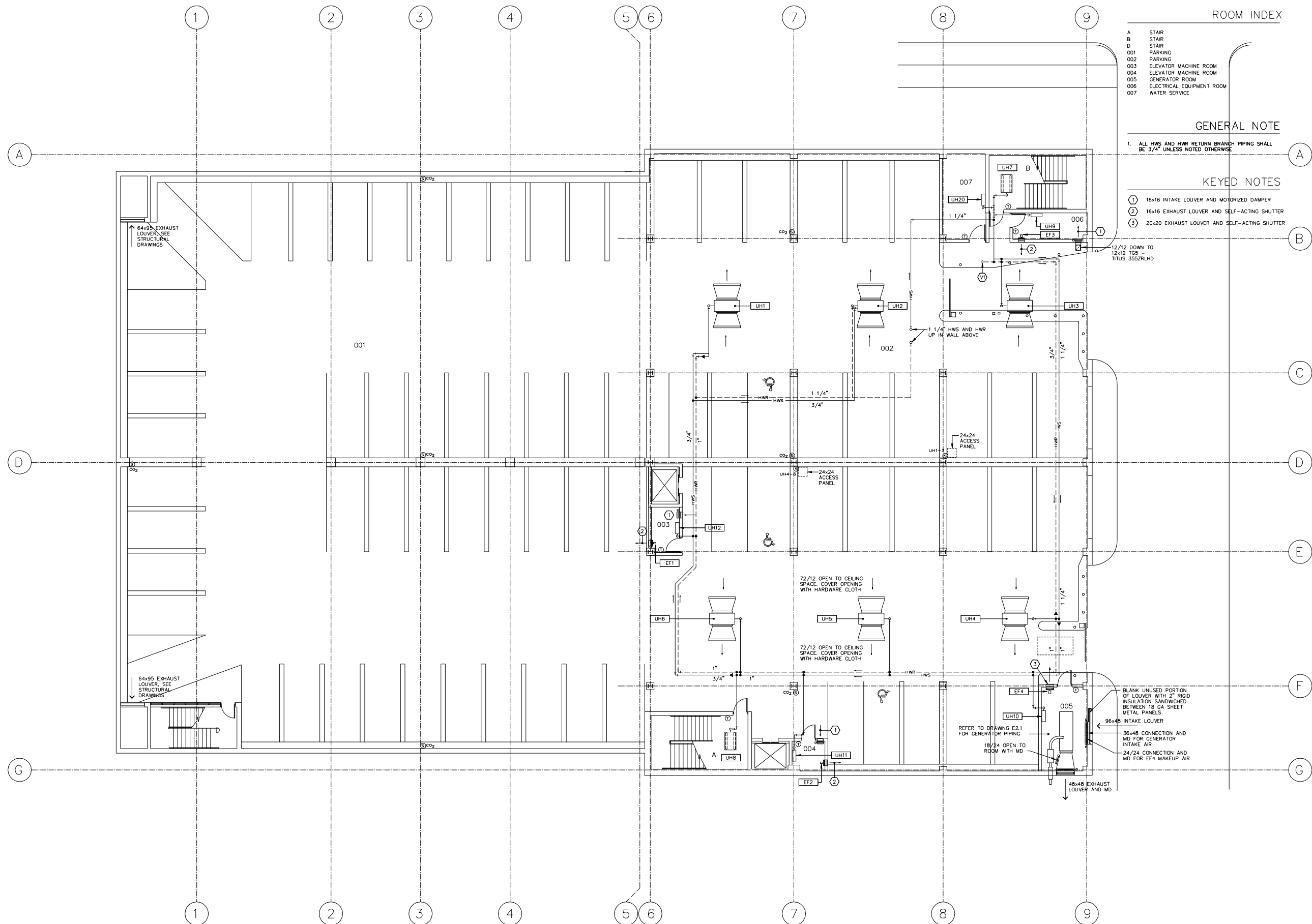
TRANE®



ADAPTIVE CONTROL™







ROOM INDEX

- A STAIR
- B STAIR
- D STAIR
- 001 PARKING
- 002 ELEVATOR MACHINE ROOM
- 003 ELEVATOR MACHINE ROOM
- 004 GENERATOR ROOM
- 005 ELECTRICAL EQUIPMENT ROOM
- 006 WATER SERVICE

GENERAL NOTE

- 1. ALL HWS AND HWR RETURN BRANCH PIPING SHALL BE 3/4\"/>

KEYED NOTES

- 1 16x16 INTAKE LOUVER AND MOTORIZED DAMPER
- 2 16x16 EXHAUST LOUVER AND SELF-ACTING SHUTTER
- 3 20x20 EXHAUST LOUVER AND SELF-ACTING SHUTTER

SHIVE-HATTERY
ENGINEERS AND ARCHITECTS, Inc.
2103 EASTLAND DRIVE, BLOOMINGTON, ILLINOIS 61702-0489
(309) 662-8952 FAX (309) 662-5808

BLOOMINGTON POLICE FACILITY AND PARKING GARAGE
109 EAST OLIVE STREET
BLOOMINGTON, ILLINOIS

REVISIONS	
REV. NO. 1	RECORD DRAWING
APPROVED	DATE 2/9/98
REV. NO. -	
APPROVED	DATE
REV. NO. -	
APPROVED	DATE
REV. NO. -	
APPROVED	DATE
REV. NO. -	
APPROVED	DATE

DRAWN	DATE 24-JAN-96
CHECKED	DATE 24-JAN-96
APPROVED	DATE 24-JAN-96
ISSUED FOR BID/CONSTR	DATE 24-JAN-96
SCALE	1/8"=1'-0"
FIELD BOOK	

RECORD DRAWING

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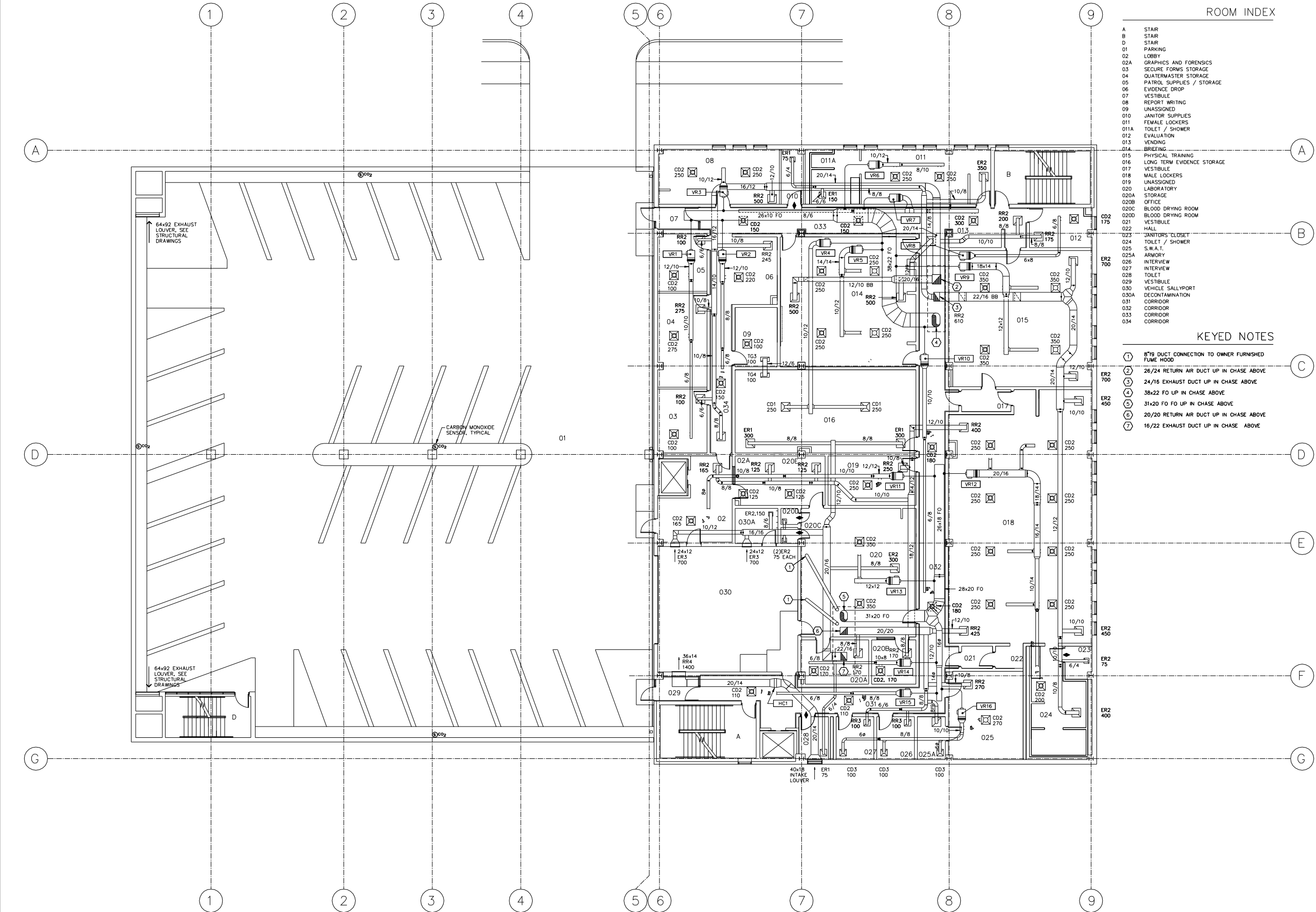


LOWER LEVEL 2 - GARAGE PLAN

SHEET NAME
LOWER LEVEL 2 -
HVAC PLAN

PROJECT NO. 694235-0
SHEET NO.

H1.1



ROOM INDEX

- A STAIR
- B STAIR
- D STAIR
- 01 PARKING
- 02 LOBBY
- 02A GRAPHICS AND FORENSICS
- 03 SECURE FORMS STORAGE
- 04 QUARTERMASTER STORAGE
- 05 PATROL SUPPLIES / STORAGE
- 06 EVIDENCE DROP
- 07 VESTIBULE
- 08 REPORT WRITING
- 09 UNASSIGNED
- 010 JANITOR SUPPLIES
- 011 FEMALE LOCKERS
- 011A TOILET / SHOWER
- 012 EVALUATION
- 013 VENDING
- 014 BRIEFING
- 015 PHYSICAL TRAINING
- 016 LONG TERM EVIDENCE STORAGE
- 017 VESTIBULE
- 018 MALE LOCKERS
- 019 UNASSIGNED
- 020 LABORATORY
- 020A STORAGE
- 020B OFFICE
- 020C BLOOD DRYING ROOM
- 020D BLOOD DRYING ROOM
- 021 VESTIBULE
- 022 HALL
- 023 JANITORS CLOSET
- 024 TOILET / SHOWER
- 025 S.W.A.T.
- 025A ARMORY
- 026 INTERVIEW
- 027 INTERVIEW
- 028 TOILET
- 029 VESTIBULE
- 030 VEHICLE SALLYPORT
- 030A DECONTAMINATION
- 031 CORRIDOR
- 032 CORRIDOR
- 033 CORRIDOR
- 034 CORRIDOR

KEYED NOTES

- 1 8" DUCT CONNECTION TO OWNER FURNISHED FUME HOOD
- 2 26/24 RETURN AIR DUCT UP IN CHASE ABOVE
- 3 24/16 EXHAUST DUCT UP IN CHASE ABOVE
- 4 38x22 FO UP IN CHASE ABOVE
- 5 31x20 FO UP IN CHASE ABOVE
- 6 20/20 RETURN AIR DUCT UP IN CHASE ABOVE
- 7 16/22 EXHAUST DUCT UP IN CHASE ABOVE

LOWER LEVEL 1 - FLOOR AND GARAGE PLAN

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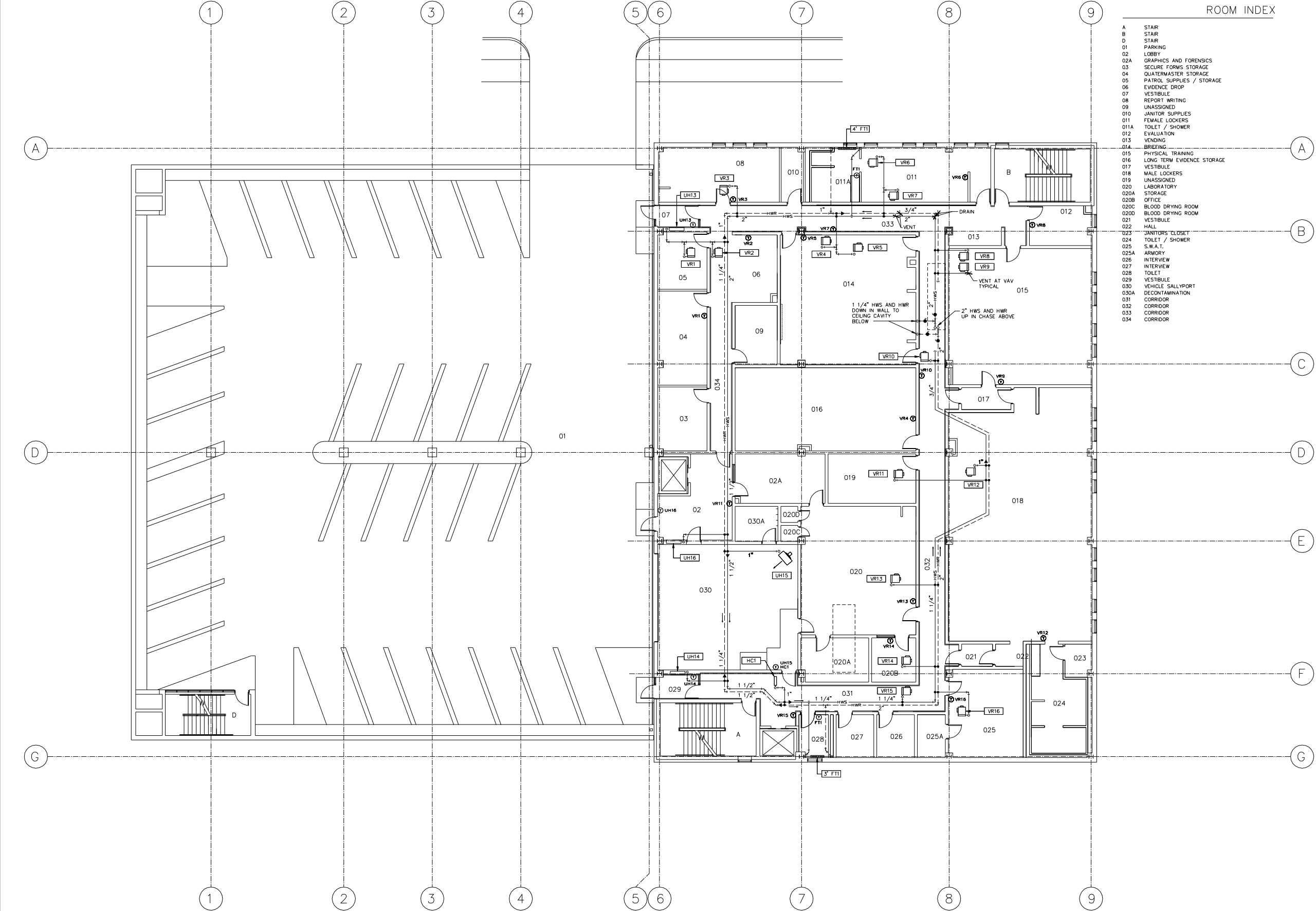
BLOOMINGTON POLICE FACILITY AND PARKING GARAGE
109 EAST OLIVE STREET
BLOOMINGTON, ILLINOIS

REVISIONS	
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RECORD DRAWING	
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FIELD BOOK	

SHEET NAME
LOWER LEVEL 1 -
HVAC DUCTWORK
PLAN

PROJECT NO. 694235-0
SHEET NO.
H1.2



ROOM INDEX

- A STAIR
- B STAIR
- D STAIR
- 01 PARKING
- 02 LOBBY
- 02A GRAPHICS AND FORENSICS
- 03 SECURE FORMS STORAGE
- 04 QUATERMASTER STORAGE
- 05 PATROL SUPPLIES / STORAGE
- 06 EVIDENCE DROP
- 07 VESTIBULE
- 08 REPORT WRITING
- 09 UNASSIGNED
- 010 JANITOR SUPPLIES
- 011 FEMALE LOCKERS
- 011A TOILET / SHOWER
- 012 EVALUATION
- 013 VENDING
- 014 BRIEFING
- 015 PHYSICAL TRAINING
- 016 LONG TERM EVIDENCE STORAGE
- 017 VESTIBULE
- 018 MALE LOCKERS
- 019 UNASSIGNED
- 020 LABORATORY
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- 022 HALL
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- 025 S.W.A.T.
- 025A ARMORY
- 026 INTERVIEW
- 027 INTERVIEW
- 028 TOILET
- 029 VESTIBULE
- 030 VEHICLE SALLYPORT
- 030A DECONTAMINATION
- 031 CORRIDOR
- 032 CORRIDOR
- 033 CORRIDOR
- 034 CORRIDOR



LOWER LEVEL 1 - FLOOR AND GARAGE PLAN

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BLOOMINGTON POLICE FACILITY AND PARKING GARAGE

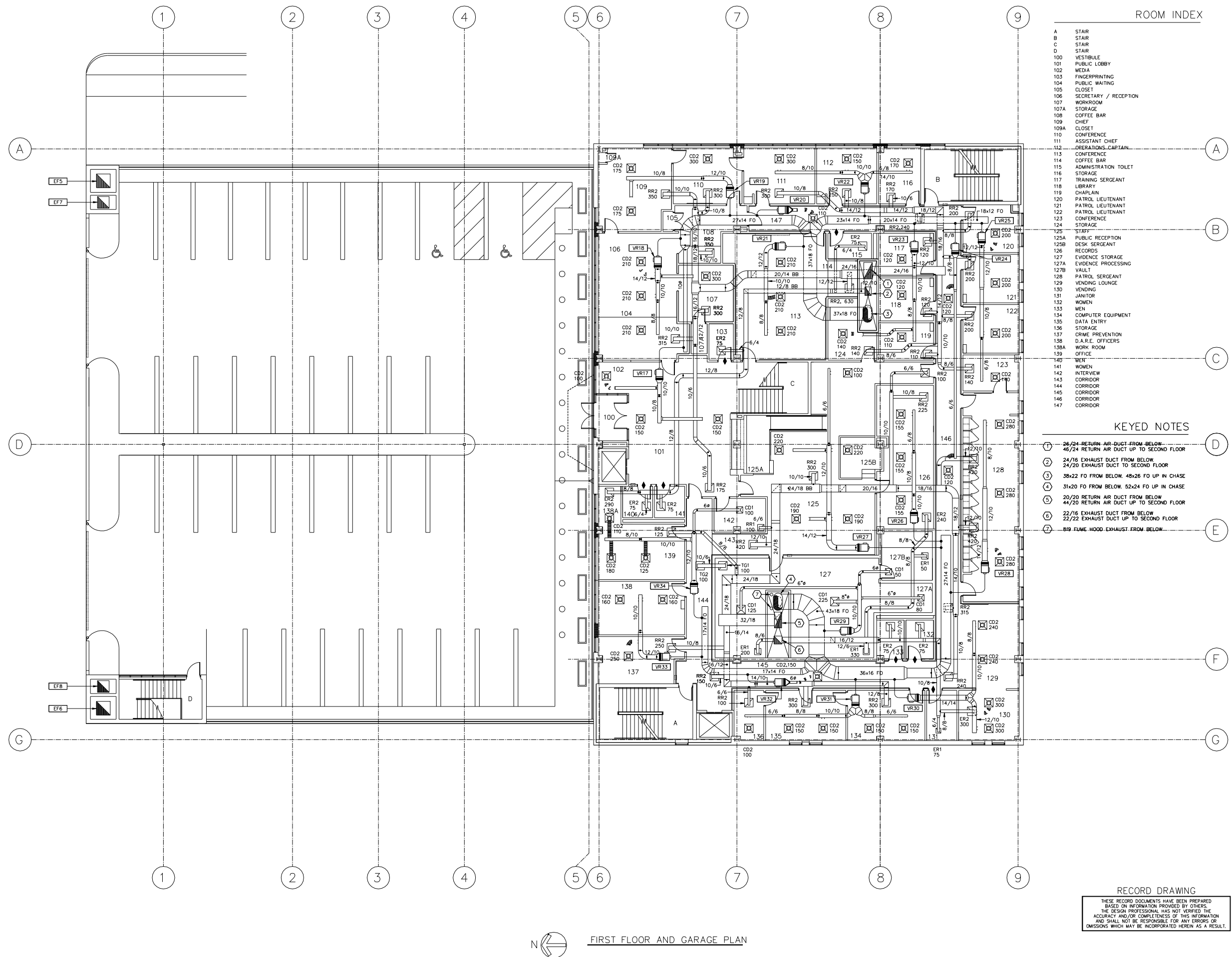
109 EAST OLIVE STREET
BLOOMINGTON, ILLINOIS

REVISIONS	
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APPROVED	
DATE	24-JAN-96
ISSUED FOR BID/CONSTR	
DATE	24-JAN-96
SCALE	1/8"=1'-0"
FIELD BOOK	

SHEET NAME
LOWER LEVEL 1 -
HVAC PIPING
PLAN

PROJECT NO. 694235-0
SHEET NO.
H1.3



9	STAIR
B	STAIR
100	STAIR
C	STAIR
100	VESTIBULE
101	PUBLIC LOBBY
102	MEDIA
103	FINGERPRINTING
104	PUBLIC WAITING
105	CLOSET
106	SECRETARY / RECEPTION
107	WORKROOM
107A	STORAGE
108	COFFEE BAR
109	CHIEF
109A	CLOSET
110	CONFERENCE
111	ASSISTANT CHIEF
112	OPERATIONS CAPTAIN
113	CONFERENCE
114	COFFEE BAR
115	ADMINISTRATION TOILET
116	STORAGE
117	TRAINING SERGEANT
118	LIBRARY
119	CHAIKIN
120	PATROL, LIEUTENANT
121	PATROL, LIEUTENANT
122	PATROL, LIEUTENANT
123	CONFERENCE
124	STORAGE
125	STAFF
125A	PUBLIC PERCEPTION
125B	DESK SERGEANT
126	RECEIPTS
127	EVIDENCE STORAGE
127A	EVIDENCE PROCESSING
127B	VAULT
128	PATROL, PATRONEER
129	VENDING LOUNGE
130	VENDING
131	JANITOR
132	WOMEN
133	MEN
134	COMPUTER EQUIPMENT
135	DATA ENTRY
136	STORAGE
137	CRIME PREVENTION
138	D.A.R.E. OFFICERS
138A	WORK ROOM
139	OFFICE
140	MEN
141	WOMEN
142	INTERVIEW
143	CORRIDOR
144	CORRIDOR
145	CORRIDOR
146	CORRIDOR
147	CORRIDOR

KEYED NOTES

- ① 26/24 RETURN AIR DUCT FROM BELOW
46/24 RETURN AIR DUCT UP TO SECOND FLOOR
- ② 24/16 EXHAUST DUCT FROM BELOW
24/20 EXHAUST DUCT TO SECOND FLOOR
- ③ 38x22 FO FROM BELOW, 48x26 FO UP IN CHASE
- ④ 31x20 FO FROM BELOW, 52x24 FO UP IN CHASE
- ⑤ 20/20 RETURN AIR DUCT FROM BELOW
44/20 RETURN AIR DUCT UP TO SECOND FLOOR
- ⑥ 22/16 EXHAUST DUCT FROM BELOW
22/22 EXHAUST DUCT UP TO SECOND FLOOR
- ⑦ B19 FUME HOOD EXHAUST FROM BELOW

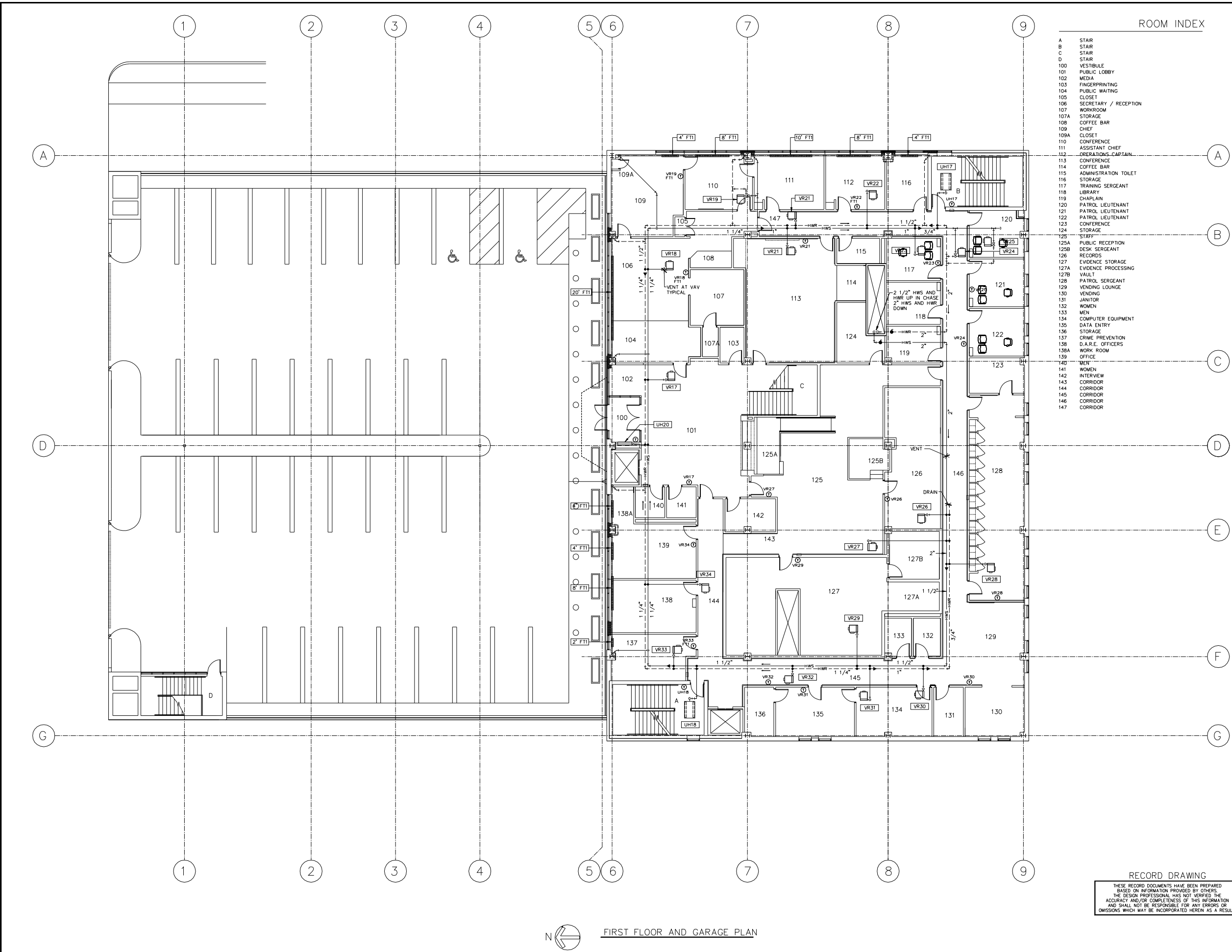
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REV. NO. Δ -	
OWNER REQUESTED REVISIONS	
APPROVED	DATE 24-JUL-96
REV. NO. 2 -	RECORD DRAWING
APPROVED	DATE 2/9/96
REV. NO. -	
APPROVED	DATE
REV. NO. -	
APPROVED	DATE
REV. NO. -	
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SCALE 1/8"=1'-0"	
FILE BOOK	

SHEET NAME
FIRST FLOOR –
HVAC DUCTWORK
PLAN

PROJECT NO. 694235-0
SHEET NO. H1.4



ROOM INDEX

- A STAIR
- B STAIR
- C STAIR
- D STAIR
- 100 VESTIBULE
- 101 PUBLIC LOBBY
- 102 MEDIA
- 103 FINGERPRINTING
- 104 PUBLIC WAITING
- 105 CLOSET
- 106 SECRETARY / RECEPTION
- 107 WORKROOM
- 107A STORAGE
- 108 COFFEE BAR
- 109 CHIEF
- 109A CLOSET
- 110 CONFERENCE
- 111 ASSISTANT CHIEF
- 112 OPERATIONS CAPTAIN
- 113 CONFERENCE
- 114 COFFEE BAR
- 115 ADMINISTRATION TOILET
- 116 STORAGE
- 117 TRAINING SERGEANT
- 118 LIBRARY
- 119 CHAPLAIN
- 120 PATROL LIEUTENANT
- 121 PATROL LIEUTENANT
- 122 PATROL LIEUTENANT
- 123 CONFERENCE
- 124 STORAGE
- 125 STAFF
- 125A PUBLIC RECEPTION
- 125B DESK SERGEANT
- 126 RECORDS
- 127 EVIDENCE STORAGE
- 127A EVIDENCE PROCESSING
- 127B VAULT
- 128 PATROL SERGEANT
- 129 VENDING LOUNGE
- 130 VENDING
- 131 JANITOR
- 132 WOMEN
- 133 MEN
- 134 COMPUTER EQUIPMENT
- 135 DATA ENTRY
- 136 STORAGE
- 137 CRIME PREVENTION
- 138 D.A.R.E. OFFICERS
- 138A WORK ROOM
- 139 OFFICE
- 140 VENT
- 141 WOMEN
- 142 INTERVIEW
- 143 CORRIDOR
- 144 CORRIDOR
- 145 CORRIDOR
- 146 CORRIDOR
- 147 CORRIDOR

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BLOOMINGTON POLICE FACILITY AND PARKING GARAGE
109 EAST OLIVE STREET
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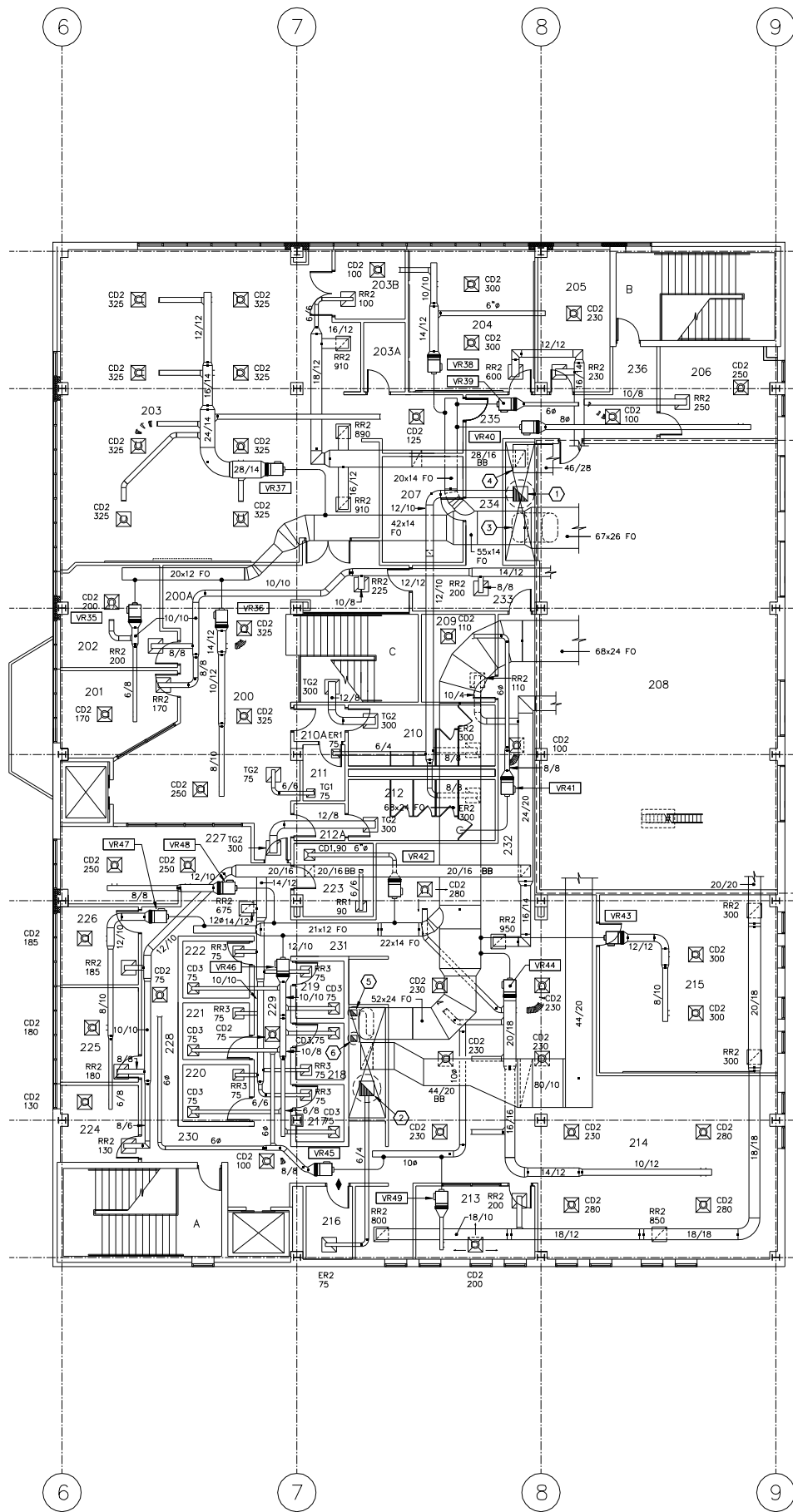
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DATE	24-JAN-96
SCALE	1/8"=1'-0"
FIELD BOOK	

SHEET NAME
FIRST FLOOR -
HVAC PIPING
PLAN

PROJECT NO. 694235-0
SHEET NO.
H1.5

FIRST FLOOR AND GARAGE PLAN



ROOM INDEX

- A STAIR
- B STAIR
- C STAIR
- 200 LOBBY
- 200A VENDING
- 201 YOUTH WAITING
- 202 INTERVIEW
- 203 TRAINING / MULTI-USE
- 203A STORAGE
- 203B STORAGE
- 204 EMERGENCY OPERATIONS CENTER
- 205 STORAGE
- 206 STORAGE / FUTURE OFFICE
- 207 EQUIPMENT STORAGE
- 208 MECHANICAL ROOM
- 209 MONITORING
- 210 MENS TOILET
- 210A VESTIBULE
- 211 JANITOR
- 212 WOMENS TOILET
- 212A VESTIBULE
- 213 INVESTIGATIONS SERGEANT
- 214 INVESTIGATORS
- 215 MAJOR CRIMES
- 216 TOILET
- 217 INTERVIEW
- 218 INTERVIEW
- 219 INTERVIEW
- 220 INTERVIEW
- 221 INTERVIEW
- 222 INTERVIEW
- 223 INTERVIEW
- 224 CRIME ANALYST
- 225 INVESTIGATIONS LIEUTENANT
- 226 INTERVIEW / CONFERENCE
- 227 SECRETARY / RECEPTIONIST
- 228 CORRIDOR
- 229 CORRIDOR
- 230 CORRIDOR
- 231 CORRIDOR
- 232 CORRIDOR
- 233 CORRIDOR
- 234 CORRIDOR
- 235 CORRIDOR
- 236 CORRIDOR

KEYED NOTES

- ① 24/20 FROM BELOW. 24/24 THRU ROOF WITH SELF ACTING SHUTTER TO EF9
- ② 22/22 FROM BELOW. 24/24 THRU ROOF WITH SELF ACTING SHUTTER TO EF10
- ③ 48x26 FO DOWN IN CHASE
- ④ 46/24 RETURN AIR DUCT FROM BELOW
- ⑤ 8"19 FUME HOOD EXHAUST FROM BELOW. TRANSITION TO 10/10 THRU ROOF WITH SELF ACTING SHUTTER TO EF11
- ⑥ 8"19 FUME HOOD EXHAUST FROM BELOW. TRANSITION TO 10/10 THRU ROOF WITH SELF ACTING SHUTTER TO EF12

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SECOND FLOOR PLAN

BLOOMINGTON POLICE FACILITY AND PARKING GARAGE

109 EAST OLIVE STREET
BLOOMINGTON, ILLINOIS

SHIVE-HATTERY
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2103 EASTLAND DRIVE, BLOOMINGTON, ILLINOIS 61702-0489
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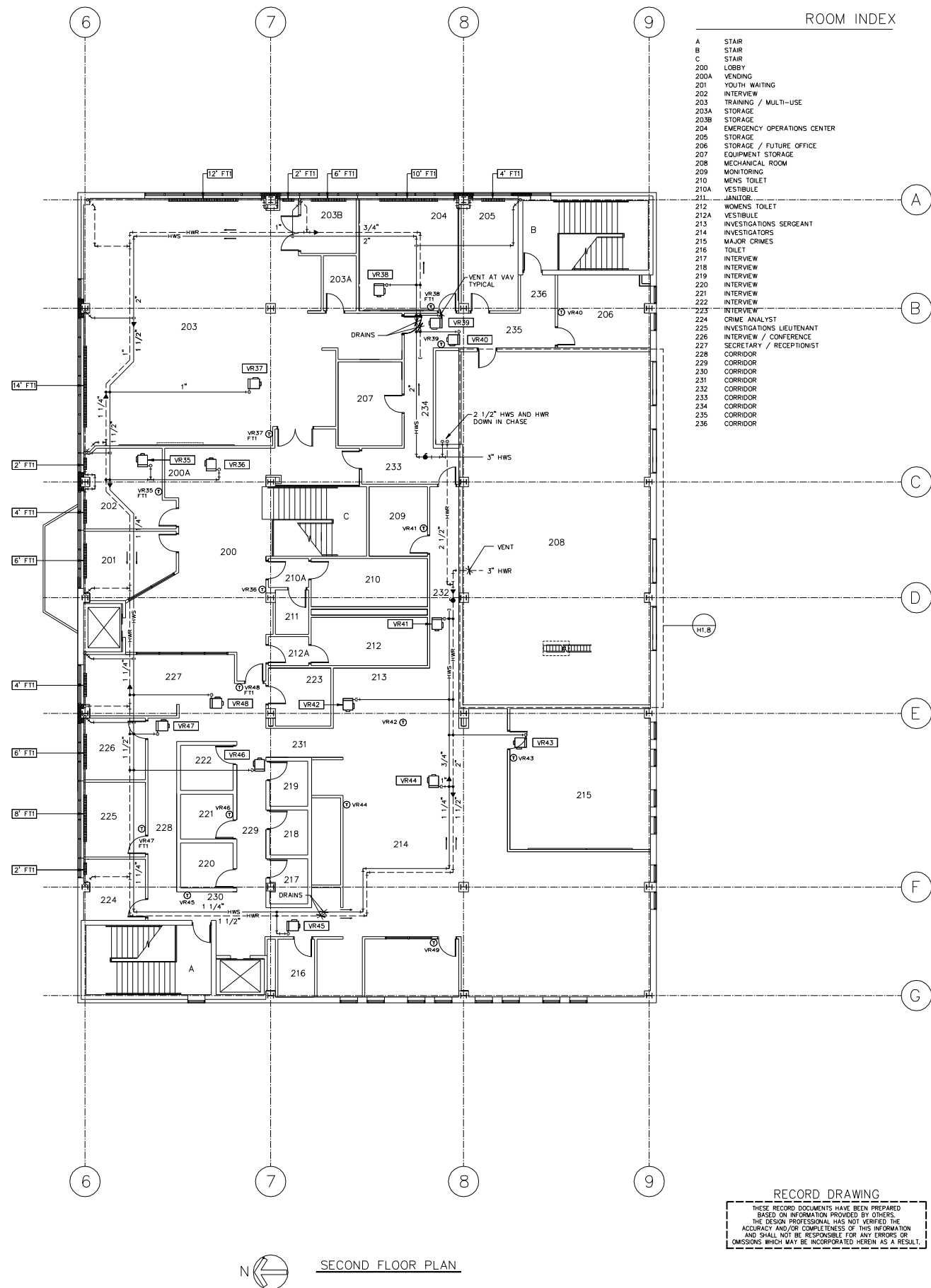
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CITY REQUESTED CHANGES	
APPROVED TNG	DATE 7-11-96
REV. NO. 2	-
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APPROVED	DATE 2/9/98
REV. NO.	-
APPROVED	DATE
REV. NO.	-
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APPROVED	DATE

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FIELD BOOK	

SHEET NAME
SECOND FLOOR -
HVAC DUCTWORK
PLAN

PROJECT NO. 694235-0
SHEET NO.

H1.6



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BLOOMINGTON POLICE FACILITY AND PARKING GARAGE

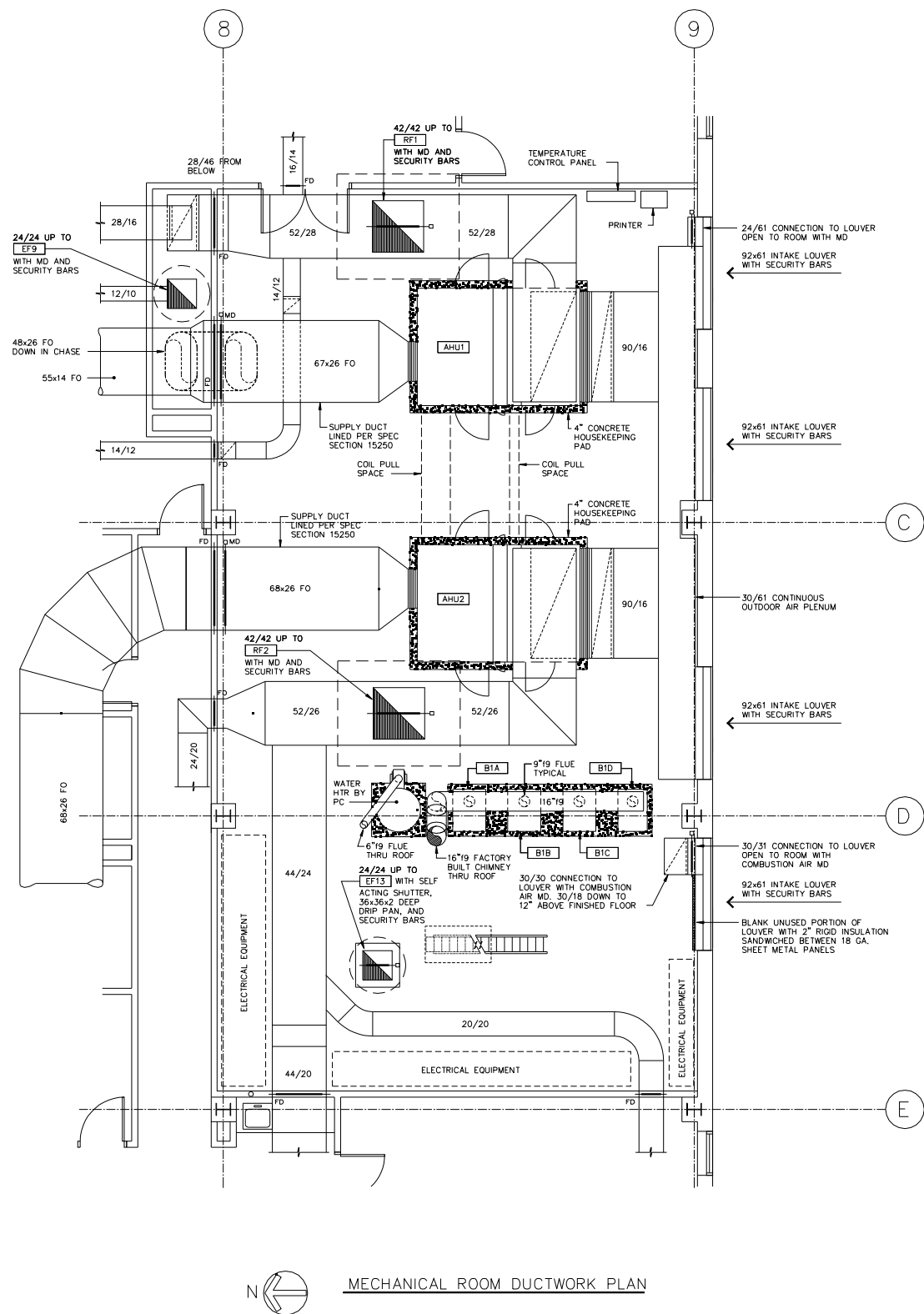
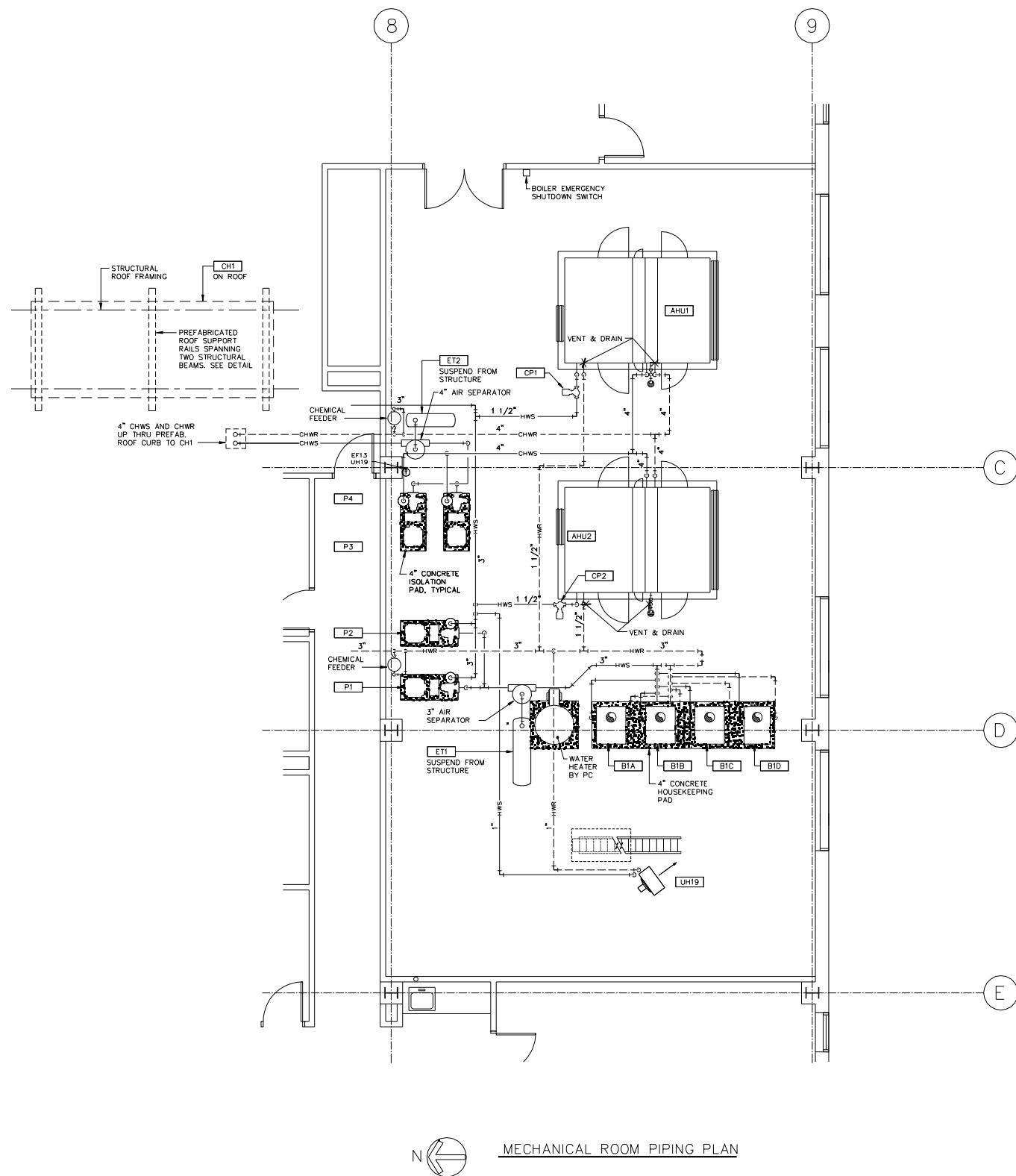
109 EAST OLIVE STREET
BLOOMINGTON, ILLINOIS

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FIELD BOOK	

SHEET NAME
SECOND FLOOR —
HVAC PIPING
PLAN

PROJECT NO. 694235-0
SHEET NO.

H1.7



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BLOOMINGTON POLICE FACILITY AND PARKING GARAGE
109 EAST OLIVE STREET
BLOOMINGTON, ILLINOIS

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FIELD BOOK	

SHEET NAME
ENLARGED HVAC FLOOR PLAN

PROJECT NO. 694235-0
SHEET NO.

H1.8



SHIVE-HATTERY
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BLOOMINGTON POLICE FACILITY AND PARKING GARAGE

109 EAST OLIVE STREET
BLOOMINGTON, ILLINOIS

SHEET NAME
HVAC DETAILS

H2.1

UNIT HEATER SCHEDULE (HOT WATER)														
PLAN MARK	CFM	ENT. AIR TEMP	LVG. AIR TEMP	MBH	GPM	AVE H2O TEMP	H2O PD FT	FAN HP	MOTOR DATA	VOLTS	9	RPM	MANUFACTURER & MODEL	REMARKS
UH1	995	60	110	47.1	1.0	180	0.5	.05	120	1	1150		TRANE FFE8100	2 MOTORS
UH2	995	60	110	47.1	1.0	180	0.5	.05	120	1	1150		TRANE FFE8100	2 MOTORS
UH3	995	60	110	47.1	1.0	180	0.5	.05	120	1	1150		TRANE FFE8100	2 MOTORS
UH4	995	60	110	47.1	1.0	180	0.5	.05	120	1	1150		TRANE FFE8100	2 MOTORS
UH5	995	60	110	47.1	1.0	180	0.5	.05	120	1	1150		TRANE FFE8100	2 MOTORS
UH6	995	60	110	47.1	1.0	180	0.5	.05	120	1	1150		TRANE FFE8100	2 MOTORS
UH7	306	70	115.7	15.2	0.5	180	1.4	.04	120	1	980		TRANE FFE8030	HORZ RECESSED
UH8	306	70	115.7	15.2	0.5	180	1.4	.04	120	1	980		TRANE FFE8030	HORZ RECESSED
UH9	212	70	122.6	12.1	0.5	180	1.2	.03	120	1	980		TRANE FFFB020	VERT WALL-HUNG
UH10	212	70	122.6	12.1	0.5	180	1.2	.03	120	1	980		TRANE FFFB020	VERT WALL-HUNG
UH11	212	70	122.6	12.1	0.5	180	1.2	.03	120	1	980		TRANE FFFB020	VERT WALL-HUNG
UH12	212	70	122.6	12.1	0.5	180	1.2	.03	120	1	980		TRANE FFFB020	VERT WALL-HUNG
UH13	212	70	122.6	12.1	0.5	180	1.2	.03	120	1	980		TRANE FFFB020	VERT RECESSED
UH14	212	70	122.6	12.1	0.5	180	1.2	.03	120	1	980		TRANE FFFB020	VERT RECESSED
UH15	1214	50	90.4	53.2	5.5	180	.43	1/8	120	1	1550		TRANE 90S	PROPELLER
UH16	212	70	122.6	12.1	0.5	180	1.2	.03	120	1	980		TRANE FFFB020	VERT RECESSED
UH17	306	70	115.7	15.2	0.5	180	1.4	.04	120	1	980		TRANE FFE8030	VERT RECESSED
UH18	306	70	115.7	15.2	0.5	180	1.4	.04	120	1	980		TRANE FFE8030	VERT RECESSED
UH19	1214	50	90.4	53.2	5.5	180	.43	1/8	120	1	1550		TRANE 90S	PROPELLER
UH20	212	70	122.6	12.1	0.5	180	1.2	.03	120	1	980		TRANE FFFB020	VERT WALL-HUNG

EXHAUST FAN SCHEDULE													
PLAN MARK	CFM	MOTOR DATA				S.P. IN H ₂ O	MOUNTING	SONES	WEIGHT LBS	MANUFACTURER & MODEL	REMARKS		
		HP	VOLTS	1/3	DRIVE	RPM							
EF1	145	1/25	120	1	DIR	1050	.125	SIDEWALL	3.0	16	GREENHECK SDE-10-24-E	MOTOR GUARD	
EF2	145	1/25	120	1	DIR	1050	.125	SIDEWALL	3.0	16	GREENHECK SDE-10-24-E	MOTOR GUARD	
EF3	145	1/25	120	1	DIR	1050	.125	SIDEWALL	3.0	16	GREENHECK SDE-10-24-E	MOTOR GUARD	
EF4	250	1/8	120	1	DIR	860	.125	SIDEWALL	6.2	20	GREENHECK SDE-12-32-C	MOTOR GUARD	
EF5	20265	5	208	3	BELT	1422	.20	ROOF	54.1	500	GREENHECK TAUB-CA-36-50	ALUM BLADES (1)	
EF6	20265	5	208	3	BELT	1422	.20	ROOF	54.1	500	GREENHECK TAUB-CA-36-50	ALUM BLADES (1)	
EF7	11020	2	208	3	BELT	1262	.20	ROOF	31.7	370	GREENHECK TAUB-CA-30-20	ALUM BLADES (1)	
EF8	11020	2	208	3	BELT	1262	.20	ROOF	31.7	370	GREENHECK TAUB-CA-30-20	ALUM BLADES (1)	
EF9	4465	3/4	120	1	BELT	606	.375	ROOF	9.6	123	GREENHECK GB-240-7	SEE SPEC FOR FAN COATING	
EF10	4095	1/2	120	1	BELT	577	.375	ROOF	8.6	123	GREENHECK GB-240-5		
EF11	250	1/4	120	1	BELT	1112	.5	ROOF	5.3	30	GREENHECK GB-80-4		
EF12	250	1/4	120	1	BELT	1112	.5	ROOF	5.3	30	GREENHECK GB-80-4		
EF13	2620	1/4	120	1	BELT	420	.25	ROOF	4.5	123	GREENHECK GB-240-4		

(1) VIBRATION ISOLATION CURB

EXPANSION/COMPRESSION TANK SCHEDULE							
PLAN MARK	LOCATION	SYSTEM	SIZE LOH-XDIA	CORRESPONDING AIR SEPARATOR	CAPACITY GAL	MANUFACTURER & MODEL	REMARKS
ET1	RM 208	HW	62x16		57	TACO CAX215	420 GAL SYSTEM CAPACITY
ET2	RM 208	CHW	45x12		22	TACO CAX84	

FIN TUBE RADIATION SCHEDULE									
PLAN MARK	TUBE SIZE	FIN SIZE	AVE. H ₂ O TEMP F	ENT AIR TEMP F	ENCL. HEIGHT	NO. ROWS	CAPACITY MBH/FT.	MANUFACTURER & MODEL	REMARKS
FT1	3/4	3 1/4	180	70	10"	1	.07	TRANE SERIES 40	TOTA ENCLOSURE

HOT WATER BOILER SCHEDULE									
PLAN MARK	INPUT MBH	OUTPUT MBH	WATER TEMP IN F	TEMP OUT F	GPM ΔP(Ft)	MANUFACTURER & MODEL	REMARKS		
B1A-D	1647	1160	180	200	90	WEIL-MCLAIN M-4PFG-PIDN-1647-1738	AUTOMATIC VENT DAMPERS		

EVAPORATOR CHILLER SCHEDULE									
PLAN MARK	CAPACITY TONS	GPM	CHILLED WATER H ₂ O ΔT F	WATER TEMP IN F	TEMP OUT F	MANUFACTURER & MODEL	REMARKS		
CH1	113	261	15	52	42	TRANE RTAA125	25% GLYCOL, 9.5 EER, 2 COMPRESSORS MCA 576, 208/60/3, 7562 LBS. OPERATING WEIGHT		

AIR HANDLING UNIT SCHEDULE																							
PLAN MARK	CFM	O.A. CFM	STATIC PRESS		MOTOR HP	VOLT	FREQ	COOLING COIL				GPM	WBP	MBH	HEATING COIL				MANUFACTURER & MODEL				
			EXT	TOTAL				MAX	FAN	DB	WB				DB	WB	EXT	LAT		LWT	GPM	WBP	MBH
AHU1	16000	4500	2.25	3.25	15	208	3	533	77.3	64.9	50.5	50.2	151	7.3	473.5	27.5	55.3	180	150	16	30	240.2	TRANE 35
AHU2	15500	3200	2.25	3.25	15	208	3	514	75.9	63.4	52.8	52.4	109.9	7.3	393.5	40	64.6	180	150	12.7	23	190.7	TRANE 35

RELIEF FAN SCHEDULE										
PLAN MARK	CFM	MOTOR DATA					SONES	S.P. IN H ₂ O	MANUFACTURER & MODEL	REMARKS
		HP	VOLTS	1/3	RPM	TS				
RF1	11500	2	208	3	845	9291	37.6	.375	GREENHECK RPBE-CA-42	2 SPEED
RF2	12300	2	208	3	885	9731	40.2	.375	GREENHECK RPBE-CA-42	2 SPEED

PUMP SCHEDULE																
PLAN MARK	GPM	CUTOFF HEAD	FT. HEAD	% EFF.	HP	VOLTS	1/3	RPM	MOUNTING	MANUFACTURER & MODEL	REMARKS					
P1	130	34	30	68	2	208	3	1750	BASE	AURORA 344A 2x2 1/2x7A	STANDBY					
P2	130	34	30	68	2	208	3	1750	BASE	AURORA 344A 2x2 1/2x7A						
P3	261	70	60	75	25	208	3	1750	BASE	AURORA 344A 2 1/2x3x9	STANDBY					
P4	261	70	60	75	25	208	3	1750	BASE	AURORA 344A 2 1/2x3x9						
CP1	16	14	11		3/4	120	1	1750	IN-LINE	AMTROL	AHU1 HTG COIL					
CP2	12.7	14	11		3/4	120	1	1750	IN-LINE	AMTROL	AHU2 HTG COIL					

TERMINAL AIR BOX SCHEDULE																
PLAN MARK	UNIT SIZE	CFM		MAX NC 9 1.0 Δ P	MIN. ROWS	HOT WATER HEATING COIL		MBH	GPM	PRESS DROP		AIR TEMP F*	ENT. LVG.	MANUFACTURER & MODEL	LOCATED IN ROOM	
		COOL	HEAT			HEAT LOSS	FEET			FEET						
VR1	06	475	235		30		3.4	12.3	0.5	0.5	55	96.9		TRANE VCWE		05
VR2	06	470	235		30		1.1	12.3	0.5	0.5	55	96.9		TRANE VCWE		06
VR3	06	500	250		30		3.7	12.3	0.5	0.5	55	96.9		TRANE VCWE		08
VR4	06	500	250		30		1.6	12.3	0.5	0.5	55	96.9		TRANE VCWE		014
VR5	11	1000	500		30		1.8	23.4	2.0	1.9	55	97.4		TRANE VCWE		014
VR6	06	500	250		30		4.3	12.3	0.5	0.5	55	96.9		TRANE VCWE		011
VR7	11	600	300		30		1.0	12.6	0.5	0.1	55	93.0		TRANE VCWE		011
VR8	03	175	90		30		1.3	7.9	0.5	0.5	55	126.7		TRANE VCWE		015
VR9	17	1400	700		30		5.8	36.4	2.0	2.9	55	102.2		TRANE VCWE		015
VR10	06	360	180		30		1.3	9.7	0.5	0.5	55	108.4		TRANE VCWE		032
VR11	11	665	330		30		2.7	19.6	2.0	1.9	55	105.6		TRANE VCWE		019
VR12	24	2200	1100		30		10.3	53.3	5.0	7.4	55	99.1		TRANE VCWE		018
VR13	11	700	350		30		1.5	20.3	2.0	1.9	55	108.0		TRANE VCWE		020
VR14	06	340	170		30		0.5	9.9	0.5	0.5	55	106.5		TRANE VCWE		020B
VR15	03	220	110		30		0.7	8.2	0.5	0.5	55	123.8		TRANE VCWE		031
VR16	06	470	235		30		2.7	12.3	0.5	0.5	55	96.9		TRANE VCWE		025
VR17	06	400	200		30		0.8	10.5	0.5	0.5	55	102.7		TRANE VCWE		101
VR18	11	930	465		30		1.8	22.6	2.0	1.9	55	101.2		TRANE VCWE		106
VR19	11	650	325		30		3.2	19.7	2.0	1.9	55	110.6		TRANE VCWE		110
VR20	03	110	55		30		0.0	PROVIDE MINIMUM	COIL		55			TRANE VCWE		147
VR21	11	630	315		30		0.0	PROVIDE MINIMUM	COIL		55			TRANE VCWE		113
VR22	11	620	310		30		2.9	19.3	2.0	1.9	55	112.0		TRANE VCWE		112
VR23	06	490	245		30		0.0	PROVIDE MINIMUM	COIL		55			TRANE VCWE		117
VR24	03	240	120		30		0.0	PROVIDE MINIMUM	COIL		55			TRANE VCWE		146
VR25	11	740	370		30		5.5	20.9	2.0	1.9	55	106.0		TRANE VCWE		120
VR26	06	465	230		30		0.0	PROVIDE MINIMUM	COIL		55			TRANE VCWE		126
VR27	11	920	460		30		0.0	PROVIDE MINIMUM	COIL		55			TRANE VCWE		125
VR28	11	840	420		30		6.3	20.8	2.0	1.9	55	106.5		TRANE VCWE		128
VR29	06	480	240		30		0.0	PROVIDE MINIMUM	COIL		55			TRANE VCWE		127
VR30	11	1080	540		30		4.1	24.2	2.0	1.9	55	95.1		TRANE VCWE		134
VR31	11	700	350		30		3.1	20.3	2.0	1.9	55	108.4		TRANE VCWE		134
VR32	03	150	75		30		0.0	PROVIDE MINIMUM	COIL		55			TRANE VCWE		145
VR33	06	570	185		30		1.7	14.7	1.0	1.9	55	101.4		TRANE VCWE		137
VR34	06	515	260		30		1.8	12.3	0.5	0.5	55	96.9		TRANE VCWE		144
VR35	06	370	185		30		2.6	10.3	0.5	0.5	55	104.6		TRANE VCWE		202
VR36	11	900	450		30		2.0	22.5	2.0	1.9	55	100.6		TRANE VCWE		200
VR37	32	2725	1360		30		9.4	65.9	6.0	4.0	55	99.4		TRANE VCWE		203
VR38	11	930	465		30		4.2	24.7	2.0	1.9	55	100.0		TRANE VCWE		204
VR39	03	100	50		30		0.7	7.9	0.5	0.5	55	126.7		TRANE VCWE		235
VR40	03	250	125		30		2.2	7.9	0.5	0.5	55	126.7		TRANE VCWE		235
VR41	03	210	105		30		1.2	7.9	0.5	0.5	55	126.7		TRANE VCWE		232
VR42	03	90	50		30		.08	7.9	0.5	0.5	55	136.0		TRANE VCWE		214
VR43	11	600	300		30		4.9	19.1	2.0	1.9	55	112.9		TRANE VCWE		214
VR44	32	2500	1250		30		14.6	63.4	6.0	4.0	55	101.2		TRANE VCWE		214
VR45	03	250	125		30		1.3	7.9	0.5	0.5	55	126.7		TRANE VCWE		230
VR46	06	450	225		30		0.9	10.9	0.5	0.5	55	99.8		TRANE VCWE		229
VR47	06	495	250		30		3.1	12.3	0.5	0.5	55	96.9		TRANE VCWE		228
VR48	06	500	250		30		1.5	12.3	0.5	0.5	55	96.9		TRANE VCWE		227
VR49	03	200	100		30		1.5	7.9	0.5	0.5	55	127.8		TRANE VCWE		213

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Bloomington Police Facility and Parking Garage Bloomington, Illinois

JOHNSON
CONTROLS
Creating a better climate for business.

- ☒ Environmental Control System
- ☒ Building Automation System
- ☐ Fire Management System
- ☐ Security System
- ☐ Lighting Services
- ☐ Telecommunication System
- ☐ Integrated Motor Control Center
- ☐ Air and Water Systems Balancing
- ☐ Instrumentation System Installation
- ☐ Building Operations Management
- ☐ Energy Conservation Control
- ☐ Custom Programmed Maintenance

Automatic Temperature Controls
Heating
Air Conditioning
Air Filters
Water Treatment
Coil Cleaning
Control Center
Fire Management
Security Management
Sound and Communication
Programmed Clocks
Contract Operations
Time-Shared Automated Building Service
Refrigeration
Electrical Equipment
Emergency Generator / Lighting Equipment
Industrial Controls / Recording / Indication Equipment

Electrical Installation Notes:

All wiring and conduit runs will be securely routed and fastened per division 16 specifications and run perpendicular or parallel to building lines. All line voltage wiring is to be run within thru-wall conduit in concrete walls and exposed equipment rooms unless otherwise noted. All line voltage wiring installed in floor slabs or underground areas will be in rigid conduit. In finished areas run conduits concealed. Route exposed conduit and conduit above accessible ceilings parallel and perpendicular to walls and adjacent piping. Low voltage control wiring (<30V) may as local codes allow, be installed without conduit (EMT), but where exposed and subject to physical damage will be protected by suitable "troughs", "Panduit" bindings or other means consistent with proper NEC procedures for similar class of wiring. All termination's in control panels and at field devices are to be identified with a permanent pressure sensitive wire tag label for easy recognition.

Wiring: In General, motor control wiring will be #14 AWG, THHN, 600V Class. Power limited supply wiring will be 2-conductor twisted #18 AWG NEC CMP Cable. Low voltage control (<30V) and sensor wiring in ceiling for VAV boxes will be either 2-conductor or 4-conductor #18 AWG NEC CMP Cable as noted on Point Schedule and may be run without conduit. Low Voltage control and sensor wiring in conduit will be either 2-conductor or 4-conductor #18 AWG NEC CMR Cable as noted on Point Schedule. High voltage wiring (>30V) may not be run within the same conduit as low voltage wiring.

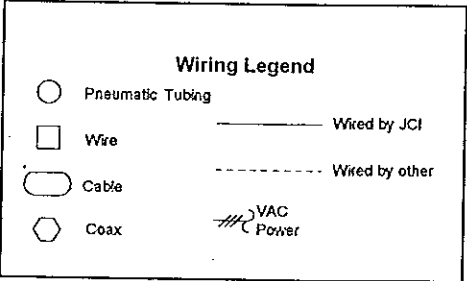
VAV Box Controllers: Direct Digital Controllers and actuators will be provided to the VAV Box Manufacturer for factory mounting and wiring. Wiring to exterior devices such as reheat valves, radiation valves and temperature sensors will be field terminated.

Power Limited Trunk: A 24VAC power limited supply trunk for VAV boxes may be run without conduit in accordance with the NEC. Trunks are limited to 4Amps (100VA Supply) and AC polarity MUST be maintained at the controllers. The N2 bus and the 24VAC power trunk may be run together between controllers.

Network Communications: Plenum rated cable may be used for all DDC Optomux (N2 Bus) cables. N2 cables are 3-conductor shielded RS-485. N2 cables may be run within floor level in approved cable tray system. Floor-to-Floor penetrations will be made within conduit.

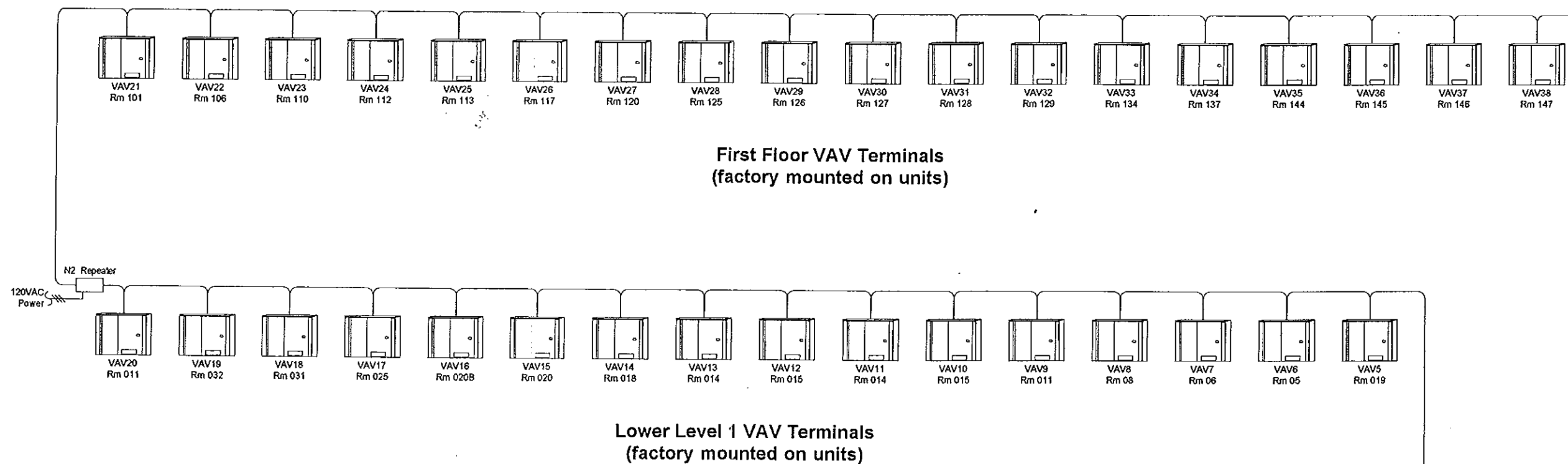
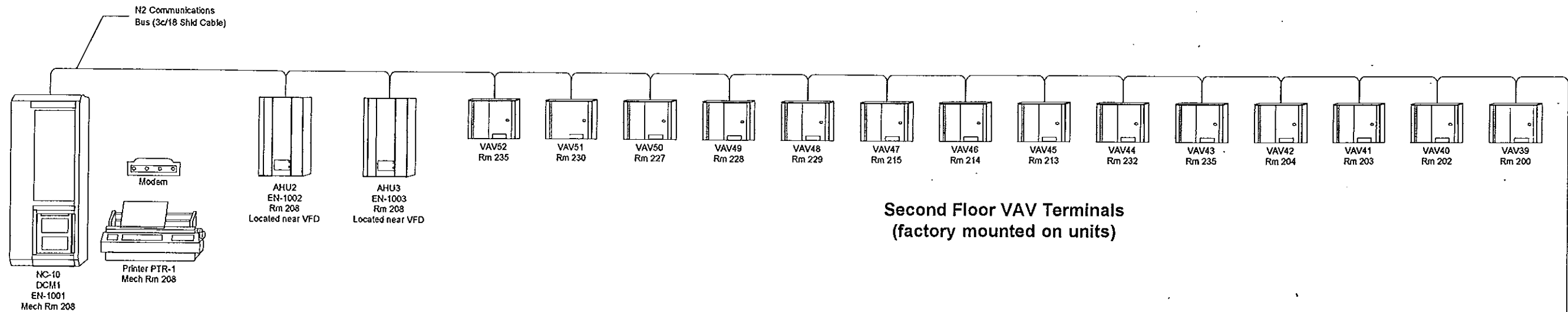
ISSUE INDEX

■ Submittal 5/07/96

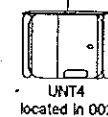


PROJECT
Bloomington Police Facility
and Parking Garage
Bloomington, Illinois

DEVELOPER The Vantage Group, Ltd. City of Bloomington		ARCHITECT/ENGINEER Shive-Hattery Engineers and Architects 2103 Eastland Drive Bloomington, Illinois 61704 Phone: (309) 662-8992 Fax: (309) 662-5808	
CONSTRUCTION MANAGER Felmley-Dickerson Co. 803 East Lafayette Street Bloomington, Illinois 61701 Phone: (309) 828-4317 Fax: (309) 828-5528		CONTRACTOR A & R Mechanical Contractors 711 Kettering Park Urbana, Illinois 61801 (217) 367-4227	
REFERENCE DRAWING	NO	REVISION/LOCATION	BY
JOHNSON CONTROLS Systems & Services Division		Branch Information 9006 N. Industrial Rd. Peoria, Illinois 61615 (309) 691-5400 Phn (309) 691-9686 Fax	
SALES ENGINEER DR	PROJECT MANAGER TP	APPLICATION ENGINEER BP	DATE 04/23/96
		CONTRACT NUMBER 6032-0004	

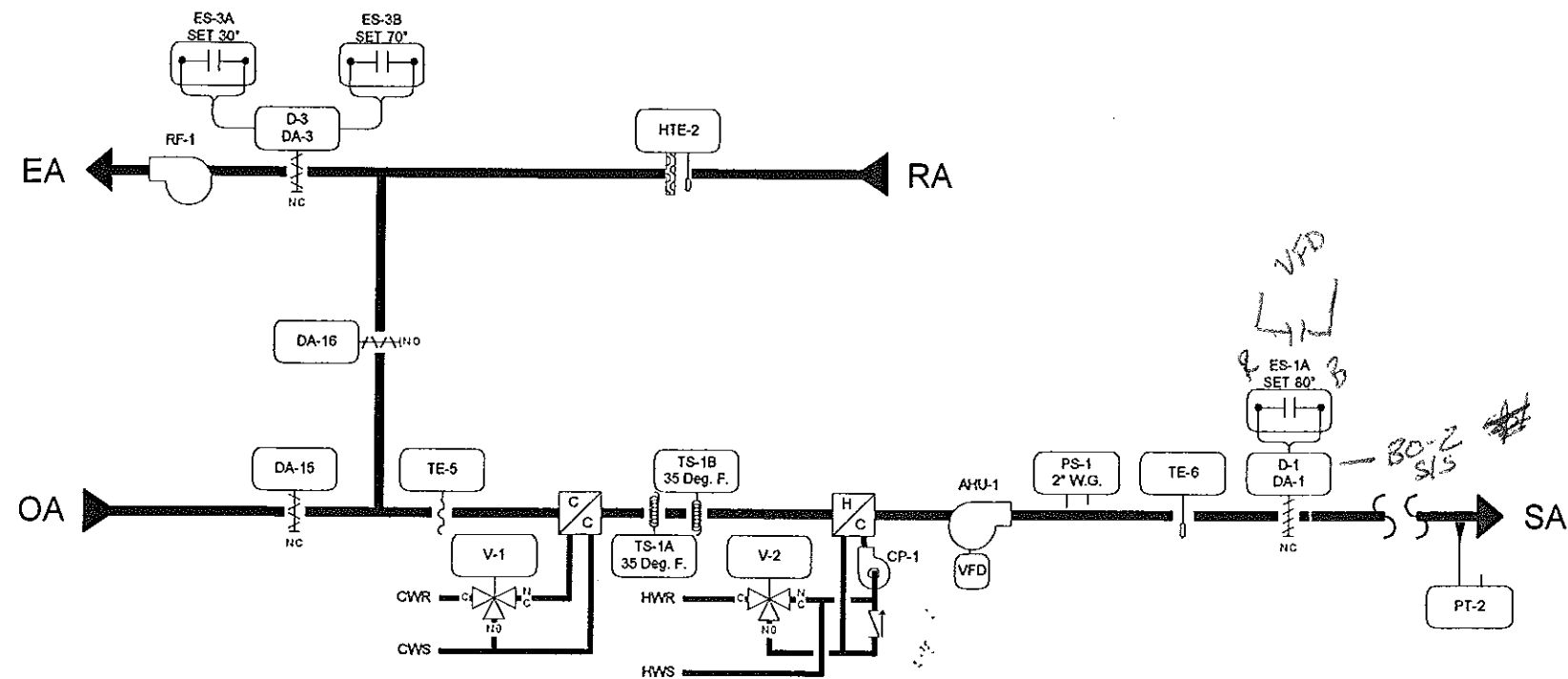


**Lower Level 2
Unit Heaters UH-1-6**



Drawing Title									
DDC SYSTEM RISER DIAGRAM									
Project Title		Branch Information		CONTRACT NUMBER		DRAWING NUMBER			
Bloomington Police Facility and Parking Garage Bloomington, Illinois		9006 N. Industrial Rd. Peoria, IL 61615		6032-0004		1			
Selling Engineer DR		Project Manager		Application Engineer BP		BY DATE		BY DATE	

Variable Air Volume Unit - AHU1



BILL OF MATERIALS

Designation	Qty	Part #	Description
D-3	1	COPAS-420X420	D-1300 COPAS DAMPER
D-1	1	CPPAS-670X260	D-1300 CPPAS DAMPER
DA-1	1	M9216-BGC-2	ELEC ACT PROP SR W/SW
DA-3	1	M9216-HGC-2	ELEC ACT PROP SR W/SW
DA-15,16	2	M9216-HGA-2	ELECT ACT PROP SR
HTE-2	1	HE-6310-2	XMTR, RH/T-Ni, DUCT, AC/DC
PS-1	1	AFS-460	CLEVELAND HI STATIC CUTOUT
PT-2	1	A301	DWYER DUCT PRESSURE PROBE
	1	DPT-2641-5	XDUCR DP 0/2.5" 4-20ma
R-1	1	PD-101-35	RLY BASE, 3PDT, 11PIN, 10A
	1	PD-109-51	RLY, 3PDT, 24VAC, 11 PIN
TE-5	1	TE-6316P-1	SENS, T-Ni, 0.1%, 17' AVG
TE-6	1	TE-6311P-1	SENS, T-Ni, 0.1%, BULB
TS-1A, 1B	2	A70HA-1C	STAT, LL, 20', EL, MAN, 15/55F
V-1	1	M150GGA-3	150#, V/ma, 24AC, NSR
	1	Q99ADN-4	MTG CHG, M100+3W, 2.5+*, CCW
	1	VB-4322-11	VLV BD MIX 3" FLG 54CV
	1	Y20EBD-3	LINKGE, M150-VB, 270#
V-2	1	VG7842NT+926HGA	3W 1" 11.6CV PROP SR

AIR HANDLING UNIT AHU-1:

Supply fan shall run continuously. Discharge air damper shall prove open before the supply fan is allowed to run.

Outdoor air damper shall open to minimum position. Return air damper shall synchronize with outdoor air damper. Outdoor air damper, return air damper, heating coil 3-way control valve and cooling coil 3-way control valve shall be modulated and sequenced by discharge air temperature sensor to maintain 55 deg. (adj.) leaving air temperature. Mixed air temperature sensor shall prevent the mixed air temperature from falling below 45 deg. (adj.) by proportionally overriding the outdoor air and return air dampers.

Return air humidity sensor shall proportionally override the chilled water coil 3-way control valve and heating coil 3-way control valve in the summer to prevent the return air humidity from rising above 50% RH (adj.).

Outdoor air enthalpy economizer shall close the outdoor air damper to minimum position.

Heating coil pump CP-1 shall run whenever the outdoor air temperature is below 40 deg. or the 3-way HWS valve is open to the coil.

Supply duct static pressure sensor, located 2/3 down the supply duct, shall modulate the supply fan VFD to maintain 1.25" w.g. (adj.).

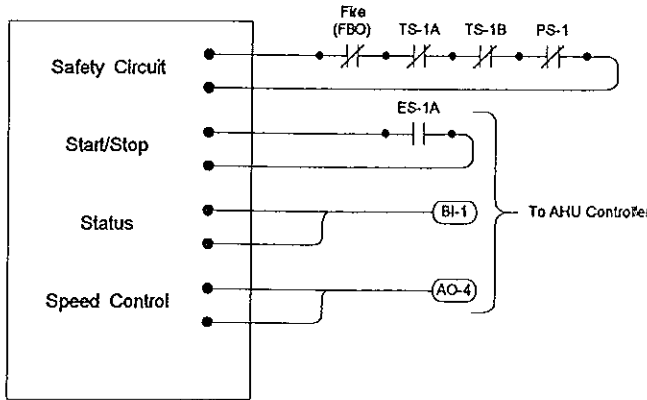
Building static pressure sensor, located in the first floor ceiling plenum, shall modulate the relief air damper and stage on relief fan RF-1 (2 speed). RF-1 shall run on low speed when relief air damper opens 30% (adj.) and high speed when relief air damper opens 70% (adj.) from auxiliary switches located on the relief air damper actuator.

Safeties:

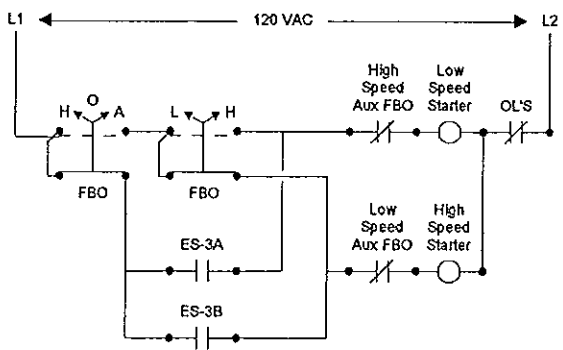
The following devices shall, upon activation, stop the supply and relief fan, close the outdoor air and relief dampers, open the return air damper, close the discharge air damper and return all controls to fail-safe position:

- Heating coil low limits (2)
- Supply fan discharge high pressure switch
- Fire alarm system shutdown relay (FBO)

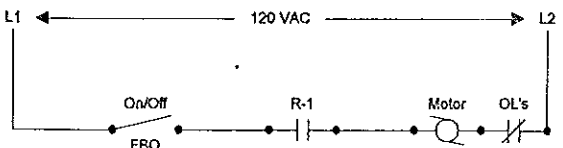
SUPPLY FAN VFD WIRING DETAILS



RETURN FAN RF1 WIRING DETAILS



HEATING PUMP CP1 WIRING DETAILS



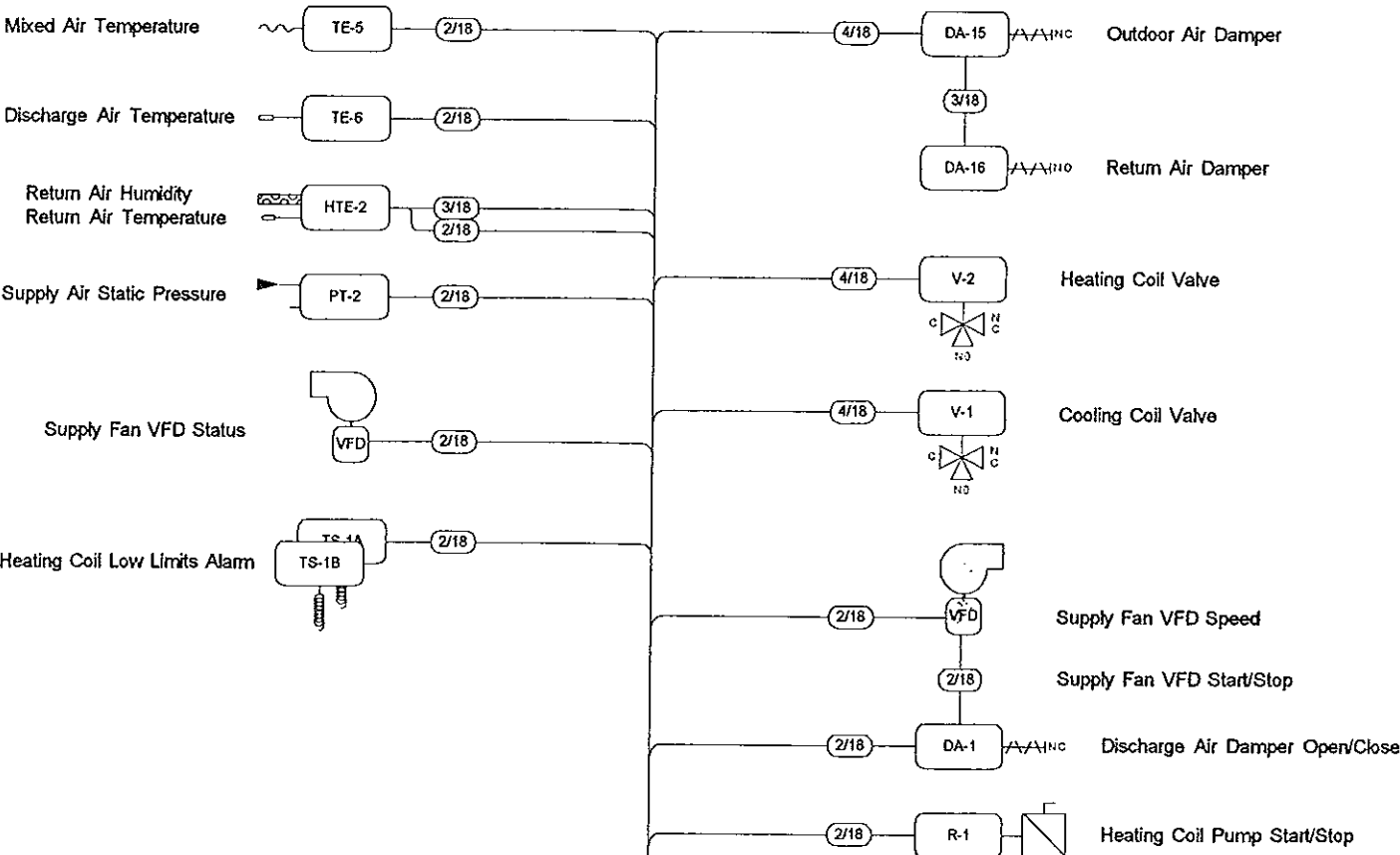
Drawing Title									
AHU1 FLOW DIAGRAM									
	REFERENCE DRAWING				120	REVISED LOCATION		BY	DATE
	Sales Engineer		Project Manager		Application Engineer		DRAWN		APPROVED
	DR		TP		BP		BY DR DATE		BY DATE
Project Title					Branch Information		CONTRACT NUMBER		
Bloomington Police Facility and Parking Garage Bloomington, Illinois	JOHNSON CONTROLS Systems & Services Division				9006 N. Industrial Rd. Peoria, IL 61615		6032-0004		
							DRAWING NUMBER 2		

Variable Air Volume Unit - AHU1

Control Panel Riser Diagram

B I L L O F M A T E R I A L S

Designation	Qty	Part #	Description
EN-1002	1	AS-AHU103-300	AHU TERM BD IN EWC35

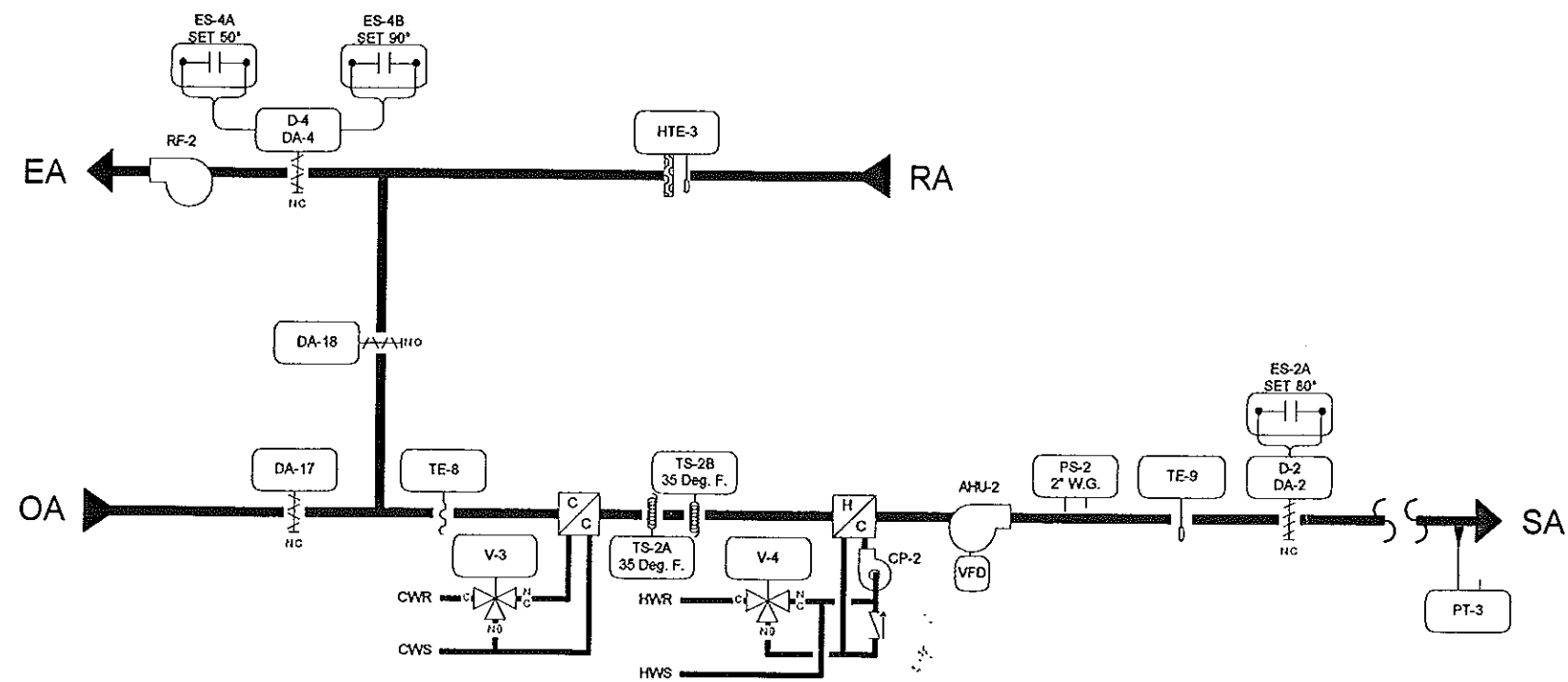


120 VAC

EN-1002
AHU-1
N1 Address = 10
N2 Address = 2
Located in Mech
Room 208

Drawing Title									
AHU1 CONTROL PANEL RISER DIAGRAM									
REFERENCE DRAWING		NO		REVISION/LOCATION		EOL		DATE	
Sales Engineer		Project Manager		Application Engineer		DRAWN		APPROVED	
DR		TP		BP		BY DR		DATE	
Project Title		Bloomington Police Facility and Parking Garage Bloomington, Illinois		Branch Information		9006 N. Industrial Rd. Peoria, IL 61615		CONTRACT NUMBER	
								6032-0004	
								DRAWING NUMBER	
								3	

Variable Air Volume Unit - AHU2



BILL OF MATERIALS

Designation	Qty	Part #	Description
D-4	1	COPAS-420x420	D-1300 COPAS DAMPER
D-2	1	CPPAS-680x260	D-1300 CPPAS DAMPER
DA-2	1	M9216-BGC-2	ELEC ACT PROP SR W/SW
DA-4	1	M9216-HGC-2	ELEC ACT PROP SR W/SW
DA-17,18	2	M9216-HGA-2	ELECT ACT PROP SR
HTE-3	1	HE-6310-2	XMTR,RH/T-Ni,DUCT,AC/DC
PS-2	1	AFS-460	CLEVELAND HI STATIC CUTOUT
PT-3	1	A301	DWYER DUCT PRESSURE PROBE
	1	DPT-2641-5	XDUCR DP 0/2.5" 4-20ma
R-2	1	PD-101-35	RLY BASE,3PDT,11PIN,10A
	1	PD-109-51	RLY,3PDT,24VAC,11 PIN
TE-8	1	TE-6316P-1	SENS,T-Ni,0.1%,17' AVG
TE-9	1	TE-6311P-1	SENS,T-Ni,0.1%,BULB
TS-2A,2B	2	A70HA-1C	STAT,LL,20',8L,MAN,15/55F
V-3	1	M150GGA-3	150#,V/mA,24AC,NSR
	1	Q99ADN-4	MTG CHG,M100+3W,2.5+*,CCW
	1	VB-4322-11	VLV BD MIX 3" FLG 54CV
	1	Y20EBD-3	LINKGE,M150-VB,270#
V-4	1	VG7842NT+926HGA	3W 1" 11.6CV PROP SR

AIR HANDLING UNIT AHU-2:

Supply fan shall run continuously. Discharge air damper shall prove open before the supply fan is allowed to run.

Outdoor air damper shall open to minimum position. Return air damper shall synchronize with outdoor air damper. Outdoor air damper, return air damper, heating coil 3-way control valve and cooling coil 3-way control valve shall be modulated and sequenced by discharge air temperature sensor to maintain 55 deg. (adj.) leaving air temperature. Mixed air temperature sensor shall prevent the mixed air temperature from falling below 45 deg. (adj.) by proportionally overriding the outdoor air and return air dampers.

Return air humidity sensor shall proportionally override the chilled water coil 3-way control valve and heating coil 3-way control valve in the summer to prevent the return air humidity from rising above 50% RH (adj.).

Outdoor air enthalpy economizer shall close the outdoor air damper to minimum position.

Heating coil pump CP-2 shall run whenever the outdoor air temperature is below 40 deg. or the 3-way HWS valve is open to the coil.

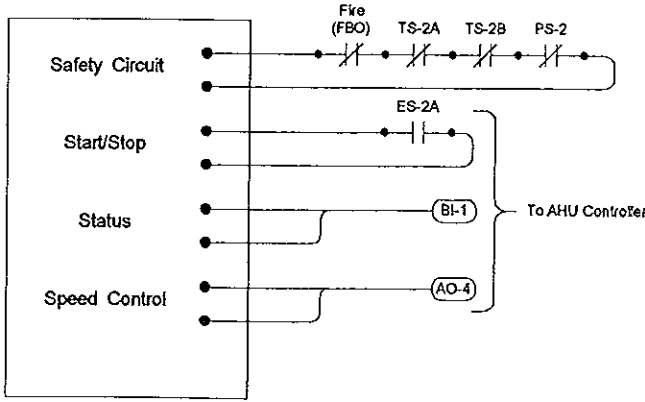
Supply duct static pressure sensor, located 2/3 down the supply duct, shall modulate the supply fan VFD to maintain 1.25" w.g. (adj.).

Building static pressure sensor, located in the first floor ceiling plenum, shall modulate the relief air damper and stage on relief fan RF-2 (2 speed). RF-2 shall run on low speed when relief air damper opens 50% (adj.) and high speed when relief air damper opens 90% (adj.) from auxiliary switches located on the relief air damper actuator.

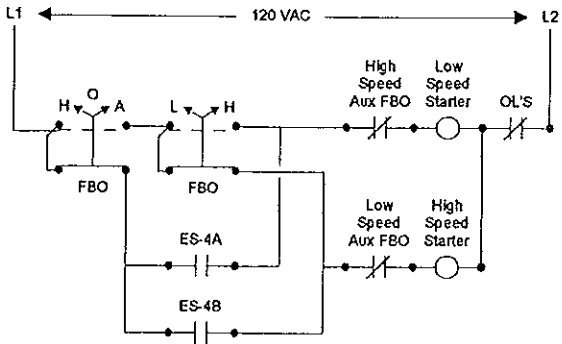
Safeties:
The following devices shall, upon activation, stop the supply and relief fan, close the outdoor air and relief dampers, open the return air damper, close the discharge air damper and return all controls to fail-safe position:

- Heating coil low limits (2)
- Supply fan discharge high pressure switch
- Fire alarm system shutdown relay (FBO)

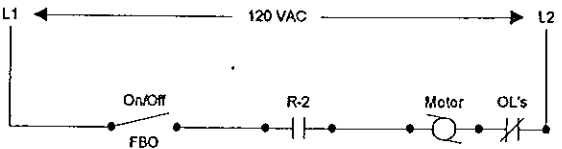
SUPPLY FAN VFD WIRING DETAILS



RETURN FAN RF2 WIRING DETAILS



HEATING PUMP CP2 WIRING DETAILS

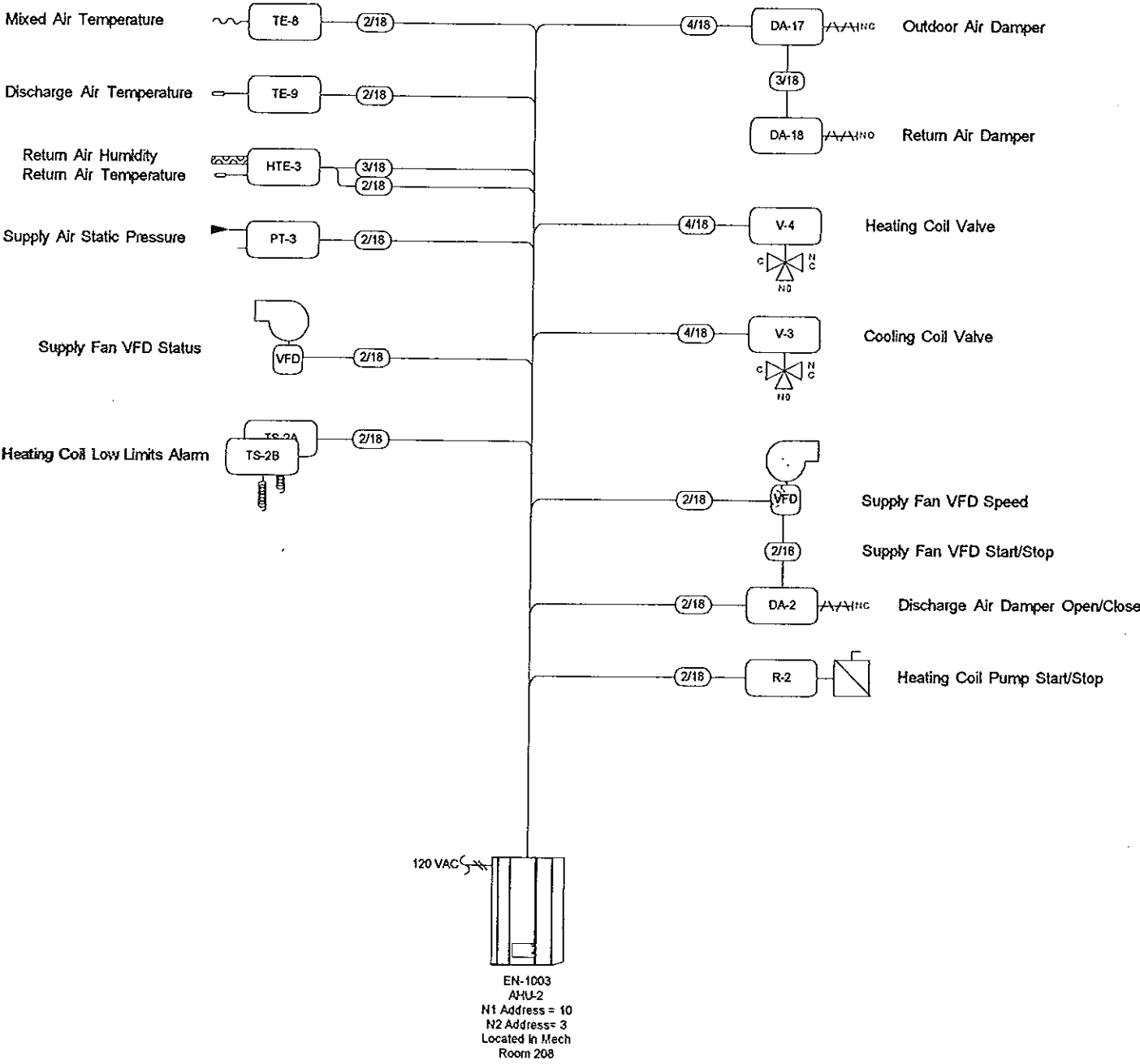


Drawing Title	AHU2 FLOW DIAGRAM			
Project Title	Bloomington Police Facility and Parking Garage Bloomington, Illinois			
REFERENCE DRAWING	NO	REVISION/LOCATION	EDN	DATE
DR	TP	BP	BY	DATE
JOHNSON CONTROLS Systems & Services Division		6032-0004 DRAWING NUMBER 4		

Variable Air Volume Unit - AHU2

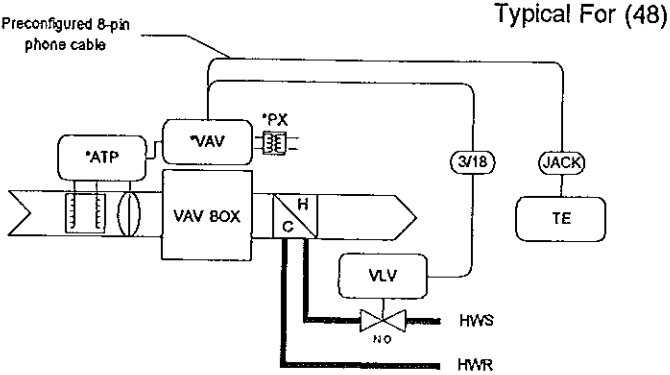
Control Panel Riser Diagram

BILL OF MATERIALS		
Designation	Qty	Part # Description
EN-1003	1	AS-AHU103-300 AHU TERM BD IN EWC35



Drawing Title							
AHU2 CONTROL PANEL RISER DIAGRAM							
REFERENCE DRAWING		NO		REVISION/LOCATION		BY DATE	
Drawn By	DR	Project Manager	TP	Application Engineer	BP	BY DATE	APPROVED
Project Title		Bloomington Police Facility and Parking Garage Bloomington, Illinois		Branch Information 9006 N. Industrial Rd. Peoria, IL 61615		CONTRACT NUMBER 6032-0004	
		JOHNSON CONTROLS Systems & Services Division				DRAWING NUMBER 5	

Digital VAV Terminal Box
with Hot Water Reheat



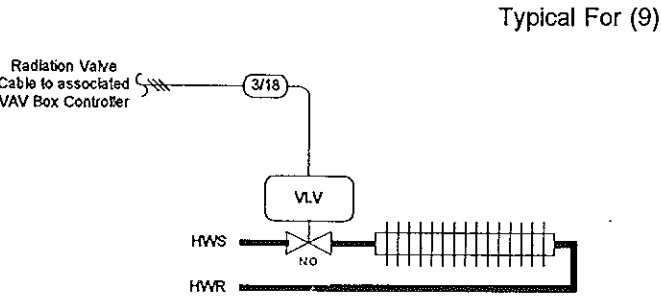
***Factory Mounting Notes:** The VAV, PX, and ATP will be factory mounted and wired. The TE will need to be field mounted and connected, via an 8-pin phone cable, to the VAV. The Valve will be field mounted and wired to the VAV. 24VAC power will be supplied to the VAV controllers in a power limited trunk application.

B I L L O F M A T E R I A L S

Designation	Qty	Part #	Description
Field Devices:			
ACC	48	Q0893-404-50	PRE-CFG VAV CBL 50' PLNUM
ATP	48	ATP-2040-212	ACT, 2MIN+1.5"DP, 1/2"CPLG
VAV	48	AS-VAV110-1	VAV 6AI, 4BI, 8BO, 8K
PX	48	Y65GS-1C	XFMR, 24/24 ISOL, 40VA, FOOT
TE	48	TE-6413S-1010	MSTAT, NI, SPF, SUR, JACK, TH
VLV	48	VG7241C0+7150G	2W1/2 NPT 0.7 VA7150 ELEC

VAV Box Control: The VAV box damper will modulate to maintain the space temperature setpoint. On a call for cooling the box damper will modulate open to allow increased CFM to cool down the space. On a call for heat the reheat valve will modulate open with the box damper at minimum position.

Fin Tube Radiation Served
from VAV Box Sensor

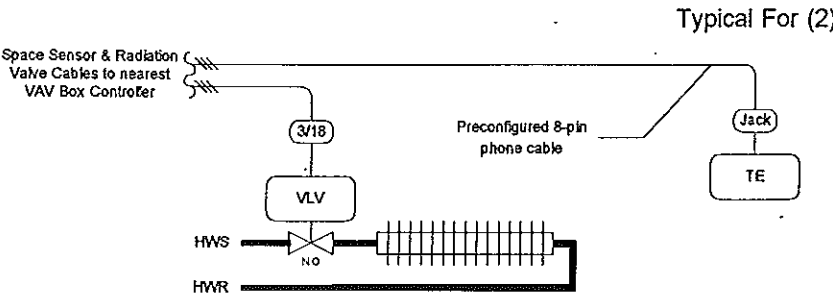


B I L L O F M A T E R I A L S

Designation	Qty	Part #	Description
Field Devices:			
VLV	9	VG7241C0+7150G	2W1/2 NPT 0.7 VA7150 ELEC

Radiation Control: Associated VAV Box controller shall modulate the 2-way HWS valve in series with the VAV Box reheat coil control valve.

Fin Tube Radiation Served
from Individual Room Sensors



B I L L O F M A T E R I A L S

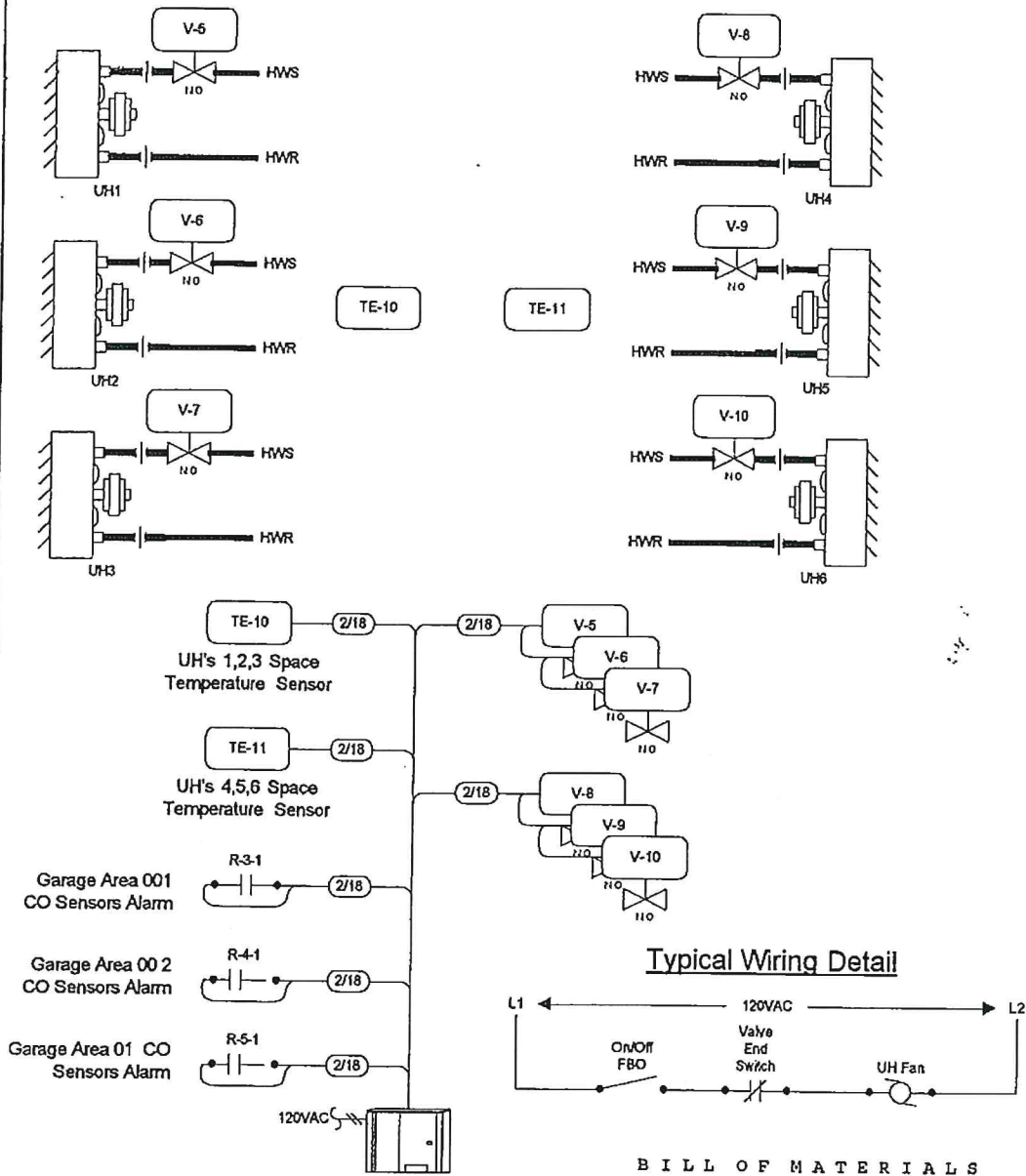
Designation	Qty	Part #	Description
Field Devices:			
TE	2	TE-6413S-2010	MSTAT, NI, SPF, SUR, TB, TH
VLV	2	VG7241C0+7150G	2W1/2 NPT 0.7 VA7150 ELEC

Radiation Control: Room sensor, through nearest VAV box controller, shall modulate the 2-way HWS valve.

Note: See Room Schedule for VAV box and
Fin Tube Assignments and Quantities

DRAWING TITLE											
VAV BOXES, RADIATION & UNIT HEATERS FLOW AND PANEL RISER DIAGRAMS											
PROJECT TITLE		Bloomington Police Facility and Parking Garage Bloomington, Illinois		JOHNSON CONTROLS Systems & Services Division		9006 N. Industrial Rd. Peoria, IL 61615		CONTRACT NUMBER 6032-0004		DRAWING NUMBER 6	
REFERENCE DRAWING		NO		REVISION/LOCATION		EQU		DATE		BY	
Sides Engineer DR		Project Manager TP		Application Engineer BP		BY		DATE		DATE	

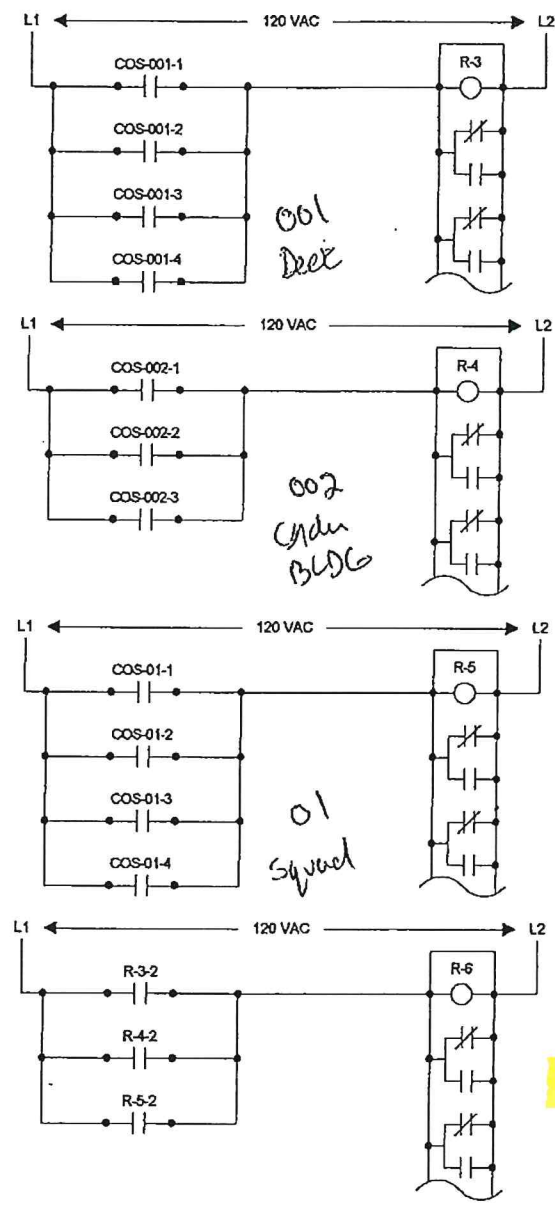
Unit Heaters UH-1,2,3,4,5,6



BILL OF MATERIALS		
Designation	Qty	Part # Description
Field Devices:		
UNT4	1	AS-UNT110-101 UNT110 MTD IN UPM, W/50VA
TE-10,11	2	TE-6410S-2000 MSTAT,NI,SUR,TB
V-5-10	6	0691C0326GA01 1/2" NO 0.9CV ELEC SR ES

UH1,2,3,4,5,6 Control: The space temperature sensors, located in the ceiling of lower level 2, shall cycle the unit heaters 2-way control valves through a ddc controller located on UH2. The fans shall run whenever their respective control valves open through end switches integral to the control valves.

Carbon Monoxide Sensors & Exhaust Fans EF-5,6,7,8



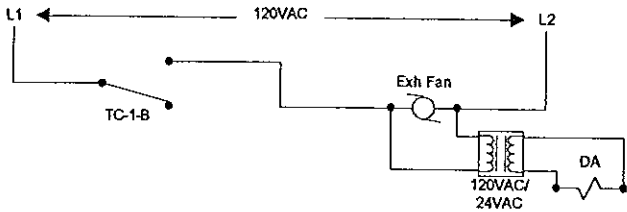
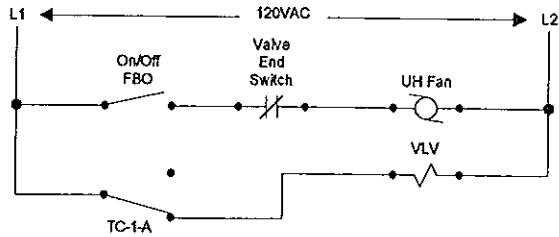
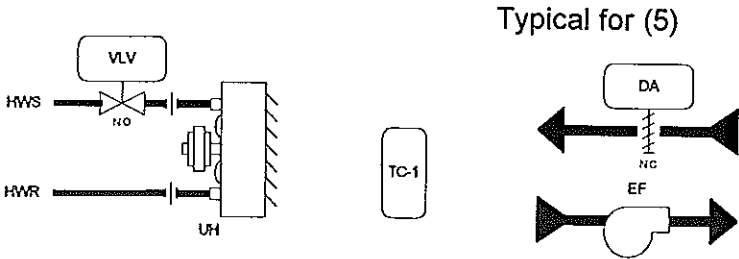
BILL OF MATERIALS		
Designation	Qty	Part # Description
Field Devices:		
COS-1-11	11	CM-21A CO DETECTOR & CONTROLLER
R-3-R-6	4	PD-109-50 RLY,4PDT,120VAC
	4	PD-101-35 RELAY BASE,4PDT

* Garage Exhaust Fans Control: Exhaust fans EF5,6,7,8 shall start whenever any one of eleven carbon monoxide (CO) sensors reach a level of 25 ppm. Each garage area (3) shall report an alarm condition to the DDC system.

The Garage fans on both levels Run 24/7/365 As Control system/Programming has Failed

DRAWING TITLE		PROJECT TITLE		DATE	
Carbon Monoxide Detectors, Exhaust Fans & UH-1 thru UH-6		Bloomington Police Facility and Parking Garage Bloomington, Illinois		7	
DESIGNED BY		CHECKED BY		DATE	
DR		TP		BP	
PROJECT MANAGER		DESIGNER		DATE	
JOHNSON CONTROLS		8006 N. Industrial Rd. Peoria, IL 61615		6032-0004	
SYSTEMS & SERVICES DIVISION		DRAWN BY		DATE	
				7	

Cabinet Unit Heaters with associated Exhaust Fans



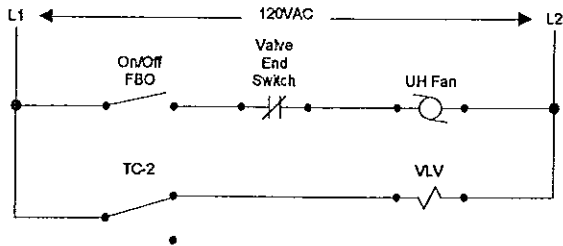
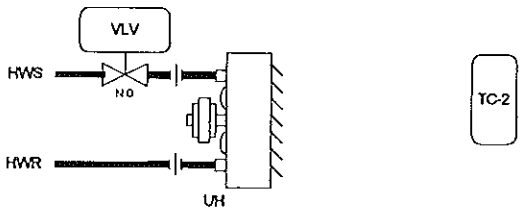
B I L L O F M A T E R I A L S

Designation	Qty	Part #	Description
Field Devices:			
DMP	3	CPVAS-160X160	D-1300 CPVAS DAMPER
	1	CPVAS-240X240	D-1300 CPVAS DAMPER
	2	CPVAS-240X304	D-1300 CPVAS DAMPER
DA	5	M9216-BGA-2	24VAC ELEC DMPR ACT SR
TC-1	5	T25A-1C	STAT, RM, 2CKT, HT/CL, ADJ
VLV	4	0691C0326GA01	1/2" NO 0.9CV ELECT SR ES
	1	0691C0328GA01	1/2" NO 3.7CV ELECT SR ES

UH/Exhaust Fan Control: Two-Stage space thermostat shall cycle the unit heater 2-way control valve on a call for heat. The fan shall run whenever the control valve opens through an end switch integral to the control valve. On a call for cooling, the two-stage space thermostat shall cycle the exhaust fan and the associated intake damper shall open.

Cabinet/Propeller Unit Heaters

Typical for (10)

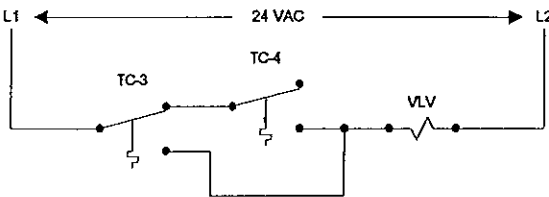
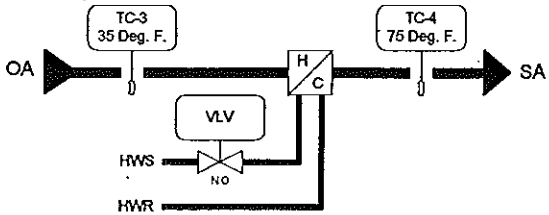


B I L L O F M A T E R I A L S

Designation	Qty	Part #	Description
Field Devices:			
TC-2	10	T26S-18C	STAT, RM, H/C, ADJ, 40/90F
VLC	9	0691C0326GA01	1/2" NO 0.9CV ELECT SR ES
	1	0691C0328GA01	1/2" NO 3.7CV ELECT SR ES

Standalone UH Control: Space thermostat shall cycle the unit heater 2-way control valve. The fan shall run whenever the control valve opens through an end switch integral to the control valve.

Heating Coil HC1

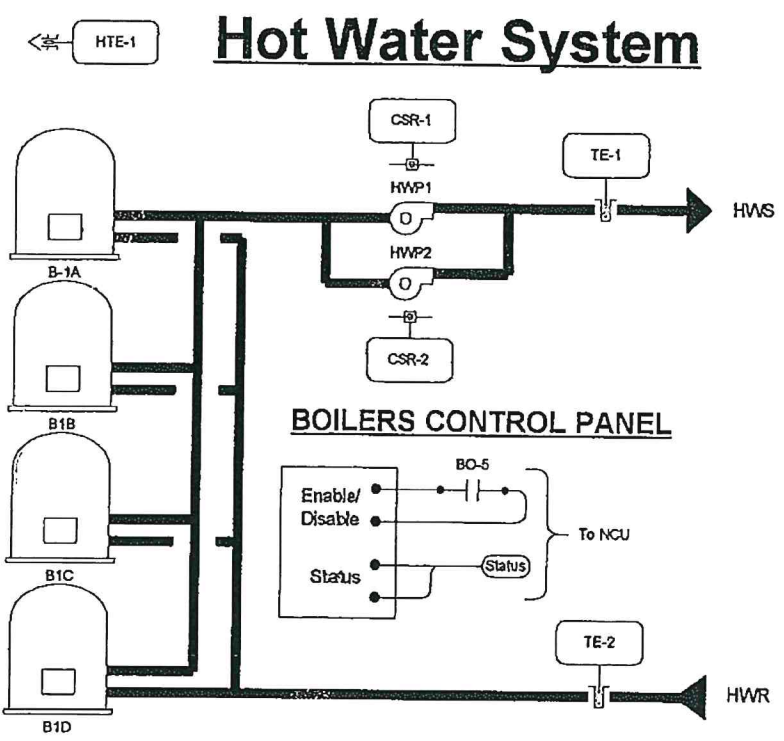


B I L L O F M A T E R I A L S

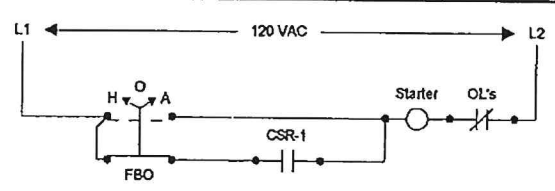
Designation	Qty	Part #	Description
Field Devices:			
TC-3,4	2	A19ABC-24C	STAT, 8'CAP, SPDT, -30/100F
VLV	1	J691C0328GA00	2NO 1/2 NPT 3.7 L 24 SR

Heating Coil Control: Duct discharge thermostat shall cycle the hot water coil control valve to maintain 75 deg. F.. Outdoor air thermostat shall open valve fully below 35 deg. F. outdoor air temperature.

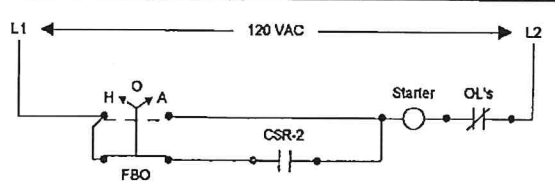
DRAWING TITLE											
CABINET UNIT HEATERS, EXHAUST FANS AND HEATING COIL HC-1											
PROJECT TITLE		Bloomington Police Facility and Parking Garage		Bloomington, Illinois		JOHNSON CONTROLS		Systems & Services Division		9008 N. Industrial Rd. Peoria, IL 61615	
REFERENCE DRAWING		NO		REVISION/LOCATION		EON		DATE		BY	
Sales Engineer DR		Project Manager TP		Application Engineer BP		BY DR		DATE		APPROVED	
										CONTRACT NUMBER	
										6032-0004	
										DRAWING NUMBER	
										8	



HOT WATER PUMP 1 WIRING DETAILS



HOT WATER PUMP 2 WIRING DETAILS



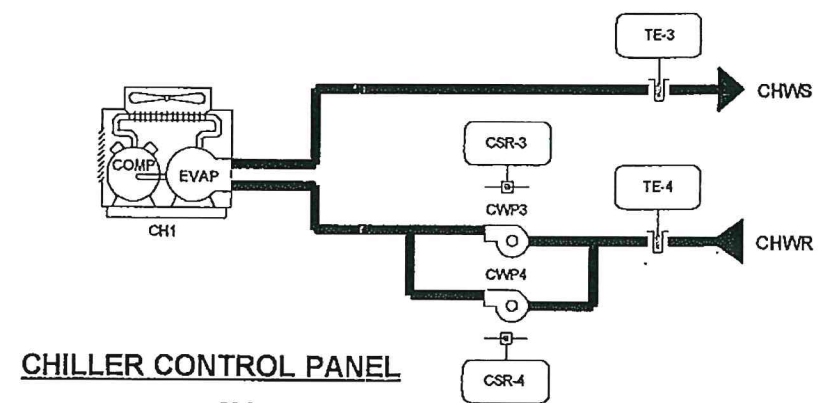
Hot Water System: The modular boilers are equipped with a microprocessor multiple boiler control system to provide an adjustable constant temperature (furnished by others). The DDC system shall enable the boiler control system whenever reheat is required. Hot water pump P1 or P2 shall prove status before the boiler system is enabled. Hot water pump P1 is the primary pump. Hot water pump P2 is the standby pump and shall run if P1 fails.

WELL MCLAREN SYSTEM WAS REMOVED and replaced by Johnson Controls. WIRING IS A MESS

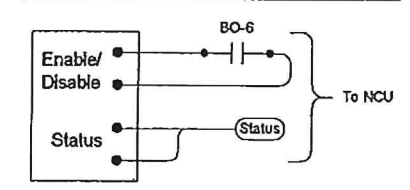
OA SENSOR is wired through exhaust fan and must be corrected

Appears it was a rush temporary fix that became permanent

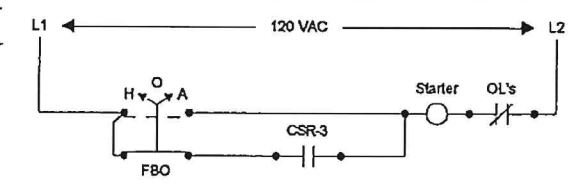
Chilled Water System



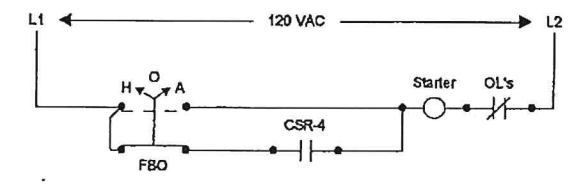
CHILLER CONTROL PANEL



CHILLED WATER PUMP 3 WIRING DETAILS



CHILLED WATER PUMP 4 WIRING DETAILS



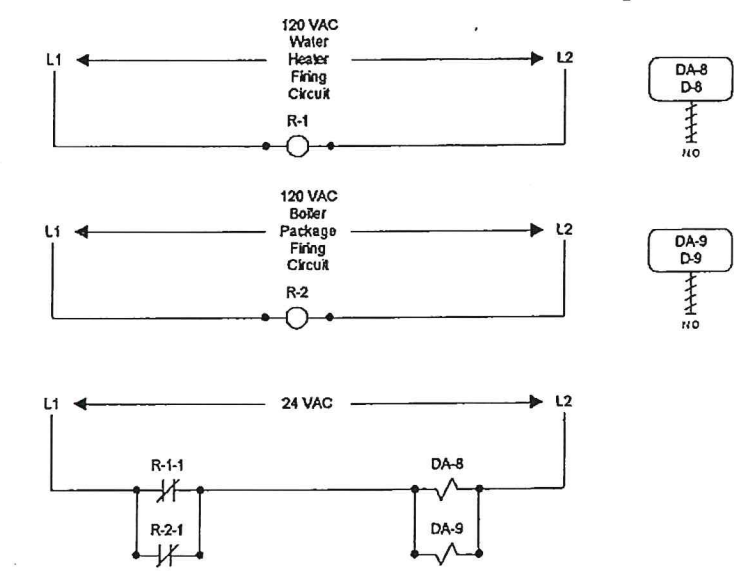
Chilled Water System: The package chiller is equipped with a microprocessor chiller control system to provide an adjustable constant temperature (furnished by others). The DDC system shall enable the chiller whenever cooling and/or dehumidification is required. Chilled water pump P3 or P4 shall prove status before the chiller is enabled. Chilled water pump P3 is the primary pump. Chilled water pump P4 is the standby pump and shall run if P3 fails.

THIS NEEDS TO BE PART OF BAS going forward w/ override capabilities on each boiler, boiler reset program, etc.

BILL OF MATERIALS

Designation	Qty	Part #	Description
Field Devices:			
CSR-1-4	4	H-735	VERIS CURR SENS W/RELAY
D-8	1	COPAS-300x310	D-1300 CPVAS DAMPER
D-9	1	COPAS-300x300	D-1300 CPVAS DAMPER
DA-1,2	2	M9216-BGA-2	ELEC ACT ON-OFF SR
HTE-1	1	RHT-3-I-O/A	SENS, HUMID/TEMP GEN EAST
R-1,2	2	PD-109-50	RLY, 3PDT, 120VAC, 11PIN
	2	PD-101-35	RLY BASE, 3PDT, 11PIN, 10A
TE-1-4	4	TE-6312P-1	SENS, T-Ni, 0.1%, 8" WELL

Combustion Air Dampers

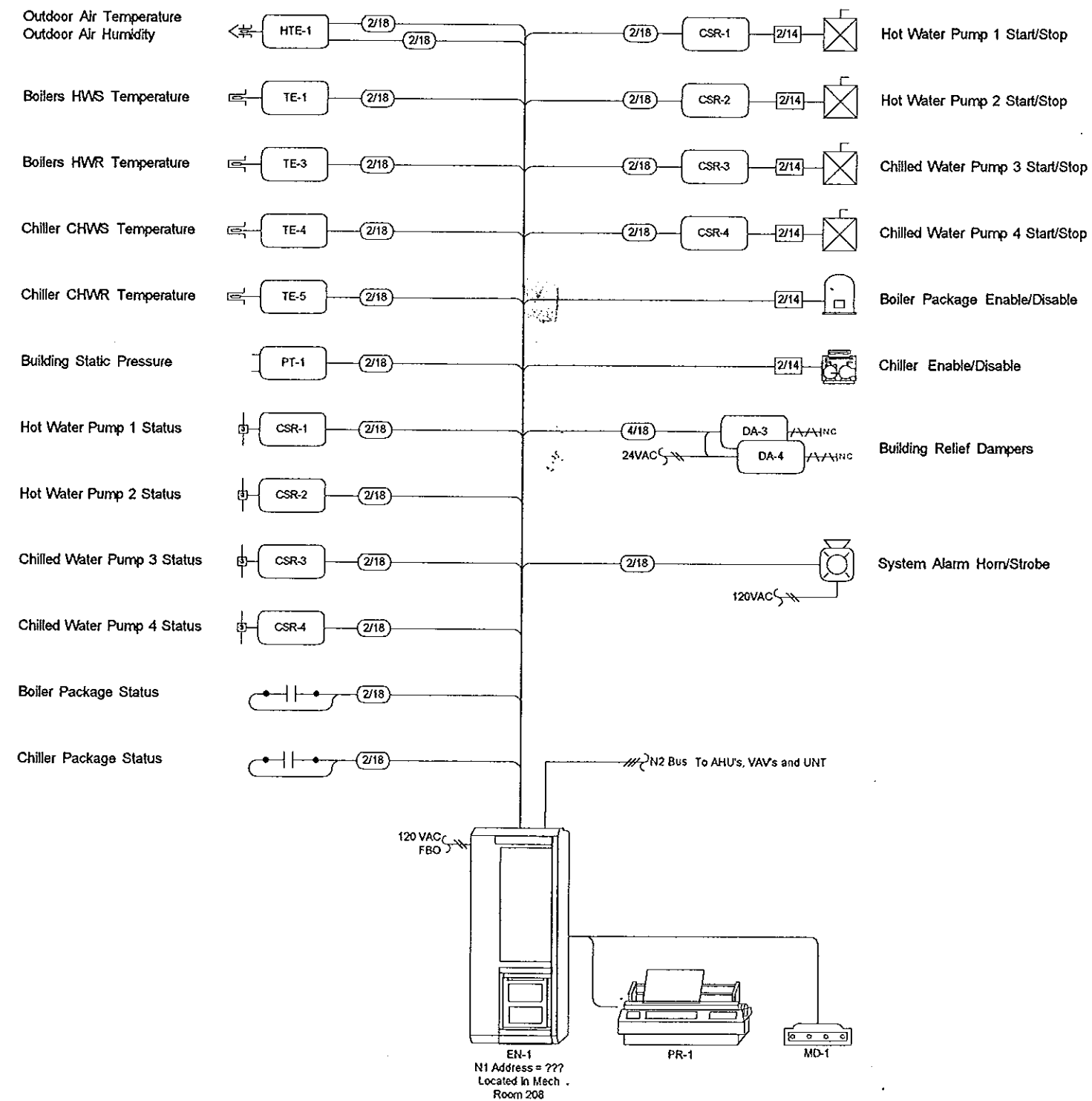


Combustion Air Dampers Control: The combustion air dampers shall open when either the water heater or boilers are operating.

DRAWING TITLE		HOT WATER & CHILLED WATER SYSTEMS FLOW DIAGRAMS	
PROJECT TITLE		Bloomington Police Facility and Parking Garage, Bloomington, Illinois	
DESIGNED BY	DATE	APPROVED BY	DATE
DR	TP	BP	
JOHNSON CONTROLS		8006 N. Industrial Rd. Peoria, IL 61615	
Systems & Services Division		CONTRACT NUMBER 6032-0004	
		DRAWING NUMBER 9	

DRAWING TITLE											
EMERGENCY GENERATOR DAMPER CONTROL AND SUPPLEMENTAL WIRING DETAILS											
		REFERENCE DRAWING		NO.		REVISION/LOCATION		BY		DATE	
		Sales Engineer		Project Manager		Application Engineer		BY		DATE	
		DR		TP		BP		BY		DATE	
								APPROVED			
								BY		DATE	
PROJECT TITLE						Branch Information		CONTRACT NUMBER			
Bloomington Police Facility and Parking Garage Bloomington, Illinois		JOHNSON CONTROLS		Systems & Services Division		9008 N. Industrial Rd. Peoria, IL 61615		6032-0004			
								DRAWING NUMBER		10	

Network Control Unit Control Panel Riser Diagram



BILL OF MATERIALS

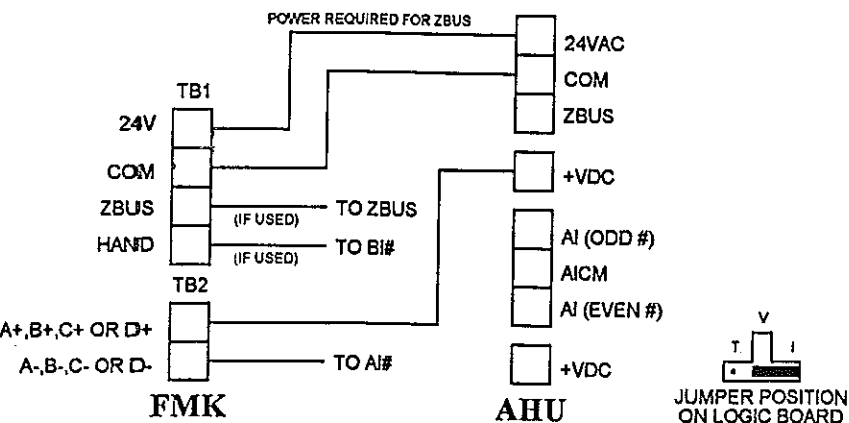
Designation	Qty	Part #	Description
EN-1	1	EN-BSF201-0	ENCL, 2 SLOT BASEFRAME
	1	EN-EWC200-0	ENCL & CVR, NCU, 2 SLOT
	1	EN-KIT103-0	NETWORK TERM CRADLE KIT
	3	FM-IBN101-0	FN MOD 2 BIN INPUT
	3	FM-IUN102-0	FN MOD UNIV INPUT
	2	FM-IAN101-0	FN MOD ANA INPUT
	6	FM-KIT127-0	FN MOD BLANKOFFS
	7	FM-ORE101-0	FN MOD MOM RLY OUT
	1	FM-OAE101-0	FN MOD ANA OUTPUT
	1	IO-NTU102-0	NETWORK TERMINAL W/LIGHT
	1	NU-DCM140-0	DIGITAL CONTROL MOD
	1	NU-NCM200-0	NETWORK CTRL MOD, BSF MNTG
	1	NU-NIM206-0	NETWORK IDENTITY MODULE
	1	NU-COM101-0	RS232 COMM MODULE
	2	NU-PWR101-0	POWER SUPPLY (NCU/NEU)
MD-1	1	PD-111-5	SONALERT HORN
	1	OPTIMA 14.4	HAYES MODEM 14.4K BAUD
PR-1	1	RS232 CABLE	CABLE FOR OPTIMA MODEM
	1	PAPER	BOX OF PAPER (1000 SHT)
	1	EPSON 6' CABLE	PRINTER CABLE 6'
	1	EPSON FX 870	DOT MATRIX PRINTER

Drawing Title											
NETWORK CONTROL UNIT RISER DIAGRAM											
Project Title		Bloomington Police Facility and Parking Garage Bloomington, Illinois		Contract Number		6032-0004		Drawing Number		11	
Sales Engineer		DR		Project Manager		TP		Application Engineer		BP	
By		DR		Date				By		Date	
Bench Information		9006 N. Industrial Rd. Peoria, IL 61615		Contract Number		6032-0004		Drawing Number		11	
Systems & Services Division											

AHU ANALOG INPUT WIRING DETAILS

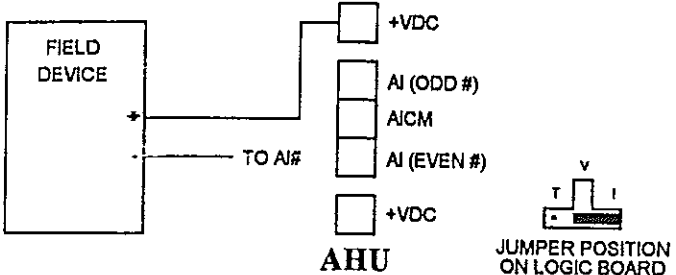
DETAIL A1:

FMK KIT



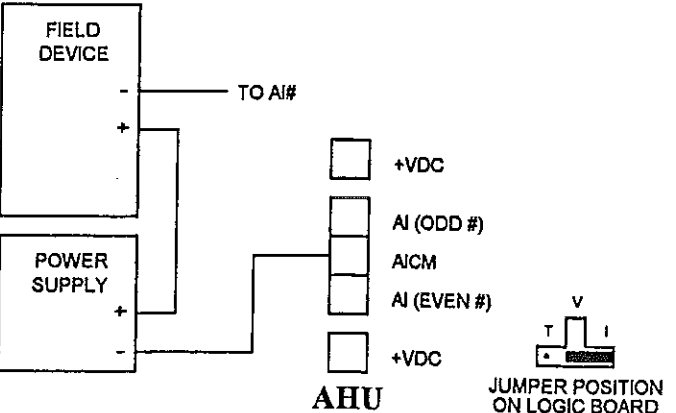
DETAIL A2:

CURRENT INPUT INTERNAL SOURCE



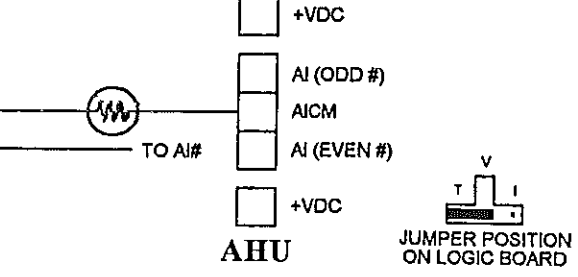
DETAIL A3:

CURRENT INPUT EXTERNAL SOURCE



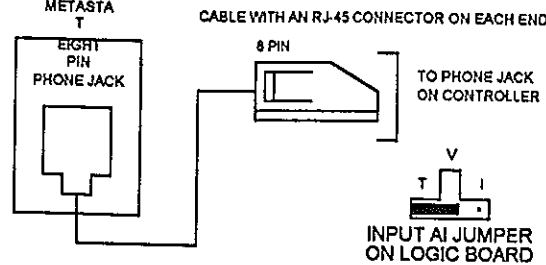
DETAIL A4:

TEMPERATURE SENSOR INPUT



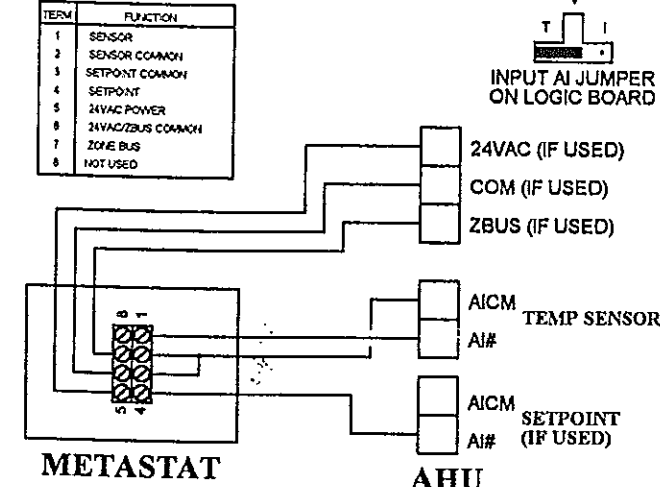
DETAIL A5:

METASTAT INPUT



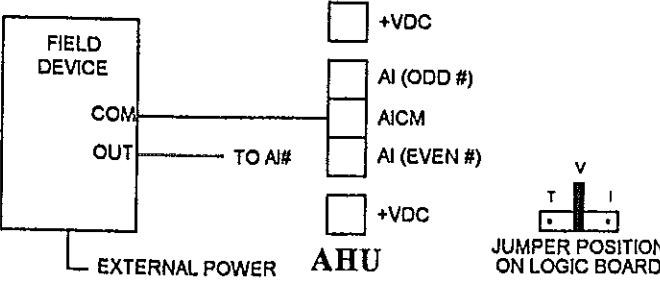
DETAIL A6:

METASTAT TERMINAL BLOCK



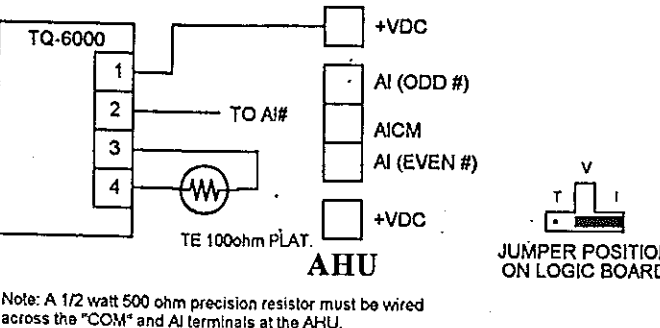
DETAIL A7:

0-10VDC INPUT EXTERNAL SOURCE



DETAIL A8:

ACTIVE TEMP ELEMENT 4-20mA INPUT

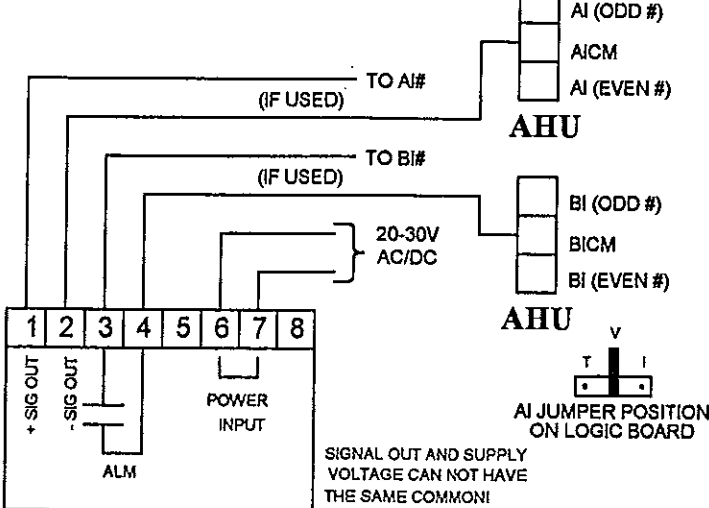


Note: 120 VAC power requires 3rd wire grounding to building ground. Do not use conduit as ground.

Note: If shielded wire is used for devices, terminate shield to conduit or enclosure wall and tape back at device.

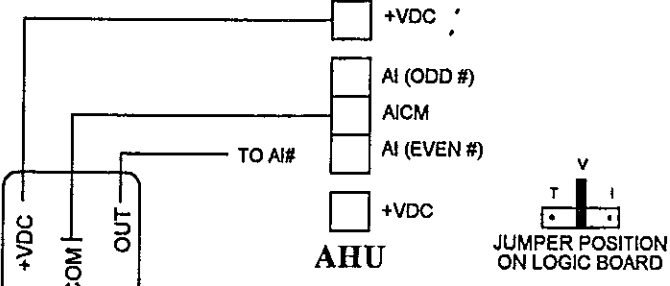
DETAIL A9:

CARBON DIOXIDE SENSOR



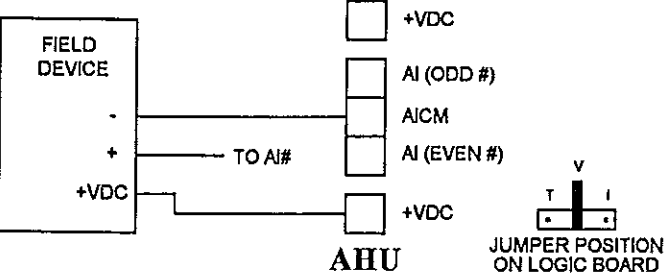
DETAIL A10:

DPT-2000 ANALOG INPUT

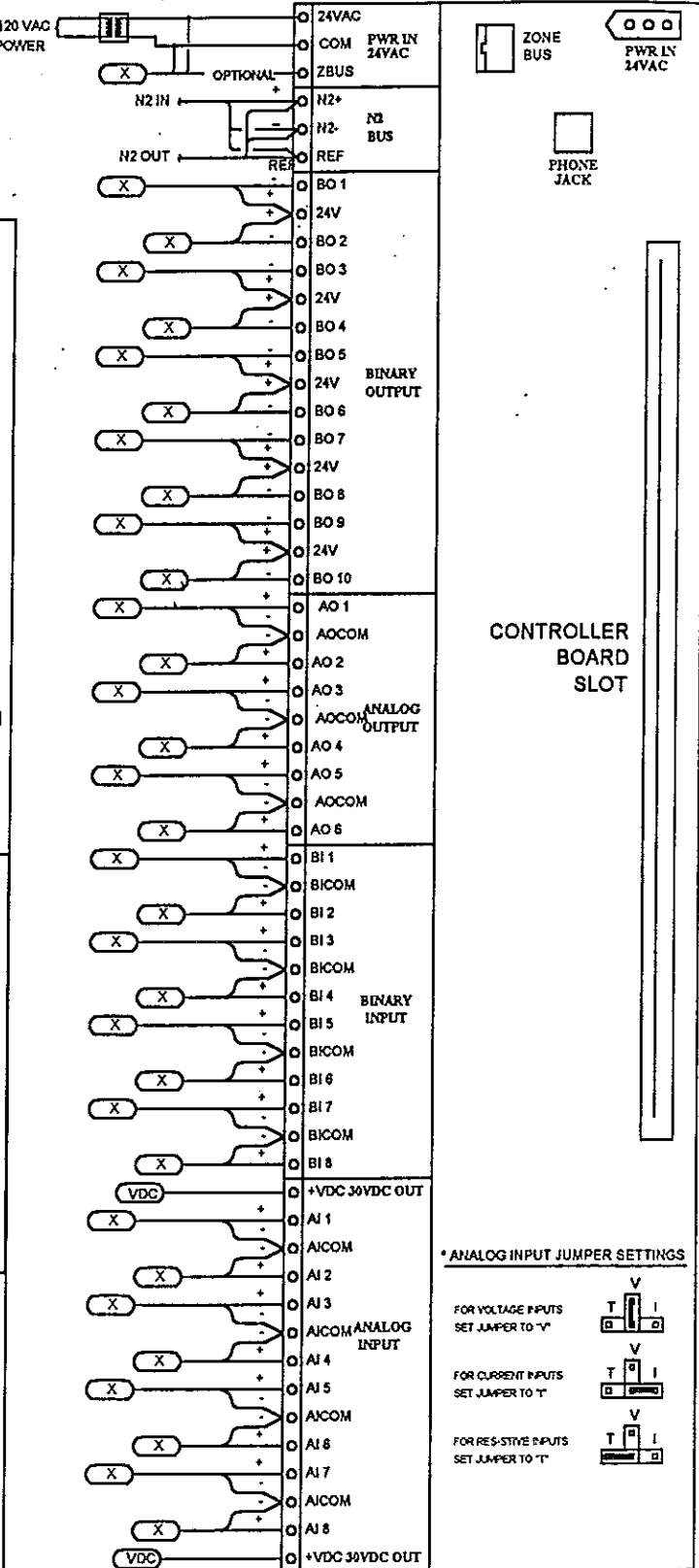


DETAIL A11:

0-10VDC INPUT INTERNAL SOURCE



AHU TERMINAL LAYOUT

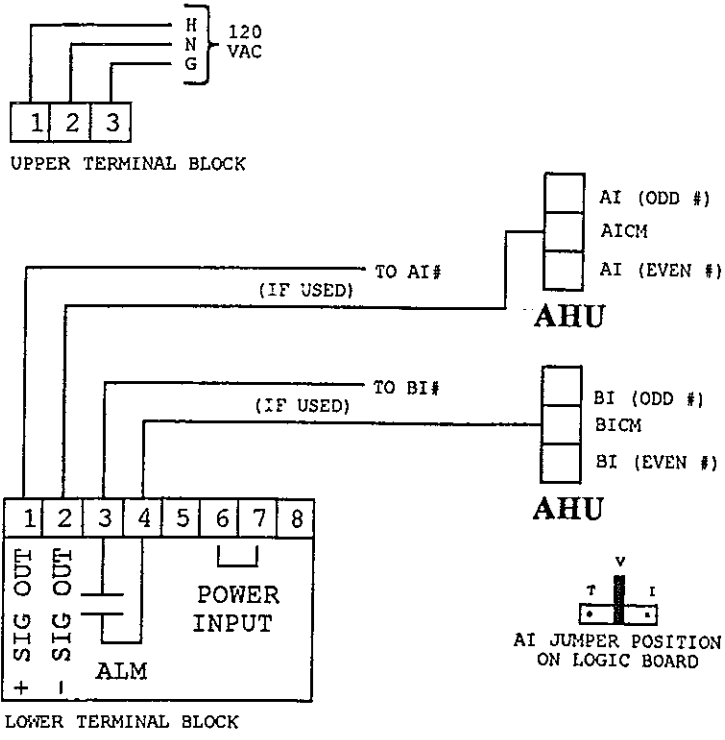


AHU ANALOG INPUT WIRING DETAILS

AHU ANALOG OUTPUT WIRING DETAILS

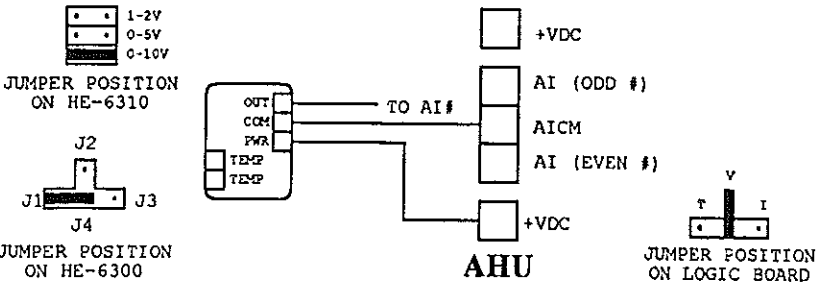
DETAIL A12:

CARBON DIOXIDE CONCENTRATION SAMPLER



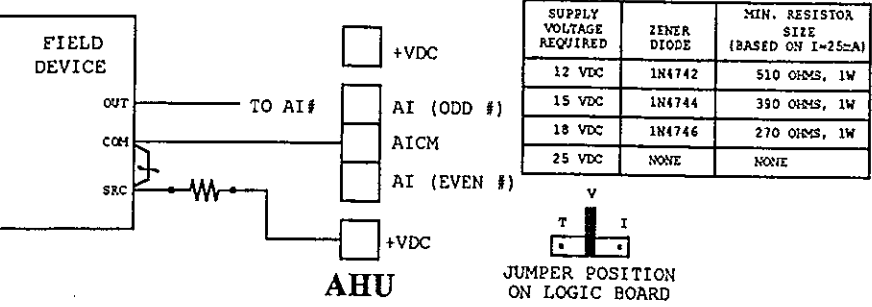
DETAIL A13:

HE-63x0 ANALOG INPUT



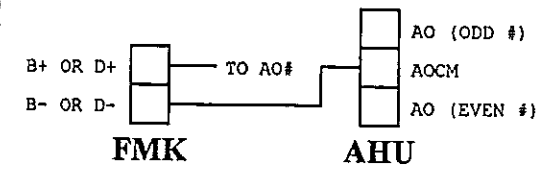
DETAIL A14:

TRANSDUCER INPUT



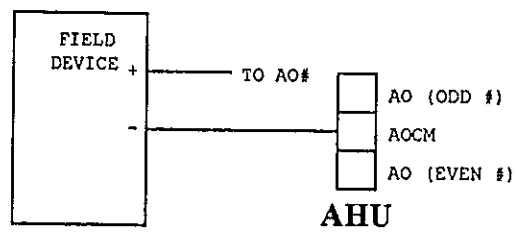
DETAIL A20:

ANALOG OUTPUT TO REMOTE FMK



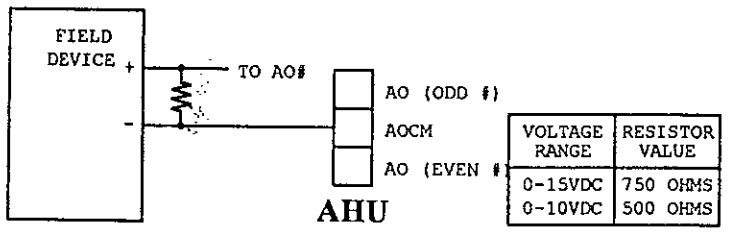
DETAIL A21:

0-20mA ANALOG OUTPUT



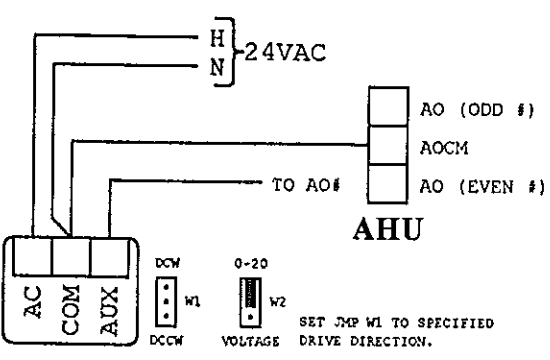
DETAIL A22:

0-10VDC ANALOG OUTPUT



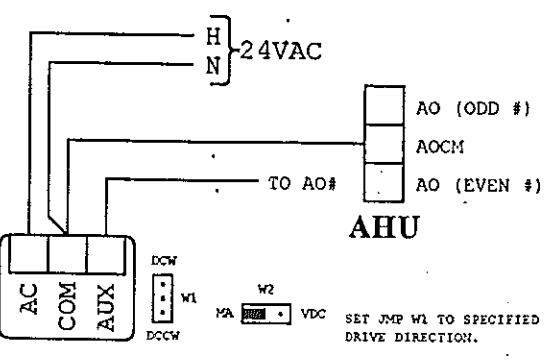
DETAIL A23:

0-20mA OUTPUT TO EDA-8x02



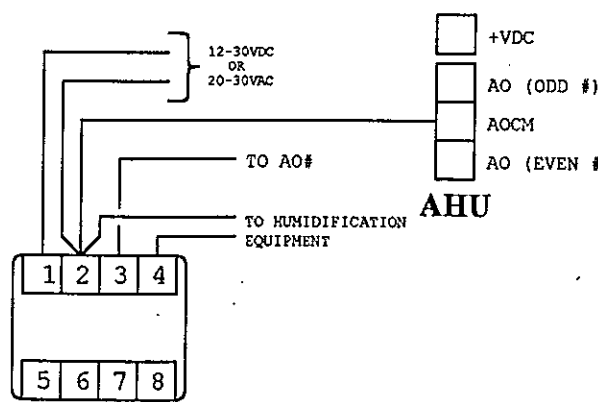
DETAIL A24:

0-20mA OUTPUT TO EPP-1000



DETAIL A25:

0-20mA OUTPUT TO HLC-1000



TERMINAL NUMBER	TERMINAL NUMBER	POLARITY	SOURCE/DESTINATION
1	POWER	+	SYSTEM CONTROLLER OR SEPARATE 24VAC
2	COM	-	FWA, INPUT, OUTPUT
3	IN	+	0-20mA
4	OUT	+	HUMID. EQUIPMENT
5	TEMP	n/a	TEMP. SENSOR
6	TEMP	n/a	TEMP. SENSOR
7	RELAY	n/a	FOR ON/OFF HUMID. EQUIPMENT
8	RELAY	n/a	FOR ON/OFF HUMID. EQUIPMENT

JUMPERS ON DEVICE

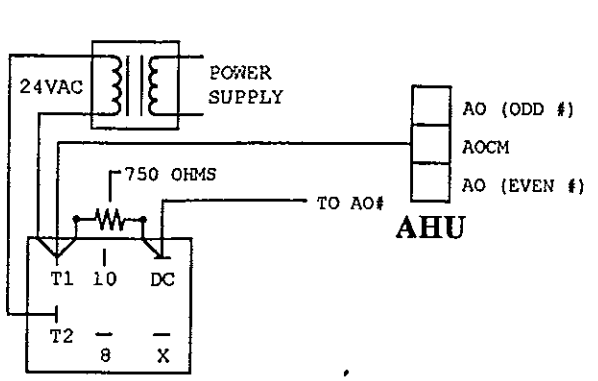
0-20mA INPUT JMP

0-10VDC OUTPUT JMP

0-20mA OUTPUT JMP

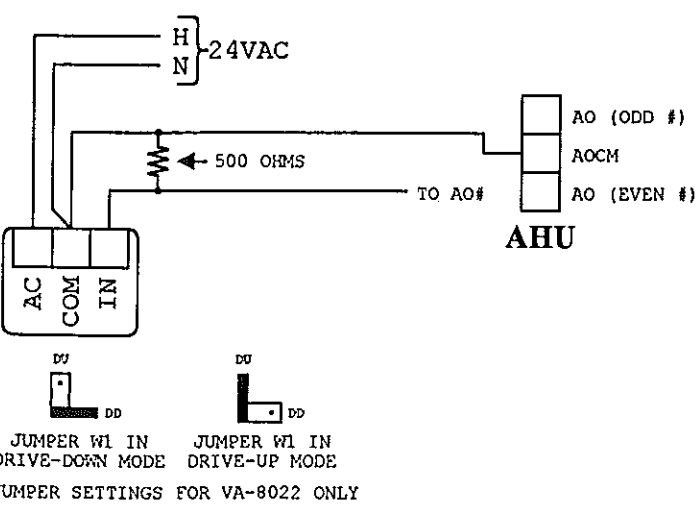
DETAIL A26:

0-15VDC OUTPUT TO M100



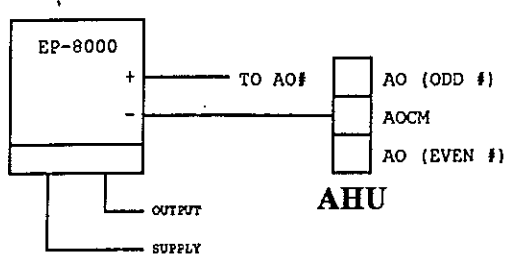
DETAIL A27:

0-10VDC OUTPUT TO VA-8022 OR VA-8052 VALVE ACTUATOR



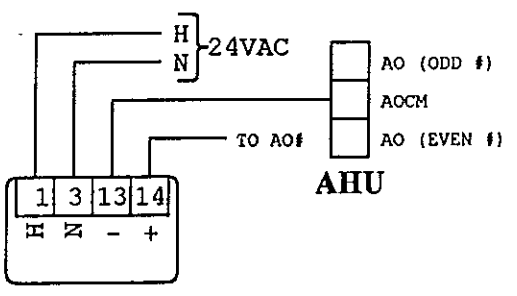
DETAIL A28:

0-20mA OUTPUT TO EP-8000



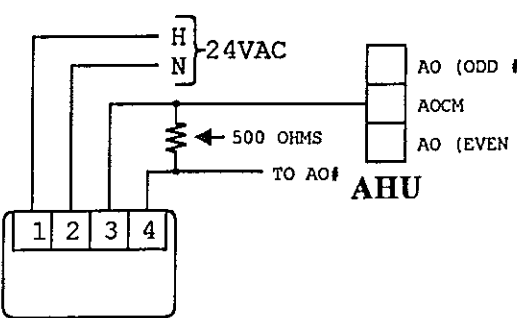
DETAIL A29:

0-20mA OUTPUT TO VA-9000



DETAIL A30:

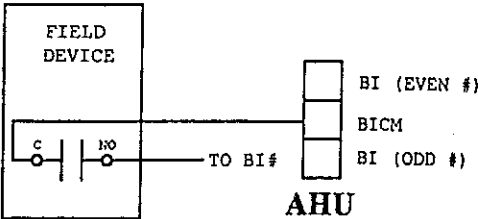
0-10VDC OUTPUT TO VA-8092



AHU BINARY INPUT WIRING DETAILS

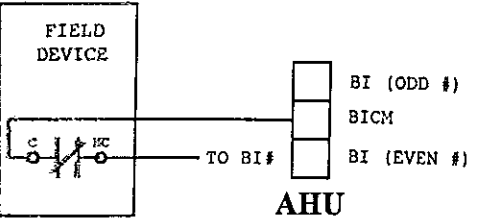
DETAIL A40:

N.O. BINARY INPUT



DETAIL A41:

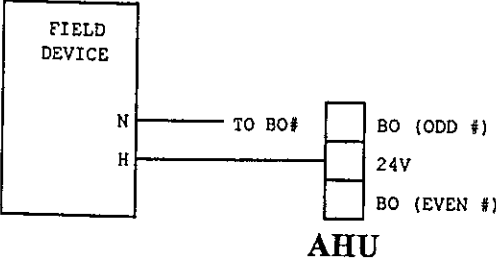
N.C. BINARY INPUT



AHU BINARY OUTPUT WIRING DETAILS

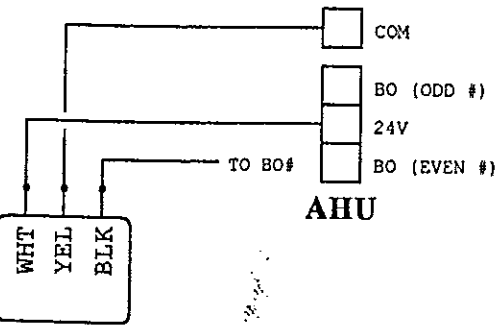
DETAIL A50:

24VAC BINARY OUTPUT



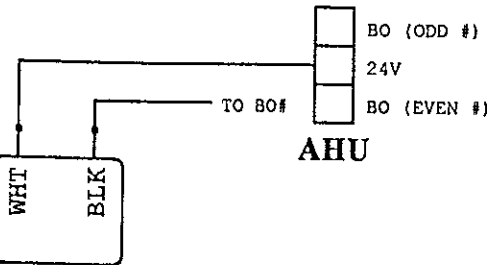
DETAIL A51:

24VAC BINARY OUTPUT TO REV MOTOR J SERIES VALVE



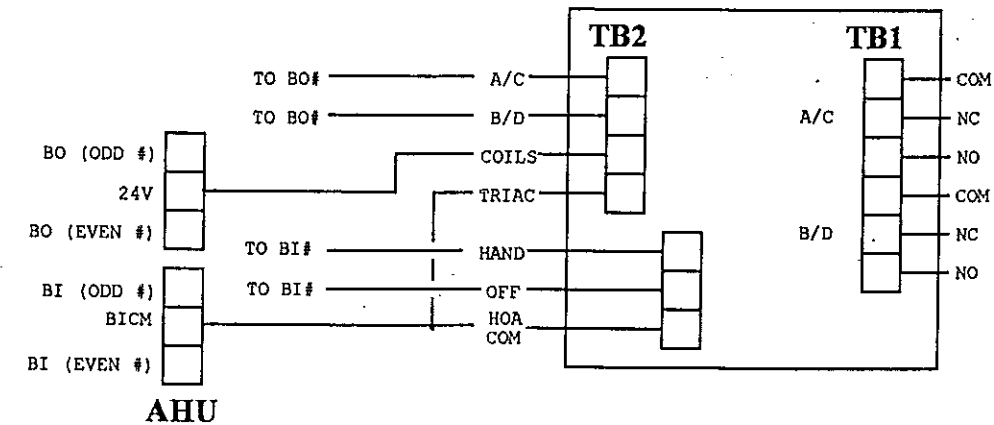
DETAIL A52:

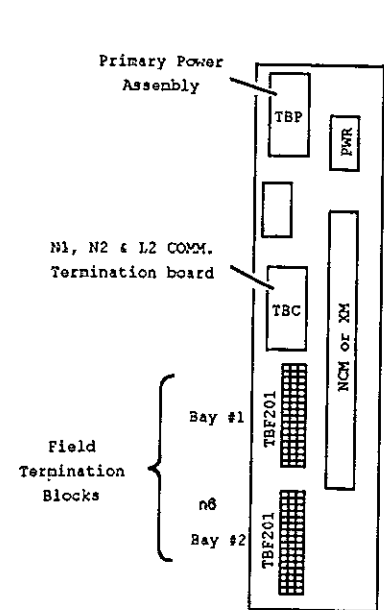
24VAC BINARY OUTPUT TO SPRING RETURN J SERIES VALVE



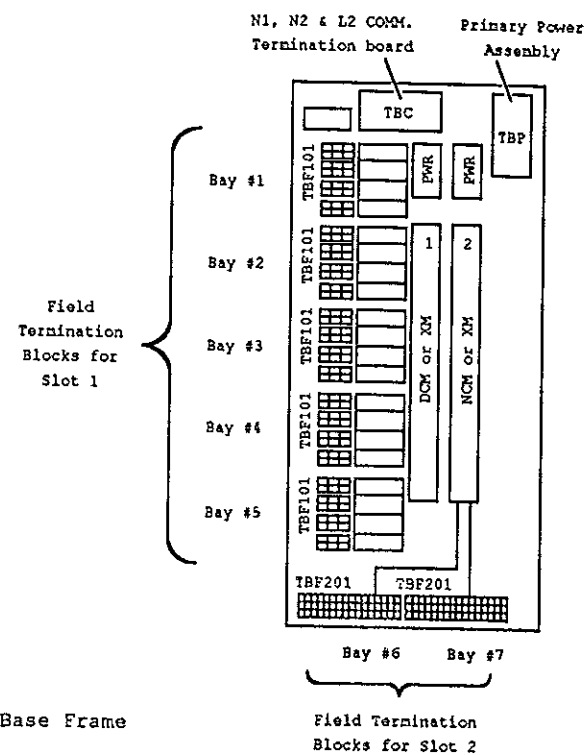
DETAIL A53:

RLY RELAY KIT

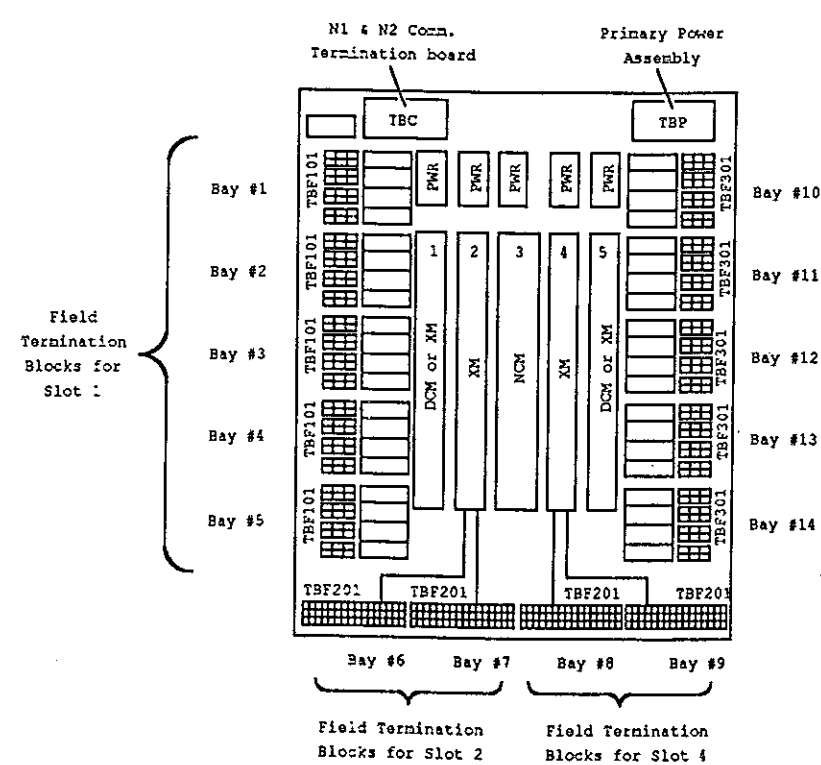




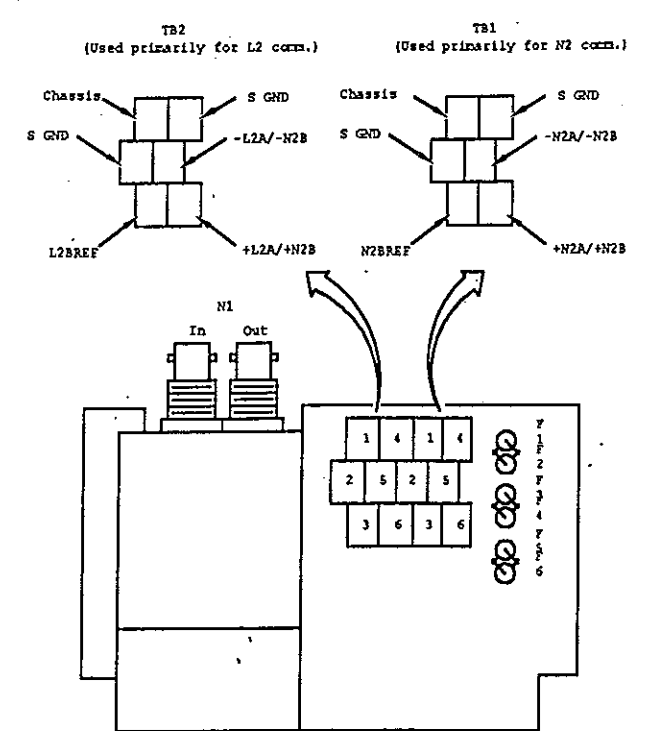
Electrical Components for 1-Slot Base Frame
Fig. 12



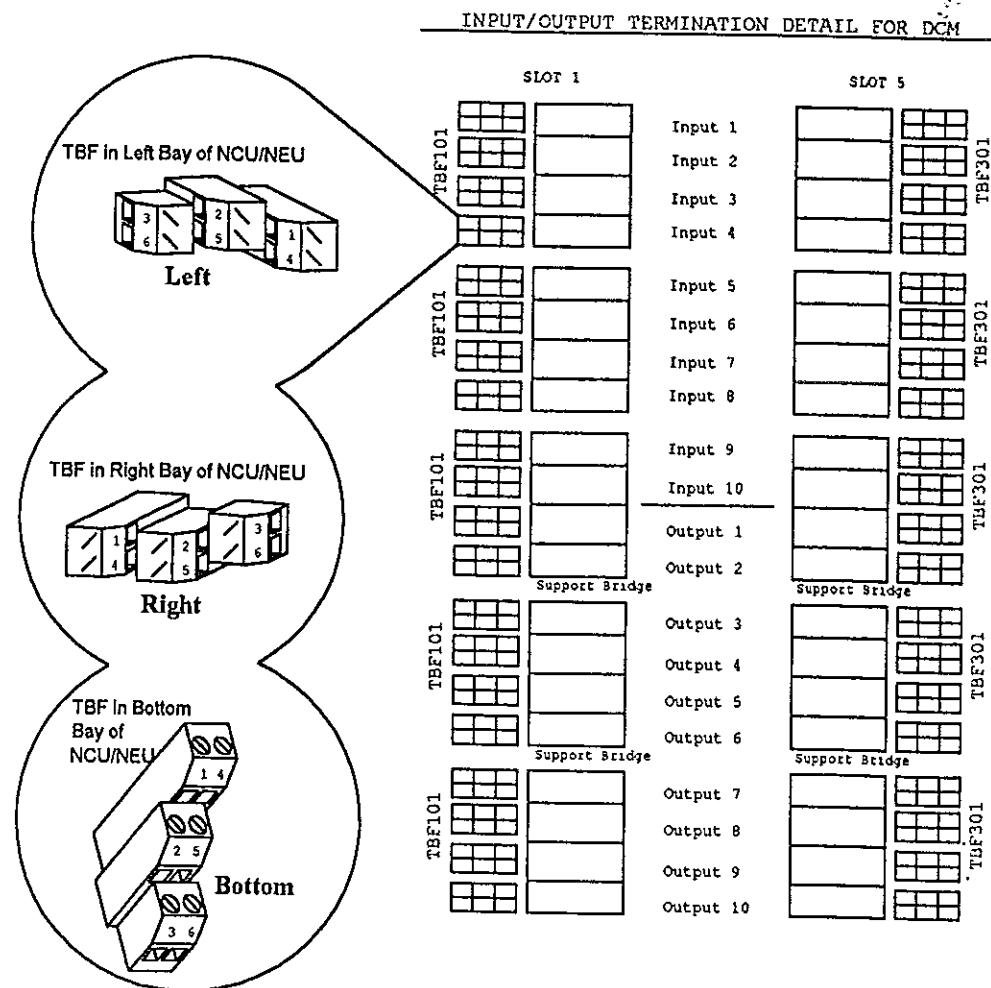
Electrical Components for 2-Slot Base Frame
Fig. 13



Electrical Components for 5-Slot Base Frame
Fig. 14



Network Connections To Field Interface Board
On NCU Base.



INPUT POINT	
FUNCTION MODULE TERMINATION SCHEDULE	
FUNCTION MODULE	TBF TERMINALS
*FM-IAP101-0	1 and 2
FM-IBF101-0	1 and 2
FM-IBN101-0	1 and 2; 3 and 4
*FM-IDPxxx-0	1 and 4
*FM-IUN102-0	See IUN Engineering Bulletin 636-038-b
REMOTE INSTALLATION- DIRECT INSTALLATION	
* INVOLVES PNEUMATIC TUBING ONLY	
OUTPUT POINT	
FUNCTION MODULE TERMINATION SCHEDULE	
FUNCTION MODULE	TBF TERMINALS
FM-OAE101-0	Curr.Source: 1 and 2 Curr.Control: 2 and 3
FM-OAI101-0	Volt.Source: 4 and 5
FM-OAI101-0	Same As OAE
FM-OAP121-0	Pneumatic Tubing Only
FM-OBE101-0	2-W Remote Xducer: 1 and 2 RLM/RXM Relay: 1 and 2
FM-ORE101-0	N.O.: 1 and 3 N.C.: 2 and 3
FM-ORL101-0	Same as ORE
FM-ORM101-0	3-W Motor Starter: 1 & 3 N.O. (ST); 5 N.C. (SP)
FM-OSV101-0	Pneumatic Tubing Only
FM-OTE101-0	1(INC); 2(DEC); 3(COM)

The above three figures illustrate the position and the numbering pattern of the electrical components for each of the base frames.

The terminal blocks in the LEFT or RIGHT bays use FMs to interface the signals. There are 10 input slots and 10 output slots for FMs available. Any FM except the IBN utilizes a complete slot per point. The IBN allows two binary inputs per slot.

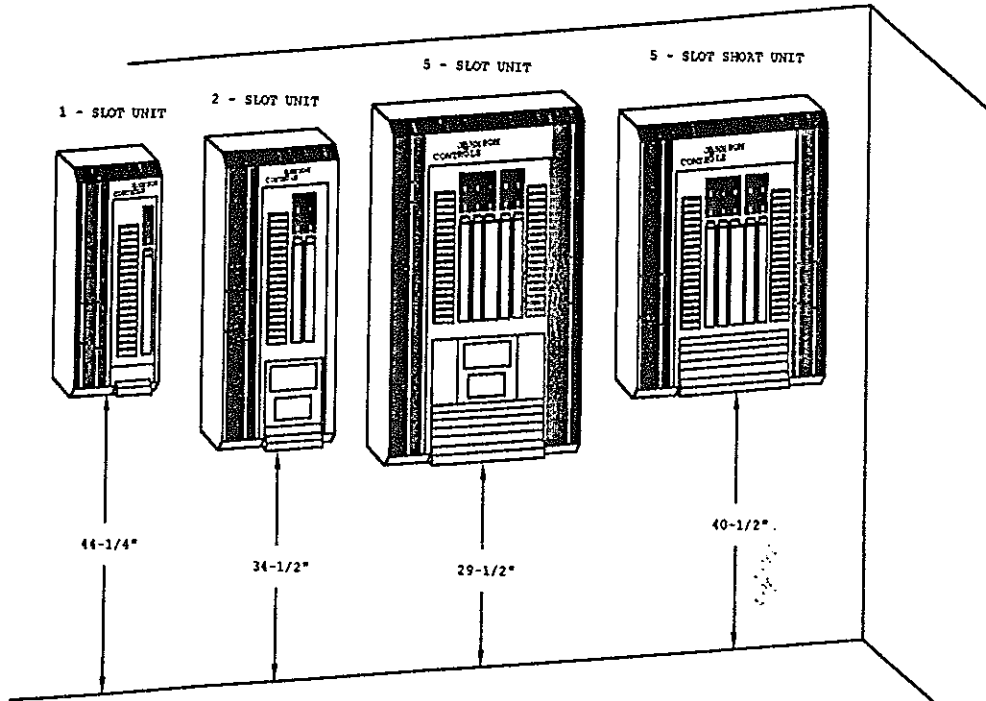
The terminal blocks in the BOTTOM bays do not use FMs to interface the signals; they connect ONLY to XMs. There are three positions for the TBF201 field terminal blocks. For the 1-Slot base frame, the blocks are in bay numbers 1 and 2 on the left side of the unit (Fig. 12)

For the 2-Slot base frames, the XM field terminal blocks are in Bays 6 and 7, horizontally positioned along the left bottom (Fig. 13). These blocks connect to the slot number 2 for the XM.

The 5-Slot base frame has XM field terminal blocks in Bays 6,7,8 and 9 horizontally positioned along the left and right bottom (Fig. 14). Bays 6 and 7 connect to the slot number 2, and Bays 8 and 9 connect to slot number 4.

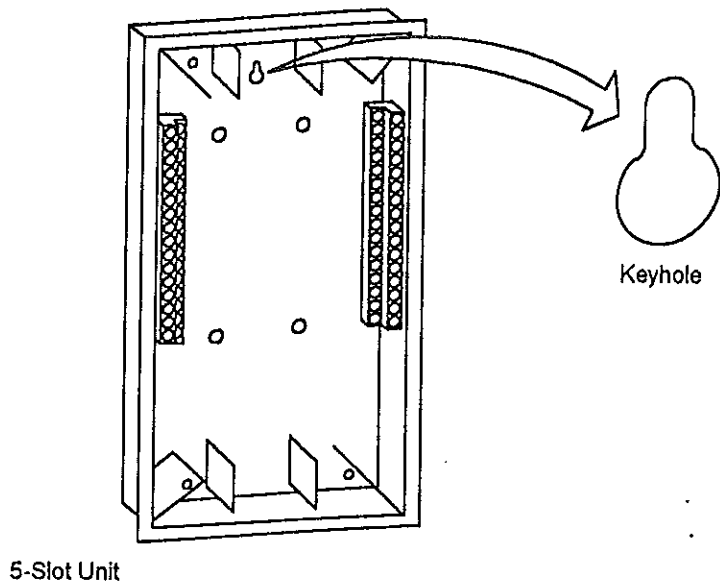
The following steps are the general procedure for mounting any size enclosure. The instructions describe mounting the enclosure on a wall, the most common location. However, any free-standing structure that meets the stability and load bearing specifications is sufficient.

1. Attach the anchor bolt to the wall. The recommended height for the differently sized panels give optimal line of vision to the panel, component LEDs, and switches.



Attaching Anchor Bolt per Recommended Wall Height
Fig. 3

2. Hang the enclosure by inserting the keyhole over the anchor bolt.



Hang Enclosure on Keyhole
Fig. 4

APPLICATION	DISTANCE	TERMINALS				JUMPER	
		1	2	4	5	W1	W 2
2-Wire RTD	250' max. #18 AWG twisted pair	X	X			3	2
4-Wire RTD	250' max. #18 AWG twisted pair	X	X	X	X	4	1
Voltage: 0 to 10 volt DC	250' max. #18 AWG twisted pair	X	X	X		1	1
Differential Voltage	250' max. #18 AWG twisted pair	X	X			4	1
3-Wire Transducer	250' max. #18 AWG twisted pair	X	X	X		2	1
Potentiometer	250' max. #18 AWG twisted pair	X	X	X		1	1
Current: Remote Source	250' max. #18 AWG twisted pair	X	X			4	3
True 2-Wire Current	See Note 1	X		X		2	3
Contacts	250' max. #18 AWG twisted pair	X	X			3	2
XM Inputs	250' max. #18 AWG twisted pair	X	X	X	X	4	1

Note 1: Use field device literature to determine max. wiring resistance, given that:

- * Source is 25V
- * IUN impedance is 499 ohms.

Connections for Typical IUN Applications
Fig. 2

3. Level the enclosure. Using the drilled mounting holes (Fig. 5) as a template, mark the mounting hole locations. Lift the enclosure off the wall.

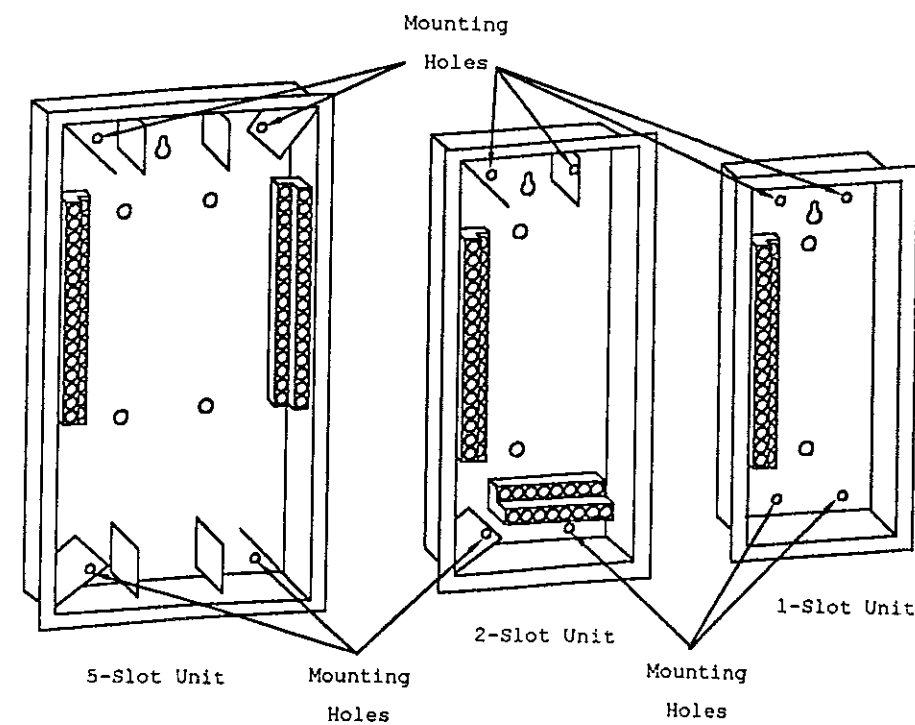
4. Select fasteners appropriate to support a fully loaded and wired base frame. Listed below are typical fully-loaded weights for each NCU base frame size. Drill the enclosure mounting holes to accommodate the selected fasteners.

1-Slot - 34 lb. 10"W X 28"H

2-Slot - 63 lb. 16"W X 38"H

5-Slot - 110 lb. (long) 26"W X 46"H

5-Slot - 95 lb. (short) 26"W X 35"H



Mounting Holes on the NCU/NEU Enclosures

Fig. 5

5. Secure the enclosure to the wall. Washer positions are molded on the inside of the enclosure to enable a flush mounting of the enclosure against the wall surface.

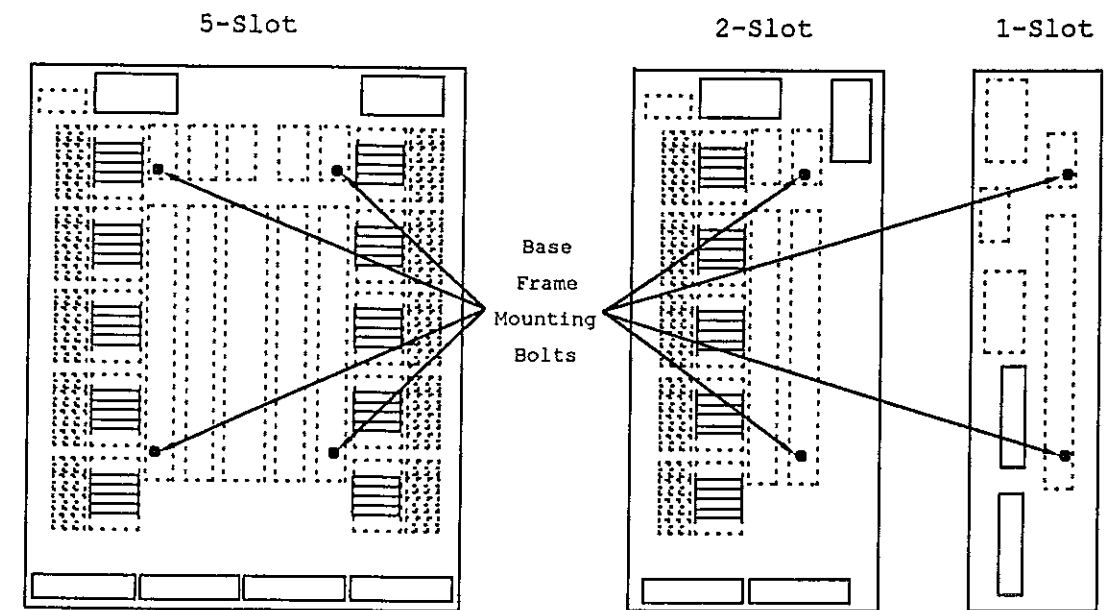
Mounting the Base Frame

Before mounting the base frame, clean out any debris in the enclosure that gathered from fastening it to the wall. Either vacuum the inside of the enclosure or wipe it with a damp cloth.

A 5-Slot base frame by itself weighs 31 pounds (2-Slot = 21, 1-Slot = 14); plan for adequate help to hold and steady it until the mounting screws are secure.

1. The 5-Slot base frame includes 4 mounting bolts (1/4 x 5/8). Align the base frame on the bosses (reinforced protrusions) and secure the mounting bolts through the base frame and enclosure into the wall.

Note: 1-Slot and 2-Slot base frames utilize only 2 mounting bolts.



Holes for Mounting Bolts

Fig. 6

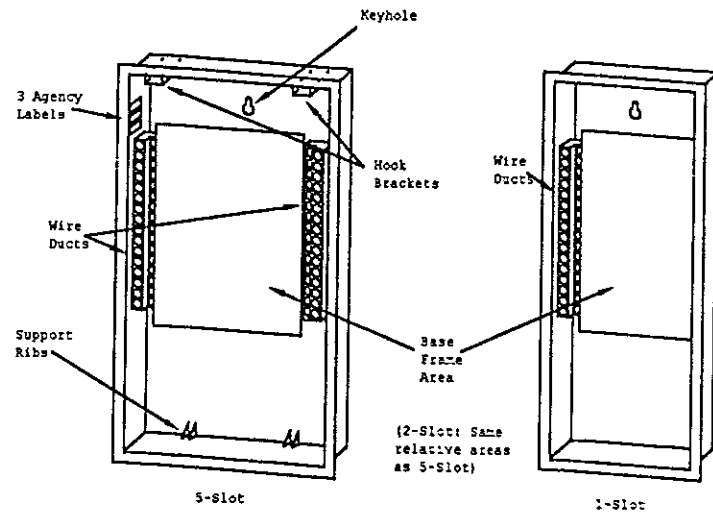
Conduit Entry

Select and holesaw entrances (or use a Greenlee Punch) for incoming conduits. Hole sizes and conduit anchoring must conform to national electric codes and local regulations.

Note: Conduit-fittings must have a 1/2" reach for a 1/4" enclosure wall. A sample fitting for a 1/2" diameter EMT is the Midwest Electric P/N 450 1/2" STL S15CR EMT conduit fitting.

CAUTION: When installing the conduit, use grounded bushings and ground jumper wires between conduit connections because the enclosure is non-metallic and does not itself provide grounding.

1. The only limitations to conduit entry are those practical for wiring convenience. In general, the conduits should penetrate the top and bottom of the enclosure, or into the sides or rear of the enclosure's lower one fourth (as shown in Fig. 7)

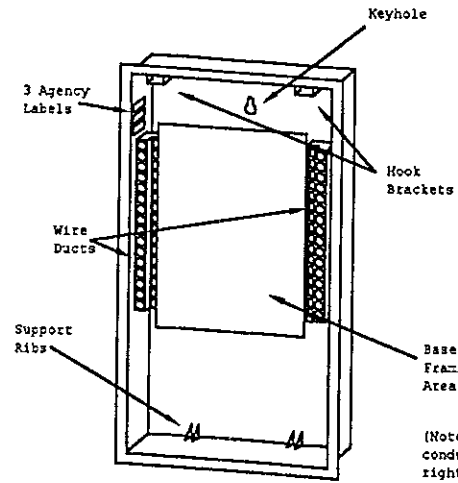


General Areas for Conduit Entry into Enclosures
Fig. 7

Specifically, avoid routing the conduit through the following:

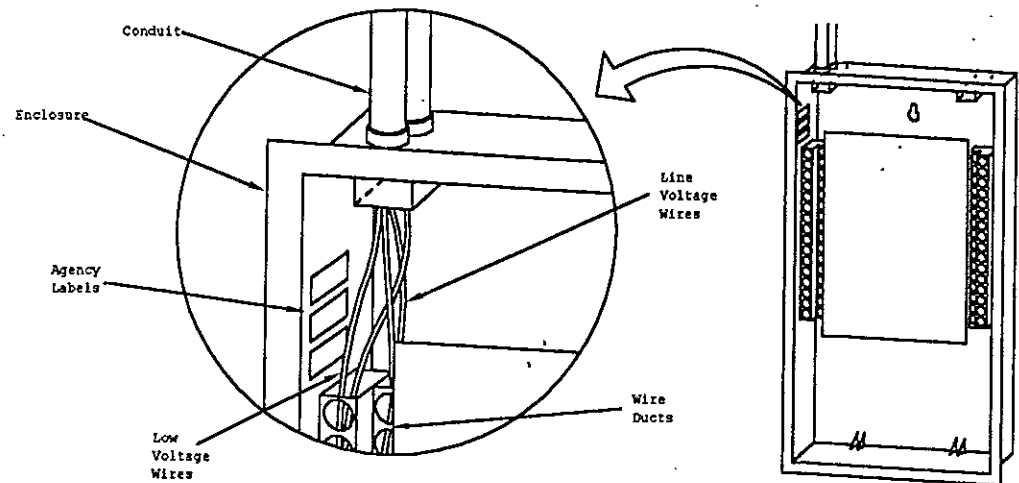
- Hook brackets on top
- Support ribs around mounting holes
- Within 1/2 inch of the keyhole
- Into the base frame
- Into the wire ducts

- For 1- and 2-Slot Enclosures, do not land conduits on the right side of the base frame, which necessitates looping the wires across or around the main modules
- Into the three agency labels at the upper left side

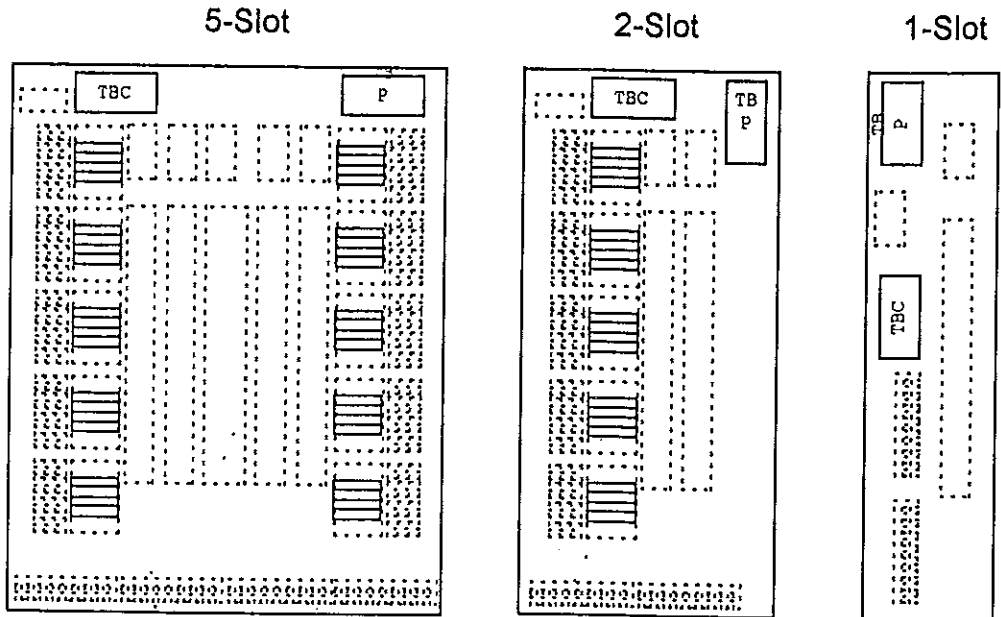


Locations To Avoid For Conduit Entrances
Fig. 8

2. Route the power source wires to the power assembly (TBP assembly), placed as shown in Figure 9.
3. If the system utilizes N1,N2, or L2 networks, route cable to the TBC board.

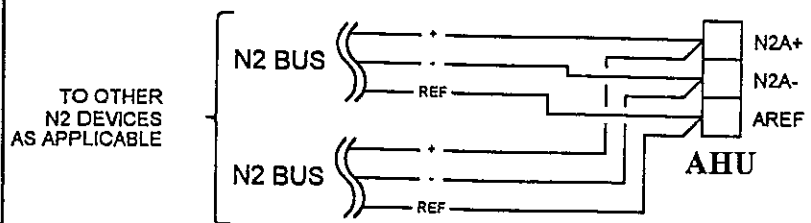


Dressing Line and Low-Voltage Wires to Terminal Blocks



TBP and TBC Board Locations on Base Frames
Fig. 9

N2 TRUNK COMMUNICATIONS



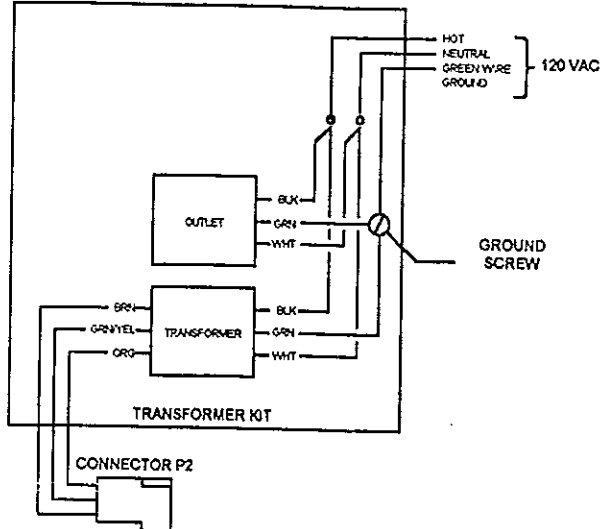
Use 18 AWG twisted pair wire for all sensor and output wiring. Shielding is not required, but if used, earth ground the shield at the AS-XFR100 Box. You may use 24 AWG wire in some applications. However, the length of wire is reduced due to the resistance. To minimize sensor error caused by field wiring, the total resistance of all resistive sensor wiring should be less than three ohms.

CAUTION: Do not run sensor wiring near line voltage wiring.

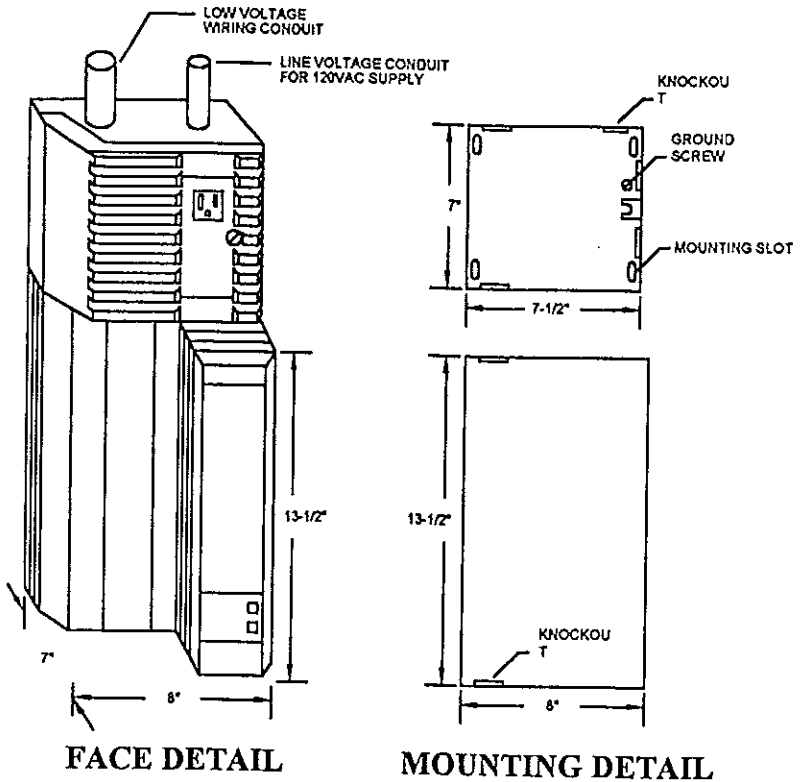
SENSOR TYPE	RUN LENGTH IN FEET (METERS)	WIRE SIZE
AI Temperature (Resistive)	500 (152.4)	18AWG
AI Voltage	500 (152.4)	18AWG
AI Current	1000 (304.8)	24-18AWG
AO Voltage/Current (See following note)	1000 (304.8)	24-18AWG
BI Voltage/Contact	500 (152.4)	18AWG
Single BO at 0.1 amp	500 (152.4)	18AWG
Single BO at 0.5 amp	100 (30.5)	18AWG
Multiple BOs using RLY100	100 500 (30.5) (152.4)	18AWG 18AWG
Zone Bus	1000 (304.8)	18AWG
24VAC Power (AS-XFR100)	5 (1.5)	18AWG

NOTE: For AO voltage, place a resistor at the end of the line at the actuator or variable speed drive. Use a 499 ohm 1% resistor for 0-10VDC, or a 249 ohm 1% resistor for 0-5VDC.

TRANSFORMER KIT WIRING

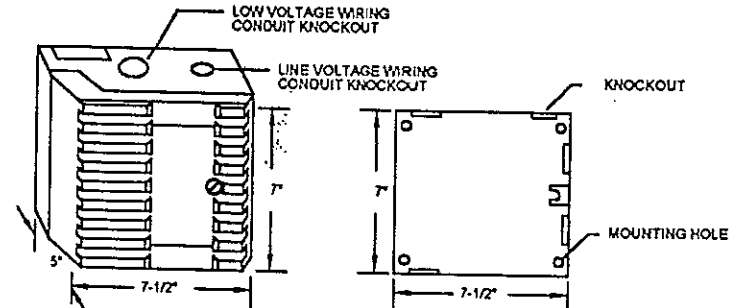


TRANSFORMER KIT AND AHU ENCLOSURES



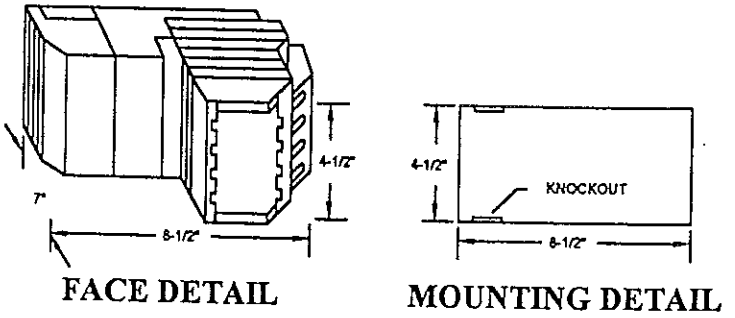
CAUTION:
AHU enclosure is non-metallic and does not itself provide grounding. Enter only at knockout locations provided. Avoid routing conduit through the following in the transformer kit:
- Support ribs around mounting holes
- Into the base frame
- Into wire ducts
- Into agency labels on enclosure

RELAY KIT ENCLOSURE

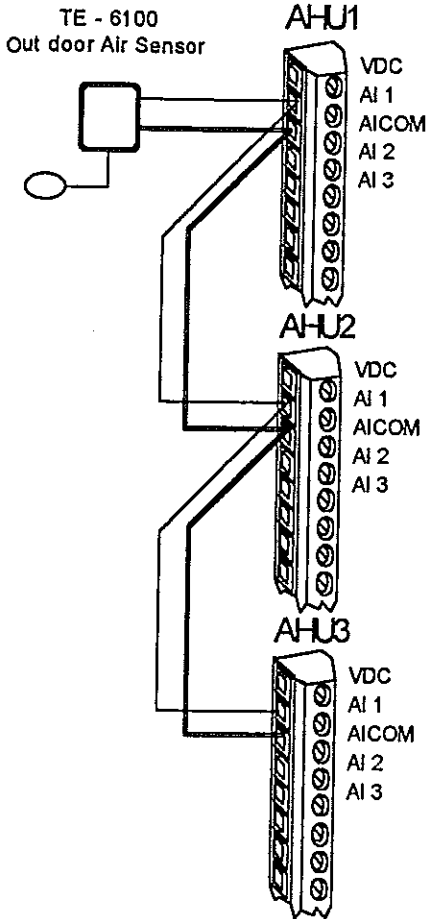
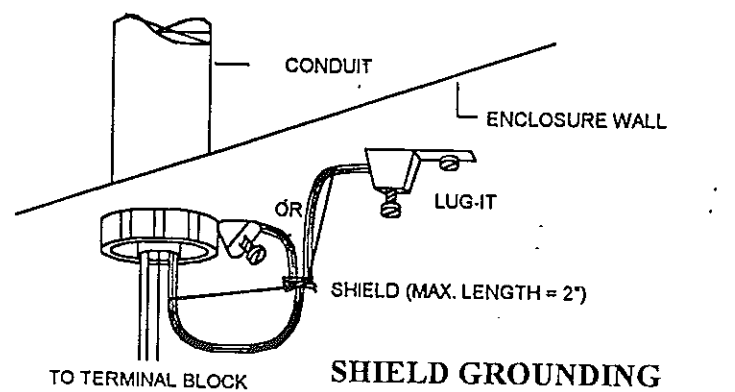


FACE DETAIL MOUNTING DETAIL

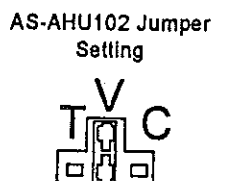
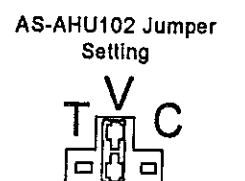
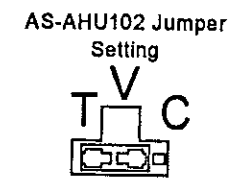
FMK ENCLOSURE



FACE DETAIL MOUNTING DETAIL



SHARED RESISTIVE SENSOR



Relay Module (AS-RLY100-0)

Power Supply/Transformer Module (AS-XFR100-0)

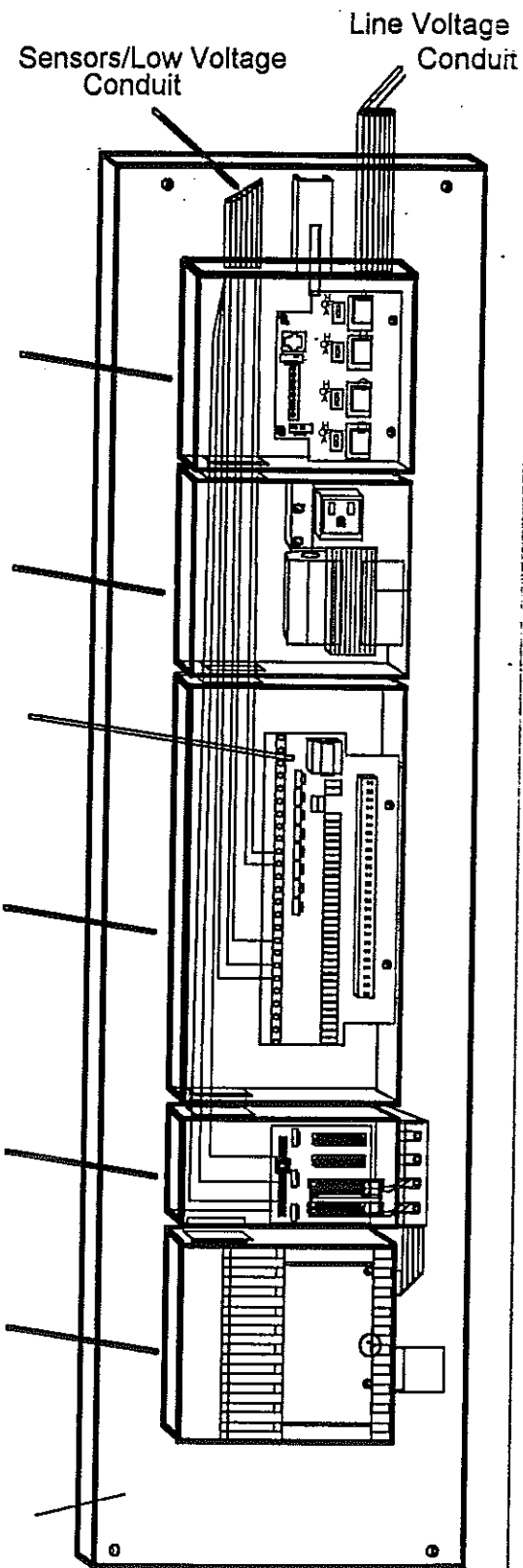
Controller Board (AS-AHU102-0)

Enclosure Kit (AS-AHU101-0)

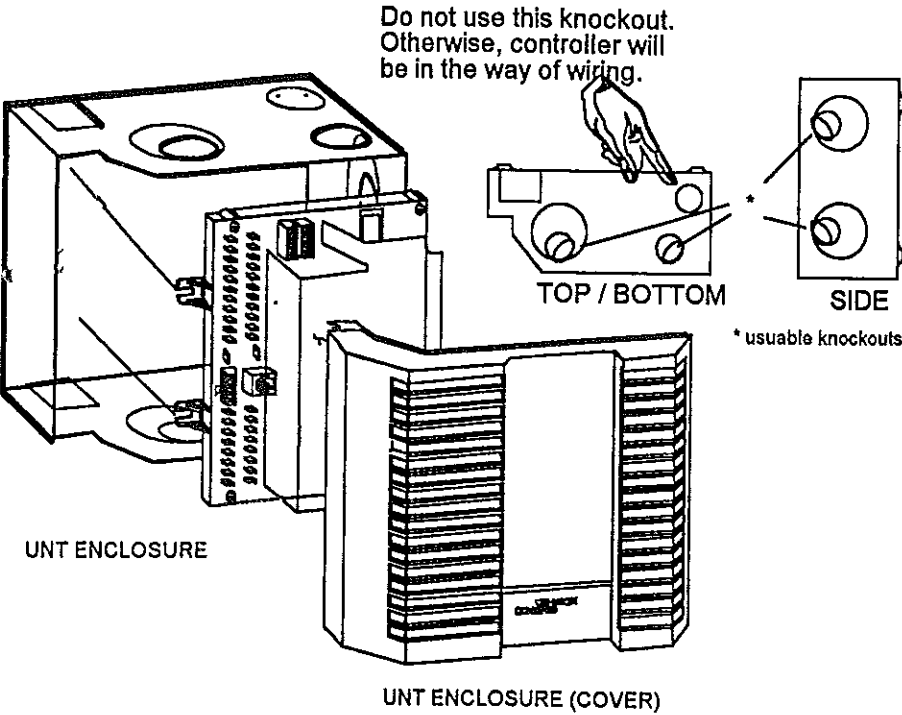
Function Module Kit (AS-FMK100-0)

Utility Enclosure Kit (AS-ENC100-0)

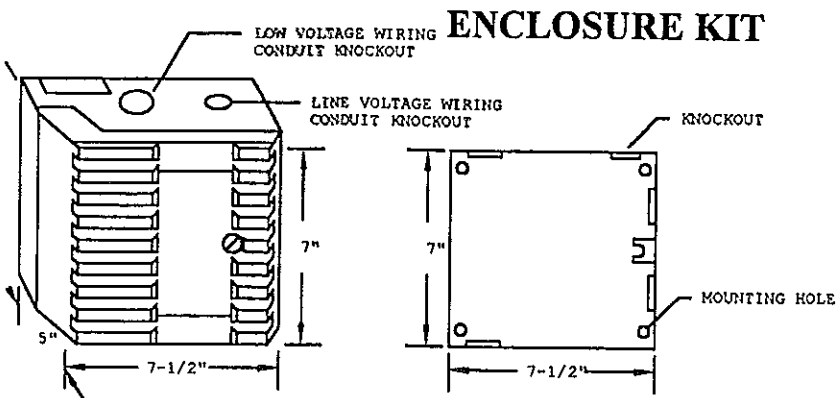
Mounting Board (Optional Available from Porteau)



You can install a Series 100/101 and 110/111 Controller into a control panel or an AS-ENC100-0 enclosure. You must enclose the Series 120/121 Controller in a BZ-1000-7 enclosure or an enclosure of comparable dimensions.



Installing the UNT Controller in an enclosure kit.



CAUTION:
Enter only at knockout locations provided.
Avoid routing conduit through the following:

- Support ribs around mounting holes
- Into the base frame
- Into wire ducts
- Into agency labels on enclosure

CAUTION: To avoid damaging equipment or possible electrical shock, ensure that all power supplies to the system have been disconnected prior to wiring installation. The CMOS circuits used in the controller are static sensitive. Use static protection (anti-static mats and/or grounding straps) when working on or near internal circuitry.

- Follow these precautions:
- Make wiring connections in accordance with the Electrical Code as well as within local regulations.
 - Locate equipment and route the wiring so that signal wiring is twisted pair, and separated from power wiring to the maximum extent possible. To establish tight, reliable electrical connections, use the correct wire sizes for the terminals.
 - Make all wiring connections to the UNT Controller using only copper conductors.
 - Do not run N2 Bus wiring in the same conduit as line voltage wiring (42 VAC or above) or wiring that switches power to highly inductive loads (such as contactors, coils, motors, or generators).
 - The N2 must be daisy chained with no "Y" or "T" connections (unless a repeater is installed in the "T" tap).

It is recommended that you use a seperate isolation transformer or stepdown transformer for each UNT controller. However, if you use one low voltage power precautions:

- Run the 24VAC wiring and N2 bus wiring together.
- Ensure polarity is maintained at each 24VAC connection.
- As per NEC code you must enclose 24VAC power trunks with greater than 4 amps (100 VA) in conduit.

Size the 24VAC power source using the following VA requirements:

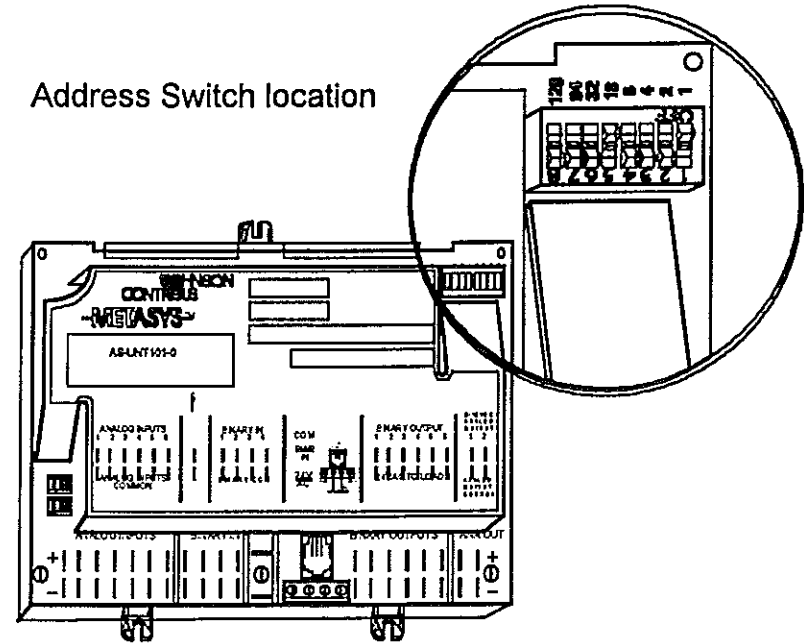
- Unt controllers with all sensors/transmitters attached draw 10 VA.
- Incremental valve actuators that source power from the triacs draw 5 VA per actuator.
- Each triac can drive 0.5 amp at 24VAC (12 VA).
- The M100 draws 30 VA if using common power for the controller and the M100 actuator.
- The series UNT 120/121 heater draws 15 VA. This is in addition to the 10 VA for normal controller operation.

You may connect the series UNT110/120 power transformer secondary directly to earth ground. If you elect to do so, the grounded side must connect to the COMMON power input terminal of the controller.

There are no isolation requirements for series UNT 110/111 or UNT 120/121 controllers.

There is no requirement for an isolation relay for series UNT 110/111 or UNT 120/121 controllers. However, you must connect the jumper wire from TRIAC terminal to the 24VAC terminal if the loads are grounded. This means that all loads must be configured for "HIGH SIDE" switching.

CAUTION: DO not run AI, BI, AO, BO, ZBus, or N2 Bus in the same conduit as line voltage wiring (42 VAC or above) or wiring that switches power to highly inductive loads (such as contactors, coils, motors or generators).

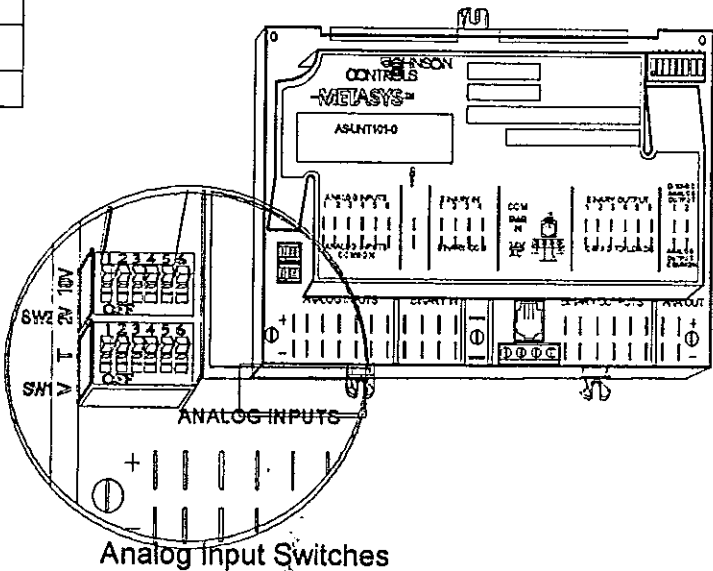


Sensor Wire Sizes and Lengths

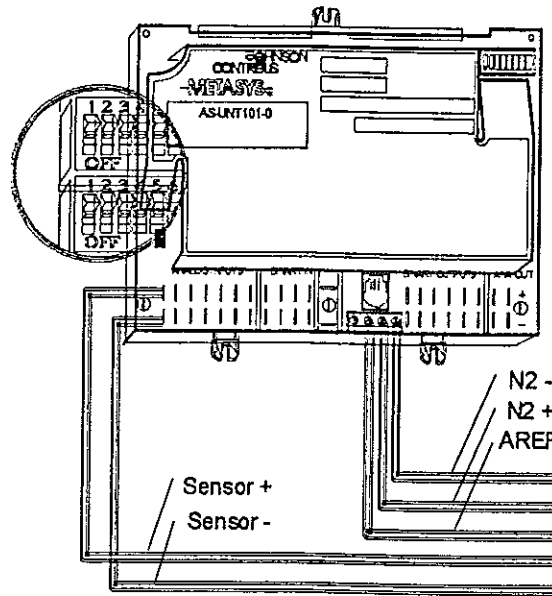
SENSOR TYPE	RUN LENGTH IN FEET (METERS)	WIRE SIZE
AI TEMPERATURE	500 (150)	#18 AWG
AI VOLTAGE	500 (150)	#18 AWG
BI VOLTAGE/CONTACT	500 (150)	#24 AWG to #18 AWG
SINGLE BO AT 0.1 amp	500 (150)	#18 AWG
SINGLE BO AT 0.5 amp	100 (30)	#18 AWG
ZONE BUS	500 (150)	#18 AWG
ZONE THERMOSTAT	50 (15)	8 conductor phone cable

Analog Input DIP Switch Settings

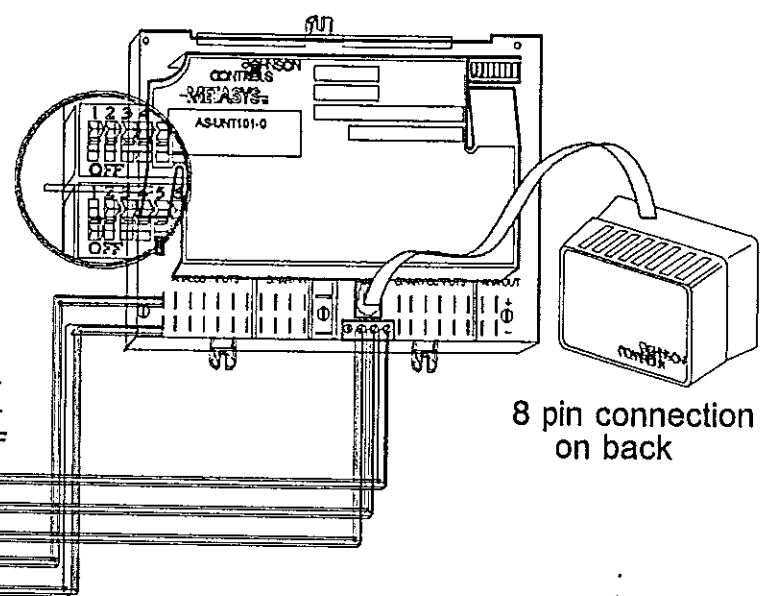
HARDWARE POINT	SWITCH		TEMP (RESISTIVE INPUT)		2VDC (0 TO 2 VDC INPUT)		10 VDC (0 TO 10 VDC INPUT)	
AI 1	SW1-1	SW2-1	ON	OFF	OFF	OFF	OFF	ON
AI 2	SW1-2	SW2-2	ON	OFF	OFF	OFF	OFF	ON
AI 3	SW1-3	SW2-3	ON	OFF	OFF	OFF	OFF	ON
AI 4	SW1-4	SW2-4	ON	OFF	OFF	OFF	OFF	ON
AI 5	SW1-5	SW2-5	ON	OFF	OFF	OFF	OFF	ON
AI 6	SW1-6	SW2-6	ON	OFF	OFF	OFF	OFF	ON



Set for Voltage and 2 VDC

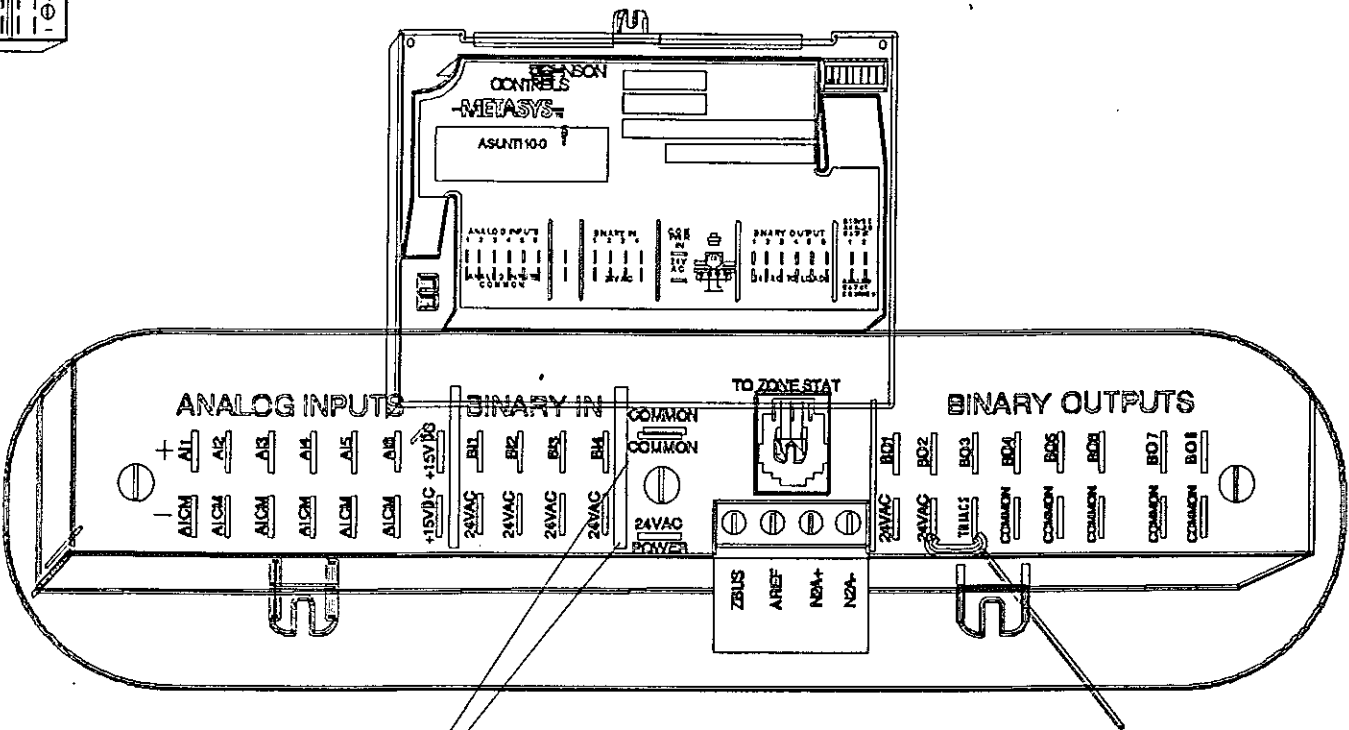


Set for Temperature and 2 VDC



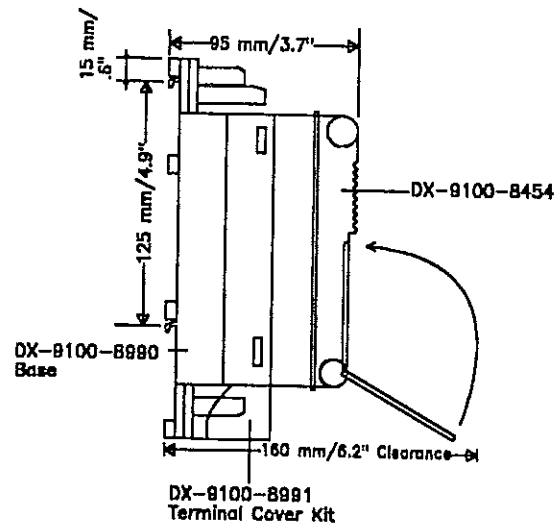
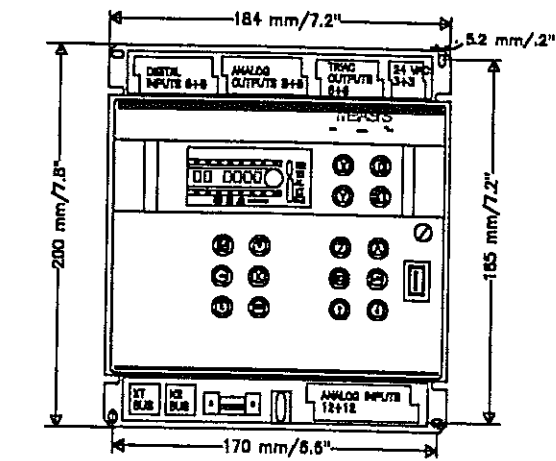
Note: Route N2 and sensor wiring together.

Example of shared resistive sensor.

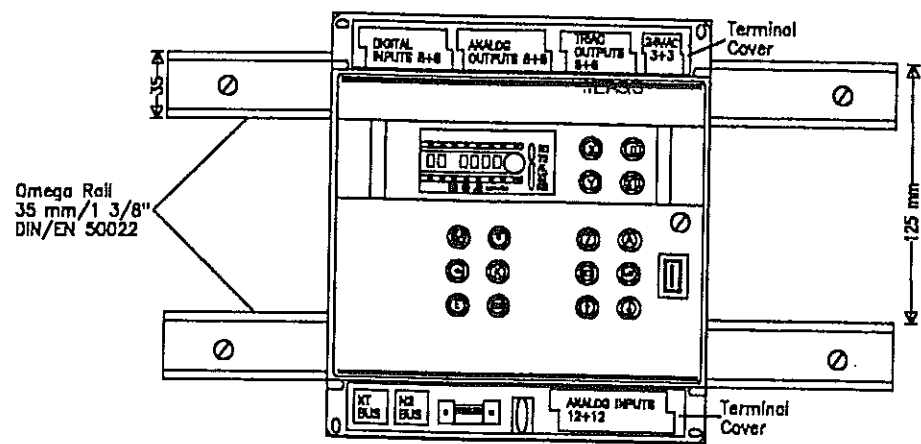


Connection for 24VAC (must be isolated from ground if switched common devices used).

Jumper as shown for switched power device connection.
Jumper from triac to common for connecting switched common devices.

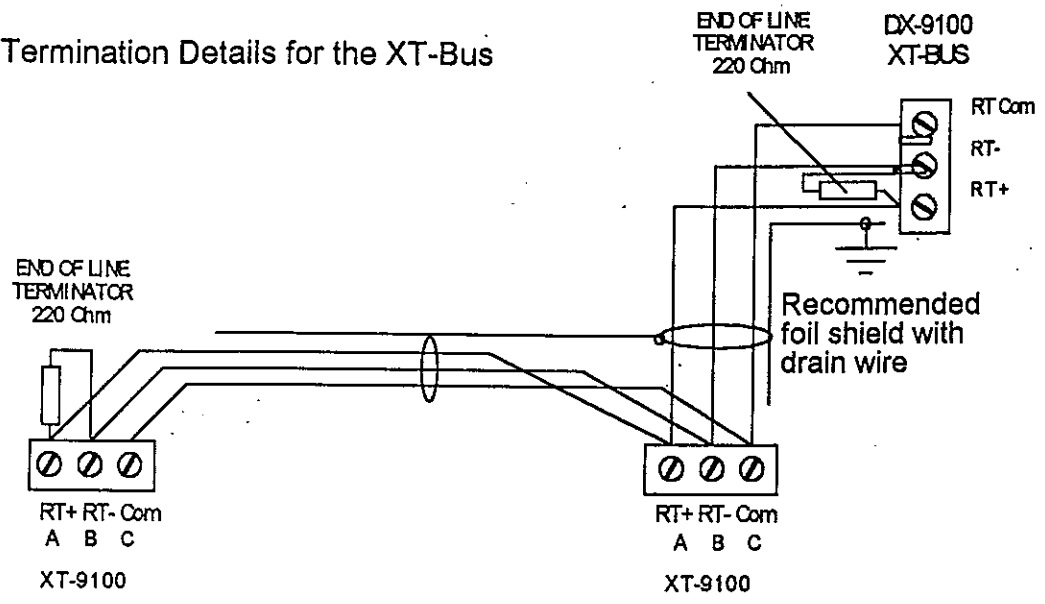


Installation Details of Version 2, DX-9100-8154

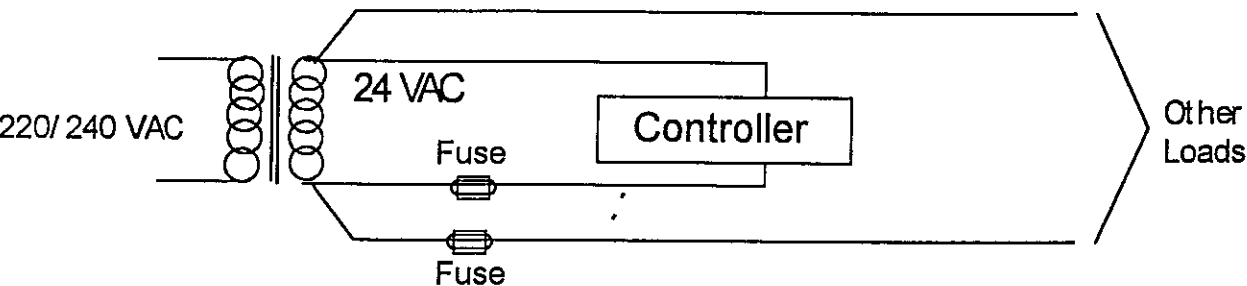


Din rail installation Details of Version 2, DX-9100-8454

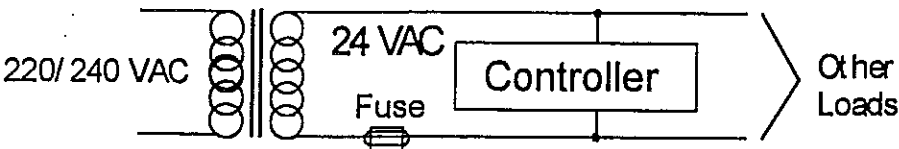
Termination Details for the XT-Bus



Install a 220-ohm end-of-line resistors at each end of the XT-Bus line when the bus length is greater than 100 meters/330 feet. When the bus length is less than 100 meters/330 feet, install one 220-ohm end-of-line resistor at the DX-9100 only.



This diagram illustrates the CORRECT way to wire a common transformer.

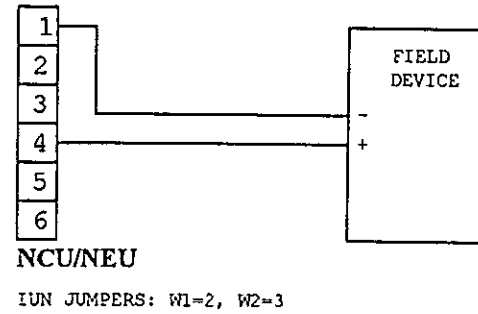


The second diagram illustrates the INCORRECT way to wire a common transformer.

NCU ANALOG INPUT WIRING DETAILS

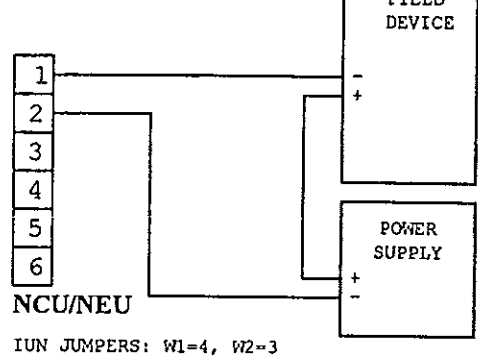
DETAIL N1:

CURRENT INPUT
INTERNAL SOURCE



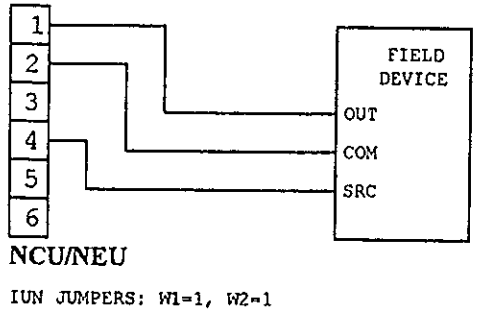
DETAIL N2:

CURRENT INPUT
EXTERNAL SOURCE



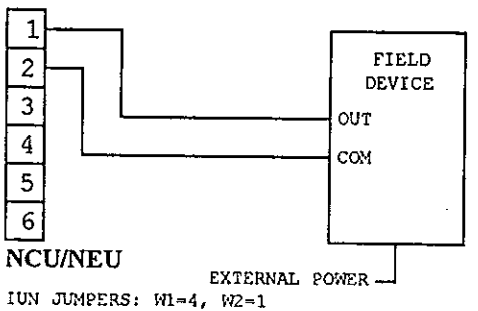
DETAIL N3:

0-10VDC INTERNAL SOURCE



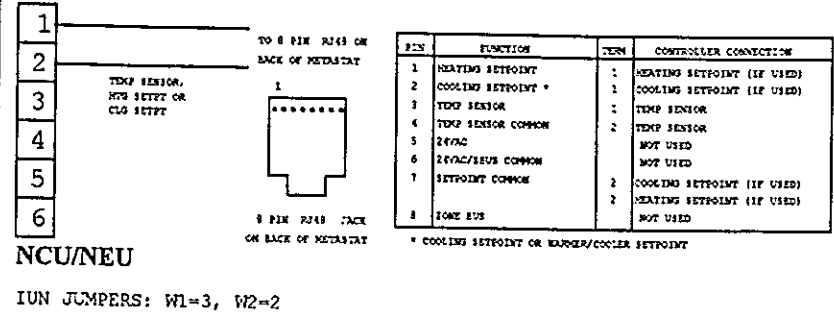
DETAIL N4:

0-10VDC INPUT
EXTERNAL SOURCE



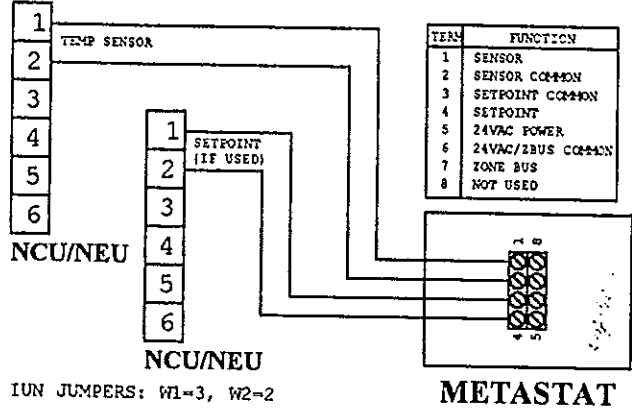
DETAIL N5:

METASTAT INPUT



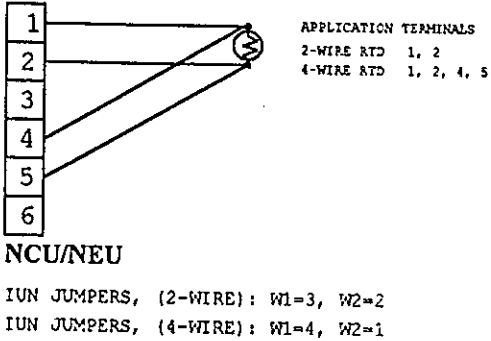
DETAIL N6:

METASTAT TERMINAL BLOCK



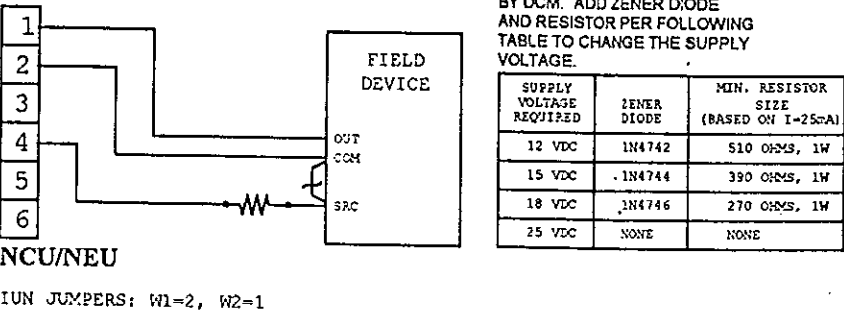
DETAIL N7:

TEMPERATURE SENSOR INPUT



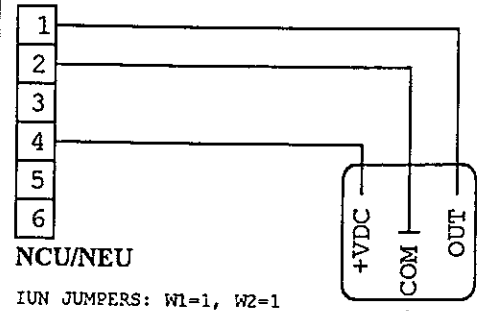
DETAIL N8:

TRANSDUCER INPUT



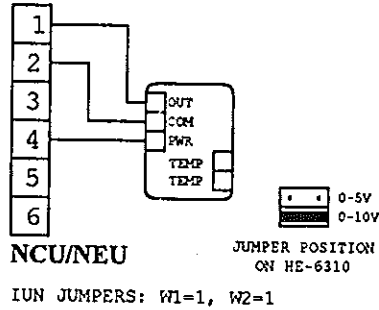
DETAIL N9:

DPT-2000 INPUT



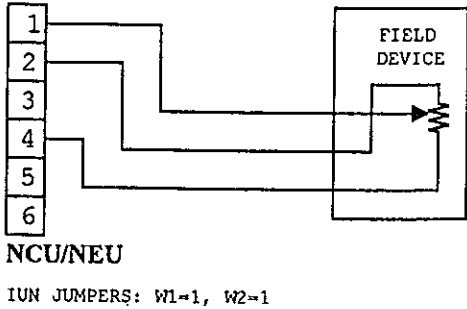
DETAIL N10:

HE-63x0 INPUT



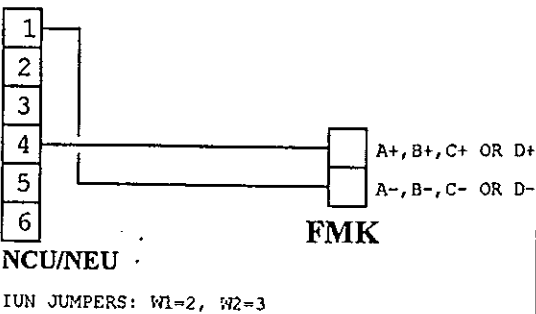
DETAIL N11:

POTENTIOMETER INPUT



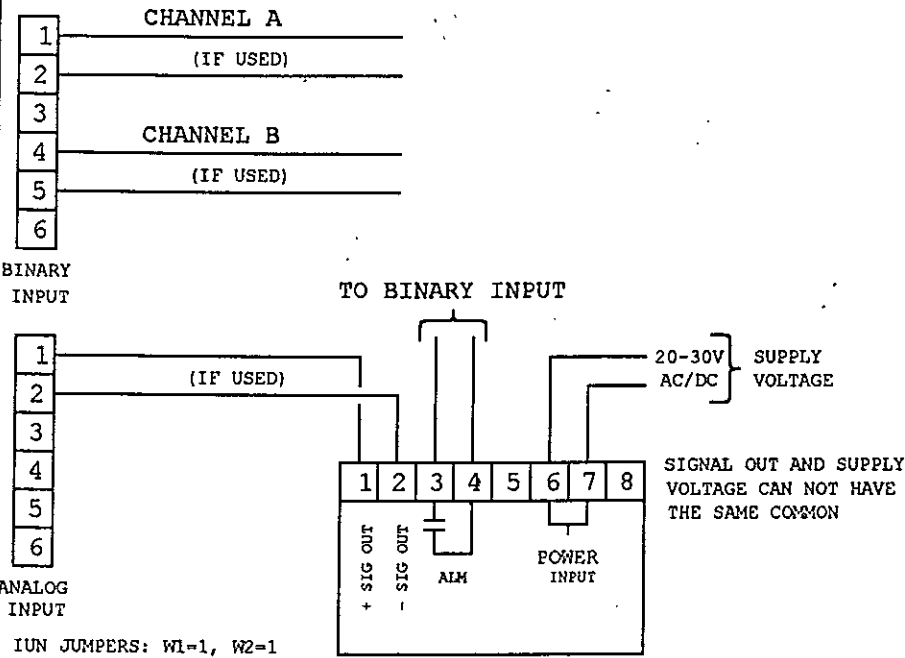
DETAIL N12:

FUNCTION MODULE KIT
WITH IDP OR IAP



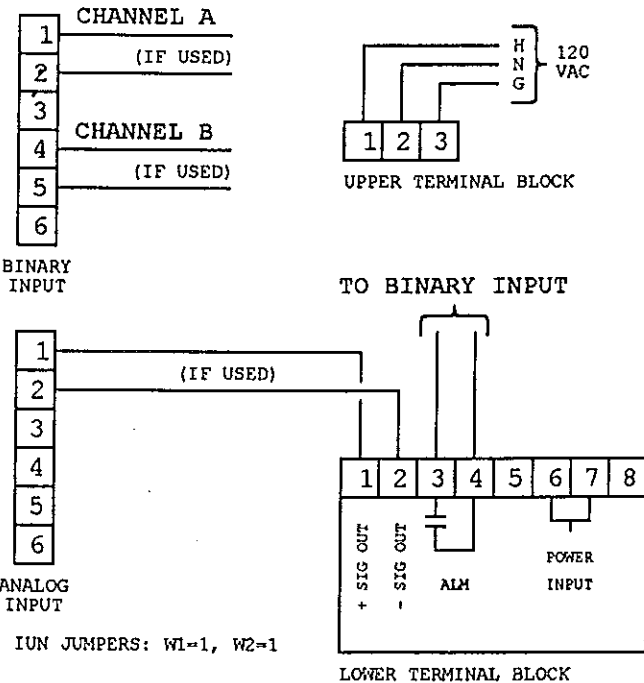
DETAIL N13:

CARBON DIOXIDE SENSOR



DETAIL N14:

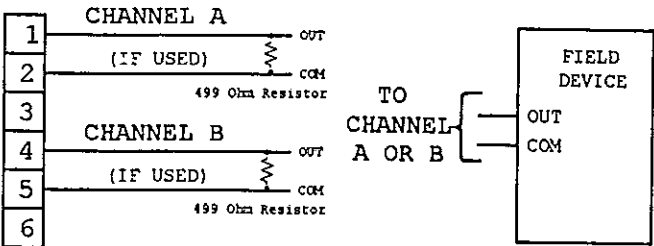
CARBON DIOXIDE CONCENTRATION SAMPLER



NCU ANALOG INPUT WIRING DETAILS

DETAIL N15:

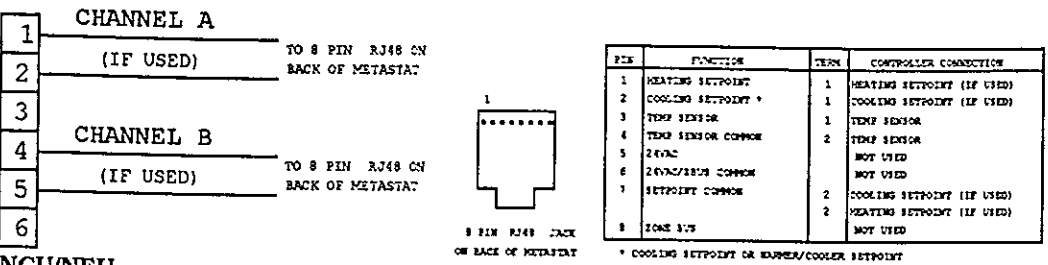
CURRENT INPUT INTERNAL SOURCE



NCU/NEU
IAN SWITCH = V

DETAIL N19:

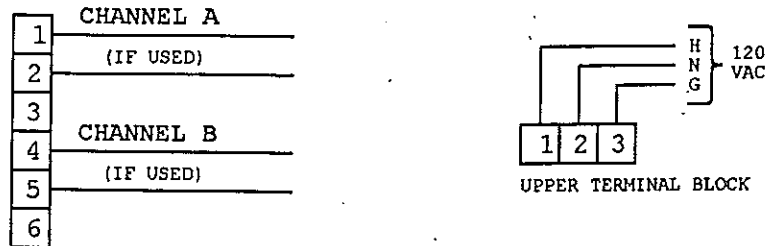
METASTAT INPUT



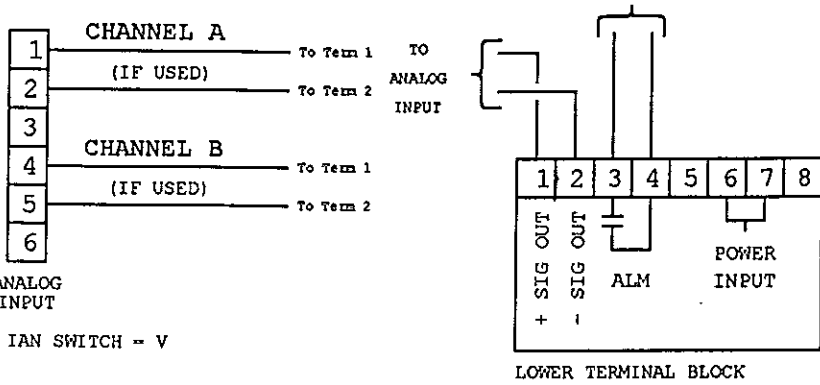
NCU/NEU
IAN SWITCH = T

DETAIL N22:

CARBON DIOXIDE CONCENTRATION SAMPLER

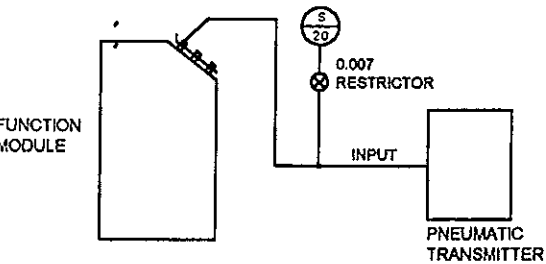


BINARY
INPUT



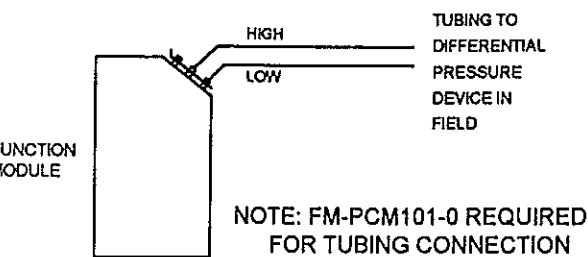
DETAIL N23:

ANALOG INPUT PNEUMATIC



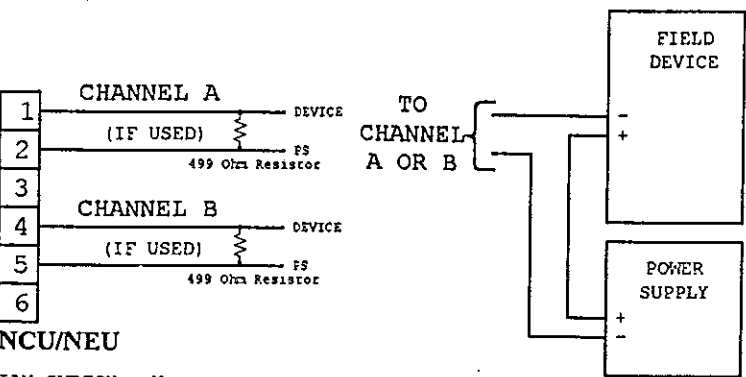
DETAIL N24:

ANALOG INPUT DIFFERENTIAL PRESSURE



DETAIL N16:

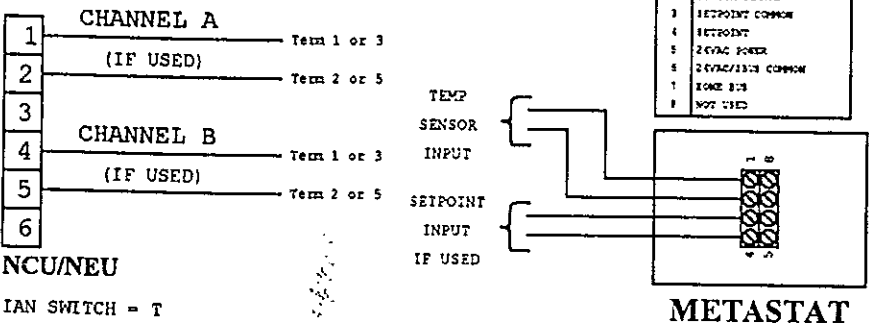
CURRENT INPUT EXTERNAL SOURCE



NCU/NEU
IAN SWITCH = V

DETAIL N20:

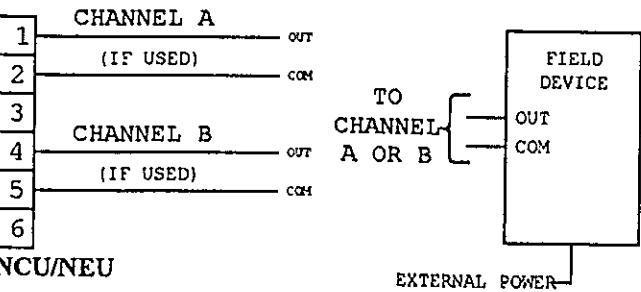
METASTAT TERMINAL BLOCK



NCU/NEU
IAN SWITCH = T

DETAIL N17:

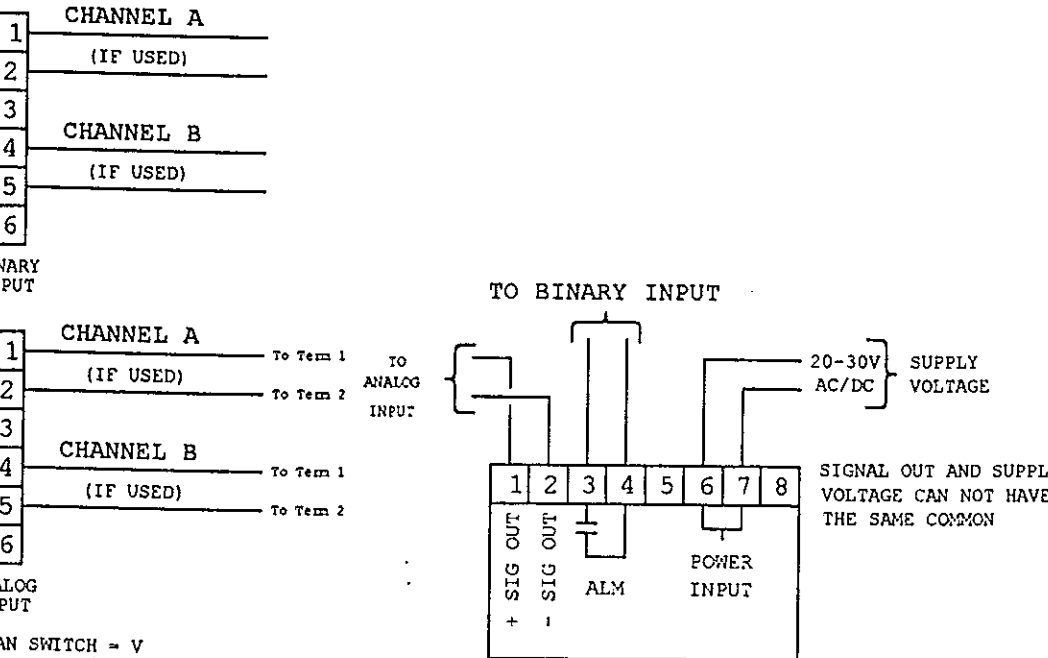
0-10VDC INPUT EXTERNAL SOURCE



NCU/NEU
IAN SWITCH = V

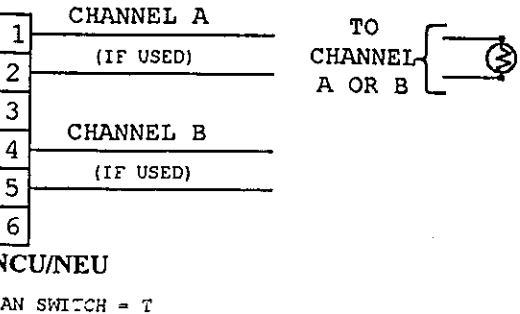
DETAIL N21:

CARBON DIOXIDE SENSOR



DETAIL N18:

TEMPERATURE SENSOR INPUT

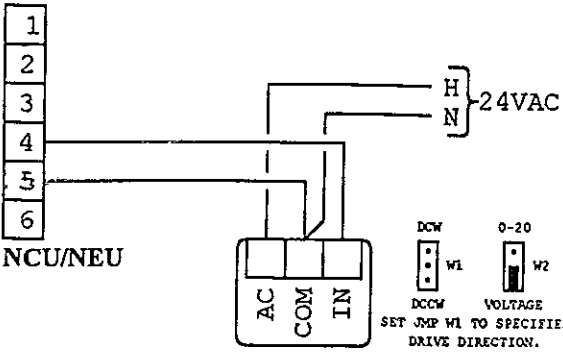


NCU/NEU
IAN SWITCH = T

NCU ANALOG OUTPUT WIRING DETAILS

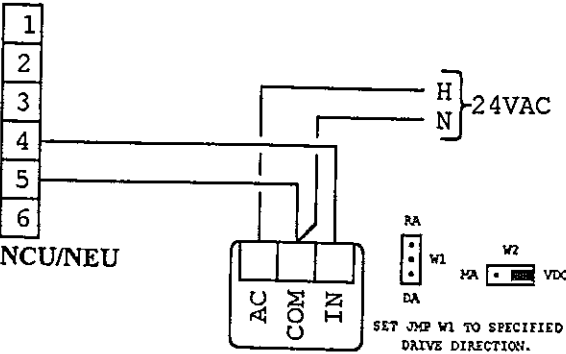
DETAIL N30:

0-10VDC OUTPUT TO EDA-8x02



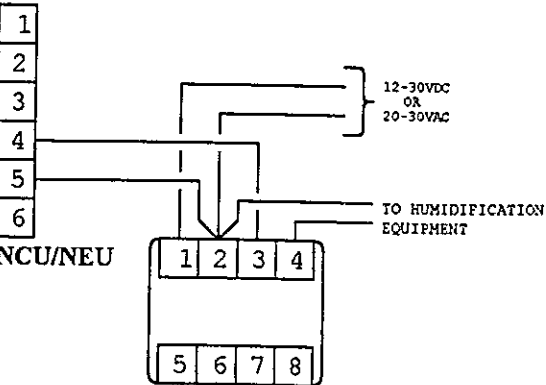
DETAIL N34:

0-10VDC OUTPUT TO EPP-1000



DETAIL N38:

0-10VDC OUTPUT TO HLC-1000



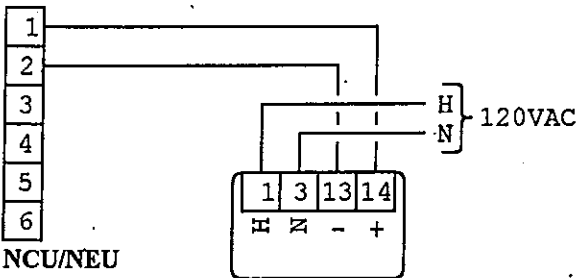
TERMINAL NUMBER	TERMINAL NUMBER	POLARITY	SOURCE/ DESTINATION
1	POWER	+	SYSTEM CONTROLLER OR SEPERATE 24VAC
2	COM	-	FWR, INPUT, OUTPUT
3	IN	+	0-20mA
4	OUT	+	HUMID. EQUIPMENT
5	TEMP	n/a	TEMP. SENSOR
6	TEMP	n/a	TEMP. SENSOR
7	RELAY	n/a	FOR ON/OFF HUMID. EQUIPMENT
8	RELAY	n/a	FOR ON/OFF HUMID. EQUIPMENT

JUMPERS ON DEVICE

0-10VDC INPUT JWP	0-10VDC OUTPUT JWP	0-20-A OUTPUT JWP
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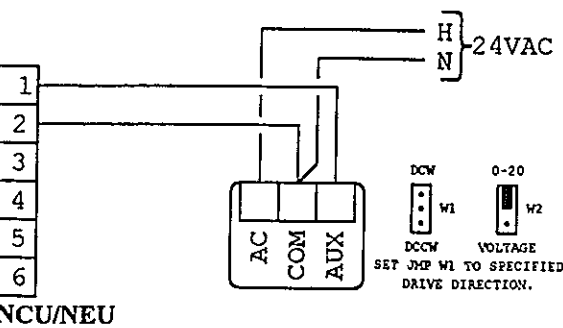
DETAIL N41:

4-20mA OUTPUT TO VA-9000



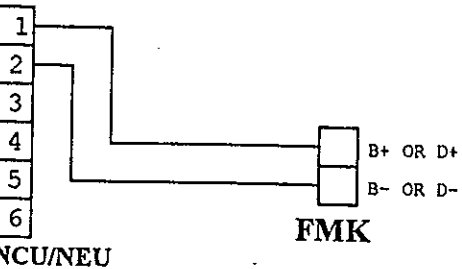
DETAIL N31:

0-20mA OUTPUT TO EDA-8x02



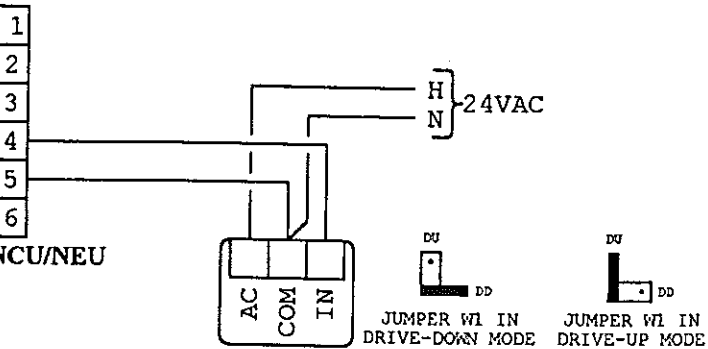
DETAIL N35:

FUNCTION MODULE KIT WITH OAP



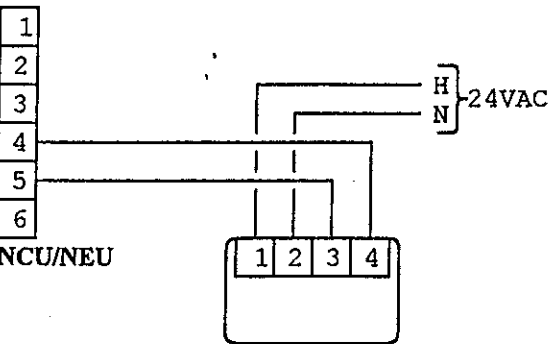
DETAIL N39:

0-10VDC OUTPUT TO VA-8022



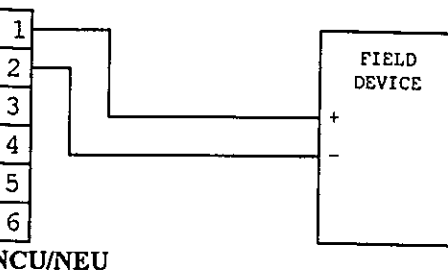
DETAIL N42:

0-10VDC OUTPUT TO VA-8092



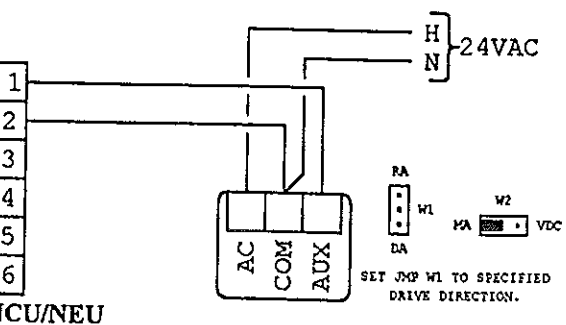
DETAIL N32:

0-20mA OUTPUT INTERNAL SOURCE



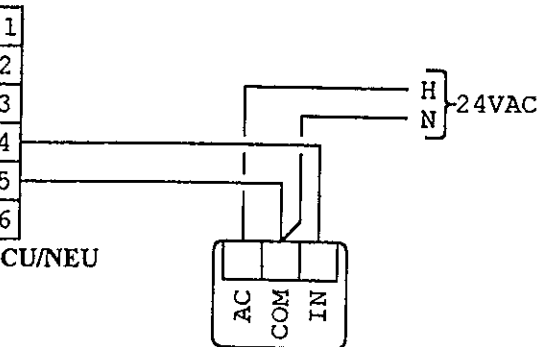
DETAIL N36:

0-20mA OUTPUT TO EPP-1000



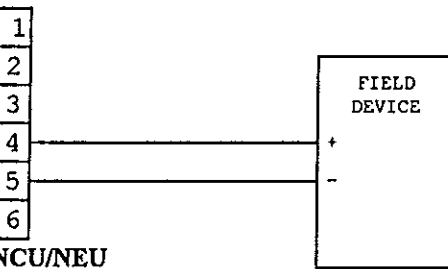
DETAIL N40:

0-10VDC OUTPUT TO VA-8052



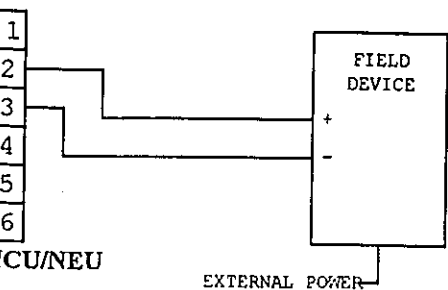
DETAIL N43:

0-10VDC OUTPUT



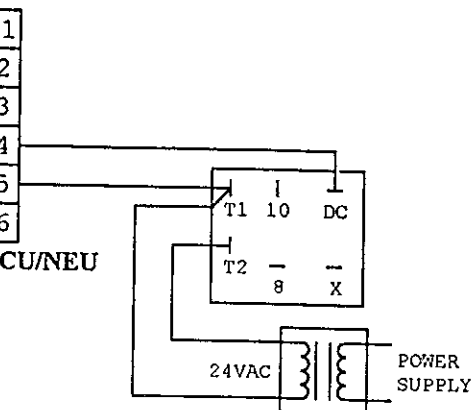
DETAIL N33:

0-20mA OUTPUT EXTERNAL SOURCE



DETAIL N37:

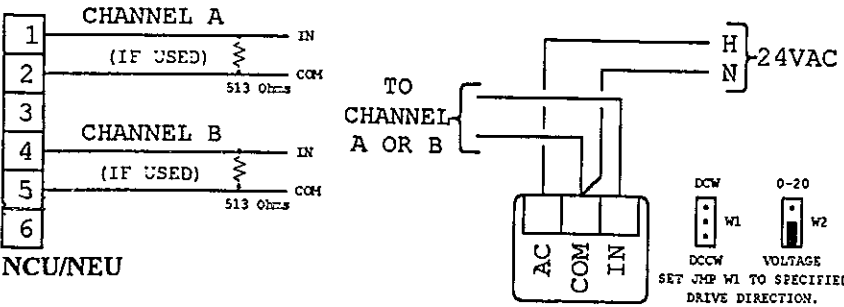
0-10VDC OUTPUT TO M100



NCU ANALOG OUTPUT WIRING DETAILS

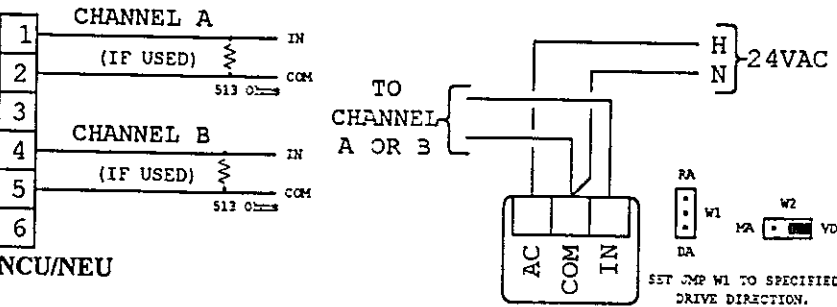
DETAIL N44:

0-10VDC OUTPUT TO EDA-8x02



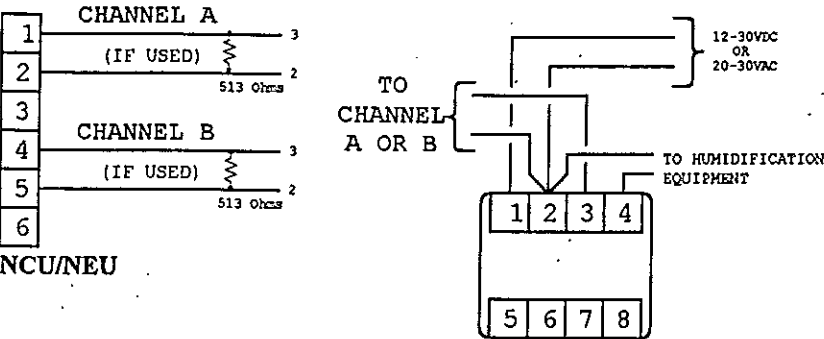
DETAIL N48:

0-10VDC OUTPUT TO EPP-1000



DETAIL N52:

0-10VDC OUTPUT TO HLC-2000



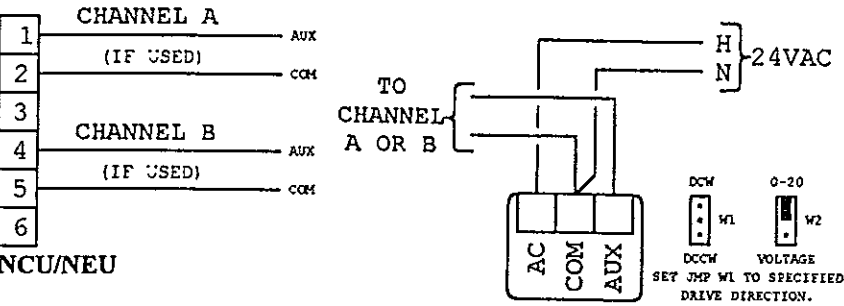
TERMINAL NUMBER	TERMINAL NUMBER	POLARITY	SOURCE/DESTINATION
1	POWER	+	SYSTEM CONTROLLER OR SEPARATE 24VAC
2	COM	-	FWA, INPUT, OUTPUT
3	N	+	0-20mA
4	OUT	+	HUMID. EQUIPMENT
5	TEMP	n/a	TEMP. SENSOR
6	TEMP	n/a	TEMP. SENSOR
7	RELAY	n/a	FOR ON/OFF HUMID. EQUIPMENT
8	RELAY	n/a	FOR ON/OFF HUMID. EQUIPMENT

JUMPERS ON DEVICE

0-10VDC INPUT JMP	0-10VDC OUTPUT JMP	0-20mA OUTPUT JMP
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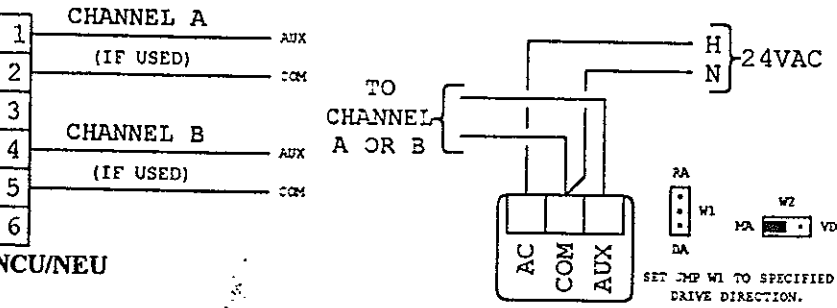
DETAIL N45:

0-20mA OUTPUT TO EDA-8x02



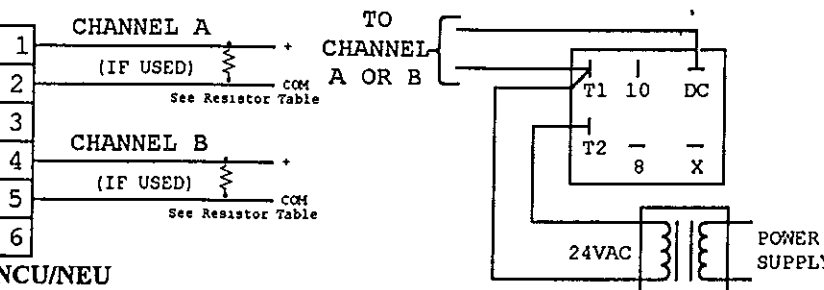
DETAIL N49:

0-20mA OUTPUT TO EPP-1000



DETAIL N53:

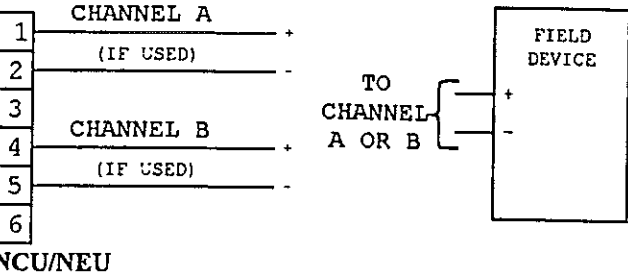
0-10VDC OUTPUT TO M100



Field Device Impedance	Resistor Needed
55K Ohms	555 Ohms
25K Ohms	513 Ohms
15K Ohms	513 Ohms
5K Ohms	555 Ohms
2K Ohms	555 Ohms
1K Ohms	555 Ohms
550 Ohms	None

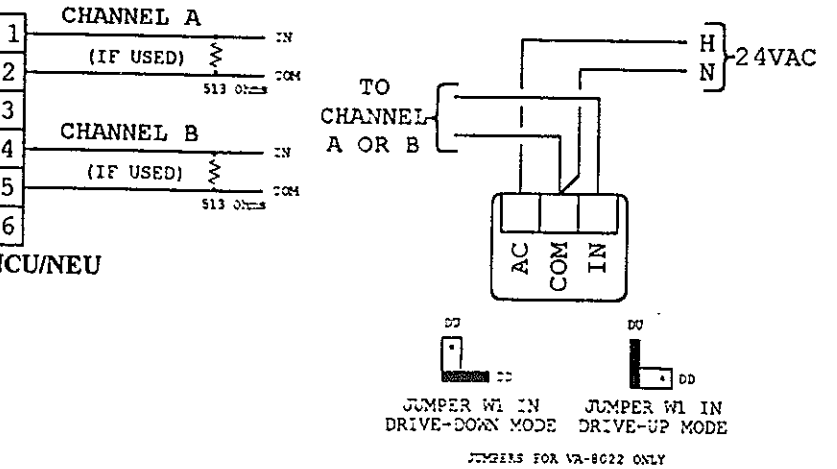
DETAIL N46:

0-20mA OUTPUT INTERNAL SOURCE



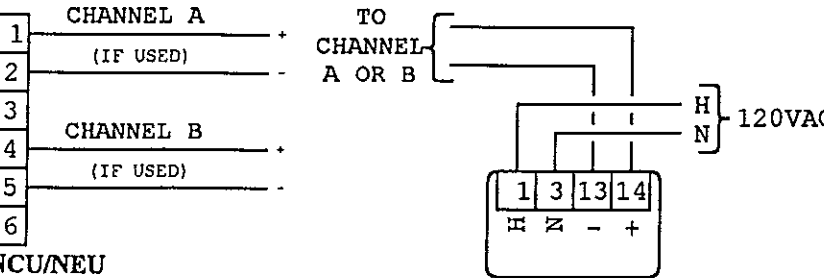
DETAIL N50:

0-10VDC OUTPUT TO VA-8022 OR VA-8052



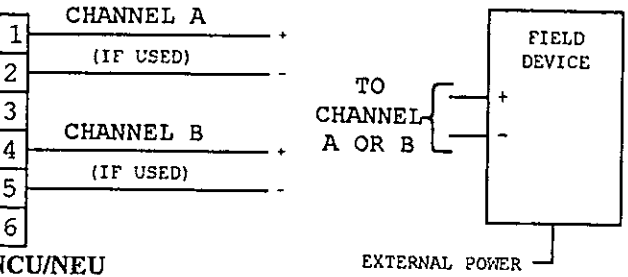
DETAIL N54:

4-20mA OUTPUT TO VA-9000



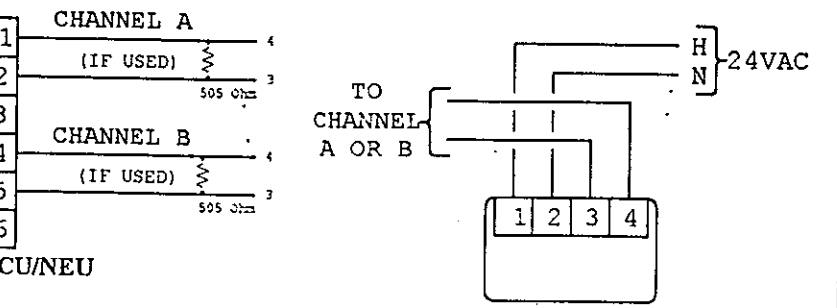
DETAIL N47:

0-20mA OUTPUT EXTERNAL SOURCE



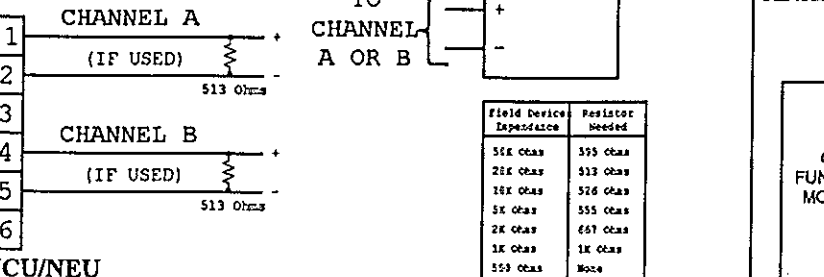
DETAIL N51:

0-10VDC OUTPUT TO VA-8092



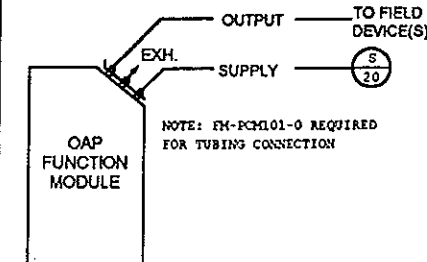
DETAIL N55:

0-10VDC OUTPUT



DETAIL N56:

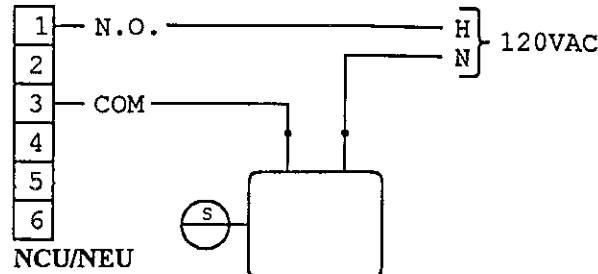
ANALOG OUTPUT PNEUMATIC



NCU BINARY OUTPUT WIRING DETAILS

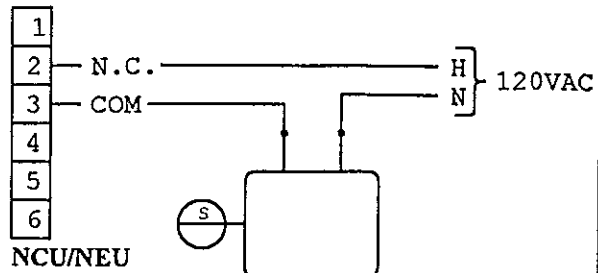
DETAIL N60:

N.O. RELAY OUTPUT TO V-9000



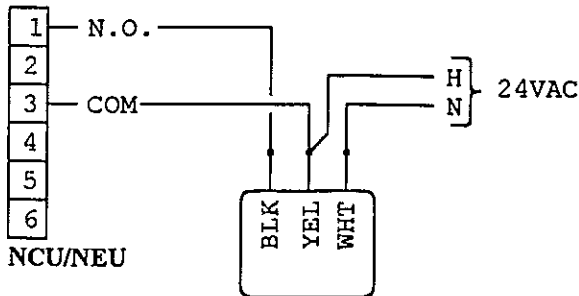
DETAIL N61:

N.C. RELAY OUTPUT TO V-9000



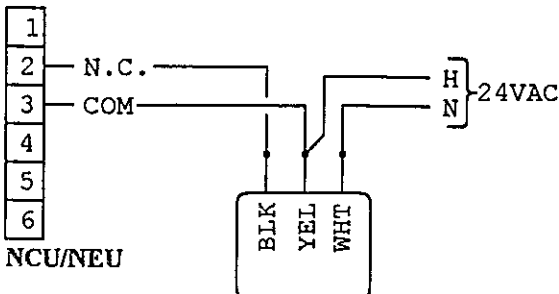
DETAIL N62:

N.O. RELAY OUTPUT TO REV MOTOR J SERIES VALVE



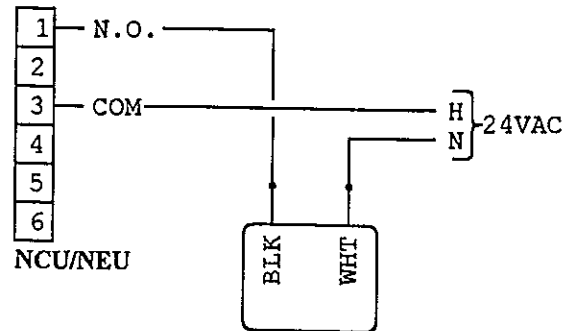
DETAIL N63:

N.C. RELAY OUTPUT TO REV MOTOR J SERIES VALVE



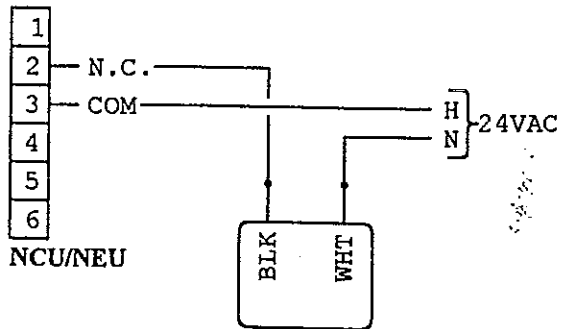
DETAIL N64:

N.O. RELAY OUTPUT TO SPRING RETURN J SERIES VALVE



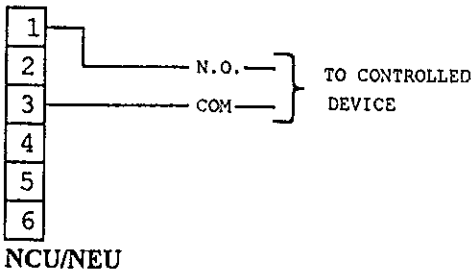
DETAIL N65:

N.C. RELAY OUTPUT TO SPRING RETURN J SERIES VALVE



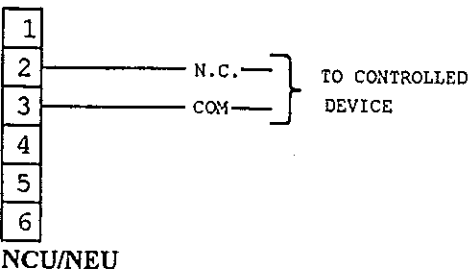
DETAIL N66:

N.O. RELAY CONTACT



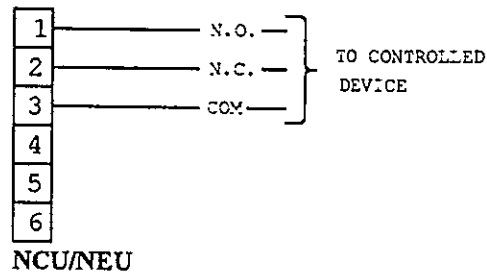
DETAIL N67:

N.C. RELAY CONTACT



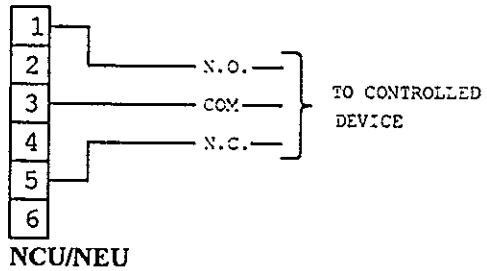
DETAIL N68:

SPDT RELAY



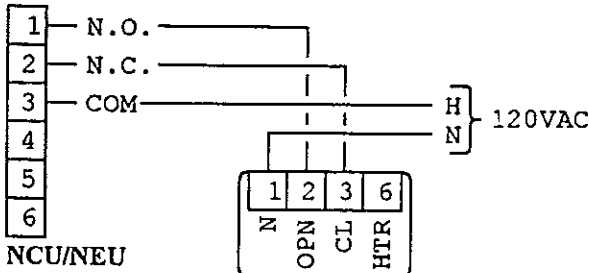
DETAIL N69:

MOMENTARY RELAY CONTACTS



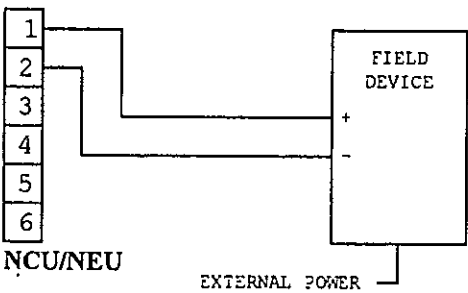
DETAIL N70:

RELAY OUTPUT TO VA-9000



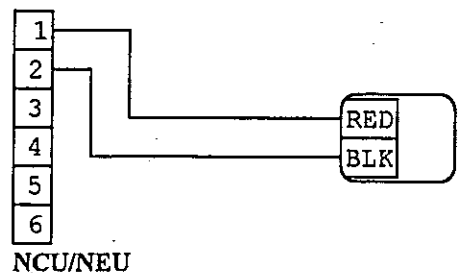
DETAIL N71:

INCREMENTAL +/-12VDC OUTPUT



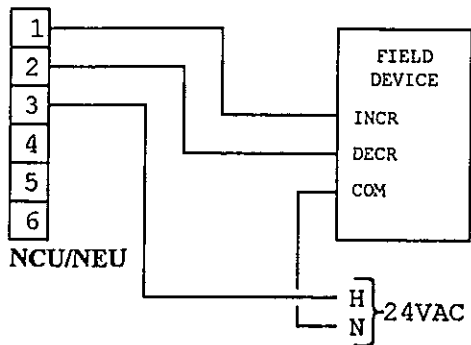
DETAIL N72:

INCREMENTAL +/-12VDC OUTPUT TO V-9012



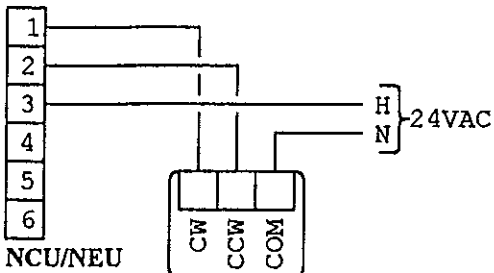
DETAIL N73:

24VAC TRIAC OUTPUT



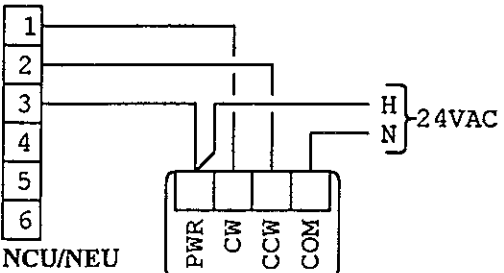
DETAIL N74:

TRIAC OUTPUT TO EDA-8000



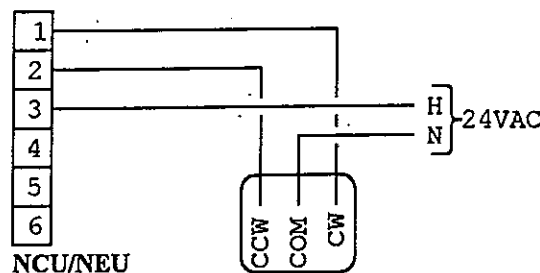
DETAIL N75:

TRIAC OUTPUT TO EDA-8100



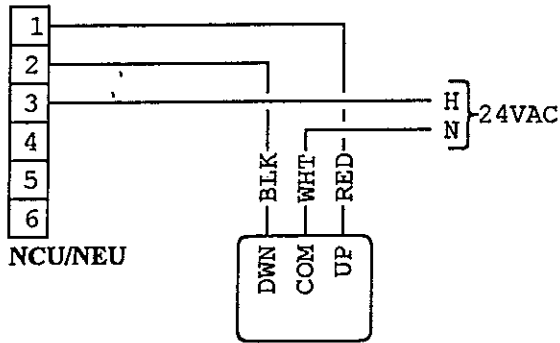
DETAIL N76:

24VAC TRIAC OUTPUT TO EDA-2040



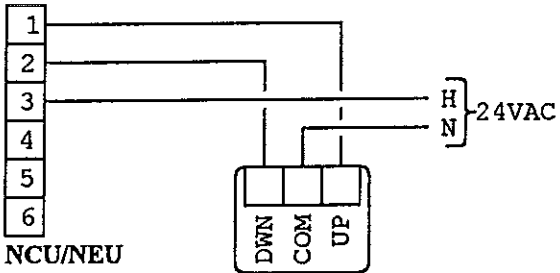
DETAIL N77:

24VAC TRIAC OUTPUT TO VA-8020



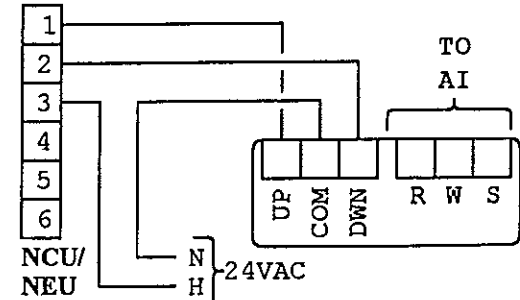
DETAIL N78:

24VAC TRIAC OUTPUT TO VA-80x0



DETAIL N79:

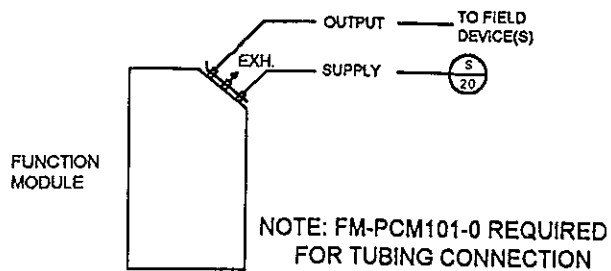
24VAC TRIAC OUTPUT TO VA-80x1



NCU BINARY OUTPUT WIRING DETAILS

DETAIL N80:

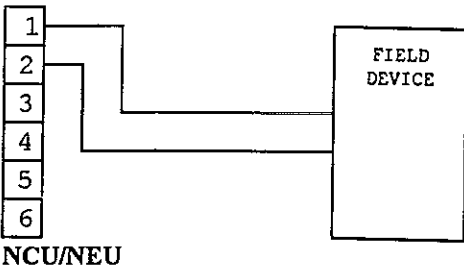
ANALOG OUTPUT SOLENOID VALVE



NCU BINARY INPUT WIRING DETAILS

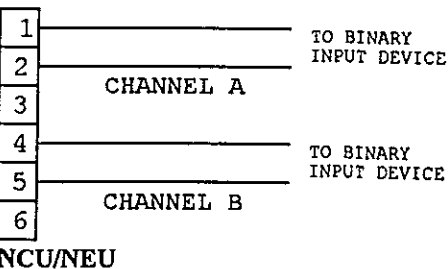
DETAIL N90:

BINARY FREQUENCY INPUT



DETAIL N91:

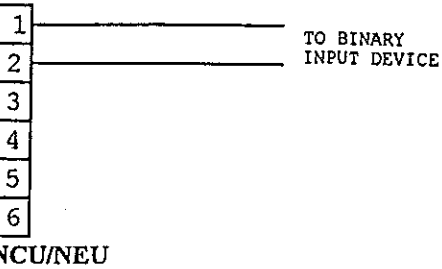
BINARY INPUT



SET INPUT SWITCH TO: NOTE: IF XM MODULE IS IN SLOT 1 OR 5
C FOR DRY CONTACT IUN REQUIRED IN IM SLOT
V FOR VOLTAGE INPUT W1-4
W2-1

DETAIL N92:

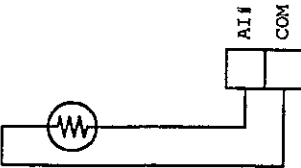
BINARY INPUT



UNT/VAV ANALOG INPUT WIRING DETAILS

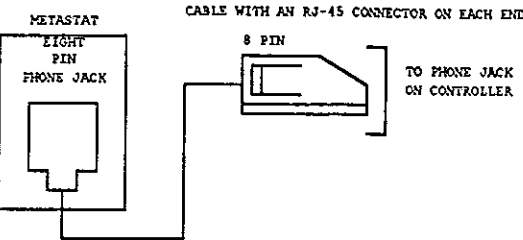
DETAIL U1: SEE TERMINAL BOARD LAYOUT
DETAIL FOR JUMPER SETTINGS.

TEMPERATURE SENSOR INPUT



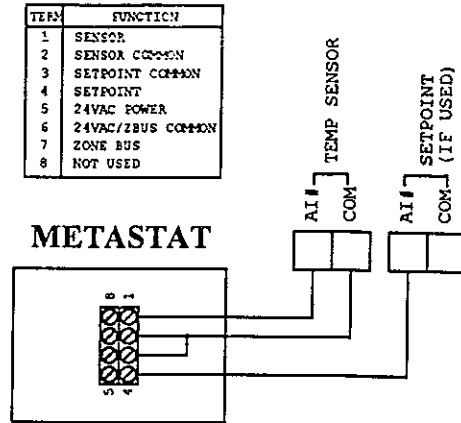
DETAIL U2: SEE TERMINAL BOARD LAYOUT
DETAIL FOR JUMPER SETTINGS.

METASTAT INPUT



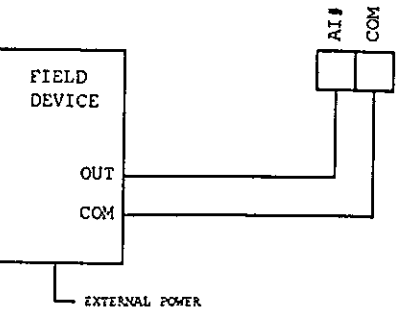
DETAIL U3: SEE TERMINAL BOARD LAYOUT
DETAIL FOR JUMPER SETTINGS.

METASTAT TERMINAL BLOCK



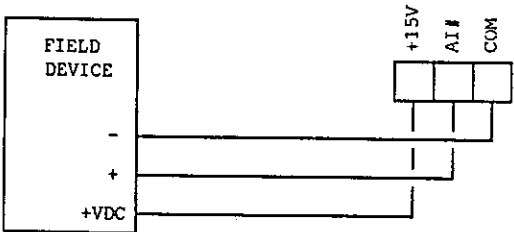
DETAIL U4: SEE TERMINAL BOARD LAYOUT
DETAIL FOR JUMPER SETTINGS.

0-10VDC INPUT EXTERNAL SOURCE



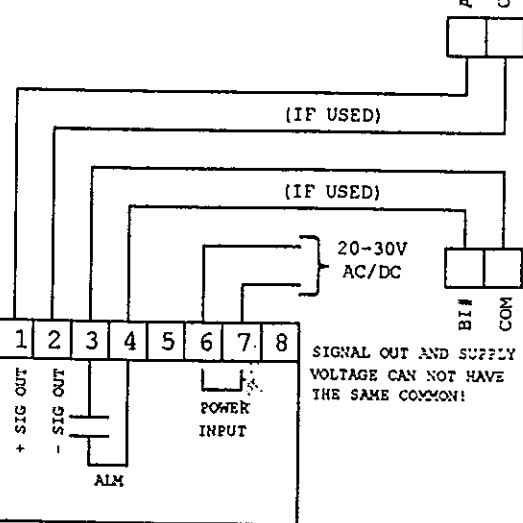
DETAIL U5: SEE TERMINAL BOARD LAYOUT
DETAIL FOR JUMPER SETTINGS.

0-10VDC INPUT INTERNAL SOURCE



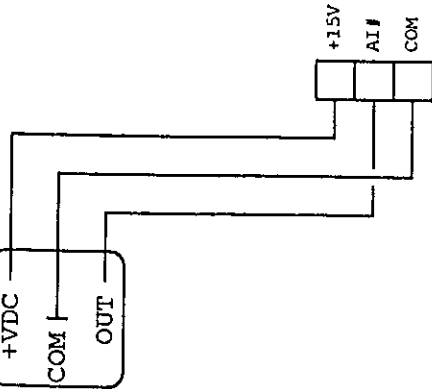
DETAIL U6: SEE TERMINAL BOARD LAYOUT
DETAIL FOR JUMPER SETTINGS.

CARBON DIOXIDE SENSOR



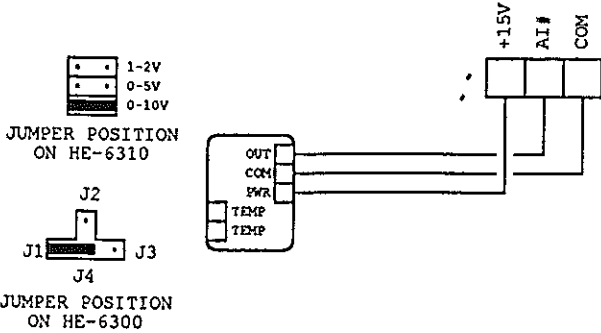
DETAIL U7: SEE TERMINAL BOARD LAYOUT
DETAIL FOR JUMPER SETTINGS.

DPT-2000 INPUT



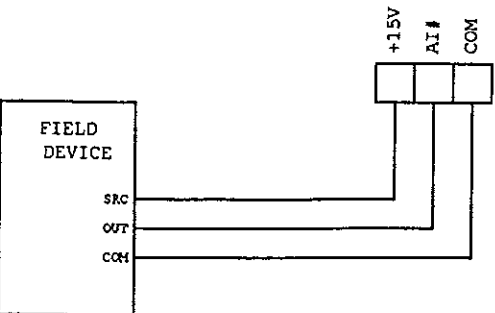
DETAIL U8: SEE TERMINAL BOARD LAYOUT
DETAIL FOR JUMPER SETTINGS.

HE-63x0 INPUT

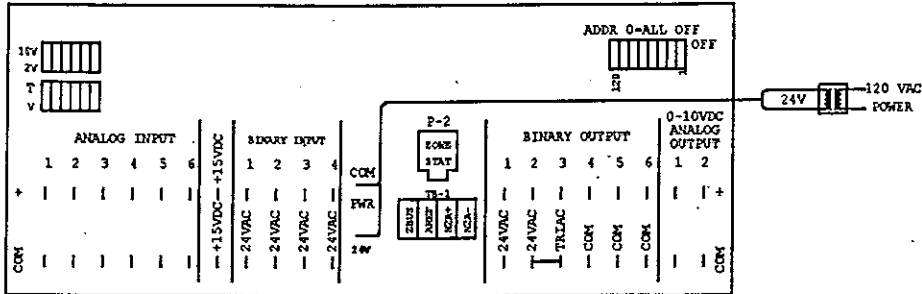


DETAIL U9: SEE TERMINAL BOARD LAYOUT
DETAIL FOR JUMPER SETTINGS.

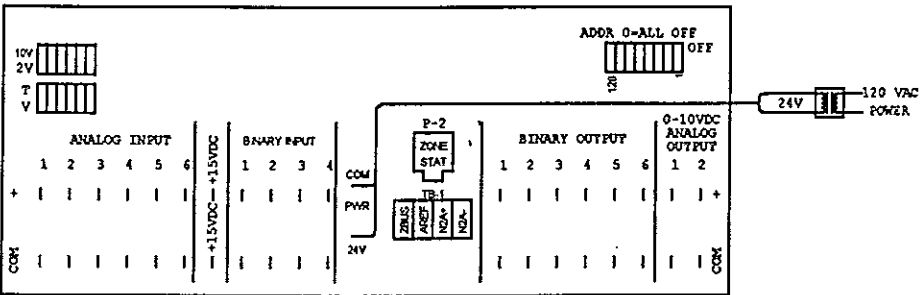
TRANSDUCER INPUT



UNT CONTROLLER

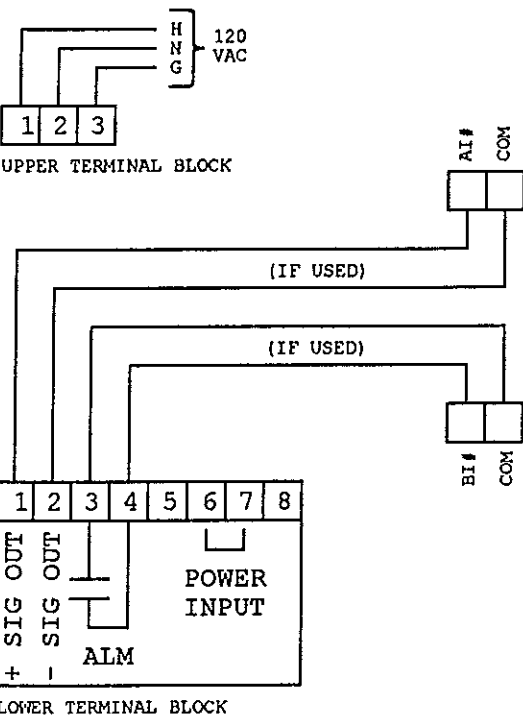


VAV CONTROLLER



DETAIL U10: SEE TERMINAL BOARD LAYOUT
DETAIL FOR JUMPER SETTINGS.

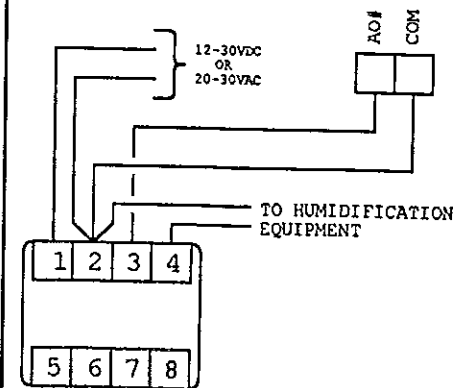
CARBON DIOXIDE CONCENTRATION SAMPLER



UNT/VAV ANALOG OUTPUT WIRING DETAILS

DETAIL U20:

0-10VDC OUTPUT TO HLC-1000



TERMINAL NUMBER	TERMINAL NUMBER	POLARITY	SOURCE/ DESTINATION
1	POWER	+	SYSTEM CONTROLLER OR SEPERATE 24VAC
2	COM	-	PWR. INPT. OUTPUT
3	IN	+	0-20mA
4	OUT	+	HUMID. EQUIPMENT
5	TEMP	n/a	TEMP. SENSOR
6	TEMP	n/a	TEMP. SENSOR
7	RELAY	n/a	FOR ON/OFF HUMID. EQUIPMENT
8	RELAY	n/a	FOR ON/OFF HUMID. EQUIPMENT

JUMPERS ON DEVICE

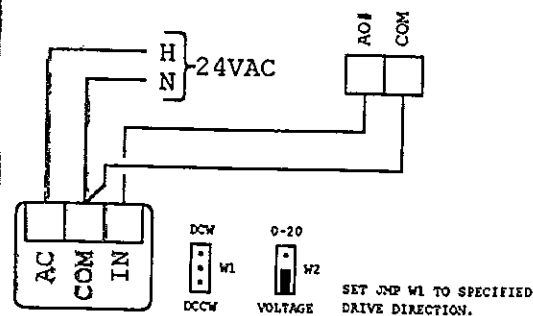
0-10VDC INPUT JMP

0-10VDC OUTPUT JMP

0-20mA OUTPUT JMP

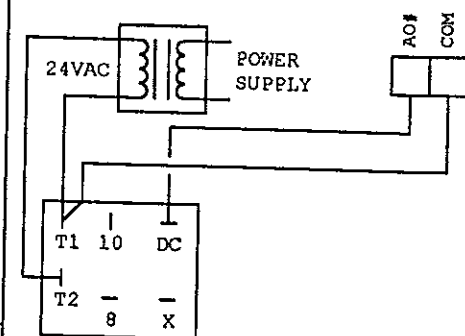
DETAIL U21:

0-10VDC OUTPUT TO EDA-8x02



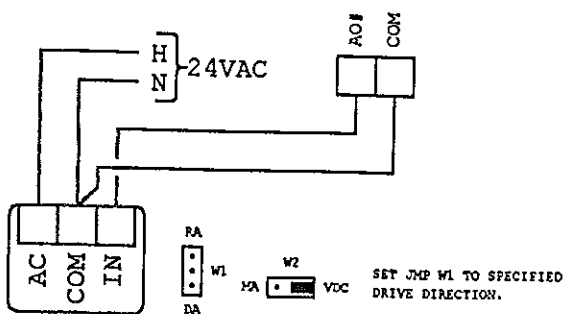
DETAIL U24:

0-10VDC OUTPUT TO M100



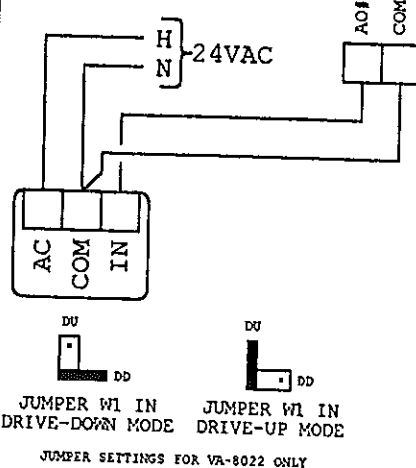
DETAIL U22:

0-10VDC OUTPUT TO EPP-1000



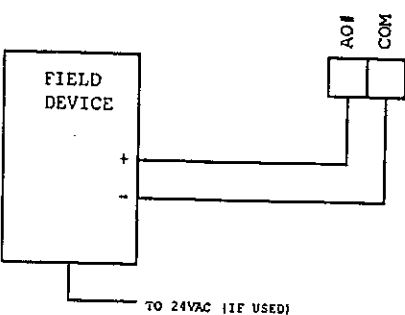
DETAIL U25:

0-10VDC OUTPUT TO VA-8022 OR VA-8052



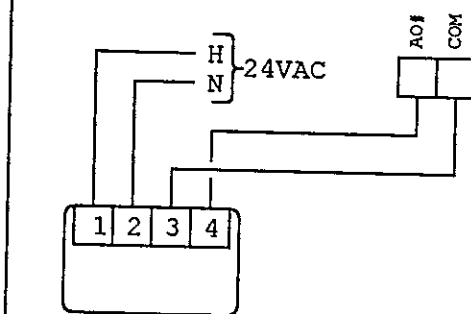
DETAIL U23:

0-10VDC ANALOG OUTPUT



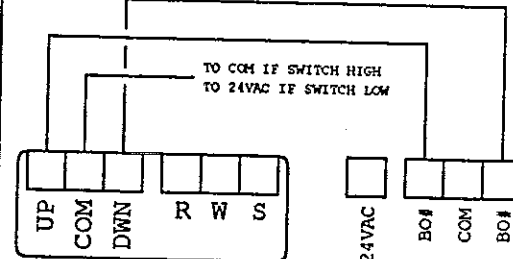
DETAIL U26:

0-10VDC OUTPUT TO VA-8092



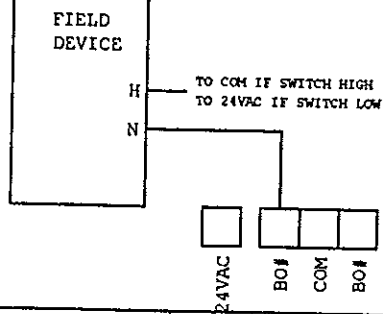
DETAIL U50:

24VAC TRIAC OUTPUT TO VA-80x1



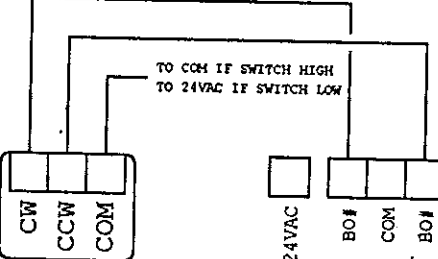
DETAIL U51:

24VAC BINARY OUTPUT



DETAIL U52:

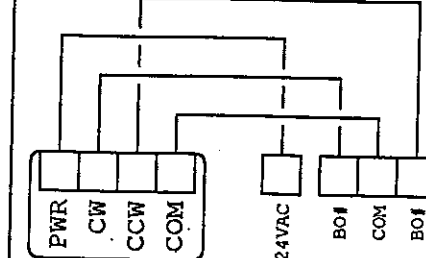
24VAC TRIAC OUTPUT TO EDA-8000



UNT/VAV BINARY OUTPUT WIRING DETAILS

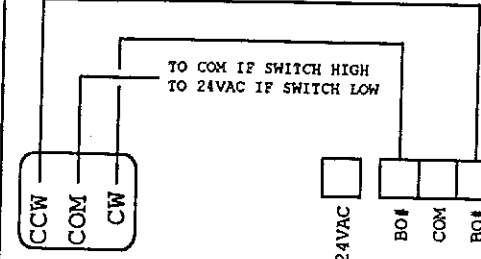
DETAIL U53:

24VAC TRIAC OUTPUT TO EDA-8100



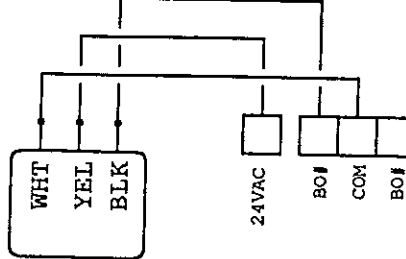
DETAIL U54:

24VAC TRIAC OUTPUT TO EDA-2040



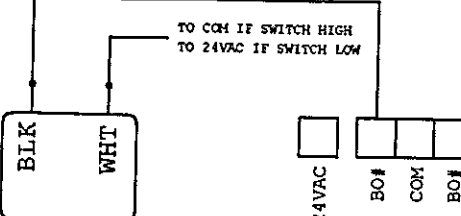
DETAIL U55:

24VAC BINARY OUTPUT TO REV MOTOR J SERIES VALVE



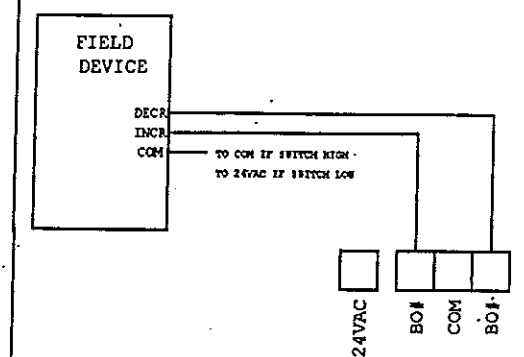
DETAIL U56:

24VAC BINARY OUTPUT TO SPRING RETURN J SERIES VALVE



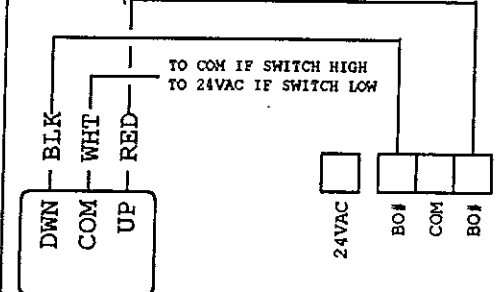
DETAIL U57:

24VAC TRIAC OUTPUT



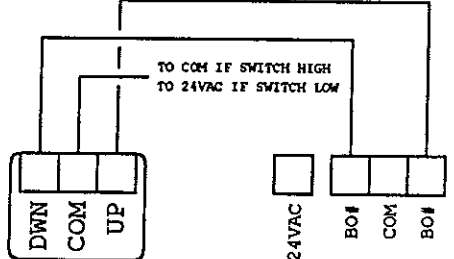
DETAIL U58:

24VAC TRIAC OUTPUT TO VA-8020



DETAIL U59:

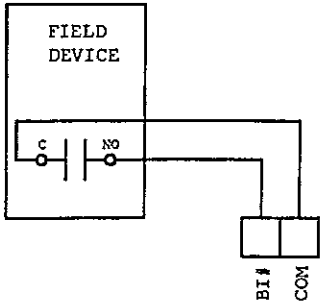
24VAC TRIAC OUTPUT TO VA-80x0



UNT/VAV BINARY INPUT WIRING DETAILS

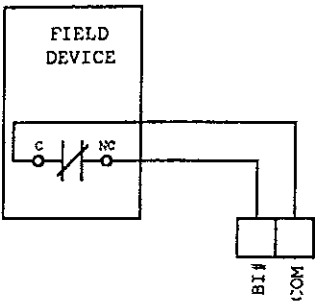
DETAIL U70:

N.O. BINARY INPUT



DETAIL U71:

N.C. BINARY INPUT



		Software				DC Information					Panel Information				Intermediate Device					Field Device						
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Addr.	Cable Destination	Module Type	Termination	Panel	Panel Location	Reference Drawing	Cable #	Wiring/ Tubing	Termination In	Device	Termination Out	Location	Wiring/ Tubing	Terminations	Device	Location	Ref. Detail	Comment	
HTE-1	AI	Boiler	OA-T	Outdoor Air Temperature	Deg F	DCM	1	1-1	FM-IUN102	1,4	EN-1001	Mech Rm 208		10-1-1-1						'2/18	PWR(-),DEV(-)	RHT-3-I-O/A		N1		
HTE-1	AI	Boiler	OA-H	Outdoor Air Humidity	% RH	DCM	1	1-2	FM-IUN102	1,4	EN-1001	Mech Rm 208		10-1-1-2							'2/18	PWR(-),DEV(-)	RHT-3-I-O/A		N1	
TE-1	AI	Boiler	HWS-T	Hot Water Supply Temp	Deg F	DCM	1	1-3A	FM-IAN101	1,2(A)	EN-1001	Mech Rm 208		10-1-1-3A							'2/18	TEMP,TEMP	TE-6312P		N18	
TE-2	AI	Boiler	HWR-T	Hot Water Return Temp	Deg F	DCM	1	1-3B	FM-IAN Above	4,5(B)	EN-1001	Mech Rm 208		10-1-1-3B							'2/18	TEMP,TEMP	TE-6312P		N18	
TE-3	AI	Chiller	CHWS-T	Chilled Water Sup Temp	Deg F	DCM	1	1-4A	FM-IAN101	1,2(A)	EN-1001	Mech Rm 208		10-1-1-4A							'2/18	TEMP,TEMP	TE-6312P		N18	
TE-4	AI	Chiller	CHWR-T	Chilled Water Ret Temp	Deg F	DCM	1	1-4B	FM-IAN Above	4,5(B)	EN-1001	Mech Rm 208		10-1-1-4B							'2/18	TEMP,TEMP	TE-6312P		N18	
PT-1	AI	Static	BLD-SP	Building Static Pressure	In. Wg	DCM	1	2-1	FM-IUN102	1,4	EN-1001	Mech Rm 208		10-1-2-1							'2/18	- , +	DPT-2641		N1	Mtd 1st Floor
	AI					DCM	1	2-2A			EN-1001	Mech Rm 208		10-1-2-2A												
	AI					DCM	1	2-2B			EN-1001	Mech Rm 208		10-1-2-2B												
CSR-1	BI	Boiler	HWP1-S	Hot Water Pump 1 Status	Off On	DCM	1	2-3A	FM-IBN101	1,2(A)	EN-1001	Mech Rm 208		10-1-2-3A							'2/18	Status	H-735		N91	Current Switch
CSR-2	BI	Boiler	HWP2-S	Hot Water Pump 2 Status	Off On	DCM	1	2-3B	FM-IBN Above	4,5(B)	EN-1001	Mech Rm 208		10-1-2-3B							'2/18	Status	H-735		N91	Current Switch
CSR-3	BI	Chiller	CHWP3-S	Chill Water Pump 3 Stat	Off On	DCM	1	2-4A	FM-IBN101	1,2(A)	EN-1001	Mech Rm 208		10-1-2-4A							'2/18	Status	H-735		N91	Current Switch
CSR-4	BI	Chiller	CHWP4-S	Chill Water Pump 4 Stat	Off On	DCM	1	2-4B	FM-IBN Above	4,5(B)	EN-1001	Mech Rm 208		10-1-2-4B							'2/18	Status	H-735		N91	Current Switch
Boiler	BI	Boiler	BLR-S	Boiler Status	Off On	DCM	1	3-1A	FM-IBN101	1,2(A)	EN-1001	Mech Rm 208		10-1-3-1A							'2/18	Status	Boiler Panel		N91	Boiler Panel
Chiller	BI	Chiller	CHLR-S	Chiller Status	Off On	DCM	1	3-1B	FM-IBN Above	4,5(B)	EN-1001	Mech Rm 208		10-1-3-1B							'2/18	Status	Chiller Panel		N91	Chiller Panel
	BI					DCM	1	3-2A			EN-1001	Mech Rm 208		10-1-3-2A												
	BI					DCM	1	3-2B			EN-1001	Mech Rm 208		10-1-3-2B												
CSR-1	BO	Boiler	HWP1-C	Hot Water Pump 1 Control	Off On	DCM	1	3-3	FM-ORE101	1,3	EN-1001	Mech Rm 208		10-1-3-3	'2/18	COIL	H-735 (RELAY)	NO,COM		'2/14	See starter detail	Starter Cct.		N66	Current Switch Integral Relay	
CSR-2	BO	Boiler	HWP2-C	Hot Water Pump 2 Control	Off On	DCM	1	3-4	FM-ORE101	1,3	EN-1001	Mech Rm 208		10-1-3-4	'2/18	COIL	H-735 (RELAY)	NO,COM		'2/14	See starter detail	Starter Cct.		N66	Current Switch Integral Relay	
CSR-3	OUT	Chiller	CHWP3-C	Chill Water Pump 3 Cntrl	Off On	DCM	1	4-1	FM-ORE101	1,3	EN-1001	Mech Rm 208		10-1-4-1	'2/18	COIL	H-735 (RELAY)	NO,COM		'2/14	See starter detail	Starter Cct.		N66	Current Switch Integral Relay	
CSR-4	OUT	Chiller	CHWP4-C	Chill Water Pump 4 Cntrl	Off On	DCM	1	4-2	FM-ORE101	1,3	EN-1001	Mech Rm 208		10-1-4-2	'2/18	COIL	H-735 (RELAY)	NO,COM		'2/14	See starter detail	Starter Cct.		N66	Current Switch Integral Relay	
Boiler	BO	Boiler	BLR-C	Boiler Control	Off On	DCM	1	4-3	FM-ORE101	1,3	EN-1001	Mech Rm 208		10-1-4-3							'2/18	Boiler Enable	(NO) Contact		N66	Boiler Panel
Chiller	OUT	Chiller	CHLR-C	Chiller Control	Off On	DCM	1	4-4	FM-ORE101	1,3	EN-1001	Mech Rm 208		10-1-4-4							'2/18	Chiller Enable	(NO) Contact		N66	Chiller Panel
DA-1	AO	Static	EA-DPR	Exhaust Air Damper	%	DCM	1	5-1	FM-OAE101	1,2	EN-1001	Mech Rm 208		10-1-5-1							'2/18	1,4	M9216-HGC		N33	M9216 to RF-1 & RF-2
WDR-1	OUT	BO SYSTEM	ALARM	SYSTEM ALARM	Alarm Alarm	DCM	1	5-2	FM-ORE101	1,3	EN-1001	Mech Rm 208		10-1-5-2							'2/18		HORN/LIGHT			
	OUT					DCM	1	5-3			EN-1001	Mech Rm 208		10-1-5-3												
	OUT					DCM	1	5-4			EN-1001	Mech Rm 208		10-1-5-4												

Software						DC Information					Panel Information				Intermediate Device				Field Device						
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Addr.	Cable Destination	Module Type	Termination	Panel	Panel Location	Reference Drawing	Cable #	Wiring/ Tubing	Termination In	Device	Termination Out	Location	Wiring/ Tubing	Terminations	Device	Location	Ref. Detail	Comment
						AHU					EN-1002	Mech Rm 208													Power to Controller
						AHU	2				EN-1002	Mech Rm 208													N2 Trunk
TE-5	AI-2	AHU-1	MA-T	Mixed Air Temperature	Deg F	AHU	2	AI-1			EN-1002	Mech Rm 208		10-2-AI-1											
TE-6	AI-3	AHU-1	DA-T	Discharge Air Temperature	Deg F	AHU	2	AI-2	AI#,AICM		EN-1002	Mech Rm 208		10-2-AI-2						'2/18	2-Wire	TE-6316P		A4	
	AI-4	AHU-1		zone temp jumper		AHU	2	AI-3	AI#,AICM		EN-1002	Mech Rm 208		10-2-AI-3						'2/18	2-Wire	TE-6311P		A4	
HTE-2	AI-5	AHU-1	RA-T	Return Air Temperature	Deg F	AHU	2	AI-4			EN-1002	Mech Rm 208		10-2-AI-4											
	AI-6	AHU-1				AHU	2	AI-5	AI#,AICOM		EN-1002	Mech Rm 208		10-2-AI-5						'2/18	TEMP,TEMP	HE-63X0-TE		A13	
PT-2	AI-7	AHU-1	SA-SP	Supply Air Static Pressure	In. Wg	AHU	2	AI-6			EN-1002	Mech Rm 208		10-2-AI-6											
HTE-2	AI-8	AHU-1	RA-H	Return Air Humidity	% RH	AHU	2	AI-7	AI#, +VDC		EN-1002	Mech Rm 208		10-2-AI-7						'2/18	-, +	DPT-2641		A2	
DA-15,16	AO-1	AHU-1	OA-DPR	Damper Control	Closed Open	AHU	2	AO-1	AI#,AICOM, +V		EN-1002	Mech Rm 208		10-2-AI-8						'3/18	OUT,COM,PWR	HE-63X0-HE		A13	
V-2	AO-2	AHU-1	HTG-VLV	Heating Coil Valve	%	AHU	2	AO-2	AO#,AOCOM		EN-1002	Mech Rm 208		10-2-AO-1						'2/18	1,4	M9216-HGA		A21	
V-1	AO-3	AHU-1	CLG-VLV	Clg Coil Valve	%	AHU	2	AO-3	AO#,AOCOM/C		EN-1002	Mech Rm 208		10-2-AO-2						'2/18	1,4	M9216-HGA		A21	
	AO-4	AHU-1	SF-VSD	Sup Fan Var Spd Drive	%	AHU	2	AO-4	AO#,AOCOM		EN-1002	Mech Rm 208		10-2-AO-3						'4/18	DC+,T1/T1,T2	M150G		A26	
	AO-5	AHU-1				AHU	2	AO-5			EN-1002	Mech Rm 208		10-2-AO-4						'2/18	Device depends	VSD		A21	
	AO-6	AHU-1				AHU	2	AO-6			EN-1002	Mech Rm 208		10-2-AO-5											
CSR-5	BI-1	AHU-1	SF-S	Supply Fan Status	Off On	AHU	2	BI-1			EN-1002	Mech Rm 208		10-2-AO-6											
	BI-2	AHU-1	freeze			AHU	2	BI-2	BI#,BICOM		EN-1002	Mech Rm 208		10-2-BI-1						'2/22	Status	H-735		A40	
	BI-3	AHU-1				AHU	2	BI-3			EN-1002	Mech Rm 208		10-2-BI-2											
	BI-4	AHU-1				AHU	2	BI-4			EN-1002	Mech Rm 208		10-2-BI-3											
	BI-5	AHU-1				AHU	2	BI-5			EN-1002	Mech Rm 208		10-2-BI-4											
	BI-6	AHU-1				AHU	2	BI-6			EN-1002	Mech Rm 208		10-2-BI-5											
	BI-7	AHU-1				AHU	2	BI-7			EN-1002	Mech Rm 208		10-2-BI-6											
	BI-8	AHU-1				AHU	2	BI-8			EN-1002	Mech Rm 208		10-2-BI-7											
R-1	BO-1	AHU-1	HWP-C	Hot Water Pump Control	Off On	AHU	2	BO-1			EN-1002	Mech Rm 208		10-2-BI-8											
CSR-5	BO-2	AHU-1	SF-C	Supply Fan 1 Control	Off On	AHU	2	BO-2	BO#,24V		EN-1002	Mech Rm 208		10-2-BO-1	'2/18	COIL	RELAY	COM,NO		'2/14	See starter detail	Starter (NO)		A60	
	BO-3	AHU-1				AHU	2	BO-3	BO#,24V		EN-1002	Mech Rm 208		10-2-BO-2	'2/18	COIL	H-735 (RELAY)	COM,NO		'2/14	See starter detail	Starter (NO)		A60	
	BO-4	AHU-1				AHU	2	BO-4			EN-1002	Mech Rm 208		10-2-BO-3											
	BO-5	AHU-1				AHU	2	BO-5			EN-1002	Mech Rm 208		10-2-BO-4											
	BO-6	AHU-1				AHU	2	BO-6			EN-1002	Mech Rm 208		10-2-BO-5											
	BO-7	AHU-1				AHU	2	BO-7			EN-1002	Mech Rm 208		10-2-BO-6											
	BO-8	AHU-1				AHU	2	BO-8			EN-1002	Mech Rm 208		10-2-BO-7											
	BO-9	AHU-1				AHU	2	BO-9			EN-1002	Mech Rm 208		10-2-BO-8											
	BO-10	AHU-1				AHU	2	BO-10			EN-1002	Mech Rm 208		10-2-BO-9											
		AHU-1				AHU	2				EN-1002	Mech Rm 208		10-2-BO-10											Low Limit Fan Shutdown

Software						DC Information					Panel Information				Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Addr.	Cable Destination	Module Type	Termination	Panel	Panel Location	Reference Drawing	Cable #	Wiring/ Tubing	Termination In	Device	Termination Out	Location	Wiring/ Tubing	Terminations	Device	Location	Ref. Detail	Comment
						AHU					EN-1002Mech Rm 208														Power to Controller
						AHU	3				EN-1002Mech Rm 208														N2 Trunk
TE-8	AI-1	AHU-2	OA-H	outside Air humidity		AHU	3	AI-1			EN-1002Mech Rm 208			10-3-AI-1											
	AI-2	AHU-2	MA-T	Mixed Air Temperature	Deg F	AHU	3	AI-2			EN-1002Mech Rm 208			10-3-AI-2											
TE-9	AI-3	AHU-2	DA-T	Discharge Air Temperature	Deg F	AHU	3	AI-3	AI#,AICM		EN-1002Mech Rm 208			10-3-AI-3						'2/18	2-Wire	TE-6316P	A4		
	AI-4	AHU-2		Zone Temp	Deg F	AHU	3	AI-4	AI#,AICM		EN-1002Mech Rm 208			10-3-AI-4						'2/18	2-Wire	TE-6311P	A4		
HTE-3	AI-5	AHU-2	RA-T	Return Air Temperature	Deg F	AHU	3	AI-5			EN-1002Mech Rm 208			10-3-AI-5											
	AI-6	AHU-2				AHU	3	AI-6	AI#,AICCM		EN-1002Mech Rm 208			10-3-AI-6						'2/18	TEMP,TEMP	HE-63X0-TE	A13		
PT-3	AI-7	AHU-2	SA-SP	Supply Air Static Pressure	In. Wg	AHU	3	AI-7			EN-1002Mech Rm 208			10-3-AI-7											
HTE-3	AI-8	AHU-2	RA-H	Return Air Humidity	% RH	AHU	3	AI-8	AI#, +VDC		EN-1002Mech Rm 208			10-3-AI-7						'2/18	-, +	DPT-2641	A2		
DA-17,18	AO-1	AHU-2	OA-DPR	Damper Control	Closed Open	AHU	3	AO-1	AI#,AICOM, +V		EN-1002Mech Rm 208			10-3-AI-8						'3/18	OUT,COM,PWR	HE-63X0-HE	A13		
V-4	AO-2	AHU-2	HTG-VLV	Heating Coil Valve	%	AHU	3	AO-2	AO#,AOCOM		EN-1002Mech Rm 208			10-3-AO-1						'2/18	1,4	M9216-HGA	A21		
V-3	AO-3	AHU-2	CLG-VLV	Clg Coil Valve	%	AHU	3	AO-3	AO#,AOCOM		EN-1002Mech Rm 208			10-3-AO-2						'2/18	1,4	M9216-HGA	A21		
	AO-4	AHU-2	SF-VSD	Sup Fan Var Spd Drive	%	AHU	3	AO-4	AO#,AOCOM/C		EN-1002Mech Rm 208			10-3-AO-3						'4/18	DC+,T1/T1,T2	M150G	A26		
	AO-5	AHU-2				AHU	3	AO-5	AO#,AOCOM		EN-1002Mech Rm 208			10-3-AO-4						'2/18	Device depende	VSD	A21		
	AO-6	AHU-2				AHU	3	AO-6			EN-1002Mech Rm 208			10-3-AO-5											
CSR-6	BI-1	AHU-2	SF-S	Supply Fan Status	Off On	AHU	3	BI-1			EN-1002Mech Rm 208			10-3-AO-6											
	BI-2	AHU-2	freeze			AHU	3	BI-2	BI#,BICOM		EN-1002Mech Rm 208			10-3-BI-1						'2/22	Status	H-735	A40		
	BI-3	AHU-2				AHU	3	BI-3			EN-1002Mech Rm 208			10-3-BI-2											
	BI-4	AHU-2				AHU	3	BI-4			EN-1002Mech Rm 208			10-3-BI-3											
	BI-5	AHU-2				AHU	3	BI-5			EN-1002Mech Rm 208			10-3-BI-4											
	BI-6	AHU-2				AHU	3	BI-6			EN-1002Mech Rm 208			10-3-BI-5											
	BI-7	AHU-2				AHU	3	BI-7			EN-1002Mech Rm 208			10-3-BI-6											
	BI-8	AHU-2				AHU	3	BI-8			EN-1002Mech Rm 208			10-3-BI-7											
R-2	BO-1	AHU-2	HWP-C	Hot Water Pump Control	Off On	AHU	3	BO-1			EN-1002Mech Rm 208			10-3-BI-8											
CSR-6	BO-2	AHU-2	SF-C	Supply Fan 1 Control	Off On	AHU	3	BO-2	BO#,24V		EN-1002Mech Rm 208			10-3-BO-1	'2/18	COIL	RELAY	COM,NO		'2/14	See starter data	Starter (NO)	A50		
	BO-3	AHU-2				AHU	3	BO-3	BO#,24V		EN-1002Mech Rm 208			10-3-BO-2	'2/18	COIL	H-735 (RELAY)	COM,NO		'2/14	See starter data	Starter (NO)	A50		
	BO-4	AHU-2				AHU	3	BO-4			EN-1002Mech Rm 208			10-3-BO-3											
	BO-5	AHU-2				AHU	3	BO-5			EN-1002Mech Rm 208			10-3-BO-4											
	BO-6	AHU-2				AHU	3	BO-6			EN-1002Mech Rm 208			10-3-BO-5											
	BO-7	AHU-2				AHU	3	BO-7			EN-1002Mech Rm 208			10-3-BO-6											
	BO-8	AHU-2				AHU	3	BO-8			EN-1002Mech Rm 208			10-3-BO-7											
	BO-9	AHU-2				AHU	3	BO-9			EN-1002Mech Rm 208			10-3-BO-8											
	BO-10	AHU-2				AHU	3	BO-10			EN-1002Mech Rm 208			10-3-BO-9											
		AHU-2				AHU					EN-1002Mech Rm 208			10-3-BO-10											Low Limit Fan Shutdown

		Software				DC Information					Panel Information				Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Addr.	Cable Destination	Module Type	Termination	Panel	Panel Location	Reference Drawing	Cable #	Wiring/ Tubing	Termination In	Device	Termination Out	Location	Wiring/ Tubing	Terminations	Device	Location	Ref. Detail	Comment
						UNT					EN-1004	Garage 002													Power to Controller
						UNT	4				EN-1004	Garage 002													N2 Trunk
	AI-1	U-HTRS	UH123-T	UH-1,2,3, Temperature	Deg F	UNT	4	AI-1		AI#,AICM	EN-1004	Garage 002		10-4-AI-1						2/18	2-Wire	TE-6410		U1	
	AI-2	U-HTRS	UH456-T	UH-4,5,6, Temperature	Deg F	UNT	4	AI-2		AI#,AICM	EN-1004	Garage 002		10-4-AI-2						2/18	2-Wire	TE-6410		U1	
	AI-3					UNT	4	AI-3			EN-1004	Garage 002		10-4-AI-3											
	AI-4					UNT	4	AI-4			EN-1004	Garage 002		10-4-AI-4											
	AI-5					UNT	4	AI-5			EN-1004	Garage 002		10-4-AI-5											
	AI-6					UNT	4	AI-6			EN-1004	Garage 002		10-4-AI-6											
	BI-1	CO	1CO-ALM	Garage Area 001 CO Alarm	Normal Alarm	UNT	4	BI-1		BI#,24VAC	EN-1004	Garage 002		10-4-BI-1						2/18	Akm Contacts	CM-21A (4)		U70	
	BI-2	CO	2CO-ALM	Garage Area 002 CO Alarm	Normal Alarm	UNT	4	BI-2		BI#,24VAC	EN-1004	Garage 002		10-4-BI-2						2/18	Akm Contacts	CM-21A (3)		U70	
	BI-3	CO	3CO-ALM	Garage Area 01 CO Alarm	Normal Alarm	UNT	4	BI-3		BI#,24VAC	EN-1004	Garage 002		10-4-BI-3						2/18	Akm Contacts	CM-21A (4)		U70	
	BI-4					UNT	4	BI-4			EN-1004	Garage 002		10-4-BI-4											
	BO-1	U-HTRS	UH123-V	UH-123 Valves	Closed Open	UNT	4	BO-1		BO#,COM	EN-1004	Garage 002		10-4-BO-1						2/18	BLK,WHT	J-VLV SPNG RET(sw hi)		U56	
	BO-2	U-HTRS	UH456-V	UH-456 Valves	Closed Open	UNT	4	BO-2		BO#,COM	EN-1004	Garage 002		10-4-BO-2						2/18	BLK,WHT	J-VLV SPNG RET(sw hi)		U56	
	BO-3					UNT	4	BO-3			EN-1004	Garage 002		10-4-BO-3											
	BO-4					UNT	4	BO-4			EN-1004	Garage 002		10-4-BO-4											
	BO-5					UNT	4	BO-5			EN-1004	Garage 002		10-4-BO-5											
	BO-6					UNT	4	BO-6			EN-1004	Garage 002		10-4-BO-6											
	BO-7					UNT	4	BO-7			EN-1004	Garage 002		10-4-BO-7											
	BO-8					UNT	4	BO-8			EN-1004	Garage 002		10-4-BO-8											

		Software				DC Information					Panel Information				Intermediate Device					Field Device					
Tag	Point Type	System Name	Object Name	Expanded ID	Display Units	DC Type	N2 Addr.	Cable Destination	Module Type	Termination	Panel	Panel Location	Reference Drawing	Cable #	Wiring/ Tubing	Termination In	Device	Termination Out	Location	Wiring/ Tubing	Terminations	Device	Location	Ref. Detail	Comment
		VAV				VAV					EN-1005Rm 02														Power to Controller
		VAV				VAV	5				EN-1005Rm 02														N2 Trunk
AI-1	VAV	ZN-T	Zone Temperature	Zone Temperature	Deg F	VAV	5	AI-1		PHONE JACK	EN-1005Rm 02			10-5-AI-1						'8/26	PHONE JACK	Metastat-Ph Jack		U2	
AI-2	VAV	ZN-STP	Zone Temp Set Point	Zone Temp Set Point	Deg F	VAV	5	AI-2			EN-1005Rm 02			10-5-AI-2								Metastat-Ph Jack			
AI-3	VAV	Rad-T	Radiation Temperature	Radiation Temperature	Deg F	VAV	5	AI-3		See Detail	EN-1005Rm 02			10-5-AI-3						'6/18	See Detail	Metastat-Term		U3	
AI-4	VAV	SA-VP	Supply Air Val Pressure	Supply Air Val Pressure	In. Wg	VAV	5	AI-4		AI#, AICM, + 15	EN-1005Rm 02			10-5-AI-4						'3/18	OUT,COM, +VD	DPT-2000		U9	
AI-5	VAV	Rad-SPT	Radiation Temp Set Point	Radiation Temp Set Point	Deg F	VAV	5	AI-5			EN-1005Rm 02			10-5-AI-5								Metastat-Term			
AI-6	VAV					VAV	5	AI-6			EN-1005Rm 02			10-5-AI-6											
BI-1	VAV					VAV	5	BI-1			EN-1005Rm 02			10-5-BI-1											
BI-2	VAV					VAV	5	BI-2			EN-1005Rm 02			10-5-BI-2											
BI-3	VAV					VAV	5	BI-3			EN-1005Rm 02			10-5-BI-3											
BI-4	VAV					VAV	5	BI-4			EN-1005Rm 02			10-5-BI-4											
BO-1	VAV	DPR-OP	Damper - Pulse Open	Damper - Pulse Open	Off	Pulse	5	BO-1		BO-a,BO-b,24V	EN-1005Rm 02			10-5-BO-1						'3/18	CW,CCW,COM	EDA-2040		U54	
BO-2	VAV	DPR-CL	Damper - Pulse Close	Damper - Pulse Close	Off	Pulse	5	BO-2			EN-1005Rm 02			10-5-BO-2							CW,CCW,COM	EDA-2040			
BO-3	VAV					VAV	5	BO-3			EN-1005Rm 02			10-5-BO-3											
BO-4	VAV	Rad-Vlv	Radiation Valve Control	Radiation Valve Control	Closed	Open	5	BO-4		BO#,24V	EN-1005Rm 02			10-5-BO-4						'2/18	BLK,WHT	"J" VLV SPRNG RET		U56	
BO-5	VAV	RHV-O	Reheat Valve - Pulse Open	Reheat Valve - Pulse Open	Off	Pulse	5	BO-5		BO-a,BO-b,24V	EN-1005Rm 02			10-5-BO-5						'3/18	UP,DWN,COM	VA-7150		U59	
BO-6	VAV	RHV-C	Reheat Valve - Pulse Close	Reheat Valve - Pulse Close	Off	Pulse	5	BO-6			EN-1005Rm 02			10-5-BO-6							UP,DWN,COM	VA-7150			
BO-7	VAV					VAV	5	BO-7			EN-1005Rm 02			10-5-BO-7											
BO-8	VAV					VAV	5	BO-8			EN-1005Rm 02			10-5-BO-8											

Room Schedule

Location					Room Controller/Sensor				Box Information							Unit Heater		Fin Tube		Exhaust Fan		Comments
Bldg./Flr.	Room		System Designation	Ref. dwg.	Controller			Sensor	Box Type				Actuator Info		Reheat Valve	Control Info		Control Info		Control Info		
	No.	Name			Code No.	NCM Addr	N2 Addr		Code No.	Box ID	Box Type	Inlet Size (In)	Min CFM	Max CFM		Code No.	Type	Device Code	Valve Device Code	Other	Valve Device Code	
LL-2	001	Parking	EF-5,6,7,8	H1.1				CM-21A														CO Detection
LL-2	001	Parking	EF-5,6,7,8	H1.1				CM-21A														CO Detection
LL-2	001	Parking	EF-5,6,7,8	H1.1				CM-21A														CO Detection
LL-2	001	Parking	EF-5,6,7,8	H1.1				CM-21A														CO Detection
LL-2	002	Parking	EF-5,6,7,8	H1.1				CM-21A														CO Detection
LL-2	002	Parking	EF-5,6,7,8	H1.1				CM-21A														CO Detection
LL-2	002	Parking	EF-5,6,7,8	H1.1				CM-21A														CO Detection
LL-2	002	Parking	UH-1,2,3	H1.1	UNT140	10	2	TE-6410								0691C0326GB01	(3)					UNT Side Loop
LL-2	002	Parking	UH-4,5,6	H1.1	^	^	^	TE-6410								0691C0326GB01	(3)					UNT Side Loop
LL-2	003	Elevator Rm	UH-12/EF-1	H1.1				T25A								0691C0326GB01				M9216-BGA-2		
LL-2	004	Elevator Rm	UH-11/EF-2	H1.1				T25A								0691C0326GB01				M9216-BGA-2		
LL-2	005	Generator Rm	UH-10/EF-4	H1.1				T25A								0691C0326GB01				M9216-BGA-2		
LL-2	005	Generator Rm	EMGEN	H1.1				T58EA								0691C0326GB01				M9216-AGA-2	(2)	Emgen Dmprs
LL-2	006	Electrical Rm	UH-9/EF-3	H1.1				T25A								0691C0326GB01				M9216-BGA-2		
LL-2	007	Water Service	UH-20	H1.1				T26S								0691C0326GB01						
LL-2	00A	Stairway A	UH-8	H1.1				T26S								0691C0326GB01						
LL-2	00B	Stairway B	UH-7	H1.1				T26S								0691C0326GB01						
LL-1	01	Parking	EF-5,6,7,8	H1.2				CM-21A														CO Detection
LL-1	01	Parking	EF-5,6,7,8	H1.2				CM-21A														CO Detection
LL-1	01	Parking	EF-5,6,7,8	H1.2				CM-21A														CO Detection
LL-1	01	Parking	EF-5,6,7,8	H1.2				CM-21A														CO Detection
LL-1	02	Lobby	UH-16	H1.3				T26S								0691C0326GB01						
LL-1	02	Lobby	AHU-2	H1.3	VAV110	10	5	TE-6413	VR-11					ATP-2040-212		VG7241ET+7150G						
LL-1	04	Quartermaster	AHU-1	H1.3	VAV110	10	6	TE-6413	VR-1					ATP-2040-212		VG7241CT+7150G						
LL-1	06	Evidence Drop	AHU-1	H1.3	VAV110	10	7	TE-6413	VR-2					ATP-2040-212		VG7241CT+7150G						
LL-1	07	Vestibule	UH-13	H1.3				T26S								0691C0326GB01						
LL-1	08	Report Writing	AHU-1	H1.3	VAV110	10	8	TE-6413	VR-3					ATP-2040-212		VG7241CT+7150G						
LL-1	011A	Toilet/Shower	FT-1	H1.3	v	v	v	TE-6413										J691C0326GB00		Not functioning		VAV Side Loop
LL-1	011	Female Lockers	AHU-1	H1.3	VAV110	10	9	TE-6413	VR-6					ATP-2040-212		VG7241CT+7150G						
LL-1	012	Evaluation	AHU-1	H1.3	VAV110	10	10	TE-6413	VR-8					ATP-2040-212		VG7241CT+7150G						
LL-1	014	Briefing	AHU-1	H1.3	VAV110	10	11	TE-6413	VR-5					ATP-2040-212		VG7241ET+7150G						
LL-1	015	Physical Training	AHU-1	H1.3	VAV110	10	12	TE-6413	VR-9					ATP-2040-212		VG7241ET+7150G						
LL-1	016	LT Evidence Strg	AHU-1	H1.3	VAV110	10	13	TE-6413	VR-4					ATP-2040-212		VG7241CT+7150G						
LL-1	018	Male Lockers	AHU-2	H1.3	VAV110	10	14	TE-6413	VR-12					ATP-2040-212		VG7241GT+7150G						
LL-1	020	Laboratory	AHU-2	H1.3	VAV110	10	15	TE-6413	VR-13					ATP-2040-212		VG7241ET+7150G						
LL-1	020B	Office	AHU-2	H1.3	VAV110	10	16	TE-6413	VR-14					ATP-2040-212		VG7241CT+7150G						
LL-1	025	S.W.A.T.	AHU-2	H1.3	VAV110	10	17	TE-6413	VR-16					ATP-2040-212		VG7241CT+7150G						
LL-1	028	Toilet	FT-1	H1.3	v	v	v	TE-6413										J691C0326GB00		Not functioning		VAV Side Loop
LL-1	029	Vestibule	UH-14	H1.3				T26S								0691C0326GB01						
LL-1	030	Vehicle Sallyport	UH-15	H1.3				T26S								0691C0328GB01						
LL-1	031	Corridor	AHU-2	H1.3	VAV110	10	18	TE-6413	VR-15					ATP-2040-212		VG7241CT+7150G						
LL-1	032	Corridor	AHU-1	H1.3	VAV110	10	19	TE-6413	VR-10					ATP-2040-212		VG7241CT+7150G						
LL-1	033	Corridor	AHU-1	H1.3	VAV110	10	20	TE-6413	VR-7					ATP-2040-212		VG7241CT+7150G						
FL-1	100	Vestibule	UH-19	H1.5				T26S								0691C0328GB01						
FL-1	101	Public Lobby	AHU-1	H1.5	VAV110	10	21	TE-6413	VR-17					ATP-2040-212		VG7241CT+7150G						
FL-1	106	Reception	AHU-1/FT-1	H1.5	VAV110	10	22	TE-6413	VR-18					ATP-2040-212		VG7241ET+7150G				J691C0326GA00		
FL-1	109	Chief	AHU-1/FT-1	H1.5	VAV110	10	23	TE-6413	VR-19					ATP-2040-212		VG7241ET+7150G				J691C0326GA00		
FL-1	112	Ops Captain	AHU-1/FT-1	H1.5	VAV110	10	24	TE-6413	VR-22					ATP-2040-212		VG7241ET+7150G				J691C0326GA00		
FL-1	113	Conference	AHU-1	H1.5	VAV110	10	25	TE-6413	VR-21					ATP-2040-212		?						
FL-1	117	Training Sergeant	AHU-1	H1.5	VAV110	10	26	TE-6413	VR-23					ATP-2040-212		?						
FL-1	121	Patrol Lieutenant	AHU-1	H1.5	VAV110	10	27	TE-6413	VR-25					ATP-2040-212		VG7241ET+7150G						
FL-1	125	Staff	AHU-2	H1.5	VAV110	10	28	TE-6413	VR-27					ATP-2040-212		?						
FL-1	126	Records	AHU-2	H1.5	VAV110	10	29	TE-6413	VR-26					ATP-2040-212		?						
FL-1	127	Evidence Storage	AHU-2	H1.5	VAV110	10	30	TE-6413	VR-29					ATP-2040-212		?						
FL-1	128	Patrol Sergeant	AHU-2	H1.5	VAV110	10	31	TE-6413	VR-28					ATP-2040-212		VG7241ET+7150G						

Program Not working EF Fans in Hand Mode

Program not working EF Fans in Hand Mode

Fin Tube Program Not functioning Automatically

*Not able to monitor TEMP on BAS for freeze issues NO BAS CONTROL

- No temp sensor for Automation

- No temp sensor for Automation

3 No temp sensor for Automation

- No temp sensor for Automation

Location					Room Controller/Sensor				Box Information							Unit Heater		Fin Tube		Exhaust Fan		Comments		
Room					Controller			Sensor		Box Type					Actuator Info		Reheat Valve	Control Info		Control Info			Control Info	
Bldg./Flr.	No.	Name	System Designation	Ref. dwg.	Code No.	NCM Addr	N2 Addr	Code No.	Box ID	Box Type	Inlet Size (In)	Min CFM	Max CFM	Code No.	Type	Device Code	Valve Device Code	Other	Valve Device Code	Other	Actuator Device Code		Other	
FL-1	129	Vending Lounge	AHU-2	H1.5	VAV110	10	32	TE-6413	VR-30					ATP-2040-212		VG7241ET+7150G								
FL-1	135	Data Entry	AHU-2	H1.5	VAV110	10	33	TE-6413	VR-31					ATP-2040-212		VG7241ET+7150G								
FL-1	137	Crime Prevention	AHU-2/FT-1	H1.5	VAV110	10	34	TE-6413	VR-33					ATP-2040-212		VG7241CT+7150G			J691C0326GA00					
FL-1	139	Office	AHU-2	H1.5	VAV110	10	35	TE-6413	VR-34					ATP-2040-212		VG7241CT+7150G								
FL-1	145	Corridor	AHU-2	H1.5	VAV110	10	36	TE-6413	VR-32					ATP-2040-212		?								
FL-1	146	Corridor	AHU-1	H1.5	VAV110	10	37	TE-6413	VR-24					ATP-2040-212		?								
FL-1	147	Corridor	AHU-1	H1.5	VAV110	10	38	TE-6413	VR-20					ATP-2040-212		?								
FL-1	A	Stairway A	UH-18	H1.5				T26S	NO TEMP sensor on Automation									0691C0326GB01						
FL-1	B	Stairway B	UH-17	H1.5				T26S										0691C0326GB01						
FL-2	200	Lobby	AHU-1	H1.7	VAV110	10	39	TE-6413	VR-36					ATP-2040-212		VG7241ET+7150G								
FL-2	202	Interview	AHU-1/FT-1	H1.7	VAV110	10	40	TE-6413	VR-35					ATP-2040-212		VG7241CT+7150G			J691C0326GA00					
FL-2	203	Training	AHU-1/FT-1	H1.7	VAV110	10	41	TE-6413	VR-37					ATP-2040-212		VG7241GT+7150G			J691C0326GA00	(2)				
FL-2	204	Emergency Ops	AHU-1/FT-1	H1.7	VAV110	10	42	TE-6413	VR-38					ATP-2040-212		VG7241ET+7150G			J691C0326GA00					
FL-2	206	Storage	AHU-1	H1.7	VAV110	10	43	TE-6413	VR-40					ATP-2040-212		VG7241CT+7150G								
FL-2	208	Mech Rm	UH-19/EF-13	H1.8				T25A	NO TEMP sensor on Automation									0691C0328GB01				M9216-BGA-2		
FL-2	209	Monitoring	AHU-2	H1.7	VAV110	10	44	TE-6413	VR-41					ATP-2040-212		VG7241CT+7150G								
FL-2	213	Investigations Sgt	AHU-2	H1.7	VAV110	10	45	TE-6413	VR-42					ATP-2040-212		VG7241CT+7150G								
FL-2	214	Investigators	AHU-2	H1.7	VAV110	10	46	TE-6413	VR-44					ATP-2040-212		VG7241GT+7150G								
FL-2	215	Major Crimes	AHU-2	H1.7	VAV110	10	47	TE-6413	VR-43					ATP-2040-212		VG7241ET+7150G								
FL-2	221	Interview	AHU-2	H1.7	VAV110	10	48	TE-6413	VR-46					ATP-2040-212		VG7241CT+7150G								
FL-2	225	Investigations Lt.	AHU-2/FT-1	H1.7	VAV110	10	49	TE-6413	VR-47					ATP-2040-212		VG7241CT+7150G			J691C0326GA00					
FL-2	227	Receptionist	AHU-2/FT-1	H1.7	VAV110	10	50	TE-6413	VR-48					ATP-2040-212		VG7241CT+7150G			J691C0326GA00					
FL-2	230	Corridor	AHU-2	H1.7	VAV110	10	51	TE-6413	VR-45					ATP-2040-212		VG7241CT+7150G								
FL-2	235	Corridor	AHU-1	H1.7	VAV110	10	52	TE-6413	VR-39					ATP-2040-212		VG7241CT+7150G								

All Fin Tube(FT)
program will not
function Automatically
Must be manually override

Valve Schedule

Tag				Valve Information													Actuator Information					
Item	System	Service	Ref. Dwg.	Qty.	Code No.	Cfg.	Fail Pos.	Pipe Size	Valve Size	Body Cfg.	Close Off	GPM or lbs/hr	Valve Cv	Actual Cv	Design Delta P	Actual Delta P	Code No.	Pilot	Type	Control Signal	Piping Detail	Comments
1	AHU-1	CLG		1	VB-4322-11	3-Way	Mix		3-0/0"	Flanged	67/38	151.0	80.0	75.5	4.0	3.6	M150GGA-3	None	Elec	0-20mA		
2	AHU-1	HTG		1	VG7842NT+926HGA	3-Way	Mix		1-0/0"	Threaded	88	16.0	11.7	9.2	3.0	1.9	M9216-HGA-2	None	Elec	0-20mA		
3	AHU-2	CLG		1	VB-4322-9	3-Way	Mix		2-1/2"	Flanged	99/64	110.0	54.0	55.0	4.0	4.1	M150GGA-3	None	Elec	0-20mA		
4	AHU-2	HTG		1	VG7842LT+926HGA	3-Way	Mix		0-3/4"	Threaded	141	12.7	7.4	7.3	3.0	2.9	M9216-HGA-2	None	Elec	0-20mA		
5	UH-1	HTG		1	0691C0326GB01	2-Way	NO		0-1/2"	Threaded	50	1.0	0.9	0.6	3.0	1.2	n/a	None	Elec	120vac		
6	UH-2	HTG		1	0691C0326GB01	2-Way	NO		0-1/2"	Threaded	50	1.0	0.9	0.6	3.0	1.2	n/a	None	Elec	120vac		
7	UH-3	HTG		1	0691C0326GB01	2-Way	NO		0-1/2"	Threaded	50	1.0	0.9	0.6	3.0	1.2	n/a	None	Elec	120vac		
8	UH-4	HTG		1	0691C0326GB01	2-Way	NO		0-1/2"	Threaded	50	1.0	0.9	0.6	3.0	1.2	n/a	None	Elec	120vac		
9	UH-5	HTG		1	0691C0326GB01	2-Way	NO		0-1/2"	Threaded	50	1.0	0.9	0.6	3.0	1.2	n/a	None	Elec	120vac		
10	UH-6	HTG		1	0691C0326GB01	2-Way	NO		0-1/2"	Threaded	50	1.0	0.9	0.6	3.0	1.2	n/a	None	Elec	120vac		
11	UH-7	HTG		1	0691C0326GB01	2-Way	NO		0-1/2"	Threaded	50	0.5	0.9	0.3	3.0	0.3	n/a	None	Elec	120vac		
12	UH-8	HTG		1	0691C0326GB01	2-Way	NO		0-1/2"	Threaded	50	0.5	0.9	0.3	3.0	0.3	n/a	None	Elec	120vac		
13	UH-9	HTG		1	0691C0326GB01	2-Way	NO		0-1/2"	Threaded	50	0.5	0.9	0.3	3.0	0.3	n/a	None	Elec	120vac		
14	UH-10	HTG		1	0691C0326GB01	2-Way	NO		0-1/2"	Threaded	50	0.5	0.9	0.3	3.0	0.3	n/a	None	Elec	120vac		
15	UH-11	HTG		1	0691C0326GB01	2-Way	NO		0-1/2"	Threaded	50	0.5	0.9	0.3	3.0	0.3	n/a	None	Elec	120vac		
16	UH-12	HTG		1	0691C0326GB01	2-Way	NO		0-1/2"	Threaded	50	0.5	0.9	0.3	3.0	0.3	n/a	None	Elec	120vac		
17	UH-13	HTG		1	0691C0326GB01	2-Way	NO		0-1/2"	Threaded	50	0.5	0.9	0.3	3.0	0.3	n/a	None	Elec	120vac		
18	UH-14	HTG		1	0691C0326GB01	2-Way	NO		0-1/2"	Threaded	50	0.5	0.9	0.3	3.0	0.3	n/a	None	Elec	120vac		
19	UH-15	HTG		1	0691C0328GB01	2-Way	NO		0-1/2"	Threaded	10	5.5	3.7	3.2	3.0	2.2	n/a	None	Elec	120vac		
20	UH-16	HTG		1	0691C0326GB01	2-Way	NO		0-1/2"	Threaded	50	0.5	0.9	0.3	3.0	0.3	n/a	None	Elec	120vac		
21	UH-17	HTG		1	0691C0326GB01	2-Way	NO		0-1/2"	Threaded	50	0.5	0.9	0.3	3.0	0.3	n/a	None	Elec	120vac		
22	UH-18	HTG		1	0691C0326GB01	2-Way	NO		0-1/2"	Threaded	50	0.5	0.9	0.3	3.0	0.3	n/a	None	Elec	120vac		
23	UH-19	HTG		1	0691C0328GB01	2-Way	NO		0-1/2"	Threaded	10	5.5	3.7	3.2	3.0	2.2	n/a	None	Elec	120vac		
24	UH-20	HTG		1	0691C0326GB01	2-Way	NO		0-1/2"	Threaded	50	0.5	0.9	0.3	3.0	0.3	n/a	None	Elec	120vac		
25	VR-1	RHT		1	VG7241CT+7150G	2-Way	NO		0-1/2"	Threaded	345	0.5	0.7	0.3	3.0	0.5	VA-7150	None	Elec	24vac		
26	VR-2	RHT		1	VG7241CT+7150G	2-Way	NO		0-1/2"	Threaded	345	0.5	0.7	0.3	3.0	0.5	VA-7150	None	Elec	24vac		
27	VR-3	RHT		1	VG7241CT+7150G	2-Way	NO		0-1/2"	Threaded	345	0.5	0.7	0.3	3.0	0.5	VA-7150	None	Elec	24vac		
28	VR-4	RHT		1	VG7241CT+7150G	2-Way	NO		0-1/2"	Threaded	345	0.5	0.7	0.3	3.0	0.5	VA-7150	None	Elec	24vac		
29	VR-5	RHT		1	VG7241ET+7150G	2-Way	NO		0-1/2"	Threaded	259	2.0	1.9	1.2	3.0	1.1	VA-7150	None	Elec	24vac		
30	VR-6	RHT		1	VG7241CT+7150G	2-Way	NO		0-1/2"	Threaded	345	0.5	0.7	0.3	3.0	0.5	VA-7150	None	Elec	24vac		
31	VR-7	RHT		1	VG7241CT+7150G	2-Way	NO		0-1/2"	Threaded	345	0.5	0.7	0.3	3.0	0.5	VA-7150	None	Elec	24vac		
32	VR-8	RHT		1	VG7241CT+7150G	2-Way	NO		0-1/2"	Threaded	345	0.5	0.7	0.3	3.0	0.5	VA-7150	None	Elec	24vac		
33	VR-9	RHT		1	VG7241ET+7150G	2-Way	NO		0-1/2"	Threaded	259	2.0	1.9	1.2	3.0	1.1	VA-7150	None	Elec	24vac		
34	VR-10	RHT		1	VG7241CT+7150G	2-Way	NO		0-1/2"	Threaded	345	0.5	0.7	0.3	3.0	0.5	VA-7150	None	Elec	24vac		
35	VR-11	RHT		1	VG7241ET+7150G	2-Way	NO		0-1/2"	Threaded	259	2.0	1.9	1.2	3.0	1.1	VA-7150	None	Elec	24vac		
36	VR-12	RHT		1	VG7241GT+7150G	2-Way	NO		0-1/2"	Threaded	259	5.0	4.7	2.9	3.0	1.1	VA-7150	None	Elec	24vac		
37	VR-13	RHT		1	VG7241ET+7150G	2-Way	NO		0-1/2"	Threaded	259	2.0	1.9	1.2	3.0	1.1	VA-7150	None	Elec	24vac		
38	VR-14	RHT		1	VG7241CT+7150G	2-Way	NO		0-1/2"	Threaded	345	0.5	0.7	0.3	3.0	0.5	VA-7150	None	Elec	24vac		
39	VR-15	RHT		1	VG7241CT+7150G	2-Way	NO		0-1/2"	Threaded	345	0.5	0.7	0.3	3.0	0.5	VA-7150	None	Elec	24vac		
40	VR-16	RHT		1	VG7241CT+7150G	2-Way	NO		0-1/2"	Threaded	345	0.5	0.7	0.3	3.0	0.5	VA-7150	None	Elec	24vac		
41	VR-17	RHT		1	VG7241CT+7150G	2-Way	NO		0-1/2"	Threaded	345	0.5	0.7	0.3	3.0	0.5	VA-7150	None	Elec	24vac		
42	VR-18	RHT		1	VG7241ET+7150G	2-Way	NO		0-1/2"	Threaded	259	2.0	1.9	1.2	3.0	1.1	VA-7150	None	Elec	24vac		
43	VR-19	RHT		1	VG7241ET+7150G	2-Way	NO		0-1/2"	Threaded	259	2.0	1.9	1.2	3.0	1.1	VA-7150	None	Elec	24vac		
44	VR-20																					
45	VR-21																					
46	VR-22	RHT		1	VG7241ET+7150G	2-Way	NO		0-1/2"	Threaded	259	2.0	1.9	1.2	3.0	1.1	VA-7150	None	Elec	24vac		
47	VR-23																					
48	VR-24																					

Zone TEMP
Sensor
Variable

Zone Setpoint
not at Service
Baseboard Heat
ISSUE

Baseboard FT
ISSUE

Offline

Baseboard FT
ISSUE
Also Zone Set
POINT ISSUE

Baseboard FT
ISSUE

Valve Schedule

Offline -
Baseboard ET
ISSUE
Baseboard ET
ISSUE
Baseboard ET
ISSUE

Tag				Valve Information													Actuator Information					
Item	System	Service	Ref. Dwg.	Qty.	Code No.	Cfg.	Fail Pos.	Pipe Size	Valve Size	Body Cfg.	Close Off	GPM or lbs/hr	Valve Cv	Actual Cv	Design Delta P	Actual Delta P	Code No.	Pilot	Type	Control Signal	Piping Detail	Comments
49	VR-25	RHT		1	VG7241ET+7150G	2-Way	NO		0-1/2"	Threaded	259	2.0	1.9	1.2	3.0	1.1	VA-7150	None	Elec	24vac		
50	VR-26																					
51	VR-27																					
52	VR-28	RHT		1	VG7241ET+7150G	2-Way	NO		0-1/2"	Threaded	259	2.0	1.9	1.2	3.0	1.1	VA-7150	None	Elec	24vac		
53	VR-29																					
54	VR-30	RHT		1	VG7241ET+7150G	2-Way	NO		0-1/2"	Threaded	259	2.0	1.9	1.2	3.0	1.1	VA-7150	None	Elec	24vac		
55	VR-31	RHT		1	VG7241ET+7150G	2-Way	NO		0-1/2"	Threaded	259	2.0	1.9	1.2	3.0	1.1	VA-7150	None	Elec	24vac		
56	VR-32																					
57	VR-33	RHT		1	VG7241CT+7150G	2-Way	NO		0-1/2"	Threaded	345	1.0	0.7	0.6	3.0	2.0	VA-7150	None	Elec	24vac		
58	VR-34	RHT		1	VG7241CT+7150G	2-Way	NO		0-1/2"	Threaded	345	0.5	0.7	0.3	3.0	0.5	VA-7150	None	Elec	24vac		
59	VR-35	RHT		1	VG7241CT+7150G	2-Way	NO		0-1/2"	Threaded	345	0.5	0.7	0.3	3.0	0.5	VA-7150	None	Elec	24vac		
60	VR-36	RHT		1	VG7241ET+7150G	2-Way	NO		0-1/2"	Threaded	259	2.0	1.9	1.2	3.0	1.1	VA-7150	None	Elec	24vac		
61	VR-37	RHT		1	VG7241GT+7150G	2-Way	NO		0-1/2"	Threaded	259	6.0	4.7	3.5	3.0	1.6	VA-7150	None	Elec	24vac		
62	VR-38	RHT		1	VG7241ET+7150G	2-Way	NO		0-1/2"	Threaded	259	2.0	1.9	1.2	3.0	1.1	VA-7150	None	Elec	24vac		
63	VR-39	RHT		1	VG7241CT+7150G	2-Way	NO		0-1/2"	Threaded	345	0.5	0.7	0.3	3.0	0.5	VA-7150	None	Elec	24vac		
64	VR-40	RHT		1	VG7241CT+7150G	2-Way	NO		0-1/2"	Threaded	345	0.5	0.7	0.3	3.0	0.5	VA-7150	None	Elec	24vac		
65	VR-41	RHT		1	VG7241CT+7150G	2-Way	NO		0-1/2"	Threaded	345	0.5	0.7	0.3	3.0	0.5	VA-7150	None	Elec	24vac		
66	VR-42	RHT		1	VG7241CT+7150G	2-Way	NO		0-1/2"	Threaded	345	0.5	0.7	0.3	3.0	0.5	VA-7150	None	Elec	24vac		
67	VR-43	RHT		1	VG7241ET+7150G	2-Way	NO		0-1/2"	Threaded	259	2.0	1.9	1.2	3.0	1.1	VA-7150	None	Elec	24vac		
68	VR-44	RHT		1	VG7241GT+7150G	2-Way	NO		0-1/2"	Threaded	259	6.0	4.7	3.5	3.0	1.6	VA-7150	None	Elec	24vac		
69	VR-45	RHT		1	VG7241CT+7150G	2-Way	NO		0-1/2"	Threaded	345	0.5	0.7	0.3	3.0	0.5	VA-7150	None	Elec	24vac		
70	VR-46	RHT		1	VG7241CT+7150G	2-Way	NO		0-1/2"	Threaded	345	0.5	0.7	0.3	3.0	0.5	VA-7150	None	Elec	24vac		
71	VR-47	RHT		1	VG7241CT+7150G	2-Way	NO		0-1/2"	Threaded	345	0.5	0.7	0.3	3.0	0.5	VA-7150	None	Elec	24vac		
72	VR-48	RHT		1	VG7241CT+7150G	2-Way	NO		0-1/2"	Threaded	345	0.5	0.7	0.3	3.0	0.5	VA-7150	None	Elec	24vac		
73	FT1-011A	RAD		1	J691C0326GB00	2-Way	NO		0-1/2"	Threaded	50	0.3	0.9	0.2	3.0	0.1	n/a	None	Elec	120vac		
74	FT1-028	RAD		1	J691C0326GB00	2-Way	NO		0-1/2"	Threaded	50	0.2	0.9	0.1	3.0	0.0	n/a	None	Elec	120vac		
75	FT1-106	RAD		1	J691C0326GA00	2-Way	NO		0-1/2"	Threaded	50	1.4	0.9	0.8	3.0	2.4	n/a	None	Elec	24vac		
76	FT1-109	RAD		1	J691C0326GA00	2-Way	NO		0-1/2"	Threaded	50	0.8	0.9	0.5	3.0	0.8	n/a	None	Elec	24vac		
77	FT1-112	RAD		1	J691C0326GA00	2-Way	NO		0-1/2"	Threaded	50	1.6	0.9	0.9	3.0	3.2	n/a	None	Elec	24vac		
78	FT1-137	RAD		1	J691C0326GA00	2-Way	NO		0-1/2"	Threaded	50	1.3	0.9	0.7	3.0	2.1	n/a	None	Elec	24vac		
79	FT1-202	RAD		1	J691C0326GA00	2-Way	NO		0-1/2"	Threaded	50	0.8	0.9	0.5	3.0	0.8	n/a	None	Elec	24vac		
80	FT1-203-N	RAD		1	J691C0326GA00	2-Way	NO		0-1/2"	Threaded	50	1.0	0.9	0.6	3.0	1.2	n/a	None	Elec	24vac		
81	FT1-203-E	RAD		1	J691C0326GA00	2-Way	NO		0-1/2"	Threaded	50	1.0	0.9	0.6	3.0	1.2	n/a	None	Elec	24vac		
82	FT1-204	RAD		1	J691C0326GA00	2-Way	NO		0-1/2"	Threaded	50	1.4	0.9	0.8	3.0	2.4	n/a	None	Elec	24vac		
83	FT1-225	RAD		1	J691C0326GA00	2-Way	NO		0-1/2"	Threaded	50	1.1	0.9	0.7	3.0	1.5	n/a	None	Elec	24vac		
84	FT1-227	RAD		1	J691C0326GA00	2-Way	NO		0-1/2"	Threaded	50	0.3	0.9	0.2	3.0	0.1	n/a	None	Elec	24vac		
85	HC-1	HTG		1	J691C0328GB00	2-Way	NO		0-1/2"	Threaded	10	6.6	3.7	3.8	3.0	3.2	n/a	None	Elec	120vac		

Tag				Damper Information																			Actuator Information							
Item	System	Service	Ref. Dwg.	Qty.	Code No.	Fail Pos.	Dmpr. Type	Dmpr. Oper.	Blade Type	Bear. Type	Seals	Duct Size		Damper Size																
												W (In.)	H (In.)	W (In.)	H (In.)	Area (ft²)	Mtg.	Qty.	Code No.	Pilot	Type	Control Signal	Mtg.	Coupld. Detail	Comments					
1	AHU-1	DAD		1	CPPAS-670x260		Control	Parallel	Double	Acetal	Standard	067-0/8"	026-0/8"	067-0/8"	026-0/8"	12.1		1	M9216-BGC-2	n/a	Elec	24vac								
2	AHU-2	DAD		1	CPPAS-680x260		Control	Parallel	Double	Acetal	Standard	068-0/8"	026-0/8"	068-0/8"	026-0/8"	12.3		1	M9216-BGC-2	n/a	Elec	24vac								
3	RF-1	RAD		1	COPAS-420x420		Control	Opposed	Double	Acetal	Standard	042-0/8"	042-0/8"	042-0/8"	042-0/8"	12.3		1	M9216-HGC-2	n/a	Elec	24vac								
4	RF-2	RAD		1	COPAS-420x420		Control	Opposed	Double	Acetal	Standard	042-0/8"	042-0/8"	042-0/8"	042-0/8"	12.3		1	M9216-HGC-2	n/a	Elec	24vac								
5	EMGEN	OAD		1	COPAS-360x480		Control	Opposed	Double	Acetal	Standard	036-0/8"	048-0/8"	036-0/8"	048-0/8"	12.0		1	M9216-HGC-2	n/a	Elec	24vac								
6	EMGEN	RAD		1	COPAS-180x240		Control	Opposed	Double	Acetal	Standard	018-0/8"	024-0/8"	018-0/8"	024-0/8"	3.0		1	M9216-BGA-2	n/a	Elec	24vac								
7	EMGEN	EAD		1	COPAS-480x480		Control	Opposed	Double	Acetal	Standard	048-0/8"	048-0/8"	048-0/8"	048-0/8"	16.0		1	M9216-AGA-2	n/a	Elec	24vac								
8	COMB-AIR	CAD		1	COPAS-300x310		Control	Opposed	Double	Acetal	Standard	030-0/8"	031-0/8"	030-0/8"	031-0/8"	6.5		1	M9216-AGA-2	n/a	Elec	24vac								
9	COMB-AIR	CAD		1	COPAS-300x300		Control	Opposed	Double	Acetal	Standard	030-0/8"	030-0/8"	030-0/8"	030-0/8"	6.3		1	M9216-BGC-2	n/a	Elec	24vac								
10	EF-1	RAD		1	CPVAS-160x160		Control	Parallel	Single	Acetal	Standard	016-0/8"	016-0/8"	016-0/8"	016-0/8"	1.8		1	M9216-BGA-2	n/a	Elec	24vac								
11	EF-2	RAD		1	CPVAS-160x160		Control	Parallel	Single	Acetal	Standard	016-0/8"	016-0/8"	016-0/8"	016-0/8"	1.8		1	M9216-BGA-2	n/a	Elec	24vac								
12	EF-3	RAD		1	CPVAS-160x160		Control	Parallel	Single	Acetal	Standard	016-0/8"	016-0/8"	016-0/8"	016-0/8"	1.8		1	M9216-BGA-2	n/a	Elec	24vac								
13	EF-4	RAD		1	CPVAS-160x160		Control	Parallel	Single	Acetal	Standard	016-0/8"	016-0/8"	016-0/8"	016-0/8"	1.8		1	M9216-BGA-2	n/a	Elec	24vac								
14	EF-13	RAD		1	COPAS-240x610		Control	Opposed	Double	Acetal	Standard	024-0/8"	061-0/8"	024-0/8"	061-0/8"	10.2		1	M9216-BGA-2	n/a	Elec	24vac								
15	AHU-1	OAD															1	M9216-HGA-2	n/a	Elec	24vac			Damper FBO						
16	AHU-1	RAD															1	M9216-HGA-2	n/a	Elec	24vac			Damper FBO						
17	AHU-2	OAD															1	M9216-HGA-2	n/a	Elec	24vac			Damper FBO						
18	AHU-2	RAD															1	M9216-HGA-2	n/a	Elec	24vac			Damper FBO						



ADDENDUM NUMBER 2: October 4, 2022

RFP #2023-11

**Police Department Administration
Building Automation System Improvements**

1. How will access into and throughout the building be handled during construction?

The awarded firm will be required to provide a list of all personnel who will work on the project including their full name and date of birth a minimum of fourteen (14) days prior to the start of the project in order to complete a security and background check. The City will not allow any personnel to work within the Police Department secured areas without having passed the security and background check. Personnel will need to obtain the needed visitor badges daily or as arranged with the project manager. All visitor passes will need to be visibly displayed when on-site. Access cards will be provided which allow entry to most rooms. However, contractor staff will need to be escorted when they are in high security areas. Police Department personnel will be readily available to provide the necessary escort.

2. What are the acceptable working hours?

The building is open 24-7 and work can be coordinated to minimize impact to Police Department operations. Preferred contractor working hours are 7am to 4pm.

3. The project specifications require all new wiring to be in conduit. Does this include low voltage control wiring or just electrical circuits?

All new or modified electrical circuit wiring shall be in conduit. Low voltage control wiring that is above ceilings or within walls does not need to be in conduit. Low voltage control wiring that is unprotected and in open areas shall be in conduit.

4. Are drawings of the building available, especially mechanical?

A full set of record drawings of the building are available. The mechanical drawings are attached as Exhibit A. All other record drawings will be made available to the awarded contractor.

5. Are there any hard ceilings in the building?

Yes, the ceiling in the south end of LL2 garage has a hard ceiling with multiple access locations. These access locations are shown on the mechanical drawings include in Exhibit A.

6. The original intended BAS operation of the garage exhaust fans was on/off controlled by the carbon monoxide sensors and an alarm per zone. Is this to remain in the improved BAS or is more automation desired?

The original intended BAS operation is acceptable. Additional automation is not desired, but compliance with applicable codes shall be confirmed and any necessary changes shall be included in this project.

7. Are the CO Monitors shown on the plans?

The CO monitors are shown on the mechanical drawings include in Exhibit A. All of these monitors will be replaced as part of this project.

8. Where is the CO Controller?

The CO control module is located in the Water Service Room on LL2.

9. Will the cabinet and unit heaters located throughout the facility be added to the BAS?

Yes, these heaters will be added to the BAS. Existing operation is a local thermostat that controls the hot water actuator and fan. New automation shall include a temperature sensor in the room/area and controller(s) for the hot water actuator and fan. Alarms for operational issues and room temperature shall also be provided. Please note that the existing unit heater controls in the mechanical and generator rooms also control dampers and room exhaust fans. This same control shall be provided in the improved BAS.

10. Will the emergency backup generator be added to the BAS?

Other than the control improvements to the unit heater, room exhaust fan & damper and addition of a temperature sensor, automated control of the generator or generator operational louvers will not be performed.

11. Will actuators or other HVAC equipment be replaced as part of the project? This work could be included in the proposal as Voluntary Alternates.

Replacement of actuators or other HVAC equipment not specifically identified in the specifications shall not be performed under this contract. Any actuators and other HVAC equipment which are faulty, damaged or otherwise require replacement shall be done by City staff or through a different contract.

12. Will the VFDs be replaced as part of the project?

Possibly. Replacement of both VFDs has been added as an alternate proposal item. Each VFD controls a 15 hp motor in either AHU 1 or 2. The name plate on one of these motors is attached as Exhibit B.

13. Will existing controllers and control wiring need to be removed as part of this project?

Existing controllers and wiring are likely not compatible for Option A. Existing controllers and wiring may be compatible for Option B, but the contractor shall make this determination. Where the controllers are not compatible, they shall be removed, disposed of by the contractor and replaced. Existing control wiring that will not be used shall be removed at connection points or other locations which interfere with the new installation. Full removal of existing unused control wiring is not required.

14. Are there floor-to-floor chases for pulling wires?

Yes. Chases for HVAC are shown on the mechanical drawings include in Exhibit A. To the extent possible, new control wiring shall follow the same path as existing control wiring.

15. The specifications and proposal documents include an alternate to insulate all VAV boxes. This work may not be necessary and is not typically included in a controls contract. Can it be removed?

The VAV insulating alternate has been removed from this project. The awarded contractor shall make note of all VAV boxes that are not insulated and provide this information to the City.

16. Will the contractor have access to the network?

Yes, it will be a VPN connection with access to a specific IP address for only the BAS.

17. Shall access to the BAS and a PC be provided in the mechanical room.

An access connection shall be provided in the mechanical room, but the City shall provide the PC.

18. What type of user interface/control in each room is desired?

User interface shall be adjustable thermostats that provide room temperature control, but include options to temporarily lock out user control or limit a range of control.

19. The Trane Adaptive Control Module on the rooftop chiller shall not be relocated from its current location. A communication cable from the chiller to the BAS access point/computer in the mechanical room shall be installed as part of this project. Cable information or other connection options are provided in the Tech View manual provided as Exhibit C. In addition, the free Trane Tech View software shown in Exhibit C shall be installed on the City provided PC by City staff with the contractor's assistance to ensure no incompatibility issues with the BAS. Chiller BAS operation will remain the same with on/off control, general alarms and supply & return temperature readings.

20. The awarded contractor shall be required to obtain all necessary permits for this work. Fees for all required City permits will be waived.

21. The awarded contractor shall provide a user manual, as-builts plans and any other operational and maintenance documents for this project. In addition, the relative plan sheet will be placed on junction boxes and the wiring or control components in these boxes shall be clearly labeled. Examples of plans and cable/component labeling are provided in Exhibit D.

22. The new BAS shall have a minimum 3 year warranty for defects and failure of all components and a one year workmanship warranty. In addition, one year of maintenance shall be provided for the new BAS. The warranties and maintenance shall be effective from the date of substantial completion.

PLEASE NOTE: Failure to acknowledge the addendum in OpenGov may result in disqualification.

Misty Shafer, Sr Procurement Specialist
10/4/2022

EXHIBIT A

See Mechanical Drawing Attachment

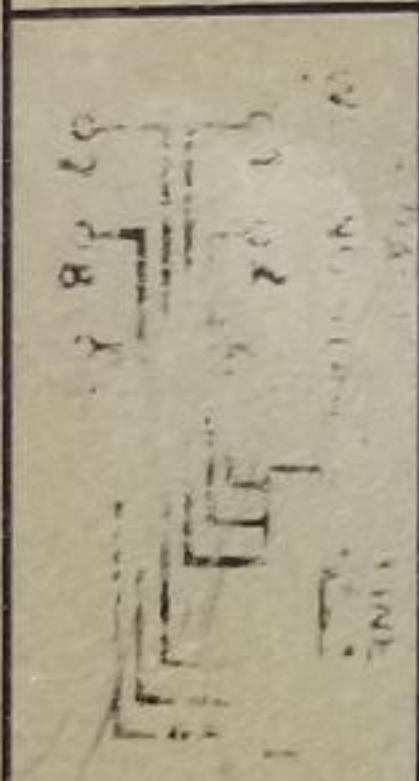
EXHIBIT B



PART	6-362661-01-00		FRAME		CATALOG NUMBER	
SERIAL CODE	B19	TYPE		OPER. INSTR.		
DUTY	CONT	NEMA DESIGN		AMBIENT/INSULATION		
H.P.	15	CODE		NEMA NOM. EFF.		
R.P.M.	1750	PHASE		NOM. POWER FACTOR		
VOLTS	200	SERVICE FACTOR	1.15	GUARANTEED MIN. EFF.		
HERTZ	60	OPERATING TEMP. CODE		DRIVE BEARING	309	
AMPS	43.5	ENCL.	13P	OPP. DRIVE BEARING	206	



WARNING HAZARDOUS VOLTAGE CAN CAUSE SEVERE OR FATAL INJURY. MUST BE INSTALLED AND GROUNDED BY QUALIFIED PERSONNEL PER NATIONAL ELECTRICAL CODE AND LOCAL CODES. TERMINAL COVER MUST BE IN PLACE FOR SAFE OPERATION. DISCONNECT POWER BEFORE SERVICING. UNIT KEEP FINGERS AND FOREIGN OBJECTS AWAY FROM OPENINGS AND MOVING PARTS.



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EXHIBIT C

Table 77. Report name: system ASHRAE chiller log

Description	Resolution	Units
Chiller Mode:		Enum
Active Chilled Water Setpoint:	XXX.X	Temperature
Active Hot Water Setpoint:	XXX.X	Temperature
Evap Entering Water Temp:	XXX.X	Temperature
Evap Leaving Water Temp:	XXX.X	Temperature
Evap Water Flow Switch Status:		Enum
Outdoor Air Temperature:	XXX.X	Temperature
Active Demand Limit Setpoint:	XXX	Percent

Table 78. Report name: circuit ASHRAE chiller log

Description	Resolution	Units
Circuit Mode:		Enum
Suction Pressure:	XXX.X	Pressure
Suction Saturated Rfgt Temp:	XXX.X	Temperature
Evap Approach Temp:	XXX.X	Temperature
Discharge Pressure:	XXX.X	Pressure
Discharge Saturated Rfgt Temp:	XXX.X	Temperature
Cond Approach Temp:	XXX.X	Temperature
Compressor A Starts:	XXXX	Integer
Compressor A Running Time:	XX:XX	Hours: Minute
Compressor B Starts:	XXXX	Integer
Compressor B Running Time:	XX:XX	Hours: Minute
Compressor C Starts:	XXXX	Integer
Compressor C Running Time:	XX:XX	Hours: Minute

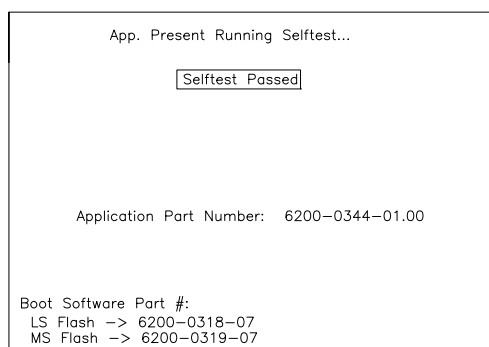
Power Up and Self Tests

Power-Up DynaView

DynaView™ will progress through three Power-Up screens:

First Screen, Application Status, Boot Software P/N, Self Test and Application Time Stamp.

This screen will display for 3-10 seconds. This screen will give the status of the Application software, the Boot Software P/N, display Self Test results and display the Application Part Number (CGAM 6200-0450-01). The contrast will also be adjustable from this screen. The message "Selftest Passed" may be replaced with "Err2: RAM Error" or "Err3: CRC Failure".



Display Formats

Temperature settings can be expressed in F or C, depending on Display Units settings.

Pressure settings can be expressed in psia, psig, kPaa (kPa absolute), or kPag (kPa gauge) depending on Display Units settings.

Dashes ("-----") appearing in a temperature or pressure report, indicates that the value is invalid or not applicable.

Languages

The languages for DynaView™ will reside in the main processor. The main processor will hold three languages, English, and two alternate languages. The service tool (TechView™) will load the main processor with user selected languages from a list of available translations.

TechView



TechView™ is the PC (laptop) based tool used for servicing Tracer CH530. Technicians that make any chiller control modification or service any diagnostic with Tracer CH530 must use a laptop running the software application "TechView." TechView is a Trane application developed to minimize chiller downtime and aid the technicians understanding of chiller operation and service requirements.

Important: *Performing any Tracer CH530 service functions should be done only by a properly trained service technician. Please contact your local Trane service agency for assistance with any service requirements.*

TechView software is available via Trane.com. (<http://www.trane.com/COMMERCIAL/DesignAnalysis/TechView.aspx?i=1435>)

This download site provides a user the TechView installation software and CH530 main processor software that must be loaded onto your PC in order to service a CH530 main processor. The TechView service tool is used to load software into the Tracer CH530 main processor.



Controls Interface

Minimum PC requirements to install and operate TechView

- Microsoft® Windows® XP Professional, Windows Vista Business or Windows 7 Enterprise operating system, Windows 10
- Internet Explorer 6.0 or higher
- USB 2.0 or higher
- Pentium II, III or higher processor
- 128Mb RAM minimum for TechView™, 1G recommended for total Windows system
- 1024 x 768 resolution of display
- CD-ROM (optional for copying TechView install to CD)
- 56K modem (optional for internet connection)
- ROVER USB-to-Serial (USB to 9-pin male)

Note: TechView™ was designed for the preceding listed laptop configuration. Any variation will have unknown results. Therefore, support for TechView is limited to only those operating systems that meet the specific configuration listed here. Only computers with a Pentium II class processor or better are supported; Intel Celeron, AMD, or Cyrix processors have not been tested.

TechView™ is also used to perform any CH530 service or maintenance function. Servicing a CH530 main processor includes:

- Updating main processor software
- Monitoring chiller operation
- Viewing and resetting chiller diagnostics
- Low Level Intelligent Device (LLID) replacement and binding
- Main processor replacement and configuration modifications
- Setpoint modifications
- Service overrides

TechView Software Download, Installation

This information can also be found at <http://www.trane.com/COMMERCIAL/DesignAnalysis/TechView.aspx?i=1435>.

1. Create a folder called "CH530" on your (C:\CH530) on your hard drive. This \CH530 folder is the standard recommended location for the installation file. Storing the installation file in this location helps you remember where it is stored and makes it easier for technical support personnel to assist you.
2. Click the link for the latest version on the TechView™ Software Download page. Enter your name, e-mail address and other required information. Click **Submit**.
3. A download link will be sent to the e-mail address provided. Before you click the link please note:

- Sent link may only be used one time.
- Internet options must be set correctly to allow download. To verify correct setting:
 - Open Internet Explorer Browser
 - Click **Tools**
 - Select **Internet Options**
 - Select **Security** tab
 - Click on **Internet** zone
 - Click **Custom Level** button
 - Scroll to **Downloads** section
 - Verify/Enable "Automatic prompting for file downloads"
 - Click **OK**
 - Click YES on warning window
 - Click Apply, then OK

Note: If this setting is incorrect, you may or may not receive an error message during download attempt.

4. Click the download link in the e-mail message.
 - If the download window does not open immediately, please look for a yellow highlighted message bar/line near the top of your browser. It may contain a message such as "To help protect your security, Internet Explorer blocked this site from downloading files to your computer. Click here for options..." Click on message line to see options.
 - When dialog box appears, click **Save** and navigate to the CH530 folder created in [Step 1](#). Click OK.
 - If you do not complete the download successfully, you will have to request another download link ([Step 2](#)).
5. Navigate to the CH530 folder created in [Step 1](#). Double-click the installation (.exe) file. The License Agreement dialog box appears.
6. Click **I Agree** after reviewing License Agreement. The **Choose Components** dialog box appears. All components are selected by default. (These are the actual MP versions for all units.) Deselect any components you do not want.

Note: Deselecting components reduces the size of the installed application.

7. Click **Install**. A progress meter dialog box appears. An information file appears when installation is complete.

Note: Techview requires a current version of JAVA. If you do not have the current release, TechView installation will be interrupted, and you will be provided with information for required JAVA software download. Once you have completed the JAVA installation, return to [Step 5](#) to restart installation.

Unit View

Unit view is a summary for the system organized by chiller subsystem. This provides an overall view of chiller operating parameters and gives you an “at-a-glance” assessment of chiller operation.

The Control Panel tab displays important operating information for the unit and allows you to change several key operating parameters. The panel is divided into four or more sub-panels (depending on the number of circuits in the unit).

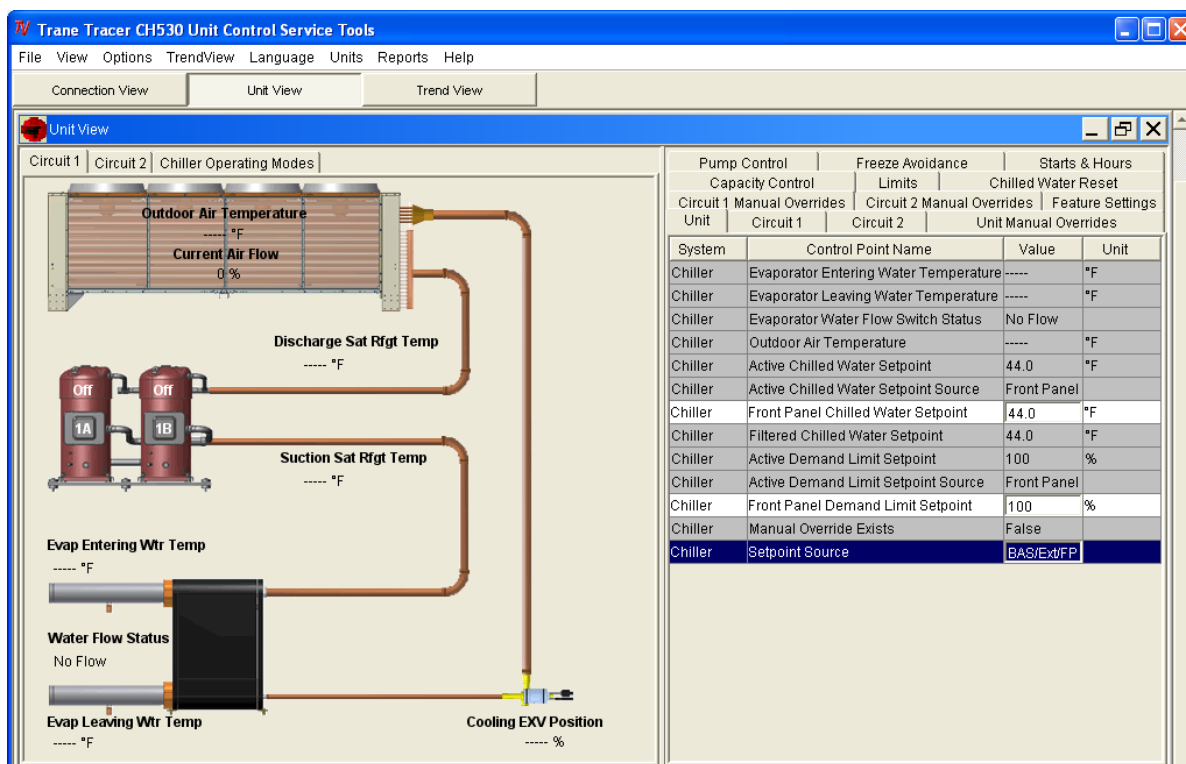
The Operating Mode tab displays the unit, circuit and compressor top level operating modes.

The Hours and Starts tab displays the number a hours (total) a compressor has run and the number of times the compressor has started. This window plays a key role in evaluating maintenance requirements.

Upon successful Local Connect TechView™ will display UNIT VIEW. The Unit View displays the system, control point name, value and unit of measure. It reflects active setpoints and allows you to make changes.

CGAM Unit View is shown below:

Figure 70. Unit view



Unit View also displays, in real time, all non-setpoint data organized by tabs. As data changes on the chiller it is automatically updated in the Unit View.

Figure 71. Unit view tabs

Pump Control	Freeze Avoidance	Starts & Hours
Capacity Control	Limits	Chilled Water Reset
Circuit 1 Manual Overrides	Circuit 2 Manual Overrides	Feature Settings
Unit	Circuit 1	Circuit 2
		Unit Manual Overrides

Table 79. Unit view tabs - detail

Tab	Item Type	Units	Min Value	Max Value	Default Value
Unit Tab					
Evaporator Entering Water Temperature	Status	Temp (°C)			
Evaporator Leaving Water Temperature	Status	Temp (°C)			
Evaporator Water Flow Switch Status	Status	Flow/No Flow			



Controls Interface

Table 79. Unit view tabs - detail (continued)

Tab	Item Type	Units	Min Value	Max Value	Default Value
Outdoor Air Temperature	Status	Temp (°C)			
Active Chilled Water Setpoint	Status	Temp (°C)			
Active Chilled Water Setpoint Source	Status	BAS/External/Front Panel/Auxiliary/Schedule			
Front Panel Chilled Water Setpoint	Setting	Temp °C (°F)	Capacity Control Chilled Water Setpoint	20°C (68°F)	6.7°C (44°F)
BAS Chilled Water Setpoint	Status	Temp (°C)			
Local Schedule Chilled Water Setpoint	Status	Temp (°C)			
External Chilled Water Setpoint	Status	Temp (°C)			
Auxiliary Chilled Water Setpoint	Status	Temp (°C)			
Filtered Chilled Water Setpoint	Status	Temp (°C)			
Active Demand Limit Setpoint	Status	%			
Active Demand Limit Setpoint Source	Status	BAS/External/Front Panel/Auxiliary/Schedule			
Front Panel Demand Limit Setpoint	Setting	%	Smallest Capacity Step	100	100
BAS Demand Limit Setpoint	Status	%			
Local Schedule Demand Limit Setpoint	Status	%			
External Demand Limit Setpoint	Status	%			
Active Ice Building Command	Status	Off /On			
Front Panel Ice Building Command	Setting	Auto	No Request	Ice Building Request	No Request
Active Ice Termination Setpoint	Status	Temp (°C)			
Front Panel Ice Termination Setpoint	Setting	Temp °C (°F)	-6.67°C (20°F)	0°C (32°F)	-2.78°C (27°F)
Manual Override Exists	Status	False/True			
Setpoint Source	Setting	BAS/Ext/FP			
Circuit 1 Tab					
Suction Pressure	Status	Pressure (kPa)			
Discharge Pressure	Status	Pressure (kPa)			
Suction Saturated Refrigerant Temperature	Status	Temp (°C)			
Suction Temperature	Status	Temp (°C)			
Discharge Saturated Refrigerant Temperature	Status	Temp (°C)			
Discharge Temperature	Status	Temp (°C)			
Condenser Approach Temperature	Status	Temp (°C)			
Evaporator Approach Temperature	Status	Temp (°C)			
EXV Position Status (%)	Status	%			
Circuit 2 Tab					
Suction Pressure	Status	Pressure (kPa)			
Discharge Pressure	Status	Pressure (kPa)			
Suction Saturated Refrigerant Temperature	Status	Temp (°C)			
Suction Temperature	Status	Temp (°C)			
Suction Superheat	Status	Delta Temp (°C)			
Discharge Saturated Refrigerant Temperature	Status	Temp (°C)			
Discharge Temperature	Status	Temp (°C)			
Condenser Approach Temp	Status	Temp (°C)			
Evaporator Approach Temp	Status	Temp (°C)			
EXV Position Status (%)	Status	%			
Unit Manual Overrides Tab					

Table 79. Unit view tabs - detail (continued)

Tab	Item	Type	Units	Min Value	Max Value	Default Value
Manual Capacity Control	Setting	Auto/Manual				
Manual Capacity Control Command	Setting	Unload/Hold/Load				
Clear Restart Inhibit	Setting					
Maximum Restart Inhibit Time Remaining	Status	Time (Seconds to MM:SS)				
Manual Evaporator Pump Control	Setting	Auto/On				
Manual Evaporator Pump Override Time	Status	Time (Seconds to MM:SS)				
Circuit 1 Manual Overrides Tab						
Front Panel Lockout	Setting	Not Locked/Locked				
Compressor A Lockout	Setting	Not Locked/Locked				
Compressor B Lockout	Setting	Not Locked/Locked				
Compressor C Lockout	Setting	Not Locked/Locked				
Manual EXV Control	Setting	Auto/Manual				
Manual EXV Control Percent	Setting	%				
Compressor 1A Pumpdown Command	Setting	Abort				
Compressor 1A Pumpdown Status	Status	Available/Not Available/ In Progress/Inhibited				
Compressor 1B Pumpdown Command	Setting	Abort/Start				
Compressor 1B Pumpdown Status	Status	Available/Not Available/ In Progress/Inhibited				
Compressor 1C Pumpdown Command	Setting	Abort/Start				
Compressor 1C Pumpdown Status	Status	Available/Not Available/ In Progress/Inhibited				
Suction Pressure	Status	Pressure (kPa)				
Circuit 2 Manual Overrides Tab						
Front Panel Lockout	Setting	Not Locked/Locked	Auto	Stop	Auto	
Compressor A Lockout	Setting	Not Locked/Locked	Auto	Stop	Auto	
Compressor B Lockout	Setting	Not Locked/Locked	Auto	Stop	Auto	
Compressor C Lockout	Setting	Not Locked/Locked	Auto	Stop	Auto	
Manual EXV Control	Setting	Auto/Manual				
Manual EXV Control Percent	Setting	%				
Compressor 2A Pumpdown Command	Setting	Abort/Start				
Compressor 2A Pumpdown Status	Status	Available/Not Available/ In Progress/Inhibited				
Compressor 2B Pumpdown Command	Setting	Abort/Start				
Compressor 2B Pumpdown Status	Status	Available/Not Available/ In Progress/Inhibited				
Compressor 2C Pumpdown Command	Setting	Abort/Start				
Compressor 2C Pumpdown Status	Status	Available/Not Available/ In Progress/Inhibited				
Suction Pressure	Status	Pressure (kPa)				
Feature Settings Tab						
Local Atmospheric Pressure	Setting	Pressure (kPa)	68.9 kPa	110.3 kPa	101.4 kPa	
Power-Up Start Delay	Setting	Time (Seconds)	0	600	0	
Operational Pumpdown Temperature Setpoint	Setting	Temp °C (°F)	-26°C (-14.8°F)	-10°C (14°F)	-17.78°C (0°F)	
External Chilled Water Setpoint	Setting	Disable/Enable	Disabled			
External Demand Limit Setpoint	Setting	Disable/Enable	Disabled			
Limit Annunciation Debounce Time	Setting	Time (Seconds)	0s	3600s	1200s	
Maximum Capacity Annunciation Debounce Time	Setting	Time (Seconds)	0s	3600s	1200s	



Controls Interface

Table 79. Unit view tabs - detail (continued)

Tab	Item Type	Units	Min Value	Max Value	Default Value
Ice Building Feature	Setting	Disable/Enable			Disabled
EXV Recalibration Time	Setting	Time (Seconds)	?	?	
Capacity Control Tab					
Cooling Design Delta Temperature	Setting	Delta Temp °C (°F)	1°C (1.8°F)	12°C (21.6°F)	5.56°C (10°F)
Differential To Start	Setting	Delta Temp °C (°F)	1°C (1.8°F)	6°C (10.8°F)	2.78°C (5°F)
Differential To Stop	Setting	Delta Temp °C (°F)	1°C (1.8°F)	7°C (12.6°F)	2.78°C (5°F)
Staging Deadband Adjustment	Setting	Delta Temp °C (°F)	-1°C (-1.8°F)	5°C (9°F)	0°C (0°F)
Circuit Staging Option	Setting	Balance Strts-Hrs/Circuit 1 Lead/ Circuit 2 Lead			Balance Starts Hours
Compressor Staging Option	Setting	Fixed Sequence/ Balanced Strts-Hrs			Fixed Sequence
Compressor Start Delay Time	Setting	Time (Seconds)	0 s	600 s	60 s
Capacity Control Softload Time	Setting	Time (Seconds)	0 s	3600 s	900 s
Limits Tab					
Cooling Low Ambient Lockout	Setting	Disable/Enable			Enabled
Cooling Low Ambient Lockout Setpoint	Setting	Temp °C (°F)	-20°C (-4°F)	20°C (68°F)	-10°C (14°F)
Discharge Pressure Limit Setpoint	Setting	%	80%	120%	85%
Discharge Pressure Limit Unload Setpoint	Setting	%	90%	120%	97%
Restart Inhibit Free Starts	Setting	Starts			2
Restart Inhibit Start To Start Time	Setting	Time (Minutes)			6 min
Chilled Water Reset Tab					
Chilled Water Reset Type	Setting	Disable/Return/Outdoor Air/Constant			
Return Reset Ratio	Setting	%	10%	120%	50%
Return Start Reset	Setting	Delta Temp °C (°F)	2.22°C (36°F)	16.67°C (62°F)	5.55°C (42°F)
Return Maximum Reset	Setting	Delta Temp °C (°F)	0°C (32°F)	11.11°C (52°F)	2.78°C (37°F)
Outdoor Reset Ratio	Setting	%	-80%	80%	10%
Outdoor Start Reset	Setting	Temp °C (°F)	10°C (50°F)	54.44°C (130°F)	32.22°C (90°F)
Outdoor Maximum Reset	Setting	Delta Temp °C (°F)	0°C (32°F)	11.11°C (52°F)	2.78°C (37°F)
Cooling Design Delta Temperature	Setting	Delta Temp °C (°F)	1°C (33.8°F)	12°C (53.6°F)	5.56°C (42°F)
Pump Control Tab					
Evaporator Water Flow Switch Status	Status	No Flow/Flow			
Evap Pump Inverter 1 Run Command	Status	Off/On			
Evaporator Pump 1 Command	Status	Off/On			
Evaporator Pump 2 Command	Status	Off/On			
Evap Pump Off Delay	Setting	Time (Minutes)	0 min	30 min	1 min
Evap Flow Overdue Wait Time	Setting	Time (Seconds)	300 s	3600 s	1200 s
High Evaporator Water Temp Setpoint	Setting	Temp °C (°F)			55°C
Freeze Avoidance Tab					
Leaving Water Temp Cutout	Setting	Temp °C (°F)	-21.7°C (-7°F)	4.4°C (40°F)	3.3°C (38°F)
Low Refrigerant Temperature Cutout	Setting	Temp °C (°F)	-29.4°C (-21°F)	2.22°C (36°F)	-3.3°C (26°F)
Evaporator Pump Freeze Avoidance	Setting	Disable/Enable			Enabled
Evap Pump Freeze Avoidance Adaptive Learning	Setting	Fixed/Adaptive			Enabled
Evap Pump Freeze Avoidance Time Constant	Setting	Time (minutes)	2 min	360 min	10 min
Evap Pump Freeze Avoidance Temp Margin	Setting	Delta Temp °C (°F)	0°C (32°F)	5°C (41°F)	2°C (35.6°F)
Starts and Hours Tab					
Chiller Running Time	Status	Time (Sec to HH:MM)			
Compressor 1A Starts	Status	Starts			

Table 79. Unit view tabs - detail (continued)

Tab	Item	Type	Units	Min Value	Max Value	Default Value
Compressor 1A Running Time	Status	Time (Sec to HH:MM)				
Compressor 1B Starts	Status	Starts				
Compressor 1B Running Time	Status	Time (Sec to HH:MM)				
Compressor 1C Starts	Status	Starts				
Compressor 1C Running Time	Status	Time (Sec to HH:MM)				
Compressor 2A Starts	Status	Starts				
Compressor 2A Running Time	Status	Time (Sec to HH:MM)				
Compressor 2B Starts	Status	Starts				
Compressor 2B Running Time	Status	Time (Sec to HH:MM)				
Compressor 2C Starts	Status	Starts				
Compressor 2C Running Time	Status	Time (Sec to HH:MM)				
Evaporator Water Pump 1 Starts	Status	Starts				
Evaporator Water Pump 1 Running Time	Status	Time (Sec to HH:MM)				
Evaporator Water Pump 1 Starts	Status	Starts				
Evaporator Water Pump 1 Running Time	Status	Time (Sec to HH:MM)				
Heat Recovery Tab						
Partial heat recovery (PHR) Fan Control	Setting	Disable/Enable				
PHR Leaving Water Temperature Setpoint	Setting	Temp (°C)				
PHR Leaving Water Temperature Adjustment	Setting	Delta Temp (°C)				
Generic Monitoring Tab						
Generic Temp Sensor	Status	Temp (°C)				
Generic Pressure Sensor	Status	Pressure (kPa)				
Generic Analog Monitor	Status	Current (mA)				
Generic Low Volt Monitor	Setting	Open/Closed				
Generic High Volt Monitor	Setting	Off/On				

The items that can be modified show up in white. The items that cannot be modified show up in gray.

Figure 72. Fields in white

Unit	Circuit 1	Circuit 2	Unit Manual Overrides	
System	Control Point Name		Value	Unit
Chiller	Evaporator Entering Water Temperature	-----		*F
Chiller	Evaporator Leaving Water Temperature	-----		*F
Chiller	Evaporator Water Flow Switch Status	No Flow		
Chiller	Outdoor Air Temperature	-----		*F
Chiller	Active Chilled Water Setpoint	44.0		*F
Chiller	Active Chilled Water Setpoint Source	Front Panel		
Chiller	Front Panel Chilled Water Setpoint	44.0		*F
Chiller	Filtered Chilled Water Setpoint	44.0		*F
Chiller	Active Demand Limit Setpoint	100		%
Chiller	Active Demand Limit Setpoint Source	Front Panel		
Chiller	Front Panel Demand Limit Setpoint	100		%
Chiller	Manual Override Exists	False		
Chiller	Setpoint Source	BAS/Ext/FP		

To change the setpoint enter a new value for the setpoint into the text field.

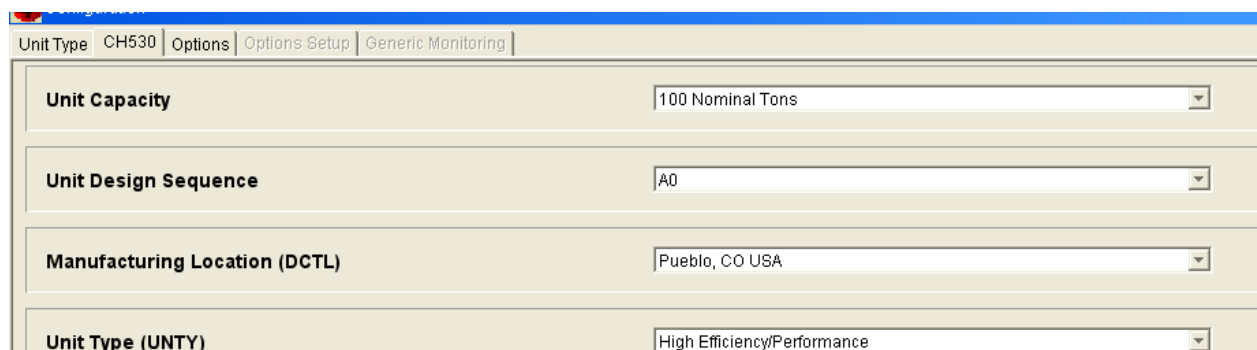
Figure 73. Change setpoint

Chiller	Front Panel Chilled Water Setpoint	42	*F
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If the entered value is outside the given range, the background turns red.

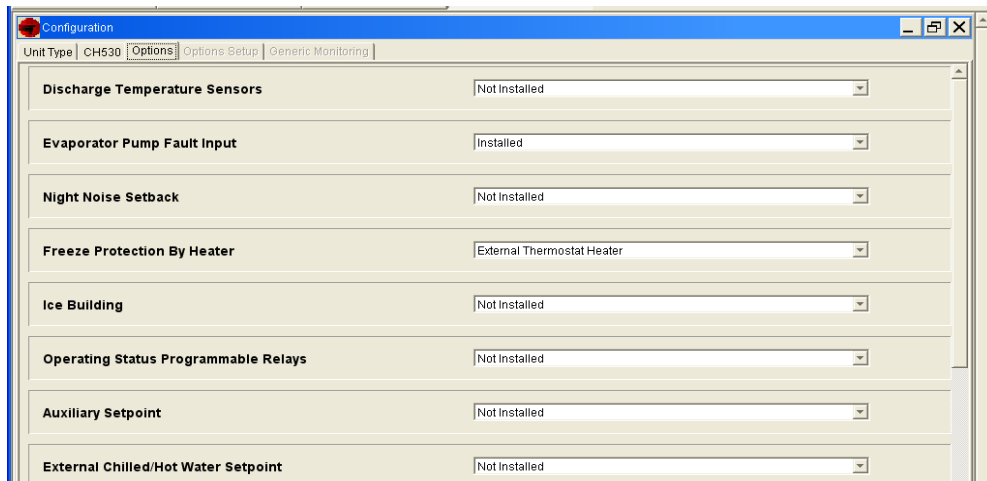
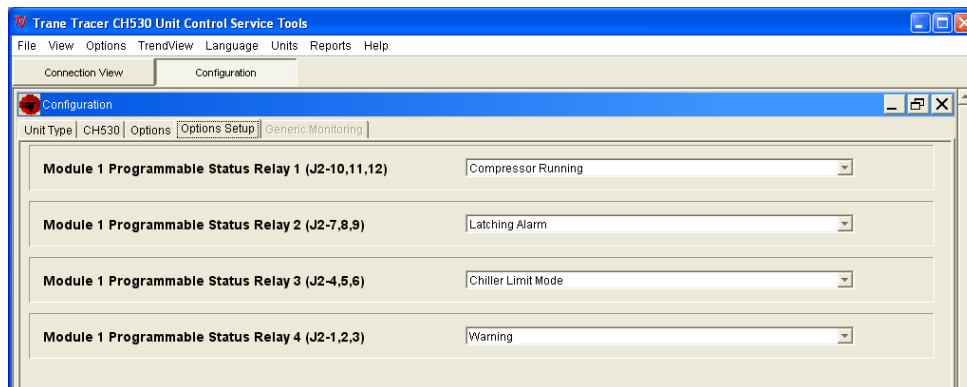
Figure 74. Change out of range

Chiller	Active Demand Limit Setpoint Source	Front Panel	
Chiller	Front Panel Demand Limit Setpoint	250	%
Chiller	Manual Override Exists	False	

Figure 77. Configuration view — CH530 tab

Table 80. Configuration view items - CH530 tab

Item	Description
Basic Product Line	CGAM - Air-Cooled Scroll Packaged Chiller
Unit Capacity	020 Nominal Tons
	023 Nominal Tons (TAI, EPL only)
	026 Nominal Tons
	030 Nominal Tons
	035 Nominal Tons
	039 Nominal Tons (EPL only)
	040 Nominal Tons
	045 Nominal Tons (EPL only)
	046 Nominal Tons (TAI, EPL only)
	052 Nominal Tons
	060 Nominal Tons
	070 Nominal Tons
	080 Nominal Tons
	090 Nominal Tons
	100 Nominal Tons
	110 Nominal Tons
	120 Nominal Tons
Unit Design Sequence	Factory Assigned
Manufacturing Location	Epinal, France
	Pueblo, USA
	Taicang, China
	Curitiba, Brazil
Unit Type	Standard Efficiency/Performance (EPL only)
	High Efficiency/Performance
Sound Package	High Duty (EPL and TAI only)
	Standard Noise
	Low Noise
Supply Power Frequency	60 Hz
	50 Hz
Unit Application	Standard Ambient (EPL and TAI only)
	Low Ambient (EPL and TAI only)
	High Ambient (EPL and TAI only)
	Wide Ambient
Heat Recovery	No Heat Recovery
	Partial Heat Recovery w/ Fan Control
	Partial Heat Recovery w/o Fan Control (EPL and TAI only)
Evaporator Pump Control	No Pump Flow Control
	Single Pump Fixed Speed (TAI, EPL only)
	Single Pump Variable Speed (TAI, EPL only)
	Dual Pump Fixed Speed (TAI, EPL only)
	Dual Pump Variable Speed

A couple of additional tabs in Configuration View allow you to change other unit configuration options using the Options tab and the Options Setup tab. The features that are installed on the Options Tab will control what is displayed on the Options Setup tab.

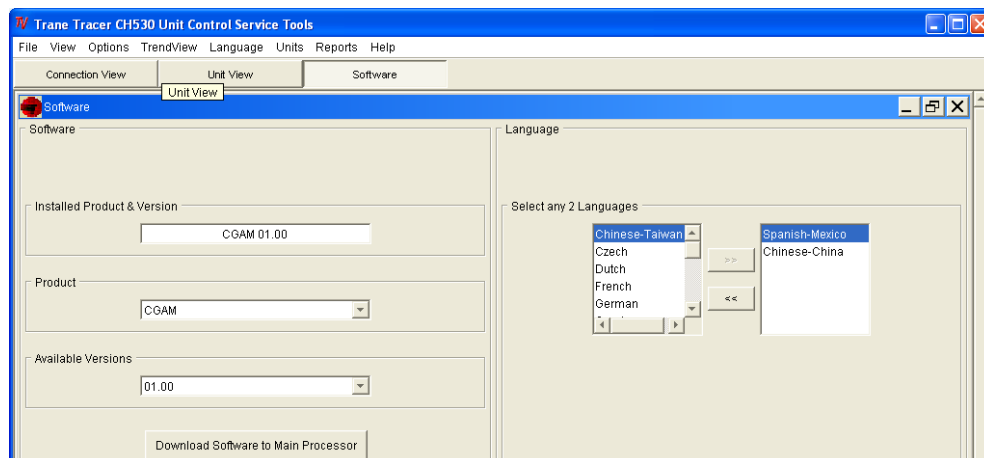
Figure 78. Configuration view — options tab

Figure 79. Configuration view — options setup tab


Software View

Software view allows you to verify the version of chiller software currently running on the DynaView™ and

download a new version of chiller software to the DynaView™.

You can also add up to two available languages to load into the DynaView™. Loading an alternate language file allows the DynaView™ to display its text in the selected alternate language, English will always be available.

Figure 80. Software view


Binding View

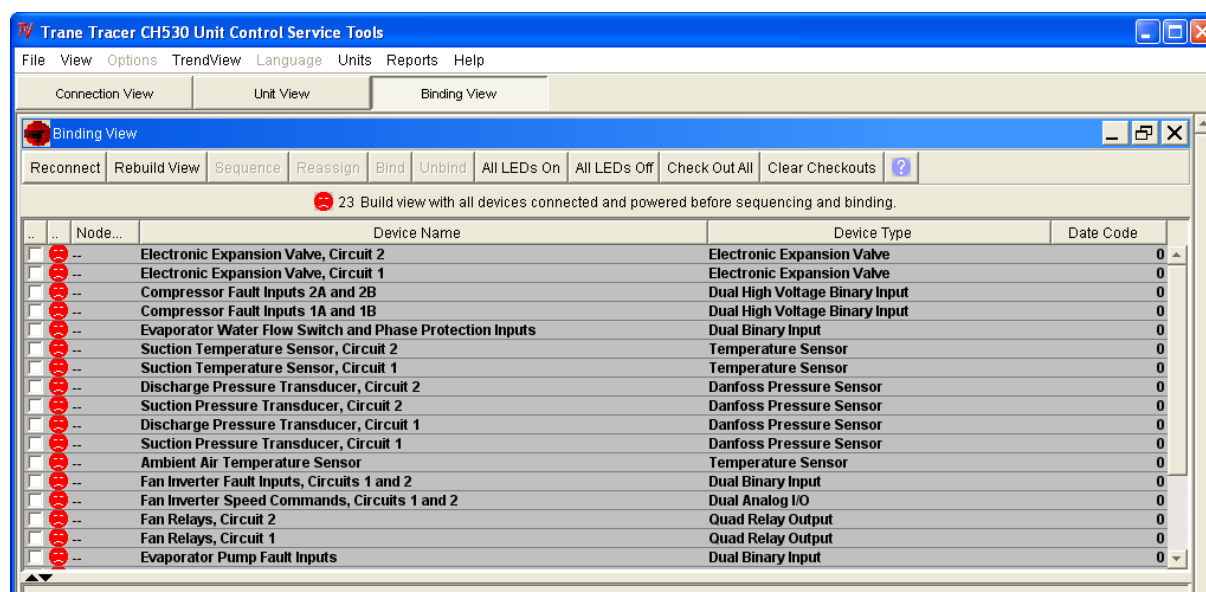
Binding View allows you to assess the status of the network and all the devices connected as a whole, or the status of individual devices by using status icons and function buttons.

Binding View is essentially a table depicting what devices and options are actually discovered on the network bus (and their communication status) versus what is required to support the configuration defined by the feature codes

and categories. Binding View allows you to add, remove, modify, verify, and reassign devices and options in order to match the configuration requirements.

Whenever a device is installed, it must be correctly configured to communicate and to function as intended. This process is called binding. Some features of Binding View are intended to serve a second purpose; that is diagnosing problems with communication among the devices.

Figure 81. Binding view



Node	Device Name	Device Type	Date Code
...	Electronic Expansion Valve, Circuit 2	Electronic Expansion Valve	0
...	Electronic Expansion Valve, Circuit 1	Electronic Expansion Valve	0
...	Compressor Fault Inputs 2A and 2B	Dual High Voltage Binary Input	0
...	Compressor Fault Inputs 1A and 1B	Dual High Voltage Binary Input	0
...	Evaporator Water Flow Switch and Phase Protection Inputs	Dual Binary Input	0
...	Suction Temperature Sensor, Circuit 2	Temperature Sensor	0
...	Suction Temperature Sensor, Circuit 1	Temperature Sensor	0
...	Discharge Pressure Transducer, Circuit 2	Danfoss Pressure Sensor	0
...	Suction Pressure Transducer, Circuit 2	Danfoss Pressure Sensor	0
...	Discharge Pressure Transducer, Circuit 1	Danfoss Pressure Sensor	0
...	Suction Pressure Transducer, Circuit 1	Danfoss Pressure Sensor	0
...	Ambient Air Temperature Sensor	Temperature Sensor	0
...	Fan Inverter Fault Inputs, Circuits 1 and 2	Dual Binary Input	0
...	Fan Inverter Speed Commands, Circuits 1 and 2	Dual Analog I/O	0
...	Fan Relays, Circuit 2	Quad Relay Output	0
...	Fan Relays, Circuit 1	Quad Relay Output	0
...	Evaporator Pump Fault Inputs	Dual Binary Input	0

Replacing or Adding Devices

If a device is communicating but incorrectly configured, it might not be necessary to replace it. If the problem with the device is related to communication, attempt to rebind it, and if the device becomes correctly configured, it will then communicate properly.

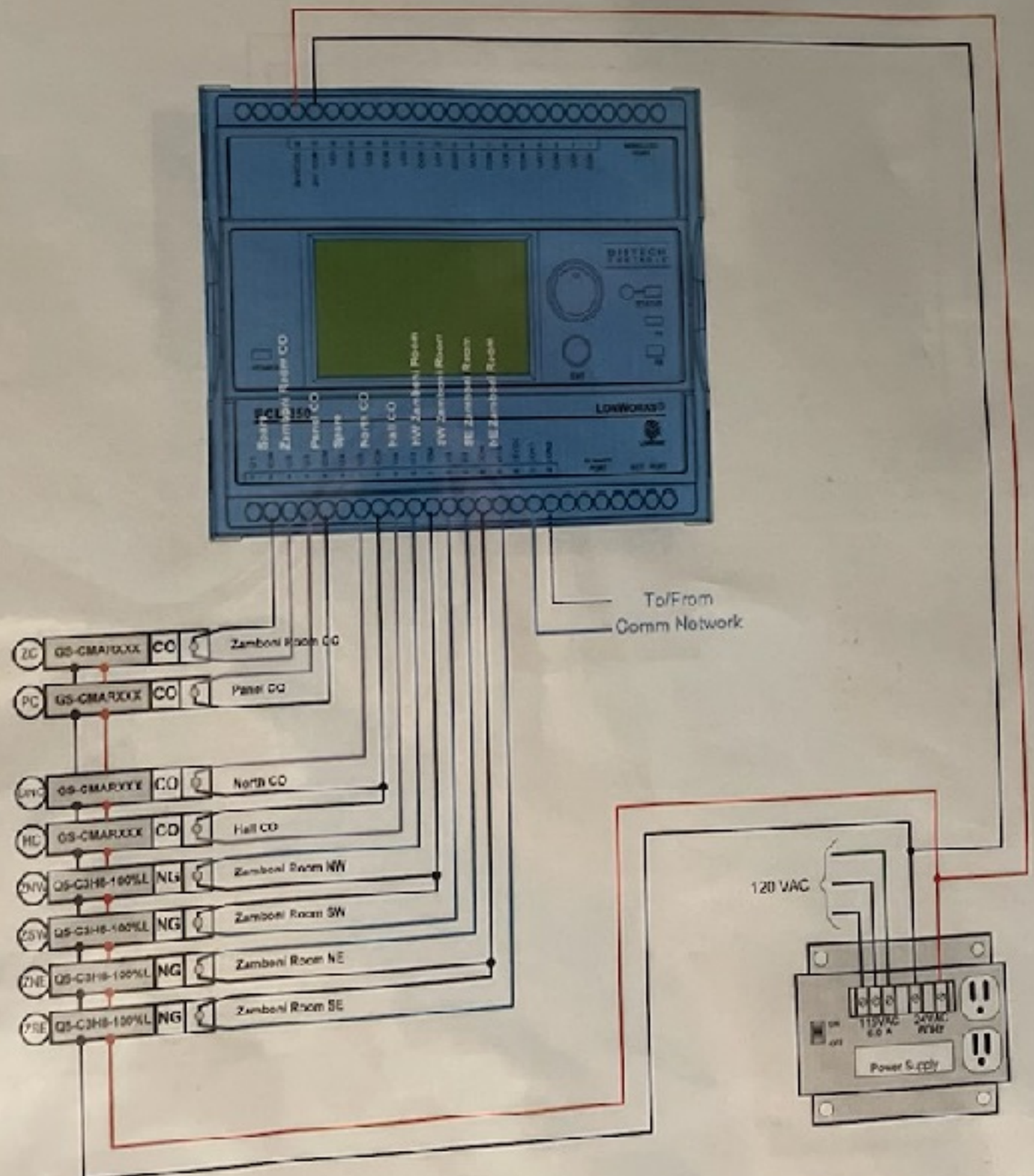
If a device that needs to be replaced is still communicating, it should be unbound. Otherwise, it will be necessary to rebuild the CH530 network image for Binding View to discover that it has been removed. An unbound device stops communicating and allows a new device to be bound in its place.

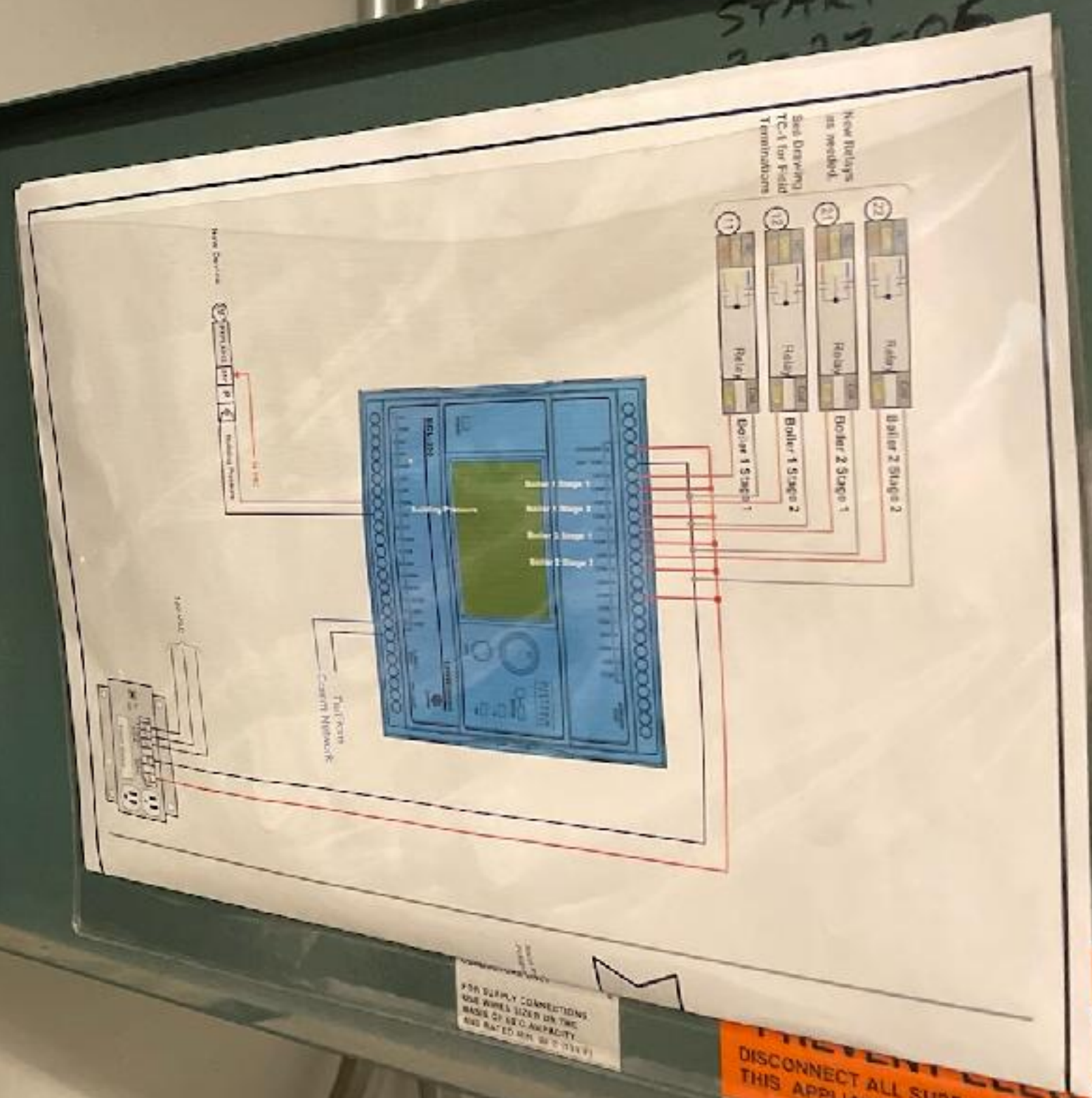
It is good practice to turn the power off while detaching and attaching devices to the CH530 network. Be sure to keep power on the service tool computer. After power is restored to the CH530 network, the reconnect function in Binding View restores communication with the network. If the service tool computer is turned off, you must restart TechView™ and Binding View.

If a device is not communicating, the binding function displays a window to request manual selection of the device to be bound. Previously-selected devices are deselected when the function starts. When manual selection is confirmed, exactly one device must be selected; if it is the correct type, it is bound. If the desired

device cannot be selected or if multiple devices are accidentally selected, you can close the manual selection window by clicking on No and repeat the bind function.

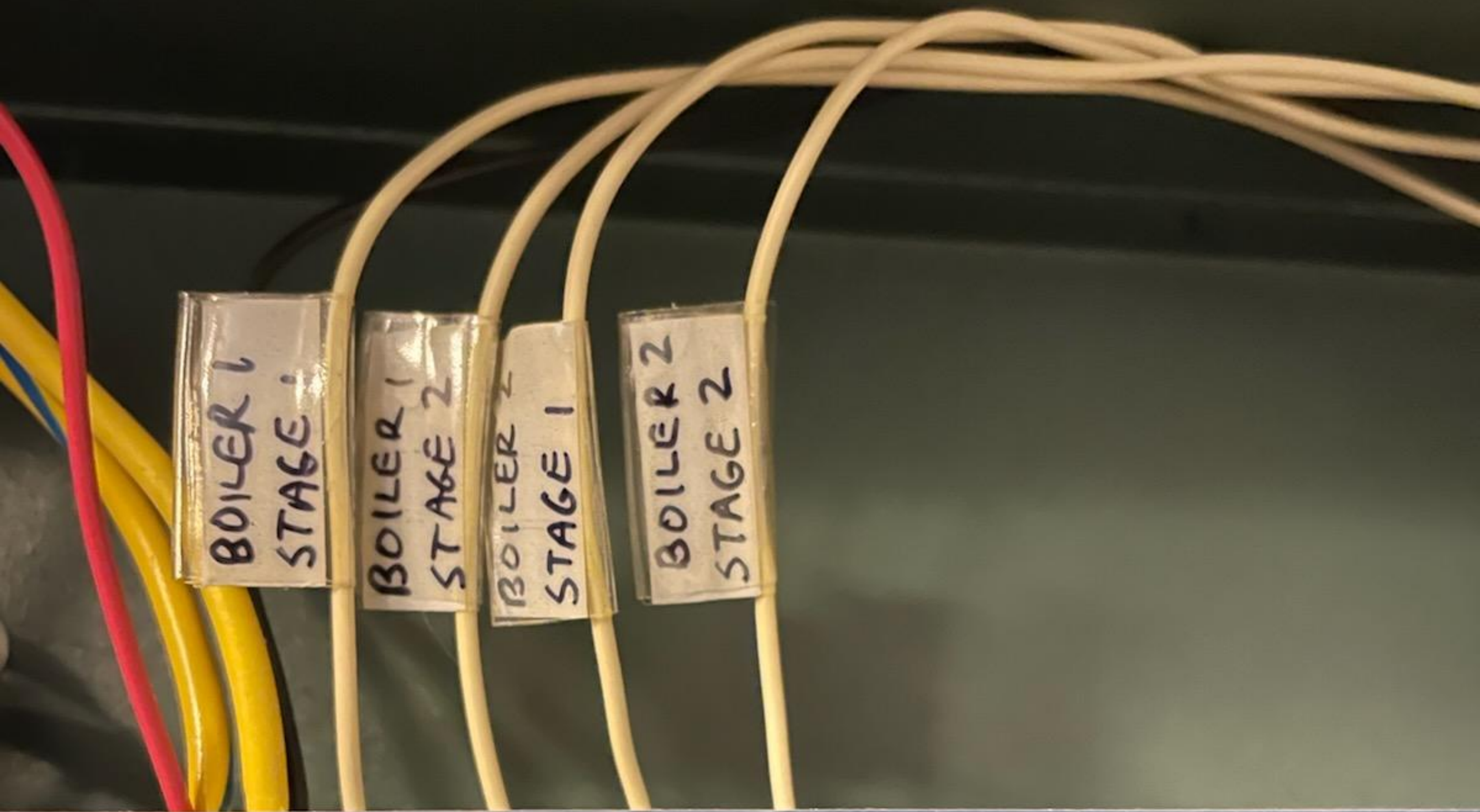
EXHIBIT D





FOR SUPPLY CONNECTIONS
USE WIRE SIZES ON THE
BASIS OF 60°C AMPACITY.
RHS RATED 60°C (141°F)

PREVENT ELECTRIC SHOCK
DISCONNECT ALL SUPPLY CONNECTIONS
BEFORE WORKING ON THIS APPLIANCE
HAS UP TO FIVE



18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3
24VAC/DC	24V COM	U01	COM	U02	COM	U03	COM	U04	COM	U05	COM	U06	COM	U07	COM

ECL-350

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
COM	UI2	UI3	COM	UI4	UI5	COM	UI6	UI7	COM	UI8	UI9	COM	UI10	15VDC	LOM1	LOM2	SUBN PORT





5. PRICING PROPOSAL

BAS UPGRADE (OPTION A)

Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total
1	BAS Upgrade in accordance with Specifications	1	LS		
2	Alternate A1 - VFD Replacement	2	Each		
TOTAL					

BAS IMPROVEMENT (OPTION B)

Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total
1	BAS Improvement in accordance with Specifications	1	LS		
2	Alternate B1 - VFD Replacement	2	Each		
TOTAL					

6. EVALUATION CRITERIA

No.	Evaluation Criteria	Scoring Method	Weight (Points)
1.	Respondents Business Qualifications	0-5 Points	40 <i>(40% of Total)</i>
2.	Respondents Employee Qualifications	0-5 Points	20 <i>(20% of Total)</i>
3.	Performance History	0-5 Points	30 <i>(30% of Total)</i>
4.	Project Management Experience	0-5 Points	10 <i>(10% of Total)</i>

7. INSURANCE REQUIREMENTS

7.1. Insurance - (\$250,000 - \$499,999.99)

Prior to the commencement of work governed by any contract between the CITY and any Third Party, the Third Party shall provide the CITY satisfactory evidence of insurance coverage via a valid Certificate of Insurance showing coverage provided by a carrier who has no less than an A- VIII rating with AM Best's Rating. The Certificate must list the CITY, its employees, and officials as additional named insured's. The Certificate must also list coverage as primary and non-contributory, include a waiver of subrogation, and include a thirty (30) days cancellation notice.

All coverage, as follows shall be maintained through the life of the contract and include, as a minimum:

- A. General Liability – \$2,000,000 per occurrence/\$4,000,000 aggregate Bodily Injury and Property Damage
- B. Products & Completed – \$2,000,000
- C. Worker's Compensation – \$1,000,000 Each Accident/\$1,000,000 Disease-Each Employee/\$1,000,000 Disease-Policy Limit
- D. Automobile Liability – \$2,000,000 with \$5,000 medical payments
- E. Umbrella/Excess Liability – \$5,000,000
- F. Errors & Omissions – \$2,000,000
 - 1. Required for contracts with Consultants for Professional Services
- G. Crime & Theft Coverage – \$2,000,000
 - 1. Required when Third Party will have access to City property

7.2. General Insurance Requirements for Contractors/Bids

Prior to the commencement of work governed by any contract between the CITY and the Contractor/contractor, the contractor shall provide the CITY satisfactory evidence of insurance coverage. A Certificate of Insurance AND any contract stating the CITY, its employees and officials as additional named insured's will be required and will also denote the description of the job. The Contractor's/contractor's insurance shall be primary and non-contributory.

All insurance coverage should be placed with a solid carrier who has no less than an A- VIII Best's Rating. The Contractor's program shall hold the CITY, its employees and officials harmless from and against all loss, cost, expense, damage, liability or claims, whether groundless or not, arising out of the bodily injury, sickness or disease (including death resulting at any time therefrom).

All coverage, as follows shall be maintained through the life of the contract and include, as a minimum:

- A. General Liability - \$4,000,000 Bodily Injury and Property Damage (Combined Single Limit) with \$2,000,000 GL annual aggregate and will include:

1. Medical payments - \$5,000
 2. Premises Operations
 3. Products and Completed Operations
 4. Blanket Contractual Liability
 5. Personal Injury Liability
 6. Expanded Definition of Property Damage
- B. Workers' Compensation and Employer's Liability –
1. \$500,000 Bodily Injury by Accident
 2. \$500,000 Bodily Injury by Disease, policy limits
 3. \$500,000 Bodily Injury by Disease, each employee
- C. Automobile Liability - \$1,000,000 Bodily Injury and Property Damage (CSL)
(Owned, Non-owned and Hired vehicles should be included) and include \$10,000 medical pay per passenger.
- D. Umbrella Liability Coverage - \$3,000,000 each occurrence, \$3,000,000 aggregate. (These limits will be excess over all underlying coverage documents and would be the minimum required). Increased limits may be required on "larger contracts" and would be at the discretion, and approval of the, CITY'S legal counsel.

All Liability (General Liability/Auto) insurance certificates should include a "blanket additional insured" endorsement, must specify that should described policies be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions.

8. TERMS AND CONDITIONS

8.1. Security

The offeror represents and warrants to the City of Bloomington that neither it nor any of its principals, shareholders, members, partners, or affiliates, as applicable, is a person or entity named as a Specially Designated National and Blocked Person (as defined in Presidential Executive Order 13224) and that it is not acting, directly or indirectly, for or on behalf of a Specially Designated National and Blocked Person. The offeror further represents and warrants to the City of Bloomington that the offeror and its principals, shareholders, members, partners or affiliates, as applicable, are not directly or indirectly engaged in, and are not facilitating, the transactions contemplated by this Agreement on behalf of any person or entity named as Specially Designated National and Blocked Person. The offeror hereby agrees to defend, indemnify, and hold harmless the City of Bloomington and all City of Bloomington elected or appointed officials, officers, employees, agents, representatives, engineers and attorneys, from and against any and all claims, damages, losses, risks, liabilities, and expenses including reasonable attorney's fees and costs arising from or related to any breach of the foregoing representation and warranties.

8.2. No Proposal

Bidders/Consultants who are not able to submit a bid for this service, but wish to receive bid tabulation should "Follow" the project to receive automated notifications pertaining to this solicitation.

8.3. Delivery

F.O.B. Bloomington, IL FREIGHT PREPAID.

Delivery will be considered in making the award and the Bidders/Consultants/Offerors shall state, in the spaces provided, expected delivery after receipt of Purchase Order. Failure to meet said delivery promises without prior consent of the City Procurement Manager may be considered a breach of faith.

8.4. Local Preference Policy

The City of Bloomington has adopted a Local Preference Purchasing Policy that is applicable in the City's competitive bidding processes, except in situations where external funding sources do not permit local preference purchasing allowances, in situations where the goods or services being purchased are available through a cooperative purchasing program, or where waived by the City. Bidders should complete the Local Preference Purchasing Policy Certificate if bidder qualifies as a local bidder under the Policy. The Policy is in place to address, in part, responsiveness and related concerns of the City.

8.5. Prevailing Wage

The State of Illinois requires under public works contracts that the general prevailing rate of wages in this locality be paid for each craft or type of worker hereunder. This requirement is in accordance with the Prevailing Wage Act (820 ILCS 130) as amended. This shall include payment of the general prevailing rate for legal holiday and overtime work. It shall be mandatory upon the subcontractor under the Contractor. A copy of the most current monthly prevailing wage rates by County is posted on the Illinois Department of Labor website at <https://www.illinois.gov/idol/Laws-Rules/CONMED/Pages/2016->

Rates.aspx. This also acknowledges Public Act 100-1177 effective June 1, 2019. Note that the Prevailing Wage rates change monthly and it is the Contractor's responsibility to ensure the correct wage is paid.

As a prerequisite of awarding construction contracts in excess of \$100,000.00, contractor(s) will provide proof of participation in apprenticeship and training programs approved and registered with the United States Department of Labor's Bureau of Apprenticeship and Training.

8.6. Certified Payroll Requirements (Public Act 94-0515)

Effective August 10, 2005, contractors and subcontractors on public works projects must submit certified payroll records on a monthly basis to the public body in charge of the construction project along with a statement affirming that such records are true and accurate, that the wages paid to each worker are not less than the required prevailing rate for that County and that the contractor is aware that filing records he or she knows to be false is a Class B misdemeanor.

The certified payroll records must include for every worker employed on the public works project, the name, address, telephone number, social security number, job classification, hourly wages paid in each period, number of hours worked each day, and starting and ending time of each work day. These certified payroll records are considered public records and public bodies must make these records available to the public under the Freedom of Information Act, with the exception of the employee's address, telephone number and social security number. Any contractor who fails to submit a certified payroll or knowingly files a false certified payroll is guilty of a Class B misdemeanor.

8.7. Substance Abuse Prevention on Public Works Projects Act

The successful proposer must be in compliance with the State of Illinois HB-1855 (Public Act 095-0635), which amends the Prevailing Wage Act. Before an employer commences work on a public works project, the employer shall have in place a written program, which meets or exceeds the program requirements in this Act, to be filed with the public body engaged in the construction of the public works and made available to the general public, for the prevention of substance abuse among its employees. The testing must be performed in a laboratory that is certified for Federal Workplace Drug Testing Programs by the Substance Abuse and Mental Health Service Administration of the U.S. Department of Health and Human Services.

8.8. Proposal Evaluation

Products/Services will be purchased from the offeror providing the best proposal per product/service or total package, whichever is in the best interest of the City. The quality of the products/services, conformity with the specifications, suitability to the requirements, delivery terms including length of time for delivery, qualifications and references will be taken into consideration in making an award.

8.9. OSHA Requirements

The Occupational Safety and Health Act of 1970 (OSHA), "guarantees workers the right to a safe and healthful workplace." Under Section 5(a) (1) of the OSHA Act, the employer must "furnish to each of his employees' employment and place of employment which are free from recognized hazards that are causing or likely to cause death or serious physical harm to its employees."

There are times when the City must hire entities and individuals (contractors) to perform services. To this end, contractors hired by the City must perform their duties in a manner that is compliant with all State and Federal health and safety laws and industry guidelines. It is the responsibility of the contractor to ensure that their personnel and subcontractors comply with all State and Federal health and safety laws, regulations and industry guidelines, including, but not limited to those set forth by: OSHA and related regulations, the Safety Inspection and Education Act, the Health and Safety Act, the National Institute of Occupational Safety and Health, the National Fire Protection Association, the Centers for Disease Control, American Industrial Hygiene Association, the American Council of Governmental Industrial Hygienists, the Environmental Protection Agency and the Department of Transportation.

8.10. Proposal Price

Please quote your best net price including delivery and discounts to meet the approval of the City. Prices shall be stated in units of quantity specified. No additional charges shall be passed to the City, including any applicable taxes, delivery or surcharges. Prices quoted shall be the final cost to the City. In case of error in the extension of prices, the unit price shall govern.

8.11. Payment Terms

If payment terms are not indicated, terms of NET 45 days shall be applied by the City. Payment terms to apply after receipt of invoice or final acceptance of the products/services, whichever is later. Payment terms offering less than 20 days for payment will not be considered. Please note: the City of Bloomington offers Electronic Funds Transfers (EFTs) for offerors receiving multiple payments.

8.12. Investigation

Offeror's must acquaint themselves with the policies of the City, and may do so by contacting the Procurement Manager. All questions as to the meaning of the scope of work must be resolved prior to the proposal submission deadline. It is the Offeror's responsibility to check with the City's e-Procurement Portal prior to submitting their proposal to ensure that they have received all Addenda that may be issued.

8.13. Proof of License, Permit, Etc.

Offerors must provide proof of conformance with any applicable Federal/State/Local permits, licenses, certifications, etc., as stated in the scope of work/specifications section. It is the Consultant's responsibility to inquire about requirements of performing the job with the requesting department contact person.

8.14. Criteria for Making Selection

Proposals may be evaluated based upon, but not limited to, criteria listed in the scope of work. These criteria shall be used by the City to determine the firm or individual(s) most qualified and best suited to perform the work. The Evaluation Committee may, in its sole discretion and in the course of its evaluation, arrange a site visit or request presentations or demonstrations with one or more selected offerors.

The City retains sole discretion to evaluate proposals and may make an award to the Contractor the City deems to have the most responsive proposal and is also in the best interest of the City. Receipt of

proposals in response to its RFP does not obligate the City in any way to engage any Contractor and the City reserves the right to reject any or all proposals, wholly or in part, at any time, without penalty. The City shall retain the right to abandon the proposal process at any time prior to the actual execution of a contract with a Contractor, and the City shall bear no financial or other responsibility in the event of such abandonment. The City reserves the right to negotiate any and all final terms and conditions including length, scope of services, and compensation of any agreements entered into.

8.15. Proposal Form

This entire package shall be returned complete and intact with all information requested and all questions answered. The amount of the proposal shall be stated on the form(s) provided. Variations from the specification/scope of work shall be noted on a separate sheet of paper. If more space is required to furnish a description of the service offered or delivery/start terms, the offeror may attach a letter hereto, which will be made a part of the proposal.

8.16. Public Requests and Request for Confidential Treatment

Proposals become the property of the City upon submittal. All proposals will be open to the public under the Illinois Freedom of Information Act (FOIA) (5 ILCS 140) and other applicable laws and rules, unless Proposer identifies in the proposal that certain parts of it contain proprietary information and are exempt from release under FOIA. A request for confidential treatment will not supersede the City's legal obligations under FOIA. The City will not honor requests to keep entire proposals confidential.

If Proposer requests confidential treatment of portions of its submission as proprietary information, Proposer must submit a separate, additional copy of the proposal with the requested proprietary information clearly marked. Proposer must submit the original and the marked confidential copy in order for the City to claim such an exemption under FOIA. As well, the proposer must state the listing of the provisions identified by section number for which it submits it is proprietary information and therefore seeks confidential treatment. Proposer will hold harmless and indemnify the City for all costs or damages associated with the City defending the Proposer's request of its proprietary information. Proposer agrees the City may copy the proposal to facilitate evaluation, or to respond to requests for public records. Proposer warrants that such copying will not violate the rights of Proposer or any third party.

8.17. Specifications

The Specification may, in some areas, be unique to a particular brand of product or type of service. If this situation exists, equal consideration will be given to all Offeror's whose items, in the opinion of the City, meets or exceeds performance in these areas.

8.18. Brand Name, Model, Scope of Work

All Offeror's shall include with their proposal brand names, models, catalog numbers, and complete information about the items they are offering. Manufacturer's Safety Data Sheets, MSDS, are required for all chemical Proposals.

8.19. Default By Offeror

In the event of default by offeror, the City reserves the right to procure the services from other sources, and hold the offeror liable for any excess costs occasioned thereby. Additionally, a contract shall not be assignable by the Offeror in whole or in part without the written consent of the City of Bloomington.

8.20. Performance Bond & Payment Bonds

The successful offeror will be required to provide Performance & Payment Bonds in the amount equal to 100% of the contract price, within ten (10) business days after the proposal award. The Performance Bond shall be duly authorized by an insurance company licensed to do business in the State of Illinois.

8.21. Cancellation

Failure to comply with the terms and conditions as herein stated shall be cause for cancellation of the contract. The City will give a written notice of unsatisfactory performance and the contractor or Contractor will be allowed thirty (30) days to take corrective action and accomplish satisfactory control. If at the end of the thirty (30) days, the City deems that the contractor or Contractor's/Vendor's performance is still unsatisfactory, the contract shall be canceled. The exercise of its right of cancellation shall not limit the City's right to seek any other remedies allowed by law.

8.22. Rejection of Bids, Waivers or Irregularity

The City of Bloomington reserves the right to reject any or all proposals, to waive irregularities, and to accept that proposal which is considered in the best interest of the City. Any such decision shall be final.

8.23. Protests

Any actual or prospective offeror/Contractor who is aggrieved in connection with this proposal or award may protest to the City Manager within ten (10) days of the award. The protest must be submitted in writing to the Office of the City Clerk immediately after such aggrieved person knows or should have known of the facts.

8.24. Indemnification

Contractor shall indemnify, defend with counsel approved by City, and hold harmless City, its officers, officials, employees and volunteers from and against all liability, loss, damage, expense, cost (including without limitation reasonable attorney's fees, expert fees and all other costs and fees of litigation) of every nature arising out of or in connection with Contractor's performance of work hereunder or its failure to comply with any of its obligations contained in this Agreement, regardless of City's passive negligence, but excepting such loss or damage which is caused by the sole active negligence or willful misconduct of the City. Should City in its sole discretion find Contractor's legal counsel unacceptable, then Contractor shall reimburse the City its costs of defense, including without limitation reasonable attorney's fees, expert fees and all other costs and fees of litigation. The Contractor shall promptly pay any final judgment rendered against the City (and its officers, officials, employees and volunteers) covered by this indemnity obligation. It is expressly understood and agreed that the foregoing provisions are intended to be as broad and inclusive as is permitted by the law of the State of Illinois and will survive termination of this Agreement.

9. VENDOR QUESTIONNAIRE

9.1. Authorized Person(s)*

By submitting a response to this solicitation, the bidder certifies that this Quote is made without prior understanding, agreement, or connection with any corporation, firm, or person submitting a quote for the same services, materials, supplies, or equipment, and is in all respect fair and without collusion and fraud. The bidder agrees to abide by all conditions of this quote and certifies that they are authorized to submit this quote.

*Response required

9.2. Payment Terms*

Please indicate whether you are or are not capable of accepting EFT payments. If yes, you may receive information later if this process will apply to you.

☐ Yes

☐ No

*Response required

9.3. Gift Ban Act*

By submitting a response to this solicitation, we certify that our organization, its officers, employees and agents, have not made any gifts to officers or employees of the City of Bloomington in violation of Illinois Compiled Statutes, 5 ILCS 430/Article 10, State Officers and Employees Ethics Act (commonly known as the "Gift Ban Act"). The Act is available online at:

<http://www.ilga.gov/legislation/ilcs/ilcs4.asp?DocName=000504300HArt%2E+10&ActID=2529&ChapterID=2&SeqStart=1700000&SeqEnd=2200000>.

We further certify that as a bidder, we have not violated the Bloomington City Code Chapter 2, Administration; Article I, Section 8: Officers and Employees Generally: Section 8a Prohibition on the Solicitation and Acceptance of Gifts; and 8b State Officials and Employees Ethics Act. This section of the Bloomington City Code is available online at <https://www.cityblm.org/government/codes-ordinances>.

☐ Please confirm

*Response required

9.4. Vendor Compliance with Public Act 85-1295*

The vendor certifies by signing this statement that this bid is made without prior understanding, agreement or accord with any other person submitting a bid for the same product or service and that this bid is in all respects bona fide, fair and not the result of any act of fraud or collusion with another person engaged in the same line of business or commerce. Furthermore, the firm certifies that it is not barred from bidding on this contract as a result of a conviction for the violation of State laws prohibiting bid-rigging or bid-rotating. Any false statement hereunder constitutes a felony and can result in a fine

and imprisonment as well as civil damages. The vendor also understands that failure to sign this statement will make the bid non-responsive and unqualified for award.

☐ Please confirm

*Response required

9.5. [Insurance*](#)

Vendors providing a service or installing equipment on or about City property shall provide to the City Clerk evidence of Comprehensive, Liability, and Workman's Compensation insurance prior to commencement of work on City property. The vendor guarantees to save the City, its agents or employees, harmless from liability of any nature or kind, for use of any copyright, composition, secret process, patented or unpatented invention, articles or appliances furnished or used in the performance of the contract, or which the vendor is not the patentee, assignee, or licensee.

Furthermore, the vendor hereby agrees to save and hold harmless and indemnify the City from and against all injury, death, damage, loss, claims and liability caused by or arising out of the performance of this agreement by the Vendor, its employees, agents or sub-vendors. This agreement extends to all claims, of any nature, whether made by the Vendor's employees or third parties.

☐ Please confirm

*Response required

9.6. [Certificate of Insurance*](#)

Please upload a copy of your Certificate of Insurance.

*Response required

9.7. [Non-Discrimination*](#)

The City of Bloomington requires all Vendors doing business with the City not to discriminate against anyone on the basis of race, age, color, religion, gender, ancestry, national origin, marital status, mental or physical disability unrelated to ability, familial status or sexual orientation.

Vendors shall comply with the Illinois Human Rights Act, 775 ILCS 5/101 et seq., as amended and any rules and regulations promulgated in accordance therewith, including, but not limited to the Equal Employment Opportunity Clause, Illinois Administrative Code, Title 44, Part 750 (Appendix A), 775 ILCS 5/1-102 and constituting of a written EEO policy and a workforce profile that demonstrates its EEO practices. Furthermore, the Vendor or Vendors shall comply with the Public Works Employment Discrimination Act, 775 ILCS 10/0.01 et seq., as amended. The Vendor or Vendors must have a written sexual harassment policy, which meets Illinois Compiled State Statutes, 775 ILCS, 15/3.

☐ Please confirm

*Response required

9.8. Equal Opportunity Guidelines*

The City requires all Vendors doing business with the City not to discriminate against anyone on the basis of race, age, color, religion, gender, sexual orientation, ancestry, national origin, and non-job-related disabilities. This program was approved by the City Council on May 27, 1974. In accordance with this program, the City shall require that the Vendor or Vendors be familiar and comply in every respect with the provisions of this program. Information regarding the program may be obtained by contacting the Human Relations Department 309-434-2218.

☐ Please confirm

*Response required

9.9. Local Preference Purchasing Policy Certification*

The City of Bloomington has adopted a local preference purchasing policy. Under the terms of the policy local Consultants may be granted a pre-determined preference in competitive bidding situations. Bids from qualified local Consultants may receive the following adjustment to the submitted bid:

- A. 5% up to a maximum of \$2,500 on bids of \$10,000 up to \$50,000;
- B. 4% up to a maximum of \$10,000 on bids of up to \$250,000;
- C. 3% up to a maximum of \$30,000 on bids of up to \$1,000,000; and
- D. \$50,000 on bids of over \$1,000,000.

For purposes of comparison and consideration in awarding contracts the preferential discount will be applied to the low bid of all qualified local Consultants when determining the lowest responsible bid. The City Council reserves the right to waive or amend the local preference purchasing policy in connection with any bid, when it deems it in the best interest of the citizens of Bloomington.

A Local Consultant is defined as any business that meets all of the following criteria:

- A. The business has established and maintained a physical presence within the County of McLean, via the ownership or lease of a building or a portion of a building for a period of not less than 12 consecutive months; and
- B. The business employs a minimum of two full time employees at the McLean County location and those employees spend the majority of their work day and work week at the McLean County location; and
- C. The business is legally authorized to conduct business within the State of Illinois and the County of McLean.

The undersigned hereby certifies to the City of Bloomington that it is a Local Consultant as defined above and qualifies for the Local Consultant Preference pursuant to the City of Bloomington Local Preference Purchasing Policy.

☐ Please confirm

*Response required

9.10. References*

Please provide a minimum of three (3) references to include the following for each reference:

Company Name

Contact Person

Address

Telephone Number

Email

Scope of work performed

*Response required

9.11. Proposal Form*

Bid 2023-11

Police Department Administration Building Automation System Improvements

By submitting a response to this solicitation, the proposer agrees to contract with the City of Bloomington to provide all necessary services, labor, supervision, machinery, tools, apparatus, documents and any other means to do all the work and furnish all the materials specified in the proposal in the manner and time therein as set forth by the proposer and that the proposer will take in full payment the amount set forth hereon. The cost of all labor, material and equipment necessary for the completion of the proposed work, even though not shown or specified, shall be included in the total price for the various items shown herein.

We further agree to complete all of the above work in a complete, neat, and workmanlike manner. Payment of prevailing wage rates as predetermined by the Bloomington City Council pursuant to the Prevailing Wage Ordinance 2018-34 is acknowledged including Public Act 100-1177 effective June 1, 2019. The proposer certifies by signature below that it has not been barred from contracting with a unit of State or Local government in the State of Illinois as a result of a violation of Section 33E-3 or 33E-4 of the Criminal Code of 1961, as amended.

☐ Please confirm

*Response required

9.12. Apprenticeship Training*

If bid is in excess of \$100,000.00, contractor(s) will provide, with their bid submission, proof of participation in apprenticeship and training programs approved and registered with the United States Department of Labor's Bureau of Apprenticeship and Training.

☐ Please confirm

*Response required

9.13. Apprenticeship Training Documentation*

Please provide your Apprenticeship Training Documentation.

*Response required

9.14. Prevailing Wage*

By submitting a response to this solicitation the vendor has read, understands and agrees to the requirements of Prevailing Wage as provided for in this solicitation.

☐ Please confirm

*Response required

9.15. Minority Owned, Women Owned, Veteran Owned, Small Business Certifi*

Please select the categories that pertain to your organization. Select all that apply.

Select all that apply

☐ Minority Owned Business

☐ Women Owned Business

☐ Veteran Owned Business

☐ Small Business Enterprise

☐ None of the Above Apply

*Response required

9.16. Subcontractor - Category Information*

By submitting a response to this solicitation, the authorized person(s) agrees to provide category information for the subcontractors utilized if they are the selected vendor on this project.

☐ Please confirm

*Response required

9.17. Other Documentation

Please upload any additional required certificates, permits, etc. pertaining to this solicitation as a single PDF file.

9.18. Equal Opportunity Plan

9.18.1. Equal Employment Opportunity*

In the event of the bidder's non-compliance with the provisions of this Equal Opportunity Clause, the Illinois Human Rights Act or the Rules and Regulations of the Illinois Department of Human Rights ("Department"), or the City of Bloomington's Contract Compliance Program, the bidder may be declared

ineligible for future contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations, including the City of Bloomington, and the contract may be canceled or voided in whole or in part, and such other sanctions or penalties may be imposed or remedies invoked as provided by statute, ordinance or regulation. During the performance of this contract, the bidder agrees as follows:

- A. That it will not discriminate against any employee or applicant for employment because of race, color, religion, gender, sexual orientation, marital status, national origin or ancestry, age, physical or mental disability unrelated to ability, or an unfavorable discharge from military service; and further that it will examine all job classifications to determine if minority persons or women are underutilized and will take appropriate affirmative action to rectify any such underutilization.
- B. That, if it hires additional employees in order to perform this bidder any portion thereof, it will determine the availability (in accordance with the Department's Rules and Regulations or those of the Human Relations Commission) of minorities and women in the area(s) from which it may reasonably recruit and it will hire for each job classification for which employees are hired in such a way that minorities and women are not underutilized.
- C. That, in all solicitations or advertisements for employees placed by it or on its behalf, it will state that all applicants will be afforded equal opportunity without discrimination because of race, color, religion, gender, sexual orientation, marital status, national origin or ancestry, age, physical or mental disability unrelated to ability, familial status, or an unfavorable discharge from military service.
- D. That it will send to each labor organization or representative of workers with which it has or is bound by a collective bargaining or other agreement or understanding, a notice advising such labor organization or representative of the bidder's obligations under the Illinois Human Rights Act and the Department's Rules and Regulations. If any such labor organization or representative fails or refuses to cooperate with the bidder in its efforts to comply with such Act and Rules and Regulations, the bidder will promptly so notify the Department and Human Relations Commission and the contracting agency and will recruit employees from other sources when necessary to fulfill its obligations thereunder.
- E. That it will submit reports as required by the Department's Rules and Regulations and Human Relations Commission, furnish all relevant information as may from time to time be requested by the Department or the contracting agency, and in all respects comply with the Illinois Human Rights Act and the Department's Rules and Regulations and those of the City of Bloomington's Contract Compliance Program.
- F. That it will permit access to all relevant books, records, accounts and work sites by personnel of the contracting agency and the Department for purposes of investigation to ascertain compliance with the Illinois Human Rights Act and the Department's Rules and Regulations and those of the City of Bloomington's Contract Compliance Program.

- G. That it will include verbatim or by reference the provisions of this clause in every subcontract it awards under which any portion of the contract obligations are undertaken or assumed, so that such provisions will be binding upon such subbidder. In the same manner as with other provisions of this contract, the bidder will be liable for compliance with applicable provisions of this clause by such subbidders; and further it will promptly notify the contracting agency, the Department and the Human Relations Commission in the event any subbidder fails or refuses to comply therewith. In addition, the bidder will not utilize any subbidder declared by the Illinois Human Rights Commission or Human Relation Commission to be ineligible for contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations including the City of Bloomington.

Failure to properly complete questions pertaining to the Equal Opportunity Plan as required as part of the submission with bid or proposal will result in your submission not being considered responsive and result in the denial of eligibility to bid or do business with the City of Bloomington for this project/services/goods. A copy of the Equal Opportunity plan for your firm should be included with this response.

☐ Please confirm

*Response required

9.18.2. Business Classification*

Please select one of the following:

☐ Corporation

☐ Partnership

☐ Individual Proprietorship

☐ Limited Liability Corporation

*Response required

9.18.3. Principal Office*

Provide the following information for your Company's principal office:

Name

Address

City, State, Zip

Major Activity of your company (product or service)

*Response required

9.18.4. EEO Policies and Practices - 1*

Is it the Company's policy to recruit, hire, train, upgrade, and discipline persons without regard to race, sex, color, religion, national origin, age, mental and/or physical disability, and sexual orientation?

☐ Yes

☐ No

*Response required

9.18.5. EEO Policies and Practices - 2*

Has someone been assigned to develop procedures, which will assure that the EO policy is implemented and enforced by managerial, administrative, and supervisory personnel? If so, please indicate the name and title of the charged with this responsibility. If not, please type "N/A".

*Response required

9.18.6. EEO Policies and Practices - 3*

Has the Company developed a written Equal Opportunity Plan? Note: A copy of the Equal Opportunity Plan must be submitted with this form in order to be considered eligible to do business with the /city of Bloomington. If you would need technical assistance in developing your plan, please contact the Community Relations Office at: (309) 434-2215.

*Response required

9.18.7. EEO Policies and Practices - 4*

Has the Company developed a written policy statement prohibiting Sexual Harassment? Please attach a copy of the policy statement.

*Response required

9.18.8. EEO Policies and Practices - 5*

Have all recruitment sources been notified that the Company will consider all qualified applicants without regard to race, color, age, sex, national origin, religion, mental and/or physical disability, or sexual orientation?

☐ Yes

☐ No

*Response required

9.18.9. EEO Policies and Practices - 6*

If advertising is used, does it specify that all qualified applicants will be considered for employment without regard to race, color, age, sex, national origin, religion, mental and/or physical disability, or sexual orientation?

☐ Yes

☐ No

*Response required

9.18.10. EEO Policies and Practices - 7*

Has the bidder notified all of its sub-bidders of their obligations to comply with the Equal Opportunity requirements either in writing, by inclusion in subbidders or purchase orders?

☐ Yes

☐ No

*Response required

9.18.11. EEO Policies and Practices - 8*

Is the Company a state certified minority/female owned business? If yes, please attach a copy of the state certification. If not, please provide a document stating that your company is not a state certified minority/female owned business.

*Response required

9.18.12. EEO Policies and Practices - 9*

Does the Company have collective bargaining agreements with labor organizations?

☐ Yes

☐ No

*Response required

9.18.13. EEO Policies and Practices - 10*

Has the labor organization been notified of the Company's responsibility to comply with the Equal Employment Opportunity requirements in all contracts by the City of Bloomington?

☐ Yes

☐ No

*Response required

9.18.14. Employment Information*

Identify the geographical area(s) from which the company may reasonably recruit employees (use city, county, SMSA, or distance in miles from your company location).

*Response required

9.18.15. Under-Utilized Workforce*

If minorities and women are currently under-utilized in your workforce, please attach a copy of an explanation for your plan to recruit and hire minorities and women. If this does not pertain to your organization, please provide documentation stating that.

*Response required

9.18.16. Workforce Analysis Form*

Please download the below documents, complete, and upload.

- [Workforce Analysis Form.pdf](#)

*Response required

9.18.17. Certification*

The Company certifies that it has answered all of the foregoing questions truthfully to the best of its knowledge and belief. The Company also agrees that it will comply and abide by the City of Bloomington's Contract Compliance Ordinance and the City of Bloomington Human Relations Ordinance.

☐ Please confirm

*Response required



CONSENT AGENDA ITEM NO. 7.E

FOR COUNCIL: November 14, 2022

WARD IMPACTED: City-Wide Impact

SUBJECT: Consideration and action to approve the 2022 Supportive Housing and Continuum of Care Grant Agreement (IL1772L5T122100) in the amount of \$56,700 with the United States Department of Housing and Urban Development, as requested by the Economic & Community Development Department.

RECOMMENDED MOTION: The proposed Agreement be approved.

STRATEGIC PLAN LINK:

Goal 5. Great Place - Livable, Sustainable City

STRATEGIC PLAN SIGNIFICANCE:

Objective 5a. Well-planned City with necessary services and infrastructure

BACKGROUND: The City has served as the fiscal agent for the McLean County Continuum of Care for more than a decade. In this role, the Community Enhancement Division undertakes fiscal monitoring and oversight of the City's Continuum of Care grants. Providing Access to Help (PATH) serves as the lead agency for the Continuum of Care (CoC), thus overseeing the general management of the Continuum. The United States Department of Housing and Urban Development (HUD) provides competitive grant funds to support the work of the Continuum of Care and its program partners through a variety of grant opportunities. On behalf of the City, PATH applied to HUD for four grant funding opportunities in 2022. This is the final Continuum of Care grant that is before Council for consideration in this cycle.

IL1772L5T122100 (CoC Planning): This grant provides funding for Continuum of Care planning activities for the entire continuum. After discussions with program partners, there was agreement that this grant would be better suited for PATH in their role as the lead applicant. However, since the grant was awarded to the City, the agreement will need to be executed before a transfer to PATH can occur. The City has executed this transfer in the past, and PATH will apply for the funds directly moving forward.

COMMUNITY GROUPS/INTERESTED PERSONS CONTACTED: Providing Access to Help (PATH) ; U.S. Department of Housing and Urban Development.

FINANCIAL IMPACT: There is no impact on the general fund. Grant revenues equal expenses for a net zero balance. The City receives no administrative funds through this grant opportunity.

AMERICAN RESCUE PLAN FUNDING IMPACT: N/A

COMMUNITY DEVELOPMENT IMPACT: This request meets the following goals and objectives of the Bloomington Comprehensive Plan 2035: Goals CWB-1: End chronic homelessness and reduce the severity of situational homelessness and CWB-1.1b: Continue

to increase focus on prevention of homeless by making funds available that would alleviate the need for emergency shelter for families and individuals with income $\leq 80\%$ of AMI (Area Median Income).

Respectfully submitted for consideration.

Prepared by: William Bessler, Grant Coordinator

ATTACHMENTS:

[E&CD 1B Agreement IL1772L5T122100 - City of Bloomington Planning 10242022](#)



U.S. Department of Housing and Urban Development
Office of Community Planning and Development
77 W. Jackson Blvd.
Chicago, IL 60604

Grant Number: IL1772L5T122100

Tax ID Number: 37-6001563

Unique Entity Identifier [SAM]: KYUDEBKLLFW5

CONTINUUM OF CARE PROGRAM (CDFA# 14.267) GRANT AGREEMENT

This Grant Agreement (“this Agreement”) is made by and between the United States Department of Housing and Urban Development (“HUD”) and City of Bloomington (the “Recipient”).

This Agreement, the use of funds provided under this Agreement (the “Grant” or “Grant Funds”), and the operation of projects assisted with Grant Funds are governed by

1. title IV of the McKinney-Vento Homeless Assistance Act 42 U.S.C. 11301 et seq. (the “Act”);
2. the Continuum of Care Program rule at 24 CFR part 578 (the “Rule”), as amended from time to time;
3. and the Notice of Funding Opportunity for the fiscal year in which the funds were awarded.

The terms “Grant” or “Grant Funds” mean the funds that are provided under this Agreement. The term “Application” means the application submissions on the basis of which the Grant was approved by HUD, including the certifications, assurances, technical submission documents, and any information or documentation required to meet any grant award condition. Capitalized terms that are not defined in this agreement shall have the meanings given in the Rule.

The Application is incorporated herein as part of this Agreement, except that only the project (those projects) listed below are funded by this Agreement. In the event of any conflict between any application provision and any provision contained in this Agreement, this Agreement shall control.

HUD’s total funding obligation authorized by this grant agreement is \$56,700, allocated between the project(s) listed below (each identified by a separate grant number) and, within those projects, between budget line items, as shown below. The Grant Funds an individual project will receive are as shown in the Application on the final HUD-approved Summary Budget for the project. Recipient shall use the Grant Funds provided for the projects listed below, during the budget period(s) period stated below.

Grant No.	Grant Term	Performance Period	Budget Period	Total Amount
IL1772L5T122100		10/01/2022 - 9/30/2023	10/01/2022 - 9/30/2023	\$56,700
a. Continuum of Care planning activities				\$56,700
b. Acquisition				\$0
c. Rehabilitation				\$0
d. New construction				\$0
e. Leasing				\$0
f. Rental assistance				\$0
g. Supportive services				\$0
h. Operating costs				\$0
i. Homeless Management Information System				\$0
j. Administrative costs				\$0
k. Relocation Costs				\$0
l. HPC homelessness prevention activities:				
Housing relocation and stabilization services				\$0
Short-term and medium-term rental assistance				\$ 0

Pre-award Costs for Continuum of Care Planning

The Recipient may, at its own risk, incur pre-award costs for continuum of care planning awards, after the date of the HUD selection notice and prior to the effective date of this Agreement, if such costs: a) are consistent with 2 CFR 200.458; and b) would be allowable as a post-award cost; and c) do not exceed 10 percent of the total funds obligated to this award. The incurrence of pre-award costs in anticipation of an award imposes no obligation on HUD either to make the award, or to increase the amount of the approved budget, if the award is made for less than the amount anticipated and is inadequate to cover the pre-award costs incurred.

These provisions apply to all Recipients:

If any new projects funded under this Agreement are for project-based rental assistance for a term of fifteen (15) years, the funding provided under this Agreement is for the performance period stated herein only. Additional funding is subject to the availability of annual appropriations.

The budget period and performance period of renewal projects funded by this Agreement will begin immediately at the end of the budget period and performance period of the grant being renewed. Eligible costs incurred between the end of Recipient's budget period and performance period under the grant being renewed and the date this Agreement is executed by both parties may be reimbursed with Grants Funds from this Agreement. No Grant Funds for renewal projects may be drawn down by Recipient before the end date of the project's budget period and performance period under the grant that has been renewed.

For any transition project funded under this Agreement the budget period and performance period of the transition project(s) will begin immediately at the end of the Recipient's final operating year under the grant being transitioned. Eligible costs, as defined by the Act and the Rule incurred between the end of Recipient's final operating year under the grant being transitioned and the execution of this Agreement may be paid with funds from the first operating year of this Agreement.

HUD designations of Continuums of Care as High-performing Communities (HPCS) are published in the HUD Exchange in the appropriate Fiscal Years' CoC Program Competition Funding Availability page. Notwithstanding anything to the contrary in the Application or this Agreement, Recipient may only use grant funds for HPC Homelessness Prevention Activities if the Continuum that designated the Recipient to apply for the grant was designated an HPC for the applicable fiscal year.

The Recipient must complete the attached "Indirect Cost Rate Schedule" and return it to HUD with this Agreement. The Recipient must provide HUD with a revised schedule when any change is made to the rate(s) included in the schedule. The schedule and any revisions HUD receives from the Recipient will be incorporated into and made part of this Agreement, provided that each rate included satisfies the applicable requirements under 2 CFR part 200 (including appendices).

This Agreement shall remain in effect until the earlier of 1) written agreement by the parties; 2) by HUD alone, acting under the authority of 24 CFR 578.107; 3) upon expiration of the budget period and performance period for all projects funded under this Agreement; or 4) upon the expiration of the period of availability of Grant Funds for all projects funded under this Agreement.

HUD notifications to the Recipient shall be to the address of the Recipient as stated in the Recipient's applicant profile in e-snaps. Recipient notifications to HUD shall be to the HUD Field Office executing the Agreement. No right, benefit, or advantage of the Recipient hereunder may be assigned without prior written approval of HUD.

The Agreement constitutes the entire agreement between the parties, and may be amended only in writing executed by HUD and the Recipient.

By signing below, Recipients that are states and units of local government certify that they are following a current HUD approved CHAS (Consolidated Plan).

This agreement is hereby executed on behalf of the parties as follows:

**UNITED STATES OF AMERICA,
Secretary of Housing and Urban Development**

By



(Signature)

Donald Kathan, Director

(Typed Name and Title)

September 8, 2022

(Date)

RECIPIENT

City of Bloomington

(Name of Organization)

By:

(Signature of Authorized Official)

Tim Gleason, City Manager

(Typed Name and Title of Authorized Official)

(Date)

Indirect Cost Schedule

Agency/Dept./Major Function	Indirect Cost Rate	Direct Cost Base

This schedule must include each indirect cost rate that will be used to calculate the Recipient's indirect costs under the grant. The schedule must also specify the type of direct cost base to which each included rate applies (for example, Modified Total Direct Costs (MTDC)). Do not include indirect cost rate information for subrecipients.

For government entities, enter each agency or department that will carry out activities under the grant, the indirect cost rate applicable to each department/agency (including if the de minimis rate is used per 2 CFR §200.414), and the type of direct cost base to which the rate will be applied.

For nonprofit organizations that use the Simplified Allocation Method for indirect costs or elects to use the de minimis rate of 10% of Modified Total Direct Costs in accordance with 2 CFR §200.414, enter the applicable indirect cost rate and type of direct cost base in the first row of the table.

For nonprofit organizations that use the Multiple Base Allocation Method, enter each major function of the organization for which a rate was developed and will be used under the grant, the indirect cost rate applicable to that major function, and the type of direct cost base to which the rate will be applied.

To learn more about the indirect cost requirements, see 24 CFR 578.63; 2 CFR part 200, subpart E; Appendix IV to Part 200 (for nonprofit organizations); and Appendix VII to Part 200 (for state and local governments).



CONSENT AGENDA ITEM NO. 7.F

FOR COUNCIL: November 14, 2022

WARD IMPACTED: City-Wide Impact

SUBJECT: Consideration and action on 1) an Ordinance Amending the Budget Ordinance for the Fiscal Year Ending April 30, 2023, to Utilize Fund Balance and Increase the Water Fund budget by \$540,800, and 2) an Ordinance Authorizing a Construction Agreement Between the City of Bloomington and Wm. Masters, Inc., for Fort Jesse Generator and Electrical Improvements (Bid # 2023-09), in the amount of \$1,540,800, as requested by the Public Works Department.

RECOMMENDED MOTION: The proposed Ordinances be approved.

STRATEGIC PLAN LINK:

Goal 2. Upgrade City Infrastructure and Facilities

STRATEGIC PLAN SIGNIFICANCE:

Objective 2d. Well-designed, well maintained City facilities emphasizing productivity and customer service

BACKGROUND: The Fort Jesse Pump station is located at 1513 Fort Jesse Road in Normal. The site includes two pump stations. Fort Jesse "A" was built in 1973, and Fort Jesse "B" was built in 1992. This facility is critical in maintaining water pressure and demand throughout the City and is designed with a generator that will run both stations during power outages. On average, generators have a life expectancy of 25 years. The Fort Jesse generator will reach 30 years in FY23.

While evaluating the electrical equipment at this site, it was discovered that when "B" was built, both shore and generator power were connected to "B" and then extended to "A," leaving one path of power. This creates an issue where "A" is dependent on "B" for power. If there were a catastrophic failure to the building or electrical system causing "B" to be inoperable, "A" would also be inoperable. In this situation, storage and critical valves would also be inoperable. The combination of inoperable components at this site during a catastrophic failure could cause pressure and water supply issues across the city.

The proposed construction project includes the installation of a new generator located outside the building, two new automatic transfer switches (one for each facility), conduit, wiring, and other electrical components needed to ensure both facilities are fully independent and operational on both utility and emergency backup power supplies. Note, Item 7.G. of the agenda recommends an agreement with Donoghue & Associates, Inc., for construction observation for this project.

The Public Works Department prepared the Fort Jesse Generator and Electrical improvements project proposal package and advertised the project for competitive bids. Bids for this contract were received until 10:00 AM on Wednesday, September 21, 2022,

electronically. Staff received two (2) bids and opened them at 10:01 AM Wednesday, September 21, 2022, by live stream on the City YouTube Website. Both bidders for this contract were local, so the local preference policy does not apply.

Wm. Masters is the lowest responsible bidder between the two bids. The full bid tabulation is attached. Staff recommend awarding the base bid and alternates 1 and 2 to Wm. Masters.

Contingency is included in the bid and shall be used for unforeseen issues which may arise during the project. This contingency shall be at the City's sole discretion and any amount not used during the project shall revert to the City and not be paid to the contractor.

COMMUNITY GROUPS/INTERESTED PERSONS CONTACTED: The Request for Bids was advertised in *The Pantagraph* and *OPENGOV* on August 31, 2022. A pre-bid meeting was held at 10:00am on September 8, 2022.

FINANCIAL IMPACT: If approved, the contract for \$1,540,800 which includes contingency will be paid out of the Water Mechanical Maintenance- Other Capital Improvement account (50100160-72620). The budgeted amount for this project was \$1,000,000, additional funds needed will be utilized from a budget amendment utilizing reserves (fund balance) from the Water Fund. Details on the budget amendment can be located on the attached "Exhibit."

AMERICAN RESCUE PLAN FUNDING IMPACT: N/A

COMMUNITY DEVELOPMENT IMPACT: This request meets the following goals and objectives of the Bloomington Comprehensive Plan 2035: Goal UEW-1.1. Maintain the existing City operated infrastructure in good condition. Objective UEW-1.5. Reliable water supply and distribution system that meets the needs of the current and future residents.

Respectfully submitted for consideration.

Prepared by: Aaron Kinder, Superintendent of Mechanical Maintenance

ATTACHMENTS:

[PW 1B Ordinance](#)

[PW 1C Agreement](#)

[PW 1D Bid Tabulation](#)

[PW 1E Procurement Document Bid #2023-09 Ft Jesse Generator & Electrical Improvements.pdf](#)

[PW 1F Ordinance - Water Fund Budget Amendment for the Fort Jesse Generator & Electrical Improvements Project.docx](#)

[PW 1G Exhibit-Water Fund Budget Amendment for the Fort Jesse Generator & Electrical Improvements Project.xlsx](#)

ORDINANCE NO. 2022 - ____

AN ORDINANCE AUTHORIZING A CONSTRUCTION AGREEMENT BETWEEN THE CITY OF BLOOMINGTON AND WM MASTERS, INC., FOR THE FORT JESSE GENERATOR AND ELECTRICAL IMPROVEMENTS (BID #2023-09), IN THE AMOUNT OF \$1,540,800.

WHEREAS, the City of Bloomington ("City") is a home rule unit of local government with authority to legislate in matters concerning its local government and affairs; and

WHEREAS, subject to the provisions of the City Code, City staff is recommending an Agreement with Wm Masters, Inc. (CONTRACTOR) be approved for the Fort Jesse Generator and Electrical Improvements (PROJECT) in the amount of \$1,540,800 and

WHEREAS, PROJECT consists of work necessary to replace the existing generator and ensure both facilities are fully independently and operational on utility and emergency backup power; and

WHEREAS, the City Council finds it in the best interest of the City to approve the contract.

NOW THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF BLOOMINGTON, ILLINOIS:

SECTION 1. The above recitals are incorporated herein by this reference as if specifically stated in full.

SECTION 2. The contract is approved and the City Manager, or designated representatives, are authorized to execute the Contract, and any other necessary documents to effectuate the purchase. The City Manager, or designee, is further authorized to approve any changes to the work utilizing the contingency amount set forth in the contract and within the contract amount, to the extent the City Manager finds such to be in the best interests of the City.

SECTION 3. In the event that any section, clause, provision, or part of this Ordinance shall be found and determined to be invalid by a court of competent jurisdiction, all valid parts that are severable from the invalid parts shall remain in full force and effect.

SECTION 4. The City Clerk is hereby authorized to publish this ordinance in pamphlet form as provided by law.

SECTION 5. This Ordinance is enacted pursuant to the authority granted to the City as a home rule unit by Article VII, Section 6 of the 1970 Illinois Constitution.

SECTION 6. This ordinance shall be effective immediately after its approval and publication as required by law.

PASSED this _14_ day of __November____ 2022.

APPROVED this ____ day of _____ 2022.

CITY OF BLOOMINGTON

ATTEST

Mboka Mwilambwe, Mayor

Leslie Smith-Yocum, City Clerk

CITY OF BLOOMINGTON AGREEMENT WITH
Wm. Masters, Inc.

FOR
Fort Jesse Generator and Electrical Improvements

THIS AGREEMENT, dated this 14 day of November, 2022, is between the City of Bloomington, IL (hereinafter "CITY") and Wm. Masters, Inc. (hereinafter "VENDOR"). CITY and VENDOR may hereinafter collectively be referred to as the "PARTIES" and individually as the "PARTY".

NOW THEREFORE, the PARTIES agree as follows:

Section 1. Recitals. The recitals set forth above are incorporated into this Section 1 as if specifically stated herein.

Section 2. Description of Services. VENDOR shall provide the services/work identified on Exhibit A, attached hereto and incorporated herein.

Section 3. Incorporation of Bid/RFP/RFQ & Proposal Terms. The following shall apply to this Agreement:

☐

This Agreement was not subject to a formal solicitation process by the CITY.

☒

This Agreement was subject to the following procurement initiative by the CITY:
Fort Jesse Generator and Electrical Improvements (Bid 2023-09) (hereinafter "REQUEST").
Accordingly, the provisions of the REQUEST and the proposal submitted by VENDOR (hereinafter collectively referred to as "PROCUREMENT DOCUMENTS" and attached hereto), shall be incorporated into this Agreement and made a part thereof and shall be considered additional contractual requirements that must be met by VENDOR. In the event of a direct conflict between the provisions of this Agreement and the incorporated PROCUREMENT DOCUMENTS, the provisions of this Agreement shall prevail.

☐

This Agreement was not subject to a formal solicitation process by the CITY, but includes the other required proposal/documents attached hereto in Exhibit C.

Section 4. Payment. For the work performed by VENDOR under this Agreement, the City shall pay VENDOR one of the following:

☐

A flat fee of \$ _____ as set forth in the Payment Terms attached as Exhibit B, attached hereto and incorporated herein.

☒

Fees as set forth in the Payment Terms attached as Exhibit B, attached hereto and incorporated herein not to exceed \$ 1,540,800.

Section 5. Requirement for Payment & Performance Bond. The following shall further apply to this Agreement:

☐

This Agreement does not require the furnishment of any bonds by the VENDOR.



This Agreement is subject to bonding requirements.

- i. It is therefore understood that the VENDOR will furnish, at no expense to the CITY, Payment and Performance Bonds to the CITY in the amount of the contract as stated in Section 4 executed by the VENDOR and at least two sureties as set forth under the Laws of the State of Illinois, as a guarantee that the VENDOR will timely and faithfully perform the work outlined herein.
- ii. Said bond shall be conditioned to save and keep harmless said CITY from any and all claims, demands, losses, suits, costs, expenses, and damages which may be brought, sustained, or recovered against said CITY by reason of any negligence, default, or failure of the said VENDOR in designing, building, constructing, or completing said improvement and its appurtenances, or any part thereof, and that said improvement when constructed shall be free from all defects and remain in good order and condition for one year from its completion and acceptance by the CITY, ordinary wear and tear, and damage resulting from accident or willful destruction excepted; which bond is attached hereto and made a part hereof.

Section 6. Default. Either PARTY shall be in default if it fails to perform all or any part of this Agreement. If either PARTY is in default, the other PARTY may terminate this contract upon giving written notice of such termination to the PARTY in default. Such notice shall be in writing and provided thirty (30) days prior to termination. The non-defaulting PARTY shall be entitled to all remedies as set forth in Section 9 herein, upon the default or violation of this Agreement.

Section 7. Termination for Cause. The CITY may, at any time, terminate this Agreement, in whole or in part, for any of the following reasons effective immediately:

- i. VENDOR is found to be in violation of any term or condition of this Agreement.
- ii. VENDOR engages in any fraudulent, felonious, grossly negligent, or other illegal acts or behavior.
- iii. VENDOR declares bankruptcy or becomes insolvent.
- iv. CITY determines, in its sole discretion, that VENDOR is no longer able to fulfill VENDOR's obligations under this Agreement or PROCUREMENT DOCUMENTS.

Upon such termination, CITY shall be entitled to all remedies laid out in Section 9, as well as reimbursement of reasonable attorney's fees and court costs.

Section 8. Force Majeure. The CITY shall not be in default of this Agreement and shall not be held liable for any losses, failure, or delay in performance of its obligations under this Agreement or any Agreement, Amendment, Exhibit, or Attachment hereto arising out of or caused, directly or indirectly, by an event of Force Majeure. Force Majeure is defined as circumstances beyond the CITY's reasonable control, including, without limitation, acts of God; earthquakes; fires; floods; wars; civil or military disturbances; acts of terrorism; sabotage; strikes; epidemics; pandemics; riots; power failures; computer failure and any such circumstances beyond its reasonable control as may cause interruption, loss or malfunction of utility, transportation, computer (hardware or software) or telephone communication service; accidents; labor disputes; acts of civil or military authority; governmental actions; or inability to obtain labor, material, equipment or transportation.

Section 9. Remedies. In the event of a default or a violation of this Agreement, the non-defaulting PARTY shall be entitled to all remedies, whether in law or equity.

Section 10. Indemnification. To the fullest extent permitted by law, VENDOR shall indemnify and hold harmless CITY, its officers, officials, agents, and employees from claims, demands, causes of action, and liabilities of every kind and nature whatsoever arising out of or in connection with VENDOR's operations performed under this Agreement, except for loss, damage, or expense arising from the sole gross negligence or willful misconduct of the CITY or the CITY's agents, servants, or independent VENDORS who are directly responsible to CITY. This indemnification shall extend to all claims occurring after this Agreement is terminated as well as while it is in force. The indemnity shall apply regardless of any concurrent negligence, whether active or passive, of the CITY or CITY's officers, officials, agents, employees, or any other persons or entities. The indemnity set forth in this section shall not be limited by insurance requirements or by any other provision of this Agreement.

Section 11. Reuse of Documents. All documents, including but not limited to, reports, drawings, specifications, and electronic media furnished by VENDOR pursuant to this Agreement are instruments of the VENDOR's services. Nothing herein, however, shall limit the CITY's right to use the documents for municipal purposes, including but not limited to the CITY's right to use documents in an unencumbered manner for purposes of remediation, remodeling, and/or construction. VENDOR further acknowledges any such documents may be subject to release under the Illinois Freedom of Information Act.

Section 12. Standard of Care. Services performed by VENDOR under this Agreement will be conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the same or similar profession currently practicing under the same or similar conditions.

Section 13. Representations of VENDOR. VENDOR hereby represents it is legally able to perform the work that is subject to the Agreement.

Section 14. Compliance with Local, State, and Federal Laws. VENDOR agrees that any and all work by VENDOR shall at all times comply with all laws, ordinances, statutes, and governmental rules, regulations and codes.

Section 15. Compliance with Prevailing Wage. The following shall apply to this Agreement:

- ☐ This Agreement is not for "public works" and therefore Prevailing Wage does not apply.
- ☒ This Agreement calls for the construction of "public works," within the meaning of the Illinois Prevailing Wage Act, 820 ILCS 130.01 et seq. (hereinafter "ACT"). The ACT requires contractors and subcontractors to pay laborers, workers, and mechanics performing services on public works projects no less than the current "prevailing rate of wages" (hourly cash wages plus an amount for fringe benefits) in the county where the work is performed. The Illinois Department of Labor (hereinafter "DEPARTMENT") publishes the prevailing wage rates on its website at <http://labor.illinois.gov/>. The DEPARTMENT revises the prevailing wage rates and the contractor/subcontractor has an obligation to check the DEPARTMENT's website for revisions to prevailing wage rates. For information regarding current prevailing wage rates, please refer to the DEPARTMENT's website. All contractors and subcontractor rendering services under this Agreement must comply with all requirements of the ACT, including but not limited to all wage requirements and notice and record keeping duties.

Section 16. Equal Opportunity Employment. During the performance of this Agreement, the VENDOR agrees as follows:

- i. The VENDOR will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The VENDOR will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The VENDOR agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- ii. The VENDOR will, in all solicitations or advertisements for employees placed by or on behalf of the VENDOR, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
- iii. The VENDOR will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the VENDOR's legal duty to furnish information.
- iv. The VENDOR will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the VENDOR's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

Section 17. Access to Records. The following access to records requirements apply to this Agreement:

- i. The VENDOR agrees to provide CITY, or any of their authorized representatives access to any books, documents, papers, and records of the VENDOR which are directly pertinent to this Agreement for the purposes of making audits, examinations, excerpts, and transcriptions.
- ii. The VENDOR agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

Section 18. Compliance with FOIA Requirements. VENDOR further explicitly agrees to furnish all records related to this Agreement and any documentation related to CITY required under the Illinois Freedom of Information Act (ILCS 140/1 et seq.) (hereinafter "FOIA") request within five (5) business days after CITY issues notice of such request to VENDOR. VENDOR agrees to not apply any costs or charge any fees to the CITY regarding the procurement of records required pursuant to a FOIA request. VENDOR agrees to defend, indemnify, and hold harmless CITY, and agrees to pay all reasonable costs connected therewith (including, but not limited to, reasonable attorney's and witness fees, filing fees, and any other expenses) for CITY to defend any and all causes, actions, causes of action, disputes, prosecutions, of conflicts arising from VENDOR actual or alleged violation of FOIA, or VENDOR failure to furnish all documentation related to a request within five (5) business days after CITY

issues notice of request. Furthermore, should VENDOR request that CITY utilize a lawful exemption under FOIA in relation to any FOIA request, thereby denying that request, VENDOR agrees to pay all costs connected therewith (such as reasonable attorney's and witness fees, filing fees, and any other expenses) to defend the denial of the request. The defense shall include, but not be limited to, challenged or appealed denials of FOIA requests to either the Illinois Attorney General or a court of competent jurisdiction. VENDOR agrees to defend, indemnify, and hold harmless CITY, and agrees to pay all costs connected therewith (such as reasonable attorney's and witness fees, filing fees, and any other expenses) to defend any denial of a FOIA request by VENDOR request to utilize a lawful exemption to CITY.

Section 19. Notices. All legal notices given in connection with this Agreement shall be made in writing and deemed complete by way of (a) hand delivery; (b) registered mail, postage prepaid; or (c) electronic mail with notice of receipt by the other PARTY at the following addresses or at such other address for a PARTY as shall be specified by like notice:

If to VENDOR:

Wm. Masters, Inc.
Attn: Ben Knochel
401 Olympia Dr.
Bloomington, IL 61704
benknochel@wmmastersinc.com

Copy to:

Stoller Law Office
15 W. Front St.
El Paso, IL 61738

If to CITY:

City of Bloomington
Attn: City Manager
115 E. Washington St., Suite 103
Bloomington, IL 61701
admin@cityblm.org

Copy to:

City of Bloomington
Attn: Legal Department
115 E. Washington St., Suite 103
Bloomington, IL 61701
legal@cityblm.org

Section 20. Insurance. VENDOR shall, at a minimum, maintain insurance as required in the PROCUREMENT DOCUMENTS or as agreed upon with the City Procurement Manager. Certificates of insurance shall be provided to the CITY and CITY shall be named as additional insured under the policy(ies).

Section 21. Assignment. No PARTY may assign this Agreement, of the proceeds thereof, without prior written consent of the other PARTY.

Section 22. Changes or Modifications. This Agreement, its method of completion, its scope of work, nor its pricing may be modified or changed in any manner without the express written consent of both PARTIES via an Amendment fully executed by both PARTIES.

Section 23. Governing Law. This Agreement shall be governed by and interpreted pursuant to the laws of the State of Illinois, County of McLean.

Section 24. Joint Drafting. The PARTIES expressly agree that this Agreement was jointly drafted, and that both had the opportunity to negotiate its terms and to obtain the assistance of counsel in reviewing its terms prior to execution. Therefore, this Agreement shall be construed neither against nor in favor of either PARTY but shall be construed in a neutral manner.

Section 25. Attorney's Fees. In the event that any action is filed in relation to this Agreement, the unsuccessful PARTY in the action shall pay to the successful PARTY, in addition to all the sums that either PARTY may be called on to pay, a reasonable sum for the successful PARTY's attorney's fees (including expert witness fees).

Section 26. Paragraph Headings. The titles to the paragraphs of this agreement are solely for the convenience of the PARTIES and shall not be used to explain, modify, simplify, or aid in the interpretation of the provisions of this Agreement.

Section 27. Term. The term of this Agreement shall be:

- ☒ Until all of the services and/or deliverables required to be provided within this Agreement are completed and accepted by CITY.
- ☐ From _____ year(s) from the date of this Agreement listed above.
- ☐ By the date state in the PROCUREMENT DOCUMENTS or no later than _____.
- ☐ This Agreement shall also be subject to the following renewal terms, if any:
_____.

Notwithstanding anything herein, the provisions in Sections 10 and 18 shall survive termination.

Section 28. Counterparts. This Agreement may be executed in any number of counterparts, including electronically, each of which shall be deemed to be an original, but all of which together shall constitute the same instrument.

IN WITNESS WHEREOF, the PARTIES hereto have executed this Space Sharing Agreement as of the date first above written.

CITY OF BLOOMINGTON

By: _____
Its City Manager

ATTEST:

By: _____
Its City Clerk

VENDOR

By: _____
Its Vice President

By: _____
Its _____

Exhibit A
Description of Services/Work Provided

The construction project includes the installation of a new generator located outside the building, two new automatic transfer switches (one for each facility), conduit, wiring, and other electrical components need to ensure both facilities are fully independent and operation on both utility and emergency backup power supplies.

Detailed specifications are included in the procurement document and are incorporated into the agreement.

Exhibit B
Payment Terms

FT JESSE GENERATOR AND ELECTRICAL IMPROVEMENT

Base Bid:	\$1,358,000
Contingency:	\$ 135,800
Alternate 1 - Concrete Removal:	\$ 28,000
Alternate 2 - Generator Access Platform:	<u>\$ 19,000</u>
	\$1,540,800



City of Bloomington

Public Works

Kevin Kothe, Director

115 East Washington Street, Suite 403, Bloomington, IL 61701

EVALUATION TABULATION

ITB No. Bid #2023-09

Ft Jesse Generator and Electrical Improvements

RESPONSE DEADLINE: September 21, 2022 at 10:00 am

Report Generated: Friday, October 28, 2022

VENDOR TOTALS WITH SELECTED ALTERNATES

Vendor	Total
Wm. Masters Inc,	\$1,540,800.00
Wilcox Electric & Service Inc.	\$2,308,532.10

BASE BID

					Wilcox Electric & Service Inc.		Wm. Masters Inc,	
Selected	Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total	Unit Cost	Total
X	1	All Work Except for Item No 2 and Alternates 1 through 3 listed below. All Sections.	1	LS	\$1,956,461.00	\$1,956,461.00	\$1,358,000.00	\$1,358,000.00
X	2	Contingency (10% of Item No. 1) Section: General Conditions 11.05 and 01 21 00	1	LS	\$195,646.10	\$195,646.10	\$135,800.00	\$135,800.00
Total						\$2,152,107.10		\$1,493,800.00

ALTERNATE

					Wilcox Electric & Service Inc.		Wm. Masters Inc,	
Selected	Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total	Unit Cost	Total
X	1	Concrete removal. Section 01 23 00	1	LS	\$33,250.00	\$33,250.00	\$28,000.00	\$28,000.00
Total						\$33,250.00		\$28,000.00

					Wilcox Electric & Service Inc.		Wm. Masters Inc,	
Selected	Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total	Unit Cost	Total
X	1	Alternate 2 - Generator Access Platform	1	LS	\$23,450.00	\$23,450.00	\$19,000.00	\$19,000.00
Total						\$23,450.00		\$19,000.00

					Wilcox Electric & Service Inc.		Wm. Masters Inc,	
Selected	Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total	Unit Cost	Total
	1	Alternate 3 - Portable Generator for Station A Emergency Circuit	1	LS	\$99,725.00	\$99,725.00	\$149,200.00	\$149,200.00
Total						\$99,725.00		\$149,200.00



INVITATION TO BID

Bid #2023-09

FT JESSE GENERATOR AND ELECTRICAL IMPROVEMENTS

City of Bloomington

115 East Washington Street, Suite 403

Bloomington, IL 61701

RELEASE DATE: August 31, 2022

DEADLINE FOR QUESTIONS: September 13, 2022

RESPONSE DEADLINE: September 21, 2022, 10:00 am

RESPONSES MUST BE SUBMITTED ELECTRONICALLY TO:

<https://secure.procurenow.com/portal/cityblm>

City of Bloomington
INVITATION TO BID
Ft Jesse Generator and Electrical Improvements

I.	Legal Notice
II.	Introduction.....
III.	Instruction to Bidders/Consultants
IV.	Scope of Work
V.	Pricing Proposal
VI.	Insurance Requirements
VII.	Terms and Conditions
VIII.	Vendor Questionnaire.....

Attachments:

A - Bid #2023-09 Bid Specifications - Ft Jesse Generator and Electrical
Improvements

B - Bid #2023-09 Bid Drawings - Fort Jesse Generator and Electrical Improvements

1. LEGAL NOTICE

1.1. Invitation to Bid - City of Bloomington, Illinois

Sealed bids will be received via the City's e-Procurement Portal, [Procurenow](https://secure.procurenow.com/portal/cityblm) (<https://secure.procurenow.com/portal/cityblm>), until Wednesday, September 21, 2022 at 10:00 am Central time, at which time they will be publicly opened and read for the following:

Bid #2023-09

Ft Jesse Generator and Electrical Improvements

We encourage bidders and the public to participate remotely by watching/listening to the bid opening remotely via the City's livestream: www.cityblm.org/bidopening.

A pre-bid meeting/site visit will be held on Thursday, September 8, 2022 at 10:00 am central time, at:
1513 Ft Jesse Road Normal, IL 61761

While attendance is not mandatory, it is recommended that all bidders attend, and subcontractors are welcome. Inquiries as to the requirements of the specifications will be addressed at the Pre-Bid Meeting.

Bid documents are to be obtained from the City's e-Procurement Portal. Bidders/Consultants shall create a FREE account with ProcureNow by signing up at <https://secure.procurenow.com/signup>. Once account registration has been completed, browse back to <https://secure.procurenow.com/portal/cityblm>, click on "Submit Response", and follow the instructions to submit the electronic bid. Only Bidders/Consultants following the project, with an active account, are eligible for the contract award.

The City of Bloomington reserves the right to reject any and all bids and to waive technicalities.

The City of Bloomington requires all Bidders/Consultants doing business with the City not to discriminate on the basis of race, age, color, religion, gender, ancestry, national origin, marital status, mental or physical disability unrelated to ability, familial status or sexual orientation.

Bid must be accompanied by a Bid guaranty which shall not be less than ten percent (10%) of the amount of the Bid. Bid guaranty may be a cashier's check, money order, certified bank check, or a surety bond. All guaranties, except surety bonds, will be deposited and reimbursement checks and surety bonds will be issued to unsuccessful bidders following the bid award. The successful bidder will be required to provide Performance and Payment Bonds in the amount equal to 100% of the contract price, within ten (10) business days after the bid award.

Contractors shall not pay less than the prevailing rates of wages to all laborers, workmen, and mechanics performing work under this contract, and shall comply with the requirements of the Illinois Prevailing Wage Act (820 ILCS 130/1-12) including Public Act 100-1177 effective June 1, 2019.

Bids may not be withdrawn for a period of 90 days after the bid opening date.

Carla Murillo, Procurement Manager

Wednesday, August 31, 2022, Bloomington, Illinois

2. INTRODUCTION

2.1. Summary

The City of Bloomington, Illinois ("City") is accepting sealed bids for Bid #2023-09, Ft Jesse Generator and Electrical Improvements to be submitted via the City's e-Procurement Portal, ProcureNow until Wednesday, September 21, 2022, 10:00 am CST.

2.2. Background

The City of Bloomington, incorporated in 1856, is a home rule unit of government under the 1970 Illinois Constitution. The City of Bloomington is located in the heart of Central Illinois, approximately 125 miles southwest of Chicago, 155 miles northeast of St. Louis and 64 miles northeast of Springfield, the State Capital. The City of Bloomington is the County Seat of McLean County, the largest county in Illinois (approximately 762,240 acres). The results of the 2010 Census shows the City now has a population of 76,610 citizens. The economic strength of the City of Bloomington metropolitan area is well diversified with no single dominating industry.

2.3. Contact Information

Carla Murillo

Procurement Manager

109 E Olive Street

Bloomington, IL 61701

Email: cmurillo@cityblm.org

Phone: [\(309\) 434-2277](tel:(309)434-2277)

Department:

Public Works

2.4. Timeline

The following projected timetable should be used as a working guide for planning purposes. The City reserves the right to adjust this timetable as required during the course of this statement process.

Bid Released	August 31, 2022
Pre-Bid Meeting/Site Visit (Non-Mandatory)	September 8, 2022, 10:00am 1513 Ft Jesse Road Normal, IL 61761
Questions Due to City	September 13, 2022, 12:00pm
Response from City	September 16, 2022, 2:00pm

Bids Due	September 21, 2022, 10:00am
Bid Opening	September 21, 2022, 10:00am We encourage bidders and the public to participate remotely by watching/listening to the bid opening remotely via the City's livestream: www.cityblm.org/bidopening .
Anticipated Award Date	October 10, 2022

3. INSTRUCTION TO BIDDERS/CONSULTANTS

3.1. Bid Submission

Bidders/Consultants are required to submit sealed bids via the City's e-Procurement Portal, until Wednesday, September 21, 2022, 10:00 am CST.

3.2. Definition

"City" shall mean the City of Bloomington, Illinois.

3.3. Pre-Bid Meeting

A non-mandatory pre-bid meeting will be held on Thursday, September 8, 2022, commencing promptly at 10:00 am, and will be held:

1513 Ft Jesse Road Normal, IL 61761

The purpose of the pre-bid meeting is to allow an open forum for discussion and questioning with City staff regarding the ITB with all prospective bidders/consultants having an equal opportunity to hear and participate. Oral questions will receive oral responses, neither of which will be official, nor become part of the ITB. Only written responses to written questions will be considered official, and will be included as part of the ITB.

All prospective bidders/consultants are strongly encouraged to attend.

3.4. Questions

All questions related to this Invitation to bid (ITB) shall be submitted in writing through the ProcureNow Question/Answer Tab via the City's e-Procurement portal, on or before, Tuesday, September 13, 2022 by 12:00 pm. Please include the section title for each question, if applicable, in order to ensure that questions asked are responded to correctly. All questions submitted and answers provided shall be electronically distributed to bidders/consultants following this solicitation on the City's e-Procurement Portal.

3.5. Addenda

Any addenda shall be posted on the City's e-Procurement Portal. Addenda notifications will be emailed to all persons on record as following this ITB. Failure of any bidder/consultant to receive any such addenda or interpretation shall not relieve such bidder/consultant from any obligation under their bid as submitted. All addenda so issued shall become part of the contract documents.

3.6. Withdrawal of Bid

Bids may be withdrawn through the City's e-Procurement Portal, the responding firm may "unsubmit" their bid in ProcureNow. After withdrawing a previously submitted bid, the responding firm may submit another bid at any time up to the deadline for submitting bids prior to the bid opening. Except as otherwise provided by regulation, all decisions to permit the correction or withdrawal of bids following the bid opening, or to cancel awards or contracts based on bid mistakes, will be submitted in writing and will be supported by a written determination made by the Procurement Manager.

3.7. [Rejection of Bids](#)

The City of Bloomington reserves the right to reject any and all bids and to waive technicalities and to accept that bid which is to be considered to be in the best interest of the City. Any such decision shall be considered final.

3.8. [Bid Opening](#)

Telephone/Fax/Verbal Offers Will Not Be Accepted.

Bids shall be publicly opened and read at the time and date set. It is the responsibility of the Bidders/Consultants/Contractors to see that the bid is submitted in the City's e-Procurement Portal, by the specified time and date. Bids received after the time and date will not be accepted.

4. SCOPE OF WORK

4.1. Ft Jesse Generator and Electrical Improvements

Please thoroughly review and read all the attached specifications and drawings for this project.

August 24, 2022

PROJECT MANUAL

CITY OF BLOOMINGTON

FORT JESSE
GENERATOR AND ELECTRICAL IMPROVEMENTS

Bloomington, Illinois

Bid #2023-09

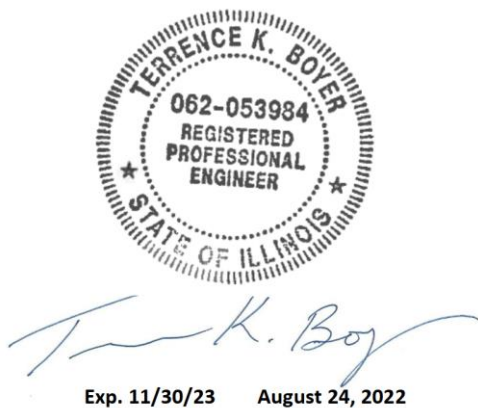
BID SET



Donohue & Associates, Inc.
1605 S. State Street Suite 1C
Champaign, IL 61820
217-352-9990 | donohue-associates.com

Donohue Project No.: 14017

PROJECT MANUAL
CITY OF BLOOMINGTON PUBLIC WORKS
FORT JESSE GENERATOR AND ELECTRICAL IMPROVEMENTS
BLOOMINGTON, ILLINOIS



Donohue & Associates
1605 S. State Street Suite 1C
Champaign, Illinois 61820
Phone: 217-352-9990

Project No. 14017

PROJECT MANUAL
CITY OF BLOOMINGTON PUBLIC WORKS
FORT JESSE GENERATOR AND ELECTRICAL IMPROVEMENTS
BLOOMINGTON, ILLINOIS

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APPENDIX

C-620 Contractor's Application for Payment
C-625 Certificate of Substantial Completion
C-940 Work Change Directive
C-942 Field Order Form
Certificate of Installation Services
Certificate of Instructional Services
Certificate of Post Startup Services
Change Order
Request for Information
Contractor's Submittal Transmittal

GENERAL CONDITIONS

This document has important legal consequences; consultation with an attorney is encouraged with respect to its use or modification. This document should be adapted to the particular circumstances of the contemplated Project and the controlling Laws and Regulations.

STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

Prepared By



Endorsed By



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STANDARD GENERAL CONDITIONS OF THE CONSTRUCTION CONTRACT

ARTICLE 1—DEFINITIONS AND TERMINOLOGY

1.01 *Defined Terms*

- A. Wherever used in the Bidding Requirements or Contract Documents, a term printed with initial capital letters, including the term's singular and plural forms, will have the meaning indicated in the definitions below. In addition to terms specifically defined, terms with initial capital letters in the Contract Documents include references to identified articles and paragraphs, and the titles of other documents or forms.
1. *Addenda*—Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the proposed Contract Documents.
 2. *Agreement*—The written instrument, executed by Owner and Contractor, that sets forth the Contract Price and Contract Times, identifies the parties and the Engineer, and designates the specific items that are Contract Documents.
 3. *Application for Payment*—The document prepared by Contractor, in a form acceptable to Engineer, to request progress or final payments, and which is to be accompanied by such supporting documentation as is required by the Contract Documents.
 4. *Bid*—The offer of a Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.
 5. *Bidder*—An individual or entity that submits a Bid to Owner.
 6. *Bidding Documents*—The Bidding Requirements, the proposed Contract Documents, and all Addenda.
 7. *Bidding Requirements*—The Advertisement or invitation to bid, Instructions to Bidders, Bid Bond or other Bid security, if any, the Bid Form, and the Bid with any attachments.
 8. *Change Order*—A document which is signed by Contractor and Owner and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, or other revision to the Contract, issued on or after the Effective Date of the Contract.
 9. *Change Proposal*—A written request by Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment in Contract Price or Contract Times; contesting an initial decision by Engineer concerning the requirements of the Contract Documents or the acceptability of Work under the Contract Documents; challenging a set-off against payments due; or seeking other relief with respect to the terms of the Contract.
 10. *Claim*
 - a. A demand or assertion by Owner directly to Contractor, duly submitted in compliance with the procedural requirements set forth herein, seeking an adjustment of Contract Price or Contract Times; contesting an initial decision by Engineer concerning the

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- requirements of the Contract Documents or the acceptability of Work under the Contract Documents; contesting Engineer's decision regarding a Change Proposal; seeking resolution of a contractual issue that Engineer has declined to address; or seeking other relief with respect to the terms of the Contract.
- b. A demand or assertion by Contractor directly to Owner, duly submitted in compliance with the procedural requirements set forth herein, contesting Engineer's decision regarding a Change Proposal, or seeking resolution of a contractual issue that Engineer has declined to address.
 - c. A demand or assertion by Owner or Contractor, duly submitted in compliance with the procedural requirements set forth herein, made pursuant to Paragraph 12.01.A.4, concerning disputes arising after Engineer has issued a recommendation of final payment.
 - d. A demand for money or services by a third party is not a Claim.
- 11. *Constituent of Concern*—Asbestos, petroleum, radioactive materials, polychlorinated biphenyls (PCBs), lead-based paint (as defined by the HUD/EPA standard), hazardous waste, and any substance, product, waste, or other material of any nature whatsoever that is or becomes listed, regulated, or addressed pursuant to Laws and Regulations regulating, relating to, or imposing liability or standards of conduct concerning, any hazardous, toxic, or dangerous waste, substance, or material.
 - 12. *Contract*—The entire and integrated written contract between Owner and Contractor concerning the Work.
 - 13. *Contract Documents*—Those items so designated in the Agreement, and which together comprise the Contract.
 - 14. *Contract Price*—The money that Owner has agreed to pay Contractor for completion of the Work in accordance with the Contract Documents.
 - 15. *Contract Times*—The number of days or the dates by which Contractor shall: (a) achieve Milestones, if any; (b) achieve Substantial Completion; and (c) complete the Work.
 - 16. *Contractor*—The individual or entity with which Owner has contracted for performance of the Work.
 - 17. *Cost of the Work*—See Paragraph 13.01 for definition.
 - 18. *Drawings*—The part of the Contract that graphically shows the scope, extent, and character of the Work to be performed by Contractor.
 - 19. *Effective Date of the Contract*—The date, indicated in the Agreement, on which the Contract becomes effective.
 - 20. *Electronic Document*—Any Project-related correspondence, attachments to correspondence, data, documents, drawings, information, or graphics, including but not limited to Shop Drawings and other Submittals, that are in an electronic or digital format.
 - 21. *Electronic Means*—Electronic mail (email), upload/download from a secure Project website, or other communications methods that allow: (a) the transmission or communication of Electronic Documents; (b) the documentation of transmissions, including sending and receipt; (c) printing of the transmitted Electronic Document by the

recipient; (d) the storage and archiving of the Electronic Document by sender and recipient; and (e) the use by recipient of the Electronic Document for purposes permitted by this Contract. Electronic Means does not include the use of text messaging, or of Facebook, Twitter, Instagram, or similar social media services for transmission of Electronic Documents.

22. *Engineer*—The individual or entity named as such in the Agreement.
23. *Field Order*—A written order issued by Engineer which requires minor changes in the Work but does not change the Contract Price or the Contract Times.
24. *Hazardous Environmental Condition*—The presence at the Site of Constituents of Concern in such quantities or circumstances that may present a danger to persons or property exposed thereto.
 - a. The presence at the Site of materials that are necessary for the execution of the Work, or that are to be incorporated into the Work, and that are controlled and contained pursuant to industry practices, Laws and Regulations, and the requirements of the Contract, is not a Hazardous Environmental Condition.
 - b. The presence of Constituents of Concern that are to be removed or remediated as part of the Work is not a Hazardous Environmental Condition.
 - c. The presence of Constituents of Concern as part of the routine, anticipated, and obvious working conditions at the Site, is not a Hazardous Environmental Condition.
25. *Laws and Regulations; Laws or Regulations*—Any and all applicable laws, statutes, rules, regulations, ordinances, codes, and binding decrees, resolutions, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.
26. *Liens*—Charges, security interests, or encumbrances upon Contract-related funds, real property, or personal property.
27. *Milestone*—A principal event in the performance of the Work that the Contract requires Contractor to achieve by an intermediate completion date, or by a time prior to Substantial Completion of all the Work.
28. *Notice of Award*—The written notice by Owner to a Bidder of Owner's acceptance of the Bid.
29. *Notice to Proceed*—A written notice by Owner to Contractor fixing the date on which the Contract Times will commence to run and on which Contractor shall start to perform the Work.
30. *Owner*—The individual or entity with which Contractor has contracted regarding the Work, and which has agreed to pay Contractor for the performance of the Work, pursuant to the terms of the Contract.
31. *Progress Schedule*—A schedule, prepared and maintained by Contractor, describing the sequence and duration of the activities comprising Contractor's plan to accomplish the Work within the Contract Times.
32. *Project*—The total undertaking to be accomplished for Owner by engineers, contractors, and others, including planning, study, design, construction, testing, commissioning, and start-up, and of which the Work to be performed under the Contract Documents is a part.

33. *Resident Project Representative*—The authorized representative of Engineer assigned to assist Engineer at the Site. As used herein, the term Resident Project Representative (RPR) includes any assistants or field staff of Resident Project Representative.
34. *Samples*—Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and that establish the standards by which such portion of the Work will be judged.
35. *Schedule of Submittals*—A schedule, prepared and maintained by Contractor, of required submittals and the time requirements for Engineer’s review of the submittals.
36. *Schedule of Values*—A schedule, prepared and maintained by Contractor, allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor’s Applications for Payment.
37. *Shop Drawings*—All drawings, diagrams, illustrations, schedules, and other data or information that are specifically prepared or assembled by or for Contractor and submitted by Contractor to illustrate some portion of the Work. Shop Drawings, whether approved or not, are not Drawings and are not Contract Documents.
38. *Site*—Lands or areas indicated in the Contract Documents as being furnished by Owner upon which the Work is to be performed, including rights-of-way and easements, and such other lands or areas furnished by Owner which are designated for the use of Contractor.
39. *Specifications*—The part of the Contract that consists of written requirements for materials, equipment, systems, standards, and workmanship as applied to the Work, and certain administrative requirements and procedural matters applicable to the Work.
40. *Subcontractor*—An individual or entity having a direct contract with Contractor or with any other Subcontractor for the performance of a part of the Work.
41. *Submittal*—A written or graphic document, prepared by or for Contractor, which the Contract Documents require Contractor to submit to Engineer, or that is indicated as a Submittal in the Schedule of Submittals accepted by Engineer. Submittals may include Shop Drawings and Samples; schedules; product data; Owner-delegated designs; sustainable design information; information on special procedures; testing plans; results of tests and evaluations, source quality-control testing and inspections, and field or Site quality-control testing and inspections; warranties and certifications; Suppliers’ instructions and reports; records of delivery of spare parts and tools; operations and maintenance data; Project photographic documentation; record documents; and other such documents required by the Contract Documents. Submittals, whether or not approved or accepted by Engineer, are not Contract Documents. Change Proposals, Change Orders, Claims, notices, Applications for Payment, and requests for interpretation or clarification are not Submittals.
42. *Substantial Completion*—The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of Engineer, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms “substantially complete” and “substantially completed” as applied to all or part of the Work refer to Substantial Completion of such Work.

43. *Successful Bidder*—The Bidder to which the Owner makes an award of contract.
44. *Supplementary Conditions*—The part of the Contract that amends or supplements these General Conditions.
45. *Supplier*—A manufacturer, fabricator, supplier, distributor, or vendor having a direct contract with Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by Contractor or a Subcontractor.
46. *Technical Data*
- a. Those items expressly identified as Technical Data in the Supplementary Conditions, with respect to either (1) existing subsurface conditions at or adjacent to the Site, or existing physical conditions at or adjacent to the Site including existing surface or subsurface structures (except Underground Facilities) or (2) Hazardous Environmental Conditions at the Site.
 - b. If no such express identifications of Technical Data have been made with respect to conditions at the Site, then Technical Data is defined, with respect to conditions at the Site under Paragraphs 5.03, 5.04, and 5.06, as the data contained in boring logs, recorded measurements of subsurface water levels, assessments of the condition of subsurface facilities, laboratory test results, and other factual, objective information regarding conditions at the Site that are set forth in any geotechnical, environmental, or other Site or facilities conditions report prepared for the Project and made available to Contractor.
 - c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data, and instead Underground Facilities are shown or indicated on the Drawings.
47. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems. An abandoned facility or system is not an Underground Facility.
48. *Unit Price Work*—Work to be paid for on the basis of unit prices.
49. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, start-up, and commissioning, all as required by the Contract Documents.
50. *Work Change Directive*—A written directive to Contractor issued on or after the Effective Date of the Contract, signed by Owner and recommended by Engineer, ordering an addition, deletion, or revision in the Work.

1.02 Terminology

- A. The words and terms discussed in Paragraphs 1.02.B, C, D, and E are not defined terms that require initial capital letters, but, when used in the Bidding Requirements or Contract Documents, have the indicated meaning.
- B. *Intent of Certain Terms or Adjectives:* The Contract Documents include the terms “as allowed,” “as approved,” “as ordered,” “as directed” or terms of like effect or import to authorize an exercise of professional judgment by Engineer. In addition, the adjectives “reasonable,” “suitable,” “acceptable,” “proper,” “satisfactory,” or adjectives of like effect or import are used to describe an action or determination of Engineer as to the Work. It is intended that such exercise of professional judgment, action, or determination will be solely to evaluate, in general, the Work for compliance with the information in the Contract Documents and with the design concept of the Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective is not intended to and shall not be effective to assign to Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility contrary to the provisions of Article 10 or any other provision of the Contract Documents.
- C. *Day:* The word “day” means a calendar day of 24 hours measured from midnight to the next midnight.
- D. *Defective:* The word “defective,” when modifying the word “Work,” refers to Work that is unsatisfactory, faulty, or deficient in that it:
 - 1. does not conform to the Contract Documents;
 - 2. does not meet the requirements of any applicable inspection, reference standard, test, or approval referred to in the Contract Documents; or
 - 3. has been damaged prior to Engineer’s recommendation of final payment (unless responsibility for the protection thereof has been assumed by Owner at Substantial Completion in accordance with Paragraph 15.03 or Paragraph 15.04).
- E. *Furnish, Install, Perform, Provide*
 - 1. The word “furnish,” when used in connection with services, materials, or equipment, means to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.
 - 2. The word “install,” when used in connection with services, materials, or equipment, means to put into use or place in final position said services, materials, or equipment complete and ready for intended use.
 - 3. The words “perform” or “provide,” when used in connection with services, materials, or equipment, means to furnish and install said services, materials, or equipment complete and ready for intended use.
 - 4. If the Contract Documents establish an obligation of Contractor with respect to specific services, materials, or equipment, but do not expressly use any of the four words “furnish,” “install,” “perform,” or “provide,” then Contractor shall furnish and install said services, materials, or equipment complete and ready for intended use.

- F. *Contract Price or Contract Times*: References to a change in “Contract Price or Contract Times” or “Contract Times or Contract Price” or similar, indicate that such change applies to (1) Contract Price, (2) Contract Times, or (3) both Contract Price and Contract Times, as warranted, even if the term “or both” is not expressed.
- G. Unless stated otherwise in the Contract Documents, words or phrases that have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.

ARTICLE 2—PRELIMINARY MATTERS

2.01 *Delivery of Performance and Payment Bonds; Evidence of Insurance*

- A. *Performance and Payment Bonds*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner the performance bond and payment bond (if the Contract requires Contractor to furnish such bonds).
- B. *Evidence of Contractor’s Insurance*: When Contractor delivers the signed counterparts of the Agreement to Owner, Contractor shall also deliver to Owner, with copies to each additional insured (as identified in the Contract), the certificates, endorsements, and other evidence of insurance required to be provided by Contractor in accordance with Article 6, except to the extent the Supplementary Conditions expressly establish other dates for delivery of specific insurance policies.
- C. *Evidence of Owner’s Insurance*: After receipt of the signed counterparts of the Agreement and all required bonds and insurance documentation, Owner shall promptly deliver to Contractor, with copies to each additional insured (as identified in the Contract), the certificates and other evidence of insurance required to be provided by Owner under Article 6.

2.02 *Copies of Documents*

- A. Owner shall furnish to Contractor four printed copies of the Contract (including one fully signed counterpart of the Agreement), and one copy in electronic portable document format (PDF). Additional printed copies will be furnished upon request at the cost of reproduction.
- B. Owner shall maintain and safeguard at least one original printed record version of the Contract, including Drawings and Specifications signed and sealed by Engineer and other design professionals. Owner shall make such original printed record version of the Contract available to Contractor for review. Owner may delegate the responsibilities under this provision to Engineer.

2.03 *Before Starting Construction*

- A. *Preliminary Schedules*: Within 10 days after the Effective Date of the Contract (or as otherwise required by the Contract Documents), Contractor shall submit to Engineer for timely review:
 - 1. a preliminary Progress Schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract;
 - 2. a preliminary Schedule of Submittals; and
 - 3. a preliminary Schedule of Values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work

into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.

2.04 *Preconstruction Conference; Designation of Authorized Representatives*

- A. Before any Work at the Site is started, a conference attended by Owner, Contractor, Engineer, and others as appropriate will be held to establish a working understanding among the parties as to the Work, and to discuss the schedules referred to in Paragraph 2.03.A, procedures for handling Shop Drawings, Samples, and other Submittals, processing Applications for Payment, electronic or digital transmittals, and maintaining required records.
- B. At this conference Owner and Contractor each shall designate, in writing, a specific individual to act as its authorized representative with respect to the services and responsibilities under the Contract. Such individuals shall have the authority to transmit and receive information, render decisions relative to the Contract, and otherwise act on behalf of each respective party.

2.05 *Acceptance of Schedules*

- A. At least 10 days before submission of the first Application for Payment a conference, attended by Contractor, Engineer, and others as appropriate, will be held to review the schedules submitted in accordance with Paragraph 2.03.A. No progress payment will be made to Contractor until acceptable schedules are submitted to Engineer.
 - 1. The Progress Schedule will be acceptable to Engineer if it provides an orderly progression of the Work to completion within the Contract Times. Such acceptance will not impose on Engineer responsibility for the Progress Schedule, for sequencing, scheduling, or progress of the Work, nor interfere with or relieve Contractor from Contractor's full responsibility therefor.
 - 2. Contractor's Schedule of Submittals will be acceptable to Engineer if it provides a workable arrangement for reviewing and processing the required submittals.
 - 3. Contractor's Schedule of Values will be acceptable to Engineer as to form and substance if it provides a reasonable allocation of the Contract Price to the component parts of the Work.
 - 4. If a schedule is not acceptable, Contractor will have an additional 10 days to revise and resubmit the schedule.

2.06 *Electronic Transmittals*

- A. Except as otherwise stated elsewhere in the Contract, the Owner, Engineer, and Contractor may send, and shall accept, Electronic Documents transmitted by Electronic Means.
- B. If the Contract does not establish protocols for Electronic Means, then Owner, Engineer, and Contractor shall jointly develop such protocols.
- C. Subject to any governing protocols for Electronic Means, when transmitting Electronic Documents by Electronic Means, the transmitting party makes no representations as to long-term compatibility, usability, or readability of the Electronic Documents resulting from the recipient's use of software application packages, operating systems, or computer hardware differing from those used in the drafting or transmittal of the Electronic Documents.

ARTICLE 3—CONTRACT DOCUMENTS: INTENT, REQUIREMENTS, REUSE

3.01 *Intent*

- A. The Contract Documents are complementary; what is required by one Contract Document is as binding as if required by all.
- B. It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents.
- C. Unless otherwise stated in the Contract Documents, if there is a discrepancy between the electronic versions of the Contract Documents (including any printed copies derived from such electronic versions) and the printed record version, the printed record version will govern.
- D. The Contract supersedes prior negotiations, representations, and agreements, whether written or oral.
- E. Engineer will issue clarifications and interpretations of the Contract Documents as provided herein.
- F. Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation will be deemed stricken, and all remaining provisions will continue to be valid and binding upon Owner and Contractor, which agree that the Contract Documents will be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.
- G. Nothing in the Contract Documents creates:
 - 1. any contractual relationship between Owner or Engineer and any Subcontractor, Supplier, or other individual or entity performing or furnishing any of the Work, for the benefit of such Subcontractor, Supplier, or other individual or entity; or
 - 2. any obligation on the part of Owner or Engineer to pay or to see to the payment of any money due any such Subcontractor, Supplier, or other individual or entity, except as may otherwise be required by Laws and Regulations.

3.02 *Reference Standards*

- A. *Standards Specifications, Codes, Laws and Regulations*
 - 1. Reference in the Contract Documents to standard specifications, manuals, reference standards, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, means the standard specification, manual, reference standard, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Contract if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.
 - 2. No provision of any such standard specification, manual, reference standard, or code, and no instruction of a Supplier, will be effective to change the duties or responsibilities of Owner, Contractor, or Engineer from those set forth in the part of the Contract Documents prepared by or for Engineer. No such provision or instruction shall be effective to assign to Owner or Engineer any duty or authority to supervise or direct the performance of the Work, or any duty or authority to undertake responsibility

inconsistent with the provisions of the part of the Contract Documents prepared by or for Engineer.

3.03 *Reporting and Resolving Discrepancies*

A. *Reporting Discrepancies*

1. *Contractor's Verification of Figures and Field Measurements:* Before undertaking each part of the Work, Contractor shall carefully study the Contract Documents, and check and verify pertinent figures and dimensions therein, particularly with respect to applicable field measurements. Contractor shall promptly report in writing to Engineer any conflict, error, ambiguity, or discrepancy that Contractor discovers, or has actual knowledge of, and shall not proceed with any Work affected thereby until the conflict, error, ambiguity, or discrepancy is resolved by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
2. *Contractor's Review of Contract Documents:* If, before or during the performance of the Work, Contractor discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents, or between the Contract Documents and (a) any applicable Law or Regulation, (b) actual field conditions, (c) any standard specification, manual, reference standard, or code, or (d) any instruction of any Supplier, then Contractor shall promptly report it to Engineer in writing. Contractor shall not proceed with the Work affected thereby (except in an emergency as required by Paragraph 7.15) until the conflict, error, ambiguity, or discrepancy is resolved, by a clarification or interpretation by Engineer, or by an amendment or supplement to the Contract issued pursuant to Paragraph 11.01.
3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor had actual knowledge thereof.

B. *Resolving Discrepancies*

1. Except as may be otherwise specifically stated in the Contract Documents, the provisions of the part of the Contract Documents prepared by or for Engineer take precedence in resolving any conflict, error, ambiguity, or discrepancy between such provisions of the Contract Documents and:
 - a. the provisions of any standard specification, manual, reference standard, or code, or the instruction of any Supplier (whether or not specifically incorporated by reference as a Contract Document); or
 - b. the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).

3.04 *Requirements of the Contract Documents*

- A. During the performance of the Work and until final payment, Contractor and Owner shall submit to the Engineer in writing all matters in question concerning the requirements of the Contract Documents (sometimes referred to as requests for information or interpretation—RFIs), or relating to the acceptability of the Work under the Contract Documents, as soon as possible after such matters arise. Engineer will be the initial interpreter of the requirements of the Contract Documents, and judge of the acceptability of the Work.

- B. Engineer will, with reasonable promptness, render a written clarification, interpretation, or decision on the issue submitted, or initiate an amendment or supplement to the Contract Documents. Engineer's written clarification, interpretation, or decision will be final and binding on Contractor, unless it appeals by submitting a Change Proposal, and on Owner, unless it appeals by filing a Claim.
- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly notify Owner and Contractor in writing that Engineer is unable to provide a decision or interpretation. If Owner and Contractor are unable to agree on resolution of such a matter in question, either party may pursue resolution as provided in Article 12.

3.05 *Reuse of Documents*

- A. Contractor and its Subcontractors and Suppliers shall not:
 - 1. have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of Engineer or its consultants, including electronic media versions, or reuse any such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of Owner and Engineer and specific written verification or adaptation by Engineer; or
 - 2. have or acquire any title or ownership rights in any other Contract Documents, reuse any such Contract Documents for any purpose without Owner's express written consent, or violate any copyrights pertaining to such Contract Documents.
- B. The prohibitions of this Paragraph 3.05 will survive final payment, or termination of the Contract. Nothing herein precludes Contractor from retaining copies of the Contract Documents for record purposes.

ARTICLE 4—COMMENCEMENT AND PROGRESS OF THE WORK

4.01 *Commencement of Contract Times; Notice to Proceed*

- A. The Contract Times will commence to run on the 30th day after the Effective Date of the Contract or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Contract. In no event will the Contract Times commence to run later than the 60th day after the day of Bid opening or the 30th day after the Effective Date of the Contract, whichever date is earlier.

4.02 *Starting the Work*

- A. Contractor shall start to perform the Work on the date when the Contract Times commence to run. No Work may be done at the Site prior to such date.

4.03 *Reference Points*

- A. Owner shall provide engineering surveys to establish reference points for construction which in Engineer's judgment are necessary to enable Contractor to proceed with the Work. Contractor shall be responsible for laying out the Work, shall protect and preserve the

established reference points and property monuments, and shall make no changes or relocations without the prior written approval of Owner. Contractor shall report to Engineer whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.

4.04 *Progress Schedule*

- A. Contractor shall adhere to the Progress Schedule established in accordance with Paragraph 2.05 as it may be adjusted from time to time as provided below.
 - 1. Contractor shall submit to Engineer for acceptance (to the extent indicated in Paragraph 2.05) proposed adjustments in the Progress Schedule that will not result in changing the Contract Times.
 - 2. Proposed adjustments in the Progress Schedule that will change the Contract Times must be submitted in accordance with the requirements of Article 11.
- B. Contractor shall carry on the Work and adhere to the Progress Schedule during all disputes or disagreements with Owner. No Work will be delayed or postponed pending resolution of any disputes or disagreements, or during any appeal process, except as permitted by Paragraph 16.04, or as Owner and Contractor may otherwise agree in writing.

4.05 *Delays in Contractor's Progress*

- A. If Owner, Engineer, or anyone for whom Owner is responsible, delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times.
- B. Contractor shall not be entitled to an adjustment in Contract Price or Contract Times for delay, disruption, or interference caused by or within the control of Contractor. Delay, disruption, and interference attributable to and within the control of a Subcontractor or Supplier shall be deemed to be within the control of Contractor.
- C. If Contractor's performance or progress is delayed, disrupted, or interfered with by unanticipated causes not the fault of and beyond the control of Owner, Contractor, and those for which they are responsible, then Contractor shall be entitled to an equitable adjustment in Contract Times. Such an adjustment will be Contractor's sole and exclusive remedy for the delays, disruption, and interference described in this paragraph. Causes of delay, disruption, or interference that may give rise to an adjustment in Contract Times under this paragraph include but are not limited to the following:
 - 1. Severe and unavoidable natural catastrophes such as fires, floods, epidemics, and earthquakes;
 - 2. Abnormal weather conditions;
 - 3. Acts or failures to act of third-party utility owners or other third-party entities (other than those third-party utility owners or other third-party entities performing other work at or adjacent to the Site as arranged by or under contract with Owner, as contemplated in Article 8); and
 - 4. Acts of war or terrorism.

- D. Contractor's entitlement to an adjustment of Contract Times or Contract Price is limited as follows:
1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.
 2. Contractor shall not be entitled to an adjustment in Contract Price for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.
 3. Adjustments of Contract Times or Contract Price are subject to the provisions of Article 11.
- E. Each Contractor request or Change Proposal seeking an increase in Contract Times or Contract Price must be supplemented by supporting data that sets forth in detail the following:
1. The circumstances that form the basis for the requested adjustment;
 2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;
 3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;
 4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference; and
 5. The impact on Contract Price, in accordance with the provisions of Paragraph 11.07.
- Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.
- F. Delays, disruption, and interference to the performance or progress of the Work resulting from the existence of a differing subsurface or physical condition, an Underground Facility that was not shown or indicated by the Contract Documents, or not shown or indicated with reasonable accuracy, and those resulting from Hazardous Environmental Conditions, are governed by Article 5, together with the provisions of Paragraphs 4.05.D and 4.05.E.
- G. Paragraph 8.03 addresses delays, disruption, and interference to the performance or progress of the Work resulting from the performance of certain other work at or adjacent to the Site.

ARTICLE 5—SITE; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

5.01 *Availability of Lands*

- A. Owner shall furnish the Site. Owner shall notify Contractor in writing of any encumbrances or restrictions not of general application but specifically related to use of the Site with which Contractor must comply in performing the Work.

- B. Upon reasonable written request, Owner shall furnish Contractor with a current statement of record legal title and legal description of the lands upon which permanent improvements are to be made and Owner's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.
- C. Contractor shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

5.02 *Use of Site and Other Areas*

A. *Limitation on Use of Site and Other Areas*

1. Contractor shall confine construction equipment, temporary construction facilities, the storage of materials and equipment, and the operations of workers to the Site, adjacent areas that Contractor has arranged to use through construction easements or otherwise, and other adjacent areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and such other adjacent areas with construction equipment or other materials or equipment. Contractor shall assume full responsibility for (a) damage to the Site; (b) damage to any such other adjacent areas used for Contractor's operations; (c) damage to any other adjacent land or areas, or to improvements, structures, utilities, or similar facilities located at such adjacent lands or areas; and (d) for injuries and losses sustained by the owners or occupants of any such land or areas; provided that such damage or injuries result from the performance of the Work or from other actions or conduct of the Contractor or those for which Contractor is responsible.
 2. If a damage or injury claim is made by the owner or occupant of any such land or area because of the performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible, Contractor shall (a) take immediate corrective or remedial action as required by Paragraph 7.13, or otherwise; (b) promptly attempt to settle the claim as to all parties through negotiations with such owner or occupant, or otherwise resolve the claim by arbitration or other dispute resolution proceeding, or in a court of competent jurisdiction; and (c) to the fullest extent permitted by Laws and Regulations, indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against any such claim, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against Owner, Engineer, or any other party indemnified hereunder to the extent caused directly or indirectly, in whole or in part by, or based upon, Contractor's performance of the Work, or because of other actions or conduct of the Contractor or those for which Contractor is responsible.
- B. *Removal of Debris During Performance of the Work:* During the progress of the Work the Contractor shall keep the Site and other adjacent areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris will conform to applicable Laws and Regulations.
 - C. *Cleaning:* Prior to Substantial Completion of the Work Contractor shall clean the Site and the Work and make it ready for utilization by Owner. At the completion of the Work Contractor shall remove from the Site and adjacent areas all tools, appliances, construction equipment

and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.

- D. *Loading of Structures:* Contractor shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall Contractor subject any part of the Work or adjacent structures or land to stresses or pressures that will endanger them.

5.03 *Subsurface and Physical Conditions*

- A. *Reports and Drawings:* The Supplementary Conditions identify:

1. Those reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data;
2. Those drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data; and
3. Technical Data contained in such reports and drawings.

- B. *Underground Facilities:* Underground Facilities are shown or indicated on the Drawings, pursuant to Paragraph 5.05, and not in the drawings referred to in Paragraph 5.03.A. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

- C. *Reliance by Contractor on Technical Data:* Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely upon the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b.

- D. *Limitations of Other Data and Documents:* Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:
 1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by Contractor, and safety precautions and programs incident thereto;
 2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings;
 3. the contents of other Site-related documents made available to Contractor, such as record drawings from other projects at or adjacent to the Site, or Owner's archival documents concerning the Site; or
 4. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions, or information.

5.04 *Differing Subsurface or Physical Conditions*

- A. *Notice by Contractor:* If Contractor believes that any subsurface or physical condition that is uncovered or revealed at the Site:
1. is of such a nature as to establish that any Technical Data on which Contractor is entitled to rely as provided in Paragraph 5.03 is materially inaccurate;
 2. is of such a nature as to require a change in the Drawings or Specifications;
 3. differs materially from that shown or indicated in the Contract Documents; or
 4. is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;

then Contractor shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing about such condition. Contractor shall not further disturb such condition or perform any Work in connection therewith (except with respect to an emergency) until receipt of a written statement permitting Contractor to do so.

- B. *Engineer's Review:* After receipt of written notice as required by the preceding paragraph, Engineer will promptly review the subsurface or physical condition in question; determine whether it is necessary for Owner to obtain additional exploration or tests with respect to the condition; conclude whether the condition falls within any one or more of the differing site condition categories in Paragraph 5.04.A; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the subsurface or physical condition in question and the need for any change in the Drawings or Specifications; and advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- C. *Owner's Statement to Contractor Regarding Site Condition:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the subsurface or physical condition in question, addressing the resumption of Work in connection with such condition, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations, in whole or in part.
- D. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the subsurface or physical condition in question may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the condition in question has been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- E. *Possible Price and Times Adjustments*
1. Contractor shall be entitled to an equitable adjustment in Contract Price or Contract Times, to the extent that the existence of a differing subsurface or physical condition, or any related delay, disruption, or interference, causes an increase or decrease in

Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

- a. Such condition must fall within any one or more of the categories described in Paragraph 5.04.A;
 - b. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03; and,
 - c. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E.
2. Contractor shall not be entitled to any adjustment in the Contract Price or Contract Times with respect to a subsurface or physical condition if:
 - a. Contractor knew of the existence of such condition at the time Contractor made a commitment to Owner with respect to Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract, or otherwise;
 - b. The existence of such condition reasonably could have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas expressly required by the Bidding Requirements or Contract Documents to be conducted by or for Contractor prior to Contractor's making such commitment; or
 - c. Contractor failed to give the written notice required by Paragraph 5.04.A.
 3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
 4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.
- F. *Underground Facilities; Hazardous Environmental Conditions:* Paragraph 5.05 governs rights and responsibilities regarding the presence or location of Underground Facilities. Paragraph 5.06 governs rights and responsibilities regarding Hazardous Environmental Conditions. The provisions of Paragraphs 5.03 and 5.04 are not applicable to the presence or location of Underground Facilities, or to Hazardous Environmental Conditions.

5.05 *Underground Facilities*

- A. *Contractor's Responsibilities:* Unless it is otherwise expressly provided in the Supplementary Conditions, the cost of all of the following are included in the Contract Price, and Contractor shall have full responsibility for:
1. reviewing and checking all information and data regarding existing Underground Facilities at the Site;
 2. complying with applicable state and local utility damage prevention Laws and Regulations;

3. verifying the actual location of those Underground Facilities shown or indicated in the Contract Documents as being within the area affected by the Work, by exposing such Underground Facilities during the course of construction;
 4. coordination of the Work with the owners (including Owner) of such Underground Facilities, during construction; and
 5. the safety and protection of all existing Underground Facilities at the Site, and repairing any damage thereto resulting from the Work.
- B. *Notice by Contractor:* If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated on the Drawings, or was not shown or indicated on the Drawings with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), notify Owner and Engineer in writing regarding such Underground Facility.
- C. *Engineer's Review:* Engineer will:
1. promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated on the Drawings, or was not shown or indicated with reasonable accuracy;
 2. identify and communicate with the owner of the Underground Facility; prepare recommendations to Owner (and if necessary issue any preliminary instructions to Contractor) regarding the Contractor's resumption of Work in connection with the Underground Facility in question;
 3. obtain any pertinent cost or schedule information from Contractor; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and
 4. advise Owner in writing of Engineer's findings, conclusions, and recommendations.
- During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.
- D. *Owner's Statement to Contractor Regarding Underground Facility:* After receipt of Engineer's written findings, conclusions, and recommendations, Owner shall issue a written statement to Contractor (with a copy to Engineer) regarding the Underground Facility in question addressing the resumption of Work in connection with such Underground Facility, indicating whether any change in the Drawings or Specifications will be made, and adopting or rejecting Engineer's written findings, conclusions, and recommendations in whole or in part.
- E. *Early Resumption of Work:* If at any time Engineer determines that Work in connection with the Underground Facility may resume prior to completion of Engineer's review or Owner's issuance of its statement to Contractor, because the Underground Facility in question and conditions affected by its presence have been adequately documented, and analyzed on a preliminary basis, then the Engineer may at its discretion instruct Contractor to resume such Work.
- F. *Possible Price and Times Adjustments*
1. Contractor shall be entitled to an equitable adjustment in the Contract Price or Contract Times, to the extent that any existing Underground Facility at the Site that was not shown

or indicated on the Drawings, or was not shown or indicated with reasonable accuracy, or any related delay, disruption, or interference, causes an increase or decrease in Contractor's cost of, or time required for, performance of the Work; subject, however, to the following:

- a. With respect to Work that is paid for on a unit price basis, any adjustment in Contract Price will be subject to the provisions of Paragraph 13.03;
 - b. Contractor's entitlement to an adjustment of the Contract Times is subject to the provisions of Paragraphs 4.05.D and 4.05.E; and
 - c. Contractor gave the notice required in Paragraph 5.05.B.
2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment will be set forth in a Change Order.
 3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 30 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.
 4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in an investigation conducted in accordance with the current edition of ASCE 38, Standard Guideline for the Collection and Depiction of Existing Subsurface Utility Data, by the American Society of Civil Engineers. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

5.06 *Hazardous Environmental Conditions at Site*

A. *Reports and Drawings*: The Supplementary Conditions identify:

1. those reports known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site;
2. drawings known to Owner relating to Hazardous Environmental Conditions that have been identified at or adjacent to the Site; and
3. Technical Data contained in such reports and drawings.

B. *Reliance by Contractor on Technical Data Authorized*: Contractor may rely upon the accuracy of the Technical Data expressly identified in the Supplementary Conditions with respect to such reports and drawings, but such reports and drawings are not Contract Documents. If no such express identification has been made, then Contractor may rely on the accuracy of the Technical Data as defined in Paragraph 1.01.A.46.b. Except for such reliance on Technical Data, Contractor may not rely upon or make any claim against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, with respect to:

1. the completeness of such reports and drawings for Contractor's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures

- of construction to be employed by Contractor, and safety precautions and programs incident thereto;
2. other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or
 3. any Contractor interpretation of or conclusion drawn from any Technical Data or any such other data, interpretations, opinions or information.
- C. Contractor shall not be responsible for removing or remediating any Hazardous Environmental Condition encountered, uncovered, or revealed at the Site unless such removal or remediation is expressly identified in the Contract Documents to be within the scope of the Work.
- D. Contractor shall be responsible for controlling, containing, and duly removing all Constituents of Concern brought to the Site by Contractor, Subcontractors, Suppliers, or anyone else for whom Contractor is responsible, and for any associated costs; and for the costs of removing and remediating any Hazardous Environmental Condition created by the presence of any such Constituents of Concern.
- E. If Contractor encounters, uncovers, or reveals a Hazardous Environmental Condition whose removal or remediation is not expressly identified in the Contract Documents as being within the scope of the Work, or if Contractor or anyone for whom Contractor is responsible creates a Hazardous Environmental Condition, then Contractor shall immediately: (1) secure or otherwise isolate such condition; (2) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by Paragraph 7.15); and (3) notify Owner and Engineer (and promptly thereafter confirm such notice in writing). Owner shall promptly consult with Engineer concerning the necessity for Owner to retain a qualified expert to evaluate such condition or take corrective action, if any. Promptly after consulting with Engineer, Owner shall take such actions as are necessary to permit Owner to timely obtain required permits and provide Contractor the written notice required by Paragraph 5.06.F. If Contractor or anyone for whom Contractor is responsible created the Hazardous Environmental Condition in question, then Owner may remove and remediate the Hazardous Environmental Condition, and impose a set-off against payments to account for the associated costs.
- F. Contractor shall not resume Work in connection with such Hazardous Environmental Condition or in any affected area until after Owner has obtained any required permits related thereto, and delivered written notice to Contractor either (1) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work, or (2) specifying any special conditions under which such Work may be resumed safely.
- G. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, as a result of such Work stoppage, such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, then within 30 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.
- H. If, after receipt of such written notice, Contractor does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special

conditions, then Owner may order the portion of the Work that is in the area affected by such condition to be deleted from the Work, following the contractual change procedures in Article 11. Owner may have such deleted portion of the Work performed by Owner's own forces or others in accordance with Article 8.

- I. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court, arbitration, or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition (1) was not shown or indicated in the Drawings, Specifications, or other Contract Documents, identified as Technical Data entitled to limited reliance pursuant to Paragraph 5.06.B, or identified in the Contract Documents to be included within the scope of the Work, and (2) was not created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.I obligates Owner to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- J. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the failure to control, contain, or remove a Constituent of Concern brought to the Site by Contractor or by anyone for whom Contractor is responsible, or to a Hazardous Environmental Condition created by Contractor or by anyone for whom Contractor is responsible. Nothing in this Paragraph 5.06.J obligates Contractor to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.
- K. The provisions of Paragraphs 5.03, 5.04, and 5.05 do not apply to the presence of Constituents of Concern or to a Hazardous Environmental Condition uncovered or revealed at the Site.

ARTICLE 6—BONDS AND INSURANCE

6.01 *Performance, Payment, and Other Bonds*

- A. Contractor shall furnish a performance bond and a payment bond, each in an amount at least equal to the Contract Price, as security for the faithful performance and payment of Contractor's obligations under the Contract. These bonds must remain in effect until one year after the date when final payment becomes due or until completion of the correction period specified in Paragraph 15.08, whichever is later, except as provided otherwise by Laws or Regulations, the terms of a prescribed bond form, the Supplementary Conditions, or other provisions of the Contract.
- B. Contractor shall also furnish such other bonds (if any) as are required by the Supplementary Conditions or other provisions of the Contract.
- C. All bonds must be in the form included in the Bidding Documents or otherwise specified by Owner prior to execution of the Contract, except as provided otherwise by Laws or

Regulations, and must be issued and signed by a surety named in “Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies” as published in Department Circular 570 (as amended and supplemented) by the Bureau of the Fiscal Service, U.S. Department of the Treasury. A bond signed by an agent or attorney-in-fact must be accompanied by a certified copy of that individual’s authority to bind the surety. The evidence of authority must show that it is effective on the date the agent or attorney-in-fact signed the accompanying bond.

- D. Contractor shall obtain the required bonds from surety companies that are duly licensed or authorized, in the state or jurisdiction in which the Project is located, to issue bonds in the required amounts.
- E. If the surety on a bond furnished by Contractor is declared bankrupt or becomes insolvent, or the surety ceases to meet the requirements above, then Contractor shall promptly notify Owner and Engineer in writing and shall, within 20 days after the event giving rise to such notification, provide another bond and surety, both of which must comply with the bond and surety requirements above.
- F. If Contractor has failed to obtain a required bond, Owner may exclude the Contractor from the Site and exercise Owner’s termination rights under Article 16.
- G. Upon request to Owner from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Owner shall provide a copy of the payment bond to such person or entity.
- H. Upon request to Contractor from any Subcontractor, Supplier, or other person or entity claiming to have furnished labor, services, materials, or equipment used in the performance of the Work, Contractor shall provide a copy of the payment bond to such person or entity.

6.02 *Insurance—General Provisions*

- A. Owner and Contractor shall obtain and maintain insurance as required in this article and in the Supplementary Conditions.
- B. All insurance required by the Contract to be purchased and maintained by Owner or Contractor shall be obtained from insurance companies that are duly licensed or authorized in the state or jurisdiction in which the Project is located to issue insurance policies for the required limits and coverages. Unless a different standard is indicated in the Supplementary Conditions, all companies that provide insurance policies required under this Contract shall have an A.M. Best rating of A-VII or better.
- C. Alternative forms of insurance coverage, including but not limited to self-insurance and “Occupational Accident and Excess Employer’s Indemnity Policies,” are not sufficient to meet the insurance requirements of this Contract, unless expressly allowed in the Supplementary Conditions.
- D. Contractor shall deliver to Owner, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Contractor has obtained and is maintaining the policies and coverages required by the Contract. Upon request by Owner or any other insured, Contractor shall also furnish other evidence of such required insurance, including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, full disclosure of all relevant exclusions, and evidence of insurance required to be purchased and maintained by

Subcontractors or Suppliers. In any documentation furnished under this provision, Contractor, Subcontractors, and Suppliers may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those applicable to this Contract.

- E. Owner shall deliver to Contractor, with copies to each additional insured identified in the Contract, certificates of insurance and endorsements establishing that Owner has obtained and is maintaining the policies and coverages required of Owner by the Contract (if any). Upon request by Contractor or any other insured, Owner shall also provide other evidence of such required insurance (if any), including but not limited to copies of policies, documentation of applicable self-insured retentions (if allowed) and deductibles, and full disclosure of all relevant exclusions. In any documentation furnished under this provision, Owner may block out (redact) (1) any confidential premium or pricing information and (2) any wording specific to a project or jurisdiction other than those relevant to this Contract.
- F. Failure of Owner or Contractor to demand such certificates or other evidence of the other party's full compliance with these insurance requirements, or failure of Owner or Contractor to identify a deficiency in compliance from the evidence provided, will not be construed as a waiver of the other party's obligation to obtain and maintain such insurance.
- G. In addition to the liability insurance required to be provided by Contractor, the Owner, at Owner's option, may purchase and maintain Owner's own liability insurance. Owner's liability policies, if any, operate separately and independently from policies required to be provided by Contractor, and Contractor cannot rely upon Owner's liability policies for any of Contractor's obligations to the Owner, Engineer, or third parties.
- H. Contractor shall require:
 - 1. Subcontractors to purchase and maintain worker's compensation, commercial general liability, and other insurance that is appropriate for their participation in the Project, and to name as additional insureds Owner and Engineer (and any other individuals or entities identified in the Supplementary Conditions as additional insureds on Contractor's liability policies) on each Subcontractor's commercial general liability insurance policy; and
 - 2. Suppliers to purchase and maintain insurance that is appropriate for their participation in the Project.
- I. If either party does not purchase or maintain the insurance required of such party by the Contract, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage.
- J. If Contractor has failed to obtain and maintain required insurance, Contractor's entitlement to enter or remain at the Site will end immediately, and Owner may impose an appropriate set-off against payment for any associated costs (including but not limited to the cost of purchasing necessary insurance coverage), and exercise Owner's termination rights under Article 16.
- K. Without prejudice to any other right or remedy, if a party has failed to obtain required insurance, the other party may elect (but is in no way obligated) to obtain equivalent insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and the Contract Price will be adjusted accordingly.

- L. Owner does not represent that insurance coverage and limits established in this Contract necessarily will be adequate to protect Contractor or Contractor's interests. Contractor is responsible for determining whether such coverage and limits are adequate to protect its interests, and for obtaining and maintaining any additional insurance that Contractor deems necessary.
- M. The insurance and insurance limits required herein will not be deemed as a limitation on Contractor's liability, or that of its Subcontractors or Suppliers, under the indemnities granted to Owner and other individuals and entities in the Contract or otherwise.
- N. All the policies of insurance required to be purchased and maintained under this Contract will contain a provision or endorsement that the coverage afforded will not be canceled, or renewal refused, until at least 10 days prior written notice has been given to the purchasing policyholder. Within three days of receipt of any such written notice, the purchasing policyholder shall provide a copy of the notice to each other insured and Engineer.

6.03 *Contractor's Insurance*

- A. *Required Insurance:* Contractor shall purchase and maintain Worker's Compensation, Commercial General Liability, and other insurance pursuant to the specific requirements of the Supplementary Conditions.
- B. *General Provisions:* The policies of insurance required by this Paragraph 6.03 as supplemented must:
 - 1. include at least the specific coverages required;
 - 2. be written for not less than the limits provided, or those required by Laws or Regulations, whichever is greater;
 - 3. remain in effect at least until the Work is complete (as set forth in Paragraph 15.06.D), and longer if expressly required elsewhere in this Contract, and at all times thereafter when Contractor may be correcting, removing, or replacing defective Work as a warranty or correction obligation, or otherwise, or returning to the Site to conduct other tasks arising from the Contract;
 - 4. apply with respect to the performance of the Work, whether such performance is by Contractor, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable; and
 - 5. include all necessary endorsements to support the stated requirements.
- C. *Additional Insureds:* The Contractor's commercial general liability, automobile liability, employer's liability, umbrella or excess, pollution liability, and unmanned aerial vehicle liability policies, if required by this Contract, must:
 - 1. include and list as additional insureds Owner and Engineer, and any individuals or entities identified as additional insureds in the Supplementary Conditions;
 - 2. include coverage for the respective officers, directors, members, partners, employees, and consultants of all such additional insureds;
 - 3. afford primary coverage to these additional insureds for all claims covered thereby (including as applicable those arising from both ongoing and completed operations);

4. not seek contribution from insurance maintained by the additional insured; and
5. as to commercial general liability insurance, apply to additional insureds with respect to liability caused in whole or in part by Contractor's acts or omissions, or the acts and omissions of those working on Contractor's behalf, in the performance of Contractor's operations.

6.04 *Builder's Risk and Other Property Insurance*

- A. *Builder's Risk*: Unless otherwise provided in the Supplementary Conditions, Contractor shall purchase and maintain builder's risk insurance upon the Work on a completed value basis, in the amount of the Work's full insurable replacement cost (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). The specific requirements applicable to the builder's risk insurance are set forth in the Supplementary Conditions.
- B. *Property Insurance for Facilities of Owner Where Work Will Occur*: Owner is responsible for obtaining and maintaining property insurance covering each existing structure, building, or facility in which any part of the Work will occur, or to which any part of the Work will attach or be adjoined. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, providing coverage consistent with that required for the builder's risk insurance, and will be maintained until the Work is complete, as set forth in Paragraph 15.06.D.
- C. *Property Insurance for Substantially Complete Facilities*: Promptly after Substantial Completion, and before actual occupancy or use of the substantially completed Work, Owner will obtain property insurance for such substantially completed Work, and maintain such property insurance at least until the Work is complete, as set forth in Paragraph 15.06.D. Such property insurance will be written on a special perils (all-risk) form, on a replacement cost basis, and provide coverage consistent with that required for the builder's risk insurance. The builder's risk insurance may terminate upon written confirmation of Owner's procurement of such property insurance.
- D. *Partial Occupancy or Use by Owner*: If Owner will occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work, as provided in Paragraph 15.04, then Owner (directly, if it is the purchaser of the builder's risk policy, or through Contractor) will provide advance notice of such occupancy or use to the builder's risk insurer, and obtain an endorsement consenting to the continuation of coverage prior to commencing such partial occupancy or use.
- E. *Insurance of Other Property; Additional Insurance*: If the express insurance provisions of the Contract do not require or address the insurance of a property item or interest, then the entity or individual owning such property item will be responsible for insuring it. If Contractor elects to obtain other special insurance to be included in or supplement the builder's risk or property insurance policies provided under this Paragraph 6.04, it may do so at Contractor's expense.

6.05 *Property Losses; Subrogation*

- A. The builder's risk insurance policy purchased and maintained in accordance with Paragraph 6.04 (or an installation floater policy if authorized by the Supplementary Conditions), will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against

Engineer or its consultants, or their officers, directors, members, partners, employees, agents, consultants, or subcontractors.

1. Owner and Contractor waive all rights against each other and the respective officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from any of the perils, risks, or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Engineer, its consultants, all individuals or entities identified in the Supplementary Conditions as builder's risk or installation floater insureds, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, under such policies for losses and damages so caused.
 2. None of the above waivers extends to the rights that any party making such waiver may have to the proceeds of insurance held by Owner or Contractor as trustee or fiduciary, or otherwise payable under any policy so issued.
- B. Any property insurance policy maintained by Owner covering any loss, damage, or consequential loss to Owner's existing structures, buildings, or facilities in which any part of the Work will occur, or to which any part of the Work will attach or adjoin; to adjacent structures, buildings, or facilities of Owner; or to part or all of the completed or substantially completed Work, during partial occupancy or use pursuant to Paragraph 15.04, after Substantial Completion pursuant to Paragraph 15.03, or after final payment pursuant to Paragraph 15.06, will contain provisions to the effect that in the event of payment of any loss or damage the insurer will have no rights of recovery against any insureds thereunder, or against Contractor, Subcontractors, or Engineer, or the officers, directors, members, partners, employees, agents, consultants, or subcontractors of each and any of them, and that the insured is allowed to waive the insurer's rights of subrogation in a written contract executed prior to the loss, damage, or consequential loss.
1. Owner waives all rights against Contractor, Subcontractors, and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, for all losses and damages caused by, arising out of, or resulting from fire or any of the perils, risks, or causes of loss covered by such policies.
- C. The waivers in this Paragraph 6.05 include the waiver of rights due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to Owner's property or the Work caused by, arising out of, or resulting from fire or other insured peril, risk, or cause of loss.
- D. Contractor shall be responsible for assuring that each Subcontract contains provisions whereby the Subcontractor waives all rights against Owner, Contractor, all individuals or entities identified in the Supplementary Conditions as insureds, the Engineer and its consultants, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, for all losses and damages caused by, arising out of, relating to, or resulting from fire or other peril, risk, or cause of loss covered by builder's risk insurance, installation floater, and any other property insurance applicable to the Work.

6.06 *Receipt and Application of Property Insurance Proceeds*

- A. Any insured loss under the builder's risk and other policies of property insurance required by Paragraph 6.04 will be adjusted and settled with the named insured that purchased the policy. Such named insured shall act as fiduciary for the other insureds, and give notice to such other insureds that adjustment and settlement of a claim is in progress. Any other insured may state its position regarding a claim for insured loss in writing within 15 days after notice of such claim.
- B. Proceeds for such insured losses may be made payable by the insurer either jointly to multiple insureds, or to the named insured that purchased the policy in its own right and as fiduciary for other insureds, subject to the requirements of any applicable mortgage clause. A named insured receiving insurance proceeds under the builder's risk and other policies of insurance required by Paragraph 6.04 shall maintain such proceeds in a segregated account, and distribute such proceeds in accordance with such agreement as the parties in interest may reach, or as otherwise required under the dispute resolution provisions of this Contract or applicable Laws and Regulations.
- C. If no other special agreement is reached, Contractor shall repair or replace the damaged Work, using allocated insurance proceeds.

ARTICLE 7—CONTRACTOR'S RESPONSIBILITIES

7.01 *Contractor's Means and Methods of Construction*

- A. Contractor shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction.
- B. If the Contract Documents note, or Contractor determines, that professional engineering or other design services are needed to carry out Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures, or for Site safety, then Contractor shall cause such services to be provided by a properly licensed design professional, at Contractor's expense. Such services are not Owner-delegated professional design services under this Contract, and neither Owner nor Engineer has any responsibility with respect to (1) Contractor's determination of the need for such services, (2) the qualifications or licensing of the design professionals retained or employed by Contractor, (3) the performance of such services, or (4) any errors, omissions, or defects in such services.

7.02 *Supervision and Superintendence*

- A. Contractor shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent who will not be replaced without written notice to Owner and Engineer except under extraordinary circumstances.

7.03 *Labor; Working Hours*

- A. Contractor shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. Contractor shall maintain good discipline and order at the Site.

- B. Contractor shall be fully responsible to Owner and Engineer for all acts and omissions of Contractor's employees; of Suppliers and Subcontractors, and their employees; and of any other individuals or entities performing or furnishing any of the Work, just as Contractor is responsible for Contractor's own acts and omissions.
- C. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site will be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent, which will not be unreasonably withheld.

7.04 *Services, Materials, and Equipment*

- A. Unless otherwise specified in the Contract Documents, Contractor shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start up, and completion of the Work, whether or not such items are specifically called for in the Contract Documents.
- B. All materials and equipment incorporated into the Work must be new and of good quality, except as otherwise provided in the Contract Documents. All special warranties and guarantees required by the Specifications will expressly run to the benefit of Owner. If required by Engineer, Contractor shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment.
- C. All materials and equipment must be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.

7.05 *"Or Equals"*

- A. *Contractor's Request; Governing Criteria:* Whenever an item of equipment or material is specified or described in the Contract Documents by using the names of one or more proprietary items or specific Suppliers, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material, or items from other proposed Suppliers, under the circumstances described below.
 - 1. If Engineer in its sole discretion determines that an item of equipment or material proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer will deem it an "or equal" item. For the purposes of this paragraph, a proposed item of equipment or material will be considered functionally equal to an item so named if:
 - a. in the exercise of reasonable judgment Engineer determines that the proposed item:
 - 1) is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;

- 2) will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
 - 3) has a proven record of performance and availability of responsive service; and
 - 4) is not objectionable to Owner.
- b. Contractor certifies that, if the proposed item is approved and incorporated into the Work:
 - 1) there will be no increase in cost to the Owner or increase in Contract Times; and
 - 2) the item will conform substantially to the detailed requirements of the item named in the Contract Documents.
- B. *Contractor's Expense*: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.
- C. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each "or-equal" request. Engineer may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an "or-equal," which will be evidenced by an approved Shop Drawing or other written communication. Engineer will advise Contractor in writing of any negative determination.
- D. *Effect of Engineer's Determination*: Neither approval nor denial of an "or-equal" request will result in any change in Contract Price. The Engineer's denial of an "or-equal" request will be final and binding, and may not be reversed through an appeal under any provision of the Contract.
- E. *Treatment as a Substitution Request*: If Engineer determines that an item of equipment or material proposed by Contractor does not qualify as an "or-equal" item, Contractor may request that Engineer consider the item a proposed substitute pursuant to Paragraph 7.06.

7.06 Substitutes

- A. *Contractor's Request; Governing Criteria*: Unless the specification or description of an item of equipment or material required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is permitted, Contractor may request that Engineer authorize the use of other items of equipment or material under the circumstances described below. To the extent possible such requests must be made before commencement of related construction at the Site.
1. Contractor shall submit sufficient information as provided below to allow Engineer to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer will not accept requests for review of proposed substitute items of equipment or material from anyone other than Contractor.
 2. The requirements for review by Engineer will be as set forth in Paragraph 7.06.B, as supplemented by the Specifications, and as Engineer may decide is appropriate under the circumstances.

3. Contractor shall make written application to Engineer for review of a proposed substitute item of equipment or material that Contractor seeks to furnish or use. The application:
 - a. will certify that the proposed substitute item will:
 - 1) perform adequately the functions and achieve the results called for by the general design;
 - 2) be similar in substance to the item specified; and
 - 3) be suited to the same use as the item specified.
 - b. will state:
 - 1) the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times;
 - 2) whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item; and
 - 3) whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.
 - c. will identify:
 - 1) all variations of the proposed substitute item from the item specified; and
 - 2) available engineering, sales, maintenance, repair, and replacement services.
 - d. will contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.
- B. *Engineer's Evaluation and Determination*: Engineer will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer may require Contractor to furnish additional data about the proposed substitute item. Engineer will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer's review is complete and Engineer determines that the proposed item is an acceptable substitute. Engineer's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer will advise Contractor in writing of any negative determination.
- C. *Special Guarantee*: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.
- D. *Reimbursement of Engineer's Cost*: Engineer will record Engineer's costs in evaluating a substitute proposed or submitted by Contractor. Whether or not Engineer approves a substitute so proposed or submitted by Contractor, Contractor shall reimburse Owner for the reasonable charges of Engineer for evaluating each such proposed substitute. Contractor shall also reimburse Owner for the reasonable charges of Engineer for making changes in the Contract Documents (or in the provisions of any other direct contract with Owner) resulting from the acceptance of each proposed substitute.

- E. *Contractor's Expense*: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.
- F. *Effect of Engineer's Determination*: If Engineer approves the substitution request, Contractor shall execute the proposed Change Order and proceed with the substitution. The Engineer's denial of a substitution request will be final and binding, and may not be reversed through an appeal under any provision of the Contract. Contractor may challenge the scope of reimbursement costs imposed under Paragraph 7.06.D, by timely submittal of a Change Proposal.

7.07 *Concerning Subcontractors and Suppliers*

- A. Contractor may retain Subcontractors and Suppliers for the performance of parts of the Work. Such Subcontractors and Suppliers must be acceptable to Owner. The Contractor's retention of a Subcontractor or Supplier for the performance of parts of the Work will not relieve Contractor's obligation to Owner to perform and complete the Work in accordance with the Contract Documents.
- B. Contractor shall retain specific Subcontractors and Suppliers for the performance of designated parts of the Work if required by the Contract to do so.
- C. Subsequent to the submittal of Contractor's Bid or final negotiation of the terms of the Contract, Owner may not require Contractor to retain any Subcontractor or Supplier to furnish or perform any of the Work against which Contractor has reasonable objection.
- D. Prior to entry into any binding subcontract or purchase order, Contractor shall submit to Owner the identity of the proposed Subcontractor or Supplier (unless Owner has already deemed such proposed Subcontractor or Supplier acceptable during the bidding process or otherwise). Such proposed Subcontractor or Supplier shall be deemed acceptable to Owner unless Owner raises a substantive, reasonable objection within 5 days.
- E. Owner may require the replacement of any Subcontractor or Supplier. Owner also may require Contractor to retain specific replacements; provided, however, that Owner may not require a replacement to which Contractor has a reasonable objection. If Contractor has submitted the identity of certain Subcontractors or Suppliers for acceptance by Owner, and Owner has accepted it (either in writing or by failing to make written objection thereto), then Owner may subsequently revoke the acceptance of any such Subcontractor or Supplier so identified solely on the basis of substantive, reasonable objection after due investigation. Contractor shall submit an acceptable replacement for the rejected Subcontractor or Supplier.
- F. If Owner requires the replacement of any Subcontractor or Supplier retained by Contractor to perform any part of the Work, then Contractor shall be entitled to an adjustment in Contract Price or Contract Times, with respect to the replacement; and Contractor shall initiate a Change Proposal for such adjustment within 30 days of Owner's requirement of replacement.
- G. No acceptance by Owner of any such Subcontractor or Supplier, whether initially or as a replacement, will constitute a waiver of the right of Owner to the completion of the Work in accordance with the Contract Documents.

- H. On a monthly basis, Contractor shall submit to Engineer a complete list of all Subcontractors and Suppliers having a direct contract with Contractor, and of all other Subcontractors and Suppliers known to Contractor at the time of submittal.
- I. Contractor shall be solely responsible for scheduling and coordinating the work of Subcontractors and Suppliers.
- J. The divisions and sections of the Specifications and the identifications of any Drawings do not control Contractor in dividing the Work among Subcontractors or Suppliers, or in delineating the Work to be performed by any specific trade.
- K. All Work performed for Contractor by a Subcontractor or Supplier must be pursuant to an appropriate contractual agreement that specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract for the benefit of Owner and Engineer.
- L. Owner may furnish to any Subcontractor or Supplier, to the extent practicable, information about amounts paid to Contractor for Work performed for Contractor by the Subcontractor or Supplier.
- M. Contractor shall restrict all Subcontractors and Suppliers from communicating with Engineer or Owner, except through Contractor or in case of an emergency, or as otherwise expressly allowed in this Contract.

7.08 *Patent Fees and Royalties*

- A. Contractor shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If an invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if, to the actual knowledge of Owner or Engineer, its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights will be disclosed in the Contract Documents.
- B. To the fullest extent permitted by Laws and Regulations, Owner shall indemnify and hold harmless Contractor, and its officers, directors, members, partners, employees, agents, consultants, and subcontractors, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device specified in the Contract Documents, but not identified as being subject to payment of any license fee or royalty to others required by patent rights or copyrights.
- C. To the fullest extent permitted by Laws and Regulations, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

7.09 *Permits*

- A. Unless otherwise provided in the Contract Documents, Contractor shall obtain and pay for all construction permits, licenses, and certificates of occupancy. Owner shall assist Contractor, when necessary, in obtaining such permits and licenses. Contractor shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of the submission of Contractor's Bid (or when Contractor became bound under a negotiated contract). Owner shall pay all charges of utility owners for connections for providing permanent service to the Work.

7.10 *Taxes*

- A. Contractor shall pay all sales, consumer, use, and other similar taxes required to be paid by Contractor in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.

7.11 *Laws and Regulations*

- A. Contractor shall give all notices required by and shall comply with all Laws and Regulations applicable to the performance of the Work. Neither Owner nor Engineer shall be responsible for monitoring Contractor's compliance with any Laws or Regulations.
- B. If Contractor performs any Work or takes any other action knowing or having reason to know that it is contrary to Laws or Regulations, Contractor shall bear all resulting costs and losses, and shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants, and subcontractors of each and any of them, from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work or other action. It is not Contractor's responsibility to make certain that the Work described in the Contract Documents is in accordance with Laws and Regulations, but this does not relieve Contractor of its obligations under Paragraph 3.03.
- C. Owner or Contractor may give written notice to the other party of any changes after the submission of Contractor's Bid (or after the date when Contractor became bound under a negotiated contract) in Laws or Regulations having an effect on the cost or time of performance of the Work, including but not limited to changes in Laws or Regulations having an effect on procuring permits and on sales, use, value-added, consumption, and other similar taxes. If Owner and Contractor are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times resulting from such changes, then within 30 days of such written notice Contractor may submit a Change Proposal, or Owner may initiate a Claim.

7.12 *Record Documents*

- A. Contractor shall maintain in a safe place at the Site one printed record copy of all Drawings, Specifications, Addenda, Change Orders, Work Change Directives, Field Orders, written interpretations and clarifications, and approved Shop Drawings. Contractor shall keep such record documents in good order and annotate them to show changes made during construction. These record documents, together with all approved Samples, will be available to Engineer for reference. Upon completion of the Work, Contractor shall deliver these record documents to Engineer.

7.13 *Safety and Protection*

- A. Contractor shall be solely responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the Work. Such responsibility does not relieve Subcontractors of their responsibility for the safety of persons or property in the performance of their work, nor for compliance with applicable safety Laws and Regulations.
- B. Contractor shall designate a qualified and experienced safety representative whose duties and responsibilities are the prevention of Work-related accidents and the maintenance and supervision of safety precautions and programs.
- C. Contractor shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury, or loss to:
 - 1. all persons on the Site or who may be affected by the Work;
 - 2. all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and
 - 3. other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, other work in progress, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.
- D. All damage, injury, or loss to any property referred to in Paragraph 7.13.C.2 or 7.13.C.3 caused, directly or indirectly, in whole or in part, by Contractor, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by Contractor at its expense (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of Owner or Engineer or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of Contractor or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them).
- E. Contractor shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection.
- F. Contractor shall notify Owner; the owners of adjacent property; the owners of Underground Facilities and other utilities (if the identity of such owners is known to Contractor); and other contractors and utility owners performing work at or adjacent to the Site, in writing, when Contractor knows that prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property or work in progress.
- G. Contractor shall comply with the applicable requirements of Owner's safety programs, if any. Any Owner's safety programs that are applicable to the Work are identified or included in the Supplementary Conditions or Specifications.
- H. Contractor shall inform Owner and Engineer of the specific requirements of Contractor's safety program with which Owner's and Engineer's employees and representatives must comply while at the Site.

- I. Contractor's duties and responsibilities for safety and protection will continue until all the Work is completed, Engineer has issued a written notice to Owner and Contractor in accordance with Paragraph 15.06.C that the Work is acceptable, and Contractor has left the Site (except as otherwise expressly provided in connection with Substantial Completion).
- J. Contractor's duties and responsibilities for safety and protection will resume whenever Contractor or any Subcontractor or Supplier returns to the Site to fulfill warranty or correction obligations, or to conduct other tasks arising from the Contract Documents.

7.14 *Hazard Communication Programs*

- A. Contractor shall be responsible for coordinating any exchange of safety data sheets (formerly known as material safety data sheets) or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.

7.15 *Emergencies*

- A. In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, Contractor is obligated to act to prevent damage, injury, or loss. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused by an emergency, or are required as a result of Contractor's response to an emergency. If Engineer determines that a change in the Contract Documents is required because of an emergency or Contractor's response, a Work Change Directive or Change Order will be issued.

7.16 *Submittals*

A. *Shop Drawing and Sample Requirements*

- 1. Before submitting a Shop Drawing or Sample, Contractor shall:
 - a. review and coordinate the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
 - b. determine and verify:
 - 1) all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect to the Submittal;
 - 2) the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
 - 3) all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto;
 - c. confirm that the Submittal is complete with respect to all related data included in the Submittal.
- 2. Each Shop Drawing or Sample must bear a stamp or specific written certification that Contractor has satisfied Contractor's obligations under the Contract Documents with respect to Contractor's review of that Submittal, and that Contractor approves the Submittal.

3. With each Shop Drawing or Sample, Contractor shall give Engineer specific written notice of any variations that the Submittal may have from the requirements of the Contract Documents. This notice must be set forth in a written communication separate from the Submittal; and, in addition, in the case of a Shop Drawing by a specific notation made on the Shop Drawing itself.
- B. *Submittal Procedures for Shop Drawings and Samples:* Contractor shall label and submit Shop Drawings and Samples to Engineer for review and approval in accordance with the accepted Schedule of Submittals.
1. *Shop Drawings*
 - a. Contractor shall submit the number of copies required in the Specifications.
 - b. Data shown on the Shop Drawings must be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show Engineer the services, materials, and equipment Contractor proposes to provide, and to enable Engineer to review the information for the limited purposes required by Paragraph 7.16.C.
 2. *Samples*
 - a. Contractor shall submit the number of Samples required in the Specifications.
 - b. Contractor shall clearly identify each Sample as to material, Supplier, pertinent data such as catalog numbers, the use for which intended and other data as Engineer may require to enable Engineer to review the Submittal for the limited purposes required by Paragraph 7.16.C.
 3. Where a Shop Drawing or Sample is required by the Contract Documents or the Schedule of Submittals, any related Work performed prior to Engineer's review and approval of the pertinent submittal will be at the sole expense and responsibility of Contractor.
- C. *Engineer's Review of Shop Drawings and Samples*
1. Engineer will provide timely review of Shop Drawings and Samples in accordance with the accepted Schedule of Submittals. Engineer's review and approval will be only to determine if the items covered by the Submittals will, after installation or incorporation in the Work, comply with the requirements of the Contract Documents, and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.
 2. Engineer's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction, or to safety precautions or programs incident thereto.
 3. Engineer's review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.
 4. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for any variation from the requirements of the Contract Documents unless Contractor has complied with the requirements of Paragraph 7.16.A.3 and Engineer has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample. Engineer will

document any such approved variation from the requirements of the Contract Documents in a Field Order or other appropriate Contract modification.

5. Engineer's review and approval of a Shop Drawing or Sample will not relieve Contractor from responsibility for complying with the requirements of Paragraphs 7.16.A and B.
6. Engineer's review and approval of a Shop Drawing or Sample, or of a variation from the requirements of the Contract Documents, will not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.
7. Neither Engineer's receipt, review, acceptance, or approval of a Shop Drawing or Sample will result in such item becoming a Contract Document.
8. Contractor shall perform the Work in compliance with the requirements and commitments set forth in approved Shop Drawings and Samples, subject to the provisions of Paragraph 7.16.C.4.

D. Resubmittal Procedures for Shop Drawings and Samples

1. Contractor shall make corrections required by Engineer and shall return the required number of corrected copies of Shop Drawings and submit, as required, new Samples for review and approval. Contractor shall direct specific attention in writing to revisions other than the corrections called for by Engineer on previous Submittals.
2. Contractor shall furnish required Shop Drawing and Sample submittals with sufficient information and accuracy to obtain required approval of an item with no more than two resubmittals. Engineer will record Engineer's time for reviewing a third or subsequent resubmittal of a Shop Drawing or Sample, and Contractor shall be responsible for Engineer's charges to Owner for such time. Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges.
3. If Contractor requests a change of a previously approved Shop Drawing or Sample, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

E. Submittals Other than Shop Drawings, Samples, and Owner-Delegated Designs

1. The following provisions apply to all Submittals other than Shop Drawings, Samples, and Owner-delegated designs:
 - a. Contractor shall submit all such Submittals to the Engineer in accordance with the Schedule of Submittals and pursuant to the applicable terms of the Contract Documents.
 - b. Engineer will provide timely review of all such Submittals in accordance with the Schedule of Submittals and return such Submittals with a notation of either Accepted or Not Accepted. Any such Submittal that is not returned within the time established in the Schedule of Submittals will be deemed accepted.
 - c. Engineer's review will be only to determine if the Submittal is acceptable under the requirements of the Contract Documents as to general form and content of the Submittal.

- d. If any such Submittal is not accepted, Contractor shall confer with Engineer regarding the reason for the non-acceptance, and resubmit an acceptable document.
- 2. Procedures for the submittal and acceptance of the Progress Schedule, the Schedule of Submittals, and the Schedule of Values are set forth in Paragraphs 2.03, 2.04, and 2.05.
- F. Owner-delegated Designs: Submittals pursuant to Owner-delegated designs are governed by the provisions of Paragraph 7.19.

7.17 Contractor's General Warranty and Guarantee

- A. Contractor warrants and guarantees to Owner that all Work will be in accordance with the Contract Documents and will not be defective. Engineer is entitled to rely on Contractor's warranty and guarantee.
- B. Owner's rights under this warranty and guarantee are in addition to, and are not limited by, Owner's rights under the correction period provisions of Paragraph 15.08. The time in which Owner may enforce its warranty and guarantee rights under this Paragraph 7.17 is limited only by applicable Laws and Regulations restricting actions to enforce such rights; provided, however, that after the end of the correction period under Paragraph 15.08:
 - 1. Owner shall give Contractor written notice of any defective Work within 60 days of the discovery that such Work is defective; and
 - 2. Such notice will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the notice.
- C. Contractor's warranty and guarantee hereunder excludes defects or damage caused by:
 - 1. abuse, or improper modification, maintenance, or operation, by persons other than Contractor, Subcontractors, Suppliers, or any other individual or entity for whom Contractor is responsible; or
 - 2. normal wear and tear under normal usage.
- D. Contractor's obligation to perform and complete the Work in accordance with the Contract Documents is absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents, a release of Contractor's obligation to perform the Work in accordance with the Contract Documents, or a release of Owner's warranty and guarantee rights under this Paragraph 7.17:
 - 1. Observations by Engineer;
 - 2. Recommendation by Engineer or payment by Owner of any progress or final payment;
 - 3. The issuance of a certificate of Substantial Completion by Engineer or any payment related thereto by Owner;
 - 4. Use or occupancy of the Work or any part thereof by Owner;
 - 5. Any review and approval of a Shop Drawing or Sample submittal;
 - 6. The issuance of a notice of acceptability by Engineer;
 - 7. The end of the correction period established in Paragraph 15.08;
 - 8. Any inspection, test, or approval by others; or

9. Any correction of defective Work by Owner.
- E. If the Contract requires the Contractor to accept the assignment of a contract entered into by Owner, then the specific warranties, guarantees, and correction obligations contained in the assigned contract will govern with respect to Contractor's performance obligations to Owner for the Work described in the assigned contract.

7.18 Indemnification

- A. To the fullest extent permitted by Laws and Regulations, and in addition to any other obligations of Contractor under the Contract or otherwise, Contractor shall indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them, from losses, damages, costs, and judgments (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals, and all court or arbitration or other dispute resolution costs) arising from third-party claims or actions relating to or resulting from the performance or furnishing of the Work, provided that any such claim, action, loss, cost, judgment or damage is attributable to bodily injury, sickness, disease, or death, or to damage to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom, but only to the extent caused by any negligent act or omission of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable.
- B. In any and all claims against Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, by any employee (or the survivor or personal representative of such employee) of Contractor, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under Paragraph 7.18.A will not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for Contractor or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.

7.19 Delegation of Professional Design Services

- A. Owner may require Contractor to provide professional design services for a portion of the Work by express delegation in the Contract Documents. Such delegation will specify the performance and design criteria that such services must satisfy, and the Submittals that Contractor must furnish to Engineer with respect to the Owner-delegated design.
- B. Contractor shall cause such Owner-delegated professional design services to be provided pursuant to the professional standard of care by a properly licensed design professional, whose signature and seal must appear on all drawings, calculations, specifications, certifications, and Submittals prepared by such design professional. Such design professional must issue all certifications of design required by Laws and Regulations.
- C. If a Shop Drawing or other Submittal related to the Owner-delegated design is prepared by Contractor, a Subcontractor, or others for submittal to Engineer, then such Shop Drawing or other Submittal must bear the written approval of Contractor's design professional when submitted by Contractor to Engineer.

- D. Owner and Engineer shall be entitled to rely upon the adequacy, accuracy, and completeness of the services, certifications, and approvals performed or provided by the design professionals retained or employed by Contractor under an Owner-delegated design, subject to the professional standard of care and the performance and design criteria stated in the Contract Documents.
- E. Pursuant to this Paragraph 7.19, Engineer's review, approval, and other determinations regarding design drawings, calculations, specifications, certifications, and other Submittals furnished by Contractor pursuant to an Owner-delegated design will be only for the following limited purposes:
 - 1. Checking for conformance with the requirements of this Paragraph 7.19;
 - 2. Confirming that Contractor (through its design professionals) has used the performance and design criteria specified in the Contract Documents; and
 - 3. Establishing that the design furnished by Contractor is consistent with the design concept expressed in the Contract Documents.
- F. Contractor shall not be responsible for the adequacy of performance or design criteria specified by Owner or Engineer.
- G. Contractor is not required to provide professional services in violation of applicable Laws and Regulations.

ARTICLE 8—OTHER WORK AT THE SITE

8.01 *Other Work*

- A. In addition to and apart from the Work under the Contract Documents, the Owner may perform other work at or adjacent to the Site. Such other work may be performed by Owner's employees, or through contracts between the Owner and third parties. Owner may also arrange to have third-party utility owners perform work on their utilities and facilities at or adjacent to the Site.
- B. If Owner performs other work at or adjacent to the Site with Owner's employees, or through contracts for such other work, then Owner shall give Contractor written notice thereof prior to starting any such other work. If Owner has advance information regarding the start of any third-party utility work that Owner has arranged to take place at or adjacent to the Site, Owner shall provide such information to Contractor.
- C. Contractor shall afford proper and safe access to the Site to each contractor that performs such other work, each utility owner performing other work, and Owner, if Owner is performing other work with Owner's employees, and provide a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work.
- D. Contractor shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. Contractor shall not endanger any work of others by cutting, excavating, or otherwise altering such work; provided, however, that Contractor may cut or alter others' work with the written consent of Engineer and the others whose work will be affected.

- E. If the proper execution or results of any part of Contractor's Work depends upon work performed by others, Contractor shall inspect such other work and promptly report to Engineer in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of Contractor's Work. Contractor's failure to so report will constitute an acceptance of such other work as fit and proper for integration with Contractor's Work except for latent defects and deficiencies in such other work.
- F. The provisions of this article are not applicable to work that is performed by third-party utilities or other third-party entities without a contract with Owner, or that is performed without having been arranged by Owner. If such work occurs, then any related delay, disruption, or interference incurred by Contractor is governed by the provisions of Paragraph 4.05.C.3.

8.02 *Coordination*

- A. If Owner intends to contract with others for the performance of other work at or adjacent to the Site, to perform other work at or adjacent to the Site with Owner's employees, or to arrange to have utility owners perform work at or adjacent to the Site, the following will be set forth in the Supplementary Conditions or provided to Contractor prior to the start of any such other work:
 - 1. The identity of the individual or entity that will have authority and responsibility for coordination of the activities among the various contractors;
 - 2. An itemization of the specific matters to be covered by such authority and responsibility; and
 - 3. The extent of such authority and responsibilities.
- B. Unless otherwise provided in the Supplementary Conditions, Owner shall have sole authority and responsibility for such coordination.

8.03 *Legal Relationships*

- A. If, in the course of performing other work for Owner at or adjacent to the Site, the Owner's employees, any other contractor working for Owner, or any utility owner that Owner has arranged to perform work, causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall be entitled to an equitable adjustment in the Contract Price or the Contract Times. Contractor must submit any Change Proposal seeking an equitable adjustment in the Contract Price or the Contract Times under this paragraph within 30 days of the damaging, delaying, disrupting, or interfering event. The entitlement to, and extent of, any such equitable adjustment will take into account information (if any) regarding such other work that was provided to Contractor in the Contract Documents prior to the submittal of the Bid or the final negotiation of the terms of the Contract, and any remedies available to Contractor under Laws or Regulations concerning utility action or inaction. When applicable, any such equitable adjustment in Contract Price will be conditioned on Contractor assigning to Owner all Contractor's rights against such other contractor or utility owner with respect to the damage, delay, disruption, or interference that is the subject of the adjustment. Contractor's entitlement to an adjustment of the Contract Times or Contract Price is subject to the provisions of Paragraphs 4.05.D and 4.05.E.

- B. Contractor shall take reasonable and customary measures to avoid damaging, delaying, disrupting, or interfering with the work of Owner, any other contractor, or any utility owner performing other work at or adjacent to the Site.
 - 1. If Contractor fails to take such measures and as a result damages, delays, disrupts, or interferes with the work of any such other contractor or utility owner, then Owner may impose a set-off against payments due Contractor, and assign to such other contractor or utility owner the Owner's contractual rights against Contractor with respect to the breach of the obligations set forth in this Paragraph 8.03.B.
 - 2. When Owner is performing other work at or adjacent to the Site with Owner's employees, Contractor shall be liable to Owner for damage to such other work, and for the reasonable direct delay, disruption, and interference costs incurred by Owner as a result of Contractor's failure to take reasonable and customary measures with respect to Owner's other work. In response to such damage, delay, disruption, or interference, Owner may impose a set-off against payments due Contractor.
- C. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, then Contractor shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents, consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9—OWNER'S RESPONSIBILITIES

9.01 *Communications to Contractor*

- A. Except as otherwise provided in these General Conditions, Owner shall issue all communications to Contractor through Engineer.

9.02 *Replacement of Engineer*

- A. Owner may at its discretion appoint an engineer to replace Engineer, provided Contractor makes no reasonable objection to the replacement engineer. The replacement engineer's status under the Contract Documents will be that of the former Engineer.

9.03 *Furnish Data*

- A. Owner shall promptly furnish the data required of Owner under the Contract Documents.

9.04 *Pay When Due*

- A. Owner shall make payments to Contractor when they are due as provided in the Agreement.

9.05 *Lands and Easements; Reports, Tests, and Drawings*

- A. Owner's duties with respect to providing lands and easements are set forth in Paragraph 5.01.
- B. Owner's duties with respect to providing engineering surveys to establish reference points are set forth in Paragraph 4.03.
- C. Article 5 refers to Owner's identifying and making available to Contractor copies of reports of explorations and tests of conditions at the Site, and drawings of physical conditions relating to existing surface or subsurface structures at the Site.

9.06 *Insurance*

- A. Owner's responsibilities, if any, with respect to purchasing and maintaining liability and property insurance are set forth in Article 6.

9.07 *Change Orders*

- A. Owner's responsibilities with respect to Change Orders are set forth in Article 11.

9.08 *Inspections, Tests, and Approvals*

- A. Owner's responsibility with respect to certain inspections, tests, and approvals is set forth in Paragraph 14.02.B.

9.09 *Limitations on Owner's Responsibilities*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for, Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

9.10 *Undisclosed Hazardous Environmental Condition*

- A. Owner's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in Paragraph 5.06.

9.11 *Evidence of Financial Arrangements*

- A. Upon request of Contractor, Owner shall furnish Contractor reasonable evidence that financial arrangements have been made to satisfy Owner's obligations under the Contract (including obligations under proposed changes in the Work).

9.12 *Safety Programs*

- A. While at the Site, Owner's employees and representatives shall comply with the specific applicable requirements of Contractor's safety programs of which Owner has been informed.
- B. Owner shall furnish copies of any applicable Owner safety programs to Contractor.

ARTICLE 10—ENGINEER'S STATUS DURING CONSTRUCTION

10.01 *Owner's Representative*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in the Contract.

10.02 *Visits to Site*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe, as an experienced and qualified design professional, the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Paragraph 10.07. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work, Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.

10.03 *Resident Project Representative*

- A. If Owner and Engineer have agreed that Engineer will furnish a Resident Project Representative to represent Engineer at the Site and assist Engineer in observing the progress and quality of the Work, then the authority and responsibilities of any such Resident Project Representative will be as provided in the Supplementary Conditions, and limitations on the responsibilities thereof will be as provided in the Supplementary Conditions and in Paragraph 10.07.
- B. If Owner designates an individual or entity who is not Engineer's consultant, agent, or employee to represent Owner at the Site, then the responsibilities and authority of such individual or entity will be as provided in the Supplementary Conditions.

10.04 *Engineer's Authority*

- A. Engineer has the authority to reject Work in accordance with Article 14.
- B. Engineer's authority as to Submittals is set forth in Paragraph 7.16.
- C. Engineer's authority as to design drawings, calculations, specifications, certifications and other Submittals from Contractor in response to Owner's delegation (if any) to Contractor of professional design services, is set forth in Paragraph 7.19.
- D. Engineer's authority as to changes in the Work is set forth in Article 11.

E. Engineer's authority as to Applications for Payment is set forth in Article 15.

10.05 *Determinations for Unit Price Work*

A. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor as set forth in Paragraph 13.03.

10.06 *Decisions on Requirements of Contract Documents and Acceptability of Work*

A. Engineer will render decisions regarding the requirements of the Contract Documents, and judge the acceptability of the Work, pursuant to the specific procedures set forth herein for initial interpretations, Change Proposals, and acceptance of the Work. In rendering such decisions and judgments, Engineer will not show partiality to Owner or Contractor, and will not be liable to Owner, Contractor, or others in connection with any proceedings, interpretations, decisions, or judgments conducted or rendered in good faith.

10.07 *Limitations on Engineer's Authority and Responsibilities*

A. Neither Engineer's authority or responsibility under this Article 10 or under any other provision of the Contract, nor any decision made by Engineer in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by Engineer, will create, impose, or give rise to any duty in contract, tort, or otherwise owed by Engineer to Contractor, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.

B. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

C. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.

D. Engineer's review of the final Application for Payment and accompanying documentation, and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by Contractor under Paragraph 15.06.A, will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals, that the results certified indicate compliance with the Contract Documents.

E. The limitations upon authority and responsibility set forth in this Paragraph 10.07 also apply to the Resident Project Representative, if any.

10.08 *Compliance with Safety Program*

A. While at the Site, Engineer's employees and representatives will comply with the specific applicable requirements of Owner's and Contractor's safety programs of which Engineer has been informed.

ARTICLE 11—CHANGES TO THE CONTRACT

11.01 *Amending and Supplementing the Contract*

- A. The Contract may be amended or supplemented by a Change Order, a Work Change Directive, or a Field Order.
- B. If an amendment or supplement to the Contract includes a change in the Contract Price or the Contract Times, such amendment or supplement must be set forth in a Change Order.
- C. All changes to the Contract that involve (1) the performance or acceptability of the Work, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, must be supported by Engineer's recommendation. Owner and Contractor may amend other terms and conditions of the Contract without the recommendation of the Engineer.

11.02 *Change Orders*

- A. Owner and Contractor shall execute appropriate Change Orders covering:
 - 1. Changes in Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive;
 - 2. Changes in Contract Price resulting from an Owner set-off, unless Contractor has duly contested such set-off;
 - 3. Changes in the Work which are: (a) ordered by Owner pursuant to Paragraph 11.05, (b) required because of Owner's acceptance of defective Work under Paragraph 14.04 or Owner's correction of defective Work under Paragraph 14.07, or (c) agreed to by the parties, subject to the need for Engineer's recommendation if the change in the Work involves the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters; and
 - 4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Article 12, Claims; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.
- B. If Owner or Contractor refuses to execute a Change Order that is required to be executed under the terms of Paragraph 11.02.A, it will be deemed to be of full force and effect, as if fully executed.

11.03 *Work Change Directives*

- A. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the modification ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order, following negotiations by the parties as to the Work Change Directive's effect, if any, on the Contract Price and Contract Times; or, if negotiations are unsuccessful, by a determination under the terms of the Contract Documents governing adjustments, expressly including Paragraph 11.07 regarding change of Contract Price.

- B. If Owner has issued a Work Change Directive and:
 - 1. Contractor believes that an adjustment in Contract Times or Contract Price is necessary, then Contractor shall submit any Change Proposal seeking such an adjustment no later than 30 days after the completion of the Work set out in the Work Change Directive.
 - 2. Owner believes that an adjustment in Contract Times or Contract Price is necessary, then Owner shall submit any Claim seeking such an adjustment no later than 60 days after issuance of the Work Change Directive.

11.04 *Field Orders*

- A. Engineer may authorize minor changes in the Work if the changes do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Such changes will be accomplished by a Field Order and will be binding on Owner and also on Contractor, which shall perform the Work involved promptly.
- B. If Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, then before proceeding with the Work at issue, Contractor shall submit a Change Proposal as provided herein.

11.05 *Owner-Authorized Changes in the Work*

- A. Without invalidating the Contract and without notice to any surety, Owner may, at any time or from time to time, order additions, deletions, or revisions in the Work. Changes involving the design (as set forth in the Drawings, Specifications, or otherwise) or other engineering or technical matters will be supported by Engineer's recommendation.
- B. Such changes in the Work may be accomplished by a Change Order, if Owner and Contractor have agreed as to the effect, if any, of the changes on Contract Times or Contract Price; or by a Work Change Directive. Upon receipt of any such document, Contractor shall promptly proceed with the Work involved; or, in the case of a deletion in the Work, promptly cease construction activities with respect to such deleted Work. Added or revised Work must be performed under the applicable conditions of the Contract Documents.
- C. Nothing in this Paragraph 11.05 obligates Contractor to undertake work that Contractor reasonably concludes cannot be performed in a manner consistent with Contractor's safety obligations under the Contract Documents or Laws and Regulations.

11.06 *Unauthorized Changes in the Work*

- A. Contractor shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents, as amended, modified, or supplemented, except in the case of an emergency as provided in Paragraph 7.15 or in the case of uncovering Work as provided in Paragraph 14.05.C.2.

11.07 *Change of Contract Price*

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment of Contract Price must comply with the provisions of Article 12.
- B. An adjustment in the Contract Price will be determined as follows:

1. Where the Work involved is covered by unit prices contained in the Contract Documents, then by application of such unit prices to the quantities of the items involved (subject to the provisions of Paragraph 13.03);
 2. Where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with Paragraph 11.07.C.2); or
 3. Where the Work involved is not covered by unit prices contained in the Contract Documents and the parties do not reach mutual agreement to a lump sum, then on the basis of the Cost of the Work (determined as provided in Paragraph 13.01) plus a Contractor's fee for overhead and profit (determined as provided in Paragraph 11.07.C).
- C. *Contractor's Fee:* When applicable, the Contractor's fee for overhead and profit will be determined as follows:
1. A mutually acceptable fixed fee; or
 2. If a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:
 - a. For costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2, the Contractor's fee will be 15 percent;
 - b. For costs incurred under Paragraph 13.01.B.3, the Contractor's fee will be 5 percent;
 - c. Where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of Paragraphs 11.07.C.2.a and 11.07.C.2.b is that the Contractor's fee will be based on: (1) a fee of 15 percent of the costs incurred under Paragraphs 13.01.B.1 and 13.01.B.2 by the Subcontractor that actually performs the Work, at whatever tier, and (2) with respect to Contractor itself and to any Subcontractors of a tier higher than that of the Subcontractor that actually performs the Work, a fee of 5 percent of the amount (fee plus underlying costs incurred) attributable to the next lower tier Subcontractor; provided, however, that for any such subcontracted Work the maximum total fee to be paid by Owner will be no greater than 27 percent of the costs incurred by the Subcontractor that actually performs the Work;
 - d. No fee will be payable on the basis of costs itemized under Paragraphs 13.01.B.4, 13.01.B.5, and 13.01.C;
 - e. The amount of credit to be allowed by Contractor to Owner for any change which results in a net decrease in Cost of the Work will be the amount of the actual net decrease in Cost of the Work and a deduction of an additional amount equal to 5 percent of such actual net decrease in Cost of the Work; and
 - f. When both additions and credits are involved in any one change or Change Proposal, the adjustment in Contractor's fee will be computed by determining the sum of the costs in each of the cost categories in Paragraph 13.01.B (specifically, payroll costs, Paragraph 13.01.B.1; incorporated materials and equipment costs, Paragraph 13.01.B.2; Subcontract costs, Paragraph 13.01.B.3; special consultants costs, Paragraph 13.01.B.4; and other costs, Paragraph 13.01.B.5) and applying to each such cost category sum the appropriate fee from Paragraphs 11.07.C.2.a through 11.07.C.2.e, inclusive.

11.08 *Change of Contract Times*

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times must comply with the provisions of Paragraph 11.09. Any Claim for an adjustment in the Contract Times must comply with the provisions of Article 12.
- B. Delay, disruption, and interference in the Work, and any related changes in Contract Times, are addressed in and governed by Paragraph 4.05.

11.09 *Change Proposals*

- A. *Purpose and Content:* Contractor shall submit a Change Proposal to Engineer to request an adjustment in the Contract Times or Contract Price; contest an initial decision by Engineer concerning the requirements of the Contract Documents or relating to the acceptability of the Work under the Contract Documents; challenge a set-off against payment due; or seek other relief under the Contract. The Change Proposal will specify any proposed change in Contract Times or Contract Price, or other proposed relief, and explain the reason for the proposed change, with citations to any governing or applicable provisions of the Contract Documents. Each Change Proposal will address only one issue, or a set of closely related issues.

- B. *Change Proposal Procedures*

- 1. *Submittal:* Contractor shall submit each Change Proposal to Engineer within 30 days after the start of the event giving rise thereto, or after such initial decision.
- 2. *Supporting Data:* The Contractor shall submit supporting data, including the proposed change in Contract Price or Contract Time (if any), to the Engineer and Owner within 15 days after the submittal of the Change Proposal.
 - a. Change Proposals based on or related to delay, interruption, or interference must comply with the provisions of Paragraphs 4.05.D and 4.05.E.
 - b. Change proposals related to a change of Contract Price must include full and detailed accounts of materials incorporated into the Work and labor and equipment used for the subject Work.

The supporting data must be accompanied by a written statement that the supporting data are accurate and complete, and that any requested time or price adjustment is the entire adjustment to which Contractor believes it is entitled as a result of said event.

- 3. *Engineer's Initial Review:* Engineer will advise Owner regarding the Change Proposal, and consider any comments or response from Owner regarding the Change Proposal. If in its discretion Engineer concludes that additional supporting data is needed before conducting a full review and making a decision regarding the Change Proposal, then Engineer may request that Contractor submit such additional supporting data by a date specified by Engineer, prior to Engineer beginning its full review of the Change Proposal.
- 4. *Engineer's Full Review and Action on the Change Proposal:* Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change

Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied, thereby commencing the time for appeal of the denial under Article 12.

5. *Binding Decision*: Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision by filing a Claim under Article 12.
- C. *Resolution of Certain Change Proposals*: If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial, and Contractor may choose to seek resolution under the terms of Article 12.
- D. *Post-Completion*: Contractor shall not submit any Change Proposals after Engineer issues a written recommendation of final payment pursuant to Paragraph 15.06.B.

11.10 *Notification to Surety*

- A. If the provisions of any bond require notice to be given to a surety of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times), the giving of any such notice will be Contractor's responsibility. The amount of each applicable bond will be adjusted to reflect the effect of any such change.

ARTICLE 12—CLAIMS

12.01 *Claims*

- A. *Claims Process*: The following disputes between Owner and Contractor are subject to the Claims process set forth in this article:
 1. Appeals by Owner or Contractor of Engineer's decisions regarding Change Proposals;
 2. Owner demands for adjustments in the Contract Price or Contract Times, or other relief under the Contract Documents;
 3. Disputes that Engineer has been unable to address because they do not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters; and
 4. Subject to the waiver provisions of Paragraph 15.07, any dispute arising after Engineer has issued a written recommendation of final payment pursuant to Paragraph 15.06.B.
- B. *Submittal of Claim*: The party submitting a Claim shall deliver it directly to the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto; in the case of appeals regarding Change Proposals within 30 days of the decision under appeal. The party submitting the Claim shall also furnish a copy to the Engineer, for its information only. The responsibility to substantiate a Claim rests with the party making the Claim. In the case of a Claim by Contractor seeking an increase in the Contract Times or Contract Price, Contractor shall certify that the Claim is made in good faith, that the supporting data are accurate and complete, and that to the best of Contractor's knowledge

and belief the amount of time or money requested accurately reflects the full amount to which Contractor is entitled.

- C. *Review and Resolution*: The party receiving a Claim shall review it thoroughly, giving full consideration to its merits. The two parties shall seek to resolve the Claim through the exchange of information and direct negotiations. The parties may extend the time for resolving the Claim by mutual agreement. All actions taken on a Claim will be stated in writing and submitted to the other party, with a copy to Engineer.
- D. *Mediation*
 - 1. At any time after initiation of a Claim, Owner and Contractor may mutually agree to mediation of the underlying dispute. The agreement to mediate will stay the Claim submittal and response process.
 - 2. If Owner and Contractor agree to mediation, then after 60 days from such agreement, either Owner or Contractor may unilaterally terminate the mediation process, and the Claim submittal and decision process will resume as of the date of the termination. If the mediation proceeds but is unsuccessful in resolving the dispute, the Claim submittal and decision process will resume as of the date of the conclusion of the mediation, as determined by the mediator.
 - 3. Owner and Contractor shall each pay one-half of the mediator's fees and costs.
- E. *Partial Approval*: If the party receiving a Claim approves the Claim in part and denies it in part, such action will be final and binding unless within 30 days of such action the other party invokes the procedure set forth in Article 17 for final resolution of disputes.
- F. *Denial of Claim*: If efforts to resolve a Claim are not successful, the party receiving the Claim may deny it by giving written notice of denial to the other party. If the receiving party does not take action on the Claim within 90 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of the inaction, the Claim is deemed denied, thereby commencing the time for appeal of the denial. A denial of the Claim will be final and binding unless within 30 days of the denial the other party invokes the procedure set forth in Article 17 for the final resolution of disputes.
- G. *Final and Binding Results*: If the parties reach a mutual agreement regarding a Claim, whether through approval of the Claim, direct negotiations, mediation, or otherwise; or if a Claim is approved in part and denied in part, or denied in full, and such actions become final and binding; then the results of the agreement or action on the Claim will be incorporated in a Change Order or other written document to the extent they affect the Contract, including the Work, the Contract Times, or the Contract Price.

ARTICLE 13—COST OF THE WORK; ALLOWANCES; UNIT PRICE WORK

13.01 *Cost of the Work*

- A. *Purposes for Determination of Cost of the Work*: The term Cost of the Work means the sum of all costs necessary for the proper performance of the Work at issue, as further defined below. The provisions of this Paragraph 13.01 are used for two distinct purposes:
 - 1. To determine Cost of the Work when Cost of the Work is a component of the Contract Price, under cost-plus-fee, time-and-materials, or other cost-based terms; or

2. When needed to determine the value of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price. When the value of any such adjustment is determined on the basis of Cost of the Work, Contractor is entitled only to those additional or incremental costs required because of the change in the Work or because of the event giving rise to the adjustment.
- B. *Costs Included:* Except as otherwise may be agreed to in writing by Owner, costs included in the Cost of the Work will be in amounts no higher than those commonly incurred in the locality of the Project, will not include any of the costs itemized in Paragraph 13.01.C, and will include only the following items:
1. Payroll costs for employees in the direct employ of Contractor in the performance of the Work under schedules of job classifications agreed upon by Owner and Contractor in advance of the subject Work. Such employees include, without limitation, superintendents, foremen, safety managers, safety representatives, and other personnel employed full time on the Work. Payroll costs for employees not employed full time on the Work will be apportioned on the basis of their time spent on the Work. Payroll costs include, but are not limited to, salaries and wages plus the cost of fringe benefits, which include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, sick leave, and vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, will be included in the above to the extent authorized by Owner.
 2. Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts accrue to Contractor unless Owner deposits funds with Contractor with which to make payments, in which case the cash discounts will accrue to Owner. All trade discounts, rebates, and refunds and returns from sale of surplus materials and equipment will accrue to Owner, and Contractor shall make provisions so that they may be obtained.
 3. Payments made by Contractor to Subcontractors for Work performed by Subcontractors. If required by Owner, Contractor shall obtain competitive bids from subcontractors acceptable to Owner and Contractor and shall deliver such bids to Owner, which will then determine, with the advice of Engineer, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee will be determined in the same manner as Contractor's Cost of the Work and fee as provided in this Paragraph 13.01.
 4. Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed or retained for services specifically related to the Work.
 5. Other costs consisting of the following:
 - a. The proportion of necessary transportation, travel, and subsistence expenses of Contractor's employees incurred in discharge of duties connected with the Work.
 - b. Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, which are

consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of Contractor.

- 1) In establishing included costs for materials such as scaffolding, plating, or sheeting, consideration will be given to the actual or the estimated life of the material for use on other projects; or rental rates may be established on the basis of purchase or salvage value of such items, whichever is less. Contractor will not be eligible for compensation for such items in an amount that exceeds the purchase cost of such item.

c. *Construction Equipment Rental*

- 1) Rentals of all construction equipment and machinery, and the parts thereof, in accordance with rental agreements approved by Owner as to price (including any surcharge or special rates applicable to overtime use of the construction equipment or machinery), and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs will be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts must cease when the use thereof is no longer necessary for the Work.
 - 2) Costs for equipment and machinery owned by Contractor or a Contractor-related entity will be paid at a rate shown for such equipment in the equipment rental rate book specified in the Supplementary Conditions. An hourly rate will be computed by dividing the monthly rates by 176. These computed rates will include all operating costs.
 - 3) With respect to Work that is the result of a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price ("changed Work"), included costs will be based on the time the equipment or machinery is in use on the changed Work and the costs of transportation, loading, unloading, assembly, dismantling, and removal when directly attributable to the changed Work. The cost of any such equipment or machinery, or parts thereof, must cease to accrue when the use thereof is no longer necessary for the changed Work.
- d. Sales, consumer, use, and other similar taxes related to the Work, and for which Contractor is liable, as imposed by Laws and Regulations.
- e. Deposits lost for causes other than negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.
- f. Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by Contractor in connection with the performance of the Work (except losses and damages within the deductible amounts of builder's risk or other property insurance established in accordance with Paragraph 6.04), provided such losses and damages have resulted from causes other than the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses include settlements made with the written consent and approval of Owner. No such losses, damages, and expenses will be included in the Cost of the Work for the purpose of determining Contractor's fee.

- g. The cost of utilities, fuel, and sanitary facilities at the Site.
 - h. Minor expenses such as communication service at the Site, express and courier services, and similar petty cash items in connection with the Work.
 - i. The costs of premiums for all bonds and insurance that Contractor is required by the Contract Documents to purchase and maintain.
- C. *Costs Excluded:* The term Cost of the Work does not include any of the following items:
- 1. Payroll costs and other compensation of Contractor's officers, executives, principals, general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks, and other personnel employed by Contractor, whether at the Site or in Contractor's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in Paragraph 13.01.B.1 or specifically covered by Paragraph 13.01.B.4. The payroll costs and other compensation excluded here are to be considered administrative costs covered by the Contractor's fee.
 - 2. The cost of purchasing, renting, or furnishing small tools and hand tools.
 - 3. Expenses of Contractor's principal and branch offices other than Contractor's office at the Site.
 - 4. Any part of Contractor's capital expenses, including interest on Contractor's capital employed for the Work and charges against Contractor for delinquent payments.
 - 5. Costs due to the negligence of Contractor, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.
 - 6. Expenses incurred in preparing and advancing Claims.
 - 7. Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in Paragraph 13.01.B.
- D. *Contractor's Fee*
- 1. When the Work as a whole is performed on the basis of cost-plus-a-fee, then:
 - a. Contractor's fee for the Work set forth in the Contract Documents as of the Effective Date of the Contract will be determined as set forth in the Agreement.
 - b. for any Work covered by a Change Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work, Contractor's fee will be determined as follows:
 - 1) When the fee for the Work as a whole is a percentage of the Cost of the Work, the fee will automatically adjust as the Cost of the Work changes.
 - 2) When the fee for the Work as a whole is a fixed fee, the fee for any additions or deletions will be determined in accordance with Paragraph 11.07.C.2.
 - 2. When the Work as a whole is performed on the basis of a stipulated sum, or any other basis other than cost-plus-a-fee, then Contractor's fee for any Work covered by a Change

Order, Change Proposal, Claim, set-off, or other adjustment in Contract Price on the basis of Cost of the Work will be determined in accordance with Paragraph 11.07.C.2.

- E. *Documentation and Audit*: Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a period of three years after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

13.02 Allowances

- A. It is understood that Contractor has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. *Cash Allowances*: Contractor agrees that:
1. the cash allowances include the cost to Contractor (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and
 2. Contractor's costs for unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the cash allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment for any of the foregoing will be valid.
- C. *Owner's Contingency Allowance*: Contractor agrees that an Owner's contingency allowance, if any, is for the sole use of Owner to cover unanticipated costs.
- D. Prior to final payment, an appropriate Change Order will be issued as recommended by Engineer to reflect actual amounts due Contractor for Work covered by allowances, and the Contract Price will be correspondingly adjusted.

13.03 Unit Price Work

- A. Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.
- B. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Payments to Contractor for Unit Price Work will be based on actual quantities.
- C. Each unit price will be deemed to include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
- D. Engineer will determine the actual quantities and classifications of Unit Price Work performed by Contractor. Engineer will review with Contractor the Engineer's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). Engineer's written decision

thereon will be final and binding (except as modified by Engineer to reflect changed factual conditions or more accurate data) upon Owner and Contractor, and the final adjustment of Contract Price will be set forth in a Change Order, subject to the provisions of the following paragraph.

E. *Adjustments in Unit Price*

1. Contractor or Owner shall be entitled to an adjustment in the unit price with respect to an item of Unit Price Work if:
 - a. the quantity of the item of Unit Price Work performed by Contractor differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and
 - b. Contractor's unit costs to perform the item of Unit Price Work have changed materially and significantly as a result of the quantity change.
2. The adjustment in unit price will account for and be coordinated with any related changes in quantities of other items of Work, and in Contractor's costs to perform such other Work, such that the resulting overall change in Contract Price is equitable to Owner and Contractor.
3. Adjusted unit prices will apply to all units of that item.

ARTICLE 14—TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

14.01 *Access to Work*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and authorities having jurisdiction have access to the Site and the Work at reasonable times for their observation, inspection, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's safety procedures and programs so that they may comply with such procedures and programs as applicable.

14.02 *Tests, Inspections, and Approvals*

- A. Contractor shall give Engineer timely notice of readiness of the Work (or specific parts thereof) for all required inspections and tests, and shall cooperate with inspection and testing personnel to facilitate required inspections and tests.
- B. Owner shall retain and pay for the services of an independent inspector, testing laboratory, or other qualified individual or entity to perform all inspections and tests expressly required by the Contract Documents to be furnished and paid for by Owner, except that costs incurred in connection with tests or inspections of covered Work will be governed by the provisions of Paragraph 14.05.
- C. If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, Contractor shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish Engineer the required certificates of inspection or approval.

- D. Contractor shall be responsible for arranging, obtaining, and paying for all inspections and tests required:
1. by the Contract Documents, unless the Contract Documents expressly allocate responsibility for a specific inspection or test to Owner;
 2. to attain Owner's and Engineer's acceptance of materials or equipment to be incorporated in the Work;
 3. by manufacturers of equipment furnished under the Contract Documents;
 4. for testing, adjusting, and balancing of mechanical, electrical, and other equipment to be incorporated into the Work; and
 5. for acceptance of materials, mix designs, or equipment submitted for approval prior to Contractor's purchase thereof for incorporation in the Work.

Such inspections and tests will be performed by independent inspectors, testing laboratories, or other qualified individuals or entities acceptable to Owner and Engineer.

- E. If the Contract Documents require the Work (or part thereof) to be approved by Owner, Engineer, or another designated individual or entity, then Contractor shall assume full responsibility for arranging and obtaining such approvals.
- F. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without written concurrence of Engineer, Contractor shall, if requested by Engineer, uncover such Work for observation. Such uncovering will be at Contractor's expense unless Contractor had given Engineer timely notice of Contractor's intention to cover the same and Engineer had not acted with reasonable promptness in response to such notice.

14.03 *Defective Work*

- A. *Contractor's Obligation:* It is Contractor's obligation to assure that the Work is not defective.
- B. *Engineer's Authority:* Engineer has the authority to determine whether Work is defective, and to reject defective Work.
- C. *Notice of Defects:* Prompt written notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- D. *Correction, or Removal and Replacement:* Promptly after receipt of written notice of defective Work, Contractor shall correct all such defective Work, whether or not fabricated, installed, or completed, or, if Engineer has rejected the defective Work, remove it from the Project and replace it with Work that is not defective.
- E. *Preservation of Warranties:* When correcting defective Work, Contractor shall take no action that would void or otherwise impair Owner's special warranty and guarantee, if any, on said Work.
- F. *Costs and Damages:* In addition to its correction, removal, and replacement obligations with respect to defective Work, Contractor shall pay all claims, costs, losses, and damages arising out of or relating to defective Work, including but not limited to the cost of the inspection, testing, correction, removal, replacement, or reconstruction of such defective Work, fines levied against Owner by governmental authorities because the Work is defective, and the costs of repair or replacement of work of others resulting from defective Work. Prior to final payment, if Owner and Contractor are unable to agree as to the measure of such claims, costs,

losses, and damages resulting from defective Work, then Owner may impose a reasonable set-off against payments due under Article 15.

14.04 *Acceptance of Defective Work*

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so (subject, if such acceptance occurs prior to final payment, to Engineer's confirmation that such acceptance is in general accord with the design intent and applicable engineering principles, and will not endanger public safety). Contractor shall pay all claims, costs, losses, and damages attributable to Owner's evaluation of and determination to accept such defective Work (such costs to be approved by Engineer as to reasonableness), and for the diminished value of the Work to the extent not otherwise paid by Contractor. If any such acceptance occurs prior to final payment, the necessary revisions in the Contract Documents with respect to the Work will be incorporated in a Change Order. If the parties are unable to agree as to the decrease in the Contract Price, reflecting the diminished value of Work so accepted, then Owner may impose a reasonable set-off against payments due under Article 15. If the acceptance of defective Work occurs after final payment, Contractor shall pay an appropriate amount to Owner.

14.05 *Uncovering Work*

- A. Engineer has the authority to require additional inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed.
- B. If any Work is covered contrary to the written request of Engineer, then Contractor shall, if requested by Engineer, uncover such Work for Engineer's observation, and then replace the covering, all at Contractor's expense.
- C. If Engineer considers it necessary or advisable that covered Work be observed by Engineer or inspected or tested by others, then Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, and provide all necessary labor, material, and equipment.
 - 1. If it is found that the uncovered Work is defective, Contractor shall be responsible for all claims, costs, losses, and damages arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and pending Contractor's full discharge of this responsibility the Owner shall be entitled to impose a reasonable set-off against payments due under Article 15.
 - 2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 30 days of the determination that the Work is not defective.

14.06 *Owner May Stop the Work*

- A. If the Work is defective, or Contractor fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, then Owner may order Contractor to stop the Work,

or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the Work will not give rise to any duty on the part of Owner to exercise this right for the benefit of Contractor, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.

14.07 Owner May Correct Defective Work

- A. If Contractor fails within a reasonable time after written notice from Engineer to correct defective Work, or to remove and replace defective Work as required by Engineer, then Owner may, after 7 days' written notice to Contractor, correct or remedy any such deficiency.
- B. In exercising the rights and remedies under this Paragraph 14.07, Owner shall proceed expeditiously. In connection with such corrective or remedial action, Owner may exclude Contractor from all or part of the Site, take possession of all or part of the Work and suspend Contractor's services related thereto, and incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere. Contractor shall allow Owner, Owner's representatives, agents and employees, Owner's other contractors, and Engineer and Engineer's consultants access to the Site to enable Owner to exercise the rights and remedies under this paragraph.
- C. All claims, costs, losses, and damages incurred or sustained by Owner in exercising the rights and remedies under this Paragraph 14.07 will be charged against Contractor as set-offs against payments due under Article 15. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of Contractor's defective Work.
- D. Contractor shall not be allowed an extension of the Contract Times because of any delay in the performance of the Work attributable to the exercise by Owner of Owner's rights and remedies under this Paragraph 14.07.

ARTICLE 15—PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

15.01 Progress Payments

- A. *Basis for Progress Payments:* The Schedule of Values established as provided in Article 2 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to Engineer. Progress payments for Unit Price Work will be based on the number of units completed during the pay period, as determined under the provisions of Paragraph 13.03. Progress payments for cost-based Work will be based on Cost of the Work completed by Contractor during the pay period.
- B. *Applications for Payments*
 - 1. At least 20 days before the date established in the Agreement for each progress payment (but not more often than once a month), Contractor shall submit to Engineer for review an Application for Payment filled out and signed by Contractor covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents.
 - 2. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment must also be accompanied by: (a) a bill of sale, invoice, copies of subcontract or purchase order payments, or other documentation

establishing full payment by Contractor for the materials and equipment; (b) at Owner's request, documentation warranting that Owner has received the materials and equipment free and clear of all Liens; and (c) evidence that the materials and equipment are covered by appropriate property insurance, a warehouse bond, or other arrangements to protect Owner's interest therein, all of which must be satisfactory to Owner.

3. Beginning with the second Application for Payment, each Application must include an affidavit of Contractor stating that all previous progress payments received by Contractor have been applied to discharge Contractor's legitimate obligations associated with prior Applications for Payment.
4. The amount of retainage with respect to progress payments will be as stipulated in the Agreement.

C. Review of Applications

1. Engineer will, within 10 days after receipt of each Application for Payment, including each resubmittal, either indicate in writing a recommendation of payment and present the Application to Owner, or return the Application to Contractor indicating in writing Engineer's reasons for refusing to recommend payment. In the latter case, Contractor may make the necessary corrections and resubmit the Application.
2. Engineer's recommendation of any payment requested in an Application for Payment will constitute a representation by Engineer to Owner, based on Engineer's observations of the executed Work as an experienced and qualified design professional, and on Engineer's review of the Application for Payment and the accompanying data and schedules, that to the best of Engineer's knowledge, information and belief:
 - a. the Work has progressed to the point indicated;
 - b. the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, the results of any subsequent tests called for in the Contract Documents, a final determination of quantities and classifications for Unit Price Work under Paragraph 13.03, and any other qualifications stated in the recommendation); and
 - c. the conditions precedent to Contractor's being entitled to such payment appear to have been fulfilled in so far as it is Engineer's responsibility to observe the Work.
3. By recommending any such payment Engineer will not thereby be deemed to have represented that:
 - a. inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to Engineer in the Contract; or
 - b. there may not be other matters or issues between the parties that might entitle Contractor to be paid additionally by Owner or entitle Owner to withhold payment to Contractor.

4. Neither Engineer's review of Contractor's Work for the purposes of recommending payments nor Engineer's recommendation of any payment, including final payment, will impose responsibility on Engineer:
 - a. to supervise, direct, or control the Work;
 - b. for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto;
 - c. for Contractor's failure to comply with Laws and Regulations applicable to Contractor's performance of the Work;
 - d. to make any examination to ascertain how or for what purposes Contractor has used the money paid by Owner; or
 - e. to determine that title to any of the Work, materials, or equipment has passed to Owner free and clear of any Liens.
5. Engineer may refuse to recommend the whole or any part of any payment if, in Engineer's opinion, it would be incorrect to make the representations to Owner stated in Paragraph 15.01.C.2.
6. Engineer will recommend reductions in payment (set-offs) necessary in Engineer's opinion to protect Owner from loss because:
 - a. the Work is defective, requiring correction or replacement;
 - b. the Contract Price has been reduced by Change Orders;
 - c. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible; or
 - e. Engineer has actual knowledge of the occurrence of any of the events that would constitute a default by Contractor and therefore justify termination for cause under the Contract Documents.

D. *Payment Becomes Due*

1. Ten days after presentation of the Application for Payment to Owner with Engineer's recommendation, the amount recommended (subject to any Owner set-offs) will become due, and when due will be paid by Owner to Contractor.

E. *Reductions in Payment by Owner*

1. In addition to any reductions in payment (set-offs) recommended by Engineer, Owner is entitled to impose a set-off against payment based on any of the following:
 - a. Claims have been made against Owner based on Contractor's conduct in the performance or furnishing of the Work, or Owner has incurred costs, losses, or damages resulting from Contractor's conduct in the performance or furnishing of the Work, including but not limited to claims, costs, losses, or damages from workplace injuries, adjacent property damage, non-compliance with Laws and Regulations, and patent infringement;

- b. Contractor has failed to take reasonable and customary measures to avoid damage, delay, disruption, and interference with other work at or adjacent to the Site;
 - c. Contractor has failed to provide and maintain required bonds or insurance;
 - d. Owner has been required to remove or remediate a Hazardous Environmental Condition for which Contractor is responsible;
 - e. Owner has incurred extra charges or engineering costs related to submittal reviews, evaluations of proposed substitutes, tests and inspections, or return visits to manufacturing or assembly facilities;
 - f. The Work is defective, requiring correction or replacement;
 - g. Owner has been required to correct defective Work in accordance with Paragraph 14.07, or has accepted defective Work pursuant to Paragraph 14.04;
 - h. The Contract Price has been reduced by Change Orders;
 - i. An event has occurred that would constitute a default by Contractor and therefore justify a termination for cause;
 - j. Liquidated or other damages have accrued as a result of Contractor's failure to achieve Milestones, Substantial Completion, or final completion of the Work;
 - k. Liens have been filed in connection with the Work, except where Contractor has delivered a specific bond satisfactory to Owner to secure the satisfaction and discharge of such Liens; or
 - l. Other items entitle Owner to a set-off against the amount recommended.
2. If Owner imposes any set-off against payment, whether based on its own knowledge or on the written recommendations of Engineer, Owner will give Contractor immediate written notice (with a copy to Engineer) stating the reasons for such action and the specific amount of the reduction, and promptly pay Contractor any amount remaining after deduction of the amount so withheld. Owner shall promptly pay Contractor the amount so withheld, or any adjustment thereto agreed to by Owner and Contractor, if Contractor remedies the reasons for such action. The reduction imposed will be binding on Contractor unless it duly submits a Change Proposal contesting the reduction.
 3. Upon a subsequent determination that Owner's refusal of payment was not justified, the amount wrongfully withheld will be treated as an amount due as determined by Paragraph 15.01.D.1 and subject to interest as provided in the Agreement.

15.02 *Contractor's Warranty of Title*

- A. Contractor warrants and guarantees that title to all Work, materials, and equipment furnished under the Contract will pass to Owner free and clear of (1) all Liens and other title defects, and (2) all patent, licensing, copyright, or royalty obligations, no later than 7 days after the time of payment by Owner.

15.03 *Substantial Completion*

- A. When Contractor considers the entire Work ready for its intended use Contractor shall notify Owner and Engineer in writing that the entire Work is substantially complete and request that Engineer issue a certificate of Substantial Completion. Contractor shall at the same time

submit to Owner and Engineer an initial draft of punch list items to be completed or corrected before final payment.

- B. Promptly after Contractor's notification, Owner, Contractor, and Engineer shall make an inspection of the Work to determine the status of completion. If Engineer does not consider the Work substantially complete, Engineer will notify Contractor in writing giving the reasons therefor.
- C. If Engineer considers the Work substantially complete, Engineer will deliver to Owner a preliminary certificate of Substantial Completion which will fix the date of Substantial Completion. Engineer shall attach to the certificate a punch list of items to be completed or corrected before final payment. Owner shall have 7 days after receipt of the preliminary certificate during which to make written objection to Engineer as to any provisions of the certificate or attached punch list. If, after considering the objections to the provisions of the preliminary certificate, Engineer concludes that the Work is not substantially complete, Engineer will, within 14 days after submission of the preliminary certificate to Owner, notify Contractor in writing that the Work is not substantially complete, stating the reasons therefor. If Owner does not object to the provisions of the certificate, or if despite consideration of Owner's objections Engineer concludes that the Work is substantially complete, then Engineer will, within said 14 days, execute and deliver to Owner and Contractor a final certificate of Substantial Completion (with a revised punch list of items to be completed or corrected) reflecting such changes from the preliminary certificate as Engineer believes justified after consideration of any objections from Owner.
- D. At the time of receipt of the preliminary certificate of Substantial Completion, Owner and Contractor will confer regarding Owner's use or occupancy of the Work following Substantial Completion, review the builder's risk insurance policy with respect to the end of the builder's risk coverage, and confirm the transition to coverage of the Work under a permanent property insurance policy held by Owner. Unless Owner and Contractor agree otherwise in writing, Owner shall bear responsibility for security, operation, protection of the Work, property insurance, maintenance, heat, and utilities upon Owner's use or occupancy of the Work.
- E. After Substantial Completion the Contractor shall promptly begin work on the punch list of items to be completed or corrected prior to final payment. In appropriate cases Contractor may submit monthly Applications for Payment for completed punch list items, following the progress payment procedures set forth above.
- F. Owner shall have the right to exclude Contractor from the Site after the date of Substantial Completion subject to allowing Contractor reasonable access to remove its property and complete or correct items on the punch list.

15.04 *Partial Use or Occupancy*

- A. Prior to Substantial Completion of all the Work, Owner may use or occupy any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which Owner, Engineer, and Contractor agree constitutes a separately functioning and usable part of the Work that can be used by Owner for its intended purpose without

significant interference with Contractor's performance of the remainder of the Work, subject to the following conditions:

1. At any time, Owner may request in writing that Contractor permit Owner to use or occupy any such part of the Work that Owner believes to be substantially complete. If and when Contractor agrees that such part of the Work is substantially complete, Contractor, Owner, and Engineer will follow the procedures of Paragraph 15.03.A through 15.03.E for that part of the Work.
2. At any time, Contractor may notify Owner and Engineer in writing that Contractor considers any such part of the Work substantially complete and request Engineer to issue a certificate of Substantial Completion for that part of the Work.
3. Within a reasonable time after either such request, Owner, Contractor, and Engineer shall make an inspection of that part of the Work to determine its status of completion. If Engineer does not consider that part of the Work to be substantially complete, Engineer will notify Owner and Contractor in writing giving the reasons therefor. If Engineer considers that part of the Work to be substantially complete, the provisions of Paragraph 15.03 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.
4. No use or occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of Paragraph 6.04 regarding builder's risk or other property insurance.

15.05 *Final Inspection*

- A. Upon written notice from Contractor that the entire Work or an agreed portion thereof is complete, Engineer will promptly make a final inspection with Owner and Contractor and will notify Contractor in writing of all particulars in which this inspection reveals that the Work, or agreed portion thereof, is incomplete or defective. Contractor shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.

15.06 *Final Payment*

A. *Application for Payment*

1. After Contractor has, in the opinion of Engineer, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, bonds, certificates or other evidence of insurance, certificates of inspection, annotated record documents (as provided in Paragraph 7.12), and other documents, Contractor may make application for final payment.
2. The final Application for Payment must be accompanied (except as previously delivered) by:
 - a. all documentation called for in the Contract Documents;
 - b. consent of the surety, if any, to final payment;
 - c. satisfactory evidence that all title issues have been resolved such that title to all Work, materials, and equipment has passed to Owner free and clear of any Liens or other title defects, or will so pass upon final payment.

- d. a list of all duly pending Change Proposals and Claims; and
 - e. complete and legally effective releases or waivers (satisfactory to Owner) of all Lien rights arising out of the Work, and of Liens filed in connection with the Work.
- 3. In lieu of the releases or waivers of Liens specified in Paragraph 15.06.A.2 and as approved by Owner, Contractor may furnish receipts or releases in full and an affidavit of Contractor that: (a) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (b) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which Owner might in any way be responsible, or which might in any way result in liens or other burdens on Owner's property, have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, Contractor may furnish a bond or other collateral satisfactory to Owner to indemnify Owner against any Lien, or Owner at its option may issue joint checks payable to Contractor and specified Subcontractors and Suppliers.
- B. *Engineer's Review of Final Application and Recommendation of Payment:* If, on the basis of Engineer's observation of the Work during construction and final inspection, and Engineer's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, Engineer is satisfied that the Work has been completed and Contractor's other obligations under the Contract have been fulfilled, Engineer will, within 10 days after receipt of the final Application for Payment, indicate in writing Engineer's recommendation of final payment and present the final Application for Payment to Owner for payment. Such recommendation will account for any set-offs against payment that are necessary in Engineer's opinion to protect Owner from loss for the reasons stated above with respect to progress payments. Otherwise, Engineer will return the Application for Payment to Contractor, indicating in writing the reasons for refusing to recommend final payment, in which case Contractor shall make the necessary corrections and resubmit the Application for Payment.
- C. *Notice of Acceptability:* In support of its recommendation of payment of the final Application for Payment, Engineer will also give written notice to Owner and Contractor that the Work is acceptable, subject to stated limitations in the notice and to the provisions of Paragraph 15.07.
- D. *Completion of Work:* The Work is complete (subject to surviving obligations) when it is ready for final payment as established by the Engineer's written recommendation of final payment and issuance of notice of the acceptability of the Work.
- E. *Final Payment Becomes Due:* Upon receipt from Engineer of the final Application for Payment and accompanying documentation, Owner shall set off against the amount recommended by Engineer for final payment any further sum to which Owner is entitled, including but not limited to set-offs for liquidated damages and set-offs allowed under the provisions of this Contract with respect to progress payments. Owner shall pay the resulting balance due to Contractor within 30 days of Owner's receipt of the final Application for Payment from Engineer.

15.07 *Waiver of Claims*

- A. By making final payment, Owner waives its claim or right to liquidated damages or other damages for late completion by Contractor, except as set forth in an outstanding Claim,

appeal under the provisions of Article 17, set-off, or express reservation of rights by Owner. Owner reserves all other claims or rights after final payment.

- B. The acceptance of final payment by Contractor will constitute a waiver by Contractor of all claims and rights against Owner other than those pending matters that have been duly submitted as a Claim, or appealed under the provisions of Article 17.

15.08 *Correction Period*

- A. If within one year after the date of Substantial Completion (or such longer period of time as may be prescribed by the Supplementary Conditions or the terms of any applicable special guarantee required by the Contract Documents), Owner gives Contractor written notice that any Work has been found to be defective, or that Contractor's repair of any damages to the Site or adjacent areas has been found to be defective, then after receipt of such notice of defect Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions:
 - 1. correct the defective repairs to the Site or such adjacent areas;
 - 2. correct such defective Work;
 - 3. remove the defective Work from the Project and replace it with Work that is not defective, if the defective Work has been rejected by Owner, and
 - 4. satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others, or to other land or areas resulting from the corrective measures.
- B. Owner shall give any such notice of defect within 60 days of the discovery that such Work or repairs is defective. If such notice is given within such 60 days but after the end of the correction period, the notice will be deemed a notice of defective Work under Paragraph 7.17.B.
- C. If, after receipt of a notice of defect within 60 days and within the correction period, Contractor does not promptly comply with the terms of Owner's written instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the defective Work corrected or repaired or may have the rejected Work removed and replaced. Contractor shall pay all costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others). Contractor's failure to pay such costs, losses, and damages within 10 days of invoice from Owner will be deemed the start of an event giving rise to a Claim under Paragraph 12.01.B, such that any related Claim must be brought within 30 days of the failure to pay.
- D. In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications.
- E. Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.

- F. Contractor's obligations under this paragraph are in addition to all other obligations and warranties. The provisions of this paragraph are not to be construed as a substitute for, or a waiver of, the provisions of any applicable statute of limitation or repose.

ARTICLE 16—SUSPENSION OF WORK AND TERMINATION

16.01 *Owner May Suspend Work*

- A. At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed. Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an adjustment in the Contract Price or an extension of the Contract Times directly attributable to any such suspension. Any Change Proposal seeking such adjustments must be submitted no later than 30 days after the date fixed for resumption of Work.

16.02 *Owner May Terminate for Cause*

- A. The occurrence of any one or more of the following events will constitute a default by Contractor and justify termination for cause:
 - 1. Contractor's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment, or failure to adhere to the Progress Schedule);
 - 2. Failure of Contractor to perform or otherwise to comply with a material term of the Contract Documents;
 - 3. Contractor's disregard of Laws or Regulations of any public body having jurisdiction; or
 - 4. Contractor's repeated disregard of the authority of Owner or Engineer.
- B. If one or more of the events identified in Paragraph 16.02.A occurs, then after giving Contractor (and any surety) 10 days' written notice that Owner is considering a declaration that Contractor is in default and termination of the Contract, Owner may proceed to:
 - 1. declare Contractor to be in default, and give Contractor (and any surety) written notice that the Contract is terminated; and
 - 2. enforce the rights available to Owner under any applicable performance bond.
- C. Subject to the terms and operation of any applicable performance bond, if Owner has terminated the Contract for cause, Owner may exclude Contractor from the Site, take possession of the Work, incorporate in the Work all materials and equipment stored at the Site or for which Owner has paid Contractor but which are stored elsewhere, and complete the Work as Owner may deem expedient.
- D. Owner may not proceed with termination of the Contract under Paragraph 16.02.B if Contractor within 7 days of receipt of notice of intent to terminate begins to correct its failure to perform and proceeds diligently to cure such failure.
- E. If Owner proceeds as provided in Paragraph 16.02.B, Contractor shall not be entitled to receive any further payment until the Work is completed. If the unpaid balance of the Contract Price exceeds the cost to complete the Work, including all related claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects,

attorneys, and other professionals) sustained by Owner, such excess will be paid to Contractor. If the cost to complete the Work including such related claims, costs, losses, and damages exceeds such unpaid balance, Contractor shall pay the difference to Owner. Such claims, costs, losses, and damages incurred by Owner will be reviewed by Engineer as to their reasonableness and, when so approved by Engineer, incorporated in a Change Order. When exercising any rights or remedies under this paragraph, Owner shall not be required to obtain the lowest price for the Work performed.

- F. Where Contractor's services have been so terminated by Owner, the termination will not affect any rights or remedies of Owner against Contractor then existing or which may thereafter accrue, or any rights or remedies of Owner against Contractor or any surety under any payment bond or performance bond. Any retention or payment of money due Contractor by Owner will not release Contractor from liability.
- G. If and to the extent that Contractor has provided a performance bond under the provisions of Paragraph 6.01.A, the provisions of that bond will govern over any inconsistent provisions of Paragraphs 16.02.B and 16.02.D.

16.03 *Owner May Terminate for Convenience*

- A. Upon 7 days' written notice to Contractor and Engineer, Owner may, without cause and without prejudice to any other right or remedy of Owner, terminate the Contract. In such case, Contractor shall be paid for (without duplication of any items):
 - 1. completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;
 - 2. expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses; and
 - 3. other reasonable expenses directly attributable to termination, including costs incurred to prepare a termination for convenience cost proposal.
- B. Contractor shall not be paid for any loss of anticipated profits or revenue, post-termination overhead costs, or other economic loss arising out of or resulting from such termination.

16.04 *Contractor May Stop Work or Terminate*

- A. If, through no act or fault of Contractor, (1) the Work is suspended for more than 90 consecutive days by Owner or under an order of court or other public authority, or (2) Engineer fails to act on any Application for Payment within 30 days after it is submitted, or (3) Owner fails for 30 days to pay Contractor any sum finally determined to be due, then Contractor may, upon 7 days' written notice to Owner and Engineer, and provided Owner or Engineer do not remedy such suspension or failure within that time, terminate the contract and recover from Owner payment on the same terms as provided in Paragraph 16.03.
- B. In lieu of terminating the Contract and without prejudice to any other right or remedy, if Engineer has failed to act on an Application for Payment within 30 days after it is submitted, or Owner has failed for 30 days to pay Contractor any sum finally determined to be due, Contractor may, 7 days after written notice to Owner and Engineer, stop the Work until payment is made of all such amounts due Contractor, including interest thereon. The

provisions of this paragraph are not intended to preclude Contractor from submitting a Change Proposal for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to Contractor's stopping the Work as permitted by this paragraph.

ARTICLE 17—FINAL RESOLUTION OF DISPUTES

17.01 *Methods and Procedures*

- A. *Disputes Subject to Final Resolution:* The following disputed matters are subject to final resolution under the provisions of this article:
 - 1. A timely appeal of an approval in part and denial in part of a Claim, or of a denial in full, pursuant to Article 12; and
 - 2. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.
- B. *Final Resolution of Disputes:* For any dispute subject to resolution under this article, Owner or Contractor may:
 - 1. elect in writing to invoke the dispute resolution process provided for in the Supplementary Conditions;
 - 2. agree with the other party to submit the dispute to another dispute resolution process; or
 - 3. if no dispute resolution process is provided for in the Supplementary Conditions or mutually agreed to, give written notice to the other party of the intent to submit the dispute to a court of competent jurisdiction.

ARTICLE 18—MISCELLANEOUS

18.01 *Giving Notice*

- A. Whenever any provision of the Contract requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:
 - 1. in person, by a commercial courier service or otherwise, to the recipient's place of business;
 - 2. by registered or certified mail, postage prepaid, to the recipient's place of business; or
 - 3. by e-mail to the recipient, with the words "Formal Notice" or similar in the e-mail's subject line.

18.02 *Computation of Times*

- A. When any period of time is referred to in the Contract by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

18.03 *Cumulative Remedies*

- A. The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract. The provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.

18.04 *Limitation of Damages*

- A. With respect to any and all Change Proposals, Claims, disputes subject to final resolution, and other matters at issue, neither Owner nor Engineer, nor any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors, shall be liable to Contractor for any claims, costs, losses, or damages sustained by Contractor on or in connection with any other project or anticipated project.

18.05 *No Waiver*

- A. A party's non-enforcement of any provision will not constitute a waiver of that provision, nor will it affect the enforceability of that provision or of the remainder of this Contract.

18.06 *Survival of Obligations*

- A. All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract, as well as all continuing obligations indicated in the Contract, will survive final payment, completion, and acceptance of the Work or termination of the Contract or of the services of Contractor.

18.07 *Controlling Law*

- A. This Contract is to be governed by the law of the state in which the Project is located.

18.08 *Assignment of Contract*

- A. Unless expressly agreed to elsewhere in the Contract, no assignment by a party to this Contract of any rights under or interests in the Contract will be binding on the other party without the written consent of the party sought to be bound; and, specifically but without limitation, money that may become due and money that is due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract.

18.09 *Successors and Assigns*

- A. Owner and Contractor each binds itself, its successors, assigns, and legal representatives to the other party hereto, its successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.

18.10 *Headings*

- A. Article and paragraph headings are inserted for convenience only and do not constitute parts of these General Conditions.

SUPPLEMENTARY CONDITIONS

SUPPLEMENTARY CONDITIONS

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SUPPLEMENTARY CONDITIONS

GENERAL

These Supplementary Conditions amend or supplement the Standard General Conditions of the Construction Contract (EJCDC C-700, 2018 Edition). All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions will have the meanings stated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings stated below, which are applicable to both the singular and plural thereof.

The address system used in these Supplementary Conditions is the same as the address system used in the General Conditions, with the prefix "SC" added thereto.

ARTICLE 1 – DEFINITIONS AND TERMINOLOGY

SC - 1.01

Delete subparagraph 1.01.A.18 in its entirety and insert the following in its place.

18. *Drawings* - The part of the Contract Documents that graphically shows the scope, extent, and character of the Work to be performed by the Contractor, as defined in the Contract.

Delete subparagraph 1.01.A.46.c in its entirety and insert the following in its place.

- c. Information and data regarding the presence or location of Underground Facilities are not intended to be categorized, identified, or defined as Technical Data.

Delete subparagraph 1.01.A.47 in its entirety and insert the following in its place.

47. *Underground Facilities*—All active or not-in-service underground lines, pipelines, conduits, ducts, encasements, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or systems at the Site, including but not limited to those facilities or systems that produce, transmit, distribute, or convey telephone or other communications, cable television, fiber optic transmissions, power, electricity, light, heat, gases, oil, crude oil products, liquid petroleum products, water, steam, waste, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

Delete subparagraph 1.01.A.49 in its entirety and insert the following in its place.

49. *Work*—The entire construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction; furnishing, installing, and incorporating all materials and equipment into such construction; and may include related services such as testing, Start-up, and commissioning, all as required by the Contract Documents.

Add the following paragraph after paragraph 1.01.A.50:

51. *Lump Sum* – A single price quoted for completing the Work. Also known as stipulated sum.
52. *Project Manual*—The written documents prepared for, or made available for, procuring and constructing the Work, including but not limited to the Bidding Documents or other construction procurement documents, geotechnical and existing conditions information, the Contract, bond forms, General Conditions, Supplementary Conditions, and Specifications. The contents of the Project Manual may be bound in one or more volumes.

Add the following paragraph after paragraph 1.01.A.51:

53. *Startup* – Coordinated operation of facilities by the Contractor, Subcontractors, Suppliers, and Owner after installation and testing are complete. Startup is considered complete when, in the opinion of the Engineer, the facilities have properly operated for 7 continuous days without significant interruption.

ARTICLE 2 – PRELIMINARY MATTERS

SC - 2.01

Delete paragraph 2.01 in its entirety.

SC - 2.02

Delete paragraph 2.02 in its entirety.

ARTICLE 3 – DOCUMENTS: INTENT, REQUIREMENTS, REUSE

SC – 3.03

Delete paragraph 3.03.A.3. in its entirety and replace it with the following:

3. Contractor shall not be liable to Owner or Engineer for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless Contractor knew or reasonably should have known thereof.

SC – 3.04

Add the following subparagraph after paragraph 3.04.A:

1. A request for written interpretation or clarification of the Contract Documents shall be submitted on the Request for Information (RFI) form provided in the Appendix of this Project Manual.

Delete paragraph 3.04.C. in its entirety and replace it with the following:

- C. If a submitted matter in question concerns terms and conditions of the Contract Documents that do not involve (1) the performance or acceptability of the Work under the Contract Documents, (2) the design (as set forth in the Drawings, Specifications, or otherwise), or (3) other engineering or technical matters, then Engineer will promptly notify Owner and Contractor in writing that Engineer is unable to provide a decision or interpretation.

ARTICLE 4 – COMMENCEMENT AND PROGRESS OF THE WORK

SC - 4.01

Delete paragraph 4.01 in its entirety.

SC – 4.05

Delete paragraph 4.05.A in its entirety and replace with the following:

- A. If Owner, Engineer, or other contractors or utility owners performing work for the Owner as contemplated by Article 8, or anyone for whom Owner is responsible delays, disrupts, or interferes with the performance or progress of the Work, then Contractor shall be entitled to an equitable adjustment in the Contract Times. Such an adjustment shall be Contractor's sole

and exclusive remedy for the delays, disruption, and interference described in this paragraph. Contractor's entitlement to an adjustment of the Contract Times is conditioned on such adjustment being essential to Contractor's ability to complete Work within the Contract Times. Except as provided for in paragraph 17.01, Contractor shall make no Claim for damages as delay in the performance of the Work occasioned by acts or neglect by Owner or any of its representatives, including Engineer, or because of any injunction which may be brought against Owner or its representatives, including Engineer, and agrees that any such claim shall be fully compensated for by an extension of time in an amount equal to the time lost due to such delay, and that such time extension shall be Contractor's sole and exclusive remedy for such delay.

Add the following as paragraph immediately after paragraph 4.05.C.4:

5. Weather-Related Delays

- a. If "abnormal weather conditions" as set forth in Paragraph 4.05.C.2 of the General Conditions are the basis for a request for an equitable adjustment in the Contract Times, such request must be documented by data substantiating each of the following: 1) that weather conditions were abnormal for the period of time in which the delay occurred, 2) that such weather conditions could not have been reasonably anticipated, and 3) that such weather conditions had an adverse effect on the Work as scheduled.

Delete paragraph 4.05.D in its entirety and replace with the following:

D. Contractor's entitlement to an adjustment of Contract Times is limited as follows:

1. Contractor's entitlement to an adjustment of the Contract Times is conditioned on the delay, disruption, or interference adversely affecting an activity on the critical path to completion of the Work, as of the time of the delay, disruption, or interference.
2. Contractor shall not be entitled to an adjustment in Contract Times for any delay, disruption, or interference if such delay is concurrent with a delay, disruption, or interference caused by or within the control of Contractor. Such a concurrent delay by Contractor shall not preclude an adjustment of Contract Times to which Contractor is otherwise entitled.
3. Adjustments of Contract Times are subject to the provisions of Article 11.

Delete paragraph 4.05.E in its entirety and replace with the following:

- E. Each Contractor request or Change Proposal seeking an increase in Contract Times must be supplemented by supporting data that sets forth in detail the following:
 1. The circumstances that form the basis for the requested adjustment;
 2. The date upon which each cause of delay, disruption, or interference began to affect the progress of the Work;
 3. The date upon which each cause of delay, disruption, or interference ceased to affect the progress of the Work;
 4. The number of days' increase in Contract Times claimed as a consequence of each such cause of delay, disruption, or interference.

Contractor shall also furnish such additional supporting documentation as Owner or Engineer may require including, where appropriate, a revised progress schedule indicating all the

activities affected by the delay, disruption, or interference, and an explanation of the effect of the delay, disruption, or interference on the critical path to completion of the Work.

Add the following as paragraph immediately after paragraph 4.05.G:

- H. Contractor must submit notification to Owner and Engineer of a potential delay which results in an adjustment in Contract Times under this paragraph within 10 days of the commencement of the delaying, disrupting, or interfering event.

Add the following as paragraph immediately after paragraph 4.05.H:

- I. Owner, Engineer, and their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall not be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

ARTICLE 5 – AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; HAZARDOUS ENVIRONMENTAL CONDITIONS

SC – 5.03

Add the following new paragraphs immediately after paragraph 5.03.D.:

- E. The following table lists the reports of explorations and tests of subsurface conditions at or adjacent to the Site that contain Technical Data, and specifically identifies the Technical Data in the report upon which Contractor may rely:

None.

- F. The following table lists the drawings of existing physical conditions at or adjacent to the Site, including those drawings depicting existing surface or subsurface structures at or adjacent to the Site (except Underground Facilities), that contain Technical Data, and specifically identifies the Technical Data upon which Contractor may rely:

None.

SC – 5.04

Delete paragraph 5.04.E.3 in its entirety and replace it with the following:

- 3. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment shall be set forth in a Change Order. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

Delete paragraph 5.04.E.4 in its entirety and replace it with the following:

- 4. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 10 days after Owner's issuance of the Owner's written statement to Contractor regarding the subsurface or physical condition in question.

SC – 5.05

Delete Paragraph 5.05.B in its entirety and replace it with the following:

- B. Notice by Contractor: If Contractor believes that an Underground Facility that is uncovered or revealed at the Site was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy, then Contractor shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by Paragraph 7.15), identify the owner of such Underground Facility and give written notice to that owner and to Owner and Engineer.

Delete Paragraph 5.05.C in its entirety and replace it with the following:

- C. Engineer's Review: Engineer will promptly review the Underground Facility and conclude whether such Underground Facility was not shown or indicated in the Contract Documents, or was not shown or indicated with reasonable accuracy; obtain any pertinent cost or schedule information from Contractor; prepare recommendations to Owner regarding the Contractor's resumption of Work in connection with the Underground Facility in question; determine the extent, if any, to which a change is required in the Drawings or Specifications to reflect and document the consequences of the existence or location of the Underground Facility; and advise Owner in writing of Engineer's findings, conclusions, and recommendations. During such time, Contractor shall be responsible for the safety and protection of such Underground Facility.

Delete Paragraph 5.05.F.2 in its entirety and replace it with the following:

2. If Owner and Contractor agree regarding Contractor's entitlement to and the amount or extent of any adjustment in the Contract Price or Contract Times, then any such adjustment shall be set forth in a Change Order. However, neither Owner or Engineer, or any of their officers, directors, members, partners, employees, agents, consultants, or subcontractors shall be liable to Contractor for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by Contractor on or in connection with any other project or anticipated project.

Delete Paragraph 5.05.F.3 in its entirety and replace it with the following:

3. Contractor may submit a Change Proposal regarding its entitlement to or the amount or extent of any adjustment in the Contract Price or Contract Times, no later than 10 days after Owner's issuance of the Owner's written statement to Contractor regarding the Underground Facility in question.

Delete Paragraph 5.05.F.4 in its entirety and replace it with the following:

4. The information and data shown or indicated on the Drawings with respect to existing Underground Facilities at the Site is based on information and data (a) furnished by the owners of such Underground Facilities, or by others, (b) obtained from available records, or (c) gathered in field investigations. If such information or data is incorrect or incomplete, Contractor's remedies are limited to those set forth in this Paragraph 5.05.F.

SC – 5.06

Add the following new paragraphs immediately after paragraph 5.06.A.2:

5. The following lists the reports known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and the Technical Data (if any) upon which Contractor may rely:

None.

6. The following lists the drawings known to Owner relating to Hazardous Environmental Conditions at or adjacent to the Site, and Technical Data (if any) contained in such Drawings upon which Contractor may rely:

None.

Delete Paragraph 5.06.G in its entirety and replace it with the following:

- I. If Owner and Contractor cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by Contractor, or any costs or expenses incurred in response to the Hazardous Environmental Condition, then within 10 days of Owner's written notice regarding the resumption of Work, Contractor may submit a Change Proposal, or Owner may impose a set-off. Entitlement to any such adjustment is subject to the provisions of Paragraphs 4.05.D, 4.05.E, 11.07, and 11.08.

ARTICLE 6 – BONDS AND INSURANCE

Delete Article 6 – Bonds and Insurance in its entirety.

ARTICLE 7 – CONTRACTOR'S RESPONSIBILITIES

SC – 7.03

Delete Paragraph 7.03.C in its entirety and replace it with the following:

- B. Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, Monday through Friday. Contractor will not perform Work on a Saturday, Sunday, or any legal holiday. Contractor may perform Work outside regular working hours or on Saturdays, Sundays, or legal holidays only with Owner's written consent.

SC - 7.04

Add the following new paragraph after paragraph 7.04.C.:

- D. Unless otherwise indicated, design of this Project is based upon the material and equipment named first in the list of Supplier's in a Specification section. Engineer has performed an evaluation of other listed Supplier's material and equipment and has determined it to be equal in quality, function and performance to that of the Supplier named first. When other Supplier's are listed, Contractor may be required to make modifications or adjustments, at Contractor's expense, to coordinate the installation of the furnished material and equipment with associated elements of Work, such as, but not limited to, piping and electrical connections, or support and mounting provisions.

SC-7.05

Delete paragraph 7.05 in its entirety.

SC-7.06

Delete paragraph 7.06 in its entirety.

SC-7.10

Add the following new paragraph immediately after paragraph 7.10.A.:

- B. Owner is exempt from payment of sales and compensating use taxes of the State of Illinois and of cities and counties thereof on all materials to be incorporated into the Work.
 - 1. Owner will furnish the required certificates of tax exemption to Contractor for use in the purchase of supplies and materials to be incorporated into the Work.
 - 2. Owner's exemption does not apply to construction tools, machinery, equipment, or other property purchased by or leased by Contractor, or to supplies or materials not incorporated into the Work.

SC – 7.13

Delete Paragraph 7.13.G. in its entirety.

SC – 7.15

Add the following new paragraph immediately after paragraph 7.15.A.:

- B. In emergencies affecting the safety or protection of persons or the Work or property at the site or adjacent thereto, and Contractor cannot be reached, Owner may act to attempt to prevent threatened damage, injury, or loss. Owner will give Contractor and Engineer prompt written notice of such action and the cost of the correction or remedy shall be charged against Contractor. Contractor shall give Engineer prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If Engineer determines that a change in the Contract Documents is required because of the action taken by Owner in response to such an emergency, a Work Change Directive or Change Order will be issued.

SC – 7.16

Delete Paragraph 7.16.D.3 and replace it with the following:

- 3. After Engineer has approved a shop drawing or sample, Engineer will not review subsequent submittals of a different manufacturer or Supplier unless Contractor provides sufficient information to Engineer that the approved material or equipment is unavailable, or time of delivery will delay the construction progress. If Contractor requests a change of a previously approved submittal item under one of the above conditions, Contractor shall be responsible for Engineer's charges to Owner for its review time, and Owner may impose a set-off against payments due to Contractor to secure reimbursement for such charges, unless the need for such change is beyond the control of Contractor.

Delete the last sentence in subparagraph 7.16.E.1.b.

SC – 7.18

Delete Paragraph 7.18 in its entirety.

ARTICLE 8 - OTHER WORK AT THE SITE

SC – 8.02

In paragraph 8.02.A. delete the words “Supplementary Conditions” and insert the words “Specifications” in their place.

SC-8.03

Delete paragraph 8.03.A. in its entirety and insert the following paragraph as 8.03.A:

- A. If, in the course of performing other work at or adjacent to the Site for Owner, any other contractor working for Owner, or any utility owner causes damage to the Work or to the property of Contractor or its Subcontractors, or delays, disrupts, interferes with, or increases the scope or cost of the performance of the Work, through actions or inaction, then Contractor shall promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.

Delete paragraph 8.03.C. in its entirety and insert the following paragraph as 8.03.C:

- D. If Contractor damages, delays, disrupts, or interferes with the work of any other contractor, or any utility owner performing other work at or adjacent to the Site, through Contractor's failure to take reasonable and customary measures to avoid such impacts, or if any claim arising out of Contractor's actions, inactions, or negligence in performance of the Work at or adjacent to the Site is made by any such other contractor or utility owner against Contractor, Owner, or Engineer, the Contractor (without involving Owner, Engineer, or construction coordinator) shall (1) promptly attempt to settle the claim as to all parties through negotiations with such other contractor or utility owner, or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law, and (2) indemnify and hold harmless Owner and Engineer, and the officers, directors, members, partners, employees, agents consultants and subcontractors of each and any of them from and against any such claims, and against all costs, losses and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such damage, delay, disruption, or interference.

ARTICLE 9 – OWNER'S RESPONSIBILITY

SC – 9.06

Delete paragraph 9.06 in its entirety.

ARTICLE 10 – ENGINEER'S STATUS DURING CONSTRUCTION

SC – 10.03

Delete paragraph 10.03 in its entirety and insert the following in its place:

10.03 Project Representative

1. The Resident Project Representative (RPR) will be Engineer's representative at the Site, will act as directed by and under the supervision of Engineer, and will confer with Engineer regarding RPR's actions.
2. General: RPR's dealings in matters pertaining to the Work in general shall be with Engineer and Contractor. RPR's dealings with Subcontractors shall only be through

or with the full knowledge and approval of Contractor. RPR shall generally communicate with Owner only with the knowledge of and under the direction of Engineer.

3. Schedules: Review the progress schedule, schedule of Shop Drawing and Sample submittals, and Schedule of Values prepared by Contractor and consult with Engineer concerning acceptability.
4. Conferences and Meetings: Attend meetings with Contractor, such as preconstruction conferences, progress meetings, job conferences, and other Project-related meetings, and prepare and circulate copies of minutes thereof.
5. Liaison:
 - a. Serve as Engineer's liaison with Contractor. Working principally through Contractor's authorized representative or designee, assist in providing information regarding the provisions and intent of the Contract Documents.
 - b. Assist Engineer in serving as Owner's liaison with Contractor when Contractor's operations affect Owner's on-Site operations.
 - c. Assist in obtaining from Owner additional details or information, when required for proper execution of the Work.
6. Interpretation of Contract Documents: Report to Engineer when clarifications and interpretations of the Contract Documents are needed and transmit to Contractor clarifications and interpretations as issued by Engineer.
7. Shop Drawings and Samples:
 - a. Record date of receipt of Samples and Contractor-approved Shop Drawings.
 - b. Receive Samples which are furnished at the Site by Contractor, and notify Engineer of availability of Samples for examination.
 - c. Advise Engineer and Contractor of the commencement of any portion of the Work requiring a Shop Drawing or Sample submittal for which RPR believes that the submittal has not been approved by Engineer.
8. Modifications: Consider and evaluate Contractor's suggestions for modifications in Drawings or Specifications and report such suggestions, together with RPR's recommendations, if any, to Engineer. Transmit to Contractor in writing decisions as issued by Engineer.
9. Review of Work and Rejection of Defective Work:
 - a. Conduct on-Site observations of Contractor's work in progress to assist Engineer in determining if the Work is in general proceeding in accordance with the Contract Documents.
 - b. Report to Engineer whenever RPR believes that any part of Contractor's work in progress is defective, will not produce a completed Project that conforms generally to the Contract Documents, or will imperil the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents, or has been damaged, or does not meet the requirements of any inspection, test or approval required to be made; and advise Engineer of that part of work in progress that RPR believes should be corrected or rejected or should be uncovered for observation, or requires special testing, inspection or approval.

10. Inspections, Tests, and System Start-ups:

- a. Verify that tests, equipment, and systems start-ups and operating and maintenance training are conducted in the presence of appropriate Owner's personnel, and that Contractor maintains adequate records thereof.
- b. Observe, record, and report to Engineer appropriate details relative to the test procedures and systems start-ups.

11. Records:

- a. Prepare a daily report or keep a diary or log book, recording Contractor's hours on the Site, Subcontractors present at the Site, weather conditions, data relative to questions of Change Orders, Field Orders, Work Change Directives, or changed conditions, Site visitors, deliveries of equipment or materials, daily activities, decisions, observations in general, and specific observations in more detail as in the case of observing test procedures; and send copies to Engineer.
- b. Record names, addresses, fax numbers, e-mail addresses, web site locations, and telephone numbers of all Contractors, Subcontractors, and major Suppliers of materials and equipment.
- c. Maintain records for use in preparing Project documentation.

12. Reports:

- a. Furnish to Engineer periodic reports as required of progress of the Work and of Contractor's compliance with the Progress Schedule and schedule of Shop Drawing and Sample submittals.
- b. Draft and recommend to Engineer proposed Change Orders, Work Change Directives, and Field Orders. Obtain backup material from Contractor.
- c. Immediately notify Engineer of the occurrence of any Site accidents, emergencies, acts of God endangering the Work, force majeure or delay events, damage to property by fire or other causes, or the discovery of any Constituent of Concern or Hazardous Environmental Condition.

13. Payment Requests: Review applications for payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the Schedule of Values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.

14. Certificates, Operation and Maintenance Manuals: During the course of the Work, verify that materials and equipment certificates, operation and maintenance manuals and other data required by the Contract Documents to be assembled and furnished by Contractor are applicable to the items actually installed and in accordance with the Contract Documents, and have these documents delivered to Engineer for review and forwarding to Owner prior to payment for that part of the Work.

15. Completion:

- a. Participate in Engineer's visits to the Site to determine Substantial Completion, assist in the determination of Substantial Completion and the preparation of a punch list of items to be completed or corrected.

- b. Participate in Engineer's final visit to the Site to determine completion of the Work, in the company of Owner and Contractor, and prepare a final punch list of items to be completed and deficiencies to be remedied.
- c. Observe whether all items on the final list have been completed or corrected and make recommendations to Engineer concerning acceptance and issuance of the notice of acceptability of the work.

C. The RPR shall not:

- 1. Authorize any deviation from the Contract Documents or substitution of materials or equipment (including "or-equal" items).
- 2. Exceed limitations of Engineer's authority as set forth in the Contract Documents.
- 3. Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers.
- 4. Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of Contractor's work.
- 5. Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
- 6. Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.
- 7. Accept Shop Drawing or Sample submittals from anyone other than Contractor.
- 8. Authorize Owner to occupy the Project in whole or in part.

SC - 10.08

Add the following new paragraph immediately after Paragraph 10.08.A.:

- B. In the event Engineer determines that Contractor's safety plans, programs, and procedures do not provide adequate protection for Engineer, Engineer may direct its employees to leave the Site or implement additional safeguards for Engineer's protection. If taken, these actions will be in furtherance of Engineer's responsibility to its own employees only, and Engineer will not assume any responsibility for protection of any other persons affected by the Work. In the event Engineer observes situations which appear to have potential for immediate and serious injury to persons, Engineer may warn the persons who appear to be affected by such situations. Such warnings, if issued, shall be given based on general humanitarian concerns, and Engineer will not, by the issuance of any such warning, assume any responsibility to issue future warnings or any general responsibility for protection of persons affected by the Work.

ARTICLE 11 – AMENDING THE CONTRACT DOCUMENTS; CHANGES IN THE WORK

SC-11.02

Delete paragraph 11.02.A.4. in its entirety and replace with the following:

4. Changes that embody the substance of any final and binding results under: Paragraph 11.03.B, resolving the impact of a Work Change Directive; Paragraph 11.09, concerning Change Proposals; Paragraph 13.02.D, final adjustments resulting from allowances; Paragraph 13.03.D, final adjustments relating to determination of quantities for Unit Price Work; and similar provisions.

Delete paragraph 11.02.B in its entirety and replace with the following:

- B. If Contractor refuses to execute a Change Order that is required to be executed under the terms of the Paragraph 11.02.A, it shall be deemed to be of full force and effect, as if fully executed.

Add the following new paragraph immediately after subparagraph 11.02.B.:

- C. Change Orders will be prepared on the form included in the Appendix of this Project Manual.

SC – 11.05

Amend paragraph 11.05.B. by adding the following sentence to the end of the paragraph: “When such changes in the Work are determined to be applicable under a Contingency, a Field Order shall be issued by the Engineer.”

SC – 11.07

Delete paragraph 11.07.A. in its entirety and replace with the following:

- A. The Contract Price may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Price must comply with the provisions of Paragraph 11.09.

Delete paragraph 11.07.B.2. in its entirety and insert the following in its place:

2. Where the Work involved is not covered by unit prices contained in the Contract Documents, then by a mutually agreed lump sum which includes an allowance for overhead and profit in accordance with Paragraph 11.07.C.2; or

SC – 11.08

Delete paragraph 11.08.A. in its entirety and insert the following in its place:

- A. The Contract Times may only be changed by a Change Order. Any Change Proposal for an adjustment in the Contract Times must comply with the provisions of Paragraph 11.09.

Add the following new paragraph immediately after paragraph 11.08.B.:

- C. Time extensions provided under paragraph 4.05 of the General Conditions will only be allowed for controlling items of Work (critical path).

SC – 11.09

Amend the first sentence of paragraph 11.09.B.1 by striking out the words “30 days” and inserting the words “10 days” in their place.

Delete paragraph 11.09.B.4. in its entirety and insert the following in its place:

4. *Engineer's Full Review and Action on the Change Proposal:* Upon receipt of Contractor's supporting data (including any additional data requested by Engineer), Engineer will conduct a full review of each Change Proposal and, within 30 days after such receipt of the Contractor's supporting data, either approve the Change Proposal in whole, deny it in whole, or approve it in part and deny it in part. Such actions must be in writing, with a copy provided to Owner and Contractor. If Engineer does not take action on the Change Proposal within 30 days, then either Owner or Contractor may at any time thereafter submit a letter to the other party indicating that as a result of Engineer's inaction the Change Proposal is deemed denied.

Delete paragraph 11.09.B.5. in its entirety and insert the following in its place:

5. *Binding Decision:* Engineer's decision is final and binding upon Owner and Contractor, unless Owner or Contractor appeals the decision.

Delete paragraph 11.09.C. in its entirety and insert the following in its place:

- C. *Resolution of Certain Change Proposals:* If the Change Proposal does not involve the design (as set forth in the Drawings, Specifications, or otherwise), the acceptability of the Work, or other engineering or technical matters, then Engineer will notify the parties in writing that the Engineer is unable to resolve the Change Proposal. For purposes of further resolution of such a Change Proposal, such notice will be deemed a denial.

ARTICLE 12 – CLAIMS

Delete Article 12 in its entirety.

ARTICLE 13 – COST OF WORK; ALLOWANCES; UNIT PRICE WORK

SC – 13.01

Delete paragraph 13.01.B.5.c.2) in its entirety.

Delete paragraph 13.01.E in its entirety and insert the following in its place:

- E. *Documentation and Audit:* Whenever the Cost of the Work for any purpose is to be determined pursuant to this Article 13, Contractor and pertinent Subcontractors will establish and maintain records of the costs in accordance with generally accepted accounting practices. Subject to prior written notice, Owner will be afforded reasonable access, during normal business hours, to all Contractor's accounts, records, books, correspondence, instructions, drawings, receipts, vouchers, memoranda, and similar data relating to the Cost of the Work and Contractor's fee. Contractor shall preserve all such documents for a minimum period of three years or as required by state law in which Work is performed after the final payment by Owner. Pertinent Subcontractors will afford such access to Owner, and preserve such documents, to the same extent required of Contractor.

SC – 13.02

Amend the title of Section 13.02 by striking out the word "Allowances" and inserting the word "Contingency" in its place.

Delete paragraph 13.02.B. in its entirety.

Delete paragraph 13.02.C. in its entirety and insert the following in its place:

- C. *Contingency*: Contractor agrees that an Owner's contingency if any, is for the sole use of the Owner to cover unanticipated costs.

Delete paragraph 13.02.D. in its entirety.

SC – 13.03

Delete Paragraph 13.03.E. in its entirety and insert the following in its place:

- E. *Adjustments in Unit Price*: Within 30 days of Engineer's written decision under the preceding paragraph, the unit price of an item of Unit Price Work shall be subject to reevaluation and adjustment under the following conditions:
1. if the total cost of a particular item of Unit Price Work amounts to 5% or more of the Contract Price and the variation in the quantity of that particular item of Unit Price Work performed by Contractor differs by more than 25% from the estimated quantity of such item indicated in the Contract; and
 2. if there is no corresponding adjustment with respect to any other item of Work; and
 3. if Contractor believes that Contractor has incurred additional expense as a result thereof; or if Owner believes that the quantity variation entitles Owner to an adjustment in the unit price.

ARTICLE 14 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

SC – 14.05

Delete Subparagraph 14.05.C.2. in its entirety and insert the following in its place:

2. If the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, then Contractor may submit a Change Proposal within 10 days of the determination that the Work is not defective.

ARTICLE 15 – PAYMENTS TO CONTRACTOR; SET-OFFS; COMPLETION; CORRECTION PERIOD

SC – 15.01

Amend the first sentence of subparagraph 15.01.B.1. by striking out the words "20 days" and inserting the words "30 days" in their place.

Amend the first sentence of paragraph 15.01.D.1. by striking out the words "Ten days" and inserting the words "Thirty days" in their place.

SC – 15.03

Add the following new subparagraph immediately after paragraph 15.03.A.:

1. Contractor's request for issuance of a Certificate of Substantial Completion shall occur after Contractor has, in the opinion of the Engineer, satisfactorily completed the systems demonstrations, delivered all guarantees, certificates of installation services, a complete set of marked up Drawings as specified in Division 1, General Requirements, and other documents. Engineer will not prepare a tentative certificate of Substantial Completion until

systems demonstrations are satisfactorily completed in accordance with Section 01 79 10, Systems Demonstrations, and a satisfactory set of marked up Drawings has been submitted in accordance with Section 01 78 39, Project Record Documents.

Add the following to the end of paragraph 15.03.F.

“The Contractor shall provide a listing of its property that it wishes to remove from the site and obtain Owner's approval before the property is removed. Only property approved by the Owner can be removed from the site. The Contractor shall schedule the removal of the property with the Owner, and shall obtain permission from the Owner to access the site. The Owner has the right to monitor the removal of the property.”

SC – 15.06

Add the following new subparagraph immediately after paragraph 15.06.E:

1. In addition to the liquidated damages set forth in the Contract, Contractor shall be liable for all additional costs for Engineer's services beyond Substantial and Final Completion dates. Owner will deduct these costs from any monies due or that may become due Contractor or Surety and pay Engineer for said services.

ARTICLE 16 – SUSPENSION OF WORK AND TERMINATION

SC – 16.01

Amend paragraph 16.01.A. by striking out the words “30 days” in and inserting the words “ten days” in their place.

SC - 16.02

Add the following to end of paragraph 16.02.D.

“within no more than 30 days of receipt of said notice.”

SC-16.04

Amend paragraphs 16.04.A. and 16.04.B. by striking out the words “30 days” in four places and inserting the words “60 days” in their place and by striking out the words “seven days” in two places and inserting the words “ten days” in their place.

ARTICLE 17 – FINAL RESOLUTION OF DISPUTES

Delete paragraph 17.01.A.1. and 17.01.A.2 in their entirety and insert the following in its place:

1. Disputes between Owner and Contractor concerning the Work, or obligations under the Contract Documents, that arise after final payment has been made.

Delete paragraph 17.01.B. in its entirety and insert the following in its place:

- B. Final Resolution of Disputes: For any dispute subject to resolution under this Article, Owner or Contractor may:
 1. agree with the other party to submit the dispute to another dispute resolution process.
 2. give written notice of intent to the other party to submit the dispute to a court of competent jurisdiction, or

- C. Notwithstanding any applicable statute of limitations, a party giving notice under paragraph 17.01.B shall commence an action on the Claim within one year of giving such notice. Failure to do so shall result in the Claim being time-barred and the action or denial shall become final and binding.

ARTICLE 18 – MISCELLANEOUS

SC – 18.01

Delete Paragraph 18.01.A. in its entirety and revise it to read the following:

- A. Whenever any provision of the Contract requires the giving of written notice to Owner, Engineer, or Contractor, it will be deemed to have been validly given only if delivered:
1. in person, by a commercial courier service or otherwise, to the recipient's place of business, and addressed to the specific intended recipient;
 2. by registered or certified mail, postage prepaid, to the recipient's place of business, and addressed to the specific intended recipient; or
 3. by e-mail to the specific intended recipient, with the words "Formal Notice" or similar in the e-mail's subject line. Written notice shall not be considered accepted until receipt is acknowledged by the intended recipient.

SC – 18.11

Add the following new paragraph immediately after paragraph 18.10:

18.11 Lien Waivers:

- A. Owner may at any time require Contractor to furnish lien waivers for labor and materials covered by specified Applications for Payment.

END OF SUPPLEMENTARY CONDITIONS

SPECIFICATIONS

DIVISION 01
GENERAL REQUIREMENTS

SECTION 01 11 00
SUMMARY OF WORK

PART 1 – GENERAL

1.01 SUMMARY

- A. The Work of this Contract is generally described as electrical improvements, generator replacement, and associated sitework, structural and instrumentation and control.

1.02 WORK BY OTHERS

- A. Utilities (Ameren Illinois):

- 1. Utility transformer work as noted below in the work sequence.

- B. Work on Site which will be, or has been executed prior to, or after, start of Work on this Contract and may be concurrent to this Contract, but is excluded from this Contract:

- 1. City of Bloomington - Fort Jesse – Tank Rehabilitation.

1.03 WORK SEQUENCE

- A. Construct Work in accordance with following requirements and to accommodate operation of existing facilities during the construction period. Coordinate construction progress schedule and operations with Engineer and Owner. Owner reserves right to place facilities taken out of service by Contractor back into service on emergency basis upon notification to Contractor.
- B. Bypassing, overflowing, or spilling of treated water to surface water, drainage courses or to ground is strictly prohibited during construction. In the event accidentally bypassing, overflowing, or spilling is caused by the Contractor's operations, the Owner shall immediately be entitled to employ others, at the Contractor's expense, to stop the bypassing, overflowing, or spilling without giving written notice to the Contractor.
- C. Penalties imposed on the Owner as a result of any bypass caused by the actions of the Contractor, his employees, or subcontractors, shall be borne in full by the Contractor, including legal fees and other expenses to the Owner resulting directly or indirectly from the bypass.
- D. Drinking water flow through the system shall be maintained at all time, with the exceptions noted below.
 - 1. One station may be taken out of service at a time in coordination with other ongoing work. At no point will both pump stations be taken out of service.
 - 2. Contractor shall plan, schedule, and coordinate Work such that one pump station remains in service at all times.
 - 3. Station that remains online shall always have 2 of the following sources of power available at any time: Utility, Existing Generator, New Generator, Rental Generator.
 - 4. Any and all shutdowns or interruptions in service must be coordinated and approved by the Owner in advance.
 - 5. De-energizing of the Pump Station PLC or Power Panel shall be coordinated in advance with the Owner to ensure continue operation of the system without these systems online.

- E. Temporary shutdowns of utilities or pipelines – when making new connections to various pipelines and electrical distribution lines within the plant, any and all shutdowns must be coordinated and approved by the Owner in advance.
- F. Site Constraints
1. Perform site demolition and new work concurrently to minimize disruptions to plant operations and flow.
 2. Contractor shall coordinate gate access to the plant with Owner for deliveries and any other needs of the Contractor.
 3. Maintain clear space at all times for Owner to receive delivery of chemicals and equipment.
 4. Contractor shall maintain Owner's access for other site usage such as access for: all buildings on site for operations and maintenance of facilities, chemical deliveries and trash service.
- G. Suggested General Sequence of Work. Not all work steps and safety measures are listed below. Contractor shall use the following sequence as a general guide to minimize outages. Contractor shall submit any modification or improvement to sequence in writing to Owner and Engineer for review prior to commencing any work. Unless noted otherwise, all work shall be the responsibility of the Contractor. Work to be completed by others, where noted, will be coordinated by the Contractor.
1. Utility Locate of all existing underground utilities.
 2. Excavation for all site conduits
 3. Planned Utility Outage to install Station A ATS and Station B ATS conduits from existing utility vault to 5' to North of existing utility vault. Minimize outage to 4 hours. Run on existing Generator Power.
 4. Install New Station A site conduits and pull strings except for conduit between Station A ECB and Wireway. Cap all conduits terminations and stub ups prior to equipment installations.
 5. Install New Station B site conduits and pull strings. Cap all conduits terminations and stub ups prior to equipment installations.
 6. Install Site Grounding.
 7. Install Site Concrete Pads.
 8. Install all outdoor equipment.
 9. Install all outdoor Station A wiring except:
 - a. Terminations at Station A ECB. Leave slack at Station A ECB for termination of ATS A wiring to Station A ECB during cutover.
 - b. Wiring from Utility Transformer to ATS A.
 10. Install all outdoor Station B wiring except:
 - a. Wiring from Utility Transformer to ATS B.
 - b. Wiring from ATS B to Station B MCC-P21

11. Station A Outage. Open Circuit Breaker at MCC-P21 – LOTO. Operate on Station B. Install the Following:
 - a. Conduits from Wireway to ECB at Station A
 - b. Terminations at Station A ECB for ATS A to ECB circuit.
12. Utility and Station B Outage. Operate Station A on New Generator. Rent 1 MW generator with fuel and have ready. Connection point will be new Portable Generator connection cabinet. Minimize outage to 4 hours. Install the following circuits:
 - a. Wiring from Utility Transformer to ATS B.
 - b. Wiring from ATS B to Station B MCC-P21
13. Utility and Station A Outage. Operate Station B on Existing Generator. Maintain rental generator. Connection point will be at Emergency lugs on existing Station B ATS if needed. Minimize outage to 4 hours. Install the following circuits:
 - a. Wiring from Utility Transformer to ATS A.
14. Station B Outage. Operate Station A on utility power, New Generator available for backup power. Minimize Station B Outage to 1 week. Complete all remaining station B work.
15. Restore Station B Power. All equipment shall be operational.
16. Complete Programming, Integration, Training
17. Complete Site Work and Restoration.

1.04 CONTRACTOR'S USE OF PREMISES

- A. Conduct operations to ensure least inconvenience to Owner and operation of existing facility. Cooperate with Owner during construction operations to minimize conflict and to facilitate Owner's operations.
- B. When keys to locked areas are needed to provide access to areas to perform Work, obtain from Owner. Return keys at end of day's Work.
- C. Employees of Contractor and Subcontractors involved in Work shall wear identifying button or badge when working in facilities occupied by Owner.
- D. Contractor shall discuss and coordinate with Owner and Engineer the removal equipment from service in order to complete Work. Owner shall retain operation of the system at all time and will remove equipment and components from service when properly planned and coordinated in advance. Owner will, at Owner's discretion, place equipment back into service if out of service equipment will cause adverse effects on plant operation.
- E. Obtain and pay for use of additional storage or Work areas needed for operations at no additional cost to Owner.

1.05 OWNER OCCUPANCY OF PREMISES

- A. Owner will occupy site and existing facilities during entire construction period for conduct of normal operations.
- B. Owner reserves right to partially occupy and to place and install equipment in completed areas of facilities, prior to Substantial Completion, provided that such occupancy does not interfere with completion of Work. Such placing of equipment and partial occupancy shall not constitute acceptance of the Work.
- C. Prior to partial Owner occupancy, mechanical and electrical systems shall be fully operational. Required inspections and tests shall have been successfully completed. Upon partial occupancy, Owner will provide operation and maintenance of mechanical and electrical systems in occupied portions of the facility.
- D. Partial occupancy shall conform to requirements of General Conditions.

PART 2 – PRODUCTS

(Not Used)

PART 3 – EXECUTION

(Not Used)

END OF SECTION

SECTION 01 21 00
CONTINGENCY

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes administrative and procedural requirements governing use of contingencies on the project.
- B. Designate in schedule of values costs and quantities required under each contingency.

1.02 DEFINITIONS

- A. Contingency:
 - 1. Included in the Contract;
 - 2. Exclusive of work indicated in the Contract Documents, for which payment is included under other items in the Bid Form;
 - 3. Used for unanticipated costs associated with investigative work or unforeseen issues which may arise during the project;
 - 4. Authorized by Field Order;
 - 5. To be used only if needed at the discretion of the Owner;
 - 6. Any unused balance of the contingency shall revert to the Owner upon completion of the work;
 - 7. Unless otherwise indicated, Contractor's cost for receiving and handling at the Project site, labor, installation, overhead and profit, and similar costs related to work ordered by the Owner as part of the contingency shall be included as part of the contingency.

1.03 SPECIFIC CONTINGENCY

- A. Contingency: Shall be equal to 10% of the subtotal as shown on the Bid Form.

PART 2 - PRODUCTS

(Not Used)

PART 3 - EXECUTION

3.01 CONTINGENCY UTILIZATION PROCEDURES

- A. When Work, not previously identified in the project documents, is determined to be applicable under the definition of Contingency, follow the following steps:
 - 1. Owner and Engineer shall review project documents and determine what work, if any, is outside of the current scope of work.
 - 2. Engineer shall issue a Field Order that includes supporting documentation. Field Order is to provide sufficient guidance to the Contractor to complete the additional work identified as being eligible for the Contingency.
 - 3. The contractor shall submit a Change Proposal to the Engineer in accordance with Article 11.09 of the General Conditions.
 - 4. Costs for work completed as part of an accepted Change Proposal shall be included and identified in subsequent Payment Application under the Contingency line item in the Schedule of Values.
- B. Any work determined to be outside of the limit of the project documents, and completed prior to acceptance of the Change Proposal, shall be solely at the Contractor's risk.

END OF SECTION

SECTION 01 21 10
COST INDEXING

PART 1 – GENERAL

1.01 SUMMARY

- A. This Section addresses adjustment for cost fluctuations for certain raw materials which will be permanently incorporated into the work. The raw material cost for the Commodities shall be subject to adjustment (increase or decrease) in accordance with this Section to account for fluctuations in costs. No adjustment will be made for changes in the cost of manufacturing, fabrication, shipping, storage, construction, installation, etc.
- B. Price adjustment shall be limited to the Commodities listed in Table 01 21 10-1 of this Section only. Price adjustment shall not be applicable for any other materials.

1.02 RELATED WORK

- A. Bid Form
- B. Bidding Requirements and Instructions to Bidders
- C. All applicable General and Detailed Specifications

1.03 REFERENCE STANDARDS

- A. U.S. Department of Labor – Bureau of Statistics, Producer Price Index (PPI)

1.04 BASE INFORMATION FOR COMMODITIES

- A. Adjustments shall be based on the indices published by the U.S. Department of Labor – Bureau of Labor Statistics index entitled “producer Price Index” (PPI). Information on the PPI is available at the following website: <http://www.bls.gov/PPI/#overview>.
- B. Data for calculating changes in the PPI will be based upon the exact PPI Category code described in Table 01 21 10-1. The PPI data is available through query from the following website: <http://www.bls.gov/PPI>. The PPI shall not be seasonally adjusted. The user selects the six PPI Category codes, checks the “not seasonally adjusted” box and data tables for the selected PPI Category codes will download. The PPI is preliminary when published; each PPI is recalculated on a systemic basis four index months after being first published.
- C. The base quantity for each commodity is to be determined and substantiated with sufficient documentation by the Contractor. The base quantity for each commodity shall be provided by the Contractor prior to the Preconstruction Meeting. The base quantity shall be the actual quantity used by the Contractor. The Owner reserves the right to adjust the base quantity in the event that a change order significantly increases or decreases the use of a listed commodity.
- D. The base price for the commodity included in Table 01 21 10-1 will be used as the initial unit price subject to adjustment. The base price represents the Engineering News Record Midwest unit price for the commodity published in July, 2022. Most base prices in Table 01 21 10-1 are directly from ENR 20-City Average with the same units. An exception is ready-mix concrete, where the published costs for 4,000 psi and 5,000 psi concrete are averaged to arrive at the table value. Another exception is ductile iron pipe. For ductile iron pipe, published costs for 6-inch, 8-inch, and 12-inch pipe are averaged and converted to price per pound based on pipe unit weight, then the resulting value is converted to per ton units.

- E. The Owner will document the initial PPI for each commodity in a file letter issued after the Notice to Proceed Date. The initial PPI for each commodity will subsequently be updated in a file letter four to five months later with the final version to document any revisions to the preliminary PPI.
- F. The PPI categories, adjustment milestones, base prices and base quantities for each commodity are shown in Table 01 21 10-1.

Table 01 21 10-1

Commodity	PPI Category	Adjustment Milestone (Days from Notice to Proceed Date)	Base Price for Commodity (BPC)	Base Quantity for Commodity (QC)
Concrete	330101B (Midwest Region Ready-Mix Concrete)	365 days	\$172.19/cy	To Be Determined and Substantiated By Contractor
Structural Steel	101507 (Other steel castings, carbon steel)	365 days	\$90.11/cwt	
Rebar	101704 (Hot rolled bars, plates, and structural shape)	365 days	\$74.16/cwt	
Stainless Steel	101508 (Other steel castings, high alloy and stainless)	365 days	\$321.11/cwt	
Ductile Iron	10150211 (Pressure pipe and fittings, ductile iron)	365 days	\$3,037.83/ton	
Asphalt	13940113 (Asphalt and Tar Paving Mixtures – excluding liquid)	365 days	\$444.92/ton	

*cwt = hundredweight = 100 lbs.

1.05 PRICE ADJUSTMENT CALCULATION

- A. The percentage of change in the PPI shall be calculated at the adjustment milestone for each commodity. The percentage of change shall be based upon the comparison of the PPI published in the same month as the Notice to Proceed Date and the PPI published within the same month as the adjustment milestone. The percentage of change in the PPI shall be calculated four to five months after the adjustment milestone, once the final PPI is published.
- B. Price adjustment for the commodities shall be calculated for adjustment milestones when the percentage change in the PPI, as described above, is more than 5.0 percent. No price adjustment will be made for a commodity at the adjustment milestone when the percentage change in the PPI is equal to or less than 5.0 percent.
- C. Price adjustment for the commodities shall be determined based on changes in the value of the PPI, in accordance with the following formula:
1. For an increase in the value of the PPI which is in excess of 5.0 percent:

$$\text{Price Adjustment} = (\text{IE/IC} - 1.05) \times \text{BPC} \times \text{QC}$$
 2. For a decrease in the value of the PPI which is in excess of 5.0 percent:

$$\text{Price Adjustment} = (\text{IE}/\text{IC} - 0.95) \times \text{BPC} \times \text{QC}$$

Where IE = Updated price index value for the adjustment milestone period
 IC = Initial price index value (first published after Notice to Proceed Date)
 BPC = Applicable Base Price
 QC = Base Quantity applicable to adjustment at milestone period

1.06 PRICE ADJUSTMENT

- A. The price for the commodity will be adjusted based upon the final PPI published during the same month as the adjustment milestone outlined in Table 01 21 10-1.
- B. The Owner will complete the price adjustment documentation for each scheduled adjustment milestone as follows:
 - 1. Determine final published PPI value for commodity from the Bureau of Labor Statistics website four to five months after the adjustment milestone date.
 - 2. Calculate change in final PPI.
 - 3. Calculate price adjustment for each commodity based upon Price Adjustment calculation formula and base quantity subject to adjustment.
 - 4. Calculate total price adjustment due to or from Contractor for progress payment and process for payment within two progress payment periods from receiving final PPI data corresponding to the adjustment milestone date.
- C. There will be a time lag of four to five months after the scheduled adjustment milestone to account for the publishing of the final PPI data.
- D. If the Contractor is paid for a price adjustment in accordance with this Section, the Contractor shall pay a properly allocated share of such price adjustment to the applicable Subcontractors and/or suppliers.

1.07 PAYMENT

- A. Payment for price adjustments will be paid by Change Order.
- B. Payment of price adjustments will be made as part of the progress payment occurring four to five months after the adjustment milestone date. The Contractor shall be liable to the Owner for decreased price adjustments and the Owner may deduct the amount thereof from any monies due or that may become due the Contractor.
- C. With the exception of the allowance items specified herein above, no separate payment will be made for the work under this Section (including, but not limited to, the Contractor's effort to prepare and obtain required documents for the price adjustment).
- D. No additional price adjustments will be made in the even the Notice to Proceed Date or the scheduled Substantial Completion Date is changed.

PART 2 – PRODUCTS

(Not Used)

PART 3 – EXECUTION

(Not Used)

END OF SECTION

SECTION 01 23 00
ALTERNATES

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes Alternates to Work defined in Contract Documents.
- B. All Alternates described in this Section are required to be reflected on the Bid form as submitted by the Bidder.
- C. Do not submit Alternates other than as described in this Section.

1.02 DEFINITIONS

- A. Alternate: An amount proposed by Bidder and stated on Bid form for certain Work defined in Bidding Requirements that may be added to or deducted from Contract Price if Owner decides to accept corresponding change in either amount of construction to be completed, or in materials, equipment, or installation methods described in Contract Documents.
- B. Cost: Net addition or deduction from Contract Price to incorporate Alternate into Work. No other adjustments will be made to Contract Price.

PART 2 – PRODUCTS

2.01 DESCRIPTION OF ALTERNATES

- A. Alternate 1: Concrete Removal.
 - 1. Remove and dispose of noted concrete equipment pads.
 - 2. Pads are both interior and exterior to Building 102 – Pump Station B.
 - 3. Pertinent Work specified elsewhere:
 - a. Alteration Project Procedures: Section 01 35 16.
 - b. Drawing: 002-CR-1 and 102-RSEN-1.
- B. Alternate 2: Generator Access Platform.
 - 1. Provide two generator access platforms, one on each side of diesel-engine-driven generator set.
 - 2. Pertinent Work specified elsewhere:
 - a. Diesel-Engine-Driven Generator Sets: Section 26 32 13.13.
 - b. Drawings: 002-CEFN-1.
- C. Alternate 3: Portable Generator Connection Cabinet for Station A Emergency Circuit.
 - 1. Provide portable generator connection cabinet in series with Station A emergency circuit.
 - 2. Pertinent Work specified elsewhere:
 - c. Portable Generator Connection Cabinet: Section 26 25 50
 - d. Drawings: 002-CEFN-1, 007-E-4

PART 3 – EXECUTION

3.01 INSTALLATION

A. Coordination:

1. Modify or adjust affected Work as necessary to integrate Work of selected Alternates into Project.
2. Include as part of each Alternate, miscellaneous devices, accessories, and items incidental to or required for complete installation whether or not indicated as part of Alternate.

B. Execute accepted Alternates under same conditions as other Work of Contract.

END OF SECTION

SECTION 01 29 73
SCHEDULE OF VALUES

PART 1 - GENERAL

1.01 SUMMARY

- A. Provide a detailed breakdown of the Contract Price showing amounts and quantities allocated to each of the various parts of the Work, as specified herein and as required by General Conditions.
- B. Upon request of Engineer, support amounts and quantities with data substantiating their correctness.

1.02 FORM AND CONTENT OF SCHEDULE OF VALUES

- A. Schedule shall be typed on 8-1/2-in. by 11-in. white paper. Contractor's standard forms and automated printout will be considered for approval by Engineer upon request. Include following:
 - 1. Project title.
 - 2. Project location.
 - 3. Owner.
 - 4. Engineer.
 - 5. Engineer's project number.
 - 6. Name and address of Contractor.
 - 7. Contract designation.
 - 8. Date.
- B. Identify installed value of Work in sufficient detail to serve as basis for computing values for progress payments during construction.
- C. Provide a separate listing of general items, such as bonds, insurance, mobilization, field supervision, construction facilities, allowances, and record documents.
- D. Follow Project Manual table of contents as format for listing component items. At a minimum, listing shall include material cost and total installed cost for each Specification Section for each structure as listed in this Section.
 - 1. Identify each line item with number and title of respective Specification Division and Section.
 - 2. Include directly proportional amount of Contractor's overhead and profit.
 - 3. For items on which progress payments will be requested for stored materials, break down value into:
 - a. Cost of materials, delivered and unloaded.
 - b. Total installed value.
- E. Provide listing of items for sitework and for each structure as follows:
 - 1. Contractor's Overhead.
 - a. Bonds and Insurance
 - b. Mobilization
 - c. Office Support

- d. Field Supervision
- e. Demobilization

- 2. Sitework.
- 3. Generator (Equipment only).
- 4. All other work not otherwise listed.
- 5. Contingency.

F. Sum of values listed shall equal total Contract Price.

G. Provide additional breakdown as required by Engineer.

PART 2 – PRODUCTS

(NOT USED)

PART 3 – EXECUTION

(NOT USED)

END OF SECTION

SECTION 01 31 19
PROJECT MEETINGS

PART 1 - GENERAL

1.01 SUMMARY

- A. Engineer will conduct preconstruction conference in accordance with the General Conditions and this Section.
- B. To enable orderly review during progress of the Work, and to provide for systematic discussion of problems, the Contractor shall conduct progress meetings, construction foreman's meetings, and specially called meetings throughout the construction period. Owner and Engineer may attend meetings. Contractor shall:
 - 1. Prepare agenda.
 - 2. Distribute written notice of specially called meetings a minimum of 1 working day in advance of the meeting date. Notice by electronic mail is acceptable.
 - 3. Make physical arrangements for meetings.
 - 4. Preside at meetings.
 - 5. Record meeting minutes.
 - 6. Prepare formal minutes within 3 working days after meeting and distribute electronic copies to:
 - a. Meeting participants.
 - b. Affected parties.
 - c. Engineer and Owner

1.02 QUALIFICATIONS

- A. Representatives of Contractor, Subcontractors, and Suppliers attending the meetings shall be authorized to act on behalf of entity each represents.
- B. Revisions to Minutes:
 - 1. Unless published minutes are challenged in writing prior to the next regularly scheduled progress meeting; they will be accepted as properly stating the activities and decisions of the meeting.
 - 2. Challenge to the minutes shall be settled at the regularly scheduled meeting.

PART 2 – PRODUCTS

(NOT USED)

PART 3 – EXECUTION

3.01 PRECONSTRUCTION CONFERENCE

- A. Location: To be selected by Owner.
- B. Attendance:
 - 1. Contractor's Project Manager.
 - 2. Contractor's Resident Superintendent.
 - 3. Contractor's "hands-on" person designated to submit Shop Drawings to Engineer.

4. Subcontractors' or Suppliers' representatives Contractor may desire to invite or Engineer may request.
5. Owner's representatives.
6. Engineer's representatives.
7. Local utility representatives, if applicable.

C. Agenda:

1. Organizational arrangement of Owner's and Engineer's forces.
2. Organizational arrangement of Contractor's, Subcontractors', and material and equipment Suppliers' forces.
3. Contract Documents, including distribution of required copies.
4. Project safety.
5. Preliminary Construction Progress Schedule.
6. Check of required bonds and insurance.
7. Liquidated damages.
8. Preliminary schedule of Shop Drawing submissions.
9. Procedures for handling submittals.
10. O & M submittals.
11. Channels and procedures for communications, correspondence, and project coordination.
12. Weekly and monthly meetings.
13. Equal opportunity requirements.
14. Laboratory and field testing requirements.
15. Provisions for inventory of material stored on-site or off-site.
16. Schedule of values.
17. Application for progress payments.
18. Field Order and Change Order procedures.
19. Project Record Documents.
20. Posting of required signs and notices.
21. Other business.

3.02 MONTHLY PROGRESS MEETINGS

A. Schedule monthly meetings.

B. Location: Contractor's field office.

C. Attendance:

1. Contractor's Project Manager.
2. Contractor's Resident Superintendent.
3. Affected Subcontractors.

D. Suggested Agenda:

1. Review of minutes of previous meeting.
2. Review of Work progress since previous meeting.
3. Project safety concerns.
4. Field observations, problems, conflicts.
5. Problems impeding Construction Progress Schedule.
6. Review of off-site fabrication, delivery schedules.
7. Corrective measures and procedures to regain conformance with Construction Progress Schedule.
8. Revisions to Construction Progress Schedule.
9. Issues raised by Owner and Engineer.
10. Proposed progress and schedule for succeeding Work period.

11. Coordination of schedules.
12. Review and update of submittal schedule.
13. Maintenance of quality standards.
14. Pending changes and Substitutions.
15. Effect of proposed changes on Construction Progress schedule.
16. Review of Project Record Documents.
17. Other business.

- E. Agenda containing specific subjects to be discussed shall be provided to each attendee and to the Owner and Engineer at least 5 working days before the meeting.

3.03 CONSTRUCTION FOREMAN'S MEETING

- A. Schedule weekly.
- B. Location: Contractor's field office.
- C. Attendance:
 1. Resident Superintendent.
 2. Subcontractors' foremen.
- D. Suggested Agenda:
 1. Review of Work progress since previous meeting.
 2. Proposed progress and schedule for succeeding Work period.
 3. Field observations, problems, conflicts.
 4. Problems that affect Construction Progress Schedule.

END OF SECTION

SECTION 01 32 15
PROGRESS SCHEDULE
(CRITICAL PATH METHOD)

PART 1 – GENERAL

1.01 SUMMARY

- A. Submit preliminary Progress Schedule in accordance with General Conditions. Preliminary schedule may be in the form of horizontal bar chart and shall outline, in detail, construction activities until the Critical Path Method (CPM) schedule is complete and becomes effective.
- B. Prepare and submit detailed CPM Progress Schedule to Engineer within 60 days after Notice to Proceed.
 - 1. Approximately midway through the 60-day period, representatives of Contractor shall meet with Engineer and Owner for the purpose of review and coordination of draft CPM schedule.

1.02 SUBMITTALS

- A. Three days before the meetings to discuss schedules, submit preliminary schedule or CPM schedule electronically, and subsequent revisions thereof, to Engineer and Owner for review.
- B. Three days prior to monthly progress meetings, submit revised schedule to Owner and Engineer electronically. Furnish revised schedule to Subcontractors as appropriate.
- C. In addition to submission requirements defined herein, post progress schedule to document management website.
- D. Failure to submit schedules on a timely basis shall be considered cause for withholding progress payments.
- E. Within 10 days after Notice to Proceed, submit name and qualifications of firm proposed to prepare schedule.

1.03 QUALITY ASSURANCE

- A. Progress Schedule and revisions to schedule shall be as directed by Contractor. Coordinate necessary input from Subcontractors and Suppliers.
- B. Engage services of firm specializing in preparation of Progress Schedules or demonstrate to Engineer experience and capabilities to prepare and revise CPM schedules.

1.04 WORKING HOURS

- A. Comply with requirements of General Conditions.
- B. No Work shall be done between 6:00 p.m. and 7:00 a.m., nor on Saturdays, Sundays or legal holidays without written permission of Owner. Emergency work may be done without prior permission.
- C. Such permission may be revoked at any time by Owner if Contractor fails to maintain adequate equipment and supervision for proper prosecution and control of Work. Revocation shall not entitle Contractor to change in Contract Price or Contract Time.

PART 2 – PRODUCTS

(NOT USED)

PART 3 – EXECUTION

3.01 FORM OF SCHEDULE

- A. Use precedence diagramming method to present manner and timing in which Contractor intends to perform Work. Resource and cost load the schedule in accordance with the payment schedule. Base CPM schedule on 5-day workweek with notations for specific constraints such as winter shut down.
- B. Schedule shall cover on- and off- site activities. Detail individual activities to such a degree that path of construction can be easily followed for each item of work. Provide early and late start and completion dates with float times indicated for each. Present schedule as follows:
 - 1. Logic diagram with critical path highlighted.
 - 2. Listing of activity items by activity number.
 - 3. Listing of activity items by early start dates.
 - 4. Listing of activity items by late start date.
 - 5. Listing of activities on critical path.
- C. Content:
 - 1. Show complete sequence of construction by activity.
 - 2. Show dates for beginning and completion of each major element of construction and installation dates for major equipment items. Include:
 - a. Each individual task of construction.
 - b. Procurement of equipment and systems including Shop Drawing submittals, Engineer's review of submittals, shop tests, and delivery dates.
 - c. Identification of Work that will affect existing plant operations.
 - d. Services of manufactures' representatives.
 - e. Startup dates for major equipment.
 - f. Field tests.
 - g. Dates of Substantial and Final completion.
 - h. Subcontractor Work items.
 - i. Allowance for inclement weather.
 - j. MBE, WBE, and SBE activities.
 - k. O&M data activities.
 - l. Contractor-provided training.

3.02 REVISIONS TO SCHEDULE

- A. Each month Contractor shall receive update information from Subcontractors and Suppliers which shall be included in current schedule. Revised schedule shall indicate changes such as:
 - 1. Major changes in scope.
 - 2. Activities modified since previous submittal.
 - 3. Revised projections of progress and completion.
 - 4. Other identifiable changes.

- B. Information supplied by Contractor shall include as minimum, activities started during preceding period, activities completed during preceding period, starting and completion dates for each, status of completion of ongoing activities, and major logic changes.
- C. Provide narrative report to define following:
 - 1. Problem area and anticipated delays and their impact on schedule.
 - 2. Corrective action recommended and its effect.

3.03 MONTHLY PROGRESS MEETINGS

- A. Once each month, in accordance with Section 01 31 19, Progress Schedule will be reviewed. Progress will be reviewed:
 - 1. To identify those activities started and completed during previous period.
 - 2. For remaining duration required to complete each activity started, but not completed.
 - 3. For durations of selected activities not yet started.
 - 4. For effect of Change Orders and proposed sequencing.
- B. During the meeting, logic diagram will be amended as needed and Contractor shall update logic diagram and computer printouts accordingly.

3.04 DELAYS AND RECOVERY

- A. If, at any time during the Project, Contractor fails to complete activity by its latest scheduled completion date, Contractor shall, within 5 working days, submit to Engineer written statement as to how and when work force will be reorganized to return to current Progress Schedule.
- B. If, during schedule review meetings, it becomes apparent that milestone completion dates or times established in Section 01 11 00 or Contract completion dates will not be met, Contractor shall take some or all of the following actions:
 - 1. Increase construction staffing in such quantities and crafts as shall eliminate backlog of Work.
 - 2. Increase number of working hours per shift, shifts per day, Work days per week, amount of construction equipment or combination of foregoing sufficient to substantially eliminate backlog of Work.
 - 3. Reschedule Work activities to achieve concurrency of accomplishment.
- C. Under no circumstances will addition of equipment or construction forces, increasing working hours or other method, manner or procedure to return to current Progress Schedule be considered justification for Contract modification or treated as acceleration.
- D. Contractor shall accept risk for delays caused by rate of progress of Work to be performed under other Contracts. If Contractor is delayed in prosecution and completion of work because of such conditions, Contractor shall have no claim for damages to Contract adjustment other than extension of time and waiving of liquidated damages during period of time occasioned by delay.

END OF SECTION

SECTION 01 32 33
CONSTRUCTION PHOTOGRAPHS

PART 1 - GENERAL

1.01 SUMMARY

- A. Provide digital-format photographs taken at the specified stages during construction, and in accordance with provisions of this Section.
- B. Provide color video of existing facilities taken before commencement of construction.

1.02 SUBMITTALS

- A. Submit digital photographs on electronic media acceptable to the Engineer. Digital photographs shall be common retrievable format as specified by Engineer during Preconstruction Conference. Submit with each application for payment.
- B. Submit color video of existing facilities using electronic media and format acceptable to the Engineer. Submit prior to commencement of construction.
- C. In addition to submission requirements described above, post digital photographs and color video to Document Management Web Site. Organize files in similar manner to Contract Drawings (sitework, and by structure).

PART 2 - PRODUCTS

2.01 PHOTOGRAPHS

- A. Provide electronic color prints:
 - 1. Electronic files shall be in JPG, TIFF, or other commonly used format. Files shall be named to adequately describe the photo without the need to open the file.
 - 2. Project name.
 - 3. Engineer's project number.
 - 4. Orientation of view.
 - 5. Date and time of photograph.
 - 6. Photograph number.
 - 7. Contractor's name and address.
- B. Submit approved electronic storage with the appropriate information shown under paragraph 2.01 A. above.

PART 3 - EXECUTION

3.01 PHOTOGRAPHIC REQUIREMENTS

- A. Take photographs at each major stage of construction.
 - 1. Before commencement of construction.
 - 2. At intervals sufficient to record construction progress but no less than at monthly intervals during construction of facilities. Photographs need show only new Work for that month.
- B. Make each photograph clear, in focus, with high resolution and sharpness, and with minimum distortion.

3.02 VIEWS

- A. Make photographs from three separate locations around Work and for each major structure.
- B. Select locations to provide diversified overall views of Work, from positions that are expected to remain accessible throughout progress of Work. Locations shall adequately illustrate condition of construction and state of Project.
- C. When directed by Engineer, because of stage of construction, change one or more locations to new locations inside or outside structure.

END OF SECTION

SECTION 01 33 00
SUBMITTAL PROCEDURES

PART 1 – GENERAL

1.01 SUMMARY

- A. Requirements for Work-related (non-administrative) submittals including Substitutes and “Or-Equal” items, Shop Drawings, product data, Samples, test results, operating and maintenance data, and other miscellaneous Work-related submittals.
 - 1. Submittals for certification of installation, instructional, and post-startup services are specified in Section 01 61 00.
 - 2. Submittals for operation and maintenance data are specified in Section 01 78 23.
 - 3. Submittals for record drawings are specified in Section 01 78 39.
- B. Administrative Submittals: Procedures concerning items such as listing of manufacturers, Suppliers, Subcontractors, Progress Schedule, bonds, payment applications, insurance certificates, Schedule of Values, and photographs are specified elsewhere.
- C. Work-Related Submittals:
 - 1. Shop Drawings:
 - a. As defined in Paragraph 1.01.A.37 of the General Conditions, and in particular includes technical data and drawings specifically prepared for this Project, including fabrication and installation drawings, diagrams, data sheets, schedules, templates, patterns, reports, instructions, design mix formulas, measurements, and similar information not in standard printed form.
 - 2. Product Data:
 - a. Includes standard catalog type printed information on manufactured materials, equipment and systems that has not been specifically prepared for this Project, including manufactures’ product specifications, catalog cut sheets, standard wiring diagrams, printed performance curves, mill reports, and standard color charts.
 - 3. Samples:
 - a. As defined in Paragraph 1.01.A.34 of the General Conditions, and in particular includes fabricated and manufactured physical examples of materials, products, and units of Work, including complete units, partial cuts of manufactured or fabricated Work, swatches showing color, texture, and pattern, and units of Work to be used for independent inspection and testing.
 - b. Mock-ups are special forms of Samples too large or otherwise inconvenient for handling in manner specified for transmittal of Sample submittals.
 - 4. Test Results:
 - a. Includes source and field quality inspection and test reports, actual performance curves, and certifications of results prepared specifically for equipment, material, and systems provided for this Project.
 - 5. Miscellaneous Submittals:

- a. Work-related submittals that do not fit in previous categories, including schedules, guarantees, warranties, certifications, maintenance agreements, workmanship bonds, survey data and reports, physical work records, copies of industry standards, field measurements, extra materials, keys, and similar information, devices, and materials applicable to Work.

PART 2 – PRODUCTS

(NOT USED)

PART 3 – EXECUTION

3.01 DOCUMENT MANAGEMENT WEB SITE – ELECTRONIC DOCUMENT SUBMISSION

A. General

1. Document Management Web Site Supplier:
 - a. eCommunication
 - b. Or Approved Equal.
2. Software tool specifically designed for construction related document management.
3. Primary means of submittal shall be electronic.
4. Provide web based document storage, notification, and transfer.
5. Contractor to include costs to set up and to maintain site throughout the duration of the Project.

B. Minimum System Features.

1. Defined work flow directed submission, review, and approval process for various types of contract related documents. Work flow process shall be specific to type of document. Include specific work flow process for:
 - a. Requests for substitutes.
 - b. Shop drawings and product data.
 - c. Test results.
 - d. Operation and Maintenance data.
 - e. Request for Proposals
 - f. Request for Information
 - g. Work Directive Changes
 - h. Pay requests, both draft and final versions.
 - i. Guarantees, Warranties, Maintenance Agreements, and Workmanship Bonds
 - j. Survey Data
 - k. Certifications
 - l. Closeout Submittals.
 - m. Miscellaneous Project related documents including
 - 1) Contract Documents - plans, specifications, and addenda.
 - 2) Project schedule.
 - 3) Schedule of Values,
 - 4) Permits,
 - 5) Project forms for document transmittal,
 - 6) Construction photographs and video,
 - 7) Inspection reports,
 - 8) Project meeting minutes,
 - 9) Contact information for each team member,

- n. Add additional categories as required by Project specific needs at no additional cost to Owner.
- 2. Defined work flow roles, responsibilities, and capabilities for defined teams including:
 - a. Owner
 - b. Engineer
 - c. Contractor
 - d. Add additional teams as required by Project specific needs. Examples:
 - 1) Sub Contractor
- 3. Activities listed below shall be available based on team membership and agreed to team based roles, and agreed to work flow process for a given category of activity:
 - a. View items
 - b. Submit new item.
 - c. Add files
 - d. Sign and annotate files
 - e. Process item
 - f. Send item back to previous step
 - g. Forward the item
 - h. Share the item
- 4. All submittals shall be posted in a searchable, bookmarked PDF format with the exception of Requests for Information (RFIs). RFIs shall be posted in Microsoft Word format. Maximum file size for submission shall be 50 MB. Submittals larger than 50 MB should be submitted as separate files within the same submittal.
- 5. Include tools to allow basic mark-up and annotation of files.
- 6. Provide email notification that submittal, RFI, or other item needs the attention of a team member.
- 7. Active item list of items requiring attention based on team member.
- 8. Ability of team members to add signature (PNG) or action stamp to files, based on assigned user rights.
- 9. Document library listing all closed documents posted on site, with ability of team members to view, print, or save items based on assigned user rights.
- 10. Ability to create and generate logs and reports.
- 11. Ability to view and download stored documents.
- C. Provide System Set Up With Input From the Owner and Engineer.
 - 1. Obtain and input email address of all project members intended to receive notification of submittal availability. Obtain and configure passwords to limit access to site. Include up to 20 persons for distribution and access.
 - 2. Modify system configuration as required for project specific requirements throughout the duration of the Project.
- D. Provide Training For All Team Members on Use of the System.
 - 1. Initial training sessions shall consist of a minimum of two (2) one (1) hour sessions. Each session shall be repeated once to accommodate team member availability.
 - 2. Coordinate training dates and times at least one week in advance of proposed training dates.
 - 3. Have training manuals available at least one day prior to training session.

4. Training shall occur in a mutually agreed to location, or may be offered via web based interactive session.
5. Provide additional follow-up training as needed at no additional cost to Owner.

E. Security:

1. Cloud hosted in off-site Tier-1 environment.
2. Include daily back-ups and redundant disk arrays (RAID 6).
3. Enterprise level firewall, monitored for intrusion, spam and virus, and physical security.
4. Capability for encrypted data transmission.

F. Project Closeout, File Retention, and Document Delivery:

1. Within 4 weeks of final closeout of the Project, all project files present on the Document Management Web Site shall be archived for long term storage.
2. Archived files shall be linked within a menu driven file structure accessible using Adobe Acrobat. Files shall be archived using the same file names and within the same file structure used on the web site interface.
3. Archived files shall be delivered on thumb drive or DVD. Provide up to ten (10) copies, and deliver to Owner, Engineer, and Contractor.

3.02 SUBMITTAL PROCEDURES

A. Scheduling:

1. Provide preliminary and final schedule of submittals in accordance with the General Conditions indicating time requirements for coordination of submittals with performance of Work.
2. Times scheduled shall indicate completion of submittal approval process for Substitute and "Or-Equal" items, Shop Drawings, product data, and Samples not later than 60 days prior to beginning systems demonstrations specified in Section 01 79 10. Completion of submittal process for above submittals will have been achieved when submittals have been returned to Contractor with submittal action of either "Approved" or "Approved As Noted".
3. Adjust schedule of submittals periodically to reflect revisions to Progress Schedule.

B. Coordination:

1. Coordinate preparation and processing of submittals with performance of Work. Coordinate each submittal with other submittals and related activities such as substitution requests, testing, purchasing, fabrication, delivery, and similar activities.
2. Coordinate submission of different units of interrelated Work so submittal will not be delayed by Engineer's need to review related submittal. Engineer may withhold action on submittal requiring coordination with other submittals until related submittals are provided.
3. Prepare and transmit each submittal sufficiently in advance of scheduled performance of related Work and other applicable activities.

C. Submittal Preparation:

1. Stamp and sign each submittal certifying to review and approval of submittal, verification of material and equipment, field measurements, field construction criteria, and coordination of information with Contract Documents in accordance with paragraph 7.16 of the General Conditions.

2. Submittals shall contain sufficient detail to confirm compliance with the requirements of the respective specification section. Submittals shall not contain excessive, non-pertinent information.
3. Submittals shall be complete for all material and equipment specified in each section. Partial submittals are not acceptable.
4. Transmittal Form: Use CONTRACTOR'S SUBMITTAL TRANSMITTAL form included in Appendix. Identify following:
 - a. Date
 - b. Transmittal and Submittal number
 - c. Project
 - d. Name and signature of Contractor:
 - e. If submittal is for substitute, identify as "Substitute" on transmittal.
 - f. Specification section and/or Drawing numbers.
 - g. Description of submittal (i.e. equipment identification numbers, motor numbers, etc.)
 - h. Variations from Contract Documents
5. The electronic submittal shall be in searchable, bookmarked PDF format.
6. Electronic submittal document shall be created with OCR (Optical Character Recognition) to allow for full alphanumeric recognition of printed characters

D. Resubmittal Preparation:

1. Comply with requirements for Submittal Preparation above, and in addition:
 - a. Identify on transmittal form submittal is a resubmission.
 - b. Make corrections or changes in submittal required by Engineer's notations on returned submittal.
 - c. On transmittal or separate page, answer or acknowledge in writing notations or questions indicated on Engineer's transmittal form of returned submittal.
 - 1) Identify each response by question or notation number established by Engineer.
 - 2) If Contractor does not respond to each notation or question, resubmission will be returned without action by Engineer until Contractor provides written response.
 - d. Contractor-initiated revisions or variations:
 - 1) On transmittal form, identify variations or revisions from previously reviewed submittal.

3.03 SPECIFIC SUBMITTAL REQUIREMENTS

A. General:

1. Comply with requirements specified below for each indicated type of submittal. Specific submittal requirements for individual units of work are specified in applicable Specification section.
2. If Engineer has responded to Request for Information submitted by Contractor, include Engineer's response with submittal.

B. Shop Drawings:

1. Maximum size 22 in. by 34 in.
2. Submit graphic information at accurate scale with name of preparer indicated.
3. Show dimensions and note which are based on field measurements.
4. Indicate compliance with standards and notation of coordination requirements.

5. Highlight, encircle or otherwise indicate variation from Contract documents or previous submittals and revisions on resubmittals.
6. Do not use Engineer's Drawings as Shop Drawings.
7. Provide blank space for Contractor stamps.
8. Provide 4-in. by 8-in. blank space for Engineer stamps.

C. Product Data:

1. Collect required data into single submittal for each unit of Work or system. Where product data includes information on several similar materials or equipment, some of which are not required for use in Project, mark copies to show which items are not applicable to Project.

D. Samples:

1. Provide Samples physically identical with proposed materials and equipment to be incorporated into work. Where variations in color, pattern, and texture are inherent in product, submit multiple units (not less than 3) showing approximate limit of variations.
2. Provide full set of option Samples where selection by Owner or Engineer is required.
3. Include information with Sample to show generic description, source, product name, manufacturer, limitations, and compliance with standards.
4. Submit Samples with other related elements of work.
5. Submit two (2) sets of Samples where Specifications indicate Engineer's selection of color, pattern, texture or similar characteristics from manufacturer's range of standard choices is necessary. Neither set will be returned.
6. Maintain set of Samples at Project site, in suitable condition and available for quality control comparisons throughout course of Work.

E. Test Results:

1. Identify each test by Specification section and type of test.
2. Submittal is to confirm that results of tests verify materials, products, and systems comply with Contract Documents and are not for approval.

F. Miscellaneous:

1. Guarantees, Warranties, Maintenance Agreements, and Workmanship Bonds:
 - a. Refer to Specification sections for requirements.
 - b. Provide 2 executed copies. Provide 2 additional copies where required for operation and maintenance data.
2. Survey Data:
 - a. Refer to Specification sections for requirements of property surveys, building or structure condition surveys, field measurements, quantitative records of actual work, damage surveys, and similar data.
3. Certifications:
 - a. Refer to Specification sections for requirements.
4. Closeout Submittals;
 - a. Refer to Specification sections for requirements of spare parts, extra and overrun stock, maintenance tools and devices, keys, and similar units to be submitted.

3.04 ACTION ON SUBMITTALS

A. General:

1. Except for submittals for record and similar purposes, where action and return is not required or requested, Engineer will review each submittal, mark the appropriate action, and return.
2. Where submittal must be held for coordination, Engineer will so advise Contractor without delay.
3. Engineer will stamp each submittal with uniform, self-explanatory action stamp, appropriately marked with submittal action.

B. Unsolicited Submittals:

1. Engineer will return unsolicited submittals without reviewing.

C. Action Stamp:

1. Marking: "Approved"

- a. Work covered by submittal may proceed provided it complies with Contract Documents. Acceptance of Work depends on that compliance.
- b. After approval, Contractor is to submit two bound copies of all "Approved" submittals to Engineer. Drawings shall be printed at not smaller than 11x17. Engineer, at his discretion, may request drawings printed in 22x34 format. Bound copies shall be stapled, comb bound, or spiral bound. Copies should be in color where required.

2. Marking: "Approved As Noted"

- a. Work covered by submittal may proceed provided it complies with Engineer's notations or corrections on submittal and with Contract Documents. Acceptance of work depends on that compliance. Resubmittal not required.
- b. After approval, Contractor is to submit two bound copies of all "Approved As Noted" submittals to Engineer. Drawings shall be printed at not smaller than 11x17. Engineer, at his discretion, may request drawings printed in 22x34 format. Bound copies shall be stapled, comb bound, or spiral bound. Copies should be in color where required.

3. Marking: "Revise and Resubmit"

- a. Do not proceed with Work covered by submittal.
- b. Revise submittal or prepare new submittal in accordance with Engineer's notations.

4. Marking: "Not Approved"

- a. Work covered by submittal does not comply with Contract Documents. Do not proceed with Work covered by submittal.
- b. Prepare new submittal complying with Contract Documents.

5. Marking: "No Action Required"

- a. Document has not been reviewed and is only filed for record purposes.

D. General Distribution:

1. Unless required elsewhere, provide distribution of submittals to Subcontractors, Suppliers, governing authorities, and others as necessary for performance of Work.
2. Provide copies of submittals bearing Engineer's action stamp to:
 - a. Job site file.
 - b. Record documents file.

END OF SECTION

SECTION 01 35 16
ALTERATION PROJECT PROCEDURES

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Cutting and patching.
2. Alterations to existing buildings or structures.
3. Demolition, removal, and abandonment of existing facilities.

B. Work Includes:

1. Cutting, moving or removal of items as shown on Drawings.
2. Cutting, moving or removal of items as necessary to provide access to allow alterations and new Work to proceed.
3. Cutting, moving or removal of items not shown to be cut, moved or removed, but which must be cut, moved or removed to allow new Work to proceed.
4. Patching or reinstalling Work or items which are to remain in finished Work.
5. Removal of existing surface finishes as needed to install new Work and finishes.
6. Removal of abandoned items.
7. Salvage of material and equipment as noted.
8. Demolition of structures.
9. Removal of portions of structures or utilities.
10. Abandonment of utilities.

1.02 SUBMITTALS

A. Test Results:

1. Facility condition surveys.

B. Miscellaneous Submittals:

1. Alteration and demolition schedule and operational sequence.

C. Submit in accordance with Section 01 33 00.

1.03 QUALITY ASSURANCE

A. Conform to requirements of regulatory agencies and utility companies.

1.04 PROTECTION AND CONTINUITY OF OPERATIONS AND UTILITIES

- A. Perform Work with trades qualified to perform Work in manner causing least damage to each type of Work.
- B. Protect existing finishes, equipment, and adjacent Work which is to remain, from damage.
- C. Protect existing and new Work from weather and extremes of temperature.
- D. Do not pile material to endanger building or structure.

- E. Structural stability of structures adjacent to or affected by Work shall be Contractor's responsibility. Provide shoring, needling, and bracing to keep buildings or structures structurally secure and free of damaging deflection or settlement.
- F. Do not close or obstruct streets, walks, or other facilities occupied and used by Owner and public without prior written permission from Owner and others having jurisdiction.
- G. Notify utilities prior to razing operations to permit them to disconnect, remove, or relocate equipment serving existing facilities.
- H. Protect existing utilities so they will continue to function during and after construction. Where interference with facilities occurs, cooperate with owner of utility and, if necessary, alter utility or facility to eliminate interference.
- I. Service Continuity:
 - 1. Perform Work so as not to interfere with Owner's operations.
 - 2. Provide and maintain continuous electrical, plumbing, and HVAC services to functioning portions of facilities during hours normally in use.
 - 3. Temporary outages are permitted during cutover work at such times and places as can be pre-arranged with Engineer and Owner. Keep such outages to minimum number and length. Make no outages without prior approval.
 - 4. Remove temporary equipment and materials when no longer required.
- J. Plant Operation:
 - 1. Maintain continuity of plant operation to functioning portions of existing plant.
 - 2. Temporary shutoff is permitted during cutover Work at such times and places as can be pre-arranged with Engineer and Owner. Keep such shutoffs to minimum number and length. Once Work has started on temporary shutoff, continue until Work is complete. Make no shutoffs without prior approval.
 - 3. Remove temporary equipment and materials when no longer required.

1.05 TEMPORARY ELECTRICAL AND MECHANICAL SERVICES

- A. Comply with Section 01 52 00.
- B. Electrical:
 - 1. Maintain existing electrical service to existing equipment until removed from service.
 - 2. Provide temporary electrical connections to new equipment if permanent wiring is not complete and equipment is required to be placed into service to continue operation of facility.
 - 3. Provide temporary electrical connections to temporary equipment or existing equipment that has been relocated, but is required to continue operation of facility.
- C. Mechanical:
 - 1. Maintain existing interior work area above 60°F.
 - 2. Provide weather protection, waterproofing, heat, and humidity control to prevent damage to remaining existing and new Work.

PART 2 – PRODUCTS

2.01 SALVAGED MATERIALS

- A. Whenever used in the Documents, the term “salvage” shall indicate material or equipment to be retained by the Owner or to be reused in the Work.
- B. Salvage sufficient quantities of cut or removed material to replace damaged Work of existing construction or patch new Work when material not readily obtainable on current market.
- C. Salvage material and equipment to be retained by Owner or to be reused in Work:
 - 1. Owner shall retain first right of refusal on all salvaged electrical and controls equipment.
- D. Salvaged materials and equipment shall be relocated on-site where indicated by Engineer.
- E. Prior to commencement of removal activities associated with the salvaging of equipment for either reuse by Owner, or reuse in Work, an inspection shall be completed by the Contractor, with the Owner and Engineer present. The inspection shall identify condition of components to be salvaged and itemize known or observed deficiencies. During the inspection, each component shall be photographically logged. A Salvaged Equipment Condition Report shall be submitted for approval by Owner and Engineer identifying condition of each component as “Good” or “Damaged”. Components identified as Damaged shall contain a description of extent of damage. Photo log shall be submitted electronically with file names matching equipment tag.
- F. Items to be salvaged for either reuse by Owner, or reuse in Work shall be removed with care to protect the existing condition of the component and ensure component can be reused in a different service. To the greatest extent possible, individual salvaged items shall be removed in one piece. Large items that have bolted connections may be disassembled to facilitate removal, but must be reassembled to same condition at location of storage. If disassembled location contained a gasketing material, a new gasket shall be provided and installed, reuse of the existing gasket will not be permitted unless specifically approved by Engineer.

2.02 PRODUCTS FOR PATCHING, EXTENDING, AND MATCHING

- A. Provide same products, salvaged materials, types of construction or finish as that in existing structure, as needed to patch, extend or match existing Work.
- B. If requested by Engineer or Owner, Contractor to provide samples of materials and details of installation a minimum of thirty (30) days prior.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Prior to alteration or demolition of facilities, accomplish following:
 - 1. Owner release of facility.
 - 2. Electrical, HVAC, process, and plumbing services rerouted or shut off outside area of Work.
 - 3. Salvage items scheduled for reuse in new Work or scheduled to be delivered to Owner.
 - 4. Survey and record condition of existing facilities to remain in-place that may be affected by Work. After Work complete, survey conditions again and restore facilities to original condition at no additional cost to Owner. Conduct surveys in presence of Engineer.
- B. Where new Work is to be installed or suspended concealing existing surfaces or spaces, Contractor shall remove foreign substances such as grease, sludge, and odoriferous material before starting Work.

- C. Where surfaces are to remain exposed, Contractor shall remove foreign substances such as grease, sludge, and odoriferous material.
- D. Coordinate alteration and demolition Work so new construction installed before, during, and after Work may commence without undue delay.

3.02 TEMPORARY ENCLOSURES

- A. Provide temporary weather tight enclosure for successive areas of buildings as Work progresses. To provide:
 - 1. Acceptable working conditions.
 - 2. Weather protection for materials.
 - 3. Allow for effective temporary heating.
 - 4. Prevent entry of unauthorized persons.
- B. Provide temporary enclosures to separate Work areas from areas of existing buildings occupied by Owner to prevent penetration of dust or moisture into occupied areas, to prevent damage to existing equipment, and to protect Owner's employees and operations.
- C. Use framing and sheet materials complying with structural and fire rating requirements of applicable codes and standards.
- D. Relocate as required by progress of construction, by storage or work requirements, and to accommodate requirements of Owner.
- E. Remove temporary enclosures when no longer required.

3.03 CUTTING AND PATCHING

- A. Cut finish surfaces such as masonry, tile, plaster or metals, by methods to terminate surfaces in smooth, straight line at natural point of division. Make cuts parallel with walls and/or floors.
- B. Make joints and finishes match adjacent or similar work.
- C. Do not cut or notch structural members without specific written approval of Engineer.
- D. At request of Engineer or Owner, Contractor shall prepare mockup of proposed materials to be used in locations adjacent to, connecting, or patching into existing surfaces to remain. Owner shall approve of appearance and match prior to Contractor's installation of permanent Work.

3.04 REMOVAL OPERATIONS

- A. Remove concrete, steel and masonry to extent indicated on Drawings.
- B. Remove equipment and appurtenances to extent indicated on Drawings.
- C. Remove utilities and piping to elevations and locations shown on Drawings and plug and seal permanently with steel cap, concrete plug, or other approved method in accordance with specified abandonment procedures.
- D. Remove abandoned utilities and underground piping within influence zone of proposed structures or piping.

- E. Where existing materials and equipment are removed or relocated, remove materials no longer used such as studs, straps, conduits, ducts, junction boxes, pull boxes, wires, anchors, and supports. Remove or cut off concealed or embedded materials and equipment to at least 1 in. below final finished surface. Patch floors and walls to match existing.
- F. Repair affected surfaces to conform to type, quality, and finish of adjacent surfaces.
- G. Dispose of removed items as specified herein.

3.05 RESTORATION

- A. Where existing partitions are removed, patch floors, walls, and ceilings with finish materials matching existing to provide smooth planes without breaks, steps, or bulkheads. Trim and refinish doors as necessary to clear new floors or flooring material.
 - 1. Where change of plane of 2 in. or more occurs, notify Engineer and request direction.
- B. Patch and replace portions of existing finished surface damaged by Contractor's operations.
 - 1. Provide adequate support of substrate prior to patching finish.
 - 2. Refinish patched portions of painted or coated surfaces to produce uniform color and texture over entire surface.
 - 3. When existing surface finish cannot be matched, refinish entire surface to nearest intersection.
- C. When new Work abuts or finishes flush with existing Work, transition shall match existing adjacent Work in texture and appearance so patch or transition is not visible at a distance of 6 feet.
- D. When smooth transition is not possible, terminate existing surface along straight line at natural division, and provide appropriate trim.
- E. Clean and repair damage caused by installation or by use of temporary facilities.
 - 1. Remove foundations and underground installations used for construction aids.
 - 2. Grade areas affected by temporary installations to required elevations and slopes.
- F. Restore existing facilities used for temporary purposes to specified, or original, condition.

3.06 CLEANING

- A. Perform periodic cleaning and final cleaning as specified in Section 01 74 00.
 - 1. Clean Owner occupied areas daily.
 - 2. Clean spillage, overspray, and heavy collection of dust in Owner occupied areas immediately.
- B. At completion of alteration and demolition Work in each area, provide final cleaning and return space to condition suitable for use by Owner.

3.07 DISPOSAL

- A. Remove debris from site each day.
- B. Equipment and materials not scheduled to be salvaged or reused in new Work shall become property of Contractor to be disposed of in accordance with applicable laws.

- C. Debris and other undesirable and unsalvageable material resulting from alteration and demolition operations shall be legally disposed offsite.

END OF SECTION

SECTION 01 41 00
REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.01 PERMITS

- A. Contractor shall obtain the following permits:
 - 1. Other Permits required for construction of the Work which are not listed as being provided by Owner.
 - 2. Contractor shall be responsible for application fees, bond costs, coordination with permitting agencies and review or inspection fees charged by permitting agencies when Contractor obtains permit.
 - 3. Annual or licensing fees which may be charged by permitting agencies for placement of facilities shall be paid for by the Owner.
- B. Comply with requirements of permits obtained by Owner. Permits obtained by Owner include:
 - 1. IEPA Permit to Construct.

1.02 NOTICES

- A. Provide notices in accordance with requirements of General Conditions and applicable construction permits to following agencies or individuals and to others as required elsewhere in Contract Documents.
 - 1. ENGINEER:
 - a. Notice: 10 working days prior to start of construction.
 - b. Notice: 5 days prior to start of additional crews.
 - 2. Fire, Police, and Sheriff's Department:
 - a. Notice: 24 hr minimum, or as required by local agencies, prior to closing streets or performing operations affecting vehicular traffic.
 - 3. Utilities: for work which requires excavation.
 - a. Notice: 72 hr minimum.
 - 5. Others as required in Contract Documents.

1.03 REGULATIONS

- A. Comply with local, state, and federal laws, rules, ordinances, and regulations. Give Engineer notice of variations in accordance with General Conditions.

END OF SECTION

SECTION 01 45 29
TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.01 SUMMARY

- A. Testing and inspecting to be provided by the Contractor.
- B. Provide the services of a testing laboratory approved by Owner.
- C. Provide all tests and inspections required by governmental agencies having jurisdiction, and required by provisions of the Contract Documents.
- D. Perform additional tests as required by Engineer.
- E. Perform additional inspections, sampling, and testing required when initial tests indicate Work does not comply with Contract Documents.
- F. Specified inspections and/or tests may be waived only by the specific approval of Engineer, and such waivers will result in credit to the Owner equal to normal cost of such inspection and/or test.

1.02 PAYMENT

- A. Include within the Contract Price an amount sufficient to cover all testing and inspecting required under this Section, and to cover all testing and inspecting required by governmental agencies.
- B. The Owner will pay for additional testing and inspecting specifically requested by the Engineer when such tests indicate conformance with Contract Documents.
- C. When additional tests requested by Engineer, or initial tests, indicate noncompliance with the Contract Documents, all inspection, sampling, and testing and subsequent retesting occasioned by the noncompliance shall be performed by the testing laboratory and the costs thereof shall be paid by the Contractor.

1.03 SUBMITTALS

- A. Upon completion of each test and/or inspection, promptly submit written report of each test and inspection; one copy each to Engineer, Owner, material supplier, and Contractor, and one copy to record documents file. Each report shall include following:
 - 1. Date issued.
 - 2. Project title and number.
 - 3. Testing laboratory name, address, and telephone number.
 - 4. Name and signature of laboratory inspector.
 - 5. Date and time of sampling or inspection.
 - 6. Temperature and weather conditions if test performed in field.
 - 7. Date of test.
 - 8. Identification of product and Specification section.
 - 9. Location of sample or test in Project.
 - 10. Type of inspection or test.
 - 11. Results of tests and compliance with Contract Documents.
 - 12. Interpretation of test results, when requested by Engineer.

1.04 QUALIFICATIONS OF LABORATORY

- A. Meet requirements of ASTM E329.
- B. Authorized to operate in state where Project located.
- C. Testing equipment calibrated at reasonable intervals by devices of accuracy traceable to either the National Bureau of Standards or other accepted values of natural physical constants.

PART 2 – PRODUCTS

(NOT USED)

PART 3 - EXECUTION

3.01 TAKING SPECIMENS AND TESTING

- A. Except as may be specifically otherwise approved by Engineer, testing laboratory shall secure and handle all samples and specimens for testing and conduct testing.
- B. Comply with specified standards.

3.02 COOPERATION WITH TESTING LABORATORY

- A. Provide access to the Work at all times and at all locations where the Work is in progress. Provide facilities for such access to enable the laboratory to perform its functions properly.
- B. Notify laboratory sufficiently in advance of operations to allow laboratory assignment of personnel and scheduling of tests.
 - 1. When tests or inspections cannot be performed due to lack of such notice, reimburse Owner for laboratory personnel, travel expenses, and cost of test normally incurred.

END OF SECTION

SECTION 01 52 00
CONSTRUCTION FACILITIES

PART 1 - GENERAL

1.01 SUMMARY

- A. Temporary construction facilities required for the Work, including, but not limited to:
 - 1. Utilities including lighting and electricity, heat, telephone service, and water.
 - 2. Sanitary facilities.
 - 3. Fire protection.
 - 4. Roads.
 - 5. Security fencing.
 - 6. Enclosures.
 - 7. Parking.
 - 8. Project signs.
 - 9. Field office for Contractor's personnel.
- B. Maintain temporary facilities in proper and safe condition throughout progress of Work.
- C. Comply with federal, state, and local codes and regulations, and utility company requirements.

1.02 LAYOUT OF TEMPORARY FACILITIES

- A. Before starting Work, submit to Engineer, for approval, proposed layout of temporary facilities.
- B. Should Contractor require space in addition to that shown on Drawings, Contractor shall make arrangements for storage of materials and equipment in locations off Site.

PART 2 - PRODUCTS

2.01 TEMPORARY LIGHTING AND ELECTRICITY

- A. General:
 - 1. Temporary lighting shall be sufficient to enable Contractor and Subcontractors to complete Work and enable Engineer to observe Work. Illumination shall meet or exceed state code requirements.
- B. Temporary electricity is not available from Owner's electrical system.
 - 1. Arrange with local utility for temporary electric service.
 - 2. Pay for installation of temporary electric service including poles, transformers, and metering.
 - 3. Register temporary meter in Contractor's name.
 - 4. Pay for electricity consumed for construction purposes until Final Completion or until occupancy by Owner.
- C. Contractor's responsibilities:
 - 1. Provide, maintain, and remove temporary electric service facilities.
 - 2. Provide temporary electric systems and components in conformance with requirements of National Electric Code and local authorities.
 - 3. Facilities exposed to weather shall be weatherproof type.

4. Enclosures shall be locked to prevent unauthorized access.
5. Provide lamps, wiring, switches, sockets, and similar equipment required for temporary lighting and power tools.
6. Provide electric service to temporary offices.

2.02 TEMPORARY HEAT

A. General:

1. Provide heating required for cold weather protection until structure is enclosed.
2. Provide heating required after enclosure of structure.
3. Except as otherwise called for, temperature shall be kept between 50°F and 75°F.
4. Heat shall be warm air from oil or gas-fired portable heaters suitably vented to outside.
5. Open salamander type heaters are not permitted.

B. Contractor's responsibilities:

1. Provide temporary heat, pay fuel costs and maintain heating units.
2. Provide adequate heat to all parts of structure.
3. Repair or replace materials damaged because of lack of heat.
4. Provide throwaway filters if permanent system used for temporary heat.

2.03 TEMPORARY TELEPHONE SERVICE

- A. Provide temporary telephone service for Contractor's use and for Owner to contact project site. Mobile or cellular phones are acceptable. Contractor may not use Owner's system for telephone service.

2.04 WATER FOR CONSTRUCTION

- A. Owner will provide place for temporary connection to non-potable water source at Site.

1. Provide temporary piping and pumping facilities required to bring water to point of use.
2. Owner will provide water at no cost to Contractor.

2.05 SANITARY FACILITIES

- A. Do not use existing sanitary facilities.

- B. Provide temporary sanitary facilities conforming to state and local regulations, in sufficient numbers for use of Contractor's and Subcontractor's employees.

- C. Maintain in sanitary condition and properly supply with toilet paper.

2.06 TEMPORARY FIRE PROTECTION

- A. Provide and maintain minimum of one fire extinguisher in each area where work is being completed, and other fire protection equipment and devices as would be reasonably effective in extinguishing fires during early stages by personnel at site.

2.07 TEMPORARY SITE AND OTHER ROADS

- A. Construct and maintain temporary roadways in snow free, ice free, driveable condition.

- B. Maintain existing roads used during construction free from accumulation of dirt, mud and construction debris. Roads shall be considered "maintained" when material has been

removed by a sweeper. Multiple sweeper passes may be required to clean the existing surfaces sufficiently in Engineers opinion. Aggregate surfaced roads and drives will be considered "maintained" when dirt and soil contaminants in excess of 1" diameter have been removed and the total volume of contaminants remaining is estimated to be less than ¼ cubic foot. Contractor shall control dust from operations in all circumstances. Comply with dust control provisions in Section 01 57 19.

- C. Temporary granular paving used prior to final paving shall be maintained in smooth condition. Ruts, holes, washboarding, or other surface deformities shall be corrected immediately by filling or scraping. All maintenance work to maintain traffic on existing roads shall be finished with a vibratory roller to recompact the surface.
- D. Contractor shall repair or replace existing roads to original or better condition prior to Final Completion. Survey and record condition of existing roads prior to construction.

2.08 CONTRACTOR'S STAGING AND WORK AREA

- A. Construct and maintain staging area at location shown on Drawings.
- B. Prepare staging with a minimum of 4-inches crushed stone surface.
- C. Work Area:
 - 1. Limit construction operations and storage of equipment and materials to areas shown on Drawings and as determined by Engineer.
 - 2. Except as provided herein, no sidewalk, private property, or other area adjacent to Site shall be used for storage of Contractor's equipment and materials unless prior written approval is obtained from legal owner of the respective locations.
 - 3. A reasonable amount of structural and other type material to be used during construction may, with written approval of agency having jurisdiction, be stored in streets or highways adjacent to Site, but only to an extent that is absolutely necessary to avoid delay in construction. A copy of written approval shall be submitted to Engineer. Such materials will not be allowed to accumulate but shall be replenished from day to day as required. Permission to store materials shall be revocable at any time. Contractor, if so ordered, shall immediately upon receipt of order, or within a time to be therein stated, remove such materials.
 - 4. Contractor shall maintain staging areas during construction in a manner that will not obstruct operations on any street areas. Work shall proceed in an orderly manner, maintaining construction Site and staging area free of debris and unnecessary equipment or materials.

2.09 SECURITY

- A. Security will not be provided by Owner.
- B. Contractor shall be responsible for loss or injury to persons or property where Work is involved, and shall provide security and take precautionary measures to protect Contractor's and Owner's interests.
- C. Provide and maintain temporary fencing of design and type needed to prevent entry onto Site by public.

2.10 ENCLOSURES

- A. Provide and maintain all enclosures, scaffolds, tarpaulins, canopies, warning signs, steps, platforms, bridges, and other temporary construction necessary for proper completion of Work.

2.11 PARKING

- A. Staging area and designated areas within construction limits may be used for parking of construction personnel's private vehicles and Contractor's lightweight vehicles.
- B. Do not allow heavy vehicles or construction equipment in parking areas.
- C. Make arrangements for additional parking off site as required.

2.12 CONTRACTOR'S FIELD OFFICES AND BUILDINGS

- A. If required by Contractor, erect where designated by Engineer, and maintain temporary field office and tool and storage buildings for Contractor's use.
- B. Buildings shall be neat and well constructed, surfaced with plywood, siding, masonite, or other similar material, well painted and void of advertisements.

PART 3 – EXECUTION

3.01 GENERAL

- A. Maintain and operate systems to ensure continuous service for duration of construction.
- B. Modify and extend systems, as Work progress requires.
- C. Material and Equipment provided as part of the project shall not be used for any temporary services.

3.02 REMOVAL

- A. Completely remove temporary materials, equipment, signs, and structures when no longer required.
- B. In unfinished areas, clean and repair damaged caused by temporary installations or use of temporary facilities, restore drainage, and evenly grade, seed or plant as necessary to provide appearance equal to or better than original.
- C. In finished areas, restore existing or permanent facilities used for temporary services to specified, or original condition.

3.03 DAMAGE TO EXISTING PROPERTY

- A. Contractor is responsible for replacing or repairing damage to existing buildings, structures, sidewalks, roads, parking areas, and other existing assets.
- B. Contractor shall have option of having Owner contract for such Work and have cost deducted from Contract Price.

3.04 OWNER'S USE

- A. Upon acceptance of Work, or portion of work defined and certified as Substantially Complete by Engineer, and Owner commences full-time successful operation of facility or portion

thereof, Owner will pay cost for utilities used for Owner's operation. Contractor shall continue to pay for utilities used until final acceptance of Work, except as provided herein. However, heat for building as required for construction purposes shall still be paid by Contractor unless, due to occupancy by Owner, more heat shall be required due to increased temperature or lengthened duration, in which case Owner will bear difference in cost.

END OF SECTION

SECTION 01 57 19
TEMPORARY ENVIRONMENT CONTROLS

PART 1 - GENERAL

1.01 SUMMARY

- A. General requirements pertaining to abatement and control of environmental pollution arising from activities of Contractor and Subcontractors in performance of the Work of the Contract.
- B. Contractor, in executing Work, shall maintain work areas free from environmental pollution that would be in violation of federal, state or local regulations.

PART 2 – PRODUCTS

(NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

- A. The land resources within boundaries of the Project, but outside the limits of permanent Work performed under this Contract shall be preserved in their present condition or be restored to a condition after completion of construction that will appear to be natural and not detract from the appearance of the Project.
- B. Insofar as possible, confine activities to pertinent areas defined on the Drawings or elsewhere in the Contract Documents.
 - 1. Return construction areas to their preconstruction elevations except where surface elevations are otherwise noted to be changed.
 - 2. Maintain natural drainage patterns.
 - 3. Conduct construction activities in such a manner that ponding of stagnant water conducive to mosquito breeding habitat will not occur at any time.
- C. Land resources:
 - 1. Do not remove, cut, deface, injure, or destroy trees or other vegetation outside the Work area limits.
 - 2. Do not remove, cut, deface, injure, or destroy trees or other vegetation inside the Work area limits, designated to be preserved, except as permitted by Engineer.
 - 3. Land resources damaged by Contractor shall be promptly replaced or repaired to the approval of Engineer at Contractor's expense.

3.02 ARCHAEOLOGICAL FINDS DURING CONSTRUCTION

- A. There are no known archaeological remains at the Project site.
- B. Should skeletons, artifacts, or other archaeological remains be uncovered:
 - 1. Suspend operations of this Contract at the site of discovery.
 - 2. Continue operations in other areas.
 - 3. Notify Engineer immediately of the finding.

- C. Should the discovery site require archaeological studies resulting in delays and/or additional work, Contractor will be compensated by an adjustment under pertinent provisions of the Contract.

3.03 PROTECTION OF STORM SEWERS

- A. Prevent construction materials, concrete, earth or other debris from entering existing storm sewers or sewer construction.

3.04 PROTECTION OF WATERWAYS

- A. Observe rules and regulations of State of Illinois and agencies of U.S. government prohibiting pollution of lakes, streams, rivers or wetlands by dumping of refuse, rubbish, dredge material or debris.
- B. Disposal of materials into waters of state must conform to requirements of Illinois EPA, Illinois DNR, and the U.S. Army Corps of Engineers
 - 1. Permits not specifically identified herein shall be obtained by CONTRACTOR at CONTRACTOR'S expense.
- C. Comply with procedures outlined in:
 - 1. U.S. EPA manuals entitled "Guidelines for Erosion and Sedimentation Control Planning and Implementation", Manual EPA-72-015 and "Processes, Procedures, and Methods to Control Pollution Resulting from All Construction Activity", Manual EPA-43019-73-007.
 - 2. Illinois EPA's Standard Specifications for Soil Erosion Control as contained in IEPA/WPC 87-012 or later edition. In order to prevent eroded soils from escaping soil stockpiles, Contractor shall erect silt fences around all stockpiled excavated materials. Silt fences shall be "Perimeter Erosion Barrier" as defined by Article 280.04(b) of IDOT's Standard Specifications.
- D. Maintain erosion control measures during Project. Remove erosion control measures upon establishment of permanent, surface stabilization.

3.05 DISPOSAL OF EXCESS EXCAVATED AND OTHER WASTE MATERIALS

- A. Excess excavated material not required or suitable for backfill and other waste material shall be disposed of in accordance with federal, state, and local regulations.
- B. In accordance with the Illinois Environmental Protection Act, 415 ILCS 5/22.51, Contractor shall obtain all certifications required by federal, state, and local regulation and by owner/operator of off-site disposal sites certifying that the excess excavated and other waste materials are uncontaminated. Certifications shall be made by a licensed professional engineer in accordance with federal, state, and local regulations. Contractor shall conduct tests and analyses in order to certify that excess excavated material and other waste materials are uncontaminated.
- C. Provide watertight conveyance of liquid, semi-liquid or saturated materials which tend to bleed during transport. Liquid loss from transported materials is not permitted, whether being delivered to construction site or hauled away for disposal.

3.06 PROTECTION OF AIR QUALITY

- A. Minimize air pollution by requiring use of properly operating combustion emission control devices on construction vehicles and equipment and encourage shutdown of motorized equipment not in use
- B. Do not burn trash on Site.
- C. If temporary heating devices are necessary for protection of Work, they shall not cause air pollution.

3.07 THAWING OF FROZEN GROUND

- A. Obtain permit from appropriate authority before building fire to thaw frozen ground, and comply with conditions of permit.
- B. Use fuel which does not create air pollution or inconvenience public
- C. Engineer reserves right to prohibit fires for thawing frozen ground whenever deemed undesirable.

3.08 USE OF CHEMICALS

- A. Chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer, reactant or of other classification, shall be approved by U.S. EPA or U.S. Department of Agriculture or any other applicable regulatory agency.
- B. Use and disposal of chemicals and residues shall comply with manufacture's instructions.

3.09 NOISE CONTROL

- A. Conduct operations to cause least annoyance to residents in vicinity of Work, and comply with applicable local ordinances.
- B. Equip construction equipment and other apparatus with mechanical devices necessary to minimize noise.
- C. Equip compressors with silencers on intake lines.
- D. Equip gasoline or oil-powered equipment with silencers or mufflers on exhaust lines.
- E. Line storage bins and hoppers with material that will deaden sounds.
- F. Route vehicles carrying rock, concrete, or other material over such streets as will cause least annoyance to public and do not operate on public streets between hours of 6:00pm and 7:00am, nor on Saturdays, Sundays or legal holidays, unless approved by Owner.

3.10 DUST CONTROL

- A. Take special care in providing and maintaining temporary roads, Owner's existing roads, and public roads used during construction operations in clean, dust free condition.
- B. Comply with requirements of 35 IAC Part 212 in addition to local regulations. If Contractor's dust control measures are considered inadequate by Engineer, Engineer may require Contractor to take additional dust control measures.

3.11 FUELS AND LUBRICANTS

- A. Comply with local, state, and federal regulations concerning transportation and storage of fuels and lubricants.
- B. Fuel storage area location shall be approved by Owner prior to installation.
- C. Report spills or leaks from fueling equipment or construction equipment to Owner and cleanup as required.
- D. Owner may require Contractor to remove damaged or leaking equipment from Site.

END OF SECTION

SECTION 01 61 00
COMMON PRODUCT REQUIREMENTS

PART 1 – GENERAL

1.01 “OR EQUAL” ITEMS

- A. “Or equal” item shall be submitted for review in accordance with Section 7 Terms and Conditions, Subsection 7.11 Equals or Substitutes of the City of Bloomington Invitation to Bid.

1.02 SUBSTITUTES

- A. Request for authorization to use substitute materials shall be addressed in accordance with Section 7 Terms and Conditions, Subsection 7.12 Equals or Substitutes of the City of Bloomington Invitation to Bid.

1.03 REUSE OF EXISTING MATERIAL

- A. Except as specifically indicated or specified, do not use removed materials and equipment in new Work. All material and equipment incorporated into the Work shall be new, and as specified, except as otherwise provided in the Contract Documents.
- B. For material and equipment specifically indicated or specified to be reused in new Work:
 - 1. Use special care in removal, handling, storage, and reinstallation to ensure proper function in completed Work.
 - 2. Provide for transportation, storage, and handling of products which require off-site storage, restoration, or renovation.

1.04 MANUFACTURER'S INSTRUCTIONS

- A. Installation of equipment and materials shall comply with manufacturer's written instructions. Maintain one set of complete instructions at job site. Distribute printed copies of instructions to parties involved in installation, including 1 copy to Engineer. Provide 1 electronic copy as a searchable, bookmarked PDF document to the Engineer.
- B. Handle, store, install, connect, clean, condition, and adjust materials and equipment in accordance with manufacturer's written instructions and in conformance with Specifications.
- C. If job conditions or specified requirements conflict with manufacturer's written instructions, consult Engineer for further direction. Do not proceed with Work without written instruction of Engineer.

1.05 TRANSPORTATION AND HANDLING

- A. Arrange deliveries of material and equipment in accordance with Construction Progress Schedule.
- B. Deliver materials and equipment in undamaged condition, in manufacturer's original containers or packaging, with identifying labels intact and legible.
- C. Protect bright-machined surfaces, such as shafts and valve faces, with heavy coat of grease prior to shipment.

- D. Immediately upon delivery, inspect shipments to ensure compliance with Contract Documents and approved submittals, and products have been protected and are undamaged.
- E. Provide equipment and personnel to handle materials and equipment by methods recommended by manufacturer to prevent soiling or damage to materials or equipment, or packaging.

1.06 STORAGE, PROTECTION, AND MAINTENANCE

- A. Store, protect, and maintain material and equipment in accordance with manufacturer's written instructions.
- B. Temporary storage areas and buildings shall conform to Section 01 52 00.
- C. Owner assumes no responsibility for damage or loss due to storage of materials and equipment.
- D. Interior Storage:
 - 1. Store with seals and labels intact and legible.
 - 2. Store materials and equipment subject to damage by elements in weather tight enclosures.
 - 3. Maintain temperature and humidity within ranges required by manufacturer.
- E. Exterior Storage:
 - 1. Store fabricated materials and equipment above ground, on blocking or skids, to prevent soiling or staining. Cover materials and equipment subject to deterioration with impervious sheet coverings. Provide ventilation to avoid condensation.
 - 2. Store loose granular materials in well-drained area on solid surfaces to prevent mixing with foreign matter.
 - 3. Store materials such as pipe, reinforcing steel, structural steel, and equipment on pallets or racks, off ground.
- F. Inspection and Maintenance:
 - 1. Arrange storage to provide easy access for inspection, maintenance, and inventory.
 - 2. Make periodic inspections of stored materials and equipment to ensure materials and equipment maintained under specified conditions are free from damage or deterioration, and coverings are in place and in condition to provide required protection.
 - 3. Perform maintenance on stored material and equipment in accordance with manufacturer's written instructions and in presence of Owner and Engineer.
 - a. Notify Engineer 24 hrs before performing maintenance.
 - b. Submit report of completed maintenance to Engineer with each Application for Payment.
 - c. Failure to perform maintenance, to notify Engineer, or to submit report may result in rejection of material or equipment.
- G. Assume responsibility for protection of completed construction and repair and restore damage to completed Work.
- H. Wheeling of loads over finished floors, with or without plank protection, not permitted in anything except rubber tired wheelbarrows, buggies, trucks or dollies. This applies to

finished floors and exposed concrete floors, as well as those covered with other applied surfacing.

- I. Where structural concrete is also finished surface, avoid marking or damaging surface.

1.07 SPECIAL TOOLS AND LUBRICATING EQUIPMENT

- A. Furnish, in accordance with manufacturer's recommendations, special tools and lubricating equipment required for checking, testing, parts replacement, and maintenance.
- B. Instruct Owner's operating personnel in operation, repair, and maintenance of equipment and use of special tools.

1.08 LUBRICATION

- A. Where lubrication is required for proper operation of equipment, incorporate necessary and proper provisions in equipment in accordance with manufacturer's requirements. Where possible, lubrication shall be automated and positive.
- B. Where oil is used, reservoir shall be of sufficient capacity to supply unit for 24-hr period.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Conform to applicable Specifications and standards. Comply with size, make, type, and quality specified or as approved on submittals.
- B. Design, fabricate, and assemble in accordance with engineering and shop practices standard with industry.
- C. Manufacture like parts of duplicate units to standard sizes and gauges, to be interchangeable. Two or more items of same kind shall be identical, by same manufacturer.
- D. Material and equipment shall be suitable for service conditions. Design so working parts are readily accessible for inspection and repair, and easily duplicated and replaced.
- E. Equipment capabilities, sizes, and dimensions shown or specified shall be adhered to, unless specifically approved in accordance with General Conditions.
- F. Equipment shall be adapted to best economy in power consumption and maintenance. Parts and components shall be portioned for stresses occurring during continuous or intermittent operation, and for additional stresses occurring during fabrication or installation.
- G. Do not use material or equipment for purpose other than for which it is designed or specified. Equipment shall not be used for any purpose, or any reason until manufacturer has completed installation services.

PART 3 – EXECUTION

3.01 GENERAL

- A. Include and pay for Supplier's services, including, but not limited to, those specified.
- B. Workday is defined as an 8-hr period during a calendar day. Workday for purposes of this section does not include travel to and from the Project Site.

3.02 INSTALLATION SERVICES

- A. Where installation services are called for in Specifications, provide competent and experienced technical representatives of manufacturers' equipment and systems to resolve assembly or installation procedures attributable to, or associated with, equipment furnished.
- B. After equipment installation, manufacturer's representative shall inspect equipment for proper installation in accordance with manufacturer's instructions, equipment has been serviced with the proper lubricants, applicable safety equipment has been properly installed, and that proper electrical and mechanical connections have been made.
- C. Manufacturer's representative shall assist Contractor in performing functional testing.
- D. Perform functional testing to determine if equipment has been installed correctly and operates as intended. Functional testing shall include, but not be limited to, checking for proper rotation, alignment, speed, excessive vibration, and noisy operation. Equipment adjustment and calibration shall be performed to conform with Specifications, manufacturer's requirements and instructions, and industry standards.
- E. Provide "Certificate of Installation Services" stating that equipment has been properly installed, that functional testing has been performed, that proper adjustment and calibration has been made, and that equipment is ready for Startup and Systems Demonstration. Use form in Appendix and furnish two copies to Engineer.

3.03 INSTRUCTIONAL SERVICES

- A. Provide in accordance with Section 01 79 30 – Instructional Services.

3.04 SYSTEMS DEMONSTRATIONS SERVICES

- A. Provide manufacturers and Supplier's services as required to successfully complete the Work specified in Section 01 79 10 – Systems Demonstrations.

3.05 POST STARTUP SERVICES

- A. After equipment or system has been in operation for at least 2 months, but not longer than 3 months, each equipment manufacturer or authorized equipment representative shall make a final inspection where so required by Specifications. Final inspection will provide assistance to Owner's personnel in making adjustments or calibrations required to ensure equipment or system is operating in conformance with design, manufacturer, and specifications.
- B. Provide "Certificate of Post Startup Services" cosigned by Owner and equipment representatives, verifying this service has been performed. Use form in Appendix and furnish 2 copies to Owner.

END OF SECTION

SECTION 01 74 00
CLEANING AND WASTE MANAGEMENT

PART 1 - GENERAL

1.01. SUMMARY

- A. Perform cleaning throughout construction period and at completion of Work.
- B. Refer to Specification sections for specific cleaning products or Work.
- C. Conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and anti-pollution laws.

PART 2 - PRODUCTS

2.01. CLEANING MATERIALS AND EQUIPMENT

- A. Use only the cleaning materials and equipment which are compatible with the surface being cleaned, as recommended by the manufacturer of the material.
- B. Use only those cleaning materials which will not create hazards to property and persons.

PART 3 - EXECUTION

3.01 DURING CONSTRUCTION

- A. Comply with general Conditions.
- B. Provide on-site containers for collection and removal of waste materials, debris, and rubbish in accordance with applicable regulations.
- C. As required preparatory to installation of succeeding materials, clean the structures or pertinent portions thereof to the degree of cleanliness recommended by the manufacturer of the succeeding material, using equipment and materials required to achieve the necessary cleanliness.
- D. Following the installation of finish floor materials, clean the finish floor daily (and more often if necessary) at all times while work is being performed in the space in which finish materials are installed.

3.02 FINAL CLEANING

- A. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from exposed interior and exterior surfaces.
- B. Wash and shine glazing and mirrors.
- C. Polish glossy surfaces to clear shine.
- D. Ventilating Systems:
 - 1. Clean permanent filters and replace disposable filters if units were operating during construction.
 - 2. Clean ducts, blowers, and coils if units were operated without filters during construction.

E. Electrical Systems:

1. Leave electrical equipment rooms broom clean.
2. Clean interior of panel cabinets, pull boxes, and other equipment enclosures.
3. Clean lighting fixtures, lamps, and other electrical equipment soiled during installation.
4. Touch-up paint or repaint finishes on electrical items delivered to Project with finished coat of paint. Engineer will make final determination of items to be repainted or touched-up.

F. Vacuum carpeted areas. Broom clean interior hard surface floors and exterior paved surfaces. Rake clean other surfaces of grounds.

G. Clean out existing or new sewers to remove sediment and other materials that have entered during construction.

H. Clean roads and streets used as haul roads during construction of accumulated material. Clean paved streets with water.

I. Prior to Final Completion or Owner occupancy, Contractor, with Engineer and Owner, shall conduct inspection of exposed interior and exterior surfaces and work areas to verify Work and Site is clean.

3.03 CLEANING DURING OWNER'S OCCUPANCY

A. Should the Owner occupy the Work or any portion thereof prior to its completion by the Contractor and acceptance by the Owner, responsibilities for interim and final cleaning shall be as determined by Engineer in accordance with the General Conditions.

END OF SECTION

SECTION 01 78 23
OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.01 SUMMARY

- A. To aid the continued instruction of Owner's operating and maintenance personnel, and to provide a positive source of information regarding products incorporated into the Work, furnish and deliver the Operation and Maintenance (O&M) data described in this Section and as specified in other sections of these Specifications.
- B. Engineer's review and acceptance of O&M data will be only for conformance with requirements of this section, for form of submittal and organization of data and completeness of information provided, but not for technical content or coordination between individual suppliers. Engineer will be sole judge of completeness of data.

1.02 PAYMENTS

- A. Progress payments for equipment delivered, stored or installed under these Contract Documents will not be made until copies of O&M data delivered to and approved by Engineer.
- B. Progress payments for control systems packaged with equipment will not be made until O&M data incorporated into equipment and control system manual delivered to and approved by Engineer.

1.03 REVIEW SUBMITTALS

- A. Submit electronic copy of complete O&M data to document management website for approval by Engineer within 30 days after Contractor receives approved Shop Drawings for equipment. The electronic formatted data shall contain all the information to be bound in O&M manuals. The information provided shall comply with the following requirements:
 - 1. The O&M manual shall be in searchable, bookmarked PDF format.
 - 2. Electronic O&M document shall be created with OCR (Optical Character Recognition) to allow for full alphanumeric recognition of printed characters
 - 3. Submit in accordance with Section 01 33 00.
- B. Electronic Media Label: Label each with "OPERATION AND MAINTENANCE INSTRUCTIONS" and following:
 - 1. Project Title: FORT JESSE PUMP ELECTRICAL IMPROVEMENTS.
 - 2. Name of equipment as set forth in Contract Documents.
 - 3. Specification section number for equipment as set forth in Contract Documents.
- C. Submit in accordance with Section 01 33 00.

1.04 FINAL SUBMITTAL

- A. After approval of the review submittal, submit 2 paper copies and 1 copies on electronic media of complete O&M data.
- B. Paper Copy Format:
 - 1. Size: 8-1/2 in. by 11 in., or 11 in. by 17 in. folded, with standard 3-hole punching.
 - 2. Paper: 20-lb minimum, white.
 - 3. Text: Manufacturer's printed data or typewritten.

4. Drawings:
 - a. Bind in text.
 - b. Fold larger drawings and place in text page size envelope bound into binder. Place identification on outside of envelope.
 5. Provide tabbed section dividers.
 - a. Provide title of section on divider.
 - b. Provide tab index in Table of Contents.
 6. Cover: Label each submittal cover with "OPERATION AND MAINTENANCE INSTRUCTIONS" and following:
 - a. Project Title: FORT JESSE PUMP ELECTRICAL IMPROVEMENTS.
 - b. Names of applicable buildings or structures as shown on Drawings in which equipment is located.
 - c. Name of equipment as set forth in Contract Documents.
 - d. Specification section number for equipment as set forth in Contract Documents.
 7. Binders:
 - a. Bind each submittal into a D-ring commercial quality binder with durable and cleanable plastic covers.
 - b. Filled to not more than 75% of capacity.
 - c. When multiple binders used, contents shall be organized into related groupings and each binder cover shall bear identification of specific content.
 - d. Label spine of binder with "OPERATION AND MAINTENANCE INSTRUCTIONS" and following:
 - i. Project Title: FORT JESSE PUMP ELECTRICAL IMPROVEMENTS.
 - ii. Name of equipment as set forth in Contract Documents.
 - iii. Specification section number for equipment as set forth in Contract Documents.
 8. Page number submittals.
- C. Electronic media copy format shall be as defined above.

1.05 QUALITY ASSURANCE

- A. In preparing data required by this section, use only personnel thoroughly trained and experienced in operation and maintenance of the described items, completely familiar with the requirements of this section, skilled in technical writing to the extent needed for communicating the essential data, and skilled in drafting to prepare required drawings.

PART 2 – PRODUCTS

(NOT USED)

PART 3 – EXECUTION

3.01 GENERAL

- A. Review O&M submittal and complete Form 1 to Section 01 78 23, CONTRACTOR SUBMITTAL FORM, in its entirety indicating requirements of this section have been met. Engineer will reject submittals without completed Form 1.

3.02 GENERAL CONTENT OF DATA

- A. Each submittal shall contain equipment data pertaining to not more than one Specification section number indicated in Contract documents.
- B. Title Sheet: First page inside cover listing following:
 - 1. Title: OPERATION AND MAINTENANCE INSTRUCTIONS.
 - 2. Project Title: FORT JESSE PUMP ELECTRICAL IMPROVEMENTS.
 - 3. Names of applicable buildings or structures as shown on Drawings in which equipment is located.
 - 4. Name of equipment as set forth in Contract Documents.
 - 5. Specification section number for equipment as set forth in Contract Documents.
 - 6. Contractor's name, address, and telephone number.
 - 7. Subcontractor's name, address, and telephone number if equipment provided by Subcontractor.
 - 8. Purchase order number, manufacturer's shop order number or other such number required for parts and service.
 - 9. Manufacturer's name, address, and telephone number.
 - 10. Name, address, and telephone number for local source of parts and service.
- C. Product List: Immediately after title sheet. List of each product and major components, indexed to content of submittal, and identified by product name and model number as set forth by manufacturer and Specification section and article number.
- D. Table of Contents: Immediately following product list. Arrange in logical, systematic order and shall be at minimum a tabbed section index. Provide each tabbed section with table of contents for section.
- E. Product Data Sheets: Provide specification and catalog sheets showing configuration, manufacturer's specifications, models, options, and styles of equipment and major components being provided. Product data sheets shall show project specific information with inapplicable information deleted by removal. Insert in tabbed sections.
- F. Drawings:
 - 1. Supplement text with drawings to clearly illustrate following:
 - a. Product and components.
 - b. Relations of component parts of equipment and systems.
 - c. Control and flow diagrams.
 - 2. Drawings to be actual drawings of equipment from manufacturer. "Typical" drawings not acceptable, unless they accurately illustrate actual equipment.
- G. Special Information:
 - 1. Provide explanation of interrelationships of equipment and components, and effects one component has on another or system.
 - 2. Provide overall instructions and procedures for equipment tying in instructions and procedures for separate components into unified instructional package.
 - 3. Provide glossary of special terms used by manufacturer.
 - 4. Organize in consistent format under separate headings for different procedures.
 - 5. Provide logical sequence on instructions for each procedure.
- H. Warranty, Bond, or Service Contract.
 - 1. Provide copy of each issued.

2. Provide information sheets to explain proper procedures in event of failure or malfunction to prevent voiding warranty or bond, and instances affecting validity of warranty or bond.

3.03 SPECIFIC CONTENT OF DATA

A. Specific content, for each unit of equipment and system, shall include following:

1. Description of Unit and Component Parts:

- a. Function, normal operating characteristics, and limiting conditions.
- b. Performance curves, engineering data, and tests as applicable.
- c. Complete nomenclature and commercial number of replacement parts.
- d. Complete nameplate data.
- e. P&ID numbers for equipment as set forth in Contract Documents.

2. Operating Procedures:

- a. Startup, break-in, and normal operating instructions.
- b. Regulation, control, stopping, shutdown, and emergency instructions.
- c. Summer and winter operating instructions.
- d. Special operating instructions.

3. Maintenance Procedures:

- a. Routine maintenance operations.
- b. Guide to troubleshooting.
- c. Disassembly, repair, and reassembly instructions.
- d. Alignment, adjusting, and checking instructions.

4. Servicing and Lubrication Schedule:

- a. List of lubricants required and quantity to be applied.
- b. Schedule of lubrication.
- c. Schedule for other routine maintenance.

5. Manufacturer's printed instructions regarding safety precautions for both protection of personnel and prevention of damage to equipment.
6. Description of sequence of operation of controls.
7. Manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
8. Recommended spare parts to be stocked, and quantity.
9. Predicted life of parts.
10. Control diagrams (ladder diagrams, instrumentation loop diagrams, and electrical schematics as appropriate).
11. Bill of material.
12. Completed EQUIPMENT DATA FORM typewritten on copy of Form 2 to Section 01 78 23. (Example of completed form is Form 3 to Section 01 78 23.)
13. Other data as required under pertinent section of Specifications.

B. Specific content for each electric and electronic system, as applicable to equipment.

1. Description of System and Component Parts:

- a. Function, normal operating characteristics, and limiting conditions.
- b. Performance curves, engineering data, rating tables, and tests as applicable.
- c. Complete nomenclature and commercial number of replaceable parts.
- d. Complete nameplate data.
- e. P&ID numbers for equipment as set forth in Contract Documents.

2. Circuit Directories of Panelboards:
 - a. Electrical service.
 - b. Controls.
 - c. Communications.
 3. Complete instrumentation loop diagrams with tabulated listing of components in each control circuit or loop.
 4. Operating Procedures:
 - a. Routine and normal operating instructions.
 - b. Sequences required.
 - c. Special operating instructions.
 5. Maintenance Procedures:
 - a. Routine maintenance operations.
 - b. Guide to troubleshooting.
 - c. Disassembly, repair, and reassembly instructions.
 - d. Adjustment and checking instructions.
 6. Manufacturer's printed instructions regarding safety precautions for both protection of personnel and prevention of damage to equipment.
 7. Recommended spare parts to be stocked, and quantity.
 8. Other data as required under pertinent sections of Specifications.
- C. Prepare and include additional data when need for such data becomes apparent during instruction of Owner's personnel.

**FORM 1 TO SECTION 01 78 23
CONTRACTOR SUBMITTAL FORM**

Page 1 of 5

TO: (Engineer) (Address) (Attn:)		DATE	
		SPECIFICATION SECTION TITLE	
		SECTION NO.	
FROM: (Contractor) (Address)		MANUFACTURER/ VENDOR	
		NO. OF COPIES	

TO ALL:

We have checked the O&M data submittal dated _____ and have found it to be in accordance with Specification Section 01 78 23 and as noted below.

Signature of Contractor

	Provided	Not Applicable	Page No.
FORMAT			
Size: 8-1/2 x 11 or 11 x 17			
Paper: 20-lb min, white			
Text: Printed data / typewritten			
Drawings:			
Standard size bound in text			
Text-size labeled envelopes			
Tabbed Section Dividers			
Cover:			
Title			
Project title			
Building / structure name			
Equipment name			
Specification section no.			
Binders: Plastic cover			
Pages: Numbered			

**FORM 1 TO SECTION 01 78 23
CONTRACTOR SUBMITTAL FORM**

Page 2 of 5

	Provided	Not Applicable	Page No.
GENERAL CONTENT			
One Specification Section			
Title Sheet:			
Title			
Project title			
Building / structure name			
Equipment name			
Specification section no.			
Contractor ID			
Subcontractor ID			
Purchase order data			
Manufacturer ID			
Service / parts supplier ID			
Product List			
Table of Contents			
Product Data Sheets: Tabbed sections			
Drawings:			
Illustrate product and components			
Control and flow diagrams			
Special Information:			
Interrelationships of equipment and components			
Unified instruction package			
Glossary			
Instructions organized in consistent format			
Instructions in logical order			
Warranty, Bond, Service Contract			

**FORM 1 TO SECTION 01 78 23
CONTRACTOR SUBMITTAL FORM**

Page 3 of 5

	Provided	Not Applicable	Page No.
SPECIFIC CONTENT (EQUIPMENT / SYSTEM)			
Description of Unit and Components:			
Equipment function			
Normal operating characteristics			
Limiting conditions			
Performance curves			
Engineering data			
Test data			
Replaceable parts list			
Nameplate data			
P&ID numbers			
Operating Procedures:			
Startup			
Normal operation			
Regulation and control			
Stopping and shutdown			
Emergency			
Seasonal operation			
Special instructions			
Maintenance Procedures			
Routine			
Troubleshooting			
Disassembly / repair / reassembly			
Adjustment and checking			
Service and Lubrication:			
List of lubricants			
Lubrication schedule			
Maintenance schedule			
Safety Precautions / Features			
Sequence of Operation of controls			
Assembly Drawings			
(Continued)			

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**FORM 1 TO SECTION 01 78 23
CONTRACTOR SUBMITTAL FORM**

Page 5 of 5

	Provided	Not Applicable	Page No.
SPECIFIC CONTENT (ELECTRIC / ELECTRONIC)			
Description:			
Equipment Function			
Normal operating characteristics			
Performance curves			
Engineering data			
Test data			
Replaceable parts list			
Nameplate data			
P&ID numbers			
Panelboard Directories			
Electrical			
Controls			
Communications			
Instrumentation Loops:			
Diagrams			
Components each circuit / loop			
Operating Procedures			
Normal operation			
Sequences			
Special instructions			
Maintenance Procedures:			
Routine			
Troubleshooting			
Disassembly / repair / reassembly			
Adjusting and checking			
Safety Precautions / Features			
Spare Parts List			
Additional Data			

FORM 2 TO SECTION 01 78 23 EQUIPMENT DATA FORM			Page 1 of 4
PROJECT NAME			
CONTRACT NO.			
CONTRACTOR			
EQUIPMENT NO.		ASSET NO.*	
DESCRIPTION		MAINT. NO.*	
LOCATION			
MANUFACTURER			
PURCHASED FROM			
VENDOR ORDER NO.			
DATE OF PURCHASE		PURCHASE PRICE	\$
LOCAL SUPPLIER			
ADDRESS			
PHONE NO.			
MODEL NO.			
NO. OF UNITS			
SERIAL NUMBERS			
*By Owner			

**FORM 2 TO SECTION 01 78 23
EQUIPMENT DATA FORM**

Page 2 of 4

EQUIPMENT NO.		ASSET NO.*	
DESCRIPTION		MAINT. NO.*	
NAMEPLATE DATA			
ELECTRIC MOTOR		PUMP / HVAC UNIT	
MANUFACTURER		MANUFACTURER	
TYPE	☐ AC ☐ DC	TYPE	
HORSEPOWER		SIZE	
RPM		CAPACITY	
VOLTAGE		PRESSURE	
AMPERAGE		ROTATION	
PHASE		IMPELLER SIZE	
FRAME		IMPELLER MATL.	
DRIVE / REDUCER		OTHER (I&C)	
MANUFACTURER		MANUFACTURER	
TYPE	☐ GEAR	TYPE	
	☐ V-BELT	SIZE	
	☐ CHAIN		
	☐ VARIDRIVE		
SERVICE FACTOR		CAPACITY	
RATIO		RANGE	
*By Owner			

Page 3 of 4

[illegible]

**FORM 2 TO SECTION 01 78 23
EQUIPMENT DATA FORM**

Page 4 of 4

LUBRICATION / RECOMMENDED SPARE PARTS LIST

EQUIPMENT NO.		ASSET NO.*	
DESCRIPTION		MAINT. NO.*	

LUBRICANT LIST

REFERENCE SYMBOL	LUBRICANT TYPE (MILITARY STANDARD)	RECOMMENDED LUBRICANT AND MANUFACTURER
List of symbols in "Maintenance Operation"	List general lubrication type.	List specific lubrication name, viscosity, and manufacturer.

RECOMMENDED SPARE PARTS LIST

PART NO.**	DESCRIPTION	UNIT	QUANTITY	UNIT COST

ADDITIONAL DATA AND REMARKS

*By Owner

**Identify parts provided by this contract with two asterisks.

Note: Attach additional sheets if necessary.

"EXAMPLE" FORM 3 TO SECTION 01 78 23 EQUIPMENT DATA FORM				Page 1 of 4
PROJECT NAME	Anytown WWTP			
CONTRACT NO.	10023			
CONTRACTOR	Built-to-Last			
EQUIPMENT NO.	P-8-6-5, P-8-6-6	ASSET NO.*		
DESCRIPTION	Feed Pumps	MAINT. NO.*		
LOCATION	Chemical Building			
MANUFACTURER	Pumptech			
PURCHASED FROM	Suppliers Inc.			
VENDOR ORDER NO.	SI-1324-aa			
DATE OF PURCHASE	May 7, 1997	PURCHASE PRICE	\$1,200	
LOCAL SUPPLIER	Helpful Tech.			
ADDRESS	464553 N. Balyor, Outthere, Ohio 45362			
PHONE NO.	354-576-9876			
MODEL NO.	CC-2-5674			
NO. OF UNITS	2			
SERIAL NUMBERS	P674A123456-A / P674A123456-B			
*By Owner				

"EXAMPLE" FORM 3 TO SECTION 01 78 23 EQUIPMENT DATA FORM				Page 2 of 4
EQUIPMENT NO.	P-8-6-5, P-8-6-6	ASSET NO.*		
DESCRIPTION	Feed Pumps	MAINT. NO.*		
NAMEPLATE DATA				
ELECTRIC MOTOR		PUMP / HVAC UNIT		
MANUFACTURER	Westinghouse	MANUFACTURER	Pumptech	
TYPE	[X]AC []DC	TYPE	Centrifugal	
HORSEPOWER	25	SIZE	2 inch	
RPM	2000	CAPACITY	9 gpm	
VOLTAGE	460	PRESSURE	14 psig	
AMPERAGE	1.4 FL	ROTATION	CW	
PHASE	3	IMPELLER SIZE	NA	
FRAME	28a	IMPELLER MATL.	NA	
DRIVE / REDUCER		OTHER (I&C)		
MANUFACTURER	Westinghouse	MANUFACTURER		
TYPE	[X]GEAR	TYPE		
	[]V-BELT	SIZE		
	[]CHAIN			
	[]VARIDRIVE			
SERVICE FACTOR		CAPACITY		
RATIO	1:1	RANGE		
*By Owner				

Page 3 of 4

[illegible]

"EXAMPLE" FORM 3 TO SECTION 01 78 23 EQUIPMENT DATA FORM Page 4 of 4				
LUBRICATION / RECOMMENDED SPARE PARTS LIST				
EQUIPMENT NO.	P-8-6-5, P-8-6-6		ASSET NO.*	
DESCRIPTION	Feed Pumps		MAINT. NO.*	
LUBRICANT LIST				
REFERENCE SYMBOL	LUBRICANT TYPE (MILITARY STANDARD)	RECOMMENDED LUBRICANT AND MANUFACTURER		
List of symbols in "Maintenance Operation"	List general lubrication type.	List specific lubrication name, viscosity, and manufacturer.		
1	Lithium base grease	Texaco TH268		
RECOMMENDED SPARE PARTS LIST				
PART NO.**	DESCRIPTION	UNIT	QUANTITY	UNIT COST
**2-567-098	Mechanical seal	1	1	
3-987-456567	O-Ring	1	2	\$6.75
ADDITIONAL DATA AND REMARKS				
*By Owner **Identify parts provided by this contract with two asterisks. Note: Attach additional sheets if necessary.				

END OF SECTION

SECTION 01 78 39
PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.01 SUMMARY

- A. Throughout progress of the Work, maintain an accurate record of changes in the Contract Documents.
- B. Maintain at Site one record copy of:
 - 1. Drawings.
 - 2. Project Manual.
 - 3. Addenda.
 - 4. Change Orders and other modifications to Contract.
 - 5. Engineer Field Orders, written instructions, or clarifications.
 - 6. Approved Shop Drawings and other Work-related submittals.
 - 7. Field modifications made to equipment by Contractor, Subcontractors and Suppliers.
 - 8. Field test records.
 - 9. Construction photographs.
 - 10. Associated permits.
 - 11. Certificates of inspection and approvals.

1.02 PAYMENTS

- A. Progress payments will not be made until the Contractor has demonstrated to the Engineer that a marked up set of Drawings is being satisfactorily maintained on the site and is available for Engineer's review as specified herein.

1.03 SUBMITTALS

- A. Prior to Substantial Completion, submit revised operation and maintenance data for field modifications made by Contractor, Subcontractors, and Suppliers. Revised operation and maintenance data shall include electronic files and paper copies.
- B. Prior to Substantial Completion, submit revised copies of approved Shop Drawings and other Work-related submittals for equipment modified in field by Contractor, Subcontractors, and Suppliers.
- C. Prior to submitting request for Substantial Completion, deliver one complete coordinated marked up set of Drawings to Engineer for use in preparation of record drawings.
- D. Prior to submitting request for final payment, submit the remaining Project Record Documents to Engineer for Owner.
- E. Accompany submittals with transmittal letter containing following:
 - 1. Date.
 - 2. Project title and number.
 - 3. Contractor's name and address.
 - 4. Title of record document.
 - 5. Signature of Contractor or authorized representative.

- F. Included with each Pay Application, submit up to date Record Drawings in PDF format for review by Engineer.

PART 2 – PRODUCTS

(NOT USED)

PART 3 - EXECUTION

3.01 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. Store documents and Samples in Contractor's field office apart from documents used for construction.
 - 1. Provide files and racks for storage of documents.
 - 2. Provide secure storage space for storage of Samples.
 - 3. Provide dedicated location for storage of flash drive that contains electronic documentation, including the most up to date Record Drawings. Flash drive shall be made available for Engineer's use to view files at all times.
- B. Maintain documents in clean, dry, legible condition and in good order.
- C. Do not use record documents for construction purposes.
- D. Record documents shall only contain marks pertaining to recorded changes and should not contain notes, calculations, or other stray information.
- E. Label each document "PROJECT RECORD" in neat, large letters.
- F. Make documents and samples available for inspection by Engineer and Owner.
- G. Failure to properly maintain record documents may be reason to delay a portion of progress payments until records comply with Contract Documents.

3.02 RECORD DRAWINGS

- A. Maintain one record set of Drawings, in electronic PDF format (one PDF file for each drawing volume), legibly annotated to show all changes made during construction and the final location of all underground piping and utilities.
 - 1. The marked up set of Drawings shall be a compilation of all of the changes made by all of the trades involved. Individual sets from the various subcontractors will not be accepted.
 - 2. The marked up set of Drawings shall graphically show the changes. Reference to RFI's, Change Orders, Field Orders, etc. will not be accepted.
 - 3. The marked up set of Drawings shall incorporate changes made to the primary drawings, and shall include the corresponding changes made to the ancillary drawings.
 - 4. Changes made to the process drawings, electrical drawings, and I&C drawings shall be depicted on the P&ID's.
- B. All annotations on Record Drawings shall be done electronically in PDF format.
 - 1. The base drawing used for Record Drawing edits shall be in an original PDF file.
 - 2. Using the following color scheme:
 - a. RED: For drawing additions or elements to be added to the drawing.
 - b. GREEN: For items to be removed or deleted from the drawing.

- c. BLUE: For descriptive notes, dimensions, arrows, or other labels to provide direction to drafters but that are not specifically intended to be added to the drawings.
 - 3. Coloring scheme, labels, dimensions, and line work shall be consistent throughout the entire Record Drawing set.
 - 4. Use a straight line drawing tool where appropriate.
 - 5. Use text boxes with appropriately sized text for all text work.
 - 6. Drawing changes shall be to scale.
 - 7. All drawing comments shall be "flattened" prior to submitting any Record Drawings to prevent the inadvertent shifting or changing of any comment or mark-up and to provide final documentation of all mark-ups.
- C. Record information concurrently with construction progress.
- D. Drawings:
- 1. Graphically depict changes by modifying or adding to plans, details, sections, elevations, or schedules.
 - 2. Note the following:
 - a. Depths of various elements of foundation in relation to finished first floor elevation.
 - b. Horizontal and vertical locations of underground cable, conduit, duct runs, underground utilities and appurtenances, and underground piping referenced to visible and accessible features. These features shall be located where they leave or enter any structure and at changes in horizontal or vertical direction. The invert elevation of piping and the top of conduit or duct banks shall be noted. GPS coordinates may be used.
 - c. Field changes.
 - d. Details not on original Drawings.
 - e. Location and identification of exposed interior piping, including those shown schematically on Drawings.
 - f. Location and size of equipment including connections.
 - g. Departures from original Drawings.

END OF SECTION

SECTION 01 79 10
SYSTEMS DEMONSTRATIONS

PART 1 – GENERAL

1.01 DESCRIPTION

A. Before Substantial Completion is considered, Contractor shall demonstrate satisfactory operation of specific equipment systems and associated facilities. Prior to conducting system demonstrations, the Contractor shall prepare a start-up plan unique to each system. Conduct demonstrations on systems listed below. Each system shall include facilities listed and associated structures, channels, conduits, piping, valves, gates, electrical, instrumentation, water, and other utilities necessary for system operation.

1. System 1 – Electrical Improvements

- a. Generator
- b. Station A ATS
- c. Station B ATS
- d. (3) Station B Soft Starters
- e. Portable Generator Connection Cabinet (Alternate Bid Item 3)

B. Preliminary:

- 1. Before Contractor begins Systems Demonstrations, the following Work shall be complete:
 - a. Electrical systems testing as specified in Section 26 01 26.
 - b. Installation services specified in Section 01 61 00.
 - c. Operation and maintenance (O&M) data in accordance with Section 01 78 23 has been submitted to and approved by Engineer.
 - d. Process control system testing as specified in Section 40 61 21.
 - e. Instructional Services specified in Section 01 79 30.
- 2. Contractor shall provide services of qualified, certified representatives of Suppliers to be present at Project Site as necessary to successfully complete Systems Demonstrations.
- 3. Contractor shall submit evidence of the representative's certification and qualifications to the Engineer for review and approval 30 days prior to the start of Systems Demonstrations.

C. Coordination:

- 1. Designate representative of Contractor to be responsible for Systems Demonstrations.
- 2. Contractor shall submit schedule of Systems Demonstrations for review by Engineer and Owner 30 days prior to Systems Demonstrations.
- 3. Notify Engineer at least 7 days before Systems Demonstrations are to begin.
- 4. Reschedule cancelled Systems Demonstrations 7 days in advance.

1.02 SUBMITTALS

A. Start-up Plans

- 1. For each System identified in Paragraph 1.01.A above, Contractor shall prepare a system specific start-up plan. Submit each start-up plan no later than 4 weeks prior to the start date of each System's 7 day demonstration test.
- 2. Each system's start-up plan shall include a detailed step-by-step procedure addressing the requirements of this Section. Each plan shall identify the required activities that need

to be completed, who will be responsible for completing each activity, the order in which the activities need to be completed, and a schedule giving the dates for each activity. Each start-up plan shall describe the documentation that needs to be prepared to confirm that the activities have been successfully completed.

3. Each start-up plan shall identify the Contractor's representative that will be leading the Systems Demonstration during the 7 day testing period.

B. Reports:

1. Prepare report for each system on results and activities encompassing system demonstration. Submit report within two working days of completion of System Demonstration.
2. Report shall describe operational conditions; daily results of systems operation; dates and names of people involved and observing operation; and statement regarding system ability to meet operational criteria.

C. Submit in accordance with Section 01 33 00.

PART 2 – PRODUCTS

(Not Used)

PART 3 – EXECUTION

3.01 SYSTEMS DEMONSTRATIONS

A. Demonstrate operation and performance of each system for 7 consecutive days.

1. Where no specific performance requirements are stated in Specifications, demonstrate to show equipment operates in accordance with acceptable industry standards for application of equipment.
2. System Demonstration shall show equipment operates within manufacturer's tolerances for noise and vibration, equipment is responsive to manual and automatic controls, control and protective devices are properly set, and equipment operates on controlled or intermittent basis when such operation is intended.
3. Demonstrate proper function and process control for each control point, alarm, and safety lockout system.

B. Temporary facilities and services are Contractor's responsibility. Contractor shall provide temporary facilities and services as required to complete testing and systems demonstrations. Contractor shall also provide required equipment maintenance during the time between the systems demonstration testing and the issuance of a Certificate of Substantial Completion.

C. For each system, Engineer will consider system demonstration successful and complete when system operates properly for 7 consecutive days without significant interruption.

D. If, in Engineer's opinion, system is not operating properly at any time during System Demonstration, Contractor shall stop demonstration and adjust, calibrate, or replace material and equipment as required to correct problem. After corrections have been made, restart System Demonstration and operate system for 7 consecutive days without significant interruption.

E. If the system is not operating properly, and the Contractor opts to continue operating the system until the corrections to the system have been completed and the system can proceed to restarting the Systems Demonstration, the Contractor shall continue to be responsible for providing ongoing required equipment maintenance, temporary facilities and services.

3.02 SUBSTANTIAL COMPLETION

- A. Engineer will not consider Work substantially complete until Systems Demonstrations have been successfully completed.

END OF SECTION

SECTION 01 79 30
INSTRUCTIONAL SERVICES

PART 1 – GENERAL

1.01 SUMMARY

A. Section includes:

1. Training manuals.
2. Classroom instruction.
3. Field training.
4. Other activities to provide comprehensive training program.

1.02 SUBMITTALS

A. Training Program:

1. Submit proposed training program to electronic document management system, including student training manual and instructor guide, for review by Engineer.
2. After training program is approved by Engineer provide 20 student training manuals and one instructor guide.

B. Resumes:

1. Submit resumes, including three outside references, for each instructor proposed for training program.
2. Engineer will review resumes. Based upon review of resumes, and contacts with references, Engineer will approve, request additional information, or reject proposed instructors for training program.
3. If proposed instructor is rejected, Contractor shall submit resume and references on an alternate instructor for acceptance.

C. Submit in accordance with Section 01 33 00.

D. Provide "Certificate of Instructional Services" cosigned by Owner and instructor, verifying training accomplished to satisfaction of all parties. Use the form in Appendix and furnish 2 copies to Engineer.

PART 2 – PRODUCTS

2.01 TRAINING PROGRAM

A. Training shall include both classroom instruction and hands-on field training:

1. Classroom instruction shall be a minimum of one hour and be completed before the field training. Classroom training shall provide an overview of the theory of equipment operation, mechanical operation and maintenance, and various modes and functions available.
2. Field training shall include hands-on instruction of the installed equipment where personnel can observe equipment operation and features, controls, and maintenance points can be directly pointed out. If field training is to be performed in a location that requires hearing protection, provide voice amplification so all students can adequately hear the training.

- B. Instruct and train Owner's personnel in maintenance and operation of equipment and systems supplied and installed under this Contract.
- C. Incorporate operation and maintenance information from shop drawings and equipment manuals into training program.
- D. Prepare instruction materials and objectives, student notes and guides, and tests required for complete classroom and field training.
- E. Classroom instruction shall be conducted with a maximum of 20 students for each instructor.
- F. Field training shall be conducted with a maximum of 10 students for each instructor, perform multiple field training sessions as required so all students attending the classroom instruction receive field training.

2.02 INSTRUCTORS

- A. Preparation of training materials and conduct of training shall be performed by personnel:
 - 1. Trained and experienced in maintenance and operation of equipment and systems installed under this Contract.
 - 2. Familiar with training requirements of Owner's personnel, that is, understand Owner's personnel training needs.

2.03 FORM OF TRAINING MATERIALS

- A. Prepare training materials in form of an instruction manual for use by Owner's personnel.
- B. Instruction manual format:
 - 1. Size: 8-1/2 inch by 11 inch.
 - 2. Paper: 20-pound minimum, white, for typed pages.
 - 3. Text: Manufacturer's printed data, or neatly typewritten, including:
 - a. Table of Contents.
 - b. Learning Objectives.
 - c. General Operation, Theory, Specific Equipment Information.
 - d. Test.
 - 4. Drawings:
 - a. Provide reinforced, punched binder tabs, bind in with text.
 - b. Reduce larger Drawings and fold to size of text pages, not larger than 11 inch by 17 inch.
 - 5. Cover: Identify each volume with typed or printed title "Training Manual; NAME OF EQUIPMENT."
 - a. Title of Project.
 - b. Identify separate structure or system as applicable.
 - c. Identify general subject matter in Manual.
 - 6. Binders:

- a. Commercial quality binder with durable and cleanable plastic covers. Binders shall include title pockets for holding notes. Binders shall not be filled more than 75 percent capacity.
- b. When multiple binders are used, correlate information into related consistent groupings.

PART 3 – EXECUTION

3.01 TRAINING LOCATIONS

- A. Use Owner's designated training facilities for classroom instruction.
- B. Field training shall be conducted at the equipment installation location.
- C. Coordinate use of Owner's facilities with Owner and Engineer, including any computer or display requirements for presenting material from the training manuals.

3.02 SCHEDULE

- A. Coordinate training periods with Engineer and Supplier's representatives.
 - 1. Notify Engineer at least 14 days before training sessions are to begin so Engineer can make arrangements with Owner's operating personnel.
 - 2. Reschedule canceled training sessions 14 days in advance.
 - 3. Failure of instructors to appear for scheduled training, failure to notify Engineer 48 hours in advance of need to cancel training session, or failure to arrive within 30 minutes of start of scheduled training session shall result in reimbursement to Owner for time lost by Owner's personnel in waiting for arrival of instructor.
- B. Provide training after completion of application software programming and before the start of Systems Demonstrations specified in Section 01 79 10. See section 01 11 00 for sequencing and constraints.

3.03 MAINTENANCE OF PROCESS EQUIPMENT

- A. Training Requirements:
 - 1. Describe functions of process equipment.
 - 2. Component preventative and corrective maintenance activities required to keep unit equipment in good operating conditions.
 - 3. Instruct trainees in locating probable source of equipment malfunctions, determining symptoms of trouble, establishing probable cause, and effecting solution.
- B. Course Materials:
 - 1. Pertinent portions of operation and maintenance manuals as well as alignment tolerances, lubrication schedules, vibration analysis instructions and parameters, and special calibration test and procedures.
 - 2. Detailed course outlines and troubleshooting guides for each piece of equipment. Troubleshooting guides shall include symptoms, probable causes, and solutions for trouble described during training program.
 - 3. Course outlines shall include objectives that indicate information to be learned. The objectives shall state the answers to the test questions. Example of objective: "Students shall identify the points and frequency of grease lubrication on the machine."
 - 4. Provide a 15 to 20 question test of the objectives being taught.
 - 5. The objectives shall be equally divided between operation and maintenance and cover the subjects listed in 3.04 and 3.05.

- C. Method of training maintenance personnel shall include Contractor using Owner's equipment to demonstrate troubleshooting, preventative and corrective maintenance procedures.

3.04 OPERATION OF PROCESS EQUIPMENT

A. Training Requirements:

1. Describe functions of equipment including how components of system are controlled together and what effects of control methods are on system and on other upstream and downstream processes.
2. Being able to implement start-up and shutdown procedures for each piece of equipment individually, as well as start-up and shutdown of systems comprising equipment. This instruction shall include normal operation, alternative operations, and emergency operations.
3. Understand functions of instrumentation, describing individual components and how each component is used in monitoring and/or controlling equipment and/or processes.
4. Understand operating modes possible as result of modifications and installations.
5. Locating probable source of system inefficiency, determining symptoms, establishing probable cause, and restabilizing system efficiency for systems.
6. Understand necessary precautions for safe operation of equipment, instrumentation, and control system installed under this Contract.
7. Emergency procedures for equipment and systems during pump malfunction, chemical spills, and other extreme conditions.

B. Course Materials:

1. Pertinent portions of operation and maintenance manuals, including start-up and shutdown procedure; descriptions of equipment and instrumentation functions and modes of operations, control, and monitoring; troubleshooting instructions and process control instructions.
2. Detailed course outlines and troubleshooting guides for equipment and processes for field use. Operations guides shall include general operating procedures, start-up and shutdown procedures, optimization procedures, and emergency operating procedures.
3. Course outlines shall include objectives that indicate information to be learned. The objectives shall state the answers to the test questions. Example of objective: "Students shall identify the points and frequency of grease lubrication on the machine."
4. Provide a 10 to 20 question test of the objectives being taught.
5. The objectives shall be equally divided between operation and maintenance and cover the subjects listed in 3.04 and 3.05.

3.05 FIELD QUALITY CONTROL

A. Training Effectiveness:

1. Effectiveness of training personnel shall be assessed through written and in-the-field skill evaluation of trainees. Evaluations shall be designed to determine trainees' ability to control processes, as well as their ability to operate and maintain equipment.
2. Unsatisfactory evaluations shall include recommendations for corrective action or additional training sessions.

END OF SECTION

DIVISION 03

CONCRETE

SECTION 03 20 00
CONCRETE REINFORCING

PART 1 – GENERAL

1.01 SUMMARY

- A. Provide concrete reinforcement where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

1.02 REFERENCES

- A. ACI: American Concrete Institute
- B. ASTM: American Society for Testing and Materials
- C. CRSI: Concrete Reinforcing Steel Institute

1.03 SUBMITTALS

- A. Shop Drawings:
 - 1. Conform to ACI SP-66 showing bending diagrams, assembly diagrams, location diagrams, splicing and laps of bars, shapes, dimensions, and details for reinforcing, and stirrup spacing, accessories, and additional reinforcing at openings.
- B. Product Data:
 - 1. Dowel Adhesive manufacturer's product data.
- C. Submit in accordance with Section 01 33 00.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Deliver reinforcement to site bundled and tagged.
- B. Use necessary precautions to maintain identification after bundles are broken.
- C. Store in a manner to prevent excessive rusting and fouling with dirt, grease, and other bond-breaking coatings.

PART 2 – PRODUCTS

2.01 REINFORCEMENT MATERIALS AND ACCESSORIES

- A. Deformed Steel Bars: ASTM A615, Grade 60.
- B. Welded Wire Reinforcement: ASTM A1064.
- C. Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcement in place:
 - 1. Comply with CRSI recommendations.
 - 2. For slabs on grade, use supports with sand plates or horizontal runners where base material will not support chair legs.

3. Exterior exposed surfaces, surfaces in contact with earth or liquid, and interior exposed surfaces in humid areas shall have all plastic or stainless steel supports.
4. When supports bear directly on the ground and it is not practical to use steel or plastic supports, solid precast concrete blocks may be used to support only the bottom mat of reinforcement. Precast blocks must be of equal or greater strength than the concrete being placed.

D. Dowel Adhesive:

1. Epoxy or acrylic adhesive.
2. Manufacturers:
 - a. HIT RE 500 V3 or HIT-HY 200-R System by Hilti Corp.
 - b. Pure 110+, AC100+ Gold or PE 1000+ by Dewalt.
 - c. SET-XP Epoxy or AT-XP Acrylic Adhesive System by Simpson Strong-Tie Co., Inc.
 - d. Red Head A7+, G5+ or C6+ by ITW Commercial Construction.

2.02 FABRICATION

- A. Fabricate reinforcing bars to conform to the required shapes and dimensions and in accordance with ACI 318 and CRSI Manual.
- B. In case of fabricating errors, do not straighten or rebend reinforcement in a manner that will weaken or injure the material.
- C. Reinforcement with any of the following defects will not be acceptable.
 1. Bar lengths, depths, and/or bends exceeding the specified fabrication tolerances.
 2. Bends or kinks not shown on the Drawings.
 3. Bars with reduced cross-section due to excessive rusting or other causes.

PART 3 – EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION

- A. Clean reinforcement to remove loose rust and mill scale, earth, and other materials which reduce or destroy bond with concrete.
- B. Position, support, and secure reinforcement against displacement by formwork, construction, and concrete placing operations. Unless otherwise noted, provide clear cover as follows:
 1. Cast against earth: 3 inches
 2. Exposed to earth, weather, or water:
 - a. #5 Bars and smaller: 1 ½ inches
 - b. #6 through #11 Bars: 2 inches

- C. Correct displacement of reinforcement prior to and during concrete placement. Maintain clear cover as noted on Drawings. Tolerances shall be in accordance with ACI 117 and ACI 318, unless noted otherwise.
- D. Support reinforcing steel in accordance with CRSI "Placing Reinforcing Bars" with maximum spacing of 4 feet.
- E. Tie reinforcing steel at intersections in accordance with CRSI "Placing Reinforcing Bars".
 - 1. Spacing for Footings, Walls, and Columns: Every third intersection, 3 feet maximum.
 - 2. Spacing for Slabs and Other Work: Every fourth intersection, 3 feet maximum.
 - 3. Tie each dowel in-place.
- F. Unless shown otherwise, place WWR between upper third point and mid point of slab. WWR placement on subgrade and pulling up during concrete placement not allowed.
- G. Do not field bend bars, including bars partially embedded in concrete unless indicated.
- H. Tack welding of, or to, reinforcement prohibited.
- I. Placement of reinforcement shall be approved by Engineer before placing concrete.
- J. Anchor dowels into drilled holes with epoxy dowel adhesive where noted. Conform to details shown.

3.03 SPLICES

- A. Lap reinforcing at splices. Tie securely to prevent displacement of splices during placement of concrete.
- B. Extend WWR to within 2 inches of edges of section. Lap sheets at least 12 inches at ends and edges and wire together. Stagger laps.

END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.01 SUMMARY

- A. Provide cast-in-place concrete where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

1.02 REFERENCES

- A. ASTM: ASTM International
- B. NRMCA: National Ready Mixed Concrete Association
- C. ACI: American Concrete Institute
- D. AASHTO: American Association of State Highway and Transportation Officials

1.03 SUBMITTALS

A. Shop Drawings:

1. Verification of Mix Design:

- a. Proposed mix design for each class of concrete to be used as specified using designations indicated. Provide dry weight of cement, saturated dry weight of coarse and fine aggregate, brand name and quantities of admixtures when applicable, fly ash and other supplementary cementitious materials when applicable, gallons of water required for 1 cubic yard of concrete, and chloride ion content.
- b. Source and material certificates of cement and fine and coarse aggregate, including sieve analysis that will be used in each class of concrete.
- c. Admixture product data.
- d. Source and test reports of fly ash and other pozzolans.
- e. Source of slag cement and documented ability of supplier to consistently furnish these materials in accordance with applicable ASTM and AASHTO requirements.
- f. Test data supporting proportions of design mixes based on laboratory trial batches or past field experience in accordance with ACI specification 301.
- g. NRMCA certification, DOT certification, or letter stating plant and equipment complies with industry standard requirements.
- h. Mix design shall be approved by Engineer before concrete delivered to site.

B. Product Data:

- 1. Curing Compound and Evaporation Retardant: Proposed rate of coverage and manufacturer's literature.
- 2. Finishing Grout manufacturer's literature.
- 3. Bonding Agent manufacturer's literature.
- 4. Patching Mortar manufacturer's literature.

C. Test Results:

- 1. Concrete test results.

2. Concrete delivery tickets: With each load of concrete delivered, provide duplicate tickets, one for Contractor, one for Engineer, with following information.
 - a. Serial number of ticket.
 - b. Date and truck number.
 - c. Name of supplier.
 - d. Class of concrete.
 - e. Type of cement and cement content in bags/cubic yard.
 - f. Admixture brand names.
 - g. Aggregate size.
 - h. Time loaded.
 - i. Amount of concrete in load.
 - j. Gallons of water added at site and slump of concrete after addition of water.
 - k. Temperature of concrete at delivery.
 - l. Time unloaded.

D. Submit in accordance with Section 01 33 00.

1.04 QUALITY ASSURANCE

- A. Plant Certification: Plant or concrete supplier shall comply with requirements of NRMCA certification plan as regards material storage and handling, batching equipment, central mixer, truck mixers with counters, agitators, nonagitating units, and ticketing system.
- B. Do not commence placement of concrete until mix designs have been reviewed and approved by Engineer.
- C. Concrete Testing: Testing shall be provided by Contractor in accordance with Section 01 45 29 and this Section.
 1. Conduct tests on sample material in accordance with methods listed below:
 - a. Slump: ASTM C143.
 - b. Air Content: ASTM C231.
 - c. Compressive Strength: ASTM C31 and ASTM C39.

1.05 PROJECT / SITE CONDITIONS

A. Hot Weather:

1. Comply with ACI 305.1.
2. Concrete temperature shall not exceed 90°F.
3. At air temperatures of 80°F or above, keep concrete as cool as possible during placement and curing.
4. When concrete temperature exceeds 80°F, water reducing, set-retarding admixtures shall be used.

B. Cold Weather:

1. Comply with ACI 306.1.
2. Temperature of reinforcement, forms, fillers, and other material in contact with concrete at time of placement shall not be less than 35°F. Preheat if temperature below 35°F.
3. Maintain air and forms in contact with concrete sections having minimum dimension less than 12 inches at temperature above 50°F for at least 3 days and at temperature above 32°F for remainder of specified curing period.

4. Maintain air and forms in contact with concrete in more massive sections at temperature above 40°F for at least 3 days and at temperature above 32°F for remainder of specified curing period.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Cementitious Materials:

1. Portland cement conforming to ASTM C150.
 - a. Type I or II except tricalcium aluminate (C_3A) content of Type I shall not exceed 8%. If this type of Type I not available, Type I with C_3A content less than 12% shall be used in combination with fly ash.
 - b. Type II shall be used for mass concrete applications and where heat hydration is a concern.
 - c. Type III may be substituted for Type I when approved by Engineer and additional requirements for Type I are met.
 - d. When aggregates determined to be deleteriously reactive, as defined by ASTM C33, alkali content of cement defined by ASTM C150 shall not exceed 0.60%.
2. Blended hydraulic cement conforming to ASTM C595.
 - a. Type IL, IP, or IS may be used in replacement of ASTM C150 Type I.
 - b. Type IL (MS), IP (MS), or Type IS (MS) may be used in replacement of ASTM C150 Type II where moderate sulfate exposure is anticipated.
 - c. Type IL (MH), IP (MH), or Type IS (MH) may be used in replacement of ASTM C150 Type II where heat of hydration is a concern.
 - d. Blended hydraulic cements may not be used in replacement of ASTM C150 Type III or V cements.
3. Fly Ash:
 - a. ASTM C618, Class C or F including requirements of Table 1A.
 - b. Supplemental Requirements:
 - i. Loss on Ignition (maximum): 3%.
 - ii. Water Requirement (maximum): 100% (as percent of control).
 - iii. Fineness (maximum retained on No. 325 sieve): 25%.
4. Slag Cement:
 - a. Slag cement shall conform to the requirements of ASTM C989 Grade 100 or 120.
 - b. Slag cement from different sources or of different grades shall not be mixed in the same construction.
5. Silica fume conforming to ASTM C1240, amorphous silica.

B. Aggregates:

1. ASTM C33, modified as follows:
 - a. Fine aggregate: Natural sand.
 - b. Coarse aggregate: Crushed gravel, crushed stone or gravel, Size 467 (1-1/2 inch maximum), size 67 (3/4 inch maximum), Size 8 (3/8 inch maximum).

2. Potential reactivity of aggregates shall be determined in accordance with ASTM C33.
- C. Admixtures:
1. Shall be non-corrosive and shall not contain intentionally added chlorides.
 2. Air-Entraining: ASTM C260.
 3. Chemical Admixtures:
 - a. Water-Reducing: ASTM C494, Type A.
 - b. Mid-Range Water-Reducing: ASTM C494, Type A.
 - c. Retarding: ASTM C494, Type B or D.
 - d. Accelerating: ASTM C494, Type C or E.
 - e. High-Range Water-Reducing: ASTM C494, Type F.
 - f. Workability-Retaining: ASTM C494, Type S.
- D. Water: Potable.
- E. Premolded Joint Filler:
1. ASTM D 1751.
 2. ASTM D1752, Type I, II, or III.
 3. Closed cell polyethylene.
- F. Membrane Forming Curing Compound:
1. Manufacturers:
 - a. Dress and Seal 30 by L&M Construction Materials, Inc.
 - b. MasterKure CC 200 WB by Master Builders Solutions.
- G. Finishing Grout
1. Manufacturers:
 - a. MasterSeal 581 by Master Builders Solutions.
 - b. Concrete Finisher with AKKRO-7T by Tamms Industries Co.
 - c. SikaTop Seal 107 by Sika Corp.
- H. Cement Grout: Mixture of cement and fine sand in proportions used in concrete being finished.
- I. Epoxy Bonding Agent:
1. Manufacturers:
 - a. MasterEmaco ADH Series by Master Builders Solutions.
 - b. Sikadur 32 Hi-Mod by Sika Corp.
 - c. Epoxite 2362 by A.C. Horn.
 - d. Sure Bond J-58 by Dayton Superior.
 - e. Epobond by L&M Construction Materials, Inc.
 - f. Five Star Bonding Adhesive by Five Star Products, Inc.
 2. Use when joining new to existing concrete.
 3. Conforming to ASTM C881.
- J. Non-Epoxy Bonding Agent:

1. Manufacturers:
 - a. Weld-Crete by Larsen Products Corp.
 - b. MasterEmaco A660 by Master Builders Solutions.
 - c. Everbond by L&M Construction Materials, Inc.
 2. Use when joining new to existing concrete when bonding agent cannot be placed immediately prior to placement of new concrete.
 3. Conforming to ASTM C1059 Type II.
- K. Evaporation Retardant:
1. Manufacturers:
 - a. Econ by L&M Construction Materials, Inc.
 - b. MasterKure ER 50 by Master Builders Solutions.
 - c. Sikafilm by Sika Corp.
- L. Patching Mortar.
1. Manufacturers:
 - a. Sikatop by Sika Corp.
 - b. Duratop by L&M Construction Materials, Inc.
 - c. MasterEmaco T 310CI by Master Builders Solutions.
 2. Polymer modified cementitious fast setting mortar for repair of concrete surfaces. Consisting of polymer and selected Portland cements, aggregates, accelerator, admixtures for controlling set, water reducers for workability, and corrosion inhibitor. Shall contain no chlorides, nitrates, gypsum, or lime. Shall not produce vapor barrier. Shall be thermally compatible with concrete and shall be freeze-thaw resistant.
 - a. Concrete gray.
 - b. 5000 pounds per square inch minimum compressive strength.
 - c. 400 pounds per square inch minimum bond strength.

2.02 CONCRETE MIX DESIGN

- A. Concrete Mix: Measure and combine cement, aggregate, water, and admixtures in accordance with ASTM C94 and ACI PRC-211.1.
1. Cement: When used in exposed concrete shall be one brand from one source. Do not mix different cements in same element of Work.
 2. Water-Cementitious Materials Ratio (if fly ash or slag cement is used, water-cement plus fly ash and slag cement ratio): 0.45 maximum for Class A concrete, 0.50 maximum for Class B concrete.
 3. Air-Entrainment: Air-entrain all concrete, unless noted otherwise.
 4. Chemical Admixtures: Use is optional to aid concrete properties and allow for efficient placement. Manner of use and amount shall be in accordance with manufacturer's written recommendations and as approved by Engineer. Do not use admixtures that increase early shrinkage or negatively affect finishing.
 5. Fly Ash: Use is optional unless otherwise noted. Combine fly ash with cement at rate of 1 pound fly ash for each pound reduction of cement. Amount of fly ash shall not be less than 15% or more than 25% of weight of cementitious material.

6. Slag Cement: Use is optional unless otherwise noted. Combine slag cement with cement at a rate of 1 pound slag cement for each pound reduction of cement. Amount of slag cement shall not be greater than 50% of weight of cementitious material.
7. Fly Ash and Slag Cement Combination: Use is optional unless otherwise noted. Combine fly ash and slag cement with cement at a rate of 1 pound fly ash or slag cement for each pound reduction of cement. Amount of fly ash and slag cement combination shall not be greater than 50% of weight of cementitious material. Amount of fly ash shall not be greater than 25% of weight of cementitious material
8. Use no admixtures other than specified, unless approved by Engineer.

B. Class of Concrete:

1. Furnish in accordance with table. Cement contents listed are minimum values and shall be increased as required to attain other specified characteristics.
2. Slumps listed are maximum, except when the mix contains an approved admixture. Maximum slump when admixtures are used shall be 10 inches.
3. Chloride ion content shall not exceed values listed in ACI 318.
4. Mid-range water reducer required for Class A1 and A2 concrete.

Class	28-Day Compressive Strength (psi)	Coarse Aggregate (size no.)	Minimum Cementitious Material (lbs/cu yd)	Air Content (%)	Slump (in.)
A1	4500	467	517	5.5±1.5	3±1
A2	4500	67	564	6±1.5	3±1
B1	3000	467	423	5.5±1.5	3±1
B2	3000	67	446	6±1.5	3±1
B3	3000	8	470	7.5±1.5	4 max
psi = pounds per square inch cu yd = cubic yard in. = inch max = maximum					

C. Concrete Usage:

1. Class A: All locations, except where Class B is specified.
2. Class B: Guard post piers and where specifically noted.
3. Class A1: Exterior unreinforced concrete pavement.
4. Class A2: Concrete curb and gutter and concrete sidewalk.
5. Do not use coarse aggregate Size 467 in sections less than 12 inches thick, where clear cover of reinforcement is less than 1-1/2 inches or where clear spacing between reinforcement bars is less than 3 inches.

2.03 MIXING AND DELIVERY

- A. Use ready mixed concrete conforming to ASTM C94.
- B. Deliver and complete discharge within 1-1/2 hours of commencing of mixing. Limitations may be waived by Engineer if concrete slump, after 1-1/2 hours, is sufficient so that concrete can be placed without addition of water. In hot weather, time criteria may be reduced by Engineer.
- C. Do not add water on-site unless slump and water-cement ratio, after addition of water, is below maximum allowed.
- D. Deliver concrete to site having temperature not less than 50°F or greater than 90°F.

PART 3 – EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 FORMS

- A. Formwork design, detailing, and installation shall be Contractor's responsibility.
- B. Type of forms used is Contractor's option, except as other wise indicated or shown. Plywood and other wood surfaces shall have smooth, level surfaces treated with formoil or sealer to produce clean release of concrete from forms.
 - 1. Where walls remain exposed use plywood, prefabricated metal or wood forms; do not use boards.
 - 2. Form ties shall be plastic cone snap ties. Cone shall be min 3/4 inch diameter by 1 inch deep. Ties for liquid holding structures or dry structures below grade shall have integral waterstop. Taper tie through-bolt form ties may be used as an alternate to plastic cone snap ties; conform to details shown. Do not use wire ties on exposed concrete.
 - 3. Removal of ties shall leave holes clean cut and without appreciable spalling at face of concrete.
 - 4. Provide 3/4 inch chamfer on external corners of exposed concrete walls, beams, columns, equipment bases and exposed edges of construction joints. Do not chamfer edges flush with masonry walls.
 - 5. Provide openings at base of vertical forms as access for cleaning and inspection of forms and reinforcing prior to depositing concrete.
- C. Coat plywood and wood forms with non-staining form release agent. Apply release agent before reinforcement is placed.
- D. Clean, patch, and repair form material before reuse.
- E. Formwork shall prevent leakage of mortar, shall not deflect under weight of concrete and workmen, and shall withstand fluid pressure of concrete.
- F. Conform to tolerances as specified in ACI specification 117.

3.03 SUBGRADE PREPARATION

- A. Subgrade and bedding shall be compacted and free of frost. If placement occurs at temperatures below freezing, provide temporary heat and protection to remove frost. Do not place concrete on frozen material.
- B. Remove standing water, ice, mud, and foreign matter before placing concrete.

3.04 PLACING CONCRETE

- A. Notify Engineer 24 hours in advance of placing operations.
- B. Place concrete, except as modified herein, in accordance with ACI specification 301.
- C. Concrete will not be allowed to drop freely where reinforcing will cause segregation of mix.

1. Concrete containing high-range water reducer: 10 feet maximum drop.
 2. Other Concrete: 5 feet maximum drop.
- D. If pumping used, do not use aluminum piping for delivery system.
- E. When placing concrete temporarily halted or delayed, provide construction joints as shown and as specified.
- F. If in process of pouring wall, pour is stopped unexpectedly, leave surface of joint level but rough. Roughened surface shall have amplitude of 1/4 inch minimum.
- G. Provide bonding agent between new and hardened or existing concrete where shown. Existing concrete shall be sandblast cleaned to remove all foreign materials, to expose the coarse aggregate, and result in a roughened surface with minimum amplitude of 1/8 inch.
- H. When hot and/or wind conditions will result in evaporation of 0.2 pounds per square foot per hour or more, evaporation retardant shall be used in accordance with manufacturer's written recommendations to minimize plastic shrinkage cracking.

3.05 JOINTS

- A. Install premolded joint filler where noted in accordance with manufacturer's recommendations. Joint filler shall be compatible with sealant and suitable for intended purpose.

3.06 EMBEDDED ITEMS

- A. Cast pipe and other embedded items into concrete as placement progresses. Do not provide blockouts.
- B. Following restrictions shall be adhered to, unless otherwise noted.
1. Duct, conduit, pipe, and fittings, when placed within slabs or walls
 - a. Shall not be larger than 1/3 thickness of slab.
 - b. Shall be placed within the middle 1/3 thickness of slab where possible.
 - c. Shall not be placed closer than 3 outside diameter clear from each other when parallel.
 - d. Shall cross each other at right angles.
 - e. Shall be secured to prevent shifting or "floating" during concrete placement.
 - f. Multiple conduits shall not cross each other at the same location.
 - g. Where conditions require conduit to be tied to the inside face of the reinforcing mat, the conduit shall be galvanized steel or PVC, shall not be tied directly adjacent to a parallel reinforcement bar, and shall be placed 3 outside diameter clear away from the parallel reinforcement bar.
 2. Reinforcing steel shall be in place before embedded items placed and reinforcing cut or removed shall be replaced with additional reinforcing as indicated.
- C. Do not place ducts, conduit, and pipes in slabs on grade. Place minimum 4 inches below slab.
- D. Set items such as bolts, anchors, piping, and frames in concrete as shown.
- E. Place items constructed of dissimilar metals to avoid physical contact with reinforcing. Secure item and reinforcing to ensure they will not shift and come into contact during concrete

placement. Contact between reinforcing steel and other metal, other than bare, coated, or plated carbon steel not permitted.

3.07 REPAIR OF SURFACE DEFECTS

A. General:

1. Prior to starting repair work, obtain Engineer's approval of proposed repair techniques and materials.
2. Method of repair shall not adversely affect the appearance of the finished structure.
3. Develop repair techniques on portion of as-cast surface selected by Engineer. Surface of repair remaining exposed to view shall match color and texture of adjacent surfaces.
4. Prepare surfaces, apply and install materials, and cure as recommended by material manufacturers.

B. Tie Holes: Fill plastic cone snap tie holes with Patching Mortar. Fill taper tie through-bolt form tie holes with Non-Shrink Grout.

C. Defective Areas:

1. Remove honeycombing, stone pockets, spalls, and other defective concrete down to sound concrete. If chipping required, make edges perpendicular to surface. Do not feather edges.
2. Fill defective area with Patching Mortar.

3.08 FINISHING SLABS AND FLATWORK

A. Slab Finishes:

Description	Concrete Finish
Exterior Exposed Slabs	Float and Broom Finish
Exterior Stairs and Walks	Float and Broom Finish

B. After placement, screed concrete with straightedges, power strike-offs or vibrating screeds.

C. After screeding, bull float or darby surfaces to eliminate ridges and to fill in voids left by screeding.

D. Float:

1. Use magnesium or aluminum hand floats or power floats with slip on float shoes.
2. Float finish shall result in uniform smooth granular texture.

E. Broom Finish: Use fine, soft-bristled broom and broom at right angles to direction of traffic to give nonskid finish approved by Engineer.

F. Tolerances:

1. Concrete slabs shall be within 3/16 inch of 10 foot straightedge in all directions except where slabs are dished for drains. Deviations from elevation indicated shall not exceed 3/4 inch.
2. Pitch floor to floor drains minimum 1/8 inch per foot or as shown. Pitch bottom of slab or beam to match top slope to maintain thickness or depth indicated. As an alternate, bottom of slab or beam may be placed level provided that min thickness or depth is maintained.

3.09 FINISHING FORMED CONCRETE

- A. As-Formed Finish: Finish resulting directly from formwork for surfaces which will be hidden from view by earth, submergence in water, or subsequent construction.
 - 1. Repair surface defects as specified herein.
 - 2. Where joint marks or fins on submerged surfaces exceed 1/4 inch, grind smooth.
- B. Rubbed Finish: Exterior concrete surfaces permanently exposed to view extending to 6 inch below finished grade or liquid level.
 - 1. Repair surface defects as specified herein.
 - 2. Grind joint marks and fins smooth with adjacent surface. Remove stains and rinse.
 - 3. Apply heavy coat of Finishing Grout. After first coat has set, apply second coat. When second coat has set, float to uniform texture.
 - 4. Follow manufacturer's written recommendations.
 - 5. Finish color shall be gray.

3.010 PROTECTION AND CURING

- A. Protect concrete from frost and keep moist for min curing period of 7 days after placement in accordance with ACI specification 308.1.
- B. Formed Surfaces:
 - 1. Wet cure by spraying surfaces as frequently as drying conditions may require to keep concrete surfaces moist.
 - 2. Surfaces may be cured by leaving forms in-place. For vertical surfaces, apply water to run down inside of forms, if necessary, to keep concrete moist.
 - 3. After forms are removed, wet cure for remainder of curing period or apply curing compound.
 - 4. Do not use curing compound where mortar, grout, concrete, or other coatings or adhesives will be applied.
- C. Flatwork:
 - 1. Cure using curing compound or wet cure.
 - 2. Do not use curing compound where mortar, grout, concrete, or other coatings or adhesives will be applied.
- D. Curing Compound:
 - 1. Apply curing compound at uniform rate sufficient to comply with requirements for water retention as specified and as measured in accordance with ASTM C156.
 - 2. Cover areas subjected to direct sunlight with ambient temperature expected to exceed 80°F with white pigmented compound, other surfaces may be covered with fugitive dye compound.
- E. Protect from damaging mechanical disturbances, load stresses, heavy shock, and excessive vibration.
- F. Protect finished concrete surfaces from damage caused by construction equipment, materials, and methods, and from rain or running water.
- G. Do not load self-supporting structures to overstress concrete.

3.011 REMOVAL OF FORMING AND SHORING

- A. Do not remove forming until member supported has acquired sufficient strength to safely support own weight and any imposed loads. Forming shall remain in place for at least min time recommended by ACI PRC-347.

3.012 FIELD QUALITY CONTROL

- A. Obtain samples of concrete in accordance with ASTM C172. Place cylinders on-site where they can be stored under conditions similar to concrete they represent without being disturbed for first 24 hours.
- B. Make slump tests daily and when requested by Engineer, in accordance with ASTM C143. Make slump tests from same load from which strength tests are made.
- C. Make air content tests daily and when requested by Engineer, in accordance with ASTM C231. Make air content tests from same load from which strength tests are made.
- D. Make temperature tests daily and when requested by Engineer, in accordance with ASTM C1064. Make temperature tests from same load from which strength tests are made.
- E. If measured slump, air content, or temperature falls outside specified limits, make check test immediately on another portion of same sample. In event of second failure, concrete shall be considered to have failed to meet requirements of Specifications and will be rejected.
- F. Make strength test specimens for each of the following conditions for each class of concrete
 - 1. Each day's pour.
 - 2. Each change of source.
 - 3. Each 100 cubic yards poured.
- G. Strength test for each class of concrete consists of (5)-cured 4 x 8 in. standard cylinders or (4)-cured 6 x 12 in. standard cylinders made from composite samples secured from same load of concrete in accordance with ASTM C172. Make compressive strength tests on 1 cylinder at 7 days and (2)-standard 6 x 12 in. cylinders or (3)-standard 4 x 8 in. cylinders at 28 days. Test remaining cylinder if needed.
 - 1. When temperatures are expected to fall below 45°F within 48 hours after concrete placement, make 2 additional cylinders and cure in the field under conditions similar to concrete they represent. Test 1 cylinder at 7 days and the other at 28 days.
- H. Strength of concrete considered satisfactory if following requirements met.
 - 1. Every average of 3 consecutive strength tests equals or exceeds specified 28-day compressive strength (f_c').
 - 2. No individual strength test falls below specified 28-day compressive strength by more than 500 psi if f_c' is 5000 psi or less, or by more than $0.10f_c'$ if f_c' is greater than 5000 psi.
- I. If analysis of strength tests indicate above requirements are not being met, make immediate adjustments to mix design and make additional tests as required by Engineer to determine strength of concrete in-place in portion of structure represented by deficient cylinders. If tests verify Work in-place is not in conformance with Specifications, Engineer will determine if Work in-place is adequate for intended use. If Work in-place is determined to be inadequate, Contractor shall follow such remedial or replacement measures which Engineer may require. Contractor shall bear costs associated with testing, engineering analysis, remedial work, and replacement required under terms of this paragraph.

END OF SECTION

SECTION 03 62 00
NON-SHRINK GROUTING

PART 1 – GENERAL

1.01 SUMMARY

- A. Cement based grout for setting equipment base plates.

1.02 REFERENCES

- A. ASTM: American Society for Testing and Materials

1.03 SUBMITTALS

- A. Product Data:
 - 1. Manufacturer's literature.
- B. Submit in accordance with Section 01 33 00.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Manufacturers:
 - 1. Five Star Grout by Five Star Products, Inc.
 - 2. SET Grout by BASF.
 - 3. Duragrout by L&M Construction Chemicals, Inc.
 - 4. SikaGrout 212 by Sika Corp.
- B. Grout:
 - 1. Preblended, cement based, nonmetallic, nongas forming, nonshrink and shall not bleed.
 - 2. Comply with ASTM C1107 and CRD C621, Grade B.
 - 3. Moderate fluidity.
 - 4. 5000 pounds per square inch minimum compressive strength.
- C. Water: Potable.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Clean grout contact surfaces of oil, grease, scale, and other foreign matter.
- B. Chip away unsound concrete leaving surface rough but level.
- C. Clean base plates, rails, anchors, bolts, etc. in contact with grout of oil, grease, dirt, and coatings.

3.02 MIXING AND PLACING

- A. Mix and place in accordance with manufacturer's written instructions.

- B. Provide forming materials where necessary to retain grout until hardened.
- C. Work grout from one side. Avoid trapping air under base plate.
- D. Do not load grout until it has reached a minimum of 3000 pounds per square inch compressive strength.

3.03 CURING

- A. Cure as recommended by grout manufacturer.

END OF SECTION

DIVISION 05

METALS

SECTION 05 50 00
METAL FABRICATIONS

PART 1 – GENERAL

1.01 SUMMARY

- A. Provide miscellaneous metal work shown on the Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Section Includes:
 - 1. Concrete anchors.
 - 2. Metal frames.
 - 3. Miscellaneous items.

1.02 DEFINITIONS

- A. Submerged: At or below level 1 foot 6 inches above maximum water level in water holding structures.

1.03 REFERENCES

- A. AISC: American Institute of Steel Construction
- B. AA: Aluminum Association
- C. AWS: American Welding Society
- D. ASTM: American Society for Testing and Materials
- E. AISI: American Iron and Steel Institute

1.04 SUBMITTALS

- A. Shop Drawings:
 - 1. Indicate materials, sizes, connections, anchors, and finishes.
- B. Product Data:
 - 1. Manufacturer's catalog sheets on premanufactured items.
- C. Submit in accordance with Section 01 33 00.

1.05 QUALITY ASSURANCE

- A. Perform shop and/or field welding required in connection with the work of this Section by certified welders in strict accordance with pertinent recommendations of AWS.
- B. Conform to AISC and AA standards.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. In fabricating items which will be exposed to view, limit materials to those which are free from surface blemishes, pitting, and roughness.
- B. Comply with following standards, as pertinent.
 - 1. Structural Steel Shapes:
 - a. W Shapes: ASTM A992, 50 ksi.
 - b. M Shapes: ASTM A36.
 - c. S, C and MC Shapes: ASTM A36.
 - d. L Shapes: ASTM A36.
 - e. HP Shapes: ASTM A572 Grade 50.
 - f. HSS Square and Rectangular Shapes: ASTM A500, Grade B, 46 ksi.
 - g. HSS Round Shapes: ASTM A500, Grade B, 42 ksi.
 - h. Pipe Shapes: ASTM A53, Grade B, 35 ksi.
 - i. Plates and Bars: ASTM A36.
 - 2. Stainless Steel:
 - a. Exterior and submerged uses: AISI, Type 316.
 - b. Interior uses: AISI, Type 304 or Type 316.
 - 3. Aluminum shapes and plates: Alloy 6061-T6 or 6063-T6.
 - 4. Floor Plate: Checkered surface aluminum plate.
 - 5. Connection Bolts:
 - a. For steel members: ASTM F3125 Grade A325.
 - b. For aluminum and galvanized steel members: Stainless steel.
 - 6. Cast-in-place Anchor Bolts:
 - a. 1/2 inch minimum diameter.
 - b. Nonsubmerged: ASTM A307, galvanized.
 - c. Submerged: Stainless steel.
 - 7. Malleable Iron: ASTM A47.
 - 8. Cast Iron: ASTM A48, Class 35B.
 - 9. Ductile Iron: ASTM A536, Grade 65-45-12.
 - 10. Cast Aluminum: ASTM B26.

2.02 CONCRETE ANCHORS

- A. Wedge Anchors:
 - 1. Manufacturers:
 - a. Power-Stud+ SD1, SD2, SD4 or SD6 by Dewalt.
 - b. Kwik Bolt TZ2 by Hilti Corp.
 - c. Ankr-TITE Wedge Anchor by Wej-it Fastening Systems.
 - d. Strong-Bolt 2 by Simpson Strong-Tie Co., Inc.
 - 2. Usage: In concrete.
 - a. 316 stainless steel unless noted otherwise.
 - b. Do not use when submerged or subjected to dynamic loads.

B. Expansion Anchors:

1. Manufacturers:

- a. Power-Bolt+ by Dewalt.
- b. HSL4 by Hilti Corp.

2. Usage: In concrete.

- a. 316 stainless steel unless noted otherwise.
- b. Do not use when submerged, in overhead applications, or subjected to dynamic loads.

C. Drop-In Anchors:

1. Manufacturers:

- a. Steel Dropin by Dewalt.
- b. HDI by Hilti Corp.
- c. Ultra-Drop Drop-In Anchor by Wej-it Fastening Systems.
- d. Drop-In by Simpson Strong-Tie Co., Inc.
- e. Red Head Multi-Set II by ITW Commercial Construction

2. Usage: In concrete.

- a. Zinc plated carbon steel where totally embedded and other protected locations.
- b. Do not use in corrosive or humid areas, tanks, when submerged, in overhead applications, or subjected to dynamic loads.

D. Adhesive Anchors (Concrete):

1. Manufacturers:

- a. HIT-RE 500 V3 or HIT-HY 200 Adhesive Anchor by Hilti Corp.
- b. Pure 110+ or AC200+ by Dewalt.
- c. SET-3G, SET-XP or AT-XP Adhesive System by Simpson Strong-Tie Co., Inc.
- d. A7+, G5+ or C6+ by Red Head.

2. Adhesive with 316 stainless steel stud assembly.

3. Usage:

- a. In concrete, submerged.
- b. Do not use in overhead applications.

E. Adhesive Anchors (Masonry):

1. Manufacturers:

- a. HIT-HY 270 Adhesive Anchor by Hilti Corp.
- b. AC100+ Gold by Dewalt.
- c. SET-XP Adhesive System by Simpson Strong-Tie Co., Inc.
- d. A7+ or C6+ by Red Head.

2. Adhesive with 316 stainless steel stud assembly.

3. Usage:

- a. In masonry.
- b. Grout masonry cores at anchor locations unless noted otherwise or approved by Engineer.
- c. Provide screen tube inserts for hollow masonry units or multi-wythe masonry.
- d. Do not locate anchors in vertical mortar joints.

2.03 FINISHES

- A. Primer: Conform to requirements of Section 09 96 00.
- B. Galvanizing Repair Paint: High zinc-dust content paint complying with MIL-P-21035.

2.04 FABRICATION

- A. Except as otherwise shown on the Drawings or the approved Shop Drawings, use materials of size, thickness, and type required to produce reasonable strength and durability in the work of this Section.
- B. Provide clips, lugs, brackets, straps, plates, bolts, nuts, washers, and similar items, as required for fabrication and erection.
- C. Fabricate with accurate angles and surfaces which are true to the required lines and levels, with projecting corners clipped, grinding exposed welds smooth and flush, forming exposed connections with hairline joints, and using concealed fasteners wherever possible.
- D. Weld shop connections and bolt or weld field connections.
- E. Use AISC standard 2-angle web connections or single plate framing connections capable of supporting min of 50% of total uniform load capacity of member.
- F. Connections shall consist of minimum two 3/4 inch diameter bolts or welds developing minimum of 10,000 pounds capacity.
- G. Prior to shop painting or priming, properly clean metal surfaces as required for the applied finish and for the proposed use of the item. Conform to Section 09 96 00.
 - 1. Do not coat ferrous metal surfaces embedded in concrete.
 - 2. Coating of cast iron or ductile iron floor access hatches and pressure relief valves not required.
 - 3. On surfaces inaccessible after assembly or erection, apply two coats of the specified primer. Change color of second coat to distinguish it from the first.
 - 4. Coat aluminum surfaces in contact with concrete in accordance with AA and Section 09 96 00. Under no circumstances shall aluminum contact dissimilar metal.
- H. Galvanizing:
 - 1. Galvanize after fabrication.
 - 2. Galvanize by hot-dip process conforming to ASTM A123 and AHDGA specifications.

2.05 METAL FRAMES

- A. Provide door, hatch, grille, louver, and other frames fabricated from structural shapes or plates.
- B. Select sections for trueness of web and flange. Straighten members so finished frames are uniform, square, and true throughout length and depth of assembled units.

- C. Miter or cope and join members with continuous welds.
- D. Provide temporary spreader bars to prevent springing frames out of shape prior to and during erection.

2.06 MISCELLANEOUS ITEMS

- A. Fabricate miscellaneous framing, supports, and items of structural shapes, plates, bars, and tubing of sizes and arrangements indicated and as required.

PART 3 – EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. General:

1. Set work accurately into position, plumb, level, true, and free from rack.
2. Tolerance: 1/8 inch in 10 feet.
3. Anchor firmly into position.
4. Where field welding is required, comply with AWS recommended procedures for appearance and quality of weld and for methods to be used in correcting welding work.
5. Grind exposed welds smooth, and touchup shop prime coats.
6. Do not cut, weld, or abrade surfaces which have been hot-dip galvanized after fabrication and which are intended for bolted or screwed field connections.
7. Perform cutting, drilling, and fitting as required for proper installation. Drill field holes for bolts, do not burn holes.
8. Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint the exposed areas with same material used for shop priming.

B. Concrete Anchors:

1. Do not install until concrete or masonry has reached its design strength.
2. Do not install closer than 6 bolt dia to edge of concrete or masonry, or closer than 12 bolt diameter to another anchor unless otherwise shown.
3. Minimum embedment shall be 8 bolt diameter.
4. Install in accordance with manufacturer's recommendations.
5. Existing reinforcing bars in the concrete structure may conflict with specific anchor locations. Unless noted on the drawings that the bars can be cut, the Contractor shall review the existing structural drawings and shall undertake to locate the position of the reinforcing bars at the locations of the concrete anchors by GPR, X-ray, chipping or other approved means.

3.03 ADJUSTING AND CLEANING

- A. Clean exposed surfaces, removing dirt, dust, and other foreign matter.
- B. Prepare surfaces for finished painting as specified in Section 09 96 00.
- C. Field Repair of Damaged Galvanized Coatings:

1. Repair surfaces damaged during shipping, erection, or construction operations.
2. Use zinc rich paint.
3. Prepare surfaces and apply in accordance with ASTM A780, Annex A2.

END OF SECTION

DIVISION 09

FINISHES

SECTION 09 96 00
HIGH-PERFORMANCE COATINGS

PART 1 – GENERAL

1.01 SUMMARY

- A. Coating of surfaces as noted on the Drawings and as specified herein, including:
1. New and existing surfaces as noted on Drawings.
 2. Interior masonry wall surfaces.
 3. Exposed interior and exterior ferrous metal, ductile iron, or cast iron piping, regardless of factory-applied finish.
 4. Exposed interior and exterior structural steel surfaces.
 5. Exterior and interior equipment, pumps, valves, motors, etc. and all appurtenances.
 6. Color-coded equipment and piping above ceilings.
 7. Copper piping and galvanized steel piping and conduit mounted to coated surfaces.
 8. Existing surfaces remodeled or damaged during construction which presently have a finish. Refinish surrounding areas as required so touch-up not visible from 6 feet away.
 9. Existing surfaces exposed by removals where adjacent surface has a finish. Finish areas as required so touch-up not visible from 6 ft away.
- B. Do not coat the following unless specifically noted otherwise:
1. Factory-finished electrical motor control center (MCC), main instrument panels (MIP), flow indicators, and related equipment.
 2. Moving parts of operating units, electrical parts, linkages, sensing devices, and motor shafts.
 3. Buried equipment and piping.
 4. Surfaces above ceilings.
 5. Factory-finished trim.
 6. Stainless steel, chrome plate, copper, bronze, galvanized surfaces, and similar finished materials.
 7. Aluminum ductwork or aluminum faced insulation.
 8. Aluminum louvers and trim.
 9. Concrete tanks.
 10. Plastic and FRP piping, equipment, and ductwork.
- C. Do not coat over any code-required labels such as UL and Factory Mutual, or any equipment identification, performance rating, name, or nomenclature plates.
- D. Equipment manufacturers are responsible for surface preparation and coating of equipment, motors, and appurtenances. Equipment to be coated and coating system is identified in the equipment specification sections.

1.02 DEFINITIONS

- A. Definitions as used in Coating Schedule included herein.
1. Coatings: Paint or heavy duty finishes for use on surfaces subject to interior and exterior exposure, submergence, high moisture, splash, or chemical environment, including primers, sealers, fillers, and intermediate and finished coats.
 2. Submerged P: Surfaces submerged in potable water plus 1 foot-6 inches above high water level.

3. Submerged NP: Surfaces submerged in non-potable liquid plus 1 foot-6 inches above high liquid level.
4. First Coat: Field primer, factory primer, or shop primer. When only one coat is required, first coat is the finished coat.
5. Second, Third, or Intermediate Coats: Successive finished coats applied over first coat.
6. DFT: Dry film thickness (mils/coat).
7. sfpg: Square feet per gallon (per coat).

1.03 SUBMITTALS

A. Product Data:

1. Manufacturer's literature including application recommendations and generic makeup for each coating scheduled.
2. Factory or shop-applied primer manufacturer's literature including application recommendations and generic makeup shall be submitted with all material and equipment submittals. All primers shall conform to the requirements of this Section.

B. Samples:

1. Actual color samples available for each coating scheduled.

C. Miscellaneous:

1. Schedules:

- a. Schedule of proposed coating systems shall contain all information as indicated in Coating Schedule included herein.

D. Submit in accordance with Section 01 33 00.

1.04 QUALITY ASSURANCE

A. Regulatory Requirements:

1. All coatings shall conform to OSHA requirements for allowable exposure to lead and other hazardous substances.
2. All coatings in contact with potable water or within potable water reservoirs shall be NSF 61 approved.

B. Applicator Qualifications:

1. Engage an experienced applicator who has successfully completed coating system applications similar in material and extent to those indicated.

C. Single-Source Responsibility:

1. Provide coating material produced by same manufacturer for each system.

1.05 DELIVERY, STORAGE, AND HANDLING

- #### A. Materials shall be delivered to site in original containers with labels intact and seals unbroken.

- B. Protect and heat or cool material storage location to maintain temperature ranges recommended by coating manufacturers, but not less than 55°F.
- C. Avoid danger of fire. Oily rags and waste must be removed from buildings each night or kept in appropriate metal containers. Provide fire extinguishers of type recommended by coating manufacturer's in areas of storage and where finishing is occurring. Allow no smoking or open containers of solvent.
- D. Empty containers shall have labels canceled and clearly marked as to use.

1.06 PROJECT / SITE CONDITIONS

A. Environmental Requirements:

- 1. Dry-heat and ventilate areas to obtain conditions recommended by coating manufacturer.
- 2. Relative humidity conditions as specified by coating manufacturer shall be adhered to.
- 3. No unprotected, unheated exterior coating shall be undertaken when cold, damp, foggy, or rainy weather appears probable, nor when the temperature of the substrate is below 55°F, unless approved in writing by coating manufacturer.
- 4. Maintain manufacturer's environmental requirements until coating is fully cured.
- 5. Apply no coating in areas where dust is being generated.
- 6. Testing and disposal of any waste and coating shall be the responsibility of the Contractor.

B. Protection:

- 1. Drop cloths shall be provided in all areas where coating is done to fully protect other surfaces.
- 2. Remove hardware, accessories, plates, lighting fixtures, and similar items or provide protection by masking. Upon completion, replace items or remove protection and clean.
- C. It is the intent of this Section that all ferrous metal items scheduled for coating be shop-primed. If items are not shop-primed, surfaces shall be prepared and coated in the field as specified.
- D. Upon Substantial Completion, remaining unused material will become property of Owner. Seal material as required for storage, mark contents with color, type, location, and shelf life, and store on Site where required by Owner. Provide minimum of two gallons of each system component and color used.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Tnemec
- B. Sherwin-Williams

2.02 MATERIALS

- A. Coatings shall meet surface burning characteristics as required by code and established by ASTM E84.
- B. Coating products listed in the Coating Schedule, are set as a standard of quality. Coatings of substitute manufacturers shall meet or exceed the characteristics of the products listed as established by the following ASTM standards; B117, C307, C413, C579, C580, C868, D870,

D1014, D1653, D2047, D2240, D2370, D2794, D3363, D4060, D4141, D4541, D4585, D4587, and G85.

- C. If the Contractor wishes to offer a substitute to the products specified, the request for a substitute shall conform to the requirements of Section 01 61 00.
- D. The Contractor and top coat coating manufacturer shall verify the compatibility of their products with the various primers used on shop primed materials and equipment.

2.03 COLORS

- A. Color shall be formed of pigments free of lead, lead compounds, or other materials which might be affected by presence of hydrogen sulfide or other gases likely to be present at Site.
- B. Colors shall be as selected by Owner.
- C. Coat access doors of electrical distribution panels and grilles to match color of adjacent wall or ceiling surfaces.
- D. In areas scheduled for finishing, coat exposed piping, conduit, and ducts to match color of adjacent or near surfaces, except for color-coding.
- E. In areas where existing surfaces are finished, coat new exposed piping, conduit, and ducts to match color of adjacent or near surfaces, except for color-coding.
- F. Equipment Colors:
 - 1. Equipment includes pumps, blowers, valves, flow meters, etc, and associated motors, structural supports, hangers, and attached portions of electrical conduit, and other associated components.
 - 2. Color of non-submerged equipment, including equipment with a manufacturer-applied finish coat, shall be same color as piping equipment serves.

2.04 THINNING, MIXING, AND TINTING

- A. Where thinning is necessary, only the products of the manufacturer furnishing the coating will be allowed. All such thinning shall be done in strict accordance with coating manufacturer's recommendations.
- B. Mix in accordance with manufacturer's recommendations.
- C. Each coat shall be slightly darker than preceding coat, unless otherwise noted. Tint undercoats similar to finish coat.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which Work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work.
- B. Materials removed and replaced to correct defects due to Work placed on unsuitable surfaces shall be at Contractor's expense.

3.02 SURFACE PREPARATION

A. General:

1. All surfaces to be coated shall be prepared as specified herein and in accordance with coating manufacturer's recommendations. The object shall be to obtain a uniform, clean, and dry surface.
2. Quality of surface preparation described herein is considered a minimum. If coating manufacturer requires a higher degree of preparation, comply with coating manufacturer's recommendations.
3. Where surface dryness is questioned, test with dampness indicating instrument. Do not apply coatings over surfaces where moisture content exceeds that permitted by coating manufacturer.
4. Shop primed surfaces shall be scarified before applying top coats. Conform to top coat manufacturers recommendations.
5. If recoat time between application of primer and second coat or between top coats is exceeded, scarify surface before applying coatings. Conform to top coat manufacturers recommendations.
6. Workmanship for surface preparation shall conform to the following SSPC specifications:
 - a. Solvent Clean: SP-1.
 - b. Hand Tool Cleaning: SP-2.
 - c. Power Tool Cleaning: SP-3.
 - d. White Metal Blast Cleaning: SP-5.
 - e. Commercial Blast Cleaning: SP-6.
 - f. Brush-Off Blast Cleaning: SP-7.
 - g. Pickling: SP-8.
 - h. Near-White Blast Cleaning: SP-10.
 - i. Power Tool Cleaning to Bare Metal: SP-11.
 - j. Surface Preparation by Water Jetting: SP-12.

B. Ferrous Metal:

1. Ferrous metal primed in the shop shall have all rust, dust, scale, and other foreign substances removed by abrasive cleaning conforming to SSPC SP-10. Cleaned metal shall be primed or pretreated immediately after cleaning to prevent new rusting.
2. Ferrous metal not primed in the shop shall be abrasive blast cleaned in the field prior to application of primer, pretreatment, or coating. Blast cleaning shall conform to SSPC SP-10 for submerged service. Blast cleaning shall conform to SSPC SP-6 for non-submerged service.
3. Prior to finish coating, primed areas that are damaged shall be cleaned and spot primed.

C. Galvanized Metal:

1. Where galvanized metal items are not submerged or buried, they shall be abrasive sweep blast cleaned and then solvent cleaned in accordance with SSPC SP-1.

D. Copper:

1. Where copper piping is not submerged or buried, it shall be lightly sanded and then solvent cleaned in accordance with SSPC SP-1.

E. Existing Surfaces:

1. Remove and replace or mask attachments if attachments are not to be coated.
2. Remove surface contamination such as oil, grease, loose or defective coatings, mill scale, dirt, rust, mold, mildew, mortar, efflorescence, and sealers to assure sound

bonding to tightly adhered old coatings. Glossy surfaces of old coatings shall be cleaned and dulled before overcoating.

3. Sand surfaces and feather edges where chips have occurred.
4. Cut out and fill cracks or other defects to match adjacent surface.
5. Exact nature of existing coatings is not known. Check compatibility of new coating by application to small area prior to starting coating. If lifting or other problems occur, notify Engineer for direction.
6. Comply with new coating manufacturer's recommendations for preparation of previously coated surfaces.
7. Prepare surfaces subject to submerged service as specified for new surfaces.

3.03 APPLICATION

- A. Surfaces shall be dry at time of application.
- B. The minimum surface temperature shall be 55°F and rising.
- C. Apply in strict accordance with manufacturer's recommendations by brush, roller, spray, or other application method. The number of coats and thickness required is the same regardless of application method.
- D. Each coat shall be allowed to dry in accordance with manufacturer's requirements. Drying time shall be construed to mean "under normal conditions". Where conditions other than normal exist, because of weather or because of confined space, longer times will be necessary. Units shall not be put in service until coatings are thoroughly dry and cured.
- E. Surfaces to be coated that will be inaccessible in the completed work shall receive the final coat before enclosure.
- F. Coatings shall be applied to provide an opaque, smooth surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, or other surface imperfections will not be acceptable. Areas cut-in by brush prior to rolling shall have uniform appearance in comparison with adjoining surfaces.
- G. Make edges of coating adjoining other materials or colors sharp and clean without overlapping.
- H. Crevices and other hard-to-apply areas shall be back-rolled/back-brushed in conjunction with application of field applied prime coat or intermediate coat. This includes, but is not limited to: between pipe flanges, pipe flange/barrel joints, equipment fittings, and other narrow openings.
- I. Finish edges of doors as specified for faces. Apply first finish coat on edges before fitting. After doors fitted and hung apply second finish coat.
- J. Manufacturer-Applied Coatings:
 1. Repair abraded areas on factory-finished items in accordance with equipment manufacturer's recommendations.
 2. Blend repaired areas into original finish.

3.04 FIELD QUALITY CONTROL

- A. Examination of Work on Site by coating manufacturer's representative shall be preformed when requested by Engineer.

B. Sampling of Materials:

1. Engineer reserves the right to select unopened containers of materials furnished for the Project and have the materials tested at an independent laboratory. Owner will pay for first tests.
2. Retests of rejected materials and tests of replacement materials shall be paid for by Contractor.
3. Remainder of contents of containers not required for testing will be returned to Contractor.

C. Coverage:

1. Before beginning Work, finish one complete room, space, surface, and item of each color scheme required, showing selected colors, finished texture, material, and workmanship. After approval, sample room, space, surface, and item shall serve as standard for similar Work.
2. If coverage is not acceptable to Engineer, Engineer reserves the right to require additional application of coating at no extra cost to Owner.

- D. Work at Site, where coat of material is to be applied, shall be observed by Engineer after surface has been prepared and before application of specified prime coat and each succeeding coat, otherwise no credit for applied coat will be given and Contractor automatically assumes responsibility to recoat Work in question. Surfaces coated without such observation shall be abrasive blast cleaned, repprepared, and recoated at no addition cost to Owner. Notify Engineer when surface preparation complete, coat applied, and when ready for inspection to comply with above.

3.05 FINAL TOUCH-UP AND CLEANING

- A. Prior to Substantial completion, examine coated surfaces and retouch or refinish surfaces to leave in condition acceptable to Engineer.
- B. Remove masking, coatings, and other material from floors, glass, and other surfaces not scheduled to be coated.

3.06 COATING SCHEDULE

- A. Scheduled thickness or coverage rate is minimum as recommended by manufacturer. Manufacturer's recommendations shall be followed, but in no case shall the thickness or coverage rate be less than scheduled.
- B. Coatings shall conform to the following schedule and coating manufacturer's recommendations. Examples of surfaces to be coated may not be all inclusive.

COATINGS SCHEDULE

System No.	Generic Type	Application	Tnemec	Sherwin-Williams
10	Polyamide Epoxy – Polyamidoamine Epoxy	Doors, Frames, Motors and other Equipment with Non-Epoxy Primer / Interior / Satin	Lightly Hand Sand Solvent Clean SP-1 First Coat – Series 27-1255 FC Typoxy Beige @ 3 mils DFT Second Coat – Series N69 Hi-Build Epoxoline II @ 5 mils DFT	Lightly Hand Sand Solvent Clean SP-1 First Coat – Recoatable Epoxy Primer Tan @ 3 mils DFT Second Coat – Macropoxy 646 @ 5 mils DFT
11	Polyamide Epoxy – Aliphatic Acrylic Polyurethane	Doors, Frames, Motors and other Equipment with Non-Epoxy Primer / Exterior / Gloss	Lightly Hand Sand Solvent Clean SP-1 First Coat – Series 27-1255 FC Typoxy Beige @ 3 mils DFT Second Coat – Series 1094 Endura-Shield @ 3 mils DFT	Lightly Hand Sand Solvent Clean SP-1 First Coat – Recoatable Epoxy Primer Tan @ 3 mils DFT Second Coat – Hi-Solids Polyurethane Gloss @ 3 mils DFT
12	Polyamidoamine Epoxy	Galvanized Metal, Copper, PVC / Non-Submerged / Interior / Satin	First Coat – Series N69-1255 Hi-Build Epoxoline II Beige @ 2 mils DFT, touch-up primer prior to second coat Second Coat – Series N69 Hi-Build Epoxoline II @ 3 mils DFT Third Coat – Series N69 Hi-Build Epoxoline II @ 3 mils DFT	First Coat – Macropoxy 646 – SW4004 @ 2 mils DFT, touch-up primer prior to second coat Second Coat – Macropoxy 646 @ 3 mils DFT Third Coat – Macropoxy 646 @ 3 mils DFT
13	Polyamidoamine Epoxy – Aliphatic Acrylic Polyurethane	Galvanized Metal, Copper, PVC / Non-Submerged / Exterior / Gloss	First Coat – Series N69-1255 Hi-Build Epoxoline II Beige @ 2 mils DFT, touch-up primer prior to second coat Second Coat – Series N69 Hi-Build Epoxoline II @ 3 mils DFT Third Coat – Series 1094 Endura-Shield @ 3 mils DFT	First Coat – Macropoxy 646 SW4004 @ 2 mils DFT, touch-up primer prior to second coat Second Coat – Macropoxy 646 @ 3 mils DFT Third Coat – Hi-Solids Polyurethane Gloss @ 3 mils DFT
20	Polyamide Epoxy Coal Tar	Dissimilar Metal Protection / Semi-Gloss	Scarify the Surface, SP-1 First Coat – Series 46H-413 Hi-Build Tneme-Tar @ 20 mils DFT	Scarify the Surface, SP-1 First Coat – HiMil Sher-Tar @ 20 mils DFT

END OF SECTION

DIVISION 26
ELECTRICAL

SECTION 26 01 26
TESTING ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.01 SUMMARY

A. Description of Work:

1. Prior to energizing equipment, retain services of recognized independent testing laboratory for purpose of performing inspections and tests as herein specified.
2. Ensure electrical equipment supplied by Contractor and Owner is operational within industry and manufacturer's tolerances and installed in accordance with Specifications.
3. Device Ratings and Settings: Verify ratings and settings of overload relays, motor circuit protectors, and overcurrent devices. Make final adjustments of devices in accordance with Section 26 05 73 prior to testing.

B. SUBMITTALS

1. Test Reports:
 - a. 7 copies of complete testing report utilizing InterNational Electrical Testing Association (NETA) printed forms.
 - b. Submit report no later than 30 days after testing complete.
2. Submit proof of testing agency qualification.

C. QUALITY ASSURANCE

1. Regulatory Requirements:
 - a. National Fire Protection Association (NFPA):
 - b. National Electrical Code (NEC) (NFPA No. 70) and amendments thereto.
 - c. Underwriters Laboratories, Inc. (UL).
2. Inspections and tests shall utilize following.
 - a. Project Specifications.
 - b. Project Drawings.
 - c. Manufacturer's instruction manuals applicable to each particular apparatus.
3. Testing Agency:
 - a. Meet federal, state, and local safety requirements for accreditation of testing laboratories, CFR Title 29, Part 1907, "Accreditation of Testing Laboratories." Membership in NETA constitutes proof of meeting such criteria.
 - b. Meet Federal Department of Commerce requirements for nationally independent testing laboratory certification.
4. Permanently record checks and tests and make available to Engineer.

D. PROJECT/SITE CONDITIONS

1. Contractor's Responsibilities:

- a. Supply source of test power to test laboratory at each test site.
 - b. Notify testing laboratory when equipment becomes available for acceptance tests.
 - c. Coordinate Work to minimize Project delay.
 - d. Supply complete set of electrical drawings, specifications, and pertinent change orders to testing laboratory prior to commencement of testing.
- 2. Testing Laboratory Responsibilities:
 - a. Notify Engineer prior to commencement of testing.
 - b. Provide material, equipment, labor, and technical supervision to perform such tests and inspections.
- 3. Recommendations for acceptance or rejection shall be given upon consultation of Engineer, Owner, Contractor, and testing laboratory's representative.

PART 2 – PRODUCTS

(Not Used)

PART 3 – EXECUTION

3.01 GENERAL

- A. Test Work and equipment installed to ensure proper and safe operation in accordance with intent of Drawings and Specifications.
 - 1. Check interlocking and automatic control sequences and test operation of safety and protective devices.
- B. Correct defects found by Work of this section.
 - 1. Cooperate with Power Company, supplier, and manufacturer representatives in order to achieve proper and intended operation of equipment.
 - 2. Test, adjust, and record operating voltages at each system level before energizing branch circuits.
- C. Transformer taps shall be adjusted to obtain as near as possible nominal system voltage.
 - 1. Where transformer is under utility jurisdiction, obtain services of utility to correct voltage.
- D. Replace devices and equipment damaged due to failure to comply with this requirement.
- E. Balance load among feeder conductors at each panelboard, switchboard or substation and reconnect loads as necessary to obtain reasonable load balance on each phase. Electrical unbalance shall not exceed 20%.

3.02 SWITCHGEAR, SWITCHBOARD, AND MOTOR CONTROL CENTER ASSEMBLIES

- A. Visual and Mechanical Inspections:
 - 1. Inspect for physical damage.
 - 2. Verify equipment supplied and connected in accordance with Specifications.
 - 3. Inspect for proper alignment, anchorage, and grounding.

4. Check tightness of accessible bolted bus joints by calibrated torque wrench method. Refer to manufacturer's instructions for proper foot-pound levels.
5. Key interlock system shall be physically tested to ensure proper function.
6. Doors, panels, and sections shall be inspected for paint, scratches, and fit.
7. Mechanical operation of relays, switches, and other devices.

B. Electrical Tests:

1. Insulation Resistance Test: Measure insulation resistance of each bus section phase-to-phase and phase-to-ground for 1 minute. Test voltage and minimum acceptable values in accordance with Paragraph 3.02.C.2.
2. Test Values:
 - a. Bolt torque levels shall be in accordance with manufacturer's instructions.
 - b. Insulation resistance test shall be performed in accordance with following.

Insulation Resistance Test Voltage	
Voltage Rating	Test Voltage
150 – 600 volts	1,000 volts
601 – 5,000 volts	2,500 volts
5,001 volts and above	5,000 volts

- c. Values of insulation resistance less than rated kilovolts +1 in megohms shall be investigated and corrected.

3.03 MOTOR CONTROLLERS

A. Visual and Mechanical Inspection:

1. Visual and Mechanical Inspection: Include following inspections and related work.
 - a. Motor Control Device Ratings and Settings: Verify ratings and settings as installed are appropriate for final loads and final system arrangement and parameters. Recommend final protective device ratings and settings where differences found. Use accepted revised ratings or settings to make final system adjustments.
 - b. Inspect for defects and physical damage and nameplate compliance with Drawings.
 - c. Exercise and perform operational tests of mechanical components and other operable devices in accordance with manufacturer's written instructions.
 - d. Check tightness of electrical connections of devices with calibrated torque wrench. Use manufacturer's recommended torque values.
 - e. Clean devices using manufacturer's approved methods and materials.
 - f. Verify proper fuse types and ratings in fusible devices.

B. Electrical Tests:

1. Perform following in accordance with manufacturer's written instructions.

- a. Insulation resistance test of motor control devices conducting parts to extent permitted by manufacturer's written instructions. Insulation resistance less than 100 megohms not acceptable.
 - b. Use primary current injection to check performance characteristics of motor circuit protectors and for overload relays of controllers for motors 15 horsepower and larger. Trip characteristics not within manufacturer's published time-current tolerances not acceptable.
 - c. Make adjustments for final settings of adjustable trip devices.
 - d. Test auxiliary protective features such as loss of phase, phase unbalance, and undervoltage to verify operation.
 - e. Check for improper voltages at terminals in controllers having external control wiring when controller disconnect opened. Voltage over 30 volts is unacceptable.
2. Correct deficiencies and retest motor control devices. Verify by system tests that specified requirements are met.

3.04 GROUNDING SYSTEM

A. Testing:

1. Subject completed grounding system to megger test at each location where maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at ground test wells.
2. Measure ground resistance not less than 2 full days after last trace of precipitation, and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
3. Perform tests by 2 point method according to Section 9.03 of IEEE 81.

B. Maximum grounding to resistance values are as follows:

1. Equipment Rated 500 KilovoltAmps (KVA) and Less: 10 ohms.
2. Equipment Rated 500 to 1000 KVA: 5 ohms.
3. Equipment Rated More than 1000 KVA: 3 ohms.
4. Unfenced Substations and Pad-Mounted Equipment: 5 ohms.
5. Manhole Grounds: 10 ohms.

C. Excessive Ground Resistance: Where resistance to ground exceeds specified values, notify Engineer promptly and include recommendations to reduce ground resistance and to accomplish recommended work.

D. Report: Prepare certified test reports, of ground resistance at each test location. Include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

3.05 GROUND FAULT SYSTEMS

A. Visual and Mechanical Inspection:

1. Inspect for physical damage and compliance with Drawings and Specifications.
2. Inspect neutral main bonding connection to ensure following.
 - a. Zero sequence system grounded upstream of sensor.
 - b. Ground strap systems grounded through sensing device.

- c. Ground connection made ahead of neutral disconnect link.
 - 3. Inspect control power transformer to ensure adequate capacity for system.
 - 4. Manual operate monitor panels (if present) for following:
 - a. Trip test.
 - b. No trip test.
 - c. Non-automatic reset.
 - 5. Record proper operation and test sequence.
 - 6. Inspect zero sequence systems for symmetrical alignment of core balance transformers about current carrying conductors.
 - 7. Verify ground fault device circuit nameplate identification by actuation observation.
 - 8. Pickup and time delay settings shall be set in accordance with settings developed through coordination study and as approved by Engineer.
- B. Electrical Tests:
- 1. Test in accordance with manufacturer's instructions.
 - 2. Measure system neutral insulation resistance to ensure no shunt ground paths exist, neutral-ground disconnect link removed, neutral insulation resistance measured, and link replaced.
 - 3. Relay pickup current shall be determined by primary injection at sensor and circuit interrupting device operated.
 - 4. Relay timing shall be tested by injecting 150% and 300% of pickup current into sensor. Total trip time shall be electrically monitored.
 - 5. System operation shall be tested at 55% rated voltage.
 - 6. Zone interlock system shall be tested by simultaneous sensor current injective and monitoring blocking function.
- C. Test Parameters:
- 1. System neutral insulation shall be minimum of 100 ohms, preferably 1 megohm or larger.
 - 2. Relay pickup current shall be within 10% of device dial or fixed setting, and in no case greater than 1,200 amps.
 - 3. Relay timing shall be in accordance with manufacturer's published time-current characteristic curves, but in no case longer than 1 second.

END OF SECTION

SECTION 26 05 19
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Building wires and cables and associated splices, connectors, and terminations for wiring systems rated 600 volts and less.

1.02 DEFINITIONS

A. Underfloor Conduits.

1. Conduits run underground within perimeter of building walls under building floor. This may consist of 1 conduit, or several conduits grouped together.

B. Duct Bank Conduits

1. Conduits run underground outside perimeter of building walls. This may consist of 1 conduit, or several conduits grouped together.

C. Underground Conduits

1. Underground conduits are both underfloor conduits and duct bank conduits.

1.03 QUALITY ASSURANCE

A. Items provided under this Section shall be listed or labeled by Underwriters Laboratories, Inc. (UL) or other Nationally Recognized Testing Laboratory (NRTL).

1. Term "NRTL" shall be as defined in Occupational Safety and Health Administration (OSHA) Regulation 1910.7.
2. Terms "listed" and "labeled" shall be as defined in National Electrical Code, Article 100.

B. Regulatory Requirements:

1. National Electrical Code (NEC): Components and installation shall comply with National Fire Protection Association (NFPA) 70.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver wire and cable according to National Electrical Manufacturers Association (NEMA) WC 26.

PART 2 – PRODUCTS

2.01 BUILDING WIRES AND CABLES

A. UL-listed building wires and cables with conductor material, insulation type, cable construction, and rating as required to meet application and NEC requirements.

B. Wire and cable for 600 volts and below: Soft drawn, copper wire with 600 volt insulation.

1. Conductors:
 - a. Annealed, copper in accordance with American Society for Testing and Materials (ASTM) B33.
 - b. Stranding: Class B in accordance with ASTM B8.
 2. Insulations and Coverings:
 - a. Rubber: Conform to NEMA WC 3.
 - b. Thermoplastic: Conform to NEMA WC 5.
 - c. Cross-Linked Polyethylene: Conform to NEMA WC 7.
 - d. Ethylene Propylene Rubber: Conform to NEMA WC 8.
- C. Feeders, service conductors, motor feeders, and: Single conductor Type XHHW-2.
- D. Branch Circuits:
1. Single Conductor Type THHN/THWN (90 degrees Celsius): Above ground and underfloor conduits.
 2. Single Conductor Type XHHW-2: Duct bank conduit.
 3. No. 12 American Wire Gauge (AWG) minimum size (unless otherwise noted) for branch circuit wiring, including motor circuits.
 4. Size 120 volt branch circuits for length of run on following basis.
 - a. 0 to 50 feet Run From Panelboard to first outlet: No. 12 AWG minimum.
 - b. 51 to 100 feet Run: Increase one wire size, i.e., No. 12 AWG becomes No. 10 AWG.
 - c. 101 to 150 feet Run: Increase two wire sizes, i.e., No. 12 AWG becomes No. 8 AWG.
 - d. 151 feet and above: Wiring sized for 3% maximum voltage drop.
 5. For other branch circuits, voltage drop for branch circuits and feeder circuit combined shall not exceed requirements of the NEC 215.
- E. Control Circuits:
1. Single conductor Type THHN/THWN (90 degrees Celsius): Above ground and underfloor conduits.
 2. No. 14 AWG minimum size (unless otherwise noted).
 3. Multi-wire cable assembly: Duct bank conduits.
- F. Non-shielded Instrumentation, Graphic Indication, and Other Control Wiring Operating at Less Than 120 volt: No. 14 AWG except as otherwise indicated with same insulation as control circuits.
1. Single conductor Type THHW/THWN (90 degrees Celsius), above ground and underfloor conduits.
 2. Multi-wire cable assembly: Duct bank conduits.
- G. Shielded instrumentation wiring, above ground and underfloor conduits:
1. Polyvinyl Chloride (PVC) insulation, tinned copper (19 by 29) stranded, No. 16 AWG, twisted pair or triplet cabled with aluminum mylar shielding, stranded, tinned, No. 18 AWG copper drain wire, and overall black FR-PVC, 90 degrees C, 600 volt jacket.
 2. Multi-wire cable assembly: duct bank conduits.

2.02 CONNECTORS AND SPLICES

- A. UL-listed factory-fabricated wiring connectors of size, ampacity rating, material, and type and class for application and for service indicated.
- B. Select to comply with Project's installation requirements and as required to meet application.
- C. Conductors No. 10 AWG and Smaller: 3M Electric Products, Skotchlok, or equal pre insulated spring connector. Comply with manufacturer's packaging requirements for number, size, and combination of conductors.
- D. Conductors No. 8 AWG and Larger: Bronze 2-bolt type connectors with spacer.

2.03 TERMINATIONS

- A. Power Conductors: Compression crimp type lugs.
- B. Control and Instrumentation Conductors: Compression crimp type fork tongue, insulated support type lugs on terminal strips. Do not splice.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Install wires and cables as indicated, according to manufacturer's written instructions and National Electrical Contractors Association (NECA) "Standard of Installation".
- B. Remove existing wire from raceway before pulling in new wire and cable.
- C. Run wire and cable in conduit unless otherwise indicated on Drawings. Pull conductors into raceway simultaneously where more than 1 is being installed in same raceway.
 - 1. Use pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation.
 - 2. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage cables or raceway.
 - 3. Do not draw conductor into conduits until building is enclosed, watertight, and work causing cable damage has been completed.
- D. Install cable supports for vertical feeders in accordance with NEC. Provide split wedge type which firmly clamps each individual cable and tightens due to cable weight.
- E. For panelboards, cabinets, wireways, switches, and equipment assemblies, neatly form, train, and tie cables in individual circuits.
- F. Seal cable and wire entering building from underground between wire and conduit, where cable exits conduit, with non-hardening approved compound.
- G. Install wire and cables in separate raceway systems as follows:
 - 1. ac Control.
 - 2. dc control.
 - 3. Shielded instrumentation.
 - 4. Network Cables.
 - 5. Emergency system.
 - 6. As required by NEC.

- H. Where control or instrumentation cables are run in underground conduit and ducts provide multi-wire cable assemblies.
- I. Where power cables and instrument/signal cables enter and pass through same or distribution box, steel barrier or separate raceways shall continue through box to avoid magnetic interaction between power cables and instrumentation conductors.
- J. Do not run instrumentation cables into control cabinets or Motor Control Center (MCC) unless cables are terminated in cabinet or MCC.
- K. Wiring at Outlets: Install with at least 12 inch (300 millimeter) of slack conductor at each outlet.
- L. Connect outlets and components to wiring and to ground as indicated and instructed by manufacturer. Tighten connectors and terminals, including screws and bolts, according to equipment manufacturer's published torque-tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals according to tightening torques specified in UL 486A.
- M. Drawings do not designate number of conductors in conduit nor does location of branch circuits and switch legs indicated on Drawings designate location or routing. Route branch circuits and switch legs as dictated by construction and these Specifications.

3.02 TERMINATIONS AND SPLICES

- A. Terminate control, instrumentation, and communication cables on terminal strips in separate terminal cabinets or as shown on Drawings.
- B. Power Cable Splices (no splices in cables unless approved by Engineer):
 - 1. Provide continuous lengths of cable without splices in motor circuits and feeders unless otherwise noted. Splices may be installed in motor circuits and feeders with prior approval by Engineer.
 - 2. Install splices and taps that possess equivalent or better mechanical strength and insulation ratings than conductors being spliced.
 - 3. Use splice and tap connectors that are compatible with conductor material.
 - 4. Where pre-insulated spring connectors are used for equipment connections, tape connector to wire to prevent loosening under vibration.
 - 5. Each tap, joint or splice in conductors No. 8 AWG and larger shall be taped with two half-lap layers of vinyl plastic electrical tape and finish wrap of color coding tape where required by code.
 - 6. Cable splices shall be made only in manholes, handholes, wireways, distribution boxes, and junction boxes.
- C. Power Cable Terminations:
 - 1. Termination of wires with full compression type lugs installed with appropriate hand or hydraulic tool. Use proper dies to achieve the desired compression.
 - 2. For screw type terminal blocks, terminations for stranded conductors shall be made with T & B lock-on fork connector with insulated sleeves.
 - 3. Motor lead conductor terminations shall be made with a T & B or approved equal, full compression lug, full ring type, bolted, and taped as required. For connecting motor lead to service wiring fasten full ring lugs together with cadmium plated steel cap screws, and cover with a minimum of 2 layers 1/2 lap, 3M Scotch No. 33 tape; option: T & B "Motor Stub Splice Insulator".

3.03 CONTROL CIRCUITS

- A. Control circuit home runs from same area for the same system returning to same panel, (e.g., Local Controls Panel (LCP), Control Station (CS), etc.) may be combined provided signal and voltage types are not mixed.
- B. Following types of home runs shall not be combined with other types:
 - 1. 4-20 milliamp direct current analog; Type 2 shielded cable.
 - 2. 24 volts direct current discrete (e.g., field or LCP powered dry contacts).

3.04 BRANCH CIRCUITS

- A. Motor branch circuits and branch circuits for 3 phase circuits shall not be combined.
- B. Branch circuits for single phase equipment devices from same Lighting Panel (LP) or Power Panel (PP) may be combined provided that such combining does not result in having to derate ampacity of conductors.

3.05 FEEDERS:

- A. Extend feeders at full capacity from origin to termination.
- B. Each conduit raceway shall contain only those conductors constituting single feeder circuit.
- C. Where multiple raceways are used for single feeder, each raceway shall contain conductor of each phase and neutral if used.
- D. Where feeder conductors run in parallel, conductors shall be of same length, material, circular-mil area, insulation type, and terminated in same manner.
- E. Where parallel feeder conductors run in separate raceways, raceways shall have same physical characteristics.
- F. Confine feeders to insulated portions of building unless otherwise shown.
- G. On network systems, neutral shall be run with phase wires. Unbalanced neutral current shall not exceed normal or derated conductor capacity.

3.06 MOTORS AND EQUIPMENT WIRING

- A. Provide motor circuits in accordance with diagrams and schedules on Drawings and code requirements, from source of supply to associated motor starter and starter to motor terminal box, including necessary and required intermediate connections.
- B. Do not include associated control conductors in same conduit with power conductors.
- C. Provide branch circuits to conform with NEC requirements and nameplate ratings. CONTRACTOR responsible for verification of ratings of motors and installing proper branch circuits.

3.07 COLOR CODING

- A. Conductors for Lighting and Power Wiring:

Phase	208/120 volts	480/277 volts
A	Black	Brown
B	Red	Orange
C	Blue	Yellow
Travelers	Pink	Purple
Neutral	White	White with non-green stripe
Ground	Green	Green

B. Colored pressure-sensitive plastic tape.

1. Apply in half overlapping turns for minimum of three inches at terminal points, and in junction boxes, pull boxes, troughs, manholes, and handholes.
2. 3/4 inch wide with colors as specified.
3. Apply last two laps of tape with no tension to prevent possible unwinding.
4. Where cable markings are covered by tape, apply tags to cable stating size and insulation type.

C. For modifications and additions to existing wiring systems, color coding shall conform to existing wiring system.

D. Color code for insulated power system wiring shall be in accordance with NEC.

E. Color code for intrinsically safe systems shall be light blue.

3.08 CONTROL, COMMUNICATION AND SIGNAL SYSTEM IDENTIFICATION

A. Install permanent wire marker at termination.

B. Identifying numbers and letters on wire markers shall correspond to those on terminal blocks or wiring diagrams used for installing systems.

C. Plastic sleeve or self adhesive vinyl cloth.

D. Comply with Section 26 05 53.

3.09 FEEDER IDENTIFICATION

A. Manholes, handholes, pullboxes, and junction boxes, install metal tags on circuit cables and wires to clearly designate circuit identification and voltage.

B. Provide tags of embossed brass type, in manholes and handholes showing cable type and voltage rating. Attach tags to cables with slip-free plastic cable lacing units.

C. Comply with Section 26 05 53.

3.10 FIELD QUALITY CONTROL

A. Visual and Mechanical Inspection:

1. Inspect cables for physical damage and proper connection in accordance with single-line diagram.

2. Test cable mechanical connections to manufacturer's recommended values using calibrated torque wrench.
3. Check cable color coding with specifications and NEC standards.

B. Electrical Tests:

1. Perform insulation-resistance test on each conductor with respect to ground and adjacent conductors. Applied potential shall be 1000 volts direct current for 1 minute.
2. Perform continuity test to insure proper cable connection.

C. Test Values:

1. Evaluation results by comparison with cables of same length and type. Investigate any value less than 50 megohms.

END OF SECTION

PART 1– GENERAL

1.01 SUMMARY

A. Section Includes:

1. Grounding of electrical systems and equipment and basic requirements for grounding for protection of life, equipment, circuits, and systems.
2. Grounding requirements specified in this Section may be supplemented in other Sections of these Specifications.

1.02 SUBMITTALS

A. Report of Field Tests and Observations: Certified by Contractor.

B. Test Results:

1. Certified field tests and observation reports indicating and interpreting test reports for compliance with performance requirements.

C. Submit in accordance with Section 01 33 00.

1.03 QUALITY ASSURANCE

A. Comply with Underwriters Laboratories, Inc (UL) 467.

B. Items provided under this section shall be listed or labeled by UL or other Nationally Recognized Testing Laboratory (NRTL).

1. Term "NRTL" shall be as defined in Occupational Safety and Health Administration (OSHA) Regulation 1910.7.
2. Terms "listed" and "labeled" shall be as defined in National Electrical Code (NEC), Article 100.

C. Regulatory Requirements:

1. NEC: Components and installation shall comply with National Fire Protection Association (NFPA) 70.

PART 2– PRODUCTS

2.01 GROUNDING AND BONDING PRODUCTS

A. Governing Requirements: Where types, sizes, ratings, and quantities indicated are in excess of NEC requirements, more stringent requirements and greater size, rating, and quantity indications govern.

2.02 WIRE AND CABLE GROUNDING CONDUCTORS

- A. Conform to NEC Table 8, except as otherwise indicated, for conductor properties, including stranding.
 - 1. Material: Copper.
- B. Equipment Grounding Conductors: Insulated with green color insulation.
- C. Grounding-Electrode Conductors: Stranded cable.
- D. Underground Conductors: Bare, tinned, stranded, except as otherwise indicated.
- E. Bare Copper Conductors:
 - 1. Solid Conductors: American Society for Testing and Materials (ASTM) B3.
 - 2. Assembly of Stranded Conductors: ASTM B8.
 - 3. Tinned Conductors: ASTM B33.

2.03 MISCELLANEOUS CONDUCTORS

- A. Grounding Bus: Bare, annealed-copper bars of rectangular cross section.
- B. Braided Bonding Jumpers: Copper tape, braided No. 3/0 American Wire Gauge (AWG) bare copper wire, terminated with copper ferrules.
- C. Bonding Straps: Soft copper, 0.05 inch (1 millimeter) thick and 2 inches (50 millimeters) wide, except as indicated.

2.04 CONNECTOR PRODUCTS

- A. Pressure Connectors: High-conductivity-plated units.
- B. Bolted Clamps: Heavy-duty type.
- C. Exothermic-Welded Connections: Provided in kit form and selected per manufacturer's written instructions for specific types, sizes, and combinations of conductors and connected items.

2.05 GROUNDING ELECTRODES AND TEST WELLS

- A. Grounding Rods: Copper-clad steel.
 - 1. Size: 3/4 inch by 120 inches (19 by 3000 millimeters).
- B. Test Wells: Fabricate from 36 inch (915 millimeters) long, square-cut section of 16 inch (406 millimeters) diameter, Schedule 80, Polyvinyl Chloride (PVC) pipe with end bell as detailed on Drawings.

PART 3— EXECUTION

3.01 APPLICATION

- A. Equipment Grounding Conductors: Comply with NEC Article 250 for types, sizes, and quantities of equipment grounding conductors, except where specific types, larger sizes, or more conductors than required by NEC are indicated.
 - 1. Install equipment grounding conductor with circuit conductors for items below in addition to those required by Code:

- a. Feeders and branch circuits.
 - b. Lighting circuits.
 - c. Receptacle circuits.
 - d. Single-phase motor or appliance branch circuits.
 - e. Three-phase motor or appliance branch circuits.
 - f. Flexible raceway runs.
 - g. Armored and metal-clad cable runs.
- 2. Busway Supply Circuits: Install separate equipment grounding conductor from grounding bus in switchgear, switchboard, or distribution panel to equipment grounding-bar terminal on busway.
- 3. Nonmetallic Raceways: Install equipment grounding conductor in nonmetallic raceways unless they are designated for telephone or data cables.
- B. Separately Derived Systems: Where NEC requires grounding, ground according to NEC Paragraph 250-30.
- C. Metal Poles Supporting Outdoor Lighting Fixtures: Ground pole to grounding electrode in addition to separate equipment grounding conductor run with supply branch circuit.
- D. Piping Systems and Other Equipment: Comply with NEC Article 250 for bonding requirements.

3.02 INSTALLATION

- A. Ground electrical systems and equipment according to NEC requirements, except where Drawings or Specifications exceed NEC requirements.
- B. Grounding Rods: Locate minimum of 1 rod length from each other and at least same distance from any other grounding electrode.
 - 1. Drive until tops are 2 inches (50 millimeters) below finished floor or final grade, except as otherwise indicated.
 - 2. Interconnect with grounding-electrode conductors. Use exothermic welds, except at test wells and as otherwise indicated. Make these connections without damaging copper coating or exposing steel.
- C. Grounding Conductors: Route along shortest and straightest paths possible, except as otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- D. Underground Grounding Conductors: Use bare tinned copper wire. Bury at least 24 inches (600 millimeters) below grade.
- E. Metal Water Service Pipe: Provide insulated copper grounding conductors, sized as indicated, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes by grounding-clamp connectors. Where dielectric main water fitting is installed, connect grounding conductor to street side of fitting. Do not install grounding jumper across dielectric fittings. Bond grounding-conductor conduit to conductor at each end.
- F. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with grounding-clamp connectors.
- G. Bond interior metal piping systems and metal air ducts to equipment grounding conductors of associated pumps, fans, blowers, electric heaters, and air cleaners. Use braided-type bonding straps.

- H. Test Wells: One for each driven grounding electrode system, except as otherwise indicated. Set top of well flush with finished grade or floor.

3.03 CONNECTIONS

- A. Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.
 - 1. Use electroplated or hot-tin-coated materials to assure high conductivity and to make contact points closer in order of galvanic series.
 - 2. Make connections with clean, bare metal at points of contact.
 - 3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
 - 4. Make aluminum-to-galvanized steel connections with tin-plated copper jumpers and mechanical clamps.
 - 5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.
- B. Exothermic-Welded Connections: Use for connections to structural steel and for underground connections, except those at test wells. Comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.
- C. Equipment Grounding-Wire Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors.
- D. Noncontact Metal Raceway Terminations: Where metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing. Connect grounding bushings with bare grounding conductor to grounding bus or terminal in housing. Bond electrically noncontinuous conduits at both entrances and exits with grounding bushings and bare grounding conductors, except as otherwise indicated.
- E. Connections at Test Wells: Use compression-type connectors on conductors and make bolted-and clamped-type connections between conductors and grounding rods.
- F. Tighten screws and bolts for grounding and bonding connectors and terminals according to manufacturer's published torque-tightening values. Where these requirements are not available, use those specified in UL 486A and UL 486B.
- G. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by manufacturer of connectors. Provide embossing die code or other standard method to make visible indication that connector has been adequately compressed on grounding conductor.
- H. Moisture Protection: Where insulated grounding conductors are connected to grounding rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.
- I. Grounding System:
 - 1. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes.

3.04 FIELD QUALITY CONTROL

A. Testing:

1. Subject completed grounding system to megger test at each location where maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at ground test wells.
 - a. Measure ground resistance not less than 2 full days after last trace of precipitation, and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform tests by 2 point method according to Section 9.03 of Institute of Electrical And Electronics Engineers (IEEE) 81.
2. Maximum grounding to resistance values are as follows:
 - a. Equipment Rated 500 kilovolt amps (kVA) and Less: 10 ohms.
 - b. Equipment Rated 500 to 1000 kVA: 5 ohms.
 - c. Equipment Rated More than 1000 kVA: 3 ohms.
 - d. Unfenced Substations and Pad-Mounted Equipment: 5 ohms.
 - e. Manhole Grounds: 10 ohms.
3. Excessive Ground Resistance: Where resistance to ground exceeds specified values, notify ENGINEER promptly and include recommendations to reduce ground resistance and to accomplish recommended work.
4. Report: Prepare certified test reports, of ground resistance at each test location. Include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

3.05 RESTORATION

- A. Restore disturbed surfaces in accordance with Section 32 92 00.

END OF SECTION

SECTION 26 05 29
HANGERS AND SUPPORTING FOR ELECTRICAL SYSTEMS

PART 1– GENERAL

1.01 SUMMARY

A. Section Includes:

1. Supports from building structure for electrical items by means of hangers, supports, anchors, sleeves, inserts, seals, and associated fastenings.

1.02 QUALITY ASSURANCE

A. Items provided under this section shall be listed and labeled by Underwriters Laboratories, Inc. (UL) or other Nationally Recognized Testing laboratory (NRTL).

1. Term "NRTL" shall be as defined in Occupational Safety and Health Administration (OSHA) Regulation 1910.7.
2. Terms "listed" and "labeled" shall be as defined in National Electrical Code (NEC), Article 100.

B. Regulatory requirements:

1. NEC: Components and installation shall comply with National Fire Protection Association (NFPA) 70.

PART 2– PRODUCTS

2.01 MATERIALS

A. Indoor locations – aluminum or stainless steel.

1. Where conduit and hanger/support are different material types provide a dissimilar metal separation. Dissimilar metal separation shall be designed/intended for use as dissimilar metal separation.

B. Outdoor, corrosive, wet or damp locations – stainless steel.

1. Aluminum supports shall be used for aluminum conduit that is installed along aluminum handrails.

2.02 MANUFACTURED SUPPORTING DEVICES

A. Raceway Supports: Clevis hangers, riser clamps, conduit straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring steel clamps.

B. Fasteners: Types, materials, and construction features as follows:

1. Expansion Anchors: Stainless steel wedge or sleeve type.
2. Toggle Bolts: All stainless steel springhead type.
3. Powder-Driven Threaded Studs: Heat-treated stainless steel, designed specifically for intended service.
4. Nuts, Washers, and Bolts: Stainless steel.

- C. Conduit Sealing Bushings: Factory-fabricated watertight conduit sealing bushing assemblies suitable for sealing around conduit passing through concrete floors and walls. Construct seals with steel sleeve, malleable iron body, neoprene sealing grommets or rings, metal pressure rings, pressure clamps, and cap screws.
- D. Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for nonarmored electrical cables in riser conduits. Provide plugs with number and size of conductor gripping holes as required to suit individual risers.
- E. U-Channel Systems: Channels, with 9/16-inch diameter holes, at minimum of 8 inch on center, in top surface. Provide fittings and accessories that mate and match with U-channel and are of same manufacture.

2.03 FABRICATED SUPPORTING DEVICES

- A. Shop- or field-fabricate supports or manufacture supports assembled from U-channel components.
- B. Brackets: Fabricated of angles, channels, and other standard structural shapes. Connect with welds and machine bolts to form rigid supports.
- C. Pipe Sleeves: Provide pipe sleeves of one of following:
 - 1. Sheet Metal: Fabricate from galvanized sheet metal; round tube closed with snaplock joint, welded spiral seams, or welded longitudinal joint. Fabricate sleeves from following gage metal for sleeve diameter noted:
 - a. 3 inch and smaller: 20 gauge
 - b. 4 inch to 6 inch: 16 gauge
 - c. Over 6 inch: 14 gauge
 - 2. Steel Pipe: Fabricate from Schedule 40 galvanized steel pipe.
 - 3. Plastic Pipe: Fabricate from Schedule 80 PVC plastic pipe.

2.04 FIRE RESISTANT JOINT SEALERS

- A. Manufacturers:
 - 1. "Dow Corning Fire Stop Foam," Dow Corning Corp.
 - 2. "Pensil 851," General Electric Co.
 - 3. Or equal.
- B. Two-part, foamed-in-place, silicone sealant formulated for use in through-penetration fire-stopping around cables, conduit, pipes, and duct penetrations through fire-rated walls and floors.
- C. Sealants and accessories shall have fire-resistance ratings indicated, as established by testing identical assemblies in accordance with American Society for Testing and Materials (ASTM) E 814, by Underwriters' Laboratories, Inc., or other testing and inspection agency acceptable to authorities having jurisdiction.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Install supporting devices to fasten electrical components securely and permanently in accordance with NEC requirements.
- B. Coordinate with structural system and with other electrical installation. Coordinate with light fixtures to ensure hangers and supports are not mounted lower or below light fixtures causing shadows.
- C. Raceway Supports: Comply with NEC and following requirements:
 - 1. Conform to manufacturer's recommendations for selection and installation of supports.
 - 2. Strength of each support shall be adequate to carry present and future load multiplied by safety factor of at least four. Where this determination results in safety allowance of less than 200 pounds, provide additional strength until there is minimum of 200 pounds safety allowance in strength of each support.
 - 3. Install individual and multiple (trapeze) raceway hangers and riser clamps as necessary to support raceways. Provide U-bolts, clamps, attachments, and other hardware necessary for hanger assembly and for securing hanger rods and conduits.
 - 4. Support parallel runs of horizontal raceways together on trapeze-type hangers.
 - 5. Support individual horizontal raceways by separate pipe hangers. Spring steel fasteners may be used in lieu of hangers only for 1 inch and smaller raceways serving lighting and receptacle branch circuits above suspended ceilings only. For hanger rods with spring steel fasteners, use 1/4 inch diameter or larger threaded steel. Use spring steel fasteners that are specifically designed for supporting single conduits or tubing.
 - 6. In vertical runs, arrange support so load produced by weight of raceway and enclosed conductors is carried entirely by conduit supports with no weight load on raceway terminals.
- D. Vertical Conductor Supports: Install simultaneously with installation of conductors.
- E. Miscellaneous Supports: Support miscellaneous electrical components as required to produce same structural safety factors as specified for raceway supports. Install metal channel racks for mounting cabinets, panelboards, disconnects, control enclosures, pull boxes, junction boxes, transformers, and other devices.
- F. Sleeves: Install in concrete slabs and walls and other fire-rated floors and walls for raceways and cable installations. For sleeves through fire rated-wall or floor construction, apply UL listed firestopping sealant in gaps between sleeves and enclosed conduits and cables.
- G. Conduit Seals: Install seals for conduit penetrations of slabs below grade and exterior walls below grade and where indicated. Tighten sleeve seal screws until sealing grommets have expanded to form watertight seal.
- H. Fastening: Unless otherwise indicated, fasten electrical items and their supporting hardware securely to building structure, including but not limited to conduits, raceways, cables, cable trays, busways, cabinets, panelboards, transformers, boxes, disconnect switches, and control components in accordance with following:
 - 1. Fasten by means of wood screws or screw-type nails on wood, toggle bolts on hollow masonry units, concrete inserts or expansion bolts on concrete or solid masonry, and machine screws, welded threaded studs, or spring-tension clamps on steel. Threaded studs driven by powder charge and provided with lock washers and nuts may be used instead of expansion bolts and machine or wood screws. Do not weld conduit, pipe straps, or items other than threaded studs to steel structures. In partitions of light steel construction, use sheet metal screws.
 - 2. Holes cut in concrete shall not cut main reinforcing bars. Fill holes that are not used.
 - 3. Load applied to any fastener shall not exceed 25% of proof test load. Use vibration- and shock- resistant fasteners for attachments to concrete slabs.

END OF SECTION

SECTION 26 05 33.13
CABINETS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Pull and junction boxes.
2. Cabinets.
3. Hinged door enclosures.

B. Conduit-body-type electrical enclosures and wiring fittings are specified in Section 26 05 33.16.

1.02 DEFINITIONS

A. Cabinets: Enclosure designed either for surface or for flush mounting and having frame, or trim in which door or doors may be mounted.

B. Device Box: Outlet box designed to house receptacle device or wiring box designed to house switch.

C. Enclosure: Box, case, cabinet, or housing for electrical wiring or components.

D. Hinged Door Enclosure: Enclosure designed for surface mounting and having swinging doors or covers secured directly to and telescoping with walls of box.

E. Outlet Box: Wiring enclosure where current is taken from wiring system to supply utilization equipment.

F. Wiring Box: Enclosure designed to provide access to wiring systems or for mounting of indicating devices or of switches for controlling electrical circuits.

1.03 SUBMITTALS

A. Product Data: Submit for cabinets and enclosures with classification higher than National Electrical Manufacturers Association (NEMA) 1.

B. Submit in accordance with Section 01 33 00.

1.04 QUALITY ASSURANCE

A. Items provided under this section shall be listed or labeled by Underwriters Laboratories, Inc. (UL) or other Nationally Recognized Testing Laboratory (NRTL).

1. Term "NRTL" shall be as defined in Occupational Safety and Health Administration (OSHA) Regulation 1910.7.
2. Terms "listed" and "labeled" shall be as defined in National Electrical Code (NEC), Article 100.

B. Regulatory Requirements:

1. NEC: Components and installation shall comply with National Fire Protection Association (NFPA 70).

PART 2 – PRODUCTS

2.01 CABINETS, BOXES, AND FITTINGS, GENERAL

- A. Electrical Cabinets, Boxes, and Fittings: Of indicated types, sizes, and NEMA enclosure classes. Where not indicated, provide units of types, sizes, and classes appropriate for use and location. Provide items complete with covers and accessories required for intended use. Provide gaskets for units in damp or wet locations.

2.02 MISCELLANEOUS MATERIALS AND FINISHES

- A. Fasteners for General Use: Corrosion resistant screws and hardware including cadmium and zinc plated items.
- B. Fasteners for Damp or Wet Locations: Stainless steel screws and hardware.
- C. Fittings for Boxes, Cabinets, and Enclosures: Conform to UL 514B. Malleable iron or zinc plated steel for conduit hubs, bushings and box connectors.
- D. Finishes:
 - 1. Exterior Finish: Galvanized or Gray baked enamel for items exposed in finished locations except as otherwise indicated.
 - 2. Interior Finish: Where indicated, white baked enamel.

2.03 METAL OUTLET, DEVICE, AND SMALL WIRING BOXES

- A. General:
 - 1. Conform to UL 514A and UL 514B.
 - 2. Boxes shall be of type, shape, size, and depth to suit each location and application.
- B. Steel Boxes: Conform to NEMA OS 1. Boxes shall be sheet steel with stamped knockouts, threaded screw holes and accessories suitable for each location including mounting brackets and straps, cable clamps, exterior rings and fixture studs.
- C. Galvanized Cast-Iron Boxes: Iron alloy, waterproof, with threaded raceway entries and features and accessories suitable for each location, including mounting ears, threaded screw holes for devices and closure plugs.

2.04 PULL AND JUNCTION BOXES

- A. General: Comply with UL 50 for boxes over 100 cubic inch volume. Boxes shall have screwed or bolted on covers of material same as box and shall be of size and shape to suit application.
- B. Stainless-Steel Boxes: Fabricate of stainless steel conforming to Type 304 of American Society for Testing and Materials (ASTM) A167. Where necessary to provide rigid assembly, construct with internal structural stainless steel bracing. Cover shall be gasketed.

2.05 STEEL ENCLOSURES WITH HINGED DOORS

- A. Comply with UL 50 and NEMA ICS 6.

B. Construction:

1. Sheet steel, 16 gauge, minimum, with continuous welded seams. NEMA class as indicated; arranged for surface mounting.
 2. Stainless steel.
- C. Doors: Hinged directly to cabinet and removable, with approximately 3/4 inch flange around each edge, shaped to cover edge of box. Provide handle operated, key locking latch. Individual door width shall be no greater than 24 inch. Provide multiple doors where required.
- D. Mounting Panel: Provide painted removable internal mounting panel for component installation.
- E. Enclosure: NEMA 12 except as indicated. Where door gasketing is required, provide neoprene gasket attached with oil-resistant adhesive, and held in place with steel retaining strips. For enclosures of class higher than NEMA 1, use hubbed raceway entrances.

2.06 MOLDED NONMETALLIC ENCLOSURES WITH HINGED DOOR

- A. Molded, glass fiber reinforced high impact strength polyester with bolt or screw secured doors and solid neoprene gaskets.

2.07 TERMINAL STRIPS

A. Manufacturers:

1. Square D.
2. Buchanan.
3. Or equal.

B. Channel mount snap-on type.

C. Individual gangable with nylon bases.

D. Solderless box lug type rated at 600 volts to accommodate No. 22 to 8 American Wire Gauge (AWG) wire or as otherwise indicated.

E. Provide 50% spare terminals.

PART 3 – EXECUTION

3.01 INSTALLATION, GENERAL

- A. Locations: Install items where indicated and where required to suit code requirements and installation conditions.
- B. Cap unused knockout holes where blanks have been removed and plug unused conduit hubs.
- C. Support and fasten items in accordance with Section 26 05 29.
- D. Sizes shall be adequate to meet NEC volume requirements, but in no case smaller than sizes indicated.
- E. Remove sharp edges where they may come in contact with wiring or personnel.

3.02 APPLICATIONS

- A. Hinged Door Enclosures: NEMA type 4X 304 stainless steel metal enclosure, or as indicated on Drawings.
- B. Outlet Boxes and Fittings: Install outlet and device boxes and associated covers and fittings of materials and NEMA types for each location in conformance with following requirements unless otherwise noted:
 - 1. Interior Dry Locations: Sheet steel, NEMA type 1 for flush mounting and ferrous Type FS or FD cast boxes with threaded conduit hubs for surface mounting.
 - 2. Locations Exposed to Weather or Dampness: Galvanized, cast metal, NEMA Type 3R.
 - 3. Wet Locations: 304 Stainless Steel, NEMA type 4X enclosures.
 - 4. Corrosive Locations: 304 Stainless Steel, NEMA type 4X enclosures.
 - 5. Metal Door Jambs: Narrow partition boxes with internal ears.
- C. Pull and Junction Boxes: Install pull and junction boxes of materials and NEMA types for each location in conformance with following requirements unless otherwise noted:
 - 1. Interior Dry Locations: Sheet steel, NEMA type 1 for flush mounting and ferrous Type FS or FD cast boxes with threaded conduit hubs for surface mounting.
 - 2. Locations Exposed to Weather or Dampness: Galvanized, cast metal, NEMA Type 3R.
 - 3. Wet Locations: 304 Stainless Steel, NEMA type 4X enclosures.
 - 4. Corrosive Locations: 304 Stainless Steel, NEMA type 4X enclosures.

3.03 INSTALLATION OF OUTLET BOXES

- A. Outlets at Windows and Doors: Locate close to window or door trim.
- B. Column and Pilaster Locations: Locate outlet boxes for switches and receptacles on columns or pilasters so centers of columns are clear for future installation of partitions.
- C. Locations in Special Finish Materials: For outlet boxes for receptacles and switches mounted in desks or furniture cabinets or in glazed tile, concrete block, marble, brick, stone or wood walls, use rectangular shaped boxes with square corners and straight sides. Install boxes without plaster rings. Saw cut recesses for outlet boxes in exposed masonry walls.
- D. Gasketed Boxes: At following locations use cast metal, threaded hub type boxes with gasketed weatherproof covers:
 - 1. Exterior locations.
 - 2. Where surface mounted on unfinished walls, columns or pilasters. (Cover gaskets may be omitted in dry locations).
 - 3. Where exposed to moisture laden atmosphere.
 - 4. Where indicated.
- E. Mounting: Mount outlet boxes for switches with long axis vertical or as indicated. Mount boxes for receptacles vertically. Gang boxes shall be mounted with long axis horizontal. Locate box covers or device plates so they will not span different types of building finishes either vertically or horizontally. Locate boxes for switches near doors on side opposite hinges and close to door trim, even though electrical floor plans may show them on hinge side.

- F. Ceiling Outlets: For fixtures, where wiring is concealed, use outlet boxes 4 inch sq by 1-1/2 inch deep, minimum with raised plaster or tile cover. Provide 3/8 inch fixture stud.
- G. Cover Plates for Surface Boxes: Use plates sized to box front without overlap.
- H. Protect outlet boxes to prevent entrance of plaster, and debris. Thoroughly clean foreign material from boxes before conductors are installed.
- I. Concrete Boxes: Use extra deep boxes to permit side conduit entrance without interfering with reinforcing, but do not use such boxes with over 6 inch depth.
- J. Secure boxes rigidly to substrate upon which being mounted or solidly embed boxes in concrete or masonry. Do not support from conduit, mechanical ductwork or piping.
- K. Set boxes in concealed conduit runs, flush with wall surfaces, with or without covers as required.
- L. Do not install boxes back to back or through wall. Offset outlet boxes on opposite sides of wall minimum 12 inch
- M. Set outlet boxes parallel to construction, securely mounted and adjusted to set true and flush with finished surface.
- N. Do not burn holes, use knockout punches or saw.
- O. Use handy boxes only where specifically indicated.
- P. Provide outlet box divider barriers between 277/480 volt and 120/240 volt devices as required per NEC.
- Q. Where emergency switches occur adjacent to normal light switches, install in separate boxes in accordance with NEC and device plate color coding separation.

3.04 OUTLET BOX LOCATIONS

- A. Locate flush mounted wall boxes in corner of nearest brick or block to keep cutting to minimum.
- B. Location of outlets and equipment as shown on Drawings is approximate and exact location to be verified and shall be determined by:
 - 1. Construction or code requirements.
 - 2. Conflict with equipment or other trades.
 - 3. Equipment manufacturer's drawings.
- C. Minor modification in location of outlets and equipment considered incidental up to distance of 10 feet with no additional compensation, provided necessary instructions given prior to roughing in of outlet.
- D. Mounting heights for devices and equipment to be measured from finished floor to centerline of device and unless otherwise noted on Drawings as follows.
 - 1. Alternating Current Receptacles: 15 inch above floor or 6 inch above counters, counter backslashes, and baseboard radiators in finished areas; 48 inch above floor in unfinished areas.
 - 2. Motor Starters and Disconnect Switches: 60 inch above floor

3.05 INSTALLATION OF PULL AND JUNCTION BOXES

- A. Box Selection: For boxes in main feeder conduit runs, use sizes not smaller than 8 inch sq by 4 inch deep. Do not exceed 6 entering and 6 leaving raceways in single box. Quantities of conductors (including equipment grounding conductors) in pull or junction box shall not exceed following:

Size of Largest Conductors in Box	Maximum No. of Conductors in Box
No. 4/0 AWG	30
250 Kcmil	20
500 Kcmil	15
Over 500 Kcmil	10

1. Cable Supports: Install clamps, grids, or devices to which cables may be secured. Arrange cables so they may be readily identified. Support cable at least every 30 inch inside boxes.
2. Mount pull boxes in inaccessible ceilings with covers flush with finished ceiling.
3. Size: Provide pull and junction boxes for telephone, signal, instrumentation, control, and other systems at least 50% larger than would be required by the NEC for boxes smaller than 24 inch by 24 inch, or as indicated. Locate boxes strategically and provide shapes to permit easy pulling of future wires or cables of types normal for such systems.

3.06 INSTALLATION OF CABINETS AND HINGED DOOR ENCLOSURES

- A. Mount with fronts straight and plumb.
- B. Install with tops 78 inch above floor.
- C. Set cabinets in finished spaces flush with walls.
- D. Terminate wires and cables on terminal strips.

3.07 GROUNDING

- A. Electrically ground metallic cabinets, boxes, and enclosures. Where wiring to item includes grounding conductor, provide grounding terminal in interior of cabinet, box or enclosure.

3.08 CLEANING AND FINISH REPAIR

- A. Upon completion of installation, inspect components. Remove burrs, dirt, and construction debris and repair damaged finish including chips, scratches, abrasions and weld marks.
- B. Galvanized Finish: Repair damage using zinc-rich paint recommended by manufacturer.
- C. Painted Finish: Repair damage using matching corrosion inhibiting touch-up coating.

END OF SECTION

SECTION 26 05 33.16
CONDUIT FOR ELECTRICAL SYSTEMS

PART 1– GENERAL

1.01 SUMMARY

A. Section includes:

1. Raceways:

- a. Galvanized rigid steel conduit (GRS).
- b. Rigid Aluminum Conduit (RAC).
- c. Intermediate metal conduit (IMC).
- d. Polyvinyl chloride (PVC) externally coated galvanized rigid steel conduit (CGRS).
- e. Polyvinyl Chloride externally coated intermediate metal conduit (CIMC).
- f. Flexible metal conduit (FMC).
- g. Liquidtight flexible metal conduit (LFMC).
- h. Liquidtight flexible non-metallic conduit (LFNC)
- i. Rigid nonmetallic polyvinyl chloride conduit (PVC).

1.02 DEFINITIONS

A. Underfloor Conduits.

- 1. Conduits which run underground within perimeter of building walls under building floor. This may consist of one conduit, or several conduits grouped together.

B. Duct Bank Conduits

- 1. Conduits which run under ground outside perimeter of building walls. This may consist of one conduit, or several conduits grouped together.

C. Underground Conduits

- 1. Underground conduits are both underfloor conduits and duct bank conduits.

1.03 SUBMITTALS

A. Submittals are not required if Contractor supplies materials or equipment as specified. If Contractor proposes substitutions to material or equipment submittals identified below are required.

- 1. Product data.
- 2. Submit in accordance with Section 01 33 00.

1.04 QUALITY ASSURANCE

A. Items provided under this section shall be listed or labeled by Underwriters Laboratories, Inc. (UL) or other Nationally Recognized Testing Laboratory (NRTL).

- 1. Term "NRTL" shall be as defined in Occupational Safety and Health Administration (OSHA) Regulation 1910.7.
- 2. Terms "listed" and "labeled" shall be as defined in National Electrical Code (NEC), Article 100.

B. Regulatory Requirements:

1. NEC: Components and installation shall comply with National Fire Protection Association (NFPA) 70.

C. Comply with National Electrical Contractors Association (NECA) "Standard of Installation."

PART 2 – PRODUCTS

2.01 METAL CONDUIT

- A. Galvanized Rigid Steel Conduit: American National Standards Institute (ANSI) C80.1.
- B. Rigid Aluminum Conduit: ANSI C80.5.
- C. Intermediate Metal Conduit: ANSI C80.6.
- D. Plastic-Coated Steel Conduit and Fittings: National Electrical Manufacturers Association (NEMA) RN 1 and ETL Verified Polyvinyl Chloride-001 Labeled.
- E. Flexible Metal Conduit: Zinc-coated steel.
- F. Liquidtight Flexible Metal Conduit: Flexible steel conduit with Polyvinyl Chloride (PVC) jacket.
- G. Liquidtight Flexible Non-Metallic Conduit: Flexible non-metallic conduit with rigid PVC reinforcement embedded within flexible PVC wall, crush-resistant construction.
- H. Hazardous Flexible Metal Conduit: Stainless steel braid.

2.02 NONMETALLIC CONDUIT

- A. Rigid Nonmetallic Polyvinyl Chloride (PVC) Conduit: NEMA TC 2, PVC Chloride
 1. Concrete Encased: Schedule 40.
 2. Direct Buried: Schedule 80.
- B. PVC Conduit Fittings: NEMA TC 3; match to conduit type and material.

2.03 FITTINGS

- A. Fittings and conduit bodies for steel conduits:
 1. Steel or malleable iron, zinc galvanized or cadmium plated.
 2. Do not use set screw or indentor type fittings.
 3. Do not use aluminum or die cast fittings.
 4. GRS Connectors and Couplings:
 - a. Threaded.
 - b. Insulated throat.
 - c. Gland compression type.
 - d. Rain and concrete type.
 5. Comply with NEMA FB 1, compatible with conduit materials.
- B. Fittings and conduit bodies for aluminum conduits:

1. Die-cast copper free aluminum with aluminum enamel.
 2. Do not use set screw or indenter type fittings.
 3. Connectors and Couplings:
 - a. Threaded.
 - b. Insulated throat.
 - c. Gland compression type.
 - d. Rain and concrete type.
 4. Comply with NEMA FB 1, compatible with conduit materials.
- C. Fittings for flexible metal conduit.
1. Insulated throat type.
 2. Threaded.
 3. Grounding type.
 4. Liquidtight: 1 piece sealing "O" rings with connectors when entering boxes or enclosures.
 5. Hazardous Locations: Stainless steel.
- D. Fittings for liquidtight flexible non-metallic conduit.
1. Insulated throat type.
 2. Threaded.
 3. Non-metallic nylon type.
 4. One piece sealing "O" rings with connectors when entering boxes or enclosures.
- E. PVC Conduit Fittings:
1. NEMA TC 3; match to conduit type and material.
- F. RTRC Conduit Fittings:
1. NEMA TC 14:
 - a. Watertight: Conduit joints and fitting joints shall use manufacturer's epoxy adhesive for a permanent watertight bond.
- G. Expansion Joints:
1. Conduit expansion fittings complete with copper bonding jumper, Crouse-Hinds Type XJ.
 2. Conduit expansion/deflection fittings with copper bonding jumper, Crouse-Hinds Type XD.
- H. Seals:
1. Wall entrance, OZ/Gedney Type FSK or FSC.
- I. Drain Fittings:
1. Automatic Drain Breather:
 - a. Capable of passing minimum 25 cubic centimeters of water per minute and minimum 0.05 cubic feet of air per minute at atmospheric pressure.
 2. Condensate Drain:
 - a. Conduit outlet body, Type T.
 - b. Threaded, galvanized plug with 3/16 inch drilled holed through plug.

2.04 WIREWAYS

- A. Material: Sheet metal sized and shaped as indicated.
- B. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireway as required for complete system.
- C. Select features where not otherwise indicated, as required to complete wiring system and to comply with NEC.
- D. Wireway Covers:
 - 1. Hinged type for dry locations.
 - 2. Bolted cover with gasket for wet locations.
- E. Finish: Manufacturer's standard enamel finish unless otherwise noted.

2.05 RACEWAY/DUCT SEALING COMPOUND

- A. Nonhardening, putty-like consistency workable at temperatures as low as 35°F.
- B. Compound shall not slump at temperature of 300 °F and shall readily adhere to clean surfaces of plastic ducts, metallic conduits, conduit coatings, concrete, masonry, lead, cable sheaths, cable jackets, insulation materials, and common metals.

PART 3– EXECUTION

3.01 EXAMINATION

- A. Examine surfaces to receive raceways, wireways, and fittings for compliance with installation tolerances and other conditions affecting performance of raceway system.
- B. Coordinate layout and installation of raceway and boxes with other construction elements to ensure adequate headroom, working clearance, and access. Coordinate layout and installation of raceway and boxes with light fixtures to ensure raceway and boxes are not mounted lower or below light fixtures causing shadows.

3.02 WIRING METHODS

- A. Outdoors, Damp or Wet Locations: Use following wiring methods unless otherwise noted on Drawings:
 - 1. Exposed: Rigid Aluminum
 - 2. Concealed: Galvanized rigid steel.
 - 3. Underground Power and Control, Single Run: Rigid nonmetallic PVC conduit or RTRC fiberglass conduit
 - a. Concrete encased except for as otherwise noted on Drawings.
 - 4. Underground Power and Control, Grouped: Rigid nonmetallic PVC conduit or RTRC fiberglass conduit.
 - a. Concrete encased.

5. Underground Shielded Instrumentation Cables and Shielded Instrumentation Cables run in concrete slabs, Single Run or Grouped: Galvanized rigid steel.
 - a. Concrete encased.
 6. Connection to Vibrating Equipment (including transformers and hydraulic, pneumatic, or electric solenoid or motor-driven equipment): Liquidtight flexible metal conduit.
- B. Indoor Dry Locations: Use following wiring methods unless otherwise noted.
1. Connection to Vibrating Equipment (including transformers and hydraulic, pneumatic, or electric solenoid or motor-driven equipment): Flexible metal conduit.
 2. Exposed: rigid aluminum conduit.
 3. Concealed: Intermediate metal conduit.
- C. Use 3/4 inch minimum size unless otherwise noted except conduit runs to room light switches may be 1/2 inch.
- D. Unless specifically indicated otherwise, use galvanized rigid steel conduit for general wiring.
1. IMC may be used for branch circuit wiring only in trade size 3/4 and 1 inch where conduit can be concealed in hollow spaces of walls inside vapor barrier, above suspended ceilings.
- E. Underground conduits:
1. Encase galvanized rigid steel conduits installed underground in at least 3 inch of concrete.
 2. PVC conduit may be used without encasing in concrete for underfloor power and control conduit or where specifically indicated on Drawings.
 3. Underground conduit shall be minimum of 1 inch outside of the building and minimum 3/4 inch within the building, buried at depth of not less than 24 inch below grade.
 4. Provide conduits or ducts terminating below grade with means to prevent entry of dirt and moisture.
 5. When using concrete encased PVC conduit or RTRC fiberglass conduit provide either:
 - a. PVC coated galvanized rigid steel elbows.
 - b. RTRC fiberglass elbows with factory installed PVC couplings when connecting to PVC conduit.
- F. In precast areas, run conduits in insulation space or in floor topping without crossing conduits, using 3/4 inch maximum conduit size.
- G. Raceways Embedded in Slabs: Install in middle third of slab thickness where practical, and leave at least 1 inch (25 millimeter) concrete cover.
1. Secure raceways to reinforcing rods to prevent sagging or shifting during concrete placement.
 2. Space raceways laterally to prevent voids in concrete.
 3. Run conduit larger than 1 inch trade size parallel to or at right angles to main reinforcement and spaced on center of at least 3 times conduit trade diameter with minimum 2 inch concrete covering. Conduits over 1 inch may not be installed in slab without approval of Engineer.
 4. When at right angles to reinforcement, place conduit close to slab support.
 5. Conduits embedded in concrete frame shall comply with applicable provisions of American Concrete Institute (ACI) 318.
- H. Do not install aluminum conduit embedded in or in contact with concrete.

3.03 INSTALLATION

- A. Conceal raceways by enclosing within finished walls, ceilings, and floors, unless otherwise indicated.
- B. Provide watertight conduit system where installed in wet places, underground or where buried in masonry or concrete.
 - 1. Use threaded hubs when entering top of enclosures.
 - 2. Use sealing type locknuts when entering sides or bottom of enclosures.
- C. Install two spare 1 inch conduits from top of each flush mounted panelboard to area above ceiling for future use. On flush mounted panelboards located on first and higher level floors, provide two spare 1 inch conduits from bottom of panelboard to ceiling area of floor below for future use.
- D. Keep raceways at least 6 inch (150 millimeter) away from parallel runs of flues and steam or hot water pipes. Install horizontal raceway runs above water and steam piping.
- E. Install raceways level and square and at proper elevations. Provide adequate headroom.
- F. Complete raceway installation before starting conductor installation.
- G. Support raceway as specified in Section 26 05 29.
- H. Use temporary closures to prevent foreign matter from entering raceway.
- I. Run concealed raceways with minimum of bends in shortest practical distance considering type of building construction and obstructions, except as otherwise indicated.
- J. Install exposed raceways parallel to or at right angles to nearby surfaces or structural members, and follow surface contours as much as practical.
 - 1. Mount exposed horizontal runs as high above floor as possible, and in no case lower than 7 foot above floors, walkways, or platforms in passage areas.
 - 2. Run parallel or banked raceways together, on common supports where practical.
 - 3. Make bends in parallel or banked runs from same center line to make bends parallel. Use factory elbows only where they can be installed parallel; otherwise, provide field bends for parallel raceways.
- K. Join raceways with fittings designed and approved for purpose and make joints tight.
 - 1. Make raceway terminations tight. Use bonding bushings or wedges at connections subject to vibration. Use bonding jumpers where joints cannot be made tight.
 - 2. Use insulating bushings to protect conductors.
- L. Terminations: Where raceways are terminated with locknuts and bushings, align raceway to enter squarely, and install the locknuts with dished part against the box. Use two locknuts, one inside and one outside the box. Use insulating bushings. Provide insulated grounding bushings to terminate ground wire.
- M. Where terminating in threaded hubs, screw raceway or fitting tight into the hub so the end bears against the wire protection shoulder. Where chase nipples are used, align the raceway so the coupling is square to box, and tighten chase nipple so no threads are exposed.
- N. Install pull wires in empty raceways. Use monofilament plastic line having not less than 200 pound (90 kilogram) tensile strength. Leave not less than 12 inch (300 millimeter) of slack at each end of pull wire.

- O. Signal System Raceways 2 inch Trade Size and Smaller: In addition to above requirements, install in maximum lengths of 150 foot (45 meters) and with maximum of two 90 degree bends or equivalent. Install pull or junction boxes where necessary to comply with these requirements.
- P. PVC Externally Coated Galvanized Rigid Steel Conduit: Use only fittings approved for use with that material. Patch nicks and scrapes in PVC coating after installing conduit.

3.04 CONDUIT STUB-UPS

- A. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portion of bends is not visible above finished slab.
- B. Transition under floor conduit to PVC coated galvanized rigid steel conduit before rising above floor. Under floor conduit elbows shall be PVC coated galvanized rigid steel conduit. Extend the PVC coated galvanized rigid steel conduit portion of the stub-up minimum 12 inch above floor or slab.

3.05 CONDUIT BENDS

- A. Make bends and offsets so inside diameter is not reduced. Unless otherwise indicated, keep legs of bend in same plane and straight legs of offsets parallel.
- B. Provide NEMA standard conduit bends, except for conduits containing medium voltage cable, fiber optic cable, or conductors requiring large radius bends.
- C. Provide large radius conduit bends for conduits containing 5 kilovolt and 15 kilovolt cables as follows:

Conduit Trade Size	Bend Radius
2 inch - 2-1/2 inch	24 inch
3 inch - 4 inch	36 inch
5 inch – 6 inch	48 inch

- 1. Where physical limitations do not permit use of above, conduit bends with radius of at 8 times diameter of largest cable passing through conduit may be used.

3.06 FLEXIBLE CONNECTIONS

- A. Use maximum of 6 foot (1830 millimeter) of flexible conduit for recessed and semi-recessed lighting fixtures.
- B. Terminate conduits at motor terminal boxes, motor operated valve stations or pipe-mounted instruments and other equipment subject to vibration with maximum of 3 foot (915 millimeter) liquidtight flexible metal conduit unless other wise indicated.
- C. Use liquidtight flexible conduit in wet, damp, and corrosive locations.
- D. Use flexible conduit and connections suitable for hazardous classified locations in hazardous classified locations.
- E. Install separate ground conductor inside flexible conduit connections.
- F. Do not route flexible conduit through walls, floors, ceilings, or roofs.

3.07 FITTINGS

- A. Install raceway sealing fittings according to manufacturer's written instructions. Locate fittings at suitable, approved, accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in flush steel box with blank cover plate having finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at following points and elsewhere as indicated:
 - 1. Where conduits enter or leave hazardous locations.
 - 2. Where conduits pass from warm locations to cold locations, such as boundaries of refrigerated spaces and air-conditioned spaces.
 - 3. Where otherwise required by NEC.
- B. Use raceway fittings compatible with raceway and suitable for use and location. For GRS RAC and IMC, use threaded conduit fittings, except as otherwise indicated.
- C. Install automatic breather drain fittings according to manufacturers written instructions. Locate fittings to drain conduit system and prevent condensate from entering device enclosures. Install automatic breather drain fittings at following points and elsewhere as indicated.
 - 1. Where vertical seals are installed.
 - 2. Low points in conduit system.
 - 3. Below field instruments at junction of flexible and rigid conduit.
 - 4. Where otherwise required by NEC.
- D. Install wall entrance seal as dictated by application where conduits pass through foundation walls below grade.
- E. Install conduit expansion fittings complete with bonding jumper in following locations.
 - 1. Conduit runs crossing structural expansion joint.
 - 2. Conduit runs attached to 2 separate structures.
 - 3. Conduit runs where movement perpendicular to axis of conduit may be encountered.
- F. Where conduit passes from inside of building to outdoors, it shall be firmly packed at fitting nearest wall line with Johns-Manville Duxseal to depth of at least 1 inch after wires and cables are pulled in; or, if conduit enters directly into equipment, it shall be fitted with seal and drain fitting to prevent water entering equipment.

3.08 GROUNDING

- A. Ground in accordance with Section 26 05 26.
- B. Provide grounding connections for raceway, boxes, and components as indicated and instructed by manufacturer. Tighten connectors and terminals, including screws and bolts, according to equipment manufacturer's published torque-tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals according to tightening torques specified in UL 486A.

3.09 PROTECTION

- A. Provide final protection and maintain conditions, in manner acceptable to manufacturer and Installer, to ensure that coatings, finishes, and cabinets are without damage or deterioration at Substantial Completion.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - 2. Repair damage to PVC or paint finishes with matching touch-up coating recommended by manufacturer.

3.10 CLEANING

- A. Upon completion of installation of system, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish, including chips, scratches, and abrasions.

END OF SECTION

SECTION 26 05 43
UNDERGROUND DUCTS FOR ELECTRICAL SYSTEMS

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Ducts.
2. Duct banks.

1.02 DEFINITIONS

- A. Duct: General term for electrical conduit and other raceway, either metallic or nonmetallic, specified for use underground, embedded in earth or concrete.
- B. Duct Bank: Group of 2 or more ducts in continuous run between two points.
- C. Duct Bank Conduits
1. Conduits which run underground outside perimeter of building walls. This may consist of 1 conduit, or several conduits grouped together.
- D. Underground Conduits
1. Underground conduits are both underfloor conduits and duct bank conduits.

1.03 SUBMITTALS

- A. Submittals identified below are required.
1. Product data.
 2. Duct entrances to buildings detailing conduit materials and a sketch showing elevations of conduits in relation to the building floor slabs, footings and frost walls.
 3. Submit in accordance with Section 01 33 00.

1.04 QUALITY ASSURANCE

- A. Items provided under this section shall be listed or labeled by Underwriters Laboratories, Inc. (UL) or other Nationally Recognized Testing Laboratory (NRTL).
1. Term "NRTL" shall be as defined in OSHA Regulation 1910.7.
 2. Terms "listed" and "labeled" shall be as defined in National Electrical Code (NEC), Article 100.
- B. Regulatory Requirements:
1. NEC: Components and installation shall comply with National Fire Protection Association (NFPA) 70.

1.05 SEQUENCING AND SCHEDULING

A. Coordination of Work:

1. Coordinate layout and installation of manholes and handholes with final arrangement of ducts as influenced by actual final location of other utilities in field.
2. Coordinate elevations of duct and raceway entrances into manholes and handholes with final profiles of ducts and raceways as determined by coordination with other utilities, underground obstructions, and buildings.
3. Establish locations and elevations to suit field conditions and assure duct runs drain to manholes, handholes, or as shown on Drawings.

PART 2 – PRODUCTS

2.01 DUCTS AND FITTINGS

- A. Comply with Section 26 05 33.16.

2.02 CAST-IN-PLACE CONCRETE

- A. Comply with Section 03 30 00 for concrete and Section 03 20 00 for reinforcing.
- B. Aggregate For Duct Encasement: 3/8 inch maximum size.
- C. Strength: 3,000 pounds per square inch (psi) minimum 28 day compressive strength.
- D. Top layer of concrete encased conduit duct bank shall be dyed red.

2.03 DUCT BANK ACCESSORIES

- A. Duct Supports: Rigid Polyvinyl Chloride (PVC) spacers selected to provide minimum duct spacings and concrete cover depths indicated, while rigidly supporting ducts during concreting.

2.04 RACEWAY/DUCT SEALING COMPOUND

- A. Compound:
1. Nonhardening, putty-like consistency workable at temperatures as low as 35 degrees Fahrenheit.
 2. Compound shall not slump at temperature of 300 degrees Fahrenheit and shall readily adhere to clean surfaces of plastic ducts, metallic conduits, conduit coatings, concrete, masonry, lead, cable sheaths, cable jackets, insulation materials, and common metals.

PART 3 – EXECUTION

3.01 WIRING METHOD

- A. General: Install ducts for wiring runs indicated. Provide sizes as indicated.
- B. Underground Power and Control, Single Run: Rigid nonmetallic PVC conduit
1. Concrete encased except for area lighting branch circuits or as otherwise noted on Drawings.
- C. Duct Banks:

1. Power and Control Conduits: Rigid nonmetallic conduit, Schedule 40, encased in concrete or RTRC fiberglass conduit encased in concrete.
2. Instrumentation Conduits: Galvanized Rigid Steel conduit encased in concrete.

3.02 EXCAVATION AND BACKFILL

A. Conform to Section 31 23 33 except as modified below:

1. Do not use heavy-duty, hydraulic-operated compaction equipment.
2. Excavation: Cut trenches neatly and uniformly, and slope uniformly to required pitch.
3. For direct-buried, nonencased ducts prepare trench bottoms free from stones, soft spots, and sharp objects. Where necessary, add 3 inch layer of stone-free sand or earth to trench bottom and compact to density of adjacent undisturbed soil to provide suitable bearing for ducts. Backfill over and around ducts on bottom of trench with stone-free sand or earth to 6 inch minimum above tops of ducts and compact by hand or pneumatic tamper to density of adjacent undisturbed earth.
4. For each additional layer of direct-buried ducts above bottom ducts, backfill over and around each layer of ducts with stone-free sand or earth to 12 inch minimum above tops of ducts and compact by hand or pneumatically to density of adjacent undisturbed earth.
5. Separation Between Direct-Buried, Nonencased Ducts: 3 inch minimum for like services, and 6 inch minimum between power and signal ducts.

3.03 INSTALLATION OF DUCTS

- A. Slope: Pitch ducts to drain towards manholes and handholes and away from buildings and equipment unless otherwise shown on Drawings. Minimum slope shall be 4 inch in 100 foot. Where necessary to achieve this between manholes, slope ducts from high point in run to drain in both directions.
- B. Curves and Bends: Use manufactured elbows for stub-ups at equipment and at building entrances. For other curves and bends, except as otherwise indicated, use manufactured long sweep bends with minimum radius of 36 inches in both horizontal and vertical directions. Conduit elbows in duct banks shall be PVC coated galvanized rigid steel or RTRC fiberglass elbows with factory installed PVC couplings when connecting to PVC conduit.
- C. Make joints in ducts and fittings watertight in accordance with manufacturer's instructions. Stagger couplings so those of adjacent ducts do not lie in same plane.
- D. Duct Entrances to Manholes and Handholes: End bells spaced approximately 10 inch center to center for 5 inch ducts and varied proportionately for other duct sizes. Change from regular spacing to end bell spacing shall start 10 foot from end bell and shall be made without reducing duct line slope and without forming trap in line. Grout end bells into manhole walls from both sides to provide watertight entrances. Provide groundable end bushings on metal ducts and connect to system grounding conductor.
- E. Duct Entrances to Buildings: Transformations from underground PVC duct to steel conduit shall be made 10 foot minimum unless otherwise indicated on drawings, outside building wall and shall use fittings manufactured for purpose. Install in accordance with following:
 1. Concrete-Encased Ducts: Install reinforcing in duct banks and coordinate duct bank with structural design at wall so duct bank is supported at wall without reducing structural or watertight integrity.

2. Direct-Buried, Nonencased Duct Entering Nonwaterproofed Walls: Install Schedule 40 galvanized steel pipe sleeve for each duct. Caulk space between conduit and sleeve with duct sealing compound on both sides for moisture-tight seal.
 3. Waterproof Entrances: Where ducts enter buildings through waterproofed floor or wall, watertight entrance-sealing device shall be installed with sealing gland assembly on inside. Anchor device securely into masonry construction with one or more integral flanges and membrane waterproofing secured to device in permanently watertight manner.
- F. Concrete-Encased Ducts: Support on plastic separators coordinated with duct size and required duct spacing, and install in accordance with following:
1. Separator Installation: Space separators close enough to prevent sagging and deforming of ducts, and secure separators to earth and to ducts to prevent floating during concreting. Do not use tie wires or reinforcing steel in such way as to form conductive or magnetic loops around ducts or duct groups.
 2. Reinforcing: Reinforce duct banks. Size and arrange reinforcing steel as indicated on Drawings.
 3. Concreting: Spade concrete carefully during pours to prevent voids under and between conduits and at exterior surface of envelope. Do not use power-driven agitating equipment unless specifically designed for duct bank application. Pour each run of envelope between manholes or other terminations in one continuous operation unless approved by Engineer. Where more than one pour is necessary, terminate each pour in vertical plane and continue duct bank reinforcing minimum of 18 inch beyond termination of pour. Top layer of concrete encased conduit duct bank shall be dyed red.
 4. Forms: Walls of trench may be used to form side walls of duct bank provided soil is self-supporting and concrete envelope can be poured without soil inclusions. Use forms where soil is not self-supporting.
 5. Minimum Clearances: 3 inch between ducts and exterior envelope wall, 3 inch between ducts for like services, and 6 inch between power and ducts for other systems.
 6. Depth: Except as otherwise indicated, top of duct bank shall be 24 inch below finished grade, minimum, in nontraffic areas, and 30 inch below finished grade, minimum, in vehicular traffic areas.
- G. Stub-ups: Duct stub-ups to equipment shall be PVC coated galvanized rigid steel. For equipment mounted on outdoor concrete pads, PVC coated rigid steel conduit shall extend minimum of 5 foot away from edge of pad. Install insulated grounding bushings on terminations. Couple steel conduits to ducts with adapters designed for purpose and encased concrete.
- H. Sealing: For ducts to be wired in this Project, provide temporary closure at terminations. For spare ducts, seal bore of ducts at terminations. Use sealing compound and plugs as required to withstand 15 psi minimum hydrostatic pressure.
- I. Pulling Cord: Provide 100 pound test nylon cord in ducts including spares.
- J. Marker Tape: Provide plastic marker tape over ducts at 12 inch below finished grade in accordance with Section 26 05 53.

3.04 CLEANING AND RESTORATION

- A. Clean Ducts: Clean full length of ducts with round bristle brush with diameter 1/2 inch greater than internal diameter of duct.
- B. Clean Manholes: Clean internal surfaces of manholes including sump. Remove foreign material.

3.05 RESTORATION

- A. Restore surface features at areas disturbed by excavation and reestablish original grades except as otherwise indicated.
- B. Where sod has been removed, replace it as soon as possible after backfilling is completed.
- C. Restore all areas disturbed by trenching, storing of dirt, cable laying, and other work to their original condition.
- D. Include necessary topsoiling, fertilizing, liming, seeding, sodding, sprigging, or mulching.
- E. Restore disturbed paving as indicated.

END OF SECTION

SECTION 26 05 53
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1– GENERAL

1.01 SUMMARY

A. Section Includes:

1. Identification of electrical materials, equipment, and installations.

1.02 SUBMITTALS

A. Product Data:

1. Submit for each type of product specified.

B. Miscellaneous:

1. Schedule of identification nomenclature to be used for identification signs and labels.

C. Submit in accordance with Section 01 33 00.

1.03 QUALITY ASSURANCE

A. Regulatory Requirements:

1. National Electrical Code (NEC): Components and installation shall comply with National Fire Protection Association (NFPA) 70.
2. Comply with American National Standards Institute (ANSI) C2.

PART 2– PRODUCTS

2.01 RACEWAY AND CONDUCTOR LABELS

- A. Manufacturer's Standard Products: Where more than one type is listed for specified application, selection is Installer's option, but provide a single type for each application category. Use colors prescribed by American National Standards Institute (ANSI) A13.1, NFPA 70, or as specified elsewhere.
- B. Conform to ANSI A13.1, Table 3, for minimum size of letters for legend and minimum length of color field for each raceway or cable size.
 1. Color: Black legend on orange field.
 2. Legend: Indicates voltage.
- C. Adhesive Labels: Preprinted, flexible, self adhesive vinyl. Legend is over-laminated with clear, wear and chemical resistant coating.
- D. Pre-tensioned, Wraparound Plastic Sleeves: Flexible, preprinted, color coded, acrylic or latex bands sized to suit diameter of line it identifies and arranged to stay in place by pre-tensioned gripping action when placed in position.
- E. Colored Adhesive Tape: Self adhesive vinyl tape not less than 3 mils thick by 1 to 2 inch wide (0.08 millimeter thick by 25 to 51 millimeter wide).

- F. Underground Line Warning Tape: Permanent, bright colored, continuous printed, vinyl tape with following features:
 - 1. Size: Not less than 6 inch wide by 4 mils thick (152 millimeter wide by 0.102 millimeter thick).
 - 2. Compounded for permanent direct burial service.
 - 3. Embedded continuous metallic strip or core.
 - 4. Printed Legend: Indicates type of underground line.
- G. Aluminum, Wraparound Marker Bands: Bands cut from 0.014 inch (0.4 millimeter) thick aluminum sheet, with stamped or embossed legend, and fitted with slots or ears for permanently securing around wire or cable jacket or around groups of conductors.
- H. Plasticized Card Stock Tags: Vinyl cloth with preprinted and field printed legends. Orange background, except as otherwise indicated, with eyelet for fastener.
- I. Aluminum Faced Card Stock Tags: Wear resistant, 18 point minimum card stock faced on both sides with embossable aluminum sheet, 0.002 inch (0.05 millimeter) thick, laminated with moisture resistant acrylic adhesive, and punched for fastener. Preprinted legends suit each application.
- J. Brass or Aluminum Tags: Metal tags with stamped legend, punched for fastener. Dimensions: 2 by 2 inch (51 by 51 millimeter) by 0.05 inch (1.3 millimeter).

2.02 ENGRAVED NAMEPLATES AND SIGNS

- A. Manufacturer's Standard Products: Where more than one type is listed for specified application, selection is Installer's option, but provide single type for each application category. Use colors prescribed by ANSI A13.1, NFPA 70, or as specified elsewhere.
- B. Engraving stock, melamine plastic laminate, 1/16 inch (1.6 millimeter) minimum thick for signs up to 20 square inch (129 square cm), 1/8 inch (3.2 millimeter) thick for larger sizes.
 - 1. Engraved Legend: Black letters on white face.
 - 2. Punched for mechanical fasteners.
- C. Baked Enamel Signs for Interior Use: Preprinted aluminum signs, punched for fasteners, with colors, legend, and size as indicated or as otherwise required for application. 1/4 inch (6.4 millimeter) grommets in corners for mounting.
- D. Exterior, Metal Backed, Signs: Wear resistant, non-fading, UV resistant ink, with reinforced UV, chemical, abrasion, and moisture resistant laminate layer. Aluminum substrate 0.04 inch (1 millimeter), with colors, legend, and size appropriate to application. 1/4 inch (6.4 millimeter) grommets in corners for mounting.
- E. Fasteners for Plastic Laminated and Metal Signs: Self tapping stainless steel screws or No. 10/32 stainless steel machine screws with nuts, flat washers and lock washers.

2.03 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Cable Ties: Fungus-inert, self extinguishing, 1 piece, self locking, Type 6/6 nylon cable ties with following features:
 - 1. Minimum Width: 3/16 inch (5 millimeter).
 - 2. Tensile Strength: 50 pound (22.3 kilograms) minimum.
 - 3. Temperature Range: Minus 40 to 185 degrees Fahrenheit (Minus 4 to 85 degrees Celsius).
 - 4. Color: As indicated where used for color coding.

- B. Paint: Alkyd-urethane enamel. Primer as recommended by enamel manufacturer.

PART 3– EXECUTION

3.01 INSTALLATION

- A. Install identification devices according to manufacturer's written instructions.
- B. Install labels where indicated and at locations for best convenience of viewing without interference with operation and maintenance of equipment.
- C. Lettering, Colors, and Graphics: Coordinate names, abbreviations, colors, and or designations used for electrical identification with corresponding designations used in Contract Documents or required by codes and standards. Use consistent designations throughout Project.
- D. Sequence of Work: Where identification is to be applied to surfaces that require finish, install identification after completion of finish work.
- E. Self Adhesive Identification Products: Clean surfaces of dust, loose material, and oily films before applying.
- F. Identify feeders over 600 volt with "DANGER-HIGH VOLTAGE" in black letters 2 inch (51 millimeter) high, stenciled with paint at 10 feet (3 meter) intervals over continuous, painted orange background. Identify following:
 - 1. Entire floor area directly above conduits running beneath and within 12 inch (305 millimeter) of basement or ground floor that is in contact with earth or is framed above unexcavated space.
 - 2. Wall surfaces directly external to conduits concealed within wall.
 - 3. All accessible surfaces of concrete envelope around conduits in vertical shafts, exposed in building, or concealed above suspended ceilings.
 - 4. Entire surface of exposed conduits.
- G. Install painted identification as follows:
 - 1. Clean surfaces of dust, loose material, and oily films before painting.
 - 2. Prime Surfaces: For galvanized metal, use single component, acrylic vehicle coating formulated for galvanized surfaces. For concrete masonry units, use heavy duty, acrylic resin block filler. For concrete surfaces, use clear, alkali resistant, alkyd binder type sealer.
 - 3. Apply one intermediate and one finish coat of silicone alkyd enamel.
 - 4. Apply primer and finish materials according to manufacturer's instructions.
- H. Identify Raceways containing power, control and instrumentation conductors with adhesive labels identifying voltage and raceway contents. Locate labels at penetrations of walls and floors, at 50 feet (15 meter) maximum intervals in straight runs, and at 25 feet (7.6 meter) in congested areas.
- I. Identify Raceways and Exposed Cables of Certain Systems with Color Banding: Band exposed and accessible raceways of systems listed below for identification.
 - 1. Bands: Pre-tensioned, snap around, colored plastic sleeves; colored adhesive tape; or combination of both. Make each color band 2 inch (51 millimeter) wide, completely encircling conduit, and place adjacent bands of 2 color markings in contact, side by side.
 - 2. Locate bands at changes in direction, at penetrations of walls and floors, at 50 feet (15 meter) maximum intervals in straight runs, and at 25 feet (7.6 meter) in congested areas.

- J. Install Caution Signs for Enclosures Over 600 volts: Use pressure sensitive, self-adhesive label indicating system voltage in black, preprinted on orange field. Install on exterior of door or cover.
- K. Install Circuit Identification Labels on Boxes: Label externally as follows:
1. Exposed Boxes: Pressure sensitive, self adhesive plastic label on cover.
 2. Concealed Boxes: Plasticized card stock tags.
 3. Labeling Legend: Permanent, water proof listing of panel and circuit number or equivalent.
- L. Identify Paths of Underground Electrical Lines: During trench backfilling, for exterior underground power, control, signal, and communications lines, install continuous underground plastic line marker located directly above line at 6 to 8 inch (150 to 200 millimeter) below finished grade. Where multiple lines installed in common trench or concrete envelope provide multiple underground line warning tapes, one for each 16 inches of width of lines. If lines do not exceed an overall width of 16 inch (400 millimeter), use single line marker.
1. Install line marker for underground wiring, both direct buried and in raceway.
- M. Color Code Conductors: Secondary service, feeder, and branch circuit conductors throughout secondary electrical system.
1. Field applied, color coding methods may be used in lieu of factory coded wire for sizes larger than No. 10 AWG.
 - a. Colored, pressure sensitive plastic tape in half lapped turns for distance of 6 inch (150 millimeter) from terminal points and in boxes where splices or taps are made. Apply last 2 turns of tape with no tension to prevent possible unwinding. Use 1 inch (25 millimeter) wide tape in colors as specified. Adjust tape bands to avoid obscuring cable identification markings.
 - b. Colored cable ties applied in groups of 3 ties of specified color to each wire at each terminal or splice point starting 3 inch (76 millimeter) from terminal and spaced 3 inch (76 millimeter) apart. Apply with special tool or pliers, tighten to snug fit, and cut off excess length.
 2. 208/120 Volt System: As follows:
 - a. Phase A: Black.
 - b. Phase B: Red.
 - c. Phase C: Blue.
 - d. Neutral: White.
 - e. Ground: Green.
 3. 480/277 Volt System: As follows:
 - a. Phase A: Brown.
 - b. Phase B: Orange.
 - c. Phase C: Yellow.
 - d. Neutral: White with non-green stripe.
 - e. Ground: Green.
- N. Power Circuit Identification: Use metal tags or aluminum wraparound marker bands for cables, feeders, and power circuits in vaults, pull boxes, junction boxes, manholes, and switchboard rooms.
1. Legend: 1/4 inch (6.4 millimeter) steel letter and number stamping or embossing with legend corresponding to indicated circuit designations.
 2. Fasten tags with nylon cable ties; fasten bands using integral ears.

O. Apply identification to conductors as follows:

1. Conductors to Be Extended in Future: Indicate source and circuit numbers.
2. Multiple Power or Lighting Circuits in Same Enclosure: Identify each conductor with source, voltage, circuit number, and phase. Use color coding for voltage and phase indication of secondary circuit.
3. Multiple Control and Communications Circuits in Same Enclosure: Identify each conductor by its system and circuit designation. Use consistent system of tags, color coding, or cable marking tape.

P. Apply warning, caution, and instruction signs and stencils as follows:

1. Install warning, caution, and instruction signs where indicated or required to ensure safe operation and maintenance of electrical systems and of items to which they connect. Install engraved, plastic laminated instruction signs with approved legend where instructions or explanations are needed for system or equipment operation. Install butyrate signs with metal backing for outdoor items.
2. Emergency Operating Signs: Install engraved laminate signs with white legend on red background with minimum 3/8 inch (9 millimeter) high lettering for emergency instructions on power transfer, load shedding, and or emergency operations.

Q. Install identification as follows:

1. Apply equipment identification labels of engraved plastic laminate on each major unit of equipment, including central or master unit of each system. This includes communication, signal, and alarm systems, unless units are specified with their own self-explanatory identification. Except as otherwise indicated, provide single line of text with 1/2 inch (13 millimeter) high lettering on 1-1/2 inch (38 millimeter) high label; where 2 lines of text are required, use lettering 2 inch (51 millimeter) high. Use black lettering on white field. Apply labels for each unit of following categories of equipment.
 - a. Panelboards, electrical cabinets, and enclosures.
 - b. Access doors and panels for concealed electrical items.
 - c. Soft Starters
 - d. Emergency Stops.
 - e. Power transfer equipment.
 - f. Control devices.
2. Apply designation labels of engraved plastic laminate for disconnect switches, breakers, push buttons, pilot lights, motor control centers, and similar items for power distribution and control components above, except panelboards and alarm/signal components where labeling is specified elsewhere. For panelboards, provide framed, typed circuit schedules with explicit description and identification of items controlled by each individual breaker.

END OF SECTION

SECTION 26 05 73
POWER SYSTEM STUDIES

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Short circuit study, protective device evaluation study, protective device coordination study, and arc flash study on entire electrical power distribution system.
 2. Portions of electrical distribution system from normal and alternate sources of power throughout distribution system. Normal system operating method, alternate operation, and operations which could result in maximum fault conditions and maximum incident energy shall be covered in study.
- B.** Contractor shall engage services of independent engineering firm for purpose of performing electric power system studies as specified.
- C.** The Electrical Power System Studies shall be performed and the shop drawing shall be submitted and approved prior to submitting the shop drawings for the electrical equipment.

1.02 SUBMITTALS

A. Study Report:

1. Provide summary of results of power system study in final report. Submit 5 bound copies of final report.
 2. Include:
 - a. Description, purpose, basis, and scope of study and single line diagram of power system.
 - b. Tabulations of circuit breaker, fuse, and other protective device ratings versus calculated short circuit duties and commentary regarding same.
 - c. Protective device time versus current color coordination curves, tabulations of relay and circuit breaker trip settings, fuse selection, and commentary regarding same.
 - d. Fault current calculations including definition of terms and guide for interpretation of computer printout.
 - e. Tabulation of appropriate tap settings for relay units.
 - f. Arc flash calculations and tabulation of incident energy level calories /square centimeter (cal/cm²) for each equipment location and recommended personal protective equipment (PPE).
- B.** Submit in accordance with Section 01 33 00.

1.03 QUALITY ASSURANCE

A. Regulatory Requirements:

1. National Electric Code (NEC): Components and installation shall comply with National Fire Protection Association (NFPA) 70.
2. National Electric Safety Code (NESC): Components and installation shall comply with American National Standards Institute (ANSI) C2.
3. Standard for Electrical Safety in the Work Place: National Fire Protection Association (NFPA) 70E.

B. Qualifications of engineering firm.

1. Corporately and financially independent engineering organization which can function as unbiased engineering authority, professionally independent of manufacturers, suppliers and installers of equipment or systems studied as specified.
2. Study report shall be signed and sealed by Professional Engineer registered in same State as project location.
3. Engineering organization may be same as testing organization.

PART 2 – PRODUCTS

(Not Used)

PART 3 – EXECUTION

3.01 STUDIES

A. Studies include following.

1. Utility Company incoming service lines.
2. Emergency Generator
3. Automatic Transfer Switches
4. Switchboards
5. Motor control centers.
6. Transformers
7. VFDs
8. Soft Starters
9. Power and lighting distribution panels.
10. Cable, wire, and conduit systems.
11. Motors greater than 25 HP.

B. Studies do not include equipment as shown on Drawings indicated as future.

C. Contractor and company performing the power system studies are responsible for gathering information on the equipment and conductors required to perform the power system studies.

3.02 SHORT CIRCUIT STUDY

A. Provide complete report with printout data sheets using digital computer type program as part of study.

B. Include utilities' short circuit contribution, resistance and reactance components of branch impedances, X/R ratios, base quantities selected, and other source impedances.

C. Calculate short circuit momentary duty values and interrupting duty values based on assumed 3-phase bolted short circuit at switch gear base medium voltage controller, switchboard, low voltage Motor Control Center (MCC), distribution panelboard, pertinent branch circuit panel, and other significant locations through system. Include short circuit tabulation of symmetrical fault currents and X/R ratios. List with respective X/R ratio each fault location, total duty on bus, and individual contribution from each connected branch.

3.03 EQUIPMENT DEVICE EVALUATION STUDY

A. Provide protective device evaluation study to determine adequacy of circuit breakers, molded case switches, automatic transfer switches, knife switches, controllers, surge arresters, busways,

and fuses by tabulating and comparing short circuit ratings of these devices with calculated fault currents. Apply appropriate multiplying factors based on system X/R ratios and protective device rating standards. Notify Engineer of problem areas or inadequacies in equipment due to short circuit currents and provide suggested alternate equipment.

3.04 EQUIPMENT DEVICE COORDINATION STUDY

- A. Provide protective device coordination study with necessary calculations and logic decisions required to select or check selection of power fuse ratings, protective relay characteristics and settings, ratios and characteristics of associated current transformers, and low voltage breaker trip characteristics and settings. Objective of study to obtain optimum protective and coordination performance from these devices.
- B. Include as part of coordination study, medium and low voltage classes of equipment from utility's incoming line protective device down to and including largest rated device in 480 volt MCCs and panelboards. Include phase and ground overcurrent protection as well as settings of other adjustable protective devices.
- C. Draw time-current characteristics of specified protective devices in color on log-log paper or computer printout. Include with plots complete titles, representative one-line diagram and legends, associated Power Company's relays or fuse characteristics, significant motor starting characteristics, complete parameters of transformers, complete operating bands of low voltage circuit breaker trip curves and fuses. Indicate types of protective devices selected, proposed relay taps, time dial and instantaneous trip settings, transformer magnetizing in-rush and ANSI transformer withstand parameters, cable thermal overcurrent withstand limits, and significant symmetrical and asymmetrical fault currents. Provide coordination plots for phase and ground protective devices on system basis. Provide sufficient number of separate curves to indicate coordination achieved.
- D. Provide separate selection and settings of protective devices in tabulated form listing circuit identification, Institute of Electrical and Electronics Engineers (IEEE) device number, current transformer ratios and connection, manufacturer and type, range of adjustment, and recommended settings. Tabulate recommended power fuse selection for medium voltage fuses where applied in system. Notify Engineer of discrepancies, problem areas or inadequacies and provide suggested alternate equipment ratings and/or settings.

3.05 ARC FLASH STUDY

- A. Provide Incident Energy Study – An incident energy study shall be done in accordance with the IEEE 1584, "IEEE Guide for Performing Arc Flash Hazard Calculations" as referenced in NFPA 70E, "Standard for Electrical Safety in the Workplace", in order to quantify the hazard for selection of personal protective equipment (PPE).
- B. Adjust system design to optimize the results of the study as it relates to safety and reliable electrical system operation (e.g. overcurrent device settings, current limiting devices). This includes mitigation, where possible, of incident energy levels that exceed 40 cal/cm². Provide suggested alternate equipment and settings to minimize incident energy levels.
- C. Provide incident energy level (cal/cm²) for each equipment location and recommended PPE.
- D. Based on the results of the incident energy study provide and install a warning label (orange <40 cal/cm²) or danger label (red > 40 cal/cm²) for each piece of equipment. The label must be readable in both indoor and outdoor environments and contain the following information:
 - 1. Arc hazard boundary (feet and inches)
 - 2. Working distance (feet and inches)
 - 3. Arc flash incident energy at the working distance (cal/cm²)

4. Voltage rating of the equipment
 5. Limited approach distance (feet and inches)
 6. Restricted approach distance (feet and inches)
 7. Equipment/bus name
 8. Date prepared
- E. Provide one day of arc flash safety training, travel time excluded and at jobsite or classroom designated by Owner, that contains the requirements referenced in Occupational Safety and Health Administration (OSHA) 1910.269, OSHA 1910 Subpart S and NFPA 70E. Training shall include but not be limited to the following:
1. Proper use of the system analysis data
 2. Interpretation of hazard labels
 3. Selection and utilization of personal protective equipment
 4. Safe work practices and procedures
- 3.06 PROTECTIVE DEVICE TESTING, CALIBRATION, AND ADJUSTMENT
- A. Comply with Section 26 01 26.

END OF SECTION

SECTION 26 25 50
PORTABLE GENERATOR CONNECTION CABINET

PART 1 - GENERAL

3.01 SUMMARY

A. Section Includes:

1. Portable Generator Connection Cabinet

3.02 SUBMITTALS

A. Product Data:

1. Submit dimensioned plans, sections, and elevations showing minimum clearances; conductor entry provisions; gutter space; installed features and devices; and materials lists.
2. Wiring diagrams, elementary or schematic, differentiating between manufacturer installed and field installed wiring.

B. Test Results:

1. Certified reports of field tests and observations

C. Miscellaneous:

1. Manufacturer's certificate of compliance to referenced standards and tested short circuit closing and withstand ratings applicable to protective devices and current ratings used in this Project, as indicated and as specified in this section.

D. Operation and Maintenance (O&M) Data:

1. Include features and operating sequences, both automatic and manual.
2. List factory settings of relays and provide relay setting and calibration instructions.
3. Submit in accordance with Section 01 78 23.

E. Submit in accordance with Section 01 33 00.

3.03 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

C. UL 1008 or ETL Listed to UL 1008 Standards.

D. Comply with NEC 700.3(F)

E. Service Entrance Rated.

3.04 GUARANTEE/WARRANTY

- A. The equipment installed under this contract shall be left in proper working order. Replace, without additional charge, new work or material which develops defects from ordinary use within one year.
- B. New materials and equipment shall be guaranteed against defects in composition, design or workmanship. Guarantee certificates shall be furnished.

PART 2 - PRODUCTS

3.01 MANUFACTURERS:

- A. ASCO
- B. Power Temp
- C. Or Approved Equal

3.02 INTEGRATED CIRCUIT BREAKER(S)

- A. Circuit breakers shall be Square D, Siemens, or ABB, LSIG, UL 489 Circuit Breakers, Comply with UL 489 with interrupt capabilities to meet the available fault currents. Include mechanical lugs on tin plated copper busbar for line and load connections.

3.03 GENERAL REQUIREMENTS

- A. (3) Sets of 400A Camlocks shall be provided for each of the following:
 - 1. Portable Generator
 - 2. Load Bank
- B. Protective Caps
 - 1. All Camlocks shall be protected with spring loaded weather proof flip covers that are clear in color to allow for easy viewing of phase color and gender.
- C. Enclosures:
 - 1. Pad mount, Bottom Entry, NEMA 3R rain-tight, stainless steel enclosure with rake system for cable entry at the bottom.
 - 2. Cable entry area at the bottom of the enclosure shall be covered by a hinged trap door.
 - a. It shall be possible to close and lock the front door to the enclosure with the trap door open, and power cables connected through the bottom of the enclosure. The enclosure shall maintain NEMA 3R integrity with power cables connected.
 - 3. Front Cover:
 - a. Hinged.
 - b. Gasketed.
 - c. Pad-lockable latch.
 - 4. Finishes:
 - a. Paint after fabrication. Powder coated Hammer Gray.

D. Phase, Neutral, and Ground Buses:

1. Material: Silver-plated, specified upon order.
2. Equipment Ground Bus: bonded to box.
3. Isolated Ground Bus: insulated from box.
4. Ground Bus: 100% of phase size.
5. Neutral Bus: Neutral bus rated 100 percent of phase bus.
6. Round edges on bus.

E. All hardware shall be stainless steel including all bolts, nuts, and hinges.

F. Portable Generator Hardwire Connections will be "Repetitive Use" Smart Lugs for the use of fine strand portable power cable, oblong cable hole, have ¾" hex head bolt type head and ½" threaded hole for ring terminal connection. Standard Cone Type mechanical lugs for THHN will not be allowed.

G. Copper bus shall be silver plated.

H. Lockable rake system with reinforced support struts to reduce cable theft.

I. Permanent generator connectors shall be broad range set-screw type, located behind an aluminum barrier.

J. Voltage & Phase shall be as shown on project one line drawing. Camlocks shall be color coded as appropriate for the specified voltage and as specified in section 26 05 53.

K. Phase rotation meter shall be included and shall have LED's to annunciate improper phase rotation as well as a dry contact output for building management monitoring.

L. Amperage rating shall be as shown on project one-line drawing.

M. Extra depth shall be provided on all quick connects with pad mount leg kits to accommodate bottom cable entry.

N. A set of temporary generator connection lugs shall be provide in addition to the portable generator camlocks and they shall be broad range set-screw type, located behind an aluminum barrier. These lugs shall be used in the event the portable generator is not supplied with camlock cables.

O. The Dual purpose docking station shall include a locked access panel covering the portable generator Camlocks so that the portable generator cannot be connected to the load bus while the permanent generator is connected to the Load bus. It shall include a Kirk Key interlock block kit for installation (by contractor), to the permanent generator circuit breaker. Kirk Key system shall include dry contacts to annunciate at a remote location that the permanent generator is disconnected from the emergency system or not able to provide emergency power per NEC 700.3(F)5 requirements.

P. Load bank and portable generator connectors shall be Camlok style mounted on 45° angle plate or on gland plate (male for the portable generator and female for the portable load bank).

Q. Load bank "dump" circuit terminal block to "dump" load bank in the event there is a utility power outage while the permanent generator is being load bank tested.

3.04 ACCESSORIES

A. Portable Generator block heater receptacle 208V (30A)

- B. Portable Generator Battery Charger receptacle 120V (20A)
- C. Portable Generator Convenience outlet 120V (20A)
- D. Internal Heater 120V (20A)

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine elements and surfaces to receive Generator Quick Connect for compliance with installation tolerances and other conditions affecting performance of the Work.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Surface, Flush or Base Mounted: Specified with order.
 - 1. Install anchor bolts to elevations required for proper attachment to Generator Quick Connect.
- B. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

3.03 FIELD QUALITY CONTROL

- A. Generator Quick Connect vendor shall be required to send a technical representative to the job site to inspect and review installation to ensure it meets the requirements of the consulting engineer.
- B. Prepare inspection report that identifies Generator Quick Connect with notations of any remedial action taken to correct any issues.

END OF SECTION

SECTION 26 27 26
WIRING DEVICES

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Receptacles, connectors, switches, and finish plates.

1.02 DEFINITIONS

A. GFCI: Ground-fault circuit interrupter.

1.03 SUBMITTALS

A. Submittals are not required if one of named manufacturers is furnished. If named manufacturer is not furnished submit Product Data and Samples.

B. Product Data:

1. For each product specified that is not one of the named manufacturers.

C. Samples:

1. For devices and device plates for color selection and evaluation of technical features.

D. Submit in accordance with Section 01 33 00.

1.04 QUALITY ASSURANCE

A. Items provided under this section shall be listed or labeled by Underwriters Laboratories, Inc. (UL) or other Nationally Recognized Testing Laboratory (NRTL).

1. Term "NRTL" shall be as defined in OSHA Regulation 1910.7.
2. Term "listed" and "labeled" shall be as defined in National Electrical Code (NEC), Article 100.

B. Regulatory Requirements:

1. NEC: Components and installation shall comply with National Fire Protection Association (NFPA) 70.

C. Comply with National Electrical Manufacturers Association (NEMA) WD 1.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Wiring Devices:

1. Bryant Electric, Inc.
2. GE Company; GE Wiring Devices.
3. Hubbell, Inc.; Wiring Devices Div.
4. Killark Electric Manufacturing Co.
5. Pass & Seymour/Legrand; Wiring Devices Div.

6. Pyle-National, Inc.; an Amphenol Co.

2.02 RECEPTACLES

- A. Straight Blade and Locking Receptacles: Heavy Duty specification grade.
- B. GFCI Receptacles: Termination type, with integral NEMA WD 6, Configuration 5-20R duplex receptacle. Design units for installation in 2-3/4 inch (70 millimeter) deep outlet box without an adapter.
- C. Industrial Heavy Duty Receptacle: Comply with International Electrotechnical Commission (IEC) 309-1 and 309-2.
- D. Color: White unless otherwise indicated or required by Code.

2.03 WALL PLATES

- A. Single and combination types match corresponding wiring devices.
 - 1. Plate Securing Screws: Metal with head color to match plate finish.
 - 2. Finished Spaces: 0.04 inch (1 millimeter) thick, Type 302, satin finished stainless steel.
 - 3. Unfinished Spaces: Galvanized steel.
 - 4. Exterior and wet locations: Weatherproof plates and covers.
 - 5. Exterior and wet locations: Weatherproof plates and covers suitable for wet locations while in use.
 - a. Hinged and gasketed cover/enclosure to maintain weather tight seal while the equipment is plugged into it. TayMac or equal.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Mounting height as follows unless otherwise shown on Drawings:
 - 1. Switches: 48 inch above floor.
 - 2. AC Receptacles and Telephone Outlets: 15 inch above floor or 6 inch above counters, counter back-splashes, and baseboard radiators in finished areas; 48 inch above floor in unfinished areas.
- B. Install devices and assemblies plumb and secure.
- C. Install wall plates when painting is complete.
- D. Install wall dimmers to achieve indicated rating after derating for ganging as instructed by manufacturer.
- E. Do not share neutral conductor on load side of dimmers.
- F. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical, and grounding terminal of receptacles on top. Group adjacent switches under single, multi-gang wall plates.
- G. Protect devices and assemblies during painting.

- H. Adjust locations at which floor service outlets and telephone/power service poles are installed to suit arrangement of partitions and furnishings.

3.02 IDENTIFICATION

- A. Comply with Section 26 05 53.
 - 1. Switches: Where three or more switches are ganged, and elsewhere as indicated, identify each switch with approved legend engraved on wall plate.
 - 2. Receptacles: Identify panelboard and circuit number from which served. Use machine printed, pressure sensitive, abrasion resistant label tape on face of plate and durable wire markers or tags within outlet boxes.

3.03 CONNECTIONS

- A. Connect wiring device grounding terminal to branch circuit equipment grounding conductor.
- B. Isolated Ground Receptacles: Connect to isolated ground conductor routed to designated isolated equipment ground terminal of electrical system.
- C. Tighten electrical connectors and terminals according to manufacturers published torque-tightening values. If manufacturers torque values are not indicated, use those specified in UL 486A.

3.04 FIELD QUALITY CONTROL

- A. Test wiring devices for proper polarity and ground continuity. Operate each device at least six times.
- B. Test GFCI operation with both local and remote fault simulations according to manufacturer's written instructions.
- C. Replace damaged or defective components.

3.05 CLEANING

- A. Internally clean devices, device outlet boxes, and enclosures. Replace stained or improperly painted wall plates or devices.

END OF SECTION

SECTION 26 28 00
LOW-VOLTAGE CIRCUIT PROTECTION DEVICES

PART 1- GENERAL

1.01 SUMMARY

A. Section Includes:

1. Circuit breakers.

1.02 SUBMITTALS

A. Product Data:

1. Submit for Circuit Breakers

- a. Descriptive data and time-current curves for protective devices and let-through current curves for those devices with current-limiting characteristics. Include coordination charts and tables, and related data.

B. Test Results:

1. Report of Field Tests and Observations certified by Contractor.

C. Operating and Maintenance Data (O&M):

1. Maintenance data for tripping devices.
2. Submit in accordance with Section 01 78 23.

D. Submit in accordance with Section 01 33 00.

E. Approval of equipment specified in this section is contingent upon approval of coordination study specified in Section 26 05 73.

1.03 QUALITY ASSURANCE

A. Items provided under this section shall be listed or labeled by UL or other Nationally Recognized Testing Laboratory (NRTL).

1. Term "NRTL" shall be as defined in OSHA Regulation 1910.7.
2. Terms "listed" and "labeled" shall be as defined in National Electrical Code (NEC), Article 100.

B. Regulatory Requirements:

1. NEC: Components and installation shall comply with National Fire Protection Association (NFPA) 70.

C. Single-Source Responsibility: Enclosed switches, fuses and circuit breakers shall be product of single manufacturer.

1.04 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.

PART 2- PRODUCTS

2.01 CIRCUIT BREAKER

- A. Compatible with Westinghouse 2100 MCC. See one-line drawings.
- B. Molded-Case Circuit Breaker: NEMA AB 1, handle lockable with 2 padlocks.
- C. Characteristics:
 - 1. Frame size, trip rating, number of poles, and auxiliary devices as indicated
 - 2. Interrupting capacity rating to meet available fault current, 35,000 symmetrical rms amps minimum
 - 3. Appropriate application listing when used for switching fluorescent lighting loads or heating, air conditioning, and refrigeration equipment.
- D. Interchangeable Trips: Circuit breakers, 200 amps and larger, with trip units interchangeable within frame size.
- E. Field-Adjustable Trips: Circuit breakers, 400 amps and larger, with adjustable short time, long-time, instantaneous, and continuous current settings.
- F. Lugs: Mechanical lugs and power-distribution connectors for number, size, and material of conductors indicated.

PART 3- EXECUTION

3.01 EXAMINATION

- A. Examine utilization equipment nameplates and installation instructions to verify proper fuse locations, sizes, and characteristics.
- B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install circuit breakers in locations as indicated, according to manufacturer's written instructions.

3.03 IDENTIFICATION

- A. Install typewritten labels on inside door of each fused switch to indicate fuse replacement information.

3.04 COORDINATION STUDY

- A. Where coordination study recommends changes in types, classes, features or ratings of equipment or devices specified in Section 26 05 73 from those indicated, make written request for instructions. Obtain instructions from Engineer before ordering equipment or devices recommended to be changed.

3.05 FIELD QUALITY CONTROL

A. Manufacturer's Field Services:

1. Supplier's or manufacturer's representative for equipment specified herein shall be present at jobsite or classroom designated by Owner for minimum workdays indicated, travel time excluded, for assistance during plant construction, plant startup, and training of OWNER'S personnel for plant operation. Include:
 - a. 1/2 workday for Installation Services.
 - b. 1/2 workday for Instructional Services.
2. Supplier or manufacturer shall direct services to system and equipment operation, maintenance, troubleshooting, and equipment and system-related areas. See Section 01 61 00.
3. In addition to the services specified above, provide manufacturer's services as required to successfully complete systems demonstration as specified in Section 01 79 10.

B. Testing:

1. Reports: Prepare certified written reports on tests and observations. Report defective materials and workmanship and unsatisfactory test results. Include complete records of repairs and adjustments made.
2. Labeling: Upon satisfactory completion of tests and related effort, apply label to tested components indicating test results, date, and responsible person.
3. Schedule visual and mechanical inspections and electrical tests with at least 1 week's advance notification.
4. Upon completing installation of system, perform following preparations for tests:
 - a. Make insulation resistance tests of circuit breaker buses, components, and connecting supply, feeder, and control circuits.
 - b. Make continuity tests of circuits.
 - c. Include full updating on final system configuration and parameters where they supplement or differ from those indicated in original Contract Documents.
 - d. Comply with manufacturer's instructions for installation and testing of circuit breaker.
5. Visual and mechanical inspection: Include following inspections and related work.
 - a. Overcurrent-Protective-Device Ratings and Settings: Verify indicated ratings and settings to be appropriate for final system arrangement and parameters. Where discrepancies are found, Engineer shall recommend final protective device ratings and settings. Use accepted revised ratings or settings to make final system adjustments.
 - b. Inspect for defects and physical damage, NRTL labeling, and nameplate compliance with current single line diagram.
 - c. Exercise and perform operational tests of mechanical components and other operable devices in accordance with manufacturer's instruction manual.
 - d. Check tightness of electrical connections of circuit breaker with calibrated torque wrench. Refer to manufacturer's instructions for proper torque values.
 - e. Clean circuit breaker using manufacturer's approved methods and materials.
 - f. Verify installation of proper fuse types and ratings in fusible circuit breaker.
6. Electrical Tests: Include following items performed in accordance with manufacturer's instructions:
 - a. Insulation resistance test of circuit breaker conducting parts. Insulation resistance less than 100 megohms is not acceptable.
 - b. Verify trip unit reset characteristics for insulated-case circuit breakers.
 - c. Make adjustments for final settings of adjustable-trip devices.

- d. Activate auxiliary protective devices such as ground fault or undervoltage relays, to verify operation of shunt-trip devices.

- 7. Retest: Correct deficiencies identified by tests and observations and retest. Verify by system tests that specified requirements are met.

3.06 ADJUSTING

- A. Set field-adjustable pick-up and time-sensitivity ranges in accordance with Section 26 05 73.

3.07 CLEANING

- A. Upon completion of installation, inspect over current protection devices. Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish.

END OF SECTION

SECTION 26 29 00
LOW-VOLTAGE CONTROLLERS

PART 1- GENERAL

1.01 SUMMARY

A. Section Includes:

1. Alternating Current (AC) motor-control devices rated 600 Volts and less that are supplied as enclosed units.

1.02 SUBMITTALS

A. Product Data:

1. Include dimensions, ratings, and data on features and components.

B. Shop Drawings: For each controller center specified in this Section. Include dimensioned plans, elevations, and component lists. Show ratings, including short-time and short-circuit ratings.

1. Schedule of features, characteristics, ratings, and factory settings of individual units.
2. Wiring Diagrams: Interconnecting wiring diagrams pertinent to class and type specified for and schematic diagram of each type of controller unit indicated.

C. Test Results:

1. Certified reports of field tests and observations.

D. Operation and Maintenance Data (O&M):

1. Maintenance data for motor controllers.
2. Submit in accordance with Section 01 78 23.

E. Miscellaneous:

1. Load-Current and Overload-Relay Heater List: Compile after motors have been installed and arrange to demonstrate that selection of heaters suits actual motor nameplate full-load currents.

F. Submit in accordance with Section 01 33 00.

G. Approval of equipment specified in this section is contingent upon approval of coordination study specified in Section 26 05 73.

1.03 QUALITY ASSURANCE

A. Manufacturer Qualifications: Maintain, within 100 miles (160 kilometers) of Project site, service center capable of providing training, parts, and emergency maintenance and repairs.

B. Source Limitations: Obtain similar motor-control devices through one source from single manufacturer.

- C. Items provided under this section shall be listed or labeled by UL or other Nationally Recognized Testing Laboratory (NRTL).
 - 1. Term "NRTL" shall be as defined in Occupational Safety and Health Administration (OSHA) Regulation 1910.7.
 - 2. Terms "listed" and "labeled" shall be as defined in National Electrical Code, Article 100.
- D. Regulatory Requirements:
 - 1. National Electrical Code (NEC): Components and installation shall comply with National Fire Protection Association (NFPA) 70.

1.04 COORDINATION

- A. Coordinate features of controllers and accessory devices with pilot devices and control circuits to which they connect.
- B. Coordinate features, accessories, and functions of each motor controller with ratings and characteristics of supply circuit, motor, required control sequence, and duty cycle of motor and load.

1.05 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.
 - 1. Spare Fuses and LED Lamps: Furnish 1 spare for every 5 installed units, but not less than 1 set of 3 of each kind.

PART 2- PRODUCTS

2.01 MANUFACTURER AND MODEL NUMBER

- A. Schneider Electric Altistart Soft Starter
- B. No substitutions

2.02 COORDINATION STUDY

- A. Where coordination study specified in Section 26 05 73 recommends changes in types, classes, features or ratings of equipment or devices from those indicated, make written request for instruction. Obtain instructions from Engineer before ordering equipment or devices recommended to be changed.

2.03 ENCLOSURE

- A. Meet environmental conditions of installed location.
 - 1. Provide National Electrical Manufacturers Association (NEMA)-250 Type 1 enclosure in electrical equipment rooms and NEMA-250 Type 12 enclosure for other indoor switches locations unless otherwise indicated.

2.04 COMBINATION SOFT START CONTROLLER

- A. Enclosure: NEMA Type 12.
- B. Control Circuit: 120 Volt; obtained from integral control power transformer, unless otherwise indicated. Include control power transformer with adequate capacity to operate connected pilot, indicating and control devices, plus 100% spare capacity.
- C. Combination Controller: Factory-assembled combination controller and disconnect switch with or without overcurrent protection as indicated.
 - 1. Circuit-Breaker Disconnect: NEMA AB 1, motor-circuit protector with field-adjustable short-circuit trip coordinated with motor locked-rotor amperes.
- D. Overload Relay:
 - 1. Electronic Overload Integral to Soft Start Combination Controller
- E. Voltage: 480V, 3 PH
- F. Rated Current: 480 FLA
- G. Motor HP: 350
- H. Keypad
- I. Integral HOA Switch
- J. Auxilliary Contacts:
 - 1. 1 NO/NC Run Contact
 - 2. 1 NO/NC Fault Contact
 - 3. 1 NO/NC Bypass Run Contact
- K. Solid-State, Reduced-Voltage Controller: NEMA ICS 2, suitable for use with standard NEMA MG 1, Design B, polyphase, medium induction motors.
 - 1. Adjustable acceleration rate control uses voltage or current ramp, and adjustable starting torque control has up to 500% current limitation for 20 sec.
 - 2. Surge suppressor in solid-state power circuits provides 3 phase protection against damage from supply voltage surges 10% or more above nominal line voltage.
 - 3. Light Emitting Diode (LED) indicators show motor and control status, including following conditions:
 - a. Run
 - b. Fault
 - c. Stop
 - 4. Integral Across the line Bypass Contactor and Isolation Contactor. When Motor reaches full speed, motor shall automatically switch to across the line.

2.05 ACCESSORIES

- A. Provide devices when indicated. Factory install in controller enclosure, where indicated.
- B. Push-Button Stations, Pilot Lights, and Selector Switches: NEMA ICS 2, heavy-duty type.
- C. Stop and Lockout Push-Button Station: Momentary-break push-button station with factory-applied hasp arranged so padlock can be used to lock push button in depressed position with control circuit open.
- D. Control Relays: Auxiliary and adjustable time-delay relays.
- E. Elapsed Time Meters: Heavy duty with digital readout in hours.
- F. Transient Voltage Surge Suppressors: IEEE C62.41, selected to meet requirements for medium-exposure category. Impulse sparkover voltage coordinated with system circuit voltage. Factory mounted with Nationally Recognized Testing Laboratory listed and labeled mounting device.

PART 3- EXECUTION

3.01 APPLICATIONS

- A. Select features of each motor controller to coordinate with ratings and characteristics of supply circuit and motor; required control sequence; duty cycle of motor, drive, and load; and configuration of pilot device and control circuit affecting controller functions.
- B. Select horsepower rating of controllers to suit motor controlled.
- C. Use fractional-horsepower manual controllers for single-phase motors, unless otherwise indicated.
- D. Use manual controllers for 3 phase motors only as indicated.
- E. Push-Button Stations: In covers of magnetic controllers for manually started motors where indicated, start contact connected in parallel with sealing auxiliary contact for low-voltage protection.
- F. Hand-Off-Automatic Selector Switches: In covers of manual and magnetic controllers of motors started and stopped by automatic controls or interlocks with other equipment where indicated.

3.02 INSTALLATION

- A. Install independently mounted motor-control devices according to manufacturer's written instructions.
- B. Location: Locate controllers within sight of motors controlled, unless otherwise indicated.
- C. For control equipment at walls, bolt units to wall or mount on lightweight structural-steel channels bolted to wall. For controllers not at walls, provide freestanding racks conforming to Section 26 05 29.
- D. Install freestanding equipment on concrete housekeeping bases conforming to Section 03 30 00.
- E. Motor-Controller Fuses: Install indicated fuses in each fusible switch.

3.03 IDENTIFICATION

- A. Identify motor-control components and control wiring according to Section 26 05 53

3.04 CONNECTIONS

- A. Tighten connectors, terminals, bus joints, and mountings. Tighten field-connected connectors and terminals, including screws and bolts, according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A.

3.05 COORDINATION STUDY

- A. Where coordination study specified in Section 26 05 73 recommends changes in types, classes, features or ratings of equipment or devices from those indicated, make written request for instructions. Obtain instructions from Engineer before ordering equipment or devices recommended to be changed.

3.06 FIELD QUALITY CONTROL

A. Manufacturer's Field Services:

1. Supplier's or manufacturer's representative for equipment specified herein shall be present at jobsite or classroom designated by Owner for minimum workdays indicated, travel time excluded, for assistance during plant construction, plant startup, and training of OWNER'S personnel for plant operation. Include:
 - a. 1 workday for Installation Services.
 - b. 1/2 workday for Instructional Services.
2. Supplier or manufacturer shall direct services to system and equipment operation, maintenance, troubleshooting, and equipment and system-related areas other than wastewater treatment process. See Section 01 61 00.
3. In addition to the services specified above, provide manufacturer's services as required to successfully complete systems demonstration as specified in Section 01 79 10.
4. Manufacturer's Field Services: Provide services of factory-authorized service representative to supervise field assembly and connection of components, including pretesting and adjustment of solid-state controllers.

B. Testing:

1. Reports: Notify Engineer in writing indicating defective materials and workmanship and unsatisfactory test results. Include records of repairs and adjustments made.
2. On completing installation of system, perform following tests.
 - a. Test insulation resistance of conducting parts of motor control components; and of connecting supply, feeder, and control circuits. For devices containing solid-state components, use test equipment and methods recommended by manufacturer.
 - b. Make continuity tests of circuits.
 - c. Review updating of final system configuration and parameters where they supplement or differ from those indicated in original Contract Documents.
 - d. Review manufacturer's written instructions for installation and testing of motor control devices.
3. Visual and Mechanical Inspection: Include following inspections and related work.

- a. Motor Control Device Ratings and Settings: Verify ratings and settings as installed are appropriate for final loads and final system arrangement and parameters. Recommend final protective device ratings and settings where differences found. Use accepted revised ratings or settings to make final system adjustments.
 - b. Inspect for defects and physical damage and nameplate compliance with Drawings.
 - c. Exercise and perform operational tests of mechanical components and other operable devices in accordance with manufacturer's written instructions.
 - d. Check tightness of electrical connections of devices with calibrated torque wrench. Use manufacturer's recommended torque values.
 - e. Clean devices using manufacturer's approved methods and materials.
 - f. Verify proper fuse types and ratings in fusible devices.
4. Electrical Tests: Perform following in accordance with manufacturer's written instructions.
- a. Insulation resistance test of motor control devices conducting parts to extent permitted by manufacturer's written instructions. Insulation resistance less than 100 megohms not acceptable.
 - b. Use primary current injection to check performance characteristics of motor circuit protectors and for overload relays of controllers for motors 15 hp and larger. Trip characteristics not within manufacturer's published time-current tolerances not acceptable.
 - c. Make adjustments for final settings of adjustable trip devices.
 - d. Test auxiliary protective features such as loss of phase, phase unbalance, and undervoltage to verify operation.
 - e. Check for improper voltages at terminals in controllers having external control wiring when controller disconnect opened. Voltage over 30 volts unacceptable.
5. Correct deficiencies and retest motor control devices. Verify by system tests that specified requirements are met.

C. Retesting:

- 1. Correct deficiencies identified by tests and completely retest equipment.
- 2. Verify by system test that total system meets specification requirements.

3.07 ADJUSTING

A. Time Delay Restart Relay:

- 1. Adjust control relay to cause motor starter to drop out at voltage slightly higher than dropout voltage of starter and have dropout time slightly faster than motor starter to ensure if motor starter drops out, relay will drop out.

B. Set field-adjustable pick-up and time-sensitivity ranges in accordance with Section 26 05 73.

3.08 CLEANING

- A. Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish. Clean devices internally, using methods and materials recommended by manufacturer.

END OF SECTION

SECTION 26 32 13.13
DIESEL-ENGINE-DRIVEN GENERATOR SETS

PART 1- GENERAL

1.01 SUMMARY

A. Section Includes:

1. Engine generator set.
2. Cooling system.
3. Fuel system.
4. Starting system.
5. Combustion air intake and engine exhaust systems.
6. Weatherproof housing.
7. Sound Attenuation
8. Generator Access Platform

1.02 DEFINITIONS

- A. Emergency or Standby Rating: Power output rating equal to power that generator set delivers continuously under normally varying load factors for duration of power outage with capability of 24 continuous operating hours.
- B. Operational Bandwidth: Total variation from lowest to highest value of parameter over range of conditions indicated, expressed as percentage of nominal value of parameter.
- C. Power Output Rating: Gross electrical power output of generator set minus total power requirements of electric motor-driven accessories normally constituting part of engine assembly.
- D. Steady-State Voltage Modulation: Uniform cyclical variation of voltage within operational bandwidth, expressed in Hertz or cycles per second.

1.03 SYSTEM DESCRIPTION

A. Design Requirements:

1. System Includes: Standby-rated, automatically started diesel engine coupled to ac generator unit. Engine and generator are factory-mounted and factory-aligned on structural steel skid. Subsystems and auxiliary components and equipment are as indicated.
2. Environmental Conditions: Engine generator system withstands following environmental conditions without mechanical or electrical damage or degradation of performance capability:
 - a. Ambient Temperature: -15 to +40°C.
 - b. Relative Humidity: 0 to 95%.
 - c. Altitude: Sea level to 1,000 feet (300 meters).

B. Performance Requirements:

1. Functional Description: Switching "On-Off" switch on generator control panel to "On" position starts generator set. "Off" position of same switch initiates shutdown of unit. When unit is running, specified system or equipment failures or derangements automatically shut down unit and initiate alarms. Operation of remote emergency stop switch also shuts down unit.

2. System Performance

- a. Steady-State Voltage Operational Bandwidth: 1% of rated output voltage from no load to full load.
- b. Steady-State Voltage Modulation: Less than 0.25 Hertz.
- c. Transient Voltage Performance: Not more than 10% variation for 50% step-load increase or decrease. Voltage recovers to remain within steady-state operating band within 2 seconds.
- d. Steady-State Frequency Operational Bandwidth: 0.5% of rated frequency from no load to full load.
- e. Steady-State Frequency Stability: When system is operating at constant load within rated load, there are no random speed variations outside steady-state operational band and no regular or cyclical hunting or surging of speed.
- f. Transient Frequency Performance: Less than 3 Hertz variation for 50% step-load increase or decrease. Frequency recovers to remain within steady-state operating band within 3 seconds.
- g. Output Waveform: At no load, harmonic content measured line-to-line or line-to-neutral does not exceed 5% total and 3% for single harmonics. Telephone influence factor determined according to NEMA MG1 does not exceed 50.
- h. Sustained Short-Circuit Current: For 3-phase bolted short circuit at system output terminals, system will supply minimum of 300% of rated full-load current for not less than 10 seconds and then clear fault automatically, without damage to any generator system component.
- i. Temperature Rise of Generator: Within acceptable limits for insulation systems used according to NEMA MG 1 when operating continuously at standby rating conditions. Temperature rise shall not exceed 125°C.
- j. Nonlinear Load Performance: System performance is not degraded from that specified in this Article by continuous operation, with load current having minimum total harmonic content of 15% root mean square (rms), and minimum single harmonic content of 10% rms.
- k. Starting Time: Maximum total time period for cold start, with ambient temperature at low end of specified range, is 10 seconds. Time period includes output voltage and frequency settlement within specified steady-state bands.

1.04 SUBMITTALS

A. Product Data:

1. Include data on features, components, ratings, and performance.
2. Include dimensioned outline plan and elevation drawings of engine generator set and other system components.

B. Shop Drawings:

1. Show connections, mounting, and support provisions and access and working space requirements.
2. Wiring Diagrams for System: Show power and control connections and distinguish between factory-installed and field-installed wiring.

C. Test Results:

1. Certified Summary of Prototype Unit Test Report: Submit certified copies of actual prototype unit test report if requested by Engineer.
2. Certified Test Reports of Components and Accessories: Submit for devices that are equivalent, but not identical, to those tested on prototype unit if requested by Engineer.
3. Exhaust Emissions Test Report. Include proof of compliance with applicable requirements.
4. Certification of Torsional Vibration Compatibility: Conform to Nation Fire Protection Association (NFPA) 110.

5. Factory Project-Specific Equipment Test Reports: For units to be shipped for this Project showing evidence of compliance with specified requirements.
 6. Field Test Report.
- D. Operation and Maintenance Data (O&M):
1. Detailed Operating Instructions: Describe operation under both normal and abnormal conditions.
 2. Submit in accordance with Section 01 78 23.
- E. Submit in accordance with Section 01 33 00.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Firms experienced in manufacturing equipment of types and capacities indicated that have record of successful in-service performance.
1. Emergency Service: System manufacturer maintains service center capable of providing training, parts, and emergency maintenance and repairs at Project site with 4 hours maximum response time.
- B. Comply with NFPA 70, National Electrical Code (NEC).
- C. Engine Exhaust Emissions and Fuel System: Comply with applicable Federal, State, and local government requirements.
- D. Permits: Provide required air permitting and fuel system permitting required in accordance with applicable Federal, State, and local government requirements.
- E. Single-Source Responsibility: Obtain engine generator system components from single manufacturer with responsibility for entire system. Unit shall be representative product built from components that have proven compatibility and reliability and are coordinated to operate as unit as evidenced by records of prototype testing.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver engine generator set and system components to their final locations in protective wrappings, containers, and other protection that will exclude dirt and moisture and prevent damage from construction operations. Remove protection only after equipment is made safe from such hazards.

1.07 MAINTENANCE

- A. Extra Materials:
1. Furnish extra materials matching products installed, as described below, packaged with protective covering for storage, and identified with labels describing contents.
 - a. Fuses: 1 for every 10 of each type and rating, but not less than 1 of each.
 - b. Pilot Lights: 2 for every 6 of each type used, but not less than 2 of each.
 - c. Filters: 1 set each of lubricating oil, fuel, and combustion air filters.

PART 2- PRODUCTS

2.01 MANUFACTURERS

A. Engine Generator Sets:

1. Cummins Power Generation
2. Caterpillar

2.01 ENGINE GENERATOR SYSTEM

A. System is coordinated assembly of compatible components.

B. Ratings: Voltage, frequency, and power output ratings of system are as indicated.

C. Motor starting kilovoltamp (KVA) of 4602 minimum required to start and operate following load steps without exceeding 20% maximum voltage dip and with return to steady state in less than 2 seconds.

1. Step No. 1 45 KW misc. loads
2. Step No. 2 350 Horsepower (HP) loaded motor operating on solid state reduce voltage starter.
3. Step No. 3 200 HP loaded motor operating across the line.
4. Step No. 4 200 HP loaded motor operating on VFD.
5. Step No. 5 200 HP loaded motor operating on VFD.

D. Safety Standard: Comply with American Society of Mechanical Engineers (ASME) B15.1.

E. Nameplates: Equip each major system component with conspicuous nameplate of component manufacturer. Nameplate identifies manufacturer of origin and address, and model and serial number of item.

2.02 ENGINE GENERATOR SET

A. Power Output Rating: Nominal ratings as indicated, with capacity as evidenced by records of prototype testing.

B. Skid: Welded steel base securely mounted with anchored mounting bolts. Adequate strength and rigidity to maintain alignment of mounted components without dependence on concrete foundation. Free from sharp edges and corners. Lifting attachments arranged to facilitate lifting with slings without damaging components.

C. Vibration Isolation: In accordance with manufacturer's recommendations. Integral vibration isolators may be provided. When integral vibration isolators are not provided, provide 95% efficient spring type vibration isolators as manufactured by Vibration Eliminator, Mason Company, or equal. Mount isolators between steel base and floor or concrete pad.

D. Rigging Diagram: Inscribed on metal plate permanently attached to skid. Diagram indicates location and lifting capacity of each lifting attachment and location of center of gravity.

2.03 ENGINE

A. Comply with NFPA 37.

B. Fuel: Diesel fuel oil grade DF-2.

C. Maximum Speeds:

1. Engine: 1,800 rpm.
 2. Piston speed for 4-cycle engines: 2,250 feet per minute.
- D. Lubrication System: Pressurized by positive displacement pump driven from engine crankshaft. Mount following items on engine or skid:
1. Filter and Strainer: Rated to remove 90% of particles 5 microns and larger while passing full flow.
 2. Oil Cooler: Maintains lubricating oil at manufacturer's recommended optimum temperature.
 3. Thermostatic Control Valve: Controls flow in system to maintain optimum oil temperature. Unit is capable of full flow and is designed to be fail-safe.
 4. Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps or siphons or special tools or appliances.
- E. Engine Fuel System: Comply with NFPA 30.
1. Integral Injection Pumps: Driven by engine camshaft. Pumps are adjustable for timing and cylinder pressure balancing.
 2. Main Fuel Pump: Mounted on engine. Pump ensures adequate primary fuel flow under starting and load conditions.
 3. Parallel Fuel Oil Filters / Water Separators: Factory installed ahead of injection pumps with changeover valves allowing independent use of either filter.
 4. Relief/Bypass Valve: Automatically regulates pressure in fuel line and returns excess fuel to source.
 5. Flexible fuel line connections for supply and return lines.
 6. Shut-off fuel solenoid valve field mounted at tank.
- F. Jacket Coolant Heater: Electric immersion type, factory-installed in jacket coolant system. Unit is rated and thermostatically controlled to maintain an engine temperature of 25 degrees Celsius at low end of specified ambient temperature range.
1. Voltage: 208, 1PH
 2. Watts: 2,500.
- G. Speed Governor: Adjustable isochronous type, with speed sensing.
- H. Include Battery Heater

2.04 ENGINE COOLING SYSTEM

- A. Closed-loop, liquid-cooled, with radiator factory-mounted on engine generator set skid and integral engine-driven coolant pumping.
1. Factory-piped and -rated for specified coolant.
 2. Fan: Driven by multiple belts from engine shaft.
 3. Overflow fill bottle on radiator to maintain proper coolant level in radiator.
- B. Radiator Core Tubes: Nonferrous metal construction other than aluminum.
- C. Coolant: Solution of 50% ethylene glycol and 50% water.
- D. Temperature Control: Self-contained thermostatic control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer. Features include:
1. Thermostatic Elements: Interchangeable and nonadjustable.

2. Actuator Design: Normally-open valves to return to open position when actuator fails.
- E. Coolant Hose: Flexible assembly with nonporous rubber inside surface and aging, ultraviolet, and abrasion-resistant fabric outer covering.
 1. Rating: 50 Pounds psi (345 kiloPascals (kPa)) maximum working pressure with 180 °F (82°C) coolant, and noncollapsible under vacuum.
 2. End Fittings: Flanges or steel pipe nipples with clamps to suit piping and equipment connections.

2.05 FUEL SUPPLY SYSTEM

- A. Dual Wall Subbase Tank: Factory-fabricated assembly or NRTL-listed fuel tank with integral, float-controlled transfer pump and features described below.
 1. Tank Capacity: Adequate to supply fuel to engine for uninterrupted period of 33 hours operation at 100% of rated power output of engine generator system without being refilled.
- B. Manual over-fill protection.
- C. Internally baffled to prevent immediate resupply of heated return fuel.
- D. Lockable 2 inch fill cap.
- E. Fuel level gauge.
 1. Provide 4-20 milliamp (mA) output for remote indication of fuel tank level.
- F. Electrical stub-in area with detachable end panel.
- G. Multiple top entry customer-select use ports.
- H. Tank to foundation ground clearance for visual secondary leak detection.
- I. Load bearing vertical "C" channel at generator set mounting points.
- J. Vertically accessible primary vent.
- K. Venting to UL 142 in both primary and secondary containments.
- L. Weatherproof secondary containment.
- M. Mounts directly to generator set skid.
- N. 8 gauge aluminized steel top.
- O. 12 gauge aluminized steel sides and bottoms.
- P. 4 inch "C" channel side and bottom load bearing structure.
- Q. Symmetrical to generator set footprint.
- R. Baked enamel finish.
- S. Listed to UL142 under Label No. 48-24-2 "Secondary Containment Generator Base Tank".
- T. Low fuel level alarm.

U. Leak detection alarm.

V. Initial Fill: Diesel fuel oil grade DF-2 Winter Blend. Contractor shall refill tank after generator testing to provide full tank.

2.06 ENGINE EXHAUST SYSTEM

A. Muffler: Critical-type, size as recommended by engine manufacturer. Measured sound level at distance of 10 feet from exhaust discharge, is 75.3 Decibels (dB) "A" or less.

2.07 GENERATOR STAIRS AND PLATFORM – ALTERNATE BID

A. Generator manufacturer shall provide access platform, stairs, and all hardware and accessories for generators mounted on sub-base fuel tanks. Provide aluminum catwalk and stair on each side of generator for access to generator mounted on top of sub-base fuel tank. Catwalk and stair configurations shall be coordinated with generator and sub-base fuel tank size and height.

B. Platform shall allow personnel to access and open all Generator enclosure doors and the equipment within without the need for a ladder.

C. Contractor shall be responsible for all platform and stair assembly required per manufacturer's instructions.

2.08 STARTING SYSTEM

A. Description: 12 volt electric with negative ground and including following items:

1. Components: Size so they will not be damaged during full engine-cranking cycle with specified maximum ambient temperature.
2. Cranking Motor: Heavy-duty unit that automatically engages and releases from engine flywheel without binding.
3. Cranking Cycle: As required by NFPA 110 for system level specified
4. Battery Cable: Size as recommended by generator set manufacturer for cable length required for connection to battery. Include required interconnecting conductors and connection accessories.
5. Battery Compartment: Factory-fabricated of metal with acid-resistant finish and thermal insulation. Thermostatically controlled heater is arranged to maintain battery above 10°C regardless of external ambient temperature within range specified under Part 1. Thermostat to turn off heater when ambient temperature is above 5°C. Include accessories required to support and fasten batteries in place.
6. Battery-Charging Alternator: Factory-mounted on engine with solid-state voltage-regulation and 35 amp minimum continuous rating.
7. Battery Charger: Current limiting, automatic equalizing and float charging-type designed for operation from 120 volt 60 Hertz supply source. Unit complies with UL 508 and includes following features:
 - a. Operation: Equalizing charging rate of 10 amps is initiated automatically after battery has lost charge until adjustable equalizing voltage is achieved at battery terminals. Unit then automatically switches to lower float-charging mode, and continues operating in that mode until battery is discharged again
 - b. Automatic Temperature Compensation: Adjusts float and equalizes voltages for variations in ambient temperature from -40 to +60°C to prevent overcharging at high temperatures and undercharging at low temperatures.

- c. Automatic Voltage Regulation: Maintains output voltage constant regardless of input voltage variations up to +10%.
- d. Ammeter and Voltmeter: Flush mounted in door. Meters indicate charging rates.
- e. Safety Functions: Include sensing of abnormally low battery voltage arranged to close contacts providing "low battery voltage" indication on control and monitoring panel. Also include sensing of high battery voltage and loss of ac input or dc output of battery charger. Either of these conditions closes contacts that provide "battery charger malfunction" indication at system control and monitoring panel.
- f. Enclosure and Mounting: NEMA Class 1 wall-mounted cabinet.

2.09 CONTROL AND MONITORING

- A. Operating and safety indications, protective devices, basic system controls, and engine gages are grouped on common control and monitoring panel mounted on generator set. Mounting method isolates control panel from generator set vibration.
 - 1. Generator Circuit Breaker: Molded case type conforming to Section 26 28 00 and with adjustable ground fault tripping. Include mechanical lugs and power-distribution connectors for number, size, and material of conductors indicated.
 - 2. Shunt Trip Device: For generator breaker, connected to trip breaker when generator set is shut down by protective devices.
 - 3. Current and Potential Transformers: Instrument accuracy class.
- B. Indicating and Protective Devices, and Controls: Include those required by NFPA 110 for Level 2 system plus following:
 - 1. Alternating current Voltmeter.
 - 2. Alternating current Ammeter.
 - 3. Alternating current Frequency Meter.
 - 4. Direct current Voltmeter (Alternator Battery Charging).
 - 5. Engine Coolant Temperature Gage.
 - 6. Engine-Lubricating Oil Pressure Gage.
 - 7. Running Time Meter.
 - 8. Ammeter/Voltmeter Phase Selector Switch or Switches.
 - 9. Generator Voltage-Adjusting Rheostat.
 - 10. Frequency Adjusting Rheostat.
 - 11. Fuel Tank Derangement Alarm.
- C. Supporting Items: Include sensors, transducers, terminals, relays, and other devices, and wiring required to support specified items. Locate sensors and other supporting items on engine, generator, or elsewhere as indicated. Where not indicated, locate to suit manufacturer's standard.
- D. Connection to Data Link: Status indication for transmission of generator status and alarms by data link to remote data terminals.
- E. Generator controller / control panel shall be provided with Ethernet/IP Network card capable of communicating information on an Allen Bradley Network.
- F. Remote Alarm Annunciator: Comply with NFPA 99. Labeled LEDs indicate alarm events. Common audible signal sounds for alarm conditions. Silencing switch in face of panel silences signal without altering visual indication. Connect so that after alarm is silenced, clearing of initiating condition will reactivate alarm until silencing switch is reset. Cabinet and faceplate are surface- or flush-mounting type to suit mounting conditions indicated.

G. Remote Emergency Stop Switch:

1. Mounted outside of the outdoor generator enclosure.
2. Protect pushbutton from accidental operation.
3. Provide switches with provisions to be locked in the open position.

2.10 GENERATOR, EXCITER, AND VOLTAGE REGULATOR

- A. Comply with NEMA MG 1 and specified performance requirements. Temperature rise shall not exceed 125°C.
- B. Drive: Generator shaft is directly connected to engine shaft. Exciter is rotated integrally with generator rotor.
- C. Electrical Insulation: Class H or Class F.
- D. Stator Winding Leads: Brought out to terminal box to permit future reconnection for other voltages if required.
- E. Construction prevents mechanical, electrical, and thermal damage due to vibration, overspeed up to 125% of rating, and heat during operation at 100% of rated capacity.
- F. Excitation uses no-slip or collector rings, or brushes, and is arranged to sustain generator output under short circuit conditions as specified.
- G. Enclosure: Dripproof.
- H. Instrument Transformers: Mounted within generator enclosure.
- I. Voltage Regulator: Solid-state-type, separate from exciter, providing performance as specified.
 1. Adjusting rheostat on control and monitoring panel provides +5% adjustment of output voltage operating band.
- J. Surge Protection: Conform to UL 1449. Mount suppressors in generator enclosure and connect to load terminals.
- K. Strip Heater: Thermostatically controlled unit arranged to maintain stator windings above dew point.
- L. Control Sequence: Control panel may be operated manually or preset for adjustable single-step loading of generator during automatic exercising. Connection of load bank to generator is by remote-controlled switching device specified in another Section.

2.11 OUTDOOR GENERATOR SET ENCLOSURE

- A. Description: Weatherproof steel housing. Multiple panels are lockable and provide adequate access to components requiring maintenance. Panels are removable by one person without tools.
- B. Fixed Louvers: At air inlet and discharge. Louvers prevent entry of rain and snow.
- C. Automatic Dampers: At air inlet and discharge. Dampers are closed to reduce engine and battery heat loss in cold weather when unit is not operating.

- D. Air Flow Through Housing: Adequate to maintain temperature rise of system components within required limits.
- E. Muffler/Silencer mounted inside enclosure.
- F. Additional Sound attenuation shall be included by the manufacturer to limit the dB to a maximum of 75.3 dB(A) measured at 25 feet in all directions from enclosure and muffler.

2.12 FINISHES

- A. Indoor Enclosures and Components: Manufacturer's standard enamel over corrosion-resistant pretreatment and primer.
- B. Outdoor Enclosures: Polyurethane enamel over corrosion-resistant pretreatment and manufacturer's compatible standard primer.

2.13 SOURCE QUALITY CONTROL

- A. Factory Tests: Include prototype testing and Project-specific equipment tests (equipment manufactured specifically for this Project).
- B. Prototype Testing: Performed on separate engine generator set using same engine model, constructed of identical or equivalent components and equipped with identical or equivalent accessories.
 - 1. Tests: Conform to those required for Level 1 energy converters in paragraphs 3.2.1, 3.2.1.1, and 3.2.1.2 of NFPA 110.
 - 2. Components and Accessories: Items furnished with installed unit that are not identical to those on tested prototype have been acceptably tested to demonstrate compatibility and reliability.
- C. Project-Specific Factory Equipment Tests: Test engine generator set and other system components and accessories prior to shipment. Test items individually and assembled and connected as complete system at factory in manner equivalent to that required at Project site. Record and report test data. Conform to SAE 8528 and following:
 - 1. Test Equipment: Use instruments calibrated within previous 12 months and with accuracy directly traceable to National Institute of Standards and Technology (NIST).
 - 2. Hydrostatic Test: Perform on radiator, heat exchanger, and engine water jacket.
 - 3. Generator Tests: Conform to Institute of Electrical and Electronics Engineers (IEEE) 115.
 - 4. Complete System Continuous Operation Test: Includes nonstop operation for minimum of 8 hours standard factory test, including at least 1 hr each at 50% and 75%, and 2 hours at 100% of full load. If unit stops during 8 hr test standard factory test, repeat complete test. Record following minimum data at start and end of each load run, at 15 minute intervals between those times, and at 15 minute intervals during balance of test:
 - a. Fuel consumption.
 - b. Exhaust temperature.
 - c. Jacket water temperature.
 - d. Lubricating oil temperature and pressure.
 - e. Generator load current and voltage, each phase.
 - f. Generator system gross and net output kW.
 - 5. Complete System Performance Tests: Include following to demonstrate conformance to specified performance requirements:

- a. Single-step load pickup.
 - b. Transient and steady-state governing.
 - c. Transient and steady-state voltage performance.
 - d. Safety shutdown devices.
- 6. Observation of Factory Test: Provide 2 week advance notice of tests and opportunity for observation of test by Owner or Engineer.
 - 7. Report test results within 10 days of completion of test.

PART 3- EXECUTION

3.01 INSTALLATION

- A. Install generator set and components in accordance with manufacturer's written instructions.
- B. Anchor generator set and other system components on concrete bases conforming Section 03 300 and as indicated. Provide anchorage and vibration isolation according to manufacturer's recommendations.
- C. If selected manufacturer ships fuel filters loose for field installation, Contractor shall install in accordance with manufacturer's written installation instructions.
- D. Maintain minimum working space around components according to manufacturer's approved submittals and NEC.

3.02 IDENTIFICATION

- A. Identify system components according to Section and Section 26 05 53.

3.03 FIELD QUALITY CONTROL

- A. Manufacturer's Field Services:
 - 1. Supplier's or manufacturer's representative for equipment specified herein shall be present at job site or classroom designated by Owner for minimum workdays indicated, travel time excluded, to supervise final adjustment of system after installation is complete, system startup, and training of Owner's personnel for system operation. Include minimum of:
 - a. 1 workdays for Installation Services.
 - b. 1/2 workdays for Instructional Services.
 - c. 1/2 workdays for Post Startup Services.
 - 2. Supplier or manufacturer shall direct services to system and equipment operation, maintenance, troubleshooting, and equipment and system related areas. See Section 01 61 00.
 - 3. In addition to the services specified above, provide manufacturer's services as required to successfully complete systems demonstration as specified in Section 01 79 10.
- B. Tests: Provide services of qualified testing agency to perform tests listed below according to manufacturer's recommendations upon completion of installation of system. Use instruments bearing records of calibration within last 12 months, traceable to NIST standards, and adequate for making positive observation of test results. Include following tests:

1. Battery Tests: Measure charging voltage and voltages between available battery terminals for full-charging and float-charging conditions. Check electrolyte level and specific gravity under both conditions. Test for contact integrity of connectors.
 2. Battery Charger Tests: Verify specified rates of charge for both equalizing and float-charging conditions.
 3. System Integrity Tests: Verify proper installation, connection, and integrity of each element of engine generator system before and during system operation. Check for air, exhaust, and fluid leaks.
 4. Simulation of malfunctions to verify proper operation of local and remote protective, alarm, and monitoring devices.
 5. Load Test: Use variable load bank capable of simulating kVA, kW, and power factor of load for which unit is rated. Run unit at 25, 50, and 75% of rated capacity for 30 minute each, and at 100% for 1 hour. Record voltage, frequency, load current, battery-charging current, power output, oil pressure, and coolant temperature during test.
 6. Exhaust Emissions Test: Conform to applicable government test criteria.
- C. Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.

3.04 CLEANING

- A. Upon completion of installation, inspect system components. Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish. Clean components internally using methods and materials recommended by manufacturer.

END OF SECTION

SECTION 26 36 00
TRANSFER SWITCHES

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Automatic Transfer Switch (ATS).

1.02 SUBMITTALS

A. Product Data:

1. Submit for each transfer switch, including dimensioned plans, sections, and elevations showing minimum clearances; conductor entry provisions; gutter space; installed features and devices; and materials lists.
2. Wiring diagrams, elementary or schematic, differentiating between manufacturer-installed and field-installed wiring.

B. Test Results:

1. Certified reports of field tests and observations.

C. Miscellaneous:

1. Manufacturer's certificate of compliance to referenced standards and tested short-circuit closing and withstand ratings applicable to protective devices and current ratings used in this Project, as indicated and as specified in this section.

D. Operation and Maintenance (O&M) Data:

1. Include features and operating sequences, both automatic and manual.
2. List factory settings of relays and provide relay setting and calibration instructions.
3. Submit in accordance with Section 01 78 23.

E. Submit in accordance with Section 01 33 00.

1.03 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms experienced in manufacturing equipment of types and capacities indicated and having record of successful in-service performance.

B. Emergency Service: Manufacturer maintains service center capable of providing emergency maintenance and repairs at Project site with 4 hour maximum response time.

C. Items provided under this section shall be listed or labeled by Underwriters Laboratories, Inc. (UL) or other Nationally Recognized Testing Laboratory (NRTL).

1. Term "NRTL" shall be as defined in Occupational Safety and Health Administration (OSHA) Regulation 1910.7.
2. Terms "listed" and "labeled" shall be as defined in National Electrical Code (NEC), Article 100.

D. Regulatory Requirements:

1. NEC: Components and installation shall comply with National Fire Protection Association (NFPA) No. 70.

PART 2– PRODUCTS

2.01 MANUFACTURERS AND MODELS

- A. Asco, Inc. 7000 Series
- B. Or Approved Equal

2.02 TRANSFER SWITCH PRODUCTS, GENERAL

- A. Number of Poles and Current and Voltage Ratings: As indicated.
- B. Solid-State Controls: Repetitive accuracy setting of within 2% or better over an operating temperature range of -20 to 70 degrees Celsius.
- C. Resistance to Damage by Voltage Transients: Components meet or exceed voltage surge withstand capability requirements when tested according to American National Standards Institute (ANSI) C37.90.1. Components meet or exceed voltage impulse withstand test of National Electrical Manufacturers Association (NEMA) ICS 1.
- D. 4-Pole Switches: Where 4-pole switches are indicated, provide full capacity neutral switching.
- E. Enclosures: General purpose, NEMA 4, conforming to UL 508, except as otherwise indicated.
- F. Heater: Within enclosure of units exposed to outdoor temperature and humidity conditions, connect thermostat within enclosure to control heater.
- G. Factory Wiring: Train and bundle factory wiring and identify consistently with Shop Drawings, by color code or by numbered or lettered wire and cable tape markers at terminations.
 1. Designated terminals accommodate field wiring.
 2. Power Terminals Arrangement and Field Wiring Space: Suitable for top, side or bottom entrance of feeder conductors as indicated.
 3. Terminals: Pressure type, suitable for copper or aluminum conductors of sizes indicated.
 4. Control Wiring: Equipped with lugs suitable for connection to terminal strips.
- H. Electrical Operation: Accomplish by nonfused, momentarily energized solenoid or electric motor-operated mechanism, mechanically and electrically interlocked in both directions. Switches using components of molded case circuit breakers or contactors not designed for continuous duty, repetitive switching between active power sources are not acceptable.
- I. Switch Action: Mechanically held in both directions for double-throw switches.
- J. Switch Contacts: Use silver composition for switching load current. Provide separate arcing contacts for units rated 225 amps and more.
- K. Overcurrent devices are part of switch products.

2.03 AUTOMATIC TRANSFER SWITCHES (ATS)

- A. Comply with Level 1 equipment in accordance with NFPA No. 110.

B. Switching arrangement:

1. Switch operator has programmed neutral position arranged to provide midpoint between 2 working switch positions with an intentional, controlled, timed pause during transfer at midpoint.
 2. Midpoint pause is adjustable from 0.5 to 30 seconds minimum, and factory set at 5.0 seconds, except as indicated.
 3. Time delay occurs for both transfer directions.
- C. ATS for Large Motor Loads: Where indicated, ATS includes factory-installed and factory-wired internal motor control undervoltage and timing relays. Relays control designated starters to de-energize motors prior to transfer and re-energize them selectively at adjustable time intervals after transfer. Control connection to motor starters is through wiring external to ATS. Time delay for individual motor loads is adjustable between 1 and 60 seconds and settings are as indicated. Relay contacts are rated for actual motor control circuit inrush and seal currents, or for pilot duty as indicated.

2.04 AUTOMATIC TRANSFER SWITCH (ATS) FEATURES

- A. Service Entrance Rated.
- B. Bypass Isolation Type.
- C. 100kA Specific Breaker Rating, include Specific Breaker required in ATS to meet rating.
- D. 65kA at 0.5 sec withstand rating.
- E. Integral Normal (Utility) line side 100% rated, LSIG circuit breaker. See one-line diagram for long time ratings.
- F. Voltage sensing for each phase of normal source. Pick-up voltage adjustable from 85% to 100% nominal, and drop-out voltage adjustable from 75% to 98% pick-up value. Factory set for pick-up at 90% and drop-out at 85%.
- G. Time-delay override of normal source voltage sensing delays transfer and engine start signals. Adjustable 0 to 6 seconds, and factory set at 1 second.
- H. Voltage/Frequency Lockout Relay: Prevents premature transfer. Voltage pick-up adjustable from 85% to 100% nominal. Factory set to pick-up at 90%. Pick-up frequency adjustable from 90% to 100% nominal. Factory set to pick-up at 95%.
- I. Retransfer Time Delay: Adjustable from 0 to 30 minutes and factory set at 10 minutes. Provides automatic defeat of delay upon loss of voltage or sustained undervoltage of standby source when normal supply has been restored.
- J. Test Switch: Simulates normal source failure.
- K. Switch-Position Pilot Lights: Indicate source to which load is connected.
- L. Source Available Indicating Lights and Dry contacts: Supervise sources via transfer switch normal and standby source sensing circuits.
1. Normal Power Supervision: Green light with nameplate engraved "Normal Source Available." Provide Dry contact to allow for "Normal Source Available" monitoring.
 2. Standby Power Supervision: Red light with nameplate engraved "Standby Source Available." Provide Dry contact to allow for "Standby Source Available" monitoring.

- 3. Power Supervision: Red light with nameplate engraved "Standby Source Available."
- M. Unassigned Auxiliary Contacts: 2 normally open Single Pole Double Throw (SPDT) contacts for each switch position.
 - 1. Rating: 10 amps at 240 Volts Alternating Current (VAC).
- N. Transfer Override Switch: Overrides automatic retransfer control so ATS remains connected to standby power source regardless of condition of normal source. Pilot light indicates override status.
- O. Engine Starting Contacts: One isolated normally closed and 1 isolated normally open. Contacts are gold-flashed or gold-plated and rated 10 amps at 32 Volts Direct Current (VDC) minimum.
- P. Engine Shut-Down Contacts: Time delay adjustable from 0 to 5 minutes. Factory set at 5 minutes.
- Q. Engine-Generator Exerciser: Solid-state programmable time switch starts engine-generator set and transfers load to it from normal source for preset time, then retransfers and shuts down engine after preset cool-down period. Initiate exercise cycle at preset intervals adjustable from 7 to 30 days. Running periods are adjustable from 10 to 30 minutes. Factory-set periods are for 7 days and 20 minutes, respectively. Exerciser features include following.
 - 1. Exerciser transfer selector switch, which permits selection between exercise with and without load transfer.
 - 2. Pushbutton programming controls with digital display of settings.
 - 3. Integral battery operation of time switch when normal control power is not available.

2.05 FINISHES

- A. Enclosures: Manufacturer's standard enamel over corrosion-resistant pretreatment and primer.

2.06 SOURCE QUALITY CONTROL

- A. Factory test components, assembled switches, and associated equipment to ensure proper operation. Check transfer time and voltage, frequency, and time-delay settings for conformance with specified requirements. Perform dielectric strength test conforming to NEMA ICS 1.

PART 3– EXECUTION

3.01 INSTALLATION

- A. Floor Mounting of Transfer Switches:
 - 1. Provide 4 inch high concrete foundation pad. Construct in accordance with Section 03 30 00.
 - 2. Level and anchor unit to equipment pad.
- B. Identify components in accordance with Section 26 05 53.

3.02 CONNECTIONS

- A. Tighten factory-made connections and field connections including connectors and terminals, screws and bolts, according to equipment manufacturer's published torque tightening values.

- B. When manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL 486A.

3.03 GROUNDING

- A. Make equipment grounding connections for transfer switch units as indicated and as required by NEC.

3.04 FIELD QUALITY CONTROL

A. Manufacturer's Field Services:

1. Supplier's or manufacturer's field technician for equipment specified herein shall be present at job site for minimum workdays indicated, travel time excluded, for service during plant construction, plant startup, and training of Owner's personnel for plant operation. Include minimum of:
 - a. 1/2 workday for Instructional Services.
 - b. 1/2 workday for Post Startup Services.
2. Supplier or manufacturer shall direct services to specific system and equipment operation, maintenance, field tests, and troubleshooting. See Section 01 61 00.
3. In addition to the services specified above, provide manufacturer's services as required to successfully complete systems demonstration as specified in Section 01 79 10.

B. Preliminary Tests: Perform electrical tests as recommended by manufacturer and as follows.

1. Measure phase-to-phase and phase-to-ground insulation resistance levels with insulation resistance tester, including external control circuits. Use test voltages and procedure recommended by manufacturer. Meet manufacturer's specified minimum resistance.
2. Check for electrical continuity of circuits and for short circuits.

C. Field Tests: Give 7 day advance notice of tests and perform tests in presence of Owner and Engineer.

D. Tests: As recommended by manufacturer and as follows.

1. Contact Resistance Test: Measure resistance of power contacts for ATSS. Resolve values in excess of 500 micro-ohms and differences between adjacent poles exceeding 50%.
2. Ground Fault Tests: Coordinate with testing specified in Section 26 28 00 to ensure sensors are properly selected and located to optimize ground-fault protection where power is being delivered from either source.
 - a. Verify grounding points and sensor ratings and locations.
 - b. Apply simulated fault current at sensors and observe reaction of circuit interrupting devices.
3. Operational Tests: Demonstrate interlock, sequence, and operational function for each switch at least 3 times.
 - a. Simulate power failures of normal source to ATSS and of standby source with normal source available.
 - b. Simulate low phase-to-ground voltage for each phase of normal source of ATSS.
 - c. Verify time-delay settings and pick-up and drop-out voltages.

- E. Test Failures: Correct deficiencies identified by tests and prepare for retest. Verify equipment meets specified requirements.
- F. Reports: Maintain written record of observations and tests. Report defective materials and workmanship, and retest corrected items. Record adjustable relay settings and measured insulation and contact resistances and time delays. Attach label or tag to each tested component indicating satisfactory completion of tests.

END OF SECTION

DIVISION 31

EARTHWORK

SECTION 31 10 00
SITE CLEARING

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Protection of existing surface features
2. Removal of miscellaneous surface features.
3. Clearing and grubbing of site.
4. Stripping topsoil.
5. Locating existing pipes and electrical conduits.
6. Removal from site and disposal of stockpiled landfill material.

1.02 SUBMITTALS

- A. Submit coordinates and elevation of each located underground pipe.
- B. Submit in accordance with Section 01 33 00.

PART 2 – PRODUCTS

(NOT USED)

PART 3 – EXECUTION

3.01 PREPARATION

- A. Provide a minimum of 3 working days notice, prior to construction, to owners of existing utilities and surface features.
- B. Protect existing utilities and surface features indicated to remain. Restore damaged existing utilities and surface features to condition equal to condition prior to construction.
- C. Protect trees, shrubs, and other land resources, where indicated to remain. Provide fencing no closer than “drip line” of trees and shrubs and of sufficient height so features will not be damaged. Comply with requirements of Section 01 57 19.
- D. Do not remove or cut down trees unless identified for removal on drawings, or located within limits of excavation, proposed structures or paving as indicated on Drawings.
- E. Do not trim trees unless shown on Drawings.
- F. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.
- G. Maintain access to site.
- H. Install erosion control measures prior to start of any earth-disturbing activities.

3.02 REMOVALS

- A. Remove obstructions such as mounds of dirt, stones, or debris located within construction limits.
- B. Remove surface features including pavements, landscaping features, and other miscellaneous items.
- C. Full depth saw cut all pavement, sidewalk and curbing to be removed.
- D. Conform to requirements of Section 01 35 16.

3.03 CLEARING AND GRUBBING

- A. Clearing and grubbing shall include cutting and disposal of trees, shrubs, brush, windfalls, logs, and other vegetation, and removal and disposal of roots, stumps, stubs, grubs, logs and other timber, and other perishable or objectionable matter.
- B. Clear and grub area within limits to be covered with tanks, buildings, walks, parking areas, drives, and where grade is to be adjusted. Clearing and grubbing limits shall be 20 feet from building or tank lines.
- C. Grub stumps and roots to a depth of at least 12 inches below existing ground surface or subgrade, whichever is lower.
- D. Cut interfering tree roots and branches 1 inch or greater in diameter perpendicular to direction of growth on tree side of trench.
- E. Remove cleared and grubbed material from site and dispose of in accordance with applicable regulations.

3.04 STRIPPING TOPSOIL

- A. After area has been cleared of vegetation, remove existing topsoil to entire depth in areas where grade is to be adjusted and in areas to be covered by structures or paving.
- B. Stripped topsoil shall be free of clay lumps, sand and gravel, stones, vegetation, and debris.
- C. Stockpile on site in an area clear of new construction. Strip stockpile areas of vegetation prior to stockpiling.
- D. Maintain the stockpile in a manner which will not obstruct the natural flow of drainage.
 - 1. Protect from erosion.
 - 2. Maintain stockpile free from debris and trash.
 - 3. Immediately stabilize stockpiles and surround stockpiles as needed with silt fence or other perimeter control if stockpiles will remain inactive for 7 days or longer.
- E. Owner has first right to excess topsoil not used in Work. Obtain Owner's approval before removing any topsoil not required for work. Remove excess topsoil not required by Owner from site.

3.05 DISPOSAL

- A. Remove brush, grass, roots, trash, and other material from site preparation operations from site.
- B. Do not store or permit debris to accumulate on the job site.

- C. Do not burn debris at the site.
- D. Dispose of materials removed by clearing and grubbing in accordance with applicable regulations.

3.06 DEMOLITION

- A. Conform to Section 01 35 16.

3.07 EXPLORATION FOR EXISTING UNDERGROUND PIPING AND ELECTRICAL CONDUITS

- A. Prior to initiating work, Contractor shall determine exact location and elevation of underground piping and conduits at locations specified.
 - 1. Excavate and expose top and sides of piping or conduit.
 - 2. Locate top and outer edges of piping or conduit by surveying with equipment capable of locating each point to within 0.1 ft. accuracy.
 - 3. Tie survey coordinate information to state plane coordinate system shown on drawings.
 - 4. Probing to locate outer edges of piping may be permissible if exposing sides of piping would compromise the structural integrity of the piping, provided the size and invert elevation can be determined from the information available.
 - 5. Each point to be surveyed shall consist of a set of three (3) survey points. One set of points shall consist of coordinates on each side of the pipe or conduit and the top center elevation of pipe or conduit.
- B. The Contractor shall excavate the following locations. Should additional location information be needed, contact the Engineer.
 - 1. The locations of proposed electric ductwork.
 - 2. The locations of proposed concrete pads and sidewalk.
- C. Submit location survey information in hard copy and electronic form to Engineer. Engineer will evaluate information for its impact on proposed structures and will revise the design as required to avoid impacting the existing piping and conduits.
- D. Contractor shall backfill and compact the backfill over the exposed piping and conduits in accordance with the requirements of Section 31 23 00 – Excavation and Backfill and/or 31 23 33 Trenching and Backfill as appropriate for the location.
- E. Disposal of excess soil material shall be in accordance with Section 31 22 00.

3.08 PRELIMINARY SITE SURVEY

- A. When required on the Drawings or specified in this or other sections, Contractor shall perform a preliminary site survey of surface features to ascertain their locations and elevations to an accuracy of 0.01 ft in all axis.
- B. In areas where pavements, driveways or sidewalks are removed and no adjoining fixed features are available to reference (curb gutter, sidewalks, remaining pavement, etc) the Contractor shall provide a survey for the entire area to be disturbed which will establish the grades and locations of the existing features which can be staked for restoration efforts. Grades shall be determined at no more than 25 ft intervals. It is the intent of the contract documents to restore the project area to existing conditions or better.

- C. In all areas where road or driveway centerlines or edges are removed the Contractor shall survey the centerline and edges to allow them to be accurately restored. Survey will not be required if existing curbing is present and is not disturbed on the pavement edge.
- D. Inlets or other structures which are removed for construction and are to be replaced shall have their rim elevation and all inverts surveyed prior to removal.
- E. Contractor shall photograph all landscape restoration areas including, but not limited to retaining walls, fences, flower beds, garden areas, birdhouses, shrubs and trees.
- F. In the vicinity of the excavation site, the existing pump station is located directly adjacent to the proposed concrete sidewalk and generator. Contractor shall perform a preliminary site survey of the building corners and face of the building at 25 ft intervals to accurately establish the location and elevation of the face of the building to an accuracy of 0.01 ft in all axis in order to ascertain if movement or damage occurs to the structure. The Contractor shall perform a survey of the same points at the completion of work to verify that the structure has not moved or settled.

END OF SECTION

SECTION 31 22 00
GRADING

PART 1 – GENERAL

1.01 SUMMARY

- A. Excavation, filling, and rough and finish grading the site to the elevations shown on the Drawings and as needed to meet the requirements of the Contract Documents.

1.02 DEFINITIONS

- A. Influence Zone Under Foundations, Pavements, or Sidewalks: Area below foundation or pavement or sidewalk subbase bounded by 1 horizontal to 2 vertical slope extending outward from 1-ft beyond outer edge of foundation or pavement or sidewalk subbase.
- B. Influence Zone Under Piping or Electrical Ducts: Area below limits bounded by line 6 in. below pipe or electrical duct and by 1 horizontal to 2 vertical slope extending outward from that line 1-foot beyond outer edge of pipe or duct.
- C. Unsuitable Material: Topsoil, peat, organic soils, and materials containing slag, cinders, foundry sand, debris, and rubble or soil with less than required bearing capacity as determined by Engineer.

1.03 REFERENCES

- A. ASTM: American Society for Testing and Materials

1.04 SUBMITTALS

- A. Test Results.
 - 1. Compaction test results.
 - 2. Proctor test results.
- B. Miscellaneous Submittals.
 - 1. Test results to verify fill materials meet Specifications.
- C. Submit in accordance with Section 01 33 00.

1.05 QUALITY ASSURANCE

- A. Testing shall be provided by Contractor in accordance with Section 01 45 29 and this section.

1.06 PROJECT / SITE CONDITIONS

- A. Notify owners of above or below ground utilities encountered during grading operations.
- B. Cap and remove or relocate services in accordance with instructions of owners of such utilities.
- C. Protect, support, and maintain conduits, wires, pipes or other utilities that are to remain in accordance with requirements of owners of such utilities.

- D. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.
- E. Maintain access to adjacent areas at all times.

PART 2 – PRODUCTS

2.01 FILL MATERIALS

- A. Structural Fill: Conform to requirements of Section 31 23 00.
- B. Earth Fill: Natural soils free of topsoil, wood, peat, cinders, organic and deleterious matter or other rubbish.

2.02 TOPSOIL

- A. Friable, fertile soil of loamy character, containing an amount of organic matter normal to the region, capable of sustaining healthy plant life, and free from subsoil, roots, heavy or stiff clay, sand and gravel, stones larger than 1/2 inch, noxious weeds, sticks, brush, litter, and other deleterious matter.
- B. Acidity Range: pH 5.0 minimum, 7.0 maximum.
- C. Obtain topsoil from source stockpiled under Section 02 41 00, or provide imported topsoil obtained from sources outside the project limits, or from both sources. Stockpiled topsoil shall be screened to meet specified requirements.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work such as areas loosened by frost action or softened by flooding or weather, or existence of unsuitable material. Do not proceed until unsatisfactory conditions are corrected.

3.02 PREPARATION

- A. Fill settled areas where excavations or trenches were backfilled and holes made by demolition, tree removal, and site preparation.
- B. Proof roll areas to receive fill material to detect soft or loose zones prior to placing fill. Remove and replace soft or loose zones.
- C. Natural soils or fill softened by frost, flooding or weather shall be removed and replaced.
- D. Remove unsuitable material within influence zone under foundations, pavements, sidewalks, piping or electrical ducts.
- E. Keep construction site free draining.
- F. Plow, step, or bench slopes steeper than 1 vertical to 4 horizontal. Disc level surfaces.

3.03 EXCAVATION

- A. Perform excavation to the lines, grades, and elevations indicated and specified herein.
- B. Method of excavation shall be consistent with soil types encountered and result in undisturbed subgrade. Loosened soils shall be recompacted or removed and replaced.
- C. Excavation of Rock:
 - 1. Where rock, boulders, or similar material is encountered, and where such material cannot be removed or excavated by conventional earth moving or ripping equipment, remove or excavate such material by means which will neither cause additional cost to the Owner, nor endanger buildings or structures on or off the site.
 - 2. Do not use explosives without written permission from the Engineer.
- D. Cut ditches and gutters accurately to the cross sections, grades, and elevations shown.

3.04 FILL USAGE

- A. Structural: Within influence zone under foundations, pavements, sidewalks, piping or electrical ducts.
- B. Earth: Other areas not previously specified.

3.05 PLACING FILL

- A. Notify Engineer before placing fill material.
- B. Do not use frozen material or place fill on frozen subgrade.
- C. Do not operate power-operated earth moving equipment closer to foundation walls or other structures than distance equal to 1/2 height of fill above footing.
- D. Place and compact fill materials in lift thickness and to densities listed.
 - 1. Degree of compaction: ASTM D1557, Modified Proctor.
 - 2. Moisture Content: Within 3% of optimum.

Location	Maximum Lift Thickness (in.)	Modified Proctor (%)
Footing, Foundation Slab, or Floor Slab Influence Zone	8 inches	95 minimum
Sidewalk, Crushed Aggregate Base Course, Pavement, Piping, or Electrical Duct Influence Zone	6 inches	90 minimum
Lawn and Landscaped Areas	12 inches	80 minimum, 90 maximum

3.06 ROUGH GRADING

- A. Grade to 4 inches below finished grade in areas to receive topsoil.
- B. Grade to bottom of base course in areas to receive sidewalk or paving.
- C. Rough grading, including excavated or filled sections and adjacent transition areas, shall be reasonably smooth, compacted, and free from irregular surface changes.

3.07 FINISH GRADING

- A. Uniformly grade the areas within limits of grading, including adjacent transition areas, with uniform levels or slopes between points where elevations are shown on the Drawings, or between such points and existing grades.
- B. Where a change of slope is indicated on the Drawings, construct a rolled transition section having a minimum radius of approximately 8 ft, unless adjacent construction will not permit such a transition, or if such a transition defeats positive control of drainage.
- C. Grade areas adjacent to buildings or structures to achieve drainage away from the structures, and to prevent ponding.
- D. Maximum allowable variation from design elevation is 1 inch in 10 feet.

3.08 FIELD QUALITY CONTROL

A. Testing:

- 1. One field density test for each 200 cubic yards of structural fill, minimum one each lift.
- 2. One field density test for each 1000 cubic yards of earth fill.
- 3. Determine in-place density of fill at maximum intervals specified in accordance with ASTM D1556, D2167, D2922 or D2937.

3.09 ADJUSTMENT AND CLEANING

- A. Remove and dispose of all unsuitable excavated material.
- B. Owner has first right to excess material suitable for backfilling or site grading, not used in Work. Deliver to site not greater than 2 miles away as determined by Owner. Conform to requirements of Section 01 41 00.
- C. Remove excess material not required by Owner, material not suitable for backfilling or site grading, and unsuitable materials from site.

3.10 MAINTENANCE

A. Protection of Newly Graded Areas:

- 1. Protect newly graded areas from traffic and erosion, and keep free from trash and weeds.
 - 2. Repair and reestablish grades in settled, eroded, and rutted areas to the specified tolerances.
- B. Where completed compacted areas are disturbed by subsequent construction operations or adverse weather, scarify the surface, reshape, and compact to the required density prior to further construction.

END OF SECTION

SECTION 31 23 00
EXCAVATION AND FILL

PART 1 – GENERAL

1.01 SUMMARY

- A. Excavation and backfilling for structures to elevations shown on Drawings and as needed to meet requirements of Contract Documents.

1.02 REFERENCES

- A. ASTM: American Society for Testing and Materials

1.03 DEFINITIONS

- A. Influence Zone Under Foundations, Pavements, or Sidewalks: Area below foundation or pavement or sidewalk subbase bounded by 1 horizontal to 2 vertical slope extending outward from 1-foot beyond outer edge of foundation or pavement or sidewalk subbase.
- B. Influence Zone Under Piping or Electrical Ducts: Area below limits bounded by line 6 inches below pipe or electrical duct and by 1 horizontal to 2 vertical slope extending outward from that line 1-foot beyond outer edge of pipe or duct.
- C. Unsuitable Material: Topsoil, peat, organic soils, and materials containing slag, cinders, foundry sand, debris, and rubble or soil with less than required bearing capacity as determined by Engineer.

1.04 SUBMITTALS

- A. Test Results.
 - 1. Compaction test results.
- B. Miscellaneous Submittals.
 - 1. Test results to verify fill materials meet Specifications.
- C. Submit in accordance with Section 01 33 00.

1.05 QUALITY ASSURANCE

- A. Testing shall be provided by Contractor in accordance with Section 01 45 29 and this Section.
- B. Sheet piling, Shoring, and Bracing:
 - 1. Sheet piling, shoring, and bracing shall conform to safety requirements of federal, state, and local agencies.
 - 2. Sheet piling, shoring, and bracing shall not affect structural integrity of new construction, water tightness or waterproofing of new construction, and shall allow for sufficient clearances necessary to install associated appurtenances adjacent to new construction.
 - 3. Sheet piling, shoring, and bracing shall not penetrate walls or slabs of new construction unless approved by Engineer.

1.06 PROJECT / SITE CONDITIONS

- A. Notify Owners of above or below ground utilities encountered during excavation operations.
- B. Cap and remove or relocate services in accordance with instructions of Owners of such utilities.
- C. Protect, support, and maintain conduits, wires, pipes or other utilities that are to remain in accordance with requirements of Owners of such utilities.
- D. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.
- E. Maintain access to adjacent areas at all times.

PART 2 – PRODUCTS

2.01 FILL MATERIALS

- A. Structural Fill:
 - 1. Well-graded sand, well-graded sand and gravel, well-graded crushed stone or gravel, or other approved material, of 2 inch maximum size, free from organic and deleterious materials.
 - 2. Plasticity Index: ASTM D4318, 6 or less. Plasticity Index shall be performed on fraction of material that passes the No. 40 sieve.
 - 3. Maximum Fines: ASTM D422, 10% passing No. 200 sieve.
 - 4. Uniformity Coefficient: 5 or greater.
 - 5. Concrete may be used as Structural Fill when approved by Engineer.
- B. Earth Fill: Conform to requirements of Section 31 22 00.
- C. Free-Draining Fill:
 - 1. ASTM C33, Size No. 67.
 - 2. Washed crushed stone.
 - 3. Maximum Fines: ASTM D422, 1% passing No. 200 sieve.

2.02 FILTER FABRIC

- A. Porous non-woven fabric with multiple layers of randomly arranged fibers, min 4.0 ounce per square yard (typical).
- B. Manufacturers:
 - 1. Mirafi 140N by Mirafi, Inc.
 - 2. Typar 340I by DuPont.
 - 3. C-40NW by Contech.
 - 4. FX-40HS by Carthage Mills.
 - 5. Or Equal.

2.03 SHEETING, SHORING, AND BRACING

- A. Type, design, detail, and installation of sheeting, shoring, and bracing shall be determined by and sole responsibility of Contractor.

2.04 SOURCE QUALITY CONTROL

A. Testing:

1. One sieve analysis, plasticity index, and uniformity coefficient for each source of structural fill.
2. One sieve analysis for each source of free-draining fill.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of Work, such as areas loosened by frost action or softened by flooding or weather, or existence of unsuitable material. Do not proceed until unsatisfactory conditions are corrected.
- B. Proof-roll and examine surfaces to receive fill and subgrades within influence zone to determine existence of soft areas, areas loosened by frost action or softened by flooding, groundwater or weather or existence of unsuitable materials.
- C. Where sensitive soils are encountered, requirement for proof rolling shall be waived, and Contractor shall perform alternative field testing to determine existence of soft areas. Method of alternative testing shall be approved by Engineer.

3.02 PREPARATION

- A. Fill settled areas where excavations or trenches were backfilled and holes made by demolition, tree removal, and site preparation.
- B. Natural soils or fill softened by frost, flooding or weather shall be removed and replaced.
- C. Remove unsuitable material within influence zone under foundations, pavements, sidewalks, piping or electrical ducts.
- D. Remove frozen soils within influence zone.

3.03 SHEETING, SHORING, AND BRACING

- A. Whenever necessary to prevent caving during excavation and to protect adjacent piping, structures, property, workers, and the public; excavations shall be sheeted, shored, and braced.
- B. When sheeting, shoring, and bracing is required, install to prevent soil from entering excavation below or through sheeting.
- C. Keep sheeting, shoring, and bracing in place until structure is placed, tested, and backfilled.
- D. Remove sheeting, shoring, and bracing in manner not damaging to structure or permitting voids within backfill.
- E. Fill settled areas after sheeting, shoring, and bracing has been removed.

3.04 DEWATERING

- A. Contractor shall dewater excavation site prior to starting excavation and shall maintain groundwater minimum of 12 inches below bottom of excavation.

- B. Contractor is responsible for choosing method of groundwater control.
- C. If Contractor chooses to use deep wells or well points, wells and well points shall be designed, installed, and operated to prevent removal of in-situ materials.
- D. Keep construction site free-draining. Keep excavations free of water.
- E. Remove soil disturbed by pressure or flow of groundwater.
- F. Maintain dewatering system to prevent uplifting of or damage to structures.
- G. Protect adjacent utilities, structures, and properties from damage resulting from dewatering operations.
- H. Drill, maintain, and abandon dewatering wells in accordance with federal, state, and local ordinances.

3.05 EXCAVATION

- A. Excavate to the lines, grades, and elevations indicated and necessary to complete construction.
- B. Method of excavation shall be consistent with soil types encountered and result in undisturbed subgrade. Loosened soils shall be recompacted or removed and replaced.
- C. Excavation of Rock:
 - 1. Where rock, boulders, or similar material is encountered, and where such material cannot be removed or excavated by conventional earth moving or ripping equipment, remove or excavate such material by means which will neither cause additional cost to Owner nor endanger buildings or structures on or off the site.
 - 2. Do not use explosives without written permission from Engineer.
- D. Protect excavated areas from freezing.

3.06 FILL USAGE

- A. Structural: Within influence zone under footings and foundations, floor slabs, pavements, sidewalks, piping or electrical ducts. Provide a minimum 6 inch layer under floor slabs when subbase material is not granular in nature.
- B. Free-Draining: Where noted.
- C. Earth: Other areas not previously specified.

3.07 PLACING FILL

- A. Notify Engineer before placing fill material.
- B. Do not use frozen material or place fill on frozen subgrade.
- C. Place filter fabric where indicated in accordance with manufacturer's recommendations.
- D. Do not backfill until concrete is properly cured and has reached 85% of design strength, coatings approved, and required tests accepted.

- E. Place fill against foundation walls enclosing interior spaces after construction such as cross-walls, beams, or slabs are in-place to brace wall and such construction has reached 85% of design strength.
- F. Place fill simultaneously on both sides of free standing structures.
- G. Do not operate power-operated earth moving equipment closer to foundation walls or other structures than distance equal to ½ height of fill above footing.
- H. Begin compaction of each layer at structure wall to minimize lateral forces against structure due to wedging action of soil.
- I. Stop backfill at specified grade to allow for placing topsoil or sidewalk or pavement subbase.
- J. Place and compact fill materials in lift thickness and to densities listed.
 - 1. Degree of compaction: ASTM D1557, Modified Proctor.
 - 2. Moisture Content: Within 3% of optimum.

Location	Maximum Lift Thickness	Modified Proctor (%)
Footing, Foundation Slab, or Floor Slab Influence Zone	8 inches	95 minimum
Sidewalk, Pavement, Piping, or Electrical Duct Influence Zone	6 inches	90 minimum
Lawn and Landscaped Areas	12 inches	80 minimum, 90 maximum

3.08 FIELD QUALITY CONTROL

A. Testing:

- 1. One field density test for each 25 cubic yards of structural fill, minimum one each lift.
- 2. One field density test for each 500 cubic yards of earth fill.
- 3. Determine in-place density of fill at maximum intervals specified in accordance with ASTM D1556, D2167, D2922 or D2937.

3.09 ADJUSTMENT AND CLEANING

- A. Conform to requirements of Section 31 22 00.

END OF SECTION

SECTION 31 23 33
TRENCHING AND BACKFILL

PART 1 – GENERAL

1.01 SUMMARY

- A. Trenching and backfilling to elevations shown on Drawings and as needed for installation of underground piping and utilities associated with Work and to meet requirements of Contract Documents.

1.02 REFERENCES

- A. ASTM: American Society for Testing and Materials

1.03 DEFINITIONS

- A. Influence Zone Under Foundations, Pavements, or Sidewalks: Area below foundation or pavement or sidewalk subbase bounded by 1 horizontal to 2 vertical slope extending outward from 1-foot beyond outer edge of foundation or pavement or sidewalk subbase.
- B. Influence Zone Under Piping or Electrical Ducts: Area below limits bounded by line 6 in. below pipe or electrical duct and by 1 horizontal to 2 vertical slope extending outward from that line 1-foot beyond outer edge of pipe or duct.
- C. Unsuitable Material: Topsoil, peat, organic soils, and materials containing slag, cinders, foundry sand, debris, and rubble or soil with less than required bearing capacity as determined by Engineer.

1.04 SUBMITTALS

- A. Test Results.
 - 1. Compaction test results.
 - 2. Proctor test results.
- B. Miscellaneous Submittals.
 - 1. Test results to verify fill materials and bedding and cover materials meet Specifications.
- C. Submit in accordance with Section 01 33 00.

1.05 QUALITY ASSURANCE

- A. Testing shall be provided by Contractor in accordance with Section 01 45 29 and this Section.
- B. Sheet piling, shoring, and bracing shall conform to safety requirements of federal, state, and local agencies.

1.06 PROJECT / SITE CONDITIONS

- A. Notify owners of above or below ground utilities encountered during trenching operations.

- B. Cap and remove or relocate services in accordance with instructions of owners of such utilities.
- C. Protect, support, and maintain conduits, wires, pipes or other utilities that are to remain in accordance with requirements of owners of such utilities.
- D. Use means necessary to prevent dust becoming a nuisance to the public, to neighbors, and to other work being performed on or near the site.
- E. Maintain access to adjacent areas at all times.

PART 2 – PRODUCTS

2.01 FINE AGGREGATE

- A. Granular material, consisting of uniformly graded durable particles. Unwashed bank-run sand and crushed bank-run gravel may be used.

1. Gradation No. 1:

Sieve Size	% Passing by Weight
1 inch	100
No. 16	45 – 80
No. 200	2 – 10

2. Gradation No. 2:

Sieve Size	% Passing by Weight
1 inch	100
3/4 inch	85 – 100
3/8 inch	50 – 80
No. 4	35 – 65
No. 40	15 – 30
No. 200	5 – 15

2.02 COARSE AGGREGATE

- A. Hard, tough, and durable crushed stone or crushed rock.

1. Gradation No. 1: (ASTM C33 Size 8)

Sieve Size	% Passing by Weight
1/2 inch	100
3/8 inch	85 – 100
No. 4	10 – 30
No. 8	0 – 10
No. 16	0 – 5

2. Gradation No. 2: (ASTM C33 – Size No. 67)

Sieve Size	% Passing by Weight
1 inch	100

3/4 inch	90 – 100
3/8 inch	20 – 55
No. 4	0 – 10
No. 8	0 – 5

3. Gradation No. 3: (ASTM C33 – Size No. 2)

Sieve Size	% Passing by Weight
3 inch	100
2-1/2 inch	90 – 100
2 inch	35 – 70
1-1/2 inch	0 – 15
3/4 inch	0 – 5

2.03 FILL MATERIALS

- A. Structural Fill: Conform to requirements of Section 31 23 00.
- B. Excavated Trench Material:
 - 1. Natural soils resulting from excavation of project trenches.
 - 2. Free of topsoil, wood, peat, cinders, organic and deleterious matter or other rubbish.

2.04 FILTER FABRIC

- A. Conform to the requirements of Section 31 23 00.

2.05 SHEETING, SHORING, AND BRACING

- A. Type, design, detail, and installation of sheeting, shoring, and bracing shall be determined by and sole responsibility of Contractor.

2.06 SOURCE QUALITY CONTROL

- A. Testing:
 - 1. One sieve analysis, plasticity index, and uniformity coefficient for each source of structural fill.
 - 2. One sieve analysis for each source of bedding material and cover material.

PART 3 – EXECUTION

3.01 EXAMINATION

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work such as areas loosened by frost action or softened by flooding or weather, or existence of unsuitable material. Do not proceed until unsatisfactory conditions are corrected.

3.02 PREPARATION

- A. Natural soils or fill softened by frost, flooding or weather shall be removed and replaced.

- B. Remove unsuitable material from within trenches.
- C. Stabilize trench bottom and replace unsuitable materials with Coarse Aggregate Gradation No. 3.
- D. Where placement of coarse aggregate will not provide an adequate foundation for laying pipe due to instability of existing materials and where ordered by Engineer, place geotextile fabric on top of unstable subgrade materials prior to placing coarse aggregate. Sufficient geotextile fabric shall be used to completely enclose foundation materials and pipe.

3.03 SHEETING, SHORING, AND BRACING

- A. Whenever necessary to prevent caving during excavation and to protect adjacent piping, structures, property, workers, and public, trenches shall be sheeted, shored, and braced.
- B. When sheeting, shoring, and bracing is required, install to prevent soil from entering excavation below or through sheeting.
- C. Remove sheeting, shoring, and bracing after backfilling, or when approved by Engineer as backfill is being placed.
- D. Remove sheeting, shoring, and bracing in manner not damaging to facility or permitting voids within backfill.
- E. Fill settled areas after sheeting, shoring, and bracing has been removed.

3.04 DEWATERING

- A. Dewater excavation site prior to starting trenching and maintain groundwater minimum of 12 inches below bottom of trench. Dewatering system shall be of a sufficient size and capacity as required to control hydrostatic pressure on trench sides and bottom to allow material to be excavated, pipe installed and backfill placed, all in a dry condition.
- B. Contractor is responsible for choosing method of groundwater control. Sequence of installation of components of dewatering system shall be in accordance with the approved dewatering plan. System shall remain in continuous operation until pipe is installed and backfilled.
- C. If Contractor chooses to use deep wells or well points, wells and well points shall be designed, installed, and operated to prevent removal of in-situ materials.
- D. Drill, maintain, and abandon dewatering wells in accordance with federal, state, and local ordinances.
- E. Keep construction site free-draining. Keep trenches free of water.
- F. Remove soil disturbed by pressure or flow of groundwater.
- G. Maintain dewatering system to prevent uplifting of or damage to facilities.
- H. Protect adjacent utilities, structures, and properties from damage resulting from dewatering operations.
- I. Direct discharge of trench dewatering pumps to sediment traps before conveying to natural drainage channels or storm water drains.

3.05 EXCAVATION

- A. Excavate to the lines, grades, and elevations indicated and necessary to complete construction.
- B. Method of excavation shall be consistent with soil types encountered and result in undisturbed subgrade. Loosened soils shall be recompacted or removed and replaced.
- C. Where possible, excavated materials shall be placed in areas that will not block existing vehicle and pedestrian traffic and drainageways.
- D. Conduct excavating operations to carefully expose all in-place underground structures without damage. Wherever excavation extends under or approaches close to an existing structure, precautions and protective measures shall be taken as necessary to preserve the structure and provide temporary support. Use hand excavation methods to probe for and expose such critical or hazardous installations as gas pipe and power or communication cables.
- E. Excavation of Rock:
 - 1. Where rock, boulders, or similar material is encountered, and where such material cannot be removed or excavated by conventional earth moving or ripping equipment, remove or excavate such material by means which will neither cause additional cost to the Owner nor endanger buildings or structures on or off site.
 - 2. Do not use explosives without written permission from Engineer.
- F. Trench Tolerances:
 - 1. Maximum width of trench at top of pipe shall be outside diameter of pipe plus 24 inches. When sheeting, shoring, and bracing required, width of trench may be increased to allow for their use, provided provisions for excess width of trench are met.
 - 2. Where trench width below top of pipe exceeds specified limit, Contractor, at his expense, shall furnish pipe with strength adequate for actual trench width.
 - 3. Minimum trench width shall be outside diameter of pipe plus 18 inches
 - 4. Top of concrete encasement for electrical duct or top of conduit shall be minimum of 24-inches below final grade or as shown on Drawings.
 - 5. Trench width at ground surface shall be the minimum allowable based on OSHA standards and soil types.
- G. Do not excavate within influence zone of existing footings or foundations without prior approval of Engineer.
- H. Excavation through Rigid Pavement:
 - 1. Remove pavement a minimum of 1 foot beyond anticipated edge of excavation.
 - 2. Saw cut pavement to ensure straight joint.
 - 3. Pavement replacement shall match existing.
- I. Excavation, backfill, and pavement replacement of roadways shall conform to requirements of local highway authority. In no case shall the replacement pavement edges bear on less than 12 inches of undisturbed soil.

3.06 FILL USAGE

- A. Bedding Material:

1. Plastic, Copper, Fiberglass or Reinforced Plastic Pipe, and Electrical Conduit or Ducts: Fine aggregate gradation No. 1.
 2. Other Pipe 18-inch diameter or less: Coarse aggregate gradation No. 1.
 3. Other Pipe over 18-inch diameter: Coarse aggregate gradation No. 2.
- B. Bedding Material Limits:
1. Electrical Ducts:
 - a. Hand grade bottom of trench to established uniform grade of not less than 4 inches / 100 feet.
 - b. Use bedding material to bring grade to desired elevation.
 2. Bedding material shall be placed over entire width of trench bottom such that after pipe has been placed thereon, imbedded to grade and aligned, there remains a 6 inch minimum depth of material below pipe barrel and a minimum of 5 inches below the bell.
 3. Bell holes shall be excavated so that entire pipe barrel rests on bedding.
- C. Cover Material:
1. Copper, Fiberglass or Reinforced Plastic Pipe and Electrical Conduit: Fine aggregate gradation No.1.
 2. Other Piping: Fine aggregate gradation No. 2.
 3. Electrical Ducts: Structural Fill or Excavated Trench Material.
 4. Bedding material may be substituted for cover material.
- D. Cover Material Limits:
1. Electrical Conduit: Minimum 6 inches above and 9 inches each side.
 2. Piping: Minimum of 12 inches above top of pipe and 12 inches each side.
- E. Structural Fill: Within trenches under pavements and sidewalks and within piping, electrical duct or structure influence zone.
- F. Excavated Trench Material: Other areas not previously specified.
- G. Flowable Fill: Where noted.

3.07 PLACING FILL

- A. Notify Engineer before placing fill material.
- B. Do not use frozen material or place fill on frozen subgrade.
- C. Place filter fabric where indicated in accordance with manufacturer's recommendations.
- D. Do not backfill until concrete is properly cured and has reached design strength, coatings approved, and required tests accepted.
- E. Place fill simultaneously on both sides of freestanding structures.
- F. Where pipes leave structures, protect by backfilling pipe influence zone down to undisturbed soil with bedding material.
- G. Where pipes or electrical ducts cross, protect piping or ducts at higher elevation by backfilling trench within influence zone of higher pipe or duct with structural fill.

- H. Where pipes or electrical ducts leave structures, protect by backfilling within influence zone of pipe or duct with structural fill.
- I. Provide mechanical compaction. Jetting, flooding, puddling, or vibroflotation methods shall not be used for compaction.
- J. Place and compact bedding, cover and fill materials in lift thickness and to densities listed below:
 - 1. Degree of compaction: ASTM D1557, Modified Proctor.
 - 2. Moisture Content: Within 3% of optimum.

Location	Maximum Lift Thickness	Modified Proctor (%)
Bedding Material or Cover Material	6 inches	90 minimum
Fill material under Footing, Foundation Slab, or Floor Slab Influence Zone	8 inches	95 minimum
Fill material under Sidewalk, Pavement, Crushed Aggregate Base Course, Piping, or Electrical Duct Influence Zone	6 inches	90 minimum
Fill material under Lawn and Landscaped Areas	12 inches	80 minimum, 90 maximum

3.08 FIELD QUALITY CONTROL

- A. Testing:
 - 1. One field density test for each 100 cubic yards, bedding material and cover material, minimum one each lift.
 - 2. Trench Backfill Material: One field density test for each 100 cubic yards.
 - 3. Determine in-place density of fill at maximum intervals specified in accordance with ASTM D1556, D2167, D2922 or D2937.
 - 4. Recompact and retest areas of backfill tested that did not meet minimum requirements.

3.09 ADJUSTMENT AND CLEANING

- A. Stockpile material suitable for backfill where designated by Engineer. Place no fill where trenches for sewers, water line, or other utilities will be located.
- B. Conform to requirements of Section 31 22 00.

END OF SECTION

SECTION 31 25 00
EROSION AND SEDIMENTATION CONTROL

PART 1 – GENERAL

1.01 SUMMARY

- A. Section describes requirements for control of erosion on construction sites. Contractor shall provide necessary materials, equipment, and labor to control erosion by methods specified herein. If no specific quantities are shown on Plans, Contractor shall use whatever quantities are necessary to prevent sediment transport into adjacent storm water conveyance systems or water bodies.
- B. Section includes:
 - 1. Silt Fence
 - 2. Mulching
 - 3. Non-Channel Erosion Mat
 - 4. Seeding
- C. Contractor shall not begin work until after initial erosion and sediment control devices are in place and approved by Engineer.

1.02 PERMITS

- A. Since the project will disturb less than one (1) acre of land a Stormwater NPDES Permit is not needed.
- B. The following laws, regulations and guidelines apply to the erosion and sedimentation control requirements described in this Section.
 - 1. Illinois Law: 415 ILCS 5/13(b)(1)
 - 2. Federal Code: 40 CFR 122.26
 - 3. Federal Code: 40 CFR 122.21
 - 4. Federal Code: 63 FR 15630-15634
 - 5. USEPA Summary Guidance Document 833-R-92-001
 - 6. EPA Illinois Urban Manual (1995 or most current edition)

1.03 DEFINITIONS

- A. IDOT: Illinois Department of Transportation Standard Specifications Current Edition including all addenda and Special Provisions.

PART 2 – PRODUCTS

2.01 TOPSOIL

- A. Topsoil shall be fertile, friable, natural loam surface soil, reasonable free of subsoil, clay lumps, brush, weeds, and free of roots, stumps, stones larger than two inches in any dimension, and other matter harmful to plant growth. Topsoil to supplement insufficient topsoil on the site shall originate from local sources, but not from bogs or marshes.
- B. Reference Section 32 92 00.

2.02 TEMPORARY EROSION CONTROL SEEDING

- A. Conform to the requirements of Article 1081.15(g) of the IDOT Standard Specifications.

2.03 SEDIMENT CONTROL FENCE

- A. Acceptable product: ADS product 3302WP or equivalent.

2.04 STRAW EROSION BLANKET

- A. Reference Section 32 92 00.

PART 3 – EXECUTION

3.01 EROSION CONTROL REQUIREMENTS

- A. Water pumped from the site and all excavations shall be treated by temporary sedimentation basins, grit chambers, sand filters, upslope chambers, hydro-cyclones, swirl concentrators, or other appropriate controls designed and used to remove particles of 100 microns or greater for the highest dewatering pumping rate. If the water is demonstrated to have no particles greater than 100 microns during dewatering operations, then no control is needed before discharge. Water may not be discharged in a manner that causes erosion of the site or receiving channels.
- B. Contractor shall take all possible precautions to prevent sediment from being tracked onto public or private roadways. Any sediment reaching a public or private road shall be removed by street cleaning (not flushing) before the end of each workday.
- C. All storm drain or culvert inlets shall be protected with sediment control fence or equivalent barrier approved by the Engineer. Channelized runoff from adjacent areas passing through the site shall be diverted around disturbed areas, if practical. Otherwise, the channel shall be protected. Street flow runoff from adjacent areas greater than 10,000 square feet in area shall also be diverted around disturbed areas, unless shown to have resultant runoff velocities of less than 0.5 ft / sec across the disturbed area for one year design storms having a duration of from 0.5 to 24 hours. Diverted runoff shall be conveyed in a manner that will not erode the conveyance and receiving channels. (Note: Soil and Conservation Service Guidelines for allowable velocities in different types of channels should be followed).
- D. All activities on the site shall be conducted in a logical sequence to minimize the area of bare soil exposed at any one time.
- E. Except as indicated below, site stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than **14 days** after the construction activities have temporarily or permanently ceased. Where the initiation of stabilization measures by the 14th day after construction activity temporary or permanently cease is precluded by snow cover, stabilization measures shall be initiated as soon as practicable. Where construction activity will resume on a portion of the site within 21 days from where activities ceased, (e.g. the total time period that construction activity is temporarily ceased is less than 21 days) then stabilization measures do not have to be initiated on that portion of site by the 14th day after construction activity temporarily ceased.
- F. Contractor shall record the dates when major grading activities occur, when construction activities temporarily or permanently cease on a portion of the site, and when stabilization measures are initiated. This record shall be incorporated into the SWPPP.

- G. All disturbed ground left inactive for the period specified above shall be stabilized by seeding followed by an application of straw erosion blanket as specified herein. All stabilization and erosion control measures shall be provided with on-going maintenance until the site has been completely stabilized in the opinion of the Owner and Engineer.
- H. For sites with more than 10 acres disturbed at one time, or if a channel originates in the disturbed area, one or more sedimentation basins shall be constructed. Each sedimentation basin shall have a surface area of at least 1% of the area draining to the basin and at least three feet of depth and shall be constructed in accordance with accepted design specifications. Sediment shall be removed to maintain a depth of three feet. The basin shall be designed to have a surface overflow rate of 1,500 gpd/SF for a two-year design storm having a duration of 24 hours. The basin discharge rate shall also be sufficiently low as to not cause erosion along the discharge channel or the receiving water.
- I. For sites with less than 10 acres disturbed at one time, sediment control fences or equivalent control measures shall be placed along all sideslope and downslope sides of the site. If a channel or area of concentrated runoff passes through the site, sediment control fences shall be placed along the channel edges to reduce sediment reaching the channel.
- J. Any soil or dirt storage piles containing more than 10 cubic yards of material should not be located with a down-slope drainage length of less than 25 feet to a roadway or drainage channel. If remaining for more than seven days, they shall be stabilized by mulching, vegetative cover, tarps, or other means. Erosion from piles which will be in existence for less than seven days shall be controlled by placing hay bales or sediment control fence barriers around the pile. In-street utility repair or construction soil; or dirt storage piles located closer than 25 feet to a roadway or drainage channel must be covered with tarps or a suitable alternative control must be used if exposed for more than seven days. Storm drain culvert inlets must be protected with straw bales or other appropriate filtering barriers.
- K. Perimeter erosion control barrier shall be installed at locations directed by the Engineer.

3.02 SEEDING

- A. Conform to the requirements of Article 280.04(f) of the IDOT Standard Specifications. Temporary seeding shall be applied at a rate of 100/lb acre.
- B. If the Contractor intends to seed for both temporary erosion control and permanent restoration, follow the requirements of Section 32 92 00.
- C. Additional stabilization measures, such as straw erosion control blankets, may be required in addition to temporary seeding at the direction of the Engineer. Conditions that may warrant additional stabilization measures include time of year (e.g. seed not expected to germinate immediately due to heat or cold), areas of concentrated flow, or steep slope or embankment areas.

3.03 CONSTRUCTION OF SEDIMENT CONTROL FENCE

- A. Reference IDOT Specification Article 280.
- B. Install and maintain silt fence at the perimeter of all disturbed areas that materials do not contaminate areas outside of the work limits.

END OF SECTION

DIVISION 32
EXTERIOR IMPROVEMENTS

SECTION 32 11 23
AGGREGATE BASE COURSES

PART 1 – GENERAL

1.01 SUMMARY

- A. Provide crushed aggregate base course where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

1.02 DEFINITIONS

- A. IDOT Specs: Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition.
- B. ASTM: American Society for Testing and Materials
- C. AASHTO: American Association of State Highway and Transportation Officials

1.03 SUBMITTALS

- A. General:
 - 1. Submit Product Data in sufficient detail to confirm compliance with requirements of this Section. Submit Product Data and Shop Drawings in one complete submittal package. Partial submittals are unacceptable.
- B. Source of Aggregates
- C. Test Results of Quality Assurance Testing
- D. Submit in accordance with Section 01 33 00.

1.04 QUALITY ASSURANCE

- A. Perform the following testing:
 - 1. Aggregate Gradation in accordance with AASHTO T 27.

PART 2 – PRODUCTS

2.01 PAVEMENT MATERIALS

- A. Aggregate:
 - 1. Furnish aggregate from local Department of Transportation approved sources.
 - 2. Conform to IDOT Section 1004 for gradation requirements.
 - 3. CA-6 and CA-10

2.02 SUBGRADE REINFORCEMENT

- A. Tensar TriAx TX140 Geogrid or Equal.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Check subbase for soundness, outline, and contour. Prepare areas for base course placement on subbase by scraping down or filling irregularities. Compact subbase prior to basecourse placement.
- B. Proof roll the prepared subbase. Make multiple passes to test entire area. Remove and replace areas where displacement in base (yielding, heaving, cracking or other signs of instability), in the opinion of the Engineer, is more than 1 inch under a fully-loaded tandem-axle dump truck. Excavate and backfill displaced areas with new base course material, compact, and retest. Do not begin placement of base course until deficient areas have been corrected.
- C. Remove excess material not required by Owner, material not suitable for backfilling or site grading, and unsuitable materials from site. Dispose of excavated material in accordance with local, state, and federal requirements.

3.02 SUBGRADE REINFORCEMENT

- A. Place after subgrade is shaped, compacted, and proof rolled.
- B. Roll out fabric on subgrade and remove wrinkles.
- C. Join separate pieces of fabric by overlapping a minimum of 18 inches.
- D. Place base course on fabric by back dumping. Do not operate construction equipment on fabric.

3.03 DELIVERY, STORAGE, AND HANDLING

- A. Adjust weight, type, capacity, haul routes, and method of operation of hauling vehicles such that there is no damage to existing streets, subgrade, or base course.
- B. Owner has final authority to designate haul routes, procedures, and operation times

3.04 INSTALLATION

- A. Construct aggregate base course in two or more layers of approximately equal thickness.
- B. Maximum compacted thickness of layer shall not exceed 6 inches.
- C. Deposit material on foundation or previously placed layer to minimize segregation and facilitate spreading to uniform layer.
- D. Compact after each layer has been placed and spread to thickness, width, and contour to 95% of maximum density (Standard Proctor), in accordance with ASTM D-1557, before succeeding layer is placed.

3.05 FIELD QUALITY CONTROL

- A. Check in-place base course for surface irregularities and repair unacceptable areas.

END OF SECTION

SECTION 32 12 16
ASPHALT PAVING

PART 1 - GENERAL

1.01 SUMMARY

- A. Provide asphalt pavement where shown on Drawings, as specified herein, and as needed for a complete and proper installation.
- B. Asphalt Pavement thickness:
 - 1. Lower Layer (Binder Course): 4 inches
 - 2. Upper Layer (Surface Course): 2 inches

1.02 DEFINITIONS

- A. IDOT Specifications: Illinois Department of Transportation Standard Specification, latest edition.
- B. ASTM: American Society for Testing and Materials
- C. AASHTO: American Association of State Highway and Transportation Officials

1.03 SUBMITTALS

- A. General:
 - 1. Submit Product Data in sufficient detail to confirm compliance with requirements of this Section. Submit Product Data and Shop Drawings in one complete submittal package. Partial submittals are unacceptable.
- B. Source of Aggregates showing use on previous local Department of Transportation Projects.
- C. Asphalt Mix Design, including aggregate gradation, showing use on previous local Department of Transportation Projects.
- D. Test Results of Quality Assurance Testing
- E. Submit in accordance with Section 01 33 00.

1.04 QUALITY ASSURANCE

- A. Asphalt supplier shall have a minimum of 5 years of experience producing asphalt mixes for the Department of Transportation.
- B. Do not commence placement of asphalt until mix design has been reviewed and approved by Engineer.
- C. Perform the following testing during asphalt mix production and placement:
 - 1. Density testing in accordance with AASHTO T 99.
- D. Frequency of testing for Aggregate Gradation, Asphalt Content, Air Voids, and VMA:
 - 1. 2 tests in each pavement lift at excavation site.

E. Testing shall be provided by Contractor in accordance with Section 01 45 29 and this section.

PART 2 - PRODUCTS

2.01 PAVEMENT MATERIALS

A. Aggregate:

1. Furnish coarse aggregate from local Department of Transportation approved sources.
2. Aggregate for Bituminous Binder Course
 - a. Sound, angular crushed stone, crushed gravel, or crushed slag, sand, stone or slag screenings.
 - b. Gradation: Well graded between limits specified and shall conform to IDOT Specs Article 1004.03 for HMA Binder Course, IL-19.0.
3. Aggregate for Bituminous Surface Course
 - a. Crushed stone, crushed gravel, crushed slag, and sharp-edged natural sand.
 - b. Sand prepared from stone, blast-furnace slag, gravel, or combinations thereof may be used if required to suit local material availability.
 - c. Gradation: Well graded between limits specified and shall conform to IDOT Specs Article 1004.03 for HMA Surface Course, IL-9.5.
4. Mineral Filler: Rock or slag dust, hydraulic cement, or other inert material complying with ASTM D242.

B. Bituminous Materials:

1. Asphalt Cement: Penetration Grade PG 64-22 in accordance with ASTM D946.

C. Mix Design:

1. Conform to IDOT Specs Section 1030.
2. Mixture type: HMA Binder Course, IL-19.0 and HMA Surface Course, IL-9.5.

D. Tack Coat

1. Comply with IDOT Standard Specifications, Section 406.

B. Prime Coat

1. Comply with IDOT Standard Specifications, Section 406. Provide a prime coat over aggregate base course (except on patches) at a rate of 0.50 gallons per square yard (SY). Prime coat shall meet Note 1 of Article 406.02, item indicated as 'prime coat on aggregate bases, of IDOT's standard specifications.

E. Recycled Asphalt Pavement

1. Stockpile recycled asphalt pavement separately from virgin materials and list each as individual job mix formula components.
2. Conform to the following maximum allowable percent binder replacement (ratio of recovered binder to total binder):

- a. Lower Layer: 35%
- b. Upper layer: 25%

PART 3 - EXECUTION

3.01 WEATHER LIMITATION

- A. Apply prime and tack coats when ambient temperature is above 35 degrees Fahrenheit. Do not apply when base is wet or contains standing water.
- B. Place asphalt material when atmospheric temperature is above 35 degrees Fahrenheit and rising, and when base is dry.
- C. Do not place asphalt material on frozen subgrade or base.

3.02 PREPARATION

- A. Check base course for soundness, outline, and contour. Prepare base course for areas to be paved by scraping down or filling irregularities. Compact base course prior to paving.
- B. Proof roll prepared aggregate base course to check for unstable areas and areas requiring additional compaction. Make multiple passes to test entire area to be paved. Remove and replace any area where displacement in base (yielding, heaving, cracking or other signs of stability), in opinion of Engineer, is more than 1 inch under a fully-loaded tandem-axle dump truck. Excavate and backfill displaced area with new base material, properly compacted and retested. Do not begin paving work until deficient areas have been corrected.
- C. Prime Coat:
 - 1. Apply at rate of 0.25 to 0.80 gallon per square yard, over compacted aggregate base.
 - 2. Apply material to penetrate and seal, but not flood, surface.
 - 3. Cure and dry as long as necessary to attain penetration and evaporation of volatile.
- D. Tack Coat:
 - 1. Apply to contact surfaces of previously paved surfaces abutting or projecting into areas to be paved.
 - 2. Apply to surface free of loose dirt, dust or other foreign matter.
 - 3. Apply at a rate of 0.025 gallon per square yard of surface.
 - 4. Apply only to areas expected to be paved in the same day.
 - 5. Allow to dry prior to paving.
 - 6. Avoid tracking or smearing bituminous materials onto adjoining surfaces. Remove material tracked or smeared to adjoining surfaces.

3.03 DELIVERY, STORAGE, AND HANDLING

- A. Transport asphalt materials in covered trucks during rainy weather and when air temperature falls below 65 degrees F.
- B. Adjust weight, type, capacity, haul routes, and method of operation of hauling vehicles such that no damage results to existing streets, subgrade, or base course.
- C. Owner has final authority to designate haul routes, procedures, and operation times.

3.04 PLACING ASPHALT MIX

- A. Place asphalt mixture on prepared surface, spread, and strike-off. Spread mixture at a temperature within 20 degrees Fahrenheit of temperature the asphalt material supplier recommends.
- B. Place using a self-propelled paver to ensure uniform spreading and strike-off of mix. Provide a smooth mixture free of tearing and segregation. Place mixture to required grade, cross-section, and compacted thickness.
- C. Place inaccessible and small areas by hand. Place mixture to required grade, cross-section, and compacted thickness.
- D. Joints: Place asphalt continuously to limit the number of joints. Make joints between old and new pavements and between successive days' work, to ensure continuous bond between adjoining work. Clean contact surfaces and apply tack coat. Construct joints to have same texture, density, and smoothness as other sections of asphalt pavement.

3.05 COMPACTION

- A. Compact asphalt mix while still hot. Compact each layer by uniformly rolling.
- B. In small areas not accessible by a roller, compact using mechanical tampers.
- C. Compact until no further consolidation is visible under action of the compaction equipment.
- D. Keep roller wheels moistened to avoid sticking.
- E. Compact upper layer to 91.5% of the maximum density. Compact lower layers constructed over aggregate base to 89.5% of the maximum density. Do not re-roll compacted mixtures falling below required densities. If densities fall below the required densities, stop placement and identify and correct problem.

3.06 FIELD QUALITY CONTROL

- A. Pavement Testing:
 - 1. General: Test in-place asphalt courses for compliance with requirements for surface smoothness and thickness. Repair or remove and replace unacceptable paving.
 - 1. Thickness Tolerance: In-place compacted thickness will not be acceptable if actual thickness exceeds the following allowable variation from required thickness:
 - a. Binder Course: 1/4 inch.
 - b. Surface Course: 1/8 inch.
 - 3. Surface Smoothness Tolerances: Test finished surface of each asphalt concrete course for smoothness, using 10 foot straight edge applied parallel with, and at right angles to, the centerline of paved area. Surfaces will not be acceptable if deviations exceed 1/8 inch.

END OF SECTION

SECTION 32 16 23
SIDEWALKS

PART 1 – GENERAL

1.01 SUMMARY

- A. Provide Portland cement concrete sidewalk including form work and reinforcement, base materials with compaction, where shown on Drawings, as specified herein, and as needed for a complete and proper installation.

1.02 REFERENCES

- A. ASTM: American Society for Testing and Materials
- B. CRSI: Concrete Reinforcing Steel Institute
- C. NRMCA: National Ready Mixed Concrete Association

1.03 SUBMITTALS

A. General:

- 1. Submit Product Data in sufficient detail to confirm compliance with requirements of this section.

B. Product Data:

- 1. Verification of concrete mix design.

C. Test Results:

- 1. Tests indicating compliance of reinforcement with referenced standards.
- 2. Concrete test results.
- 3. Base material test results.
- 4. Concrete delivery tickets: With each load of concrete delivered, provide duplicate tickets, one for Contractor, one for Engineer, with following information.
 - a. Serial number of ticket.
 - b. Date and truck number.
 - c. Name of supplier.
 - d. Class of concrete.
 - e. Type of cement and cement content in bags/cubic yard.
 - f. Admixture brand names.
 - g. Aggregate size.
 - h. Time loaded.
 - i. Amount of concrete in load.
 - j. Gallons of water added at site and slump of concrete after addition of water.
 - k. Temperature of concrete at delivery.
 - l. Time unloaded.

- 5. Certified reports of field tests and observations.

D. Submit in accordance with Section 01 33 00.

1.04 QUALITY ASSURANCE

- A. Plant Certification: Plant or concrete supplier shall comply with requirements of NRMCA certification plan as regards material storage and handling, batching equipment, central mixer, truck mixers with counters, agitators, nonagitating units, and ticketing system.
- B. Do not commence placement of concrete until mix designs have been reviewed and approved by Engineer.
- C. Concrete Testing: Testing shall be provided by Contractor in accordance with Section 01 45 29 and this Section.
 - 1. Conduct tests on sample material in accordance with methods listed below:
 - a. Slump: ASTM C143.
 - b. Air-Entrainment: ASTM C231.
 - c. Compressive Strength: ASTM C31 and ASTM C39.

PART 2 – PRODUCTS

2.01 BASE MATERIAL

- A. Aggregate Base Courses in accordance with Section 32 11 23.

2.02 FORMS

- A. Construct forms to exact sizes, shapes, lines, and dimensions shown, and as required to obtain accurate alignment, location, grades, and level and plumb work in finished concrete. All forms must be inspected and approved by Engineer, prior to placement of concrete.
- B. Forms shall be straight and of sufficient strength to resist pressure of concrete without bending, tipping, or other deformation. Bracing and staking of forms shall be such that the forms remain in both horizontal and vertical alignment until their removal.
- C. Forms shall not be removed from freshly placed concrete until it has hardened sufficiently to resist spalling, cracking or any other damage.
- D. Slip form machines may be used provided sidewalk can be constructed to the requirements of specifications.

2.03 CONCRETE

- A. Conform to Section 1020.04, Table 1 of IDOT Specifications.

- 1. Class Sl.

2.04 OTHER MATERIALS

- A. Curing Compounds:
 - 1. AASHTO M148, Type 2.
- B. Preformed Expansion Joint Material:

1. Meet requirements of ASTM D 1751.
2. 1/2 inch thick and premolded.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Place base material in accordance with Section 32 11 23.
- B. Check base course outline, and contour. Scrape down or fill irregularities.
- C. Compact base course prior to paving.
- D. Set castings and frames of manholes, catch basins, etc. to required alignment and grade. Hand vibrate concrete adjacent to structures.
- E. Remove foreign matter accumulated in formwork. Forms may be oiled, if necessary.
- F. Remove excess material not required by Owner, material not suitable for backfilling or site grading, and unsuitable materials from site. Dispose of excavated material in accordance with local, state, and federal requirements.

3.02 MIXING AND DELIVERY

- A. Use ready mixed concrete conforming to ASTM C94.
- B. Deliver and complete discharge within 1-1/2 hours of commencing of mixing. Limitations may be waived by Engineer if concrete slump, after 1-1/2 hours, is sufficient so that concrete can be placed without addition of water. In hot weather, time criteria may be reduced by Engineer.
- C. Do not use concrete that has stood for over 30 minutes after leaving the mixer.

3.03 CONVEYING CONCRETE

- A. Perform concrete placement at such a rate that concrete which is being integrated with fresh concrete is still plastic.
- B. Deposit concrete as nearly as practicable in its final location so as to avoid separation due to rehandling and flowing.
- C. Do not use concrete which becomes non-plastic and unworkable, does not meet required quality control limits, or has been contaminated by foreign materials.
- D. Remove rejected concrete from job site.

3.04 CONCRETE PLACEMENT

- A. Deposit concrete in a continuous operation, within limits of construction joints, until placing of a section is complete.
- B. Consolidate concrete immediately after placing by use of internal concrete vibrators supplemented by hand spading, rodding, or tamping.
- C. Do not vibrate forms or reinforcement.

- D. Do not use vibrators to transport concrete inside the forms.
- E. Bring surfaces to correct level with straightedge, and then strike off.
- F. Use bullfloats or darbies to smooth surface, leaving surface free from bumps and hollows.

3.05 CONCRETE FINISHING

- A. Check sidewalk with 10-foot straight edge. For areas showing irregularities of 0.25 inches or more cut down high areas or fill depressions with freshly mixed concrete and strike off, consolidate and refinish concrete. Do not add water to correct surface deficiencies.
- B. Provide a light broom finish perpendicular to direction of travel.
- C. Expansion joints:
 - 1. Extend entire width of sidewalk, at intervals not to exceed 100 feet.
 - 2. Install full depth of sidewalk.
 - 3. Install at all construction joints and where sidewalk abuts castings or other rigid structures.
 - 4. Place expansion joints perpendicular to sidewalk.
- D. Control Joints:
 - 1. Spacing: Maximum intervals of 6 feet.
 - 2. Formed control joints:
 - a. Depth of not less than 1/4 the sidewalk depth
 - b. Use 0.25 inch radius jointing tool.
 - 3. Sawed joints:
 - a. Not less than 2 inches deep
 - b. Make within 24 hours after concrete placement.
- E. Finish all edges with 0.25 inch radius edging tool.
- F. Apply curing compound to all exposed surfaces immediately after finishing operations have been completed and surface water has disappeared.

3.07 PROTECTION FROM FREEZING

- A. These provisions shall be followed when the atmospheric temperature is 35°F, or is expected to drop below 35°F during the curing period.
- B. Heating of aggregates and water:
 - 1. Concrete temperature shall be at least 50°F and not more than 80°F at the time of placing.
 - 2. Heating equipment or methods which alter or prevent the entrainment of the required amount of air in the concrete shall not be used.
 - 3. The equipment shall be capable of heating the materials uniformly.
 - 4. Neither aggregates nor water used for mixing shall be heated to a temperature exceeding 150°F.
 - 5. Materials containing frost or lumps of frozen material shall not be used.
 - 6. When either aggregates or water are heated to 100°F, they shall be combined first in the mixer before cement is added.

- C. Immediately after a pour is completed, the freshly placed concrete and forms shall be covered so as to form a protective enclosure and the air in the enclosure kept at a temperature above 50°F for at least 72 hours.

3.08 FIELD QUALITY CONTROL

- A. If tests verify Work in-place is not in conformance with Specifications, Engineer will determine if Work in-place is adequate for intended use. If Work in-place is determined to be inadequate, Contractor shall follow such remedial or replacement measures which Engineer may require. Contractor shall bear costs associated with testing, engineering analysis, remedial work, and replacement required under terms of this paragraph

END OF SECTION

SECTION 32 92 00
TURF AND GRASSES

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Preparing ground surface.
2. Seed and sod.
3. Fertilizer.
4. Maintenance.

B. Except for paved, riprapped, or built-up areas, all areas of site which are disturbed and areas noted on Drawings shall be seeded.

C. Surfaces on 3H to 1V slope or less may be either seeded or sodded. Surfaces on steeper than 3H to 1V slope shall be sodded.

1.02 REFERENCES

A. ASTM: American Society for Testing and Materials.

B. IDOT Standard Specifications: Illinois Department of Transportation Standard Specifications for Road and Bridge Construction, current edition, including Supplemental Specifications.

1.03 SUBMITTALS

A. General:

1. Submit Product Data in sufficient detail to confirm compliance with requirements of this Section. Submit Product Data and Shop Drawings in one complete submittal package. Partial submittals are unacceptable.
2. Mix analysis and names of seed mixes.

B. Test Results:

1. Topsoil test results including fertilizer and lime requirements.

C. Submit in accordance with Section 01 33 00.

1.04 QUALITY ASSURANCE

A. Meet or exceed specifications of Federal, State, and local laws requiring inspection for plant disease and insect control.

B. Seed shall conform to U.S. Department of Agriculture Rules and Regulations under Federal Seed Act and requirements of state seed laws.

C. Contractor shall engage certified soils testing laboratory to perform a soils evaluation of existing and/or imported topsoil to determine fertilizer and lime requirements. Provide a

minimum of 1 composite soil sample, consisting of 5 test borings, for every 5 acres to be seeded or sodded.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Provide seed mixture in sealed containers showing percentage of seed mix, year of production, net weight, date of packaging, and location of packaging.
- B. Deliver fertilizer to site in waterproof bags showing weight, chemical analysis, and name of manufacturer.

1.06 WARRANTY

- A. Warranty lawn areas for period of 1 year after acceptance of seeding and sodding to be alive and in satisfactory growth at end of warranty period.
 - 1. For purpose of establishing acceptable standard, scattered bare spots, none larger than 1 square foot, will be allowed up to a maximum of 3% of lawn area.

PART 2 – PRODUCTS

2.01 SEED

- A. Class 2 seed mixture per Article 250.07 of the IDOT Standard Specifications.

2.02 FERTILIZER

- A. Conform to the requirements of Article 1081.08 of the IDOT Standard Specifications.

2.03 ACCESSORIES

- A. Mulch: Dry oat or wheat straw or wood cellulose fiber free of weeds and foreign matter detrimental to plant life. Hay or chopped corn stalks are not acceptable.
- B. Water: Furnished by Owner from existing on-site source. Provide pumps, tankage, hose, piping, and attachments as required to bring water to point of use.
- C. Erosion Control Blanket:
 - 1. Short term duration, light duty, organic Erosion Control Revegetative Mat
 - 2. Non-organic photodegradable or biodegradable netting allowed.
 - 3. Manufacturers:
 - a. Curlex I, by American Excelsior
 - b. S75, DS75, or DS150, by North American Green
 - c. Excel SR-1, by Western Excelsior
 - d. ECS1, by East Coast Erosion Blankets
 - e. Or Equal
- D. Steel Edging: 3/16 inch thick by 4 inches deep
 - 1. Manufacturers:
 - a. General Edging by J. T. Ryerson & Son
 - b. General Edging by Brighton By-Products

- E. Landscape Stone: Washed, light colored crushed granite or other approved locally available stone conforming to ASTM C33, Size 4.

(ASTM C33 – Size No. 4)

Sieve Size	% Passing by Weight
2 inch	100
1-1/2 inch	90 – 100
1 inch	20 – 55
3/4 inch	0 – 15
3/8 inch	0 – 5

PART 3 – EXECUTION

3.01 SURFACE CONDITIONS

- A. Examine areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 PLANTING SEASONS

- A. Spring Planting Season: From time soil can be satisfactorily worked until following dates.
1. Seed: April 1st to June 15th.
- B. Fall Planting Season:
1. Seed: August 1st to November 1st.
- C. Dormant Seeding: October 21st to November 15th (Soil at 1" < 50 degrees Fahrenheit), seed with cover crop of winterwheat at 20 pounds per acre.
- D. Perform planting of seed or placement of sod only when weather conditions and soil conditions are acceptable.
- E. Planting season limits may be changed when approved by Engineer.

3.03 PREPARATION

- A. Finish grading will be performed under Section 31 22 00.
- B. Do not plant seed or place sod until trees, shrubs, and other landscaping completed.
- C. Scarify existing topsoil where grade is not being raised, or where topsoil is over compacted, to depth of 2 inches.
- D. For topsoil with high acidity, add lime as recommended in topsoil test report.
- E. Grade, rake, and roll with roller weighing not more than 100 pounds per foot or less than 25 pounds per foot.
- F. Maximum variation from correct elevation is 1/2 inch 10 feet.

3.04 FERTILIZING

- A. Fertilizer shall be applied at a 1:1:1 ratio, with an application rate of 270 pounds of fertilizer nutrients per acre. Fertilizer shall be applied according to Article 250.04 of the IDOT Standard Specifications.

3.05 SEEDING

- A. Apply seed at the rate specified in the IDOT Standard Specifications, Article 250.07, Table 1. Seeding operations shall be in conformance with Section 250 of the IDOT Standard Specifications.
- B. Seeding method shall establish smooth, uniform turf.
- C. Cover seed with 1/8 inches of soil by light racking.
- D. Do not seed following rain, if soil has been compacted by rain, or if ground is too dry.
- E. Do not seed when wind velocity exceeds 6 miles per hour.
- F. Do not seed areas in excess of that which can be mulched on same day.
- G. Immediately after seeding, apply mulch to flat areas and erosion control blanket to areas with greater than 3H to 1V slopes.
- H. Place mulch loose to allow some sunlight to penetrate and air to circulate, but thick enough to shade ground, conserve soil moisture, and prevent erosion.
- I. Butt ends and edges of erosion control blanket snugly and staple to ground surface with 6 inch staples.
- J. Apply water with fine spray immediately after area has been mulched or application of erosion control blanket. Leave area thoroughly soaked at close of each working day.

3.06 LANDSCAPE STONE

- A. Provide 6 inches deep of landscape stone at locations shown on Drawings.
- B. Prior to install landscaping mat, spray subgrade with approved pre-emergent herbicide.
- C. Install steel edging and landscaping mat and pin in place.
- D. Consolidate landscape stone to achieve uniform and level surface.

3.07 PROTECTION

- E. Protect turf areas by erecting temporary fences, barriers, signs, and similar protection as necessary to prevent trampling until acceptance by Owner.
- F. Replace, repair, restake, or replant damaged seeding or sod.
- G. Protect slopes and embankments against erosion until Work is accepted. Repair eroded areas by refilling, resodding, reseeding, and remulching as required.

3.08 FIELD QUALITY CONTROL

- A. Acceptance:

1. Notify Engineer when lawn areas are ready for final inspection.
2. Substantial completion will be granted upon conformance with following;
 - a. Turf reasonable free from weeds, diseases or other visible imperfections.
 - b. Turf displays uniform color, quality and coverage.
 - c. Minimum 3 mowings performed.
 - d. Fertilizer application performed after mowing.
3. After substantial completion, Owner will be responsible for maintenance.

3.10 MAINTENANCE

- A. Maintenance shall begin immediately following installation of each portion of lawn. Continue until substantial completion.
- B. Maintain lawns by watering, mowing, and repairing or replanting as may be necessary to produce uniform stand of grass until Work accepted.
- C. Perform first mowing when average height of grass reaches 3 inches. Perform interim mowings, 2 minimum, as needed to maintain grass height at 2 to 2-1/2 inches. Do not remove more than 1/3 of leaf blade by mowing.
- D. After completion of required interim mowings, apply 18-5-9 fertilizer as specified herein.
- E. Control weed growth; apply herbicide in accordance with manufacturer's instructions.
- F. Top dress or resod excessive cracks appearing upon soil shrinkage.

END OF SECTION

DIVISION 40
PROCESS INTERCONNECTIONS

SECTION 40 61 13
PROCESS CONTROL SYSTEM (PCS) GENERAL PROVISIONS

PART 1 – GENERAL

1.01 SUMMARY

- A. Section covers general provisions and requirements for all work necessary for Engineering, furnishing, installing, adjusting, testing, documenting, programming, and starting-up the Process Control System, complete.
- B. Unless otherwise noted, the System Integrator shall assume responsibility for specification sections:
 - 1. Process Control System – Configuration Services Section 40 61 20.
 - 2. Process Control System – Testing Section 40 61 21.
 - 3. Process Control System – Training Section 40 61 26.
 - 4. Process Control System – O&M Data Section 40 61 30.
 - 5. Process Control System I/O Listing Section 40 61 93.
 - 6. Process Control Descriptions Section 40 61 96.
- C. The Contract Documents including drawings and specifications are complementary parts and what is called for by one part shall be as binding as if called for by all parts.

1.02 REFERENCES AND ABBREVIATIONS

- A. References:
 - 1. ANSI: American National Standards Institute
 - 2. CSA: Canadian Standards Association
 - 3. EN: European Standards (generic)
 - 4. FM: Factory Mutual
 - 5. IEC: International Electrotechnical Commission
 - 6. IEEE: Institute of Electrical and Electronics Engineers
 - 7. ISA: International Society of Automation
 - 8. NEC: National Electrical Code
 - 9. NEIS: National Electrical Installation Standards
 - 10. NEMA: National Electrical Manufacturers Association
 - 11. NIST: National Institute of Standards and Technology
 - 12. NRTL: Nationally Recognized Testing Laboratory
 - 13. NFPA: National Fire Protection Agency
 - 14. OSHA: Occupational Safety and Health Administration
 - 15. UL: Underwriters Laboratory
- B. Abbreviations:
 - 1. HMI: Human/Machine Interface
 - 2. I&C: Instrumentation and Controls
 - 3. I/O: Input / Output
 - 4. LOS: Line of Sight
 - 5. PC: Personal Computer
 - 6. PCN: Process Control Network
 - 7. PCS: Process Control System
 - 8. PLC: Programmable Logic Controller

- 9. OIU: Operator Interface Unit
- 10. SCADA : Supervisory Control and Data Acquisition
- 11. UPS: Uninterruptible Power Supply

1.03 DEFINITIONS

- A. Process Control System: a complete, integrated system of PLCs, PCs, Windows-based servers, instruments, devices, wireless and wired process control networks, software, application Engineering, and ancillary equipment for monitoring and control of wastewater collection and treatment facilities.
- B. Process Control Network: a complete, integrated and secured communication network consisting of equipment and cabling that provides communications between components of the Process Control System.
- C. System Integrator: Organization whose principal function is to design, program, configure, manufacture, install, and service the PCS. An organization, under the direction of the Contractor, who shall assume complete responsibility for: detail design, manufacture, installation, configuration, technically advising on and certifying correctness of installation, testing and adjusting, documenting and starting-up, and training of the complete PCS.

1.04 SUBMITTALS

- A. In addition to the requirements of Section 01 33 00, the following information shall be provided in tabbed, booklet format covering all Project work.
- B. Shop Drawings:
 - 1. General:
 - a. Drawings shall include ancillary devices such as terminal strips, relays, fuses, utility lights and receptacles, fans, heaters, etc.
 - b. Typical drawings for multiple circuits or systems are not acceptable.
 - 2. Panel Interconnection Diagrams – Wiring interconnection diagrams prepared to show all signal and power wiring for external connections to control panels provided for Project. Wire and cable tags information shall be provided to Contractor in an electronic format for in physical wire and cable tagging.
 - a. Drawings prepared on a per control panel basis.
 - b. Show interconnecting wiring between field devices and control panel.
 - c. Interconnecting wiring shall include wire and cable tag numbers.
 - d. Field device information shall include device tag and description, signal description, signal electrical characteristics, and range.
 - e. Control panel information shall include terminal strip identification and terminal number.
 - f. Drawings shall indicate source of control signal power.
 - g. Prepare drawings in accordance with requirements of NFPA 79.
 - 3. PLC Equipment Layout Drawing including processing equipment, I/O components, power supplies, and peripheral devices.
 - 4. Test reports.

C. List of special tools (including software) required for instrument calibration, startup, checking, testing, parts replacement, troubleshooting, and maintenance of all components of the Process Control System. Identify any special tools specially designed or adapted for use on parts of this system.

D. Product Data:

1. Catalog Information - Provide catalog information and descriptive literature on all equipment associated with the PCS.
2. Product Data (Specification) Sheets – Provide product data sheets for each component provided under this Section. The purpose of the data sheets is to supplement the generalized catalog information provided by citing all specific features for each specific component (e.g., scale range, materials of construction, special options included). Product Data Sheets shall follow General ISA S20 format.

E. Test Outline and Procedure Submittal

1. A detailed description of each specified test procedure and demonstration shall be submitted for approval. The decision of Engineer upon the acceptability of the procedure shall be final.
2. It is required that this be a two-step submittal: outlines first followed, upon receipt of Engineer's approval, by specific test descriptions.
3. Test descriptions shall be in sufficient detail to fully describe the specific tests to be conducted to demonstrate conformance with these Specifications.
4. Provide detailed step-by-step in-factory and field test procedure in accordance with Section 40 61 21. Include proposed test documentation and sign-off sheets and punch list forms.
5. Identify complete inventory of equipment to be tested at factory including make, model, and serial number. Label each piece of equipment.

F. Operation and Maintenance (O&M) Data:

1. Process Control System - Submit in accordance with Section 40 61 30.
2. Fully document copy of all application programs including PLC, PC and Server-based applications. See Section 40 61 30 for requirements
3. Network, server and workstation setup instructions. See Section 40 61 30 for requirements.

G. Record Drawings: Submit in accordance with Section 40 61 30.

1.05 QUALITY ASSURANCE

- A. Contractor shall engage the services of a qualified System Integrator for the purposes of furnishing the Process Control System, providing technical assistance on the installation of System, and certifying the correctness of said installation.
- B. Equipment shall be of the latest and most modern design at the time of the Notice to Proceed.
- C. All software and firmware used in this Project shall be the latest version that is compatible with each other at the time of the Notice to Proceed.
- D. Like items of Equipment shall be end products of single manufacturer to achieve standardization for maintenance, spare parts, operation, and service.

- E. Coordination - In order to ensure timely performance of the Contract and the System's conformance with Specifications, coordination meeting(s) shall be held during the course of the project.
 - 1. Within 45 days of date of Contract Time commencement, submit Progress Meeting schedule for final coordination by Owner/Engineer, Contractor and Systems Integrator. Submit also the Submittal Schedule and Project Activity Schedule for final review.
 - 2. Progress Meetings shall be held at the project site and designated by Owner with Owner/Engineer's, Contractor's and System Integrator's representatives in attendance.
 - 3. Purpose of Progress Meetings is to obtain Owner/Engineer's clarification on intent of Contract Documents during Submittal preparation and prior to HMI and PLC software configuration at no additional cost to Owner. Progress Meeting(s) shall cover following:
 - a. Review of functional descriptions describing equipment operation.
 - b. Owner/Engineer selection of options.
 - c. Owner/Engineer review documentation
 - 4. Prepare and submit Startup Schedule, coordinated with overall Construction Schedule including the following:
 - a. Factory Acceptance Test(s).
 - b. Review of Wiring Sign-Off forms by Owner/Engineer.
 - c. I/O checkout by System Integrator.
 - d. Plant startup.
 - e. Training.
 - f. Post-startup services.

1.06 SYSTEM INTEGRATOR RESPONSIBILITY

- A. System Integrator shall inspect Equipment provided under this Section prior to shipment to Project sites.
- B. System Integrator shall coordinate work with Contactor to ensure that:
 - 1. All components provided are properly installed.
 - 2. All components provided are properly configured.
 - 3. The proper type, size, and number of control wires with conduits are provided.
 - 4. Proper electric power circuits are provided for all components and systems.
- C. System Integrator shall be responsible for coordination of voltage levels and signal types for signals connected to Process Control System. Provide relays, signal isolators, termination or pull-up resistors, signal conditioners or other devices as required for proper interfacing and operation of non-compatible devices.
- D. System Integrator shall be responsible for establishing proper communication of all control system equipment as shown on drawings and specified. System Integrator shall test and document communications as part of testing specified in Section 40 61 21.
- E. System Integrator shall be responsible for the operational testing of the HMI, OIU and PLC software programs.

- F. System Integrator shall coordinate Process Control Network addressing schemes with Owner and Application Engineer and incorporate agreed upon scheme for all equipment on the PCS including vendor supplied equipment.
- G. All field located conduits, wiring and cables shall be provided in accordance with Division 26 – Electrical. Exceptions to this are copper Ethernet cable and fiber optic Ethernet cable which shall be provided in accordance with Division 40.
- H. Modifications to existing control equipment.
 - 1. Provide equipment necessary to affect changes to existing control equipment as shown on drawings and specified.
 - 2. Provide interposing relays and current-to-current isolation relays only as required to affect signal interfacing with non-compatible devices.
 - 3. Modify documents of existing control equipment to reflect new as-built conditions and submit revised drawings per Section 01 33 00.
- I. Contractor shall furnish Owner with copy of all configured PLC application programs after On-Site Acceptance Test.

1.07 APPLICATION ENGINEERING SERVICES

- A. Application Engineering Services shall be provided by System Integrator
- B. Application Engineering Services shall include the following:
 - 1. Develop written loop descriptions from the Process Control Descriptions of Section 40 61 96. These loop descriptions will define the proposed operation and control of the plant equipment and treatment systems affected by the work on this project.
 - 2. Develop sample Human Machine Interface (HMI) graphic screen layouts.
 - 3. Organize and lead one half day Generator Monitoring and Controls Workshop with Owner at the project site to review and discuss:
 - a. Loop descriptions for operation and control of the plant equipment and treatment systems affected by the Work on this Project.
 - b. Sample HMI graphic screen layouts.
 - c. HMI navigation alternatives and approach.
 - d. Trending requirements.
 - e. Alarm and event requirements.
 - f. HMI Security requirements.
 - 4. Prepare draft meeting notes of this Controls Workshop including any mutually agreed-upon changes to the loop descriptions and the sample HMI graphics presented.
 - 5. Develop PLC and HMI application software associated with the Project in accordance with Section 40 61 20. Application software will be based on the standards established with the Owner during the pre-programming phase of the construction of the project and will be integrated into the plant-wide process control system.
 - 6. Install and test PLC and HMI application software developed by Application Engineer. Modify tested software to incorporate changes agreed to between the Owner and Application Engineer.
 - 7. Develop the alarm notification feature of the HMI software to alert operations and maintenance personnel of critical alarms by means of their existing cell phones.
 - 8. Develop standard trends and set up custom trend features.

9. Prepare an operation and maintenance manual for the new PLC and HMI application software. The manual will serve as the basis for training provided by Application Engineer.
10. Provide one day of on-site training of Owner operations and maintenance personnel in the use of the HMI and PLC application software configurations provided.
11. Deliverables:
 - a. One electronic copy of PLC and HMI program documentation on flash drive or other media acceptable to Owner.
 - b. Three hardcopy and one electronic copy of O&M Manual prepared for this project. O&M manual electronic copy will be MSWord with supporting material in PDF.

1.08 WORK FOR HIRE

- A. Any and all configuration, programming, setup or other software functions (Software) performed on all intelligent devices provided as part of this Project is to be considered "Work for Hire" under the 1976 Copyright Act as amended (Title 17 of the United States Code). The Software shall be owned by Owner and shall be turned over to Owner fully documented as the work is completed.
- B. Owner intends only to obtain the Software for its own use.
- C. Owner will not prevent the Software supplier from reuse of the Software concepts and ideas for other projects. Any reuse of the Software concepts and ideas generated under this Project is solely the responsibility of the Software supplier. The Software supplier shall defend, indemnify and hold harmless Owner from all claims, damages and expenses (including reasonable litigation costs), arising out of any use, misuse or misapplication of Software concepts and ideas.

1.09 WARRANTY

(NTS: Coordinate Location of warranty requirements with the Project Manager.)

- A. System Integrator shall warranty the Process Control System in accordance with General Conditions 00 72 00.7.17.
- B. System defects and deficiencies shall be corrected by Contractor within 24 hours of notification if Owner does not have necessary replacement parts in stock and within 4 hours of notification if Owner has necessary replacement parts in stock.

PART 2 – PRODUCTS

2.01 SYSTEM INTEGRATORS

- A. SCADAWARE
- B. No Equals

2.02 EQUIPMENT, SYSTEMS, AND SERVICES

- A. Equipment, Systems and Services provided under this Section shall conform to the following requirements.
 1. UL 508 - Standards for Safety, Industrial Control Equipment.
 2. NEMA ICS 1 - General Standards for Industrial Control and Systems.
 3. NEMA ICS 2 - Standards for Industrial Control Devices, Controllers and Assemblies.
 4. NEMA ICS 3 - Industrial Systems.

5. NEMA ICS 6 - Enclosures for Industrial Controls and Systems.
6. NEMA ICS 250 - Enclosures for Electrical Equipment.
7. NFPA 79 - Electrical Standard for Industrial Machinery
8. UL 698A Intrinsic Safe Circuits.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. Contractor shall install and wire Process Control System equipment in accordance with System Integrator's and instrument manufacturer's written instructions and approved submittals.
- B. PCS components shall be grounded in accordance with NEC requirements.
- C. The System Integrator shall supervise final power and signal connections by Contractor to all equipment provided or interfacing with the Process Control System.
- D. System Integrator shall field calibrate and completely configure equipment and instruments at time of startup on loop-by-loop basis and make adjustments necessary to place equipment in satisfactory operation.

3.02 FIELD QUALITY CONTROL

- A. Protection During Construction.
 1. Throughout Contract, Contractor shall provide protection for materials and equipment against loss or damage and the effects of weather. Prior to installation, store items in indoor, dry locations. Provide heating in storage areas for items subject to corrosion under damp conditions. Specific storage requirements shall be in accordance with the System Integrator's recommendations.
- B. Cleaning and Touch-up Painting.
 1. Keep the premises free from accumulation of waste material or rubbish. Upon completion of work, remove materials, scraps, and debris from premises and from interior and exterior of all devices and equipment. Touch-up scratches, scrapes, or chips in interior and exterior surfaces of devices and equipment with finishes matching as nearly as possible the type, color, consistency, and type of surface of the original finish.
- C. Panels and Panel-Mounted Equipment.
 1. Panels and panel-mounted devices shall be assembled as completely as possible at the System Integrator's facility. No work other than field terminations and correction of minor defects or minor transit damage shall be done on the panels at the job site.
- D. Inspections.
 1. System Integrator shall provide services of qualified service personnel to supervise and inspect equipment installation to ensure system is installed in accordance with System Integrator's recommendations.
 2. All materials, equipment, and workmanship shall be subject to observation at any time by Engineer's representatives.

END OF SECTION

SECTION 40 61 20
PROCESS CONTROL SYSTEM (PCS) – CONFIGURATION SERVICES

PART 1 – GENERAL

1.01 SUMMARY

- A. Items specified in this section shall conform to general requirements of Section 40 61 13.
- B. Configuration of Process Control System (PCS) in conjunction with following Sections:
 - 1. Section 40 61 93 Process Control System I/O List.
 - 2. Section 40 61 96 Process Control Descriptions.

1.02 RESPONSIBILITIES

- A. Configuration Services (PLC Programming) shall be provided by the Systems Integrator as defined in Section 40 61 13 using existing software:
- B. Configuration Services (Operator Interface Terminal Programming) shall be provided by the Systems Integrator as defined in Section 40 61 13 using existing software:
- C. Configuration Services (SCADA HMI Programming) shall be provided by the Systems Integrator defined in Section 40 61 13 using the following software:

1.03 DEFINITIONS

- A. DMZ
 - 1. Short for demilitarized zone. A computer or small subnetwork that is located between a trusted internal network, such as a corporate private LAN, and an untrusted external network, such as the public Internet. For the purposes of this project, the DMZ shall be where Internet data (including Geotivity and ADS data) shall be delivered and stored until requested by the Historian which shall pull the data in long term storage.
- B. Plant-Wide Process Network
 - 1. A virtual network created by the Ethernet Switches. The Process Network shall primarily handle data communication between HMI Server and the PLC's in the system as well as the communications to the radio network. This traffic shall contain collected data and control commands.
- C. Plant-Wide Information Network
 - 1. A virtual network created by the Ethernet Switches. The Information Network shall primarily handle data communications between the HMI Server and users of that information including the HMI Clients, the Portal Server and the Historian Server.

1.04 SYSTEM DESCRIPTION

- A. Design requirements:
 - 1. System shall use PLC form factor I/O subsystems to connect local and remote Equipment.
 - 2. System shall provide separate 24 volts direct current regulated power supplies to power I/O

- subsystem and to power analog instrumentation loops as required.
3. System shall provide peer-to-peer communication between PLCs, HMI computers, and other devices connected to System.
 4. System shall be provided with quantity and type of I/O as specified in Section 40 61 93 and as shown on the drawings.

B. Performance requirements:

1. HMI shall serve only as operator interface to PLCs and shall not contain automatic control functions. Automatic control functions shall be programmed into the PLCs. Timers, time clocks, and repeat cycle timers shall be a function of the PLC.
2. PLCs shall be programmed to be autonomous; a loss of the Process Control Network (PCN) shall not cause any PLC to lose the ability to maintain control of its respective processes.
3. System shall perform process monitoring and supervisory control using PLCs and HMI computers.
4. PLCs shall send/receive process data to/from field devices and be capable of following when configured:
 - a. Receive analog data from primary control elements; convert to engineering units, process for alarms and responsibility checks, and store.
 - b. Receive digital data from primary control elements, check for alarm and status change, and store.
 - c. Perform control and arithmetic calculations, including software PID and other regulatory control functions, based on system parameters and real-time data and output the properly conditioned control commands to final control elements.
 - d. Perform sequential control functions.
 - e. Ascertain off-normal conditions of process parameters and generate alarms for monitoring at the HMI. The HMI shall not be the source of alarm generation.
 - f. Communicate with HMI computer over Ethernet data highway.
 - g. Communicate with all Plant Operator Interface Terminals (OIT's).
 - h. Respond to operator requests for data and to control commands from HMI.
 - i. Respond to inhibit, enable and interlock signals from other sources.
 - j. Respond to supervisory requests for data, to control commands and to process parameter setting changes from plant PCS.
5. HMI computers shall receive/send process data from/to PLCs, maintain databases, and be capable of following when configured.
 - a. Real-time data collection. Receive and store process data from PLCs.
 - b. Receive and store manually entered data from keyboard or pointing device such as operator changes and process parameter setting changes.
 - c. Send operator and process parameter setting changes to PLCs.
 - d. Display plant activity with alphanumeric and color graphic displays of I/O associated with PLC.
 - e. Data collection for maintenance management. Provide operating information from which to generate reports and logs.
 - f. Historical data storage and reporting.
 - g. Provide overall plant alarm and status monitoring with visual and audible alarming.
 - h. Record alarms and events on screen and store to file.
 - i. Allow operator input of data not collected automatically.
6. "Local" mode of field mounted Local/Remote selector switches shall enable field control of equipment. PLC control shall be inhibited in "Local" mode. "Remote" mode shall enable PLC based Manual or Automatic control. Field control shall be inhibited in "Remote" mode.
7. Control logic for "Automatic" mode shall be programmed functions of the PLC.

C. Control Panel Requirements:

1. Unless otherwise specified, “running” signals shall be derived from equipment motor starter normally open auxiliary contacts.
2. Equipment on panels shall be identified as follows:
 - a. Indicating Light Off: Equipment Not Running.
 - b. Indicating Light Green: Equipment in Operation.
 - c. Indicating Light Red: Equipment in Alarm Condition.
 - d. Indicating Light White: Power Supply Energized.
3. Fail Logic: Failure of equipment, after having been “called to run”, shall generate a Fail alarm. Typical points of failure are motor overload (overcurrent), motor undercurrent (blower surge), motor under voltage, fail-to-start and power fail. Power fail shall include, in addition to loss of control power, the tripping of equipment circuit breakers while equipment is called to run. Provide necessary logic to sense discrepancy between “called to run” and “running” signals and activate Fail Alarm signal after adjustable time delay.
4. References to “selector switch” refer to maintained contact type functions. Loss and return of control power to circuit does not change control mode or requirement as dictated by switch position.
5. References to “pushbutton” refer to momentary contact type functions. Loss and return of control power to circuit reverts control mode or requirement to default condition. Initiating pushbutton is required to re-establish control mode or requirement.

D. Instrumentation & Control

1. Design is based upon the concept of facilities with automatic and semi-automatic control of specific plant functions. With this in mind, the following design concepts were developed:
 - a. Use of custom fabricated, PLC – based control panels. Panels shall act as area controllers, located in several of the process areas.
 - b. Operator access to the PLC panels shall be through a system of distributed desktop type personal computers running HMI software (HMI terminal server computers). Wherever possible, these units shall be located in proximity to the PLC panels. PLC panels shall not incorporate panel-mounted PCs unless absolutely necessary.
 - c. Use of a distributed HMI computer system to monitor critical and non-critical alarms, equipment run times, status conditions, plant flows and levels, and to act as input terminals for supervisory setpoint and timer function changes.
 - d. Use of locally mounted OIT's provide monitoring and control of systems throughout the Plant along with operational status, critical, non-critical, and dial-out alarm conditions.
 - e. Vendor furnished panels with PLC's or communications modules for data link interface shall be connected to the PCN.

PART 2 – SERVICES

2.01 SUMMARY

- A. Provide configuration services for Process Control System HMI computers, Control Panel PLC's, Control Panel OIU's, and for Multifunction Display/Keypads (HKUs).
- B. Graphic displays (screens) shall be formatted as schematic or symbolic representations of equipment shown on drawings.

- C. Provide, as a minimum, one graphic display per major piece of process equipment.

2.02 PLC PROGRAMMING GUIDELINES

- A. PLC programming shall follow existing Plant programming guidelines and standards. Any and all deviations shall be approved by the Owner prior to initiating programming work.
- B. Set-points, alarm values, timer values, control loop tuning parameters, and other numeric values used within PLC and HMI programs shall be part of continuous common data table within program. Parameter changes shall not require modification to instructions within program. Parameter changes shall be adjustable by changing data table through operator input via HMI.
- C. Unless specified otherwise, procedure for control power fail Restart for equipment shall be as follows:
 - 1. Equipment shall shut down on loss of control power.
 - 2. Upon restoration of power, previously running equipment shall be restarted using same sequence of startup used for "Auto" control.
 - 3. Prior to Restart, Auxiliary equipment shall be placed in "Off" position.
 - 4. Equipment Restart shall be sequenced through use of timer functions to prevent simultaneous restart.
- D. PLC shall not be enabled to control equipment unless respective field Hand/Off/Auto, Local/Remote, On/Off/Remote or Open/Close/Remote selector switch is in "Remote" or "Auto" position. Equipment status monitoring/ displaying and process parameter logging/ trending shall continue in all modes of control.
- E. Determination of high (low) Off-Normal conditions shall be by comparing an analog input value to Operator entered set-point values. Off-Normal status bit shall be set when rising (falling) input value is equal or greater (less) than entered set-point value. Off-Normal status bit shall be reset when falling (rising) input value is equal or less (greater) than entered set-point value minus (plus) entered deadband value. Operator entered high (low) set-point values are absolute values and deadband values are relative values. All values are entered through HMI.
- F. Setting of Off-Normal status bits shall cause status conditions to be displayed and/or alarmed at HMI.
- G. Resetting Off-Normal status bits shall cause status conditions displayed and/or alarmed at HMI to be cleared.
- H. Adjustable delay timers on alarm points shall prevent nuisance alarming or nuisance clearing of alarms. Timer values shall be ranged 0-30 seconds. Initial setting, unless otherwise specified, shall be 5 sec.
- I. All status conditions alarmed at HMI shall also be logged to data table.
- J. Motor Running status shall be monitored and displayed at HMI continuously.
- K. Setting of Motor Failed status bits:
 - 1. If motor is required to run via PLC control (control station Hand/Off/Auto selector switch in "Auto"),
 - 2. And If absence of Motor Running feedback status causes Motor Fail watchdog timer to time out,
 - 3. Then Motor Failed status bit shall be set.

- L. Setting a Motor Failed status bit shall cause motor command output to be inhibited and shall cause Motor Failed status to be displayed and alarmed at HMI.
- M. Resetting of Motor Failed status bits:
 - 1. If control station Hand/Off/Auto selector switch is in "Auto" position,
 - 2. And if HMI On/Off/Auto control function is cycled to "Off" position from either "On" or "Auto" positions,
 - 3. Then Motor Failed status bit shall be reset.
- N. Resetting a Motor Failed status bit shall cause motor command output to be re-enabled and shall cause Motor Failed status displayed and alarmed at HMI to be cleared.
- O. Unless specified otherwise the following watchdog timer values shall cause equipment fail status bits to be Set:
 - 1. Valve fail to open: 30 sec.
 - 2. Valve fail to close: 30 sec.
 - 3. Equipment fail to start: 30 sec.
- P. Adjustable filtering of analog inputs shall eliminate process upsets due to noise. Filtering shall be by running-average method.
- Q. Integration algorithm shall be included for "Totalizing" analog flow signals.
- R. Integration algorithm shall be included for "Totalizing" Equipment Run times (Elapsed Time Meter).
- S. Proportional/Integral/Derivative (PID) control outputs shall utilize sample and hold algorithm. Intent is to allow slow reacting processes to stabilize before additional control output changes are made by maintaining constant output from PID control for adjustable time period. PID control shall utilize deviation set-points to reactivate controller in event deviation is exceeded during controller off time. Unless specified otherwise off time shall have an adjustable range of 0-30 minutes.
- T. PLC input coils shall be configured as non-latched unless specified otherwise.
- U. PLC output contacts shall be configured as maintained unless specified otherwise.

2.03 HMI COMPUTER PROGRAMMING GUIDELINES

- A. HMI/OIT programming shall follow existing Plant programming guidelines and standards. Any and all deviations shall be approved by the Owner prior to initiating programming work.
- B. For the purposes of this section, HMI and OIT functionality shall be functionally similar.
- C. Screens:
 - 1. Overview screens and reports shall be the first screens configured. Coordinate layout and information requirements with Owner prior to development of screens.
 - 2. Graphic screens for HMI shall be formatted to resemble Process and Instrumentation Diagrams shown in the Drawings. As a minimum, one graphic display per process loop shall be provided.
 - 3. Screens shall be simplified representation of process flow stream and associated equipment as shown on Drawings. Only major devices shall be shown. Non-reporting equipment (isolation valves, check valves, indicators) shall not be shown.

4. In addition to process related display screens, the following shall also be provided:
 - a. Main Screen: Director for all other screens. Selection of any other screens shall be by cursor pick of description for that screen or function key identifier for that screen.
 - b. Utility Screen: Equipment status, Motor Run totalizer (hours).
 - c. Alarm Screens: Screen for points in alarm as selected by alarm selection matrix and screen for equipment in off-normal state (ie. Out of Service).
 - d. Data Screens: Listing of all Operator and Engineering entered values.
 - e. Trend Screen: Operator selected points for trending.
 - f. Report Screen: Operator initiated report generator.
5. Operator and Engineering screens shall be segregated to allow password protection of engineering-entered values.
6. There shall be pick-fields on all screens that will allow for return to main menu or to adjacent process flow screen (continuation of all process flow paths, either entering or existing).
7. Pick-fields shall be activated by placing mouse cursor on object or text and clicking left mouse button, or by selection of associated function key (F1-F12).

D. Data Input:

1. Data entry areas shall be provided at HMI for adjustment of process and alarm set-points. Data entry areas shall be password protected.
2. Upper and lower limits shall be provided for all data entry values. Entry of values outside of limits shall not be accepted and shall generate appropriate error message on screen. Upper and lower limit values shall be adjustable at HMI and shall be password protected.
3. Upper and lower limits shall be provided for all logged analog input values. Logged values outside of limits shall generate appropriate alarm. Upper and lower limit values shall be adjustable at HMI and shall be password protected.
4. Upper and lower limits shall determine range of analog input value. Value shall be scaled in standard Engineering Units.
5. Password protection shall consist of alpha-numeric sequence and shall be intended for Plant Supervisor and Head Operator entry only.
6. Unless otherwise specified in Functional Descriptions, process points shall be scanned as follows:
 - a. Critical Alarm points and analog input process points shall be scanned continuously.
 - b. Non-Critical Alarm points shall be scanned only on change of state into alarm condition.
 - c. All other points scanned only when required for display at HMI/OIU.
7. All dynamic screen displays shall be updated every 2 seconds, minimum.

E. Display Objects – General

1. Process piping and pumps/fans/mixers may be animated with color to show active/non-active status.
2. Tankage shall be rendered in 3D.
3. Use graphic symbology for rendering of objects.

F. Display Objects – Process Lines and Inline Device Symbology

1. Where inline devices are dynamic in nature, their equipment symbols shall be formatted as Display Objects to change color based upon feedback. Coordinate color use with Owner's existing HMI configuration. Recommended color use:
 - a. Off – Gray.

- b. On – Green.
- c. Warning – Red, Solid.
- d. Fail/Alarm – Red, Flashing.
- e. Status – Amber.

- 2. Inline devices shall have alphanumeric tag identified near them, adjacent to associated symbol.
- 3. Arrow heads shall be used as pointers for flow direction at all points of entrance to equipment, at all points where process lines change direction and at points of merger.
- 4. Process lines entering or leaving screen shall have points of continuation identified by boxed text, indicating From/To screen. One end of box shall form arrow to show direction of flow and act as pick-field for selection of screen of continuation. Color shall be same as associated process line.
- 5. Process lines shall be identified with flow stream abbreviation as listed in standard symbolic table and as shown on P&IDs, where convenient.

G. Display Objects – Large Equipment Symbolology

- 1. Symbol shape shall be simple reflection of true shape of equipment being depicted.
- 2. Outline color shall be white.
- 3. Equipment tag and description name shall be located within shape. If not practical, locate near shape. Text shall be white and enclosed in white border box. For example:
 - a. Tank levels shall be displayed within tank symbol as vertical bar, with bar color representative of fluid within tank.
 - b. Tank level bar height shall be proportional to analog input value scaled from 0 to 100%. 100% shall be equal to full vertical height of symbol.

H. Display Objects – Data Fields

- 1. Analog process data not conducive to graphic symbology shall be formatted as rectangular Data Fields:
- 2. Process values (i.e. Flow, pH, D.O., Elapsed Time) shall be displayed as Data Fields near associated device symbol and shall consist of: alphanumeric tag, green in color; data value, white in color, right justified; engineering unit, green in color. Entire field shall be grouped as one block.
- 3. Data Fields shall be configured with high and low limits as described above.

I. Display Objects – Status Displays

- 1. Status Displays shall be similar to Data Fields but shall be linked to discrete data points or status bits:
- 2. Discrete equipment parameters (i.e. Run, Fail, On/Off, Open/Close) shall be indicated as rectangular Status Displays and shall consist of: alphanumeric tag, green in color; single or dual-state equipment value, white in color, center justified. Entire field shall be grouped as one block.
- 3. Displays shall be classified as Alarms or Events (see below).

J. Control Objects

- 1. Control Objects shall reside on graphic screens as either visible objects or as pop-up objects.
- 2. Visible Control Objects shall be restricted to simple functions. For example:
 - a. Single-State Pushbutton (i.e. Reset, Silence, Acknowledge, GoTo):
 - 1) Display alphanumeric tag of equipment or function to be manipulated. Function shall

be independent of equipment control mode. There shall be graphic representation of one pushbutton, black in color with white or green text, center justified. Button shall act as pick-field and when selected by cursor and activated by clicking left mouse button, shall generate programmed output. Output shall not latch. Button, when activated, shall highlight with white border.

b. Dual-State Pushbutton (i.e. Open/Close, On/Off, Start/Stop):

- 1) Display alphanumeric tag of equipment or function to be manipulated. Function shall be dependent upon equipment control mode. There shall be graphic representation of one pushbutton, black in color with white or green text, center justified. Button shall act as pick-field and when selected by cursor and activated by clicking left mouse button, shall generate programmed output. Pick-field shall indicate change of state by changing text within object and/or changing color. Output shall latch, requiring mouse click to toggle back to original state. Button, when activated, shall highlight with white border.

c. Data Entry Field:

- 1) Similar to Data Display Field described above. Allows operator entry of process values such as set-points.

K. Alarming Requirements

1. Alarms shall be provided for conditions which would result in a safety or health risk, environmental damage, property or equipment damage, or process failure.
2. Alarms are considered critical or non-critical in nature and are defined as follows:
 - a. Critical Alarms are for conditions which would result in a safety or health risk, environmental damage, significant property or equipment damage, failure of process operations critical to meeting effluent limitations if not attended to and corrected immediately, or other conditions the Owner wishes to be notified of immediately.
 - b. Non-Critical Alarms are for conditions which if not attended to and corrected within a specific timeframe, may eventually cause a safety or health risk, environmental or property damage, or process failure.
3. Critical Alarms shall be annunciated at a location where personnel responsible for operation of the facilities are expected to be stationed or on call at all times. Critical alarms generated after working hours shall notify the on-call plant operator.
4. Non-critical Alarms shall be indicated at a location where the presence of an operator is expected periodically. Non-critical alarms generated after working hours will not call out.
5. Operator shall be provided with a matrix to designate each alarm as Critical or Non-Critical.
6. Alarms and Events shall be logged to data file.
7. Provide alarm summary screen(s) at HMI.
8. Display only current alarms. Acknowledged alarms which are no longer active shall not be displayed.
9. Allow operator to acknowledge alarms using single keystroke or cursor pick at alarm summary screen.
10. Alarm Display shall include following information:
 - a. Time and date alarm initially occurred.
 - b. Alarm point identification.
 - c. Alarm value and engineering units for alarms generated from analog process points.
 - d. Description of alarm (up to 40 characters).

11. Events shall be logged to separate data file. Events shall not be displayed unless evoked and shall not be annunciated.

L. Data Logging requirements – Analog and Discrete

1. All input process points shall be logged to the hard disk of the HMI computer.
2. Procedure for data collection and storage shall be as follows:
 - a. HMI I/O driver shall poll process points as specified on I/O list and transfer data to image table.
 - b. HMI shall scan image table for analog process points once every second, and log value to data base.
 - c. HMI shall calculate minimum, maximum and average for each analog process point and log to data base.
 - d. HMI shall scan image table for discrete process points on status change only, and log value to data base.

M. Trend Display Requirements

1. Configure HMI computer to display logged data in graphical trend format.
2. Trend Display Requirements:
 - a. Identification of process point being displayed. Use same nomenclature as used on HMI screens.
 - b. Start and end time of data being displayed.
 - c. Display shall incorporate movable vertical cursor along time axis. Parameter values at cursor date and time shall be displayed digitally.
 - d. Initial configuration of displays shall display data from present time back to 72 hrs prior to present time. Provide capability for operator to enter new start time for data being displayed to view parameter trend more than 72 hrs old.
 - e. Displays shall include y-axis range identification, including values and engineering units.
 - f. Configure trend displays to use maximum of computer screen area possible for purpose of increased resolution.
 - g. Trend displays shall be accessible, via single keystroke, from graphic screen displaying trended point.
3. Organize graphics screens for trend displays into categories by process:
 - a. Provide separate graphic screen within each category to display each process point trend. Provide different color for each process point.
 - b. Provide separate category for manually entered data from HMI computer.

PART 3 – EXECUTION

3.01 PERFORMANCE

- A. Configure PLC's and HMI computers consistent with Drawings and Specifications.
- B. During course of Work and Warranty period, furnish all software and firmware with latest revisions published.
- C. Label hardware revision levels on equipment and spares installed.

END OF SECTION

SECTION 40 61 21
PROCESS CONTROL SYSTEM (PCS) – TESTING

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes in-factory and field testing requirements.
- B. Testing of Process Control System (PCS) in conjunction with following Sections.
 - 1. Section 40 61 93 Process Control System I/O List.
 - 2. Section 40 61 96 Process Control Descriptions.

1.02 SUBMITTALS

- A. In addition to submittal requirements of Section 40 61 13, provide the following:
 - 1. Test Results:
 - a. Pass/fail status of all digital I/O.
 - b. Results of analog I/O testing.
 - 2. Miscellaneous:
 - a. Detailed step-by-step in-factory and field test procedure at least 6 wks in advance of scheduled test date. Include sign-off sheets and punch list forms and description of configurations to be tested.
 - b. Complete inventory of equipment to be tested at factory including make, model, and serial number. Label each piece of equipment.
 - 3. Submit in accordance with Section 01 33 00.

PART 2 – SERVICES

2.01 PREPARATION

- A. Meet following criteria prior to start of test.
 - 1. Complete submittals and resolve disputes, if any.
 - 2. Engineer review of test procedure.
 - 3. Include PLC processor, PLC network interface, and HMI computer in testing.
 - 4. Coordinate test date agreeable to each party.
- B. Schedule:
 - 1. At end of test, meet to review list of deficiencies. Engineer will indicate those items which must be corrected prior to shipment.
 - 2. Confirm, in writing, times and dates 2 weeks before tests.

2.02 FIELD I/O AND SOFTWARE TESTING

A. General:

1. Field testing is intended to check installation of the Process Control System PLC's in addition to providing a diagnostic check of field equipment and wiring.
2. Testing shall begin after Process Control System PLC has been installed and all terminations are complete.
3. Test as follows:
 - a. Run hardware diagnostics.
 - b. Testing of all input and output (I/O) signals by activation or injection of signal at field device.

1) Digital input signals:

- a) For all equipment run signals, test by on/off operation of equipment. If operation of equipment is deemed inadvisable by Owner or PLC supplier due to potential process upset, inaccessibility of generating device, hazard to personnel or other factors, test by jumpering of motor starter auxiliary contact or other source of run signal.
- b) For all alarm or status signals, test by activation of device generating alarm. If generation of alarm is deemed inadvisable by Owner or PLC supplier due to potential process upset, inaccessibility of generating device, hazard to personnel or other factors, test by jumpering of alarm contact at nearest accessible location to generating device.
- c) For signals designated as spare, test by jumpering of signal at Process Control System PLC panel field termination point.
- d) Demonstrate change of state in PLC data table.
- e) Demonstrate change of state at SCADA HMI.
- f) Demonstrate change of state at Operator Interface Terminal.

2) Digital or Relay output signals:

- a) Manipulate PLC data table or use forces to test response of all discrete output signals.
- b) Verify proper response of other devices in loop to signals.
- c) For signals designated as spare, test by checking signal at Process Control System PLC panel field termination point.

3) Analog input signals:

- a) Verify impedance capabilities of transmitting device has not been exceeded by installation of Process Control System PLC.
- b) Disconnect transmitting device and inject 0, 4, 12, and 20 mAdc into loop.
- c) Demonstrate proper response to various signals in PLC data table.
- d) Demonstrate change of value at SCADA HMI.
- e) Demonstrate change of value at Operator Interface Terminal.
- f) Verify proper response of other devices in analog loop to various signals.
- g) For signals designated as spare, test by injection of signal at Process Control System PLC panel field termination point.

4) Analog output signals:

- a) Verify impedance capabilities of analog outputs are not exceeded.
- b) Generate 4, 12, and 20 mAdc signals for all analog outputs through PLC data

table.

- c) Demonstrate change of value at SCADA HMI.
- d) Demonstrate change of value at Operator Interface Terminal.
- e) Verify proper response of other devices in analog loop to various signals. Verify proper loop current through measurement.
- f) For signals designated as spare, test by measuring of signal at Process Control System PLC panel field termination point.

4. Documentation

- a. Prepare field testing sign-off document. Document shall include following as a minimum:

- 1) Project description and number.
- 2) Company name for Owner, PLC supplier, and Engineer.
- 3) For each I/O point, include area for initials of PLC supplier, Owner, and Engineer representative indicating passing of inspection. Include separate line for I/O point to be tested.
- 4) Include area for handwritten notes of any corrections required.

5. Problem field devices or wiring.

- a. Provide written documentation of any problems encountered with Owner's existing field devices or wiring during testing.

PART 3 – EXECUTION

3.01 PERFORMANCE

- A. Test PLC's, HMI computer, and Operator Interface Terminal consistent with Drawings and Specifications.

END OF SECTION

SECTION 40 61 26
PROCESS CONTROL SYSTEM (PCS) – TRAINING

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes process control system training requirements.
- B. Include training on the following subjects:
 - 1. Overview of equipment and how it interacts with equipment and processes.
 - 2. Operation and use of control programs residing at each PLC and HMI.
 - 3. Overview of equipment areas and how they interact with field panels and instruments and other area equipment.
 - 4. Care-taking procedures for PLC's.
 - 5. Overview of plant communications hardware and equipment.
 - 6. PLC programming.
 - 7. SCADA software.
- C. Comply with requirements of Section 01 79 30.

1.02 ABBREVIATIONS AND REFERENCES

- A. HMI Human Machine Interface
- B. OIU Operator Interface Unit
- C. PLC Programmable Logic Controller
- D. SCADA Supervisory Control And Data Acquisition

1.03 SUBMITTALS

- A. General:
 - 1. Two weeks prior to training provide to Engineer a copy of the training documents to be presented to participants.
 - 2. Material shall be arranged in a 3-ring tabbed binder separated by primary subjects as defined below.
 - 3. Material shall be comprehensive, yet arranged in a manner easy to find or reference key information.
 - 4. Partial submittals are not acceptable.

PART 2 – PRODUCTS – Not Applicable

PART 3 – EXECUTION

3.01 MAINTENANCE TRAINING

- A. Cover following areas as a minimum:
 - 1. Testing programs which can isolate faults to functional area.
 - 2. Theory, logic flow, physical hardware awareness, and interface connections and assembly of

each equipment item.

3. Diagnostic procedures using special and general purpose test equipment. Theory, testing, and troubleshooting procedures given for special test equipment.
4. Operation of computers and peripherals.
5. Programming routines and procedures to enable students to take advantage of on-line and standby equipment for maintenance and performance verification.
6. Present short operator's course to ensure students understand operator functions and man/machine interfaces. Explain displays and printouts so students understand how information is derived, when it is presented incorrectly, and use of guidelines to differentiate between software and hardware problems.

3.02 INSTRUMENT TRAINING

A. Cover following areas as a minimum:

1. General principle of operation.
2. Calibration schedule.
3. Calibration procedure.
4. Calibration equipment required (if needed).
5. Recommended spare parts.
6. Consumable part – recommended replacement schedule (e.g. reagents, filters, probe tips) and procedure.
7. General care and maintenance with special consideration to all instruments that may require cleaning such as level elements, etc.

3.03 HMI/OIU/PLC TRAINING

- A. HMI functionality.
- B. OIU functionality.
- C. Block diagram of how PLC program works.

END OF SECTION

SECTION 40 61 30
PROCESS CONTROL SYSTEM (PCS) – O&M DATA

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes requirements for Operations and Maintenance (O&M) data for Process Control System.
- B. Comply with requirements of:
 - 1. Section 01 33 00 Submittal Procedures.
 - 2. Section 01 78 23 Operation and Maintenance Data.

PART 2 – SERVICES

2.01 HARDWARE MANUALS

- A. General:
 - 1. Include equipment comprising system. Provide instructions for O&M of installed system and individual equipment units comprising system.
 - 2. Provide level of comprehension so experienced electronics technician can understand them. Convey understanding of how system operates and provide sufficient procedures for O&M. Use abbreviated tabular data such as charts, tables, checklists, and diagrams whenever practical, in lieu of written text. Make Drawings and tables integral part of manuals.
 - 3. Standard hardware manuals are acceptable, if errata sheets are included to reflect specific equipment provided.
- B. Organization and Content:
 - 1. Introduction Section: Brief explanation of function of equipment covered. Be concise and do not include detailed descriptions. Provide quick orientation to use and purpose of manual and its relationship to system and equipment.
 - 2. Safety Precautions: Major hazards to personnel and equipment peculiar to equipment or jobs covered. Intersperse specific hazard information, cautions or warning notes at appropriate points throughout other sections of manual.
 - 3. Physical Description: Physical description (size, dimension, weight, special attachments, and physical orientation or clearances) for installation and operation. Identify special environmental (cooling, exhausting or noise) constraints.
 - 4. Functional Description: How various functions operate together to cause desired results. Include block diagrams and flow diagrams for clarification and understanding. Provide text and diagrams which mutually support each other.
 - 5. Operating procedures: Include maintenance-oriented operating procedures for individual equipment so maintenance personnel will be able to verify proper operation.
 - a. Describe each equipment, unit, and assembly in detail with regard to technical or theoretical operation. Include information to component level. Describe each circuit and mechanical mechanism. Cross-reference descriptions so functions of each piece of equipment are covered. Use schematic diagrams, sketches, equivalent diagrams, tables, and graphs to supplement text.
 - b. Applicable checkout, troubleshooting, servicing, removal and replacement, and in-place repair procedures which are performed on system basis. Provide written procedures for every adjustment point of equipment.

6. Checkout Procedures: Verify satisfactory operation of system, subsystem or unit as applicable. If checkout requires detailed step-by-step procedure include such procedures. Indicate why checkout is performed and what conditions are to be satisfied.
7. Troubleshooting Procedures: Isolate faulty components. Sequence troubleshooting procedures in logical progression from malfunction indication to location of faulty component(s). Indicate special connections or test equipment required for troubleshooting.
8. Servicing Requirements: Cleaning, lubricating, replenishing, and other housekeeping and preventive maintenance procedures applying to particular equipment. Make reference to applicable manuals which describe various servicing procedures.
9. Removal and Replacement Procedures: Step-by-step instructions for removal and replacement of items subject to frequent replacement. If special tools are required, identify by name and part number.
10. Diagrams: Schematic diagrams, logic diagrams, and associated data necessary for maintenance personnel to trace circuits, make continuity checks, and accomplish general and specific troubleshooting on inoperative or malfunctioning circuits. Provide pin wiring diagrams and cabling and plug tables showing to-and-from wiring information. Provide symbol chart where necessary to explain graphic symbols appearing on diagrams.
11. Tabular Listing: Special tools, equipment, and test equipment applicable to test, adjustment, and fault isolation procedures. Write systems maintenance instructions to enable correct use of test equipment.
12. Parts Lists: Provide clear traceability from equipment to replaceable component. Identify each component part with original manufacturer's name and part number. Identify component parts or assemblies modified for Project by part number. Parts lists may be tabulated or supplied in form of engineering or manufacturing drawings.

2.02 SOFTWARE AND CONFIGURATION MANUALS

A. General:

1. Manufacturer's standard PLC programming and software manuals.
 2. Manufacturer's standard PLC data highway network programming and software manuals.
- B. Provide complete, organized, and standardized documentation. Structure documentation so each level develops different degree of detail. Begin with broad approach (Systems Manual), focus on smaller pieces of overall system (Subsystem Documentation), and finally pinpoint finest detail (Program Documentation).
- C. Systems Manual: Describe overall content of systems software. Describe what is included in software and not how components function. Provide global view of system and complete description of interaction of various software subsystems. Include following.
1. Table of contents.
 2. Overall narrative of system including special techniques and general philosophies.
 3. Block diagram showing subsystem interaction.
 4. List of subsystems including brief discussion of purpose of each.
 5. List of programs included, categorized by subsystem, to which each belongs.
 6. Description of files or tables within system which are not unique to any particular subsystem. Files or tables used uniquely within subsystem may be defined therein.
- D. Cold Boot Manual and Boot Disks: Provide detailed instructions and bootstrap software for restoring all configured equipment to normal operation in the event of an equipment crash. Document all soft and hard points used, both in programming code and in Excel format.

2.03 SYSTEM CONFIGURATION DRAWING AND MANUALS

- A. System configuration drawing showing Process Control System Equipment including, but not

limited to PLC, HMI's, OIUs, remote I/O controllers, and local area network hardware. Show cabling and interconnection between system components.

- B. Configuration data manual describing how final system configured. Describe unique data and system parameters.

2.04 DRAWINGS

- A. Provide following for Process Control System elements.

1. Block Diagram: Diagram showing major Process Control System components. Identify components by manufacturer and model number. Show interconnecting cables diagrammatically.
2. Power and Grounding Interconnection Diagrams:
 - a. Power diagrams shall detail interconnections from power source through power conditioning equipment, to process control system equipment.
 - b. Grounding diagram shall illustrate grounding philosophy and implementation.
3. Interconnecting Wiring Diagrams: Show Process Control System elements, interconnecting cables and wiring terminations, and terminations to interacting elements and subsystems. Number terminations. Label terminations for circuits extending outside PLC assemblies.
 - a. Coordinate external circuit portion of diagram with Work specified under Division 26 and bear Contractor's mark showing Work is complete.
 - b. Nomenclature for external connections shall be in accordance with I/O lists in these Contract Documents and on Drawings.
4. Shop Drawings for specifically assembled Process Control System equipment such as panels, consoles, and cabinets. Drawings shall include, but not be limited to, following.
 - a. Complete connection diagram.
 - b. Bill of materials listing each major item of assembly. Provide data sheets for each item, annotated as necessary to describe specific items/options furnished.
 - c. Layout and fabrication drawings showing locations of components.
 - d. Installation and mounting detail drawings.
 - e. Anchor bolt size and location.
 - f. Equipment weights.
 - g. Cabinet details and location.
 - 1) Exterior dimensions.
 - 2) Cable ingress and egress areas.
 - 3) Cable routing.
 - 4) Power termination location.
 - 5) Ground lug location.
 - 6) Cable termination points.
 - 7) Nameplate schedules.

PART 3 – EXECUTION

NOT USED

END OF SECTION

SECTION 40 61 93
PROCESS CONTROL SYSTEM (PCS) – INPUT/OUTPUT LIST

PART 1 – GENERAL

1.01 SUMMARY

- A. Items specified in this Section shall conform to general requirements of Section 40 61 13 - PCS General Provisions.
- B. Section includes Process Control System hard-wired PLC I/O and programming parameters, and is to be used in conjunction with the following Sections:
 - 1. Section 40 61 20 PCS Configuration Services.
 - 2. Section 40 61 96 Process Control Descriptions.
- C. I/O List as shown in Schedule 1 of this Section contains information to configure I/O subsystem hardware and to indicate range conversion or signal function.
- D. I/O list does not include existing signals, and/or signals communicated over radio or networks.

1.02 ABBREVIATIONS AND REFERENCES

- A. I/O Inputs/Outputs
- B. PLC Programmable Logic Controller
- C. RTD Resistance Temperature Detector

1.03 I/O LIST DEFINITIONS

- A. LOCATION is the tag number for the PLC/RIO/RTU panel the I/O point terminates at.
- B. DRAWING is the Drawing number of Process and Instrumentation Diagram (P&ID) in which the I/O point is located.
- C. TAG is the field tagname given to the I/O point as designated on the Drawings.
 - 1. This list is not to be considered a comprehensive list of PLC tagnames.
- D. EQUIPMENT describes the equipment associated with the I/O point.
 - 1. Equipment in Schedule 1 table may be truncated and/or abbreviated due to space considerations.
 - 2. Shop Submittals for PLC Drawings shall have Equipment tagnames as described on Process and Instrumentation Diagram (P&ID) Drawings.
- E. FUNCTION describes associated process parameter or programmable controller action.
- F. I/O TYPE is defined as one of following:
 - 1. AI Designates Analog Input.
 - 2. AO Designates Analog Output.
 - 3. DI Designates Discrete Input.

4. DO Designates Discrete Output (non-relay)
5. RO Designates Relay Output; momentary, maintained or latched relay contact output.
6. RTD Designates RTD Input.

G. SIGNAL TYPE Description:

1. Analog Input (AI):
 - a. 4-20mA DC.
 - b. DATA 1: Process parameter range.
 - c. DATA 2: Process parameter engineering units.
 - d. POLL TIME: 0.25 second.
2. Analog Output (AO):
 - a. 4-20mA DC.
 - b. DATA 1: Process parameter range.
 - c. DATA 2: Process parameter engineering units.
3. Discrete Input (DI):
 - a. 24Vdc.
 - b. DATA 1: Condition existing when field contact open.
 - c. DATA 2: Condition existing when field contact closed.
 - d. POLL TIME: Change-of-State, exception-based.
4. Discrete Output (DO):
 - a. 24Vdc.
 - b. DATA 1: Contact open function.
 - c. DATA 2: Contact closed function.
5. Relay Output (RO):
 - a. 24Vdc.
 - b. DATA 1: Contact open function.
 - c. DATA 2: Contact closed function.

H. DATA 1 and DATA 2 describe function or signal characteristics. These are further defined under SIGNAL TYPE above.

1. I/O point data fields are subject to review and modification by Engineer during Shop Drawing review phase. Incorporate modifications into entire system.

PART 2 – PRODUCTS – NOT USED

PART 3 – EXECUTION

3.01 I/O CONFIGURATION

- A. I/O shall be configured such that any single I/O module failure shall not prevent operation of all equipment for a given unit process. The objective of this configuration is to avoid a total unit process failure because of a single I/O module failure. For example, if a treatment system includes 4 pumps, the I/O for each pump should be placed such that the failure of an I/O module

will only affect one of the four pumps so the remaining pumps can operate normally.

B. Spare I/O points and utilization:

1. Required spare I/O points are not included in the Schedule attached to this Section.
2. Include sufficient I/O modules to provide 25% spare I/O prewired to terminal strips. Where no I/O of a listed type (digital input, digital output, analog input, analog output, etc.) is shown, provide one spare prewired I/O module.
3. Incorporate spare points into active point data base. Include changing point names, descriptions, ranges, or status from spare to new point. Include related documentation changes.
4. Spares utilization will be subject to following limitations:
 - a. Incorporation shall not significantly alter control software functions. Minor change is addition of device alarm input. Significant change is addition of control device.
 - b. Incorporation shall not significantly alter local area panels or field wiring to device. Minor alterations include additions of signals to terminations. Significant alterations include addition of major equipment.
 - c. Additions shall not increase size of reports beyond that specified elsewhere.
 - d. Changes shall not be made subsequent to submittal approval for a given panel or process area loop drawings.
 - e. Treat changing of active points to spare points in same manner as incorporation of spares.

(See following pages for Schedule 1 of this Section)

SCHEDULE 1 TO SECTION 40 61 93
I/O LIST

TAG	DWG	PANEL	EQUIPMENT	FUNCTION	I/O TYPE	SIGNAL TYPE	DATA 1	DATA 2
ATS_ON_UTILITY	009-N-1	FTJA-PLC	ATS A	ON UTILITY POWER	DI	24VDC	NOT ON UTILTIY	ON UTILITY
ATSA_GEN_AVAILABLE	009-N-1	FTJA-PLC	ATS A	GENERATOR AVAILABLE	DI	24VDC	NOT AVAILABLE	AVAILABLE
ATSA_UTIL_AVAILABLE	009-N-1	FTJA-PLC	ATS A	UTILITY AVAILABLE	DI	24VDC	NOT AVAILABLE	AVAILABLE
ATS_ON_GENERATOR	009-N-1	FTJA-PLC	ATS A	ON GENERATOR POWER	DI	24VDC	NOT ON GENERATOR	ON GENERATOR
ATSB_UTIL_AVAILABLE	009-N-1	FTJB-PLC	ATS B	UTILITY AVAILABLE	DI	24VDC	NOT AVAILABLE	AVAILABLE
ATSB_GEN_AVAILABLE	009-N-1	FTJB-PLC	ATS B	GENERATOR AVAILABLE	DI	24VDC	NOT AVAILABLE	AVAILABLE
ATSB_ON_GENERATOR	009-N-1	FTJB-PLC	ATS B	ON GENERATOR POWER	DI	24VDC	NOT ON GENERATOR	ON GENERATOR
ATSB_ON_UTILITY	009-N-1	FTJB-PLC	ATS B	ON UTILITY POWER	DI	24VDC	NOT ON UTILITY	ON UTILITY
GEN_COMMON_ALARM	009-N-1	FTJB-PLC	GENERATOR	COMMON ALARM	CE	NET (B)	NO ALARMED	ALARMED
GEN_LOW_BATTERY_VOLTAGE	009-N-1	FTJB-PLC	GENERATOR	LOW BATTERY VOLTAGE	CE	NET (B)	NOT LOW	LOW
GEN_HIGH_BATTERY_VOLTAGE	009-N-1	FTJB-PLC	GENERATOR	HIGH BATTERY VOLTAGE	CE	NET (B)	NOT HIGH	HIGH
GEN_LOW_FUEL	009-N-1	FTJB-PLC	GENERATOR	LOW FUEL	CE	NET (B)	NOT LOW	LOW
GEN_HIGH_ENGINE_TEMP	009-N-1	FTJB-PLC	GENERATOR	HIGH ENGINE TEMPERATURE	CE	NET (B)	NOT HIGH	HIGH
GEN_LOW_OIL_PRESSURE	009-N-1	FTJB-PLC	GENERATOR	LOW OIL PRESSURE	CE	NET (B)	NOT LOW	LOW
GEN_OVERSPEED	009-N-1	FTJB-PLC	GENERATOR	OVERSPEED	CE	NET (B)	NOT OVERSPED	OVERSPED
GEN_OVERCRANK	009-N-1	FTJB-PLC	GENERATOR	OVERCRANK	CE	NET (B)	NOT OVERCRANKED	OVERCRANKED
GEN_LOW_COOLANT_LEVEL	009-N-1	FTJB-PLC	GENERATOR	LOW COOLANT LEVEL	CE	NET (B)	NOT LOW	LOW
GEN_SUPPLYING_LOAD	009-N-1	FTJB-PLC	GENERATOR	SUPPLYING LOAD	CE	NET (B)	NOT SUPPLYING	SUPPLYING
GEN_NOT_IN_AUTO	009-N-1	FTJB-PLC	GENERATOR	NOT IN AUTO	CE	NET (B)	IN AUTO	NOT IN AUTO
GEN_LOW_CRANK_VOLTAGE	009-N-1	FTJB-PLC	GENERATOR	LOW CRANK VOLTAGE	CE	NET (B)	NOT LOW	LOW
GEN_BATTERY_CHARGE_FAIL	009-N-1	FTJB-PLC	GENERATOR	BATTERY CHARGER FAIL	CE	NET (B)	NOT FAILED	FAILED
GEN_PHASEA_VOLTAGE	009-N-1	FTJB-PLC	GENERATOR	PHASE A VOLTAGE	CE	NET (W)	0-700	VOLTS
GEN_PHASEB_VOLTAGE	009-N-1	FTJB-PLC	GENERATOR	PHASE B VOLTAGE	CE	NET (W)	0-700	VOLTS
GEN_PHASEC_VOLTAGE	009-N-1	FTJB-PLC	GENERATOR	PHASE C VOLTAGE	CE	NET (W)	0-700	VOLTS
GEN_NEUTRAL_VOLTAGE	009-N-1	FTJB-PLC	GENERATOR	NEUTRAL VOLTAGE	CE	NET (W)	0-700	VOLTS
GEN_PHASEA_CURRENT	009-N-1	FTJB-PLC	GENERATOR	PHASE A CURRENT	CE	NET (W)	0-2000	AMPERES
GEN_PHASEB_CURRENT	009-N-1	FTJB-PLC	GENERATOR	PHASE B CURRENT	CE	NET (W)	0-2000	AMPERES
GEN_PHASEC_CURRENT	009-N-1	FTJB-PLC	GENERATOR	PHASE C CURRENT	CE	NET (W)	0-2000	AMPERES
GEN_NEUTRAL_CURRENT	009-N-1	FTJB-PLC	GENERATOR	NEUTRAL CURRENT	CE	NET (W)	0-2000	AMPERES
GEN_POWER_KW	009-N-1	FTJB-PLC	GENERATOR	POWER - KW	CE	NET (W)	0-1000	KILOWATTS
GEN_POWER_KVA	009-N-1	FTJB-PLC	GENERATOR	POWER - KVA	CE	NET (W)	0-1250	KILOVOLT-AMPS
GEN_POWER_FACTOR	009-N-1	FTJB-PLC	GENERATOR	POWER FACTOR	CE	NET (W)	0.00 - 1.00	NO UNIT - DECEIMAL
GEN_ESTOP_PRESSED	009-N-1	FTJB-PLC	GENERATOR	EMERGENCY STOP	CE	NET (B)	NOT PRESSED	PRESSED

B = BIT, W = WORD

TAG	DWG	PANEL	EQUIPMENT	FUNCTION	I/O TYPE	SIGNAL TYPE	DATA 1	DATA 2
PUMP1_SS_FAIL	009-N-1	FTJB-PLC	STA B PUMP NO. 1 SOFT STARTER	FAIL STATUS	DI	24VDC	NOT FAILED	FAILED
PUMP2_SS_FAIL	009-N-1	FTJB-PLC	STA B PUMP NO. 2 SOFT STARTER	FAIL STATUS	DI	24VDC	NOT FAILED	FAILED
PUMP3_SS_FAIL	009-N-1	FTJB-PLC	STA B PUMP NO. 3 SOFT STARTER	FAIL STATUS	DI	24VDC	NOT FAILED	FAILED
PUMP1_SS_AUTO	009-N-1	FTJB-PLC	STA B PUMP NO. 1 SOFT STARTER	IN AUTO STATUS	DI	24VDC	NOT IN AUTO	IN AUTO
PUMP2_SS_AUTO	009-N-1	FTJB-PLC	STA B PUMP NO. 2 SOFT STARTER	IN AUTO STATUS	DI	24VDC	NOT IN AUTO	IN AUTO
PUMP3_SS_AUTO	009-N-1	FTJB-PLC	STA B PUMP NO. 3 SOFT STARTER	IN AUTO STATUS	DI	24VDC	NOT IN AUTO	IN AUTO
PUMP1_SS_RUN	009-N-1	FTJB-PLC	STA B PUMP NO. 1 SOFT STARTER	RUN STATUS	DI	24VDC	NOT RUNNING	RUNNING
PUMP2_SS_RUN	009-N-1	FTJB-PLC	STA B PUMP NO. 2 SOFT STARTER	RUN STATUS	DI	24VDC	NOT RUNNING	RUNNING
PUMP3_SS_RUN	009-N-1	FTJB-PLC	STA B PUMP NO. 3 SOFT STARTER	RUN STATUS	DI	24VDC	NOT RUNNING	RUNNING
PUMP1_SS_CALLTORUN	009-N-1	FTJB-PLC	STA B PUMP NO. 1 SOFT STARTER	CALL TO RUN	DO	24VDC	NOT CALLED TO RUN	CALLED TO RUN
PUMP2_SS_CALLTORUN	009-N-1	FTJB-PLC	STA B PUMP NO. 2 SOFT STARTER	CALL TO RUN	DO	24VDC	NOT CALLED TO RUN	CALLED TO RUN
PUMP3_SS_CALLTORUN	009-N-1	FTJB-PLC	STA B PUMP NO. 3 SOFT STARTER	CALL TO RUN	DO	24VDC	NOT CALLED TO RUN	CALLED TO RUN

SECTION 40 61 96
PROCESS CONTROL DESCRIPTIONS

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes Process Control System in conjunction with P&IDs.
- B. Items specified in this section shall conform to general requirements of Section 40 61 13.
- C. See Section 40 61 20 for PCS Configuration Requirements.

PART 2 – PROCESS CONTROL DESCRIPTIONS

2.01 PLC-BASED CONTROL PANELS – GENERAL

- A. PLC-Based Control Panel Functional Descriptions - General:
 - 1. Functional Descriptions for PLC-based control panels that follow pertain to “Auto” modes requiring supervisory control with interactive logic.
 - 2. PLC control of equipment shall require “Hand/Off/Auto” selector switches to be in the “Auto” position. Equipment not in “Auto” shall be considered to be in “Hand” mode and shall be controlled manually at the equipment. “Hand” mode shall be for maintenance purposes and may inhibit equipment safeguards such as seal fail or overtemp conditions.
 - 3. Equipment that is capable of auto operation (and controlled from Plant PLC) shall alarm the Operator if the equipment has been removed from “Remote” or “Auto” operation for longer than 24 hours.
 - 4. Stop or emergency stops shall work as designed for all modes of operation.
 - 5. All equipment fail signals shall alert the Operator, alarm the equipment, and remove from equipment sequencer.
 - 6. All adjustable set-points described in this Section shall be by the Operator or higher level authority such as a Supervisor. Hierarchy shall be defined with the Owner by the HMI SCADA Programmer.

2.02 **FORT JESSE PUMP STATION A PLC**

FTJA-PLC

A. Expanded Functional Description – Pumps (009-N-1)

- 1. Pump X Disable (Load Shed) bit register shall be added to FTJA-PLC for each pump, X = Pump Number.
- 2. Default for Pump X Disable (Load Shed) bit shall be 0, pump not disabled.
- 3. The logic for setting this bit shall be added to the Fort Jesse B Pump Station PLC, FTJB-PLC (see load shed description below).
- 4. If the Pump X Disable (Load Shed) bit register is 0, Pump X shall be able to run. If the Pump X Disable Load Shed bit register is 1, the Pump X shall not run.

- B. Functional Description – Automatic Transfer Switch, ATS-2203 (009-N-1)
1. See P&ID for ATS-2203 monitoring and alarming.
 2. ATS-2203 shall control if Pump Station A is on Utility power or Generator power based on its internal Utility and Generator Power monitoring.
 3. An Alarm shall be sent to Operator when ATS-2203 detects that Utility Power is not available.

2.03 **FORT JESSE PUMP STATION B PLC** FTJB-PLC

- A. Expanded Functional Description – Pumps (009-N-1)
1. Pump X Disable (Load Shed) bit register shall be added to FTJA-PLC for each pump, X = Pump Number.
 2. Default for Pump X Disable (Load Shed) bit shall be 0, pump not disabled.
 3. The logic for setting this bit shall be added to the Fort Jesse B Pump Station PLC, FTJB-PLC (see load shed description below).
 4. If the Pump X Disable (Load Shed) bit register is 0, Pump X shall be able to run. If the Pump X Disable Load Shed bit register is 1, the Pump X shall not run.
 5. The following signals associated with each pump soft starter shall be tested after new wiring and terminations are made:
 - a) Call to Run
 - b) Run Status
 - c) Fail Status
 - d) In Auto
- B. Functional Description – Automatic Transfer Switch, ATS-2204 (009-N-1)
1. See P&ID for ATS-2204 monitoring and alarming.
 2. The ATS-2204 shall control if Pump Station A is on Utility Power or Generator Power based on its internal Utility and Generator Power monitoring.
 3. The following alarms shall be sent to Operator remotely. Use existing remote alarming system.
 - a) Utility Not Available

C. Functional Description – Generator, GEN-2203/04 (009-N-1)

1. See P&ID for GEN-2203/04 monitoring and alarming.

D. Functional Description – Load Shed Control (009-N-1)

1. The Load Shed Control shall only apply to the Main Station A and Station B Pumps.
2. Logic shall be added to FTJB-PLC to determine the bit values of the Pump X Disable (Load Shed) bit for each pump.
3. This pump disable bit shall be in addition to existing pump disable bits already programmed.
4. If the Generator is not running, the bit values shall be 0 for all pumps, pumps not disabled.
5. If the Generator is running the following logic shall be applied:
 - a) Only one Station B Pump shall be allowed to run.
 - b) Only three Station A Pumps shall be allowed to run.
 - c) The HMI on PLC B shall allow the operator to select which pumps to disable when the generator is running.
 - d) If the Operator does not select enough pumps to disable when generator is running on the Load Shed Control screen on HMI, the system shall issue a warning.
 - e) If no station A pumps are selected to be disabled when generator is running, the PLC shall automatically disable pump no 4.
 - f) If no station B pumps are selected to be disabled when generator is running, the PLC shall automatically disable all pumps except the pump that last ran.
 - g) The Systems Integrator shall adjust Load Shed logic shall be reviewed with Owner

PART 3 – EXECUTION – NOT USED

END OF SECTION

APPENDIX

APPENDIX

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5	CERTIFICATE OF INSTALLATION SERVICES	CIS-1
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7	CERTIFICATE OF POST STARTUP SERVICES	CIS-3
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Contractor's Application for Payment

Owner: _____ Engineer: _____ Contractor: _____ Project: _____ Contract: _____	Owner's Project No.: _____ Engineer's Project No.: _____ Contractor's Project No.: _____																								
Application No.: _____ Application Date: _____ Application Period: From _____ to _____																									
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%;">1. Original Contract Price</td> <td style="width: 30%; text-align: right;">\$ -</td> </tr> <tr> <td>2. Net change by Change Orders</td> <td style="text-align: right;">\$ -</td> </tr> <tr> <td>3. Current Contract Price (Line 1 + Line 2)</td> <td style="text-align: right;">\$ -</td> </tr> <tr> <td>4. Total Work completed and materials stored to date (Sum of Column G Lump Sum Total and Column J Unit Price Total)</td> <td style="text-align: right;">\$ -</td> </tr> <tr> <td>5. Retainage</td> <td></td> </tr> <tr> <td> a. _____ X \$ - Work Completed</td> <td style="text-align: right;">\$ -</td> </tr> <tr> <td> b. _____ X \$ - Stored Materials</td> <td style="text-align: right;">\$ -</td> </tr> <tr> <td> c. Total Retainage (Line 5.a + Line 5.b)</td> <td style="text-align: right;">\$ -</td> </tr> <tr> <td>6. Amount eligible to date (Line 4 - Line 5.c)</td> <td style="text-align: right;">\$ -</td> </tr> <tr> <td>7. Less previous payments (Line 6 from prior application)</td> <td></td> </tr> <tr> <td>8. Amount due this application</td> <td style="text-align: right;">\$ -</td> </tr> <tr> <td>9. Balance to finish, including retainage (Line 3 - Line 4)</td> <td style="text-align: right;">\$ -</td> </tr> </table>		1. Original Contract Price	\$ -	2. Net change by Change Orders	\$ -	3. Current Contract Price (Line 1 + Line 2)	\$ -	4. Total Work completed and materials stored to date (Sum of Column G Lump Sum Total and Column J Unit Price Total)	\$ -	5. Retainage		a. _____ X \$ - Work Completed	\$ -	b. _____ X \$ - Stored Materials	\$ -	c. Total Retainage (Line 5.a + Line 5.b)	\$ -	6. Amount eligible to date (Line 4 - Line 5.c)	\$ -	7. Less previous payments (Line 6 from prior application)		8. Amount due this application	\$ -	9. Balance to finish, including retainage (Line 3 - Line 4)	\$ -
1. Original Contract Price	\$ -																								
2. Net change by Change Orders	\$ -																								
3. Current Contract Price (Line 1 + Line 2)	\$ -																								
4. Total Work completed and materials stored to date (Sum of Column G Lump Sum Total and Column J Unit Price Total)	\$ -																								
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6. Amount eligible to date (Line 4 - Line 5.c)	\$ -																								
7. Less previous payments (Line 6 from prior application)																									
8. Amount due this application	\$ -																								
9. Balance to finish, including retainage (Line 3 - Line 4)	\$ -																								
Contractor's Certification The undersigned Contractor certifies, to the best of its knowledge, the following: (1) All previous progress payments received from Owner on account of Work done under the Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with the Work covered by prior Applications for Payment; (2) Title to all Work, materials and equipment incorporated in said Work, or otherwise listed in or covered by this Application for Payment, will pass to Owner at time of payment free and clear of all liens, security interests, and encumbrances (except such as are covered by a bond acceptable to Owner indemnifying Owner against any such liens, security interest, or encumbrances); and (3) All the Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.																									
Contractor: _____ Signature: _____ Date: _____																									
Recommended by Engineer By: _____ Title: _____ Date: _____ Approved by Funding Agency By: _____ Title: _____ Date: _____	Approved by Owner By: _____ Title: _____ Date: _____ By: _____ Title: _____ Date: _____																								

Progress Estimate - Lump Sum Work

Contractor's Application for Payment

Owner: _____ Engineer: _____ Contractor: _____ Project: _____ Contract: _____						Owner's Project No.: _____ Engineer's Project No.: _____ Contractor's Project No.: _____		
Application No.: _____		Application Period: From _____ to _____		Application Date: _____				
A	B	C	D	E	F	G	H	I
Item No.	Description	Scheduled Value (\$)	Work Completed		Materials Currently Stored (not in D or E) (\$)	Work Completed and Materials Stored to Date (D + E + F) (\$)	% of Scheduled Value (G / C) (%)	Balance to Finish (C - G) (\$)
			(D + E) From Previous Application (\$)	This Period (\$)				
Original Contract								
			-			-		-
						-		-
						-		-
						-		-
						-		-
						-		-
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						-		-
						-		-
						-		-
Original Contract Totals		\$ -	\$ -	\$ -	\$ -	\$ -		\$ -

Progress Estimate - Lump Sum Work

Contractor's Application for Payment

Owner: _____						Owner's Project No.: _____		
Engineer: _____						Engineer's Project No.: _____		
Contractor: _____						Contractor's Project No.: _____		
Project: _____								
Contract: _____								
Application No.: _____		Application Period: From _____ to _____				Application Date: _____		
A	B	C	D	E	F	G	H	I
Item No.	Description	Scheduled Value (\$)	Work Completed		Materials Currently Stored (not in D or E) (\$)	Work Completed and Materials Stored to Date (D + E + F) (\$)	% of Scheduled Value (G / C) (%)	Balance to Finish (C - G) (\$)
			(D + E) From Previous Application (\$)	This Period (\$)				
Change Orders								
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						-		-
Change Order Totals		\$ -	\$ -	\$ -	\$ -	\$ -		\$ -
Original Contract and Change Orders								
Project Totals		\$ -	\$ -	\$ -	\$ -	\$ -		\$ -

Contractor's Application for Payment

Owner:		Owner's Project No.:	
Engineer:		Engineer's Project No.:	
Contractor:		Contractor's Project No.:	
Project:			
Contract:			

[illegible]

Progress Estimate - Unit Price Work

Contractor's Application for Payment

Owner: _____						Owner's Project No.: _____					
Engineer: _____						Engineer's Project No.: _____					
Contractor: _____						Contractor's Project No.: _____					
Project: _____											
Contract: _____											

Application No.: _____		Application Period: From _____ to _____		Application Date: _____							
A	B	C	D	E	F	G	H	I	J	K	L
Bid Item No.	Description	Contract Information				Work Completed		Materials Currently Stored (not in G) (\$)	Work Completed and Materials Stored to Date (H + I) (\$)	% of Value of Item (J / F) (%)	Balance to Finish (F - J) (\$)
		Item Quantity	Units	Unit Price (\$)	Value of Bid Item (C X E) (\$)	Estimated Quantity Incorporated in the Work	Value of Work Completed to Date (E X G) (\$)				
Change Orders											
					-		-		-		-
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Change Order Totals					\$ -		\$ -	\$ -	\$ -		\$ -
Original Contract and Change Orders											
Project Totals					\$ -		\$ -	\$ -	\$ -		\$ -

Contractor's Application for Payment

Owner:		Owner's Project No.:	
Engineer:		Engineer's Project No.:	
Contractor:		Contractor's Project No.:	
Project:			
Contract:			

Application No.:	Application Period:	From	to	Application Date:
------------------	---------------------	------	----	-------------------

[illegible]

CERTIFICATE OF SUBSTANTIAL COMPLETION

Owner:

Owner's Project No.:

Engineer:

Engineer's Project No.:

Contractor:

Contractor's Project No.:

Project:

Contract Name:

This ☐ Preliminary ☐ Final Certificate of Substantial Completion applies to:

☐ All Work ☐ The following specified portions of the Work:

[Describe the portion of the work for which Certificate of Substantial Completion is issued]

Date of Substantial Completion: **[Enter date, as determined by Engineer]**

The Work to which this Certificate applies has been inspected by authorized representatives of Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion of the Work or portion thereof designated above is hereby established, subject to the provisions of the Contract pertaining to Substantial Completion. The date of Substantial Completion in the final Certificate of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

A punch list of items to be completed or corrected is attached to this Certificate. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor; see Paragraph 15.03.D of the General Conditions.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work must be as provided in the Contract, except as amended as follows:

Amendments to Owner's Responsibilities: ☐ None ☐ As follows:

[List amendments to Owner's Responsibilities]

Amendments to Contractor's Responsibilities: ☐ None ☐ As follows:

[List amendments to Contractor's Responsibilities]

The following documents are attached to and made a part of this Certificate:

[List attachments such as punch list; other documents]

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents, nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract Documents.

Engineer

By *(signature)*:

Name *(printed)*:

Title:

WORK CHANGE DIRECTIVE NO.: [Number of Work Change Directive]

Owner: _____ Owner's Project No.: _____
Engineer: _____ Engineer's Project No.: _____
Contractor: _____ Contractor's Project No.: _____
Project: _____
Contract Name: _____
Date Issued: _____ Effective Date of Work Change Directive: _____

Contractor is directed to proceed promptly with the following change(s):

Description:

[Description of the change to the Work]

Attachments:

[List documents related to the change to the Work]

Purpose for the Work Change Directive:

[Describe the purpose for the change to the Work]

Directive to proceed promptly with the Work described herein, prior to agreeing to change in Contract Price and Contract Time, is issued due to:

Notes to User—Check one or both of the following

☐ Non-agreement on pricing of proposed change. ☐ Necessity to proceed for schedule or other reasons.

Estimated Change in Contract Price and Contract Times (non-binding, preliminary):

Contract Price: \$ _____ **[increase] [decrease] [not yet estimated].**

Contract Time: _____ days **[increase] [decrease] [not yet estimated].**

Basis of estimated change in Contract Price:

☐ Lump Sum ☐ Unit Price ☐ Cost of the Work ☐ Other

Recommended by Engineer

Authorized by Owner

By:

Title:

Date:

FIELD ORDER NO.: [Number of Field Order]

Owner:

Owner's Project No.:

Engineer:

Engineer's Project No.:

Contractor:

Contractor's Project No.:

Project:

Contract Name:

Date Issued:

Effective Date of Field Order:

Contractor is hereby directed to promptly perform the Work described in this Field Order, issued in accordance with Paragraph 11.04 of the General Conditions, for minor changes in the Work without changes in Contract Price or Contract Times. If Contractor considers that a change in Contract Price or Contract Times is required, submit a Change Proposal before proceeding with this Work.

Reference:

Specification Section(s):

Drawing(s) / Details (s):

Description:

[Description of the change to the Work]

Attachments:

[List documents supporting change]

Issued by Engineer

By: _____ *(signature)*

Title: _____ *(printed name)*

Date: _____

CERTIFICATE OF INSTALLATION SERVICES	
Project	
Equipment	
Specification Section	
Contract	
I hereby certify the equipment supplier/manufacture has inspected this equipment and that it has been properly installed, adjusted, and calibrated. I further certify this equipment may now be operated for test purposes and/or normal use.	
MANUFACTURER'S REPRESENTATIVE	
Signature	Date
Name (print)	
Title	
Representing	
CONTRACTOR	
Signature	Date
Name (print)	
Title	
Comments:	

This form shall be completed and submitted to ENGINEER prior to training of OWNER'S personnel in accordance with Section 01 61 00.

CERTIFICATE OF INSTRUCTIONAL SERVICES	
Project	
Equipment	
Specification Section	
Contract	
I hereby certify the equipment supplier/manufacture has instructed OWNER'S personnel in the startup, operation, and maintenance of this equipment as required in the Specifications.	
CONTRACTOR	
Signature	Date
Name (print)	
Title	
I hereby certify that my operating personnel received _____ days instruction from _____ for startup, operation, and maintenance of this equipment.	
OWNER	
Signature	Date
Name (print)	
Title	
Comments:	

This form shall be completed and submitted to ENGINEER after training of OWNER'S personnel in accordance with Section 01 61 00.

CERTIFICATE OF POST STARTUP SERVICES	
Project	
Equipment	
Specification Section	
Contract	
I hereby certify the equipment supplier/manufacturer has inspected this equipment, made adjustments and calibrations, and that it is operating in conformance with the design, Specification, and manufacturer's requirements. Notation of improper operation shall be detailed and recommendations made and attached to this form.	
MANUFACTURER'S REPRESENTATIVE	
Signature	Date
Name (print)	
Title	
Representing	
CONTRACTOR	
Signature	Date
Name (print)	
Title	
OWNER	
Signature	Date
Name (print)	
Title	
Comments:	

This form shall be completed and submitted to OWNER upon completion of the 1-year reinspection as required by the Specifications.

CHANGE ORDER NO. _____CHANGE ORDER
DATE OF ISSUANCE _____COMMENCEMENT OF
CONTRACT TIME _____

OWNER _____

CONTRACTOR _____

PROJECT _____ CONTRACT NO. _____

ENGINEER _____

YOU ARE DIRECTED TO MAKE THE FOLLOWING CHANGES IN THE CONTRACT DOCUMENTS:
DESCRIPTION:

REASON FOR CHANGE ORDER:

ATTACHMENTS:

CHANGE IN CONTRACT PRICE
Original Contract Price: \$ _____
Net increase (decrease) from previous Change Orders: \$ _____
Net increase (decrease) of this Change Order: \$ _____
Revised Contract Price: \$ _____

CHANGE IN CONTRACT TIMES
Original Contract Times: <i>(days or dates)</i> Substantial Completion: _____ Ready for Final Payment: _____
Net increase (decrease) from previous Change Orders: <i>(days)</i> Substantial Completion: _____ Ready for Final Payment: _____
Net increase (decrease) of this Change Order: <i>(days)</i> Substantial Completion: _____ Ready for Final Payment: _____
Revised Contract Times: <i>(days or dates)</i> Substantial Completion: _____ Ready for Final Payment: _____

CONTRACTOR agrees that this Change Order includes any and all costs associated with or resulting from the change ordered herein, including all impacts, delays, and accelerated costs. Other than the dollar amount and time allowance listed above, there shall be no other dollar or time compensation as a result of this Change Order.

THIS DOCUMENT SHALL BECOME AN AMENDMENT TO THE CONTRACT AND ALL
STIPULATIONS AND COVENANTS OF THE CONTRACT SHALL APPLY HERETO.

RECOMMENDED:

APPROVED:

ACCEPTED:

By: _____
ENGINEER *(signature)*By: _____
OWNER *(signature)*By: _____
CONTRACTOR *(signature)*_____
ENGINEER *(printed name)*_____
OWNER *(printed name)*_____
CONTRACTOR *(printed name)*

Date: _____

Date: _____

Date: _____

Note: OWNER is required to complete the Change Order Authorization form on the back if change increase or decrease is for \$10,000 or more, or time of completion is 30 days or more.

CHANGE ORDER AUTHORIZATION

for

Illinois Public Projects

Name of Project: _____

Change Order No.: _____

Date: _____

This Change Order authorizes: *(check applicable boxes)*

- ☐ (a) an increase/decrease in Contract cost by \$10,000 or more \$ _____
(amount)
- ☐ (b) an increase/decrease in Contract completion date by 30 days or more _____
(amount)
- ☐ (c) other (please describe below)

OWNER (or it's designee _____) has determined that the circumstances said to necessitate the change in performance, which are: *(give circumstances requiring change)*

(check one)

- ☐ (a) were not reasonably foreseeable at the time the Contract was signed.
- ☐ (b) were germane to the original Contract as signed.
- ☐ (c) are in the best interest of the District and authorized by law.

Prepared by ENGINEER

Date

Authorized by OWNER

Date

OWNER shall preserve a copy of this Authorization in a permanent Contract file that is open to the public in accordance with P.A. 85-1295, Ill. Rev. Stat. Ch. 38, par. 33E-9.

REQUEST FOR INFORMATION	
Request No.	Date:
Contractor:	Specification Section / Drawing No.:
Project:	
Contract:	
This is a request for a information on the following:	
Prepared By:	Date Response Needed:
Response:	
Prepared By:	Date:
Response Returned to Contractor On:	
cc: Owner: _____ Resident Project Representative: _____	

CONTRACTOR'S SUBMITTAL TRANSMITTAL

CONTRACT: _____

	[NTU: INSERT CONTRACTOR OF OWNER LOGO]
To: //Donohue Shop Drawing Coordinator// Donohue & Associates, Inc. //3311 Weeden Creek Road// //Sheboygan, WI 53081// Phone: //920-803-7358// Email: //person@donohue-associates.com//	From: //INSERT CONTRACTOR NAME, ADDRESS, PHONE NUMBER, AND EMAIL//

Specification Section:	<<Section Number>> (same as selected in eCommunication database)
Donohue Title:	<<Section Title from TOC>> (same as selected in eCommunication database)
Description:	Xxxx xxxx xxxx (same as entered in eCommunication database)
Type:	(same as selected in eCommunication database)

Applicable Contract Clarification / Interpretation Request(s) were submitted and response(s) received:

☒ No ☐ Yes If Yes, List RFI Numbers: _____

Submittal includes variations from the requirements of the Contract Documents:

☒ No ☐ Yes If Yes, Variations are identified below and in accordance with paragraph 7.16 of the General Conditions:

Variations are as follows:

1. <<None>>

Contractor certifies that this submittal has been prepared in accordance with paragraph 7.16 of the General Conditions and Contractor has reviewed and approved this submittal in accordance with paragraph 7.16 of the General Conditions:

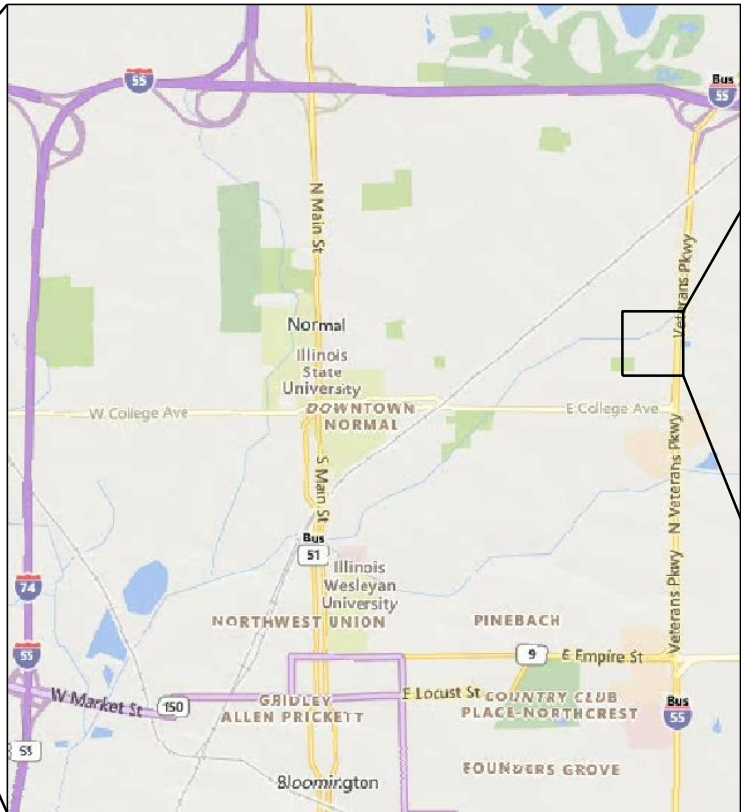
☒ Yes ☐ No

CITY OF BLOOMINGTON FORT JESSE GENERATOR AND ELECTRICAL IMPROVEMENTS

NORMAL, IL
AUGUST 24, 2022



ILLINOIS



PROJECT LOCATION MAP



PROJECT SITE MAP

INDEX TO DRAWINGS		
Sheet Number	Sheet Title	Description
001-GENERAL		
1	001-G-1	
2	001-G-2	SYMBOLS AND ABBREVIATIONS
3	001-G-3	CIVIL LEGEND AND GEENRAL NOTES
4	001-G-4	ELECTRICAL LEGEND
5	001-G-5	
6	001-ENV-1	ENVIRONMENTAL
002-SITE DEVELOPMENT		
7	002-CR-1	REMOVAL
8	002-CEFN-1	CIVIL, ELECTRICAL, AND STRUCTURAL
9	002-CEFN-2	CIVIL, ELECTRICAL, AND STRUCTURAL
007-ONE-LINE DIAGRAMS		
10	007-E-1	STATION B REMOVAL
11	007-E-2	STATION A REMOVAL
12	007-E-3	STATION B
13	007-E-4	STATION A
14	007-E-5	PANELBOARD
009 - P&ID		
15	009-N-1	PROCESS AND INSTRUMENTATION DIAGRAM
101-PUMP STATION A		
16	101-RE-1	ELECTRICAL
102-PUMP STATION B		
17	102-RSEN-1	ELECTRICAL
999-STANDARD DETAILS		
18	999-C-1	CIVIL
19	999-C-2	CIVIL
20	999-E-1	ELECTRICAL
21	999-E-2	ELECTRICAL
22	999-S-1	STRUCTURAL

PREPARED FOR



BID SET

PREPARED BY



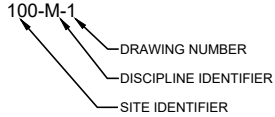
1605 S. STATE STREET - SUITE 1C
CHAMPAIGN, IL 61820
217-352-9990

GENERAL LEGEND

DISCIPLINE IDENTIFIER

DISCIPLINE	DISCIPLINE IDENTIFIER
GENERAL	G
CIVIL KEY	CK
CIVIL NOTES	CN
CIVIL REMOVAL	CR
CIVIL FACILITIES	CF
CIVIL GRADING	CG
CIVIL EROSION CONTROL	CE
CIVIL PIPING	CP
REMOVALS	R
ARCHITECTURAL	A
STRUCTURAL FOUNDATION	SF
STRUCTURAL	S
PROCESS-MECHANICAL	M
PLUMBING	P
HVAC	H
ELECTRICAL	E
ELECTRICAL LIGHTING	L
INSTRUMENTATION AND CONTROL	N

DRAWING NUMBER DESIGNATION



PLAN NOTE DESIGNATION



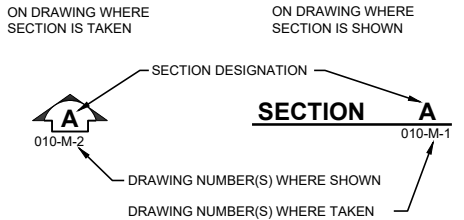
STANDARD DETAIL DESIGNATION



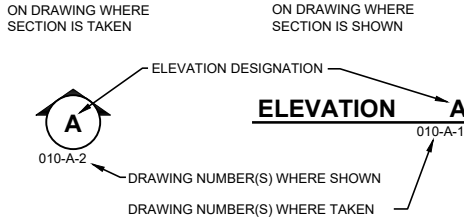
NOTE:
STANDARD DETAILS ARE LOCATED ON DRAWINGS THAT HAVE BEEN ASSIGNED A SITE IDENTIFIER OF 999 FOLLOWED BY A DISCIPLINE IDENTIFIER. THESE DRAWINGS ARE PLACED LAST IN THE DRAWING SET.

EXAMPLE: 999-M-1

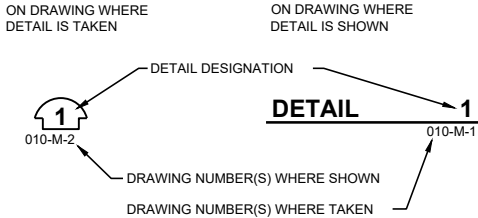
SECTION DESIGNATION



CASEWORK ELEVATION DESIGNATION



DETAIL DESIGNATION



AREA DESIGNATION

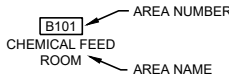
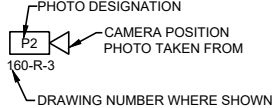


PHOTO DESIGNATION



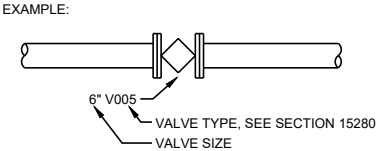
SYMBOLS

	NON-RIGID INSULATION		BAR GRATING
	RIGID INSULATION		CHECKERED PLATE
	SAND OR FILL		PLANK GRATING
	FREE DRAINING FILL		2' x 2' SUSPENDED ACOUSTICAL CEILING
	ROUGH CARPENTRY (NOMINAL SIZE INDICATED)		GYPSUM BOARD CEILING. REFER TO ROOM FINISH SCHEDULE FOR FINISH
	CONCRETE		CEILING HEIGHT ABOVE FINISHED FLOOR
	CONCRETE BLOCK		DOOR DESIGNATOR
	FACE BRICK		WINDOW NO. WINDOW DESIGNATOR
	PRECAST CONCRETE PLANK		
	EARTH OR BACKFILL		
	ROCK		
	REMOVAL		

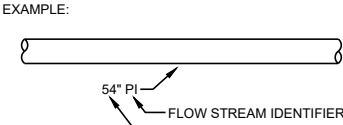
INSTRUMENT IDENTIFICATION

SAME AS SHOWN ON P&ID LEGEND.
EXCEPTION: COMPONENT DESIGNATORS NOT USED ON PROCESS MECHANICAL DRAWINGS

VALVE IDENTIFICATION



PIPE IDENTIFICATION



ABBREVIATIONS

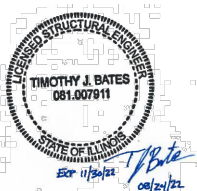
ACT	ACOUSTICAL TILE	F/	FACE OF	N	NEW	T	TOP
AD	ACCESS DOOR	FCA	FLANGED COUPLING ADAPTOR	NIC	NOT IN CONTRACT	T	TREAD
ADDL	ADDITIONAL	FD	FLOOR DRAIN	NO. or #	NUMBER	T/	TOP OF
AFF	ABOVE FINISHED FLOOR	FE	FIRE EXTINGUISHER	NOM	NOMINAL	T/S	TOP OF STEEL
AL	ALUMINUM	FEC	FIRE EXTINGUISHER CABINET	NR	NON-RATED	T&B	TOP AND BOTTOM
ALT	ALTERNATE	FF	FINISH FLOOR	NTS	NOT TO SCALE	T & G	TONGUE & GROOVE
APPROX	APPROXIMATE	FFE	FINISH FLOOR ELEVATION			TDC	TRAFFIC DECK COVERING
ARCH	ARCHITECTURAL	FH	FULL HEIGHT	OC	ON CENTER	TEMP	TEMPERED
AVG	AVERAGE	FHC	FIRE HOSE CABINET	OD	OUTSIDE DIAMETER	THK	THICK
		FIN	FINISH	OFI	OWNER FURNISHED ITEM	TOC	TOP OF CONCRETE or CURB
B	BOTTOM	FL or FLR	FLOOR	OFOI	OWNER FURNISHED	TOP	TOP OF PARAPET
B/	BOTTOM OF	FLG	FLANGE		OWNER INSTALLED	TOS	TOP OF STEEL
BF	BLIND FLANGE	FO	FINISHED OPENING	OPNG or OPNG	OPENING	TOW	TOP OF WALL
BFP	BACKFLOW PREVENTER	FOC	FACE OF CONCRETE	OPPO	OPPOSITE	TYP	TYPICAL
BLDG	BUILDING	FOS	FACE OF STUD	P&ID	PROCESS AND INSTRUMENTATION DIAGRAM		
BLK	BLOCK	FOUND	FOUNDATION			UNO	UNLESS NOTED OTHERWISE
BLKG	BLOCKING	FOW	FACE OF WALL	P. LAM.	PLASTIC LAMINATE		
BM	BEAM	FRP	FIBER REINFORCED PLASTIC	PC	PORTLAND CEMENT	VB	VINYL BASE
BOB	BOTTOM OF BEAM	FS	FLOOR SINK	PCP	PRE-STRESSED CONCRETE	VCT	VINYL COMPOSITION TILE
BOT	BOTTOM	FS	FULL SIZE	PIPE		VER	VERIFY
BRD	BOARD	FSD	FULL SIZE DETAIL	PJF	PREFORMED JOINT FILLER	VERT	VERTICAL
		FT	FEET	PL	PLATE	VIF	VERIFY IN FIELD
		FTG	FOOTING	PLAS	PLASTIC		
		FV	FIELD VERIFY	PLYWD	PLYWOOD		
				PR	PAIR	W	WIDE
CL	CENTERLINE	GA	GAUGE	PREP	PREPARATION	W/	WITH
CEM	CEMENT	GALV	GALVANIZED	PROJ	PROJECTION	WC	WATER CLOSET
CH	CEILING HEIGHT	G.B.	GRAB BAR	PT	PAINT	WD	WOOD
CJ or CJT	CONTROL JOINT	GCMU	GLAZED CONCRETE	PVC	POLYVINYL CHLORIDE	WL	WATER LEVEL
CLG or CEIL	CEILING					WO	WITHOUT
CLO	CLOSET	GL	GLASS	QT	QUARRY TILE	WP	WATERPROOFING
CLR	CLEAR	GR	GRADE			WS	WATERSTOP
CMU	CONCRETE MASONRY UNIT	GYP BD	GYPSUM BOARD	R	RISER	WWF	WELDED WIRE FABRIC
CO	CLEAN OUT			R or RAD	RADIUS	YR	YEAR
COL	COLUMN	H	HIGH	RC	ROOF CONDUCTOR		
COMPO	COMPOSITION	HB	HOSE BIB	RCP	REINFORCED CONCRETE PIPE		
CONC	CONCRETE	H/C	HANDICAPPED	RCP	REFLECTED CEILING PLAN		
CONF	CONFERENCE	HDWD	HARDWOOD	RD	ROOF DRAIN		
CONN	CONNECTION	HDWR	HARDWARE	REC	RECESSED		
CONST	CONSTRUCTION	HM	HOLLOW METAL	RED	REDUCER		
CONT	CONTINUOUS	HORZ	HORIZONTAL	REDWD	REDWOOD		
CONTR	CONTRACT/CONTRACTOR	HP	HIGH POINT	REF	REFERENCE		
CONTR JT	CONTRACTION JOINT	HT	HEIGHT	REFL	REFLECTED		
CORR	CORRIDOR	HVL	HIGH WATER LEVEL	REINF	REINFORCE/REINFORCING		
C.T.	CERAMIC TILE			REQD	REQUIRED		
CPVC	CHLORINATED POLYVINYL CHLORIDE	ID	INSIDE DIAMETER	RES	RESILIENT		
		INSUL	INSULATION	REV	REVISION/REVISED		
		INV	INVERT	RM	ROOM		
CSK	COUNTERSINK	JAN	JANITOR	RO	ROUGH OPENING		
CTR	CENTER			SCHED	SCHEDULE		
		KITCH	KITCHEN	SD	SUMP DISCHARGE		
DBL	DOUBLE	LAV	LAVATORY	SECT	SECTION		
DEG	DEGREE	LEV	LEVEL	SHT	SHEET		
DEG	DEGREES (ANGULAR)	LIG	LAY-IN-GRID CEILING	SIM	SIMILAR		
DET	DETAIL	LLH	LONG LEG HORIZONTAL	SPA	SPACE OR SPACING		
DIA	DIAMETER	LLV	LONG LEG VERTICAL	SPECS	SPECIFICATIONS		
DIAG	DIAGONAL	LP	LOW POINT	SQ	SQUARE		
DIM	DIMENSION	LR	LONG RADIUS	SR	SHORT RADIUS		
DIP	DUCTILE IRON PIPE	LTG	LIGHTING	SS or SST	STAINLESS STEEL		
DIR	DIRECTION	LTWT	LIGHT WEIGHT	STD	STANDARD		
DN	DOWN	LWL	LOW WATER LEVEL	STL	STEEL		
DWG	DRAWING	MAINT	MAINTENANCE	STRUCT	STRUCTURAL		
		MATL	MATERIAL	SUSP	SUSPENDED		
EA	EACH	MAX	MAXIMUM	SV	STAIN AND VARNISH		
ECC	ECCENTRIC	MB	MACHINE BOLT				
EF	EACH FACE	MECH	MECHANICAL				
EJ	EXPANSION JOINT	MET	METAL				
EL	ELEVATION	MEZZ	MEZZANINE				
ELEC	ELECTRICAL	MFR	MANUFACTURER				
ELEV or EL	ELEVATION	MH	MANHOLE				
ELL	ELBOW	MIN	MINIMUM				
ELEV	ELEVATOR	MISC	MISCELLANEOUS				
EQ	EQUAL	MJ	MECHANICAL JOINT				
EQUIP	EQUIPMENT	MO	MASONRY OPENING				
EW	EACH WAY	MULL	MULLION				
EWC	ELECTRICAL WATER COOLER						
EXIST or (X)	EXISTING						
EXP	EXPANSION						
EXP JT	EXPANSION JOINT						
EXT	EXTERIOR						

FLOW STREAM IDENTIFIERS

ALP	AIR (LOW PRESSURE)	H2S	HYDROGEN SULFIDE	RAS	RETURN ACTIVATED SLUDGE	WAS	WASTE ACTIVATED SLUDGE
AHP	AIR (HIGH PRESSURE)	HGR	HEATING GLYCOL RETURN	RCY	RECYCLE	W1	POTABLE CITY WATER
		HGS	HEATING GLYCOL SUPPLY	RWW	RAW WASTEWATER	W2	NON-POTABLE CITY WATER
BD	BASIN DRAIN	HWR	HEATING WATER RETURN			W3	PLANT EFFLUENT WATER (NON-POTABLE)
		HWS	HEATING WATER SUPPLY	SA	SAMPLE		
CEN	CENTRATE			SAN	SANITARY SEWER		
CGR	COOLING GLYCOL RETURN	LPO	LIQUID POLYMER	SBS	SODIUM BISULFITE		
CGS	COOLING GYLCOL SUPPLY	ML	MIXED LIQUOR	SCN	SCREENINGS		
		NG	NATURAL GAS	SE	SECONDARY EFFLUENT		
D	DRAIN	OA	ODOROUS AIR	SI	SECONDARY INFLUENT		
DCT	DECANT	OF	OVERFLOW	SHC	SODIUM HYPOCHLORITE		
DG	DIGESTER GAS	PE	PRIMARY EFFLUENT	SSM	SECONDARY SCUM		
DSC	DIGESTED SLUDGE	PI	PRIMARY INFLUENT	SUP	SUPERNATANT		
		PO	POLYMER				
DS	DIGESTED SLUDGE	PSD	PRIMARY SLUDGE				
DSH	DIGESTED SLUDGE HEATED	PSM	PRIMARY SCUM				
DSL	DIGESTED SLUDGE LOADOUT						
DSM	DIGESTED SLUDGE MIXING						
DST	DIGESTED SLUDGE TRANSFER						
EXH	EXHAUST						
				V	VENT		
FE	FINAL EFFLUENT						
FECL	FERRIC CHLORIDE						
FLT	FILTRATE						
GRS	GRIT SLURRY						
GRT	GRIT						

NOTE:

- THIS IS STANDARD LEGEND. NOT ALL OF THE INFORMATION SHOWN ON THIS LEGEND IS NEEDED IN THESE CONTRACT DRAWINGS.
- WORK IN THIS CONTRACT SHOWN FULL-TONE UNLESS OTHERWISE NOTED.



CITY OF BLOOMINGTON
DRINKING WATER SYSTEM
ELECTRICAL IMPROVEMENTS
FORT JESSE PUMP STATION

SYMBOLS AND ABBREVIATIONS



Sheet No.

2

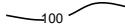
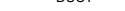
Drawing No.

001-G-2

LEGEND

EXISTING	PROPOSED	
		BENCHMARK
		CATCH BASIN
		CULVERT
		CULVERT OVER 24" (SHOWN ACTUAL SIZE)
		GAS VALVE
		GUY WIRE
		HAY BALES
		HEADWALL
		HYDRANT
		INLET
		IRON PIPE
		MANHOLE
		MARSH
		METER
		UTILITY POLE
		UTILITY POLE WITH LIGHT
		SECTION CORNER
		SIGN
		SPOT ELEVATION
		SOIL BORING
		STREET LIGHT
		SURVEY CONTROL POINT
		TELEPHONE PEDESTAL
		TREE CONIFEROUS, DECIDUOUS
		TREE REMOVAL
		TREE/SHRUB LINE
		WATER VALVE

LINE TYPE IDENTIFICATION

EXISTING	PROPOSED	
 CATV		CABLE TV
		CENTERLINE OF ROAD
		CONTOUR
		DITCH/SWALE
		EASEMENT
		FENCE
 E	 E	ELECTRIC
 DUCT	 DUCT	ELECTRICAL DUCT
 FO	 FO	FIBER OPTIC
 FM	 FM	FORCEMAIN
 G	 G	GAS
		GUARDRAIL
 OH		OVERHEAD ELECTRIC
		PIPE, ABANDON
		PIPE, PREVIOUSLY ABANDONED
		PIPE OVER 24" (SHOWN ACTUAL SIZE)
		PROPERTY LINE
		R.O.W.
		RAILROAD
 SAN	 SAN	SANITARY SEWER
 STM	 STM	SILT FENCE
 T	 STM	STORM SEWER
 W		TELEPHONE
		WATER
		WATERS EDGE
 WET		WETLAND

GENERAL NOTES

1. THE TOPOGRAPHIC MAPPING SHOWN IS BASED ON 1991 AND 1993 RECORD DRAWINGS PROVIDED BY OWNER.
2. DIMENSIONS OR COORDINATES TAKE PRECEDENCE OVER SCALE. CONTRACTORS TO VERIFY ALL DIMENSIONS AND COORDINATES IN THE FIELD FOR PROPER FIT AND ALIGNMENT.
3. THE CONTRACTOR SHALL CONTACT JULIE AT 1-800-892-0123 A MINIMUM OF 72 HOURS PRIOR TO PERFORMING ANY EARTH MOVING OR EXCAVATION ACTIVITIES. THE CONTRACTOR SHALL ALSO CONTACT ANY OTHER UTILITIES WHICH MAY BE PRESENT WHICH ARE NOT PART OF THE ONE CALL SYSTEM. NOTIFY PLANT STAFF ONE WEEK IN ADVANCE OF PLANT UTILITY LOCATION NEEDS TO ALLOW ADEQUATE RESPONSE TIME FOR PLANT STAFF.
4. EXISTING BURIED UTILITIES SHOWN IN PLAN AND PROFILE ARE INDICATED IN ACCORDANCE WITH THE AVAILABLE RECORDS AND FIELD INFORMATION AVAILABLE TO THE ENGINEER. OTHER UTILITIES MAY ALSO BE PRESENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING FROM THE OWNERS OF THE EXISTING UTILITIES THE LOCATION OF THEIR BURIED FACILITIES. ANY UTILITIES DAMAGED OR DESTROYED BY THE CONTRACTOR'S OPERATIONS WHETHER SHOWN ON THE DRAWINGS OR NOT, SHALL BE REPLACED OR REPAIRED TO THE UTILITY'S SATISFACTION AT NO COST TO THE OWNER.
5. IF UTILITY FACILITIES OTHER THAN THOSE SHOWN ARE LOCATED, OR IF UTILITIES ARE LOCATED WHICH ARE NOT IN ACCORDANCE WITH THE LOCATION SHOWN ON THE DRAWINGS, THE ENGINEER SHALL BE NOTIFIED TO DETERMINE IF PLAN REVISIONS ARE NEEDED. CONTRACTOR IS REQUIRED TO FIELD LOCATE ALL CROSSING UTILITIES SUFFICIENTLY IN ADVANCE OF CONSTRUCTION ACTIVITIES TO ALLOW ENGINEER TO REVISE LOCATIONS OF NEW FACILITIES TO AVOID CONFLICTS WITHOUT ADDITIONAL COST TO OWNER.
6. ACCESS CONSTRAINTS TO BE PLACED ON THE CONTRACTOR FOR THE PROJECT ARE SPECIFIED IN SECTION 01110 OF THE SPECIFICATIONS.
7. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL SITE FACILITIES DURING CONSTRUCTION. CONTRACTOR SHALL PLAN ITS WORK SEQUENCE AND ACTIVITIES TO ENSURE THAT ITS WORK DOES NOT INTERFERE WITH PUBLIC NEEDS OR PUBLIC FACILITIES OPERATIONS, DELIVERIES, PICKUPS OR OTHER ACCESS NEEDS.
8. THE CONTRACTOR SHALL COORDINATE THE ACTIVITIES OF ITS PERSONNEL, SUBCONTRACTORS, AND UTILITIES PERFORMING WORK ON THIS PROJECT. THE CONTRACTOR SHALL ALSO COORDINATE WITH CITY CREWS AND OTHER CONTRACTORS WORKING IN OR NEAR THE PROJECT AREA.
9. THE CONTRACTOR SHALL MAINTAIN ON FILE WITH THE OWNER AND ENGINEER A CURRENT LIST OF EMERGENCY TELEPHONE NUMBERS FOR THE CONTRACTORS SUPERVISORY PERSONNEL ASSIGNED TO THIS PROJECT. NO LESS THAN 2 NAMES WITH 24 HOUR PHONE NUMBERS SHALL BE INCLUDED.
10. ELEVATIONS CALLED OUT ON THE DRAWINGS ARE TYPICALLY AT THE "INVERT" OR BOTTOM OF PIPES AND STRUCTURES, ALONG THE FLOW LINE IN GUTTERS AND SWALES, AND AT THE "RIM" OR TOP (FINISHED GRADE) OF THE FRAME AND COVERS. OTHER ELEVATIONS ARE SPECIFICALLY NOTED.
11. UNLESS NOTED OTHERWISE RESTORATION OF EXISTING SANITARY SEWERS AND SERVICE LINES, WATER MAINS AND SERVICE LINES, STORM SEWERS, OTHER UTILITIES, SIDEWALKS, CURBS, DRIVEWAYS, STREETS OR OTHER IMPROVEMENTS NOT SHOWN AS BEING REMOVED, REPLACED OR MODIFIED BY THE PROJECT IS REQUIRED ONLY TO THE EXTENT THEY ARE DAMAGED OR DISTURBED BY CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL RESTORE ALL DAMAGED AND DISTURBED IMPROVEMENTS TO THE IMPROVEMENT OWNERS AND ENGINEERS SATISFACTION.
12. WHERE NEW WORK ABUTS EXISTING CURBS, SIDEWALK, DRIVES, OR OTHER PAVEMENTS WHICH ARE TO REMAIN IN PLACE, THE CONTRACTOR SHALL PROVIDE NEAT SAWCUTS, FULL DEPTH AT THE LIMIT OF CONSTRUCTION.
13. CONTRACTOR SHALL PROVIDE SUPPORT AND SHALL MAINTAIN SERVICE TO ALL ABOVE AND BELOW GRADE UTILITIES INCLUDING POLES, CABLES, WIRES, WATER, GAS, STORM, AND SANITARY FACILITIES, OR WITH THE WRITTEN CONCURRENCE OF THE UTILITY OWNER, MAY REMOVE, STORE, REINSTALL AND REPLACE AS NECESSARY.
14. CONTRACTOR IS RESPONSIBLE FOR SITE SAFETY DURING CONSTRUCTION OF THE PROJECT.
15. THE CONTRACTOR SHALL PROTECT ALL PROPERTY PINS (STEEL REBARS, PIPES, CAPPED PINS, ETC.) WHICH WERE FOUND OR LOCATED ON THE PROJECT SITE WHETHER SHOWN ON THE PLANS OR ENCOUNTERED DURING CONSTRUCTION FROM BEING DAMAGED, DESTROYED OR MOVED. IF PROPERTY PINS ARE DAMAGED, DESTROYED OR MOVED, THE CONTRACTOR SHALL PROVIDE THE SERVICES OF A REGISTERED ILLINOIS LAND SURVEYOR TO REPLACE THEM AT NO COST TO THE OWNER.
16. AS PART OF THE CONTRACTORS RESPONSIBILITIES A DETAILED SET OF RECORD DRAWINGS SHALL BE KEPT TO RECORD CHANGES OR DEVIATIONS FROM THE PLANS AND TO SHOW EXISTING UNDERGROUND UTILITIES OR OTHER FEATURES ENCOUNTERED DURING CONSTRUCTION.

ABBREVIATIONS

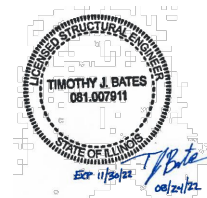
AGG	AGGREGATE	NG	NATURAL GAS
B/C BIT	BACK OF CURB BITUMINOUS/ASPHALT	OH	OVERHEAD UTILITY
CIP	CAST IRON PIPE	PC	POINT OF CURVATURE
CO	CLEANOUT	PE	POLYETHYLENE PIPE
CONC	CONCRETE	PI	POINT OF INTERSECTION
CMP	CORRUGATED METAL PIPE	PL	PROPERTY LINE
CSP	CONCRETE SEWER PIPE	PT	POINT OF TANGENCY
		PVC	POLYVINYL CHLORIDE PIPE
		PVI	POINT OF VERTICAL INTERSECTION
DIA	DIAMETER		
DIP	DUCTILE IRON PIPE	R	RADIUS
DW	DEWATERING PIPE	RCP	REINFORCED CONCRETE PIPE
		RIM	TOP OF CASTING ELEVATION
EXTG	EXISTING	ROW	RIGHT OF WAY
EOP	EDGE OF PAVEMENT	RT	RIGHT
F&C	FRAME AND COVER		
		SAN	SANITARY SEWER
F/C	FACE OF CURB	STM	STORM SEWER
F-F	FACE TO FACE	SD	SUMP DISCHARGE
F/G	FINISHED GRADE		
FES	FLARED END SECTION	T/C	TOP OF CURB
FOR	FUEL OIL RETURN	T/W	TOP OF WALL
FOS	FUEL OIL SUPPLY		
		UD	UNDERDRAIN
INV	INVERT		
		VC	VERTICAL CURVE
L	LENGTH OF CURVE		
LF	LINEAR FT		
LT	LEFT		

SYMBOLS

	EXISTING ASPHALTIC PAVEMENT TO REMAIN
	PROPOSED ASPHALTIC PAVEMENT
	PROPOSED CONCRETE PAVEMENT
	PROPOSED GRAVEL
	REMOVE EXISTING ASPHALTIC PAVEMENT & BASE
	REMOVE & REPLACE EXISTING ASPHALTIC PAVEMENT
	REMOVE & REPLACE EXISTING CONCRETE PAVEMENT
	REMOVE GRAVEL
	STAGING AREA
	STRUCTURE DEMOLITION
	LANDSCAPE STONE
	CONSTRUCTION LAYDOWN AREA

NOTE:

1. PROCESS FLOW STREAM IDENTIFIERS SAME AS SHOWN ON THE PROCESS MECHANICAL LEGEND
2. THIS IS STANDARD LEGEND. NOT ALL OF THE INFORMATION SHOWN ON THIS LEGEND IS NEEDED IN THESE CONTRACT DRAWINGS.

[illegible]

CITY OF BLOOMINGTON

DRINKING WATER SYSTEM

ELECTRICAL IMPROVEMENTS

FORT JESSE PUMP STATION

CIVIL LEGEND AND GENERAL NOTES



Sheet No. 3

Drawing No.

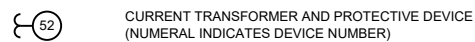
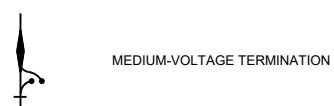
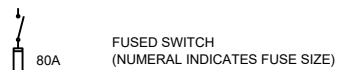
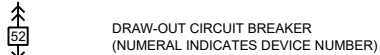
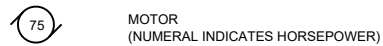
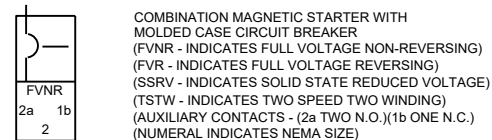
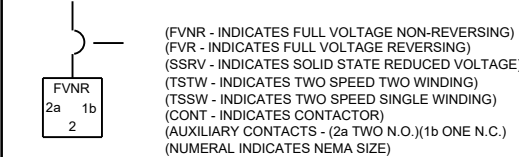
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599

PLAN SYMBOLS

A	AMPERE
AF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AIC	AMPERE INTERRUPTING CAPACITY
C	CONTACTOR/CONDUIT/COIL
CB	CIRCUIT BREAKER
CKT, CCT	CIRCUIT
DISC	DISCONNECT
EP	EXPLOSION PROOF
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFP	GROUND FAULT PROTECTION
GRD	GROUND
GRS	GALVANIZED RIGID STEEL
HF	HARMONIC FILTER
HH	HANDHOLE
HID	HIGH INTENSITY DISCHARGE
HP	HORSEPOWER
J	JUNCTION BOX
KVA	KILOVOLT AMPERE
KW	KILOWATT
LCP	LOCAL CONTROL PANEL
LP	LIGHTING PANEL
MCC	MOTOR CONTROL CENTER
MH	MANHOLE
MV	MEDIUM VOLTAGE MANHOLE
NEC	NATIONAL ELECTRICAL CODE (ANSI/NFPA-70)
NEU, N	NEUTRAL
NC	NORMALLY CLOSED
NF	NON FUSED
NGR	NEUTRAL GROUND RESISTOR
NO	NORMALLY OPEN
OL	OVERLOAD RELAY
PC	PHOTOCELL
PMG	PADMOUNT GEAR
PMT	PADMOUNT TRANSFORMER
PP	POWER PANEL
PVC	POLY VINYL CHLORIDE
SW	SWITCH
SWB	SWITCH BOARD
SWGR	SWITCHGEAR
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
V	VOLTS
VFD	VARIABLE FREQUENCY DRIVE
WP	WEATHERPROOF
XFMR	TRANSFORMER

15 (OR) **CL** **900**
M **500**

MOLDED CASE CIRCUIT BREAKER
 (UPPER NUMERAL INDICATES FRAME SIZE)
 (LOWER NUMERAL INDICATES TRIP SETTING)
 (CL - INDICATES CURRENT LIMITING CIRCUIT BREAKER)
 (M - INDICATES MOTOR CIRCUIT PROTECTOR)
 MAGNETIC STARTER AND MOLDED CASE CIRCUIT BREAKER



	LED OR FLUORESCENT FIXTURE - RECESSED (LETTER DENOTES TYPE)		MANUAL STARTER WITH PILOT LIGHT
	LED OR FLUORESCENT FIXTURE - SURFACE/SUSPENDED (LETTER DENOTES TYPE)		THREE PHASE MAGNETIC STARTER
	LED OR FLUORESCENT FIXTURE - WALL MOUNTED (LETTER DENOTES TYPE)		INFORMATION OUTLET
	LED OR HID FIXTURE - POLE MOUNTED FIXTURE (LETTER DENOTES TYPE)		THREE PHASE COMBINATION MAGNETIC STARTER AND DISCONNECT SWITCH
	LED OR HID FIXTURE - SURFACE/SUSPENDED (LETTER DENOTES TYPE)		SINGLE PHASE MAGNETIC STARTER
	EMERGENCY BATTERY LIGHT		NON-FUSED DISCONNECT SWITCH (NUMERAL INDICATES SWITCH RATING)
	REMOTE HEAD FOR EMERGENCY BATTERY LIGHT		FUSED DISCONNECT SWITCH - 3 POLE UNLESS OTHERWISE INDICATED (UPPER NUMERAL INDICATES SWITCH RATING) (LOWER NUMERAL INDICATES FUSE RATING)
	EXIT LIGHT WITH INDICATING DIRECTIONAL ARROW		3-PHASE MANUAL MOTOR SWITCH
	SWITCH (SINGLE POLE, 2-POLE, 3-WAY, 4-WAY)		LIGHTING PANEL
	MOMENTARY CONTACT SWITCH - CENTER OFF		TRANSFORMER
	SWITCH / PILOT LIGHT		POWER PANEL
	DUPLEX GROUNDED RECEPTACLE - 120V		TERMINAL CABINET (ITC - INDICATES INSTRUMENTATION) (TTC - INDICATES TELEPHONE)
	EXPLOSIONPROOF SIMPLEX GROUNDED RECEPTACLE - 120V		MOTOR
	TELEPHONE OUTLET, WALL MOUNT WITH 3/4" CONDUIT TO TELEPHONE TERMINAL CABINET		JUNCTION BOX
	DATA INFORMATION OUTLET		HANDHOLE
	RECESSED CEILING SPEAKER		MANHOLE
	VOLUME CONTROL		SURVEILLANCE CAMERA
	WALL SPEAKER		GROUND ROD
	SMOKE DETECTOR		CONDUIT STUB
	FIRE ALARM HORN		CONDUIT TURNING UP OR TO OBSERVER
	FIRE ALARM HORN AND STROBE		CONDUIT TURNING DOWN OR AWAY FROM OBSERVER
	FIRE ALARM STROBE		FLEXIBLE CONDUIT CONNECTION
	FIRE ALARM PULL STATION		HOMERUN CIRCUIT OR CONDUCTORS
	HEAT DETECTOR		DIRECT BURIAL CABLE
	FLOW SWITCH		UNDERGROUND ELECTRICAL DUCT, CONCRETE ENCASED.
	MOTION DETECTOR		

BUILDING NO. _____

LIGHTING OR POWER
PANEL AS INDICATED _____

PANEL NO. _____

CIRCUIT NO. _____

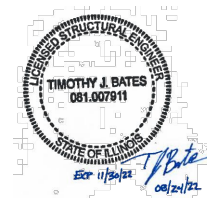
010LP1-4

DEVICE NUMBER	FUNCTION
27	UNDervoltage RELAY
32	REVERSE POWER RELAY
46	PHASE-BALANCE CURRENT RELAY
47	PHASE-SEQUENCE VOLTAGE RELAY
50	INSTANTANEOUS OVERCURRENT
51	AC TIME OVERCURRENT RELAY
51N	GROUND OVERCURRENT
52	AC CIRCUIT BREAKER
59	OVERVOLTAGE RELAY
67	AC DIRECTIONAL OVERCURRENT
81	OVER/UNDER FREQUENCY RELAY
86	LOCKOUT RELAY
89	POTENTIAL TRANSFORMER

BUILDING NO. _____

MCC NO. _____

1. THIS IS STANDARD LEGEND. NOT ALL OF THE INFORMATION SHOWN ON THIS LEGEND IS NEEDED IN THESE CONTRACT DRAWINGS.

[illegible]

**CITY OF BLOOMINGTON
DRINKING WATER SYSTEM
ELECTRICAL IMPROVEMENTS
FORT JESSE PUMP STATION**

ELECTRICAL LEGEND

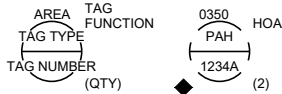

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Sheet No. 4

Drawing No.

001-G-4

INSTRUMENT TAG IDENTIFICATION



COMPONENT DESIGNATOR

AREA	0350:	BUILDING OR PROCESS AREA NUMBER
TAG TYPE	P:	FIRST LETTER, SEE TABLE BELOW
	AH:	SUCCEEDING LETTERS, SEE TABLE BELOW
TAG NUMBER	12:	P&ID NUMBER
	3:	LOOP NUMBER
	4:	EQUIPMENT NUMBER
	A:	DEVICE LETTER IF MULTIPLE DEVICES
TAG FUNCTION	HOA:	TAG FUNCTION ABBREVIATION, SEE LISTING AT RIGHT
(QUANTITY)	(2):	TOTAL NUMBER OF DEVICES WHERE MORE THAN ONE DEVICE IS REQUIRED. DEVICE NUMBERS ARE SEQUENTIAL BEGINNING WITH THE TAG NUMBER SHOWN. IF QUANTITY IS NOT SHOWN THEN ONE DEVICE ONLY IS REQUIRED.

COMPONENT DESIGNATOR ♦ SEE LISTING AT RIGHT

MISCELLANEOUS ABBREVIATIONS

ACC	ACCUMULATE/ACCUMULATION	PCN	PROCESS CONTROL NETWORK
ALT	ALTERNATE	PLC	PROGRAMMABLE LOGIC CONTROLLER
CAM	CAMERA	PROT	PROTECTOR/PROTECTION
CN	CONTROLNET	PTR	PRINTER
CPU	CENTRAL PROCESSING UNIT	PWR	POWER
CTL	CONTROL		
DN	DEVICENET	RAD	RADIO
DO	DATA OUTLET	RIO	REMOTE I/O
DSC	DISCONNECT	SBOX	SPLICE BOX
		SEQ	SEQUENCE
ESW	ETHERNET SWITCH	SM	SINGLE MODE
ETM	ELAPSED TIME METER	SW	SWITCH
FOC	FIBER OPTIC CABLE	TEMP	TEMPERATURE
FW	FIREWALL		
HMI	HUMAN MACHINE INTERFACE	UPS	UNINTERRUPTIBLE POWER SUPPLY
INIT	INITIATE		
INT	INTERVAL		
IP	INTERNET PROTOCOL		
ISB	INTRINSICALLY SAFE BARRIER		
JBX	JUNCTION BOX		
MOR	MOTOR OVERLOAD RELAY		
MPR	MOTOR PROTECTION RELAY		
MC	MEDIA CONVERTER		
MM	MULTIMODE		
MS	MOTOR STARTER		
NIC	NETWORK INTERFACE CARD		
OIU	OPERATOR INTERFACE UNIT		

MEANINGS OF INSTRUMENT IDENTIFICATION LETTERS

LETTER	FIRST LETTER (S)	SUCCEEDING LETTERS
	PROCESS OR INITIATING VARIABLE	MODIFIER
A	ANALYSIS (*)	ALARM (W. LOGGING)
B	BURNER, FLAME, COMBUSTION	USERS CHOICE (*)
C	USERS CHOICE (*)	CONTROL
D	USERS CHOICE (*)	DIFFERENTIAL
E	VOLTAGE	PRIMARY ELEMENT
F	FLOW RATE	RATIO
G	USERS CHOICE (*)	GLASS, VIEWING DEVICE
H	HAND (MANUAL)	HIGH
I	CURRENT	INDICATE
J	POWER	SCAN
K	TIME OR TIME SCHEDULE	TIME RATE OF CHANGE
L	LEVEL	KEYPAD (DATA ENTRY)
M	MOTOR, MOISTURE, HUMIDITY	LIGHT (PILOT)
N	USERS CHOICE (*)	MOMENTARY
O	USERS CHOICE (*)	MULTIFUNCTION (*)
P	PRESSURE OR VACUUM	ORIFICE
Q	QUANTITY OR HEAT DUTY	POINT (TEST CONNECTION)
R	RADIATION	RECORD, TREND, LOG
S	SPEED OR FREQUENCY	SWITCH
T	TEMPERATURE	TRANSMIT
U	UNIVERSAL/MULTIVARIABLE (*)	MULTIFUNCTION (*)
V	VIBRATION, MECHANICAL ANAL.	VALVE, DAMPER, LOUVER
W	WEIGHT, FORCE, TORQUE	WELL
X	UNCLASSIFIED (*)	UNCLASSIFIED (*)
Y	EVENT, STATE, OR PRESENCE	UNCLASSIFIED (*)
Z	POSITION, DIMENSION	UNCLASSIFIED (*)

(*) WHEN USED. AN EXPLANATION IS SHOWN ADJACENT TO SYMBOL.

TAG FUNCTION ABBREVIATIONS

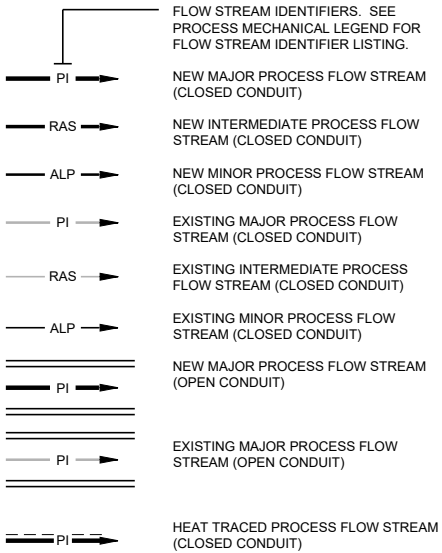
ALT	ALTERNATE
C	CLOSE/CLOSED
COMM	COMMUNICATIONS
CM	COMPUTER-MANUAL
DIFF	DIFFERENCE/DIFFERENTIAL
DN	DEVICENET
DO	DISSOLVED OXYGEN
ESTP	EMERGENCY STOP (ESTOP)
F	FAIL
F(X)	CHARACTERIZED/FUNCTION
FOR	FORWARD-STOP(OFF)-REVERSE (MAINTAINED CONTACT)
FSR	FORWARD-STOP-REVERSE (MOMENTARY CONTACT)
FWD	FORWARD
F/R	FORWARD/REVERSE (MOTOR STARTER COILS)
HOA	HAND-OFF-AUTOMATIC (MAINTAINED CONTACT)
HOR	HAND-OFF-REMOTE (MAINTAINED CONTACT)
II	CURRENT TO CURRENT
IP	CURRENT TO PNEUMATIC
LL	LEAD-LAG (MAINTAINED CONTACT)
LOE	LOSS OF ECHO (ULTRASONIC SENSOR FAILURE)
LOR	LOCAL-OFF-REMOTE (MAINTAINED CONTACT)
LOS	LOCKOUT STOP (LOCKABLE IN STOP POSITION)
L/R	LOCAL-REMOTE (MAINTAINED CONTACT)
MA	MANUAL-AUTOMATIC (MAINTAINED CONTACT)
MOA	MANUAL-OFF-AUTOMATIC (MAINTAINED CONTACT)
O	OPEN/OPENED
OA	OFF-AUTOMATIC
OCA	OPEN-CLOSE-AUTOMATIC (MAINTAINED CONTACT)
OC	OPEN-CLOSE
OSC	OPEN-STOP-CLOSE (SPRING RETURN TO CENTER)
OO	ON-OFF (MAINTAINED CONTACT)
OOA	ON-OFF-AUTO (MAINTAINED CONTACT)
OOR	ON-OFF-REMOTE (MAINTAINED CONTACT)
QTY	QUANTITY
R	RUN
REV	REVERSE
RST	RESET
SBL	SLUDGE BLANKET INTERFACE LEVEL
SP	SPEED POTENTIOMETER
SPD	SPEED
SORT	SQUARE ROOT
SS	START-STOP (MOMENTARY CONTACT)
SSA	START-STOP-AUTOMATIC (MOMENTARY CONTACT)
SSL	START-STOP-LOCK (LOCKABLE IN STOP POSITION)
SUM	SUMMATION
VIB	VIBRATION
X	MULTIPLE/MULTIPLY

COLOR ABBREVIATIONS

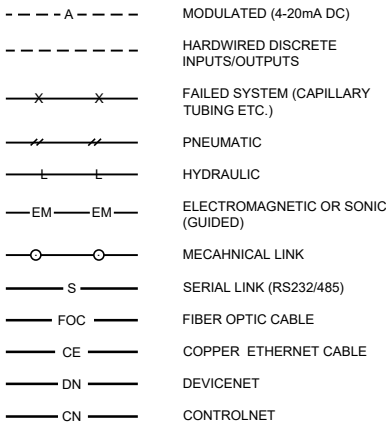
AMB	AMBER	ORG	ORANGE
BLK	BLACK	RED	RED
BLU	BLUE		
BRW	BROWN	WHT	WHITE
GRN	GREEN		
GRY	GRAY		

LINE IDENTIFICATION

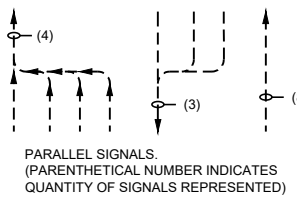
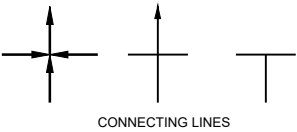
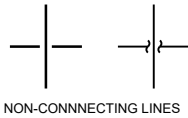
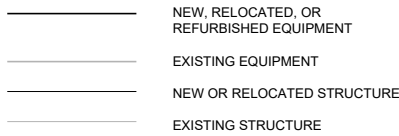
PROCESS FLOW



SIGNALS

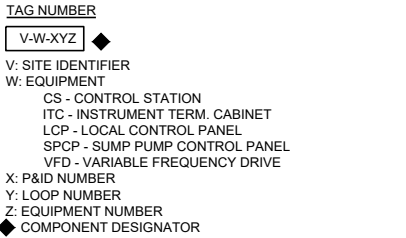


STRUCTURES AND EQUIPMENT



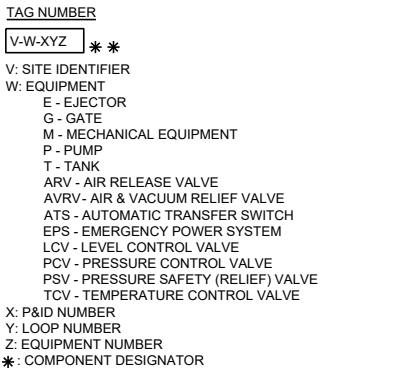
LOCAL CONTROL PANEL

TAG IDENTIFICATION



EQUIPMENT AND VALVE

TAG IDENTIFICATION



INSTRUMENT SYMBOLS

	FIELD MOUNTED	PANEL MOUNTED ACCESSIBLE TO OPERATOR	PANEL MOUNTED INACCESSIBLE TO OPERATOR	MOTOR STARTER MOUNTED ACCESSIBLE TO OPERATOR	MOTOR STARTER MOUNTED INACCESSIBLE TO OPERATOR
DISCRETE INSTRUMENTS	()	()	()	()	()
PROGRAMMABLE CONTROLLER-BASED FUNCTIONS					
PANEL MOUNTED OIU FUNCTIONS	()	()	()	()	()
PC BASED HMI WORKSTATION FUNCTIONS					

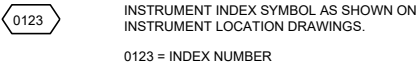
GENERAL NOTES

- DRAWINGS SHOW CONTROL, SIGNAL AND ASSOCIATED SINGLE PHASE POWER WIRING REQUIREMENTS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WIRING, WHETHER SHOWN OR NOT, NECESSARY FOR A COMPLETE AND OPERABLE SYSTEM.
- DRAWINGS SHOW APPROXIMATE LOCATIONS OF DEVICES AND PANELS, FIELD VERIFY DIMENSIONS AND ELEVATIONS.
- SHIELDED AND UNSHIELDED CONDUCTORS SHALL BE RUN IN CONDUIT. SHIELDED CONDUCTORS SHALL NOT BE COMBINED WITH UNSHIELDED CONDUCTORS IN ANY CONDUIT. NEITHER SHIELDED NOR UNSHIELDED CONDUCTORS SHALL BE INCLUDED IN THE SAME CONDUIT AS POWER WIRING.
- CONDUITS SHALL BE SIZED TO ACCOMMODATE REQUIRED CONDUCTORS AND SPARES.
- DRAWINGS DO NOT SHOW CONDUIT SYSTEMS. PROVIDE, AS A MINIMUM, PULL BOXES AS RECOMMENDED BY CONDUCTOR MANUFACTURER. CONDULETS SHALL NOT BE USED AS PULL BOXES.
- PROVIDE EXPLOSION-PROOF SEAL-OFF FITTINGS ON ALL CONDUIT EXITING CLASSIFIED OR RATED LOCATIONS. FITTINGS SHALL BE INSTALLED PER NEC.
- SHIELDED AND UNSHIELDED CONDUCTORS SHALL HAVE A MINIMUM OF 6" SEPARATION BETWEEN CONDUIT ON PARALLEL RUNS.
- SHIELDED AND UNSHIELDED CONDUCTORS SHALL BE SEPARATED BY STEEL BARRIERS IN ALL COMBINED SIGNAL JUNCTION BOXES AND INSTRUMENT TERMINATION CABINETS.
- CONDUCTORS SHALL NOT BE SPLICED EXCEPT AT TERMINALS OR AS DESIGNATED BY ENGINEER.
- FOR EACH CONDUIT, PROVIDE A MINIMUM OF TWO CONDUCTORS OR 10% OF TOTAL CONDUCTORS IN CONDUIT, WHICHEVER IS GREATER AS SPARES. TAG BOTH ENDS OF EACH SPARE. TERMINATE EACH END OF SPARE CONDUCTORS AT TERMINALS WHENEVER POSSIBLE.
- SPARE AND GROUND CONDUCTORS ARE GENERALLY NOT SHOWN IN WIRING TABLES.

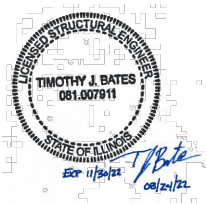
INDEX LEGEND

()	#14 (QUANTITY)	#14 THHN/THWN CONDUCTORS.
()	STP (QUANTITY)	#16 SHIELDED TWISTED PAIR.
()	MB (QUANTITY)	#16 SHIELDED TWISTED PAIR (MODBUS).
()	3C-S (QUANTITY)	#16 SHIELDED 3-CONDUCTOR.
()	4C-S (QUANTITY)	#16 SHIELDED 4-CONDUCTOR.
()	5C-S (QUANTITY)	#16 SHIELDED 5-CONDUCTOR.
()	RTD (QUANTITY)	3-WIRE RTD CABLE.
()	E (QUANTITY)	TYPE E THERMOCOUPLE CABLE.
()	K (QUANTITY)	TYPE K THERMOCOUPLE CABLE.
()	FOC (QUANTITY)	FIBER OPTIC CABLE.
()	CE (QUANTITY)	COPPER ETHERNET.
()	VFC (QUANTITY)	VENDOR FURNISHED CABLE.

INDEX SYMBOLS



0123 = INDEX NUMBER



CITY OF BLOOMINGTON
DRINKING WATER SYSTEM
ELECTRICAL IMPROVEMENTS
FORT JESSE PUMP STATION
INSTRUMENTATION AND CONTROL
STANDARD LEGEND

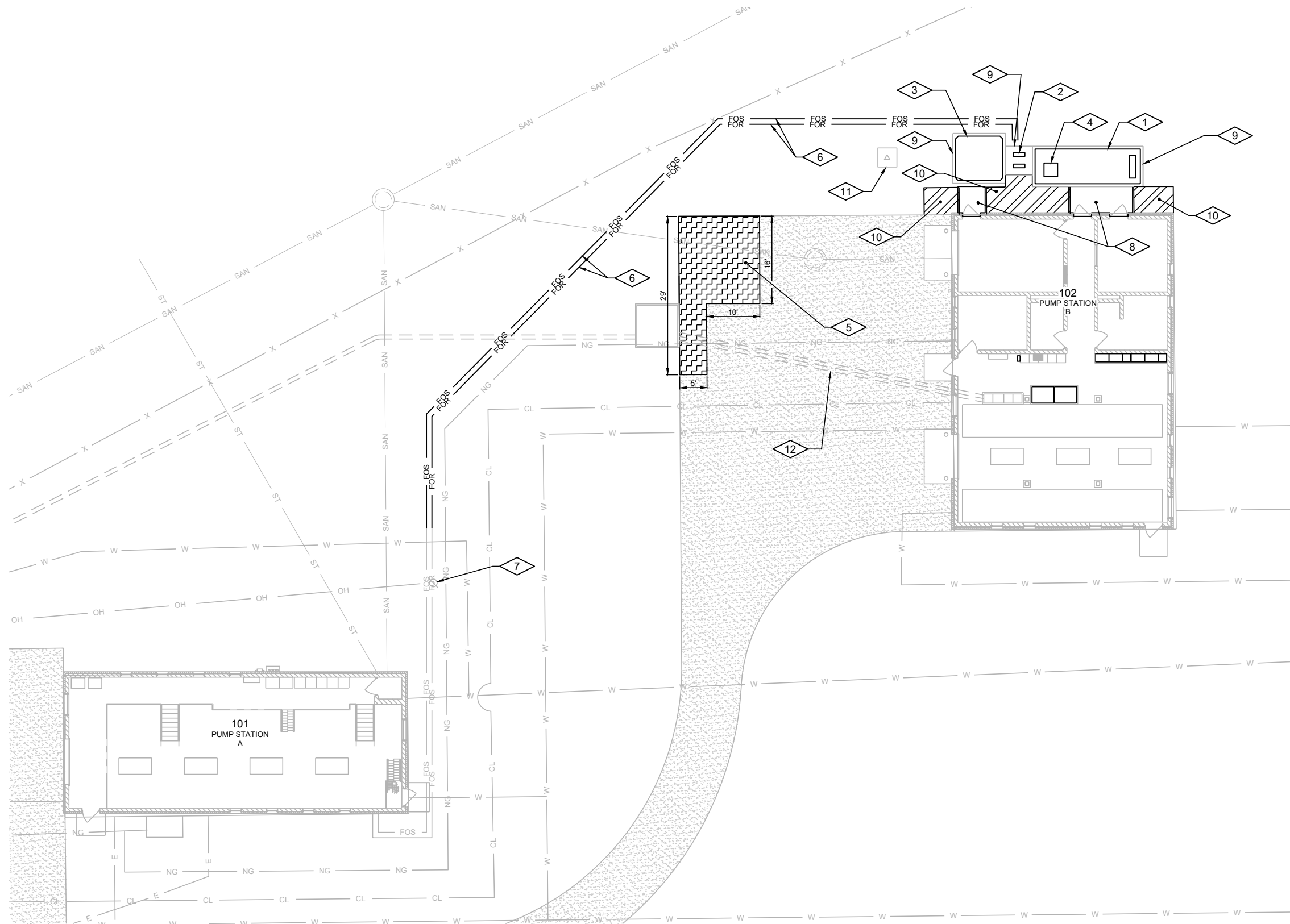


Sheet No.

Drawing No.

001-G-5

601



PARTIAL REMOVAL SITE PLAN

GENERAL NOTES:

1. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS, DIMENSIONS, AND ELEVATIONS PRIOR TO CONSTRUCTION AND/OR FABRICATION. EXISTING SITE FACILITIES AND GRADING AS SHOWN ARE BASED ON EXISTING DRAWINGS.
2. DIMENSIONS PROVIDED ARE BASED ON EXISTING RECORD DRAWINGS AND ARE INTENDED FOR REFERENCE ONLY.
3. CALL AND LOCATE ALL UNDERGROUND UTILITIES BEFORE COMMENCING ANY EARTH WORK.
4. FULL TONE COMPONENTS TO BE REMOVED.
5. SAWCUT AND REMOVE CONCRETE TO THE LIMITS NOTED. IN EXPOSED AREAS NOT COVERED BY NEW CONSTRUCTION, REMOVE REINFORCEMENT AND EMBEDMENTS 1" BEYOND FINISHED SURFACE AND PATCH SURFACE WITH PATCHING MORTAR TO MATCH ADJACENT FINISHED SURFACE.
6. REMOVE CONCRETE ANCHORS, ANCHOR BOLTS, AND OTHER EMBEDMENTS FOR MATERIALS AND EQUIPMENT BEING REMOVED. IN EXPOSED AREAS NOT COVERED BY NEW CONSTRUCTION, REMOVE CONCRETE ANCHORS, ANCHOR BOLTS, AND OTHER EMBEDMENTS 1" BEYOND FINISHED SURFACE AND PATCH SURFACE WITH PATCHING MORTAR. FINISH SURFACE TO MATCH ADJACENT FINISHED SURFACE.
7. WHERE EQUIPMENT IS INDICATED TO BE REMOVED, REMOVE ALL ASSOCIATED POWER AND CONTROL WIRING AND CONDUIT BACK TO SOURCE. REMOVE JUNCTION BOXES AND PULL BOXES ASSOCIATED WITH THE REMOVED CONDUITS. WHERE CONDUIT SYSTEM CONTAINS CIRCUITS TO OTHER EQUIPMENT THAT REMAINS, RETAIN THESE CIRCUITS AND RELOCATE EXISTING CONDUIT AND EXTEND EXISTING CIRCUITS AS REQUIRED FOR THE INSTALLATION OF NEW EQUIPMENT.
8. REMOVE ALL SUPPORTS ASSOCIATED WITH REMOVED PIPING, DUCTWORK, CONDUIT, AND EQUIPMENT. REMOVE RODS AND FASTENERS FROM CEILINGS, FLOORS, AND WALLS WITH CARE. WHERE SURFACE HAS BEEN MARRED, CHIPPED, SPAWLED, ETC. AS A RESULT OF REMOVAL, PATCH SURFACE WITH PATCHING MORTAR AND FINISH TO MATCH ADJACENT FINISHED SURFACE.
9. WHERE OPENINGS ARE LEFT IN WALLS, SLABS, OR CEILINGS DUE TO REMOVED PIPING, DUCTWORK, EQUIPMENT, OR OTHER WORK, PATCH OPENING TO MATCH ADJACENT SURFACES UNLESS NOTED OTHERWISE.
10. OWNER SHALL HAVE FIRST RIGHT REFUSAL ON ALL REMOVED EQUIPMENT.

PLAN NOTES:

1. REMOVE GENERATOR AND ENCLOSURE.
2. REMOVE OIL FUEL PUMPS.
3. REMOVE FUEL TANK.
4. REMOVE AUTOMATIC TRANSFER SWITCH.
5. REMOVE AND REPLACE EXISTING ASPHALT PAVEMENT.
6. REMOVE PREVIOUSLY ABANDONED FUEL LINES TO THE EXTENTS SHOWN.
7. PROTECT EXISTING UTILITY POLE.
8. REMOVE CONCRETE STOOPS. SEE STRUCTURE 102 DRAWINGS FOR ADDITIONAL INFORMATION.
9. IF OWNER ACCEPTS ALTERNATE 1, REMOVE CONCRETE EQUIPMENT PADS.
10. REMOVE AND REPLACE CONCRETE SIDEWALK.
11. PROTECT EXISTING RADIO TOWER AND PAD.
12. EXISTING ELECTRICAL DUCT BANK TO REMAIN. PROTECT DUCT BANK, CONDUIT, AND WIRING FOR REUSE.



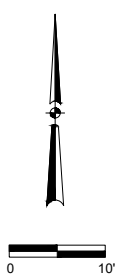
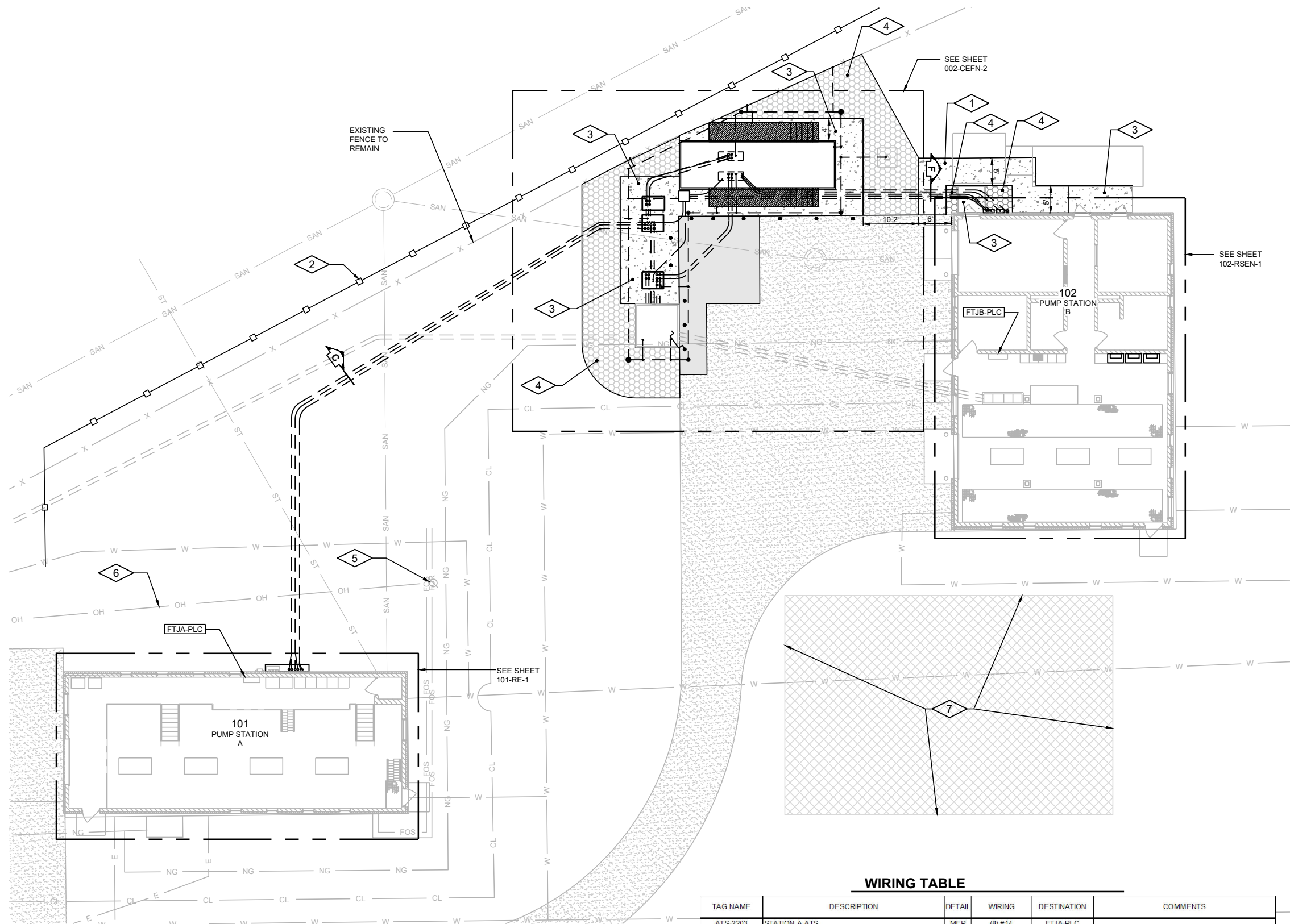
CITY OF BLOOMINGTON
DRINKING WATER SYSTEM
ELECTRICAL IMPROVEMENTS
FORT JESSE PUMP STATION
REMOVAL
SITE PLAN



DONOHUE

Sheet No. 7
Drawing No.

002-CR-1



GENERAL NOTES:

1. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS, DIMENSIONS, AND ELEVATIONS PRIOR TO CONSTRUCTION AND/OR FABRICATION. EXISTING SITE FACILITIES AND GRADING AS SHOWN ARE BASED ON EXISTING DRAWINGS.
2. DIMENSIONS PROVIDED ARE BASED ON EXISTING RECORD DRAWINGS AND ARE INTENDED FOR REFERENCE ONLY.
3. CALL AND LOCATE ALL UNDERGROUND UTILITIES BEFORE COMMENCING ANY EARTH WORK.
4. CONTRACTOR SHALL LOCATE, PROTECT, AND KEEP IN SERVICE ALL EXISTING NATURAL GAS, SEWER, WATER AND OTHER UTILITY SERVICES.
5. ALL DISTURBED AREAS NOT COVERED BY PAVING OR OTHERWISE NOTED SHALL BE RESTORED WITH TOPSOIL, MULCH AND SEED. SEE DETAIL C050.
6. MAINTAIN MINIMUM 12" DISTANCE BETWEEN NEW UTILITY PRIMARY CONDUITS AND EXISTING UTILITIES.
7. SEE DRAWING 999-E-2 FOR ALL DUCTBANK SECTIONS SHOWN ON THIS SHEET.
8. CONTRACTOR TO CONSTRUCT SIDEWALK TO GRADE AWAY FROM BUILDING AND EQUIPMENT PADS.

PLAN NOTES:

1. CONCRETE SIDEWALK, SEE DETAIL C150.
2. SILT FENCE, SEE DETAIL C031.
3. CONCRETE DOOR STOOP. SEE STRUCTURE 102 DRAWINGS FOR ADDITIONAL INFORMATION.
4. LANDSCAPE STONE ON GEOTEXTILE FABRIC WITH EDGING PLACED ADJACENT TO GRASS.
5. EXISTING 35KV POLE TO BE UPGRADED BY AMEREN.
6. EXISTING 35KV OVERHEAD PRIMARY TO BE MODIFIED BY AMEREN.
7. CONTRACTOR LAYDOWN AREA.

PARTIAL SITE PLAN

WIRING TABLE

TAG NAME	DESCRIPTION	DETAIL	WIRING	DESTINATION	COMMENTS
ATS-2203	STATION A ATS	MFR	(8) #14	FTJA-PLC	
ES-2203/4	GENERATOR ESTOP	MFR	(2) #14	GEN-2203/4	
FTJA-PLC	STATION A PLC	N/A	-	-	EXISTING
FTJB-PLC	STATION B PLC	N/A	-	-	EXISTING
GEN-2203/4	GENERATOR	MFR	CAT 6	FTJB-PLC	
ATS-2204	STATION B ATS	MFR	(8) #14	FTJB-PLC	

Provide ground conductor (not shown) as needed. See General Notes on sheet 001-G-5.

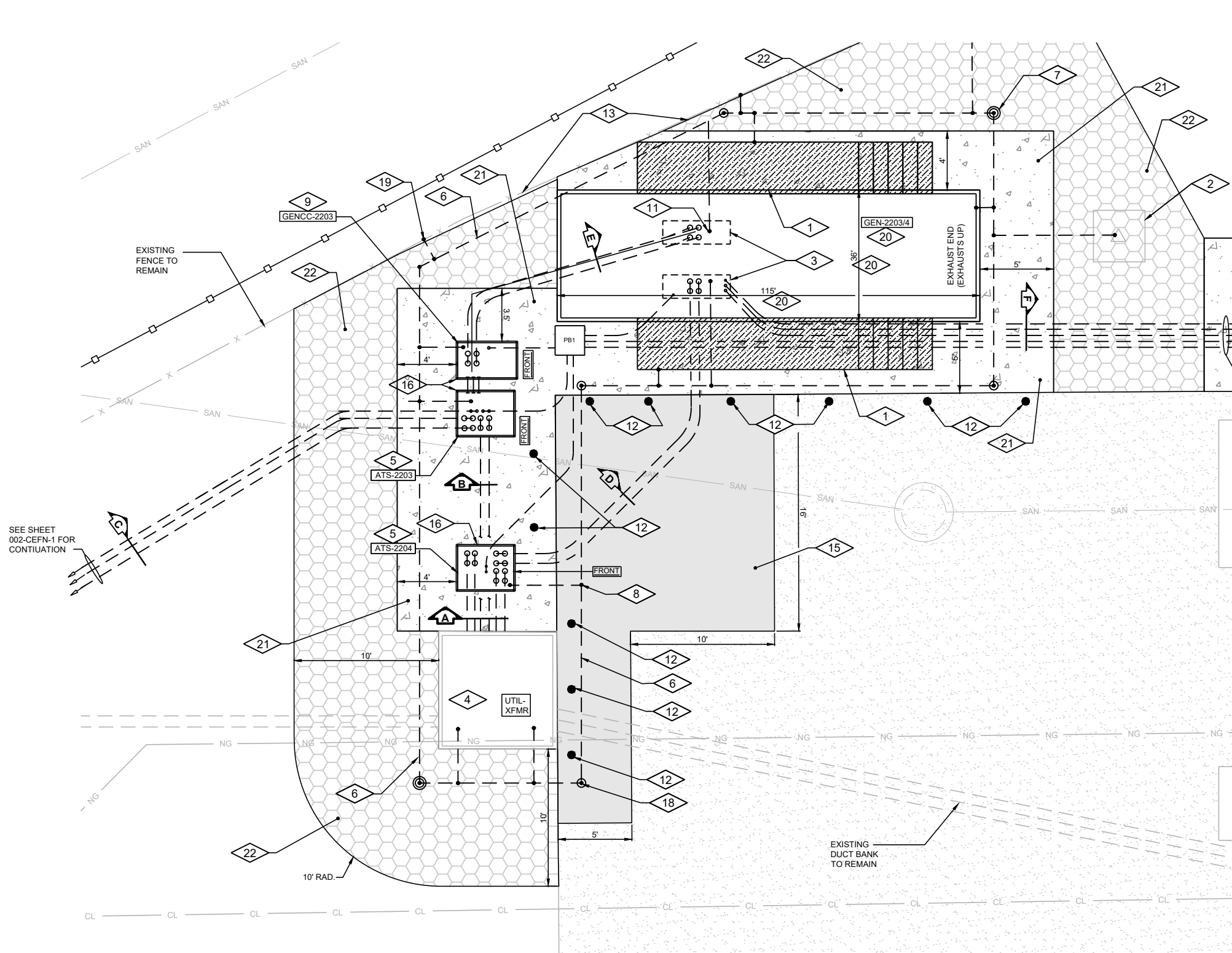
**CITY OF BLOOMINGTON
DRINKING WATER SYSTEM
ELECTRICAL IMPROVEMENTS
FORT JESSE PUMP STATION
CIVIL, ELECTRICAL, AND STRUCTURAL
SITE PLAN**



DONOHUE

Sheet No. 8
Drawing No.

002-CEFN-1

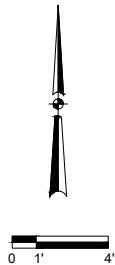


PARTIAL SITE PLAN

WIRING TABLE

TAG NAME	DESCRIPTION	DETAIL	WIRING	DESTINATION	COMMENTS
ATS-2203	STATION A ATS	MFR	(8) #14	FTJA-PLC	
ES-2203/4	GENERATOR ESTOP	MFR	(2) #14	GEN-2203/4	
FTJA-PLC	STATION A PLC	N/A	-	-	EXISTING
FTJB-PLC	STATION B PLC	N/A	-	-	EXISTING
GEN-2203/4	GENERATOR	MFR	CAT 6	FTJB-PLC	
ATS-2204	STATION B ATS	MFR	(8) #14	FTJB-PLC	

Provide ground conductor (not shown) as needed. See General Notes on sheet 001-G-5.



GENERAL NOTES:

- CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS, DIMENSIONS, AND ELEVATIONS PRIOR TO CONSTRUCTION AND/OR FABRICATION. EXISTING SITE FACILITIES AND GRADING AS SHOWN ARE BASED ON EXISTING DRAWINGS.
- DIMENSIONS PROVIDED ARE BASED ON EXISTING RECORD DRAWINGS AND ARE INTENDED FOR REFERENCE ONLY.
- CALL AND LOCATE ALL UNDERGROUND UTILITIES BEFORE COMMENCING ANY EARTH WORK.
- CONTRACTOR SHALL LOCATE, PROTECT, AND KEEP IN SERVICE ALL EXISTING NATURAL GAS, SEWER, WATER AND OTHER UTILITY SERVICES.
- ALL DISTURBED AREAS NOT COVERED BY PAVING OR OTHERWISE NOTED SHALL BE RESTORED WITH TOPSOIL, MULCH AND SEED. SEE DETAIL C050.
- MAINTAIN MINIMUM 12" DISTANCE BETWEEN NEW UTILITY PRIMARY CONDUITS AND EXISTING UTILITIES.
- SEE DRAWING 999-E-2 FOR ALL DUCTBANK SECTIONS SHOWN ON THIS SHEET.
- CONTRACTOR TO CONSTRUCT SIDEWALK TO GRADE AWAY FROM BUILDING AND EQUIPMENT PADS.

PLAN NOTES:

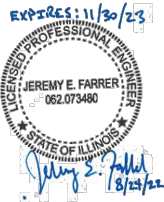
- ACCESS PLATFORM AND STAIRS FOR GENERATOR TO BE FURNISHED BY GENERATOR MANUFACTURER AND INSTALLED BY CONTRACTOR IF OWNER ACCEPTS ALTERNATE 2.
- PROTECT EXISTING RADIO TOWER AND PAD.
- CONDUIT STUB UP LOCATION. COORDINATE EXACT STUB UP LOCATIONS WITH APPROVED GENERATOR SHOP DRAWINGS.
- NEW CONDUCTORS FROM LOAD SIDE OF ATS-2204 TO BE PULLED THROUGH TRANSFORMER VAULT AND EXISTING CONDUITS.
- EQUIPMENT REQUIRES REAR ACCESS.
- GROUNDING LOOP. PROVIDE #4/0 BARE CU CONDUCTORS. BURY 12" BELOW FINISHED GRADE.
- GROUND TEST WELL. SEE DETAIL E455.
- CADWELD CONNECTION, TYPICAL. SEE DETAIL E463.
- PROVIDE THIS EQUIPMENT IF OWNER ACCEPTS ALTERNATE 3.
- NOT USED.
- EQUIPMENT GROUND, TYPICAL. SEE DETAIL E452.
- BOLLARDS. SEE DETAIL C801.
- EXISTING FENCE PROTECT DURING CONSTRUCTION.
- NOT USED.
- ASPHALT PAVEMENT REPLACEMENT, SEE DETAIL C121.
- CONCRETE PAD FOR EQUIPMENT. VERIFY FINAL SIZE AND EQUIPMENT LAYOUT WITH ENGINEER PRIOR TO CONCRETE PLACEMENT. SEE DETAIL S348.
- NOT USED.
- 3/4" X 10' CU CLAD GROUND ROD, TYPICAL.
- BOND TO FENCE, TYPICAL.
- CONTRACTOR SHALL PROVIDE CONCRETE PAD FOR GENERATOR. FINAL DIMENSIONS SHALL BE PER APPROVED GENERATOR SHOP DRAWINGS. SEE DETAIL S348.
- CONCRETE SIDEWALK, SEE DETAIL C150.
- LANDSCAPE STONE ON GEOTEXTILE FABRIC WITH EDGING PLACED ADJACENT TO GRASS.

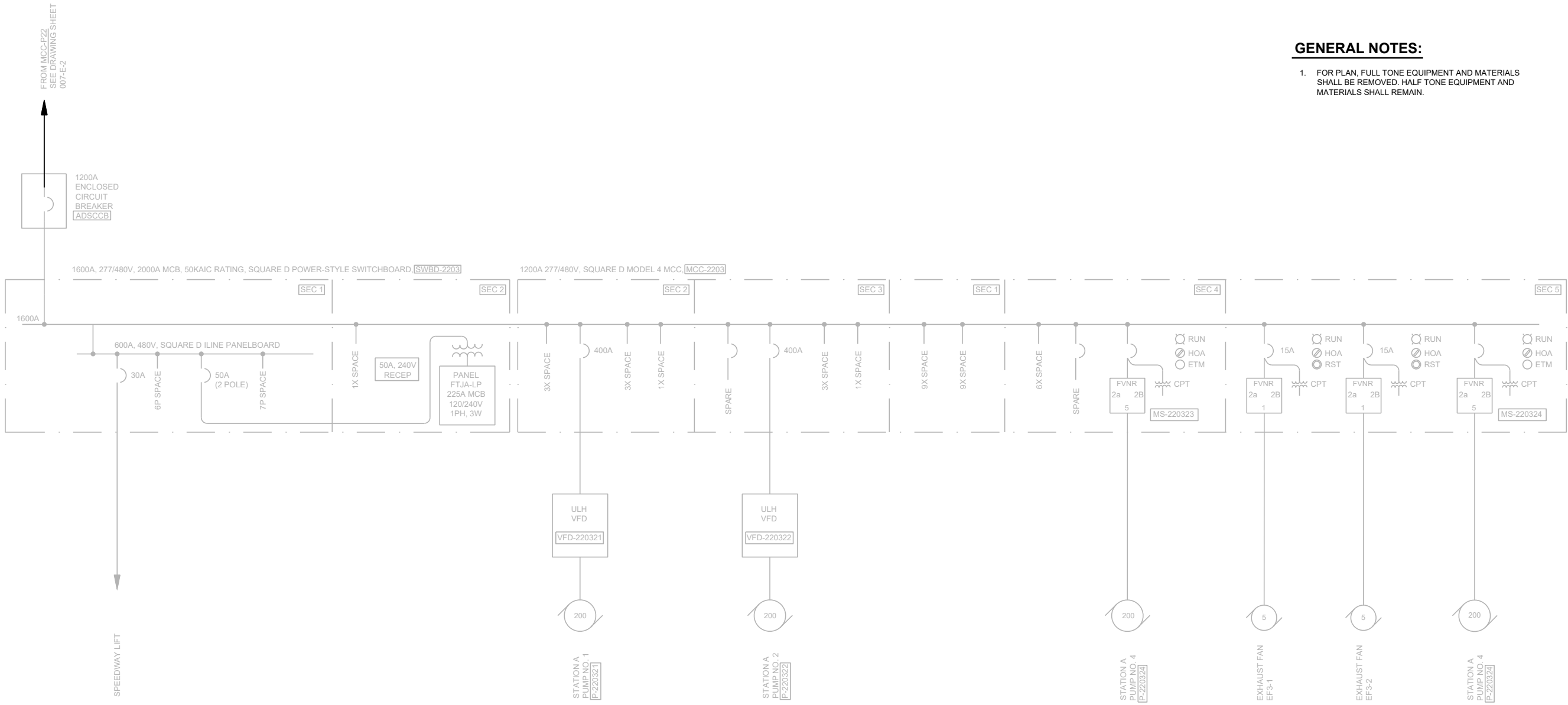
CITY OF BLOOMINGTON
DRINKING WATER SYSTEM
ELECTRICAL IMPROVEMENTS
FORT JESSE PUMP STATION
CIVIL, ELECTRICAL, AND STRUCTURAL



Sheet No. 9
Drawing No.

002-CEFN-2





GENERAL NOTES:

1. FOR PLAN, FULL TONE EQUIPMENT AND MATERIALS SHALL BE REMOVED. HALF TONE EQUIPMENT AND MATERIALS SHALL REMAIN.

ONE-LINE DIAGRAM - REMOVAL

NTS

CITY OF BLOOMINGTON
DRINKING WATER SYSTEM
ELECTRICAL IMPROVEMENTS
FORT JESSE PUMP STATION

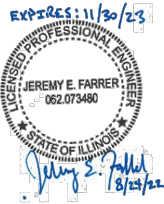
STATION A REMOVAL
ONE-LINE DIAGRAM



Sheet No. 11

Drawing No.

007-E-2



SURFACE MOUNTED NEMA 1		PANEL SCHEDULE			200A MAIN BREAKER	
120 / 208	V, 3	PHASE, 4	WIRE	AA	225A MAIN BUS	
RATING 22,000 A.I.C.					225A GRD. BUS	
CKT. NO.	TRIP/P	DESCRIPTION	PHASE	DESCRIPTION	TRIP/P	CKT. NO.
			A B C			
1	20/1	OFF/STOR/TOILET LTS		EXHAUST FAN EF2-5	20/1	2
3	20/1	PUMP ROOM LTS		EXHAUST FAN EF2-6	20/1	4
5	30/1	PUMP ROOM LTS		CHLORINATOR	20/1	6
7	20/1	PUMP ROOM LTS		WELDER RECEP	50/2	8
9	20/1	PUMP ROOM LTS				10
11	20/1	MECH / CL2/ CORRIDOR		SPARE	20/1	12
13	20/1	RECEPTS / GENERATOR		CL2 LEAK DETECTOR	20/1	14
15	20/1	RECEPTS OFF / STORAGE		CHLORINE ALARM PANEL	20/1	16
17	20/1	RECEPTS OFF / STORAGE		UNIT HEATER UH2-1,2	20/1	18
19	20/1	RECEPTS OFF / STORAGE		UNIT HEATER UH2-3, 5	20/1	20
21	20/1	RECEPT PUMP ROOM		UNIT HEATER UH2-4	20/3	22
23	20/1	RECEPT PUMP ROOM				24
25	20/1	RECEPTS MECH / CL2				26
27	20/1	EYEWASH ALARM UNIT		ELECTRIC WATER HEATER	20/2	28
29	20/1	?				30
31	30/2	GENERATOR BLOCK HEATER		SPACE		32
33				SPACE		34
35	20/1	GENERATOR BATTERY HEATER		SPACE		36
37	20/1	GENERATOR BATTERY CHARGER		SPACE		38
39	20/1	ATS-2204 ENCLOSURE HEATER		SPACE		40
41		SPACE		SPACE		42
TOTALS:		-	-	-		

SURFACE MOUNTED NEMA 1		PANEL SCHEDULE			MLO MAIN LUG ONLY	
120 / 208	V, 3	PHASE, 4	WIRE	AB	200A MAIN BUS	
RATING 22,000 A.I.C.					200A GRD. BUS	
CKT. NO.	TRIP/P	DESCRIPTION	PHASE	DESCRIPTION	TRIP/P	CKT. NO.
			A B C			
1	20/1	INSTRUMENT PANEL		SPARE	20/2	2
3	20/1	INSTRUMENT PANEL (OFF)			4	
5	20/1	MCC P22 SPACE HEATERS (OFF)		SPARE	20/1	6
7	20/1	MCC P21 SPACE HEATER (OFF)		FUEL OIL PUMP	20/1	8
9	20/1	SUMP PUMP		FUEL OIL PUMP	20/1	10
11	20/1	MTR VAULT SUMP PUMP		UNIT HEATER UH2-7	20/1	12
13	20/1	MTR VAULT RECEPTACLE		UNIT HEATER UH2-7	20/1	14
15	20/1	MTR VAULT FLOW METER		FUEL OIL LEAK DET	20/1	16
17	20/1	FUEL SYS CONTROLS		VFD SPACE HEATER (OFF)	20/1	18
19	20/1	STORAGE EXIT & WEST WALL PACK		VFD SPACE HEATER (OFF)	20/1	20
21	20/1	STORAGE RECEP		WALL HEATER	20/2	22
23	20/1	STORAGE RECEP				24
25	20/1	ATS-2203		SPARE		26
27	20/1	SPARE		SPARE		28
29	20/1	SPARE		SPARE		30
31	30/2	GENCC-2203 BLOCK HEATER RECEP		SPACE		32
33				SPACE		34
35	20/1	GENCC-2203 BATTERY CHARGER		SPACE		36
37	20/1	GENCC-2203 CONVENIENCE RECEP		SPACE		38
39	20/1	ATS-2203 ENCLOSURE HEATER		SPACE		40
41		SPACE		SPACE		42
TOTALS:		-	-	-		

PLAN NOTES:

- CONTRACTOR SHALL FURNISH AND INSTALL 2-#10, 1-#10G TO EQUIPMENT/DEVICE.
- CONTRACTOR SHALL FURNISH AND INSTALL NEW CIRCUIT BREAKER AS INDICATED IN AVAILABLE SPACE. UPDATE PANEL DIRECTORY.
- INSTALL THESE CIRCUITS IN SAME 2" C.
- EXISTING PANELBOARD IS WESTINGHOUSE MODEL PRL1. LOCATED IN STATION B.
- INSTALL THESE CIRCUITS IN SAME 2" C.
- CONTRACTOR SHALL FURNISH AND INSTALL 3-#8,1-#10G TO EQUIPMENT/DEVICE SHOWN.
- CONTRACTOR SHALL FURNISH AND INSTALL 2-#12, 1-#12G, 1" C. TO DEVICE SHOWN.

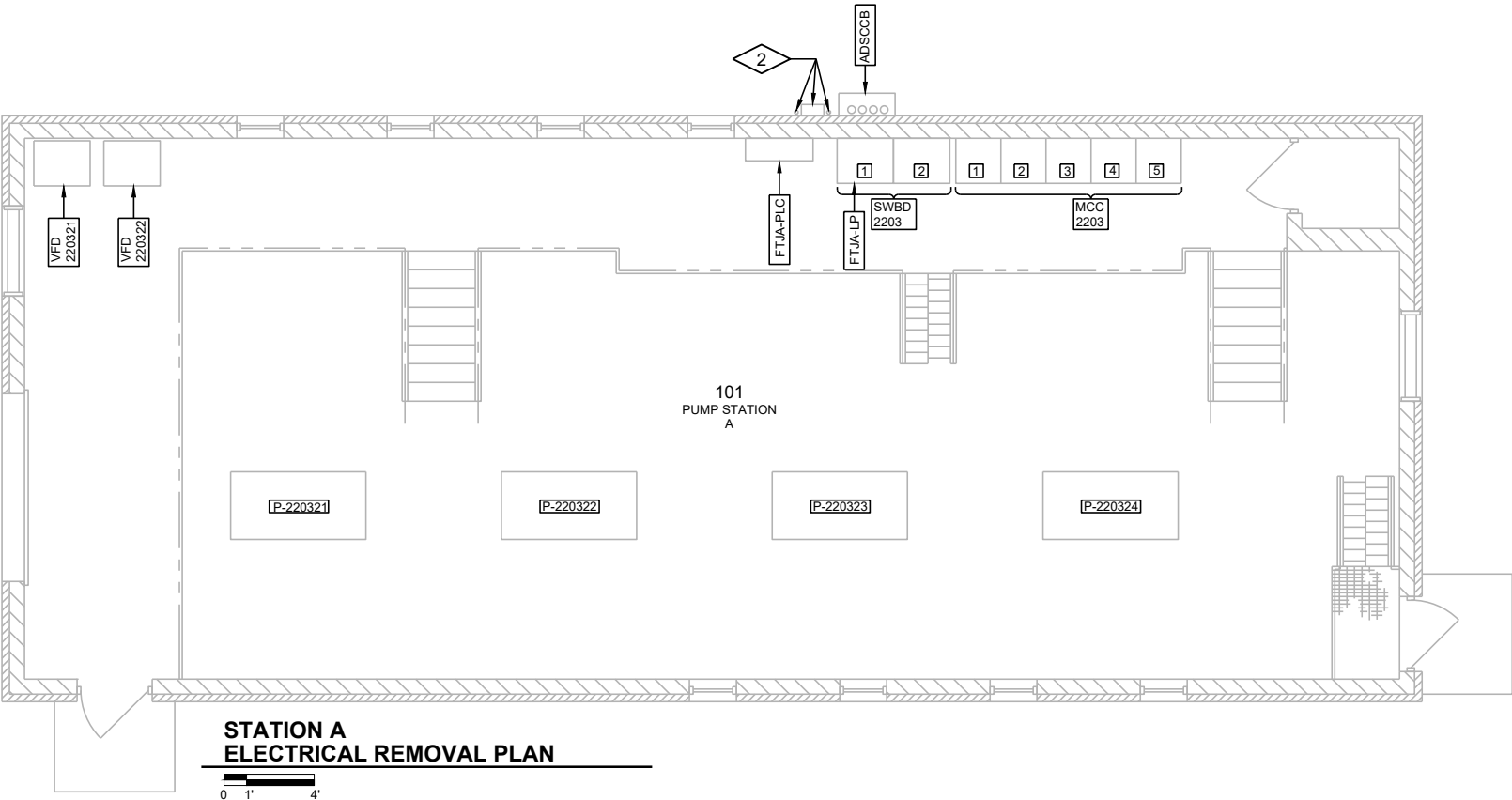
GENERAL NOTES:

- NEW CIRCUITS FROM PANELBOARDS AA/AB ROUTE THROUGH PULL BOX, [PBP-2204]
- FOR PLAN, FULL TONE EQUIPMENT AND MATERIALS SHALL BE NEW. HALF TONE EQUIPMENT AND MATERIALS SHALL REMAIN.
- PROVIDE CIRCUIT BREAKERS FOR NEW CIRCUITS IN EXISTING PANELBOARD.

Date							
Checked By							
Drawn By							
Revision Description							
Revision Number							
Designed By	JF						
Drawn By	JF						
Checked By	JB						
Approved By	JF						
Filename	007E5.DWG						
Project No.	14017						
Project Date	08/24/2022						

CITY OF BLOOMINGTON
DRINKING WATER SYSTEM
ELECTRICAL IMPROVEMENTS
FORT JESSE PUMP STATION

PANELBOARD
SCHEDULES

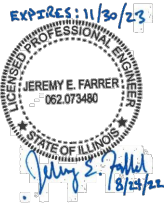
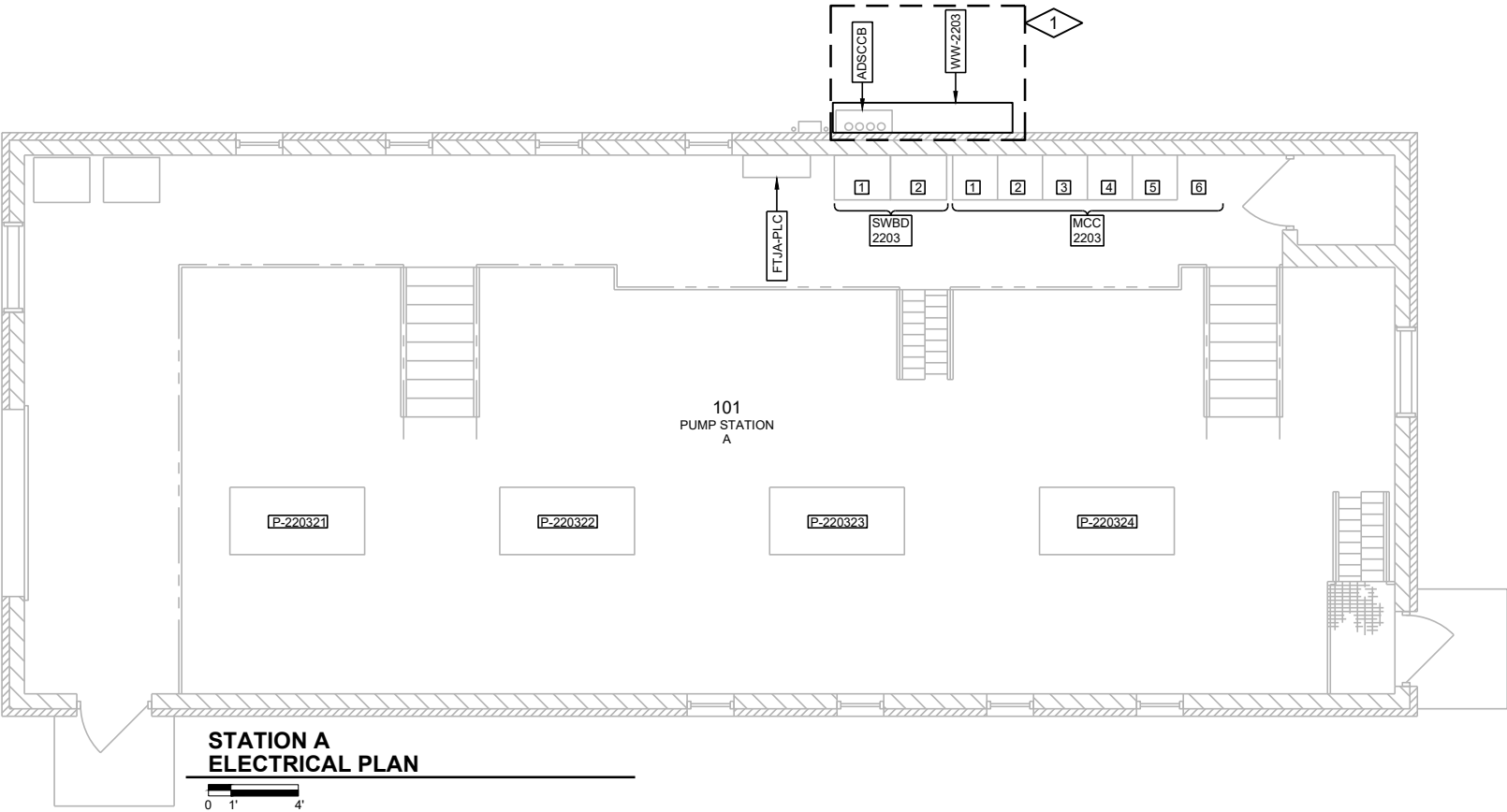


GENERAL NOTES:

- 1. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS, DIMENSIONS, AND ELEVATIONS PRIOR TO CONSTRUCTION AND/OR FABRICATION.
- 2. REMOVE CONCRETE ANCHORS, ANCHOR BOLTS, AND OTHER EMBEDMENTS FOR MATERIALS AND EQUIPMENT BEING REMOVED. IN EXPOSED AREAS NOT COVERED BY NEW CONSTRUCTION, REMOVE CONCRETE ANCHORS, ANCHOR BOLTS, AND OTHER EMBEDMENTS 1" BEYOND FINISHED SURFACE AND PATCH SURFACE WITH PATCHING MORTAR. FINISH SURFACE TO MATCH ADJACENT FINISHED SURFACE.
- 3. WHERE EQUIPMENT IS INDICATED TO BE REMOVED, REMOVE ALL ASSOCIATED POWER AND CONTROL WIRING AND CONDUIT BACK TO SOURCE. REMOVE JUNCTION BOXES AND PULL BOXES ASSOCIATED WITH THE REMOVED CONDUITS. WHERE CONDUIT SYSTEM CONTAINS CIRCUITS TO OTHER EQUIPMENT THAT REMAINS, RETAIN THESE CIRCUITS AND RELOCATE EXISTING CONDUIT AND EXTEND EXISTING CIRCUITS AS REQUIRED FOR THE INSTALLATION OF NEW EQUIPMENT.
- 4. REMOVE ALL SUPPORTS ASSOCIATED WITH REMOVED PIPING, DUCTWORK, CONDUIT, AND EQUIPMENT. REMOVE RODS AND FASTENERS FROM CEILINGS, FLOORS, AND WALLS WITH CARE. WHERE SURFACE HAS BEEN MARRED, CHIPPED, SPAWLED, ETC. AS A RESULT OF REMOVAL, PATCH SURFACE WITH PATCHING MORTAR AND FINISH TO MATCH ADJACENT FINISHED SURFACE.
- 5. WHERE OPENINGS ARE LEFT IN WALLS, SLABS, OR CEILINGS DUE TO REMOVED PIPING, DUCTWORK, EQUIPMENT, OR OTHER WORK, PATCH OPENING TO MATCH ADJACENT SURFACES UNLESS NOTED OTHERWISE. THE PERIMETER OF OPENINGS IN CONCRETE WALLS AND SLABS EXPOSED TO EARTH, WEATHER, OR WATER SHALL BE LINED WITH A GASKET TYPE WATERSTOP PRIOR TO PATCHING OF THE WALL. OPENINGS IN PRECAST CONCRETE ROOF MEMBERS ARE TO BE PATCHED WITH CONCRETE AND DOWELED TO THE EXISTING ROOF MEMBERS UNLESS NOTED OTHERWISE. ROOFING SYSTEM SHALL BE PATCHED TO PREVENT ANY LEAKING AT THE OPENING.
- 6. FOR REMOVAL PLAN, FULL TONE EQUIPMENT AND MATERIALS SHALL BE REMOVED. HALF TONE EQUIPMENT AND MATERIALS SHALL REMAIN.
- 7. FOR NEW PLAN, FULL TONE EQUIPMENT AND MATERIALS SHALL BE NEW. HALF TONE EQUIPMENT SHALL REMAIN.

PLAN NOTES:

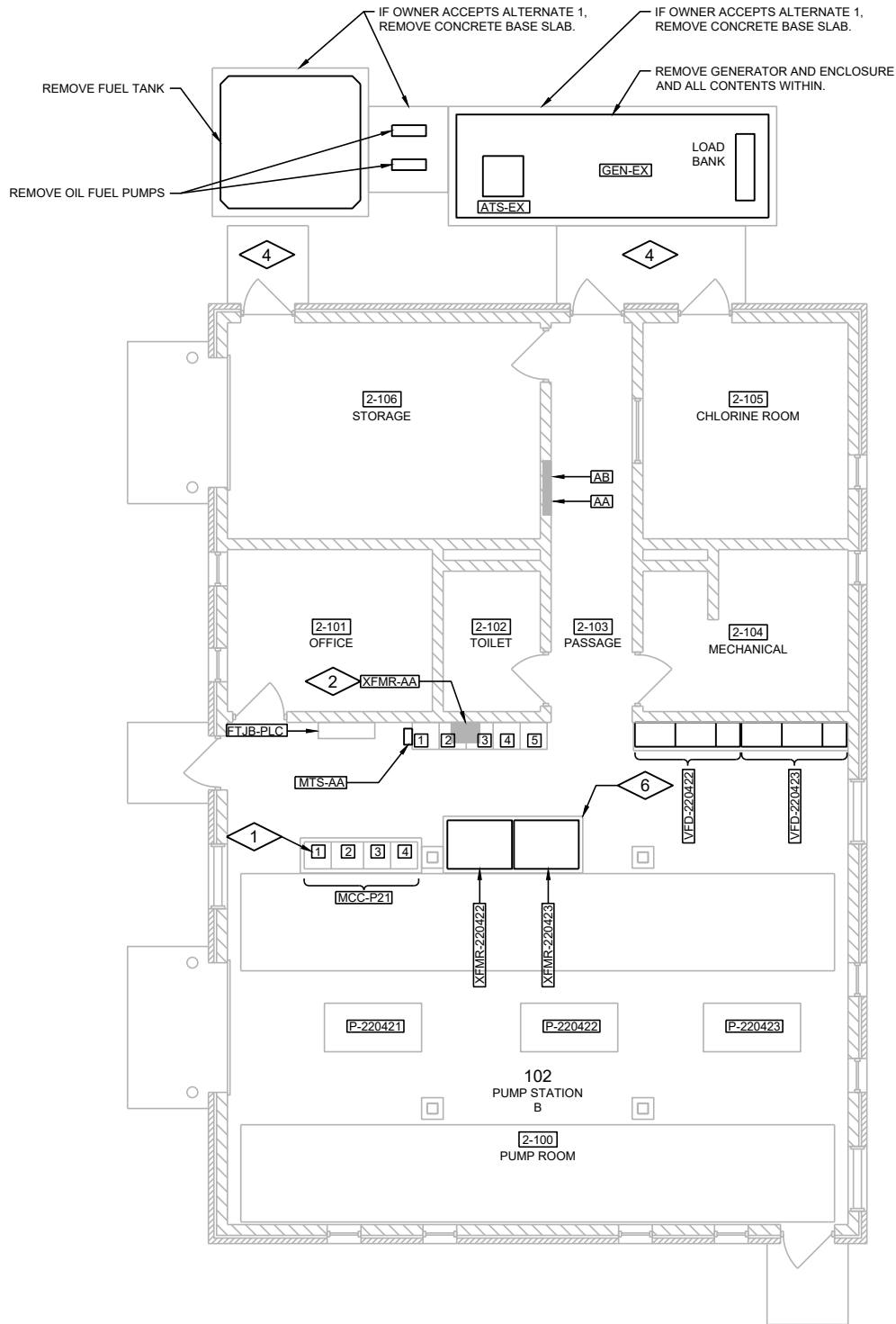
- 1. SEE ELEVATION DETAIL E001
- 2. EXISTING CONDUITS AND TELEPHONE UTILITY BOX TO REMAIN.



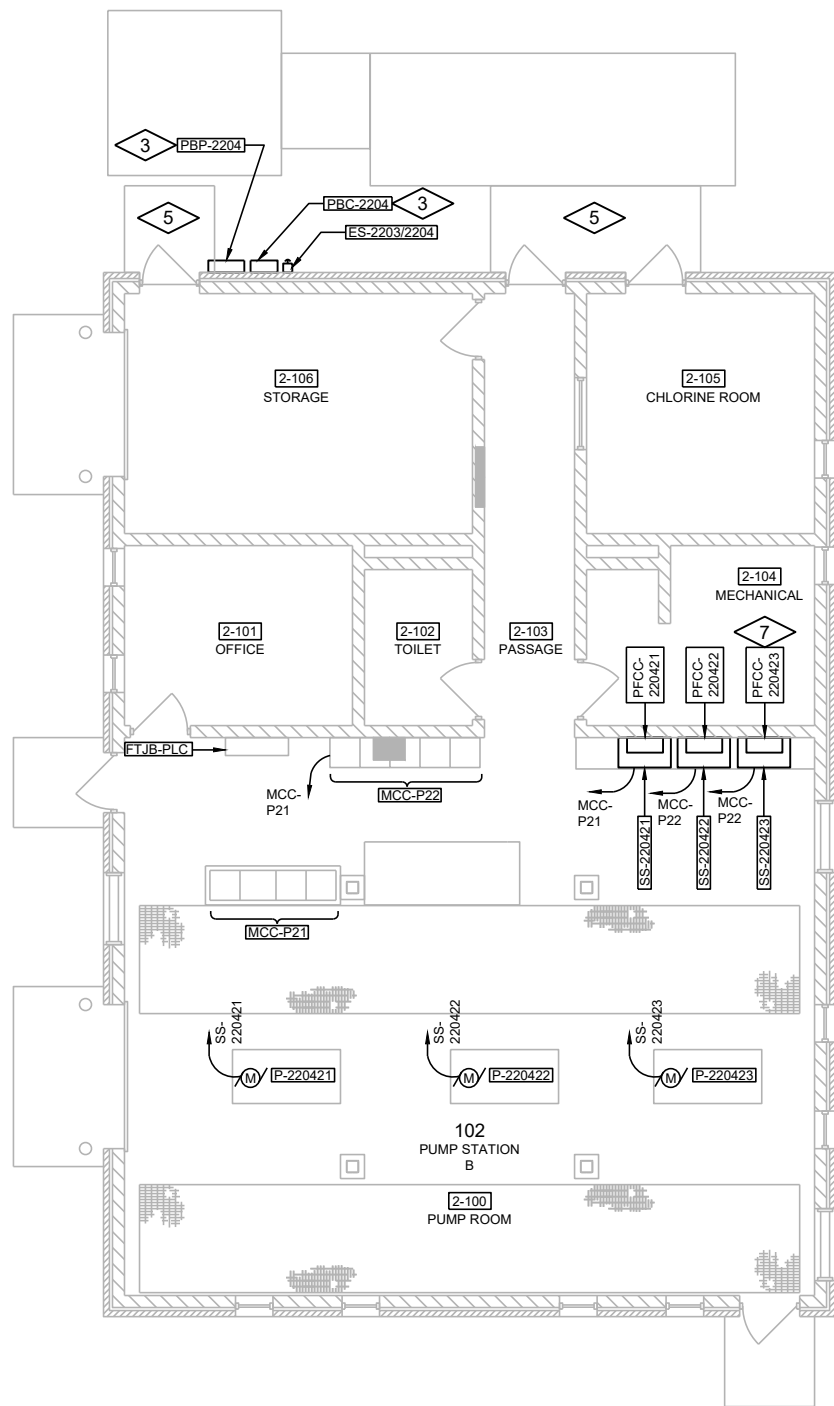
CITY OF BLOOMINGTON
DRINKING WATER SYSTEM
ELECTRICAL IMPROVEMENTS
FORT JESSE PUMP STATION
ELECTRICAL
PLAN



Sheet No. 16
Drawing No.



STATION B
ELECTRICAL REMOVAL PLAN



STATION B
ELECTRICAL PLAN



GENERAL NOTES:

- CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS, DIMENSIONS, AND ELEVATIONS PRIOR TO CONSTRUCTION AND/OR FABRICATION.
- REMOVE CONCRETE ANCHORS, ANCHOR BOLTS, AND OTHER EMBEDMENTS FOR MATERIALS AND EQUIPMENT BEING REMOVED. IN EXPOSED AREAS NOT COVERED BY NEW CONSTRUCTION, REMOVE CONCRETE ANCHORS, ANCHOR BOLTS, AND OTHER EMBEDMENTS 1" BEYOND FINISHED SURFACE AND PATCH SURFACE WITH PATCHING MORTAR. FINISH SURFACE TO MATCH ADJACENT FINISHED SURFACE.
- WHERE EQUIPMENT IS INDICATED TO BE REMOVED, REMOVE ALL ASSOCIATED POWER AND CONTROL WIRING AND CONDUIT BACK TO SOURCE. REMOVE JUNCTION BOXES AND PULL BOXES ASSOCIATED WITH THE REMOVED CONDUITS. WHERE CONDUIT SYSTEM CONTAINS CIRCUITS TO OTHER EQUIPMENT THAT REMAINS, RETAIN THESE CIRCUITS AND RELOCATE EXISTING CONDUIT AND EXTEND EXISTING CIRCUITS AS REQUIRED FOR THE INSTALLATION OF NEW EQUIPMENT.
- REMOVE ALL SUPPORTS ASSOCIATED WITH REMOVED PIPING, DUCTWORK, CONDUIT, AND EQUIPMENT. REMOVE RODS AND FASTENERS FROM CEILINGS, FLOORS, AND WALLS WITH CARE. WHERE SURFACE HAS BEEN MARRED, CHIPPED, SPAWLED, ETC. AS A RESULT OF REMOVAL, PATCH SURFACE WITH PATCHING MORTAR AND FINISH TO MATCH ADJACENT FINISHED SURFACE.
- WHERE OPENINGS ARE LEFT IN WALLS, SLABS, OR CEILINGS DUE TO REMOVED PIPING, DUCTWORK, EQUIPMENT, OR OTHER WORK, PATCH OPENING TO MATCH ADJACENT SURFACES UNLESS NOTED OTHERWISE. THE PERIMETER OF OPENINGS IN CONCRETE WALLS AND SLABS EXPOSED TO EARTH, WEATHER, OR WATER SHALL BE LINED WITH A GASKET TYPE WATERSTOP PRIOR TO PATCHING OF THE WALL. OPENINGS IN PRECAST CONCRETE ROOF MEMBERS ARE TO BE PATCHED WITH CONCRETE AND DOWELED TO THE EXISTING ROOF MEMBERS UNLESS NOTED OTHERWISE. ROOFING SYSTEM SHALL BE PATCHED TO PREVENT ANY LEAKING AT THE OPENING.
- FOR REMOVAL PLAN, FULL TONE EQUIPMENT AND MATERIALS SHALL BE REMOVED. HALF TONE EQUIPMENT AND MATERIALS SHALL REMAIN.
- FOR NEW PLAN, FULL TONE EQUIPMENT AND MATERIALS SHALL BE NEW. HALF TONE EQUIPMENT SHALL REMAIN.

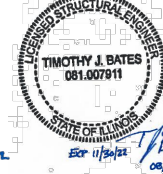
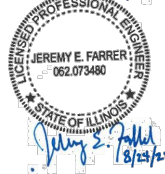
PLAN NOTES:

- SECTION NUMBER, TYPICAL.
- MOUNTED ABOVE MCC.
- CONDUIT PENETRATION THROUGH WALL REQUIRED FOR THIS EQUIPMENT. SEE DETAIL (E011).
- REMOVE DOOR STOOPS. PROTECT DOOR AND MASONRY WORK FROM DAMAGE.
- CONCRETE APPROACH SLAB. FIELD VERIFY DIMENSIONS TO MATCH EXISTING. SEE (S365).
- REMOVE CONCRETE EQUIPMENT PADS IF OWNER ACCEPTS ALTERNATE 1.
- POWER FACTOR CORRECTION CAPACITOR MOUNTED ON WALL ABOVE SOFT STARTER, TYPICAL.

TAG NAME	DESCRIPTION	DETAIL	WIRING	DESTINATION	COMMENTS
SS-220421	STATION B PUMP NO.1 SOFT STARTER	MFR	(8) #14,#14G	FTJB-PLC	
SS-220422	STATION B PUMP NO.2 SOFT STARTER	MFR	(8) #14,#14G	FTJB-PLC	
SS-220423	STATION B PUMP NO.3 SOFT STARTER	MFR	(8) #14,#14G	FTJB-PLC	

Provide ground conductor (not shown) as needed. See General Notes on sheet 001-G-5.

EXPIRES: 11/30/23



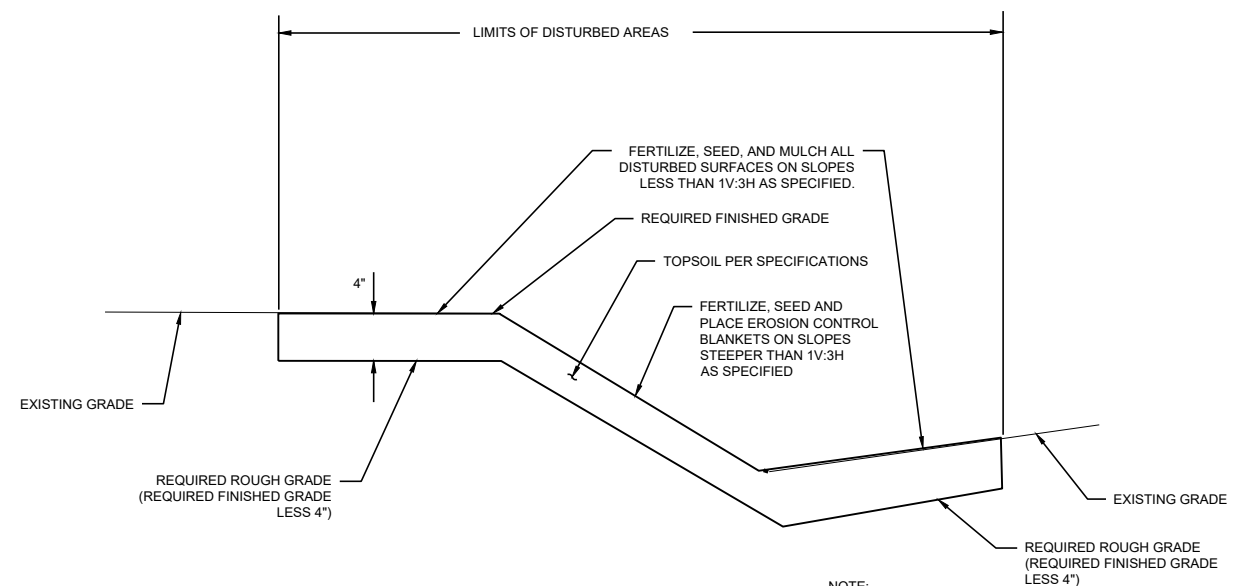
CITY OF BLOOMINGTON
DRINKING WATER SYSTEM
ELECTRICAL IMPROVEMENTS
FORT JESSE PUMP STATION
ELECTRICAL
PLAN



Sheet No. 17

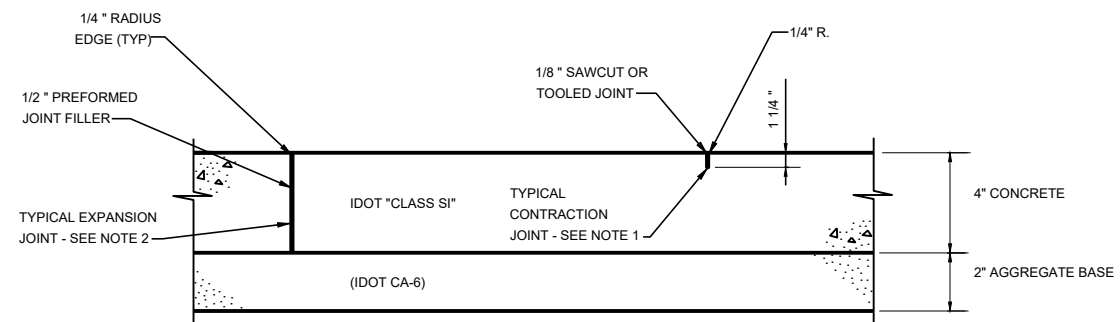
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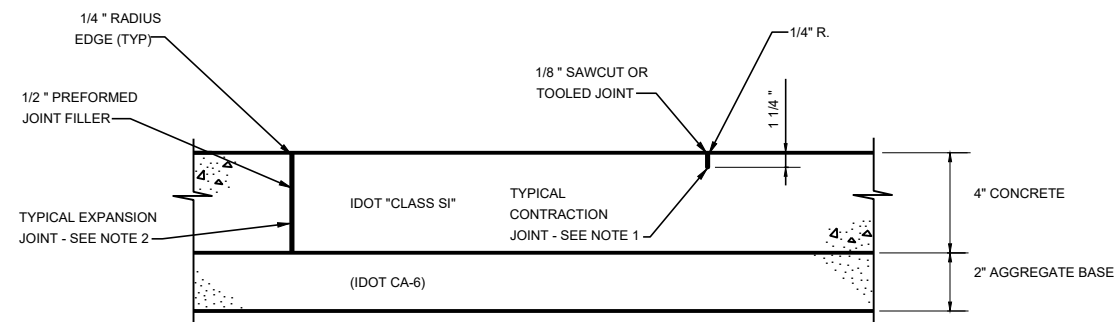


**TYPICAL TURF RESTORATION
FOR TOPSOIL AND TURF** **C050**

NTS



UNREINFORCED CONCRETE
SIDEWALK **C150**



UNREINFORCED CONCRETE
SIDEWALK **C150**

CITY OF BLOOMINGTON
DRINKING WATER SYSTEM
ELECTRICAL IMPROVEMENTS
FORT JESSE PUMP STATION

CIVIL
DETAILS

CIVIL DETAILS

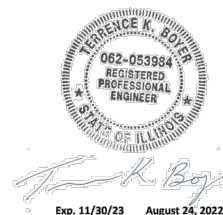

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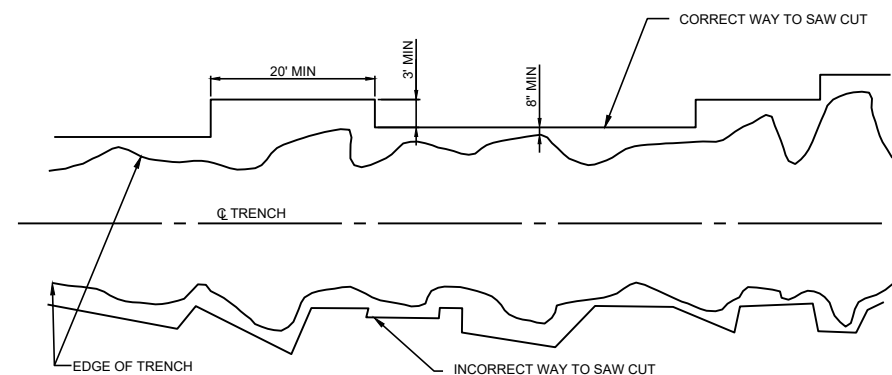
Sheet No. 18

Drawing No.

99-C-1

614

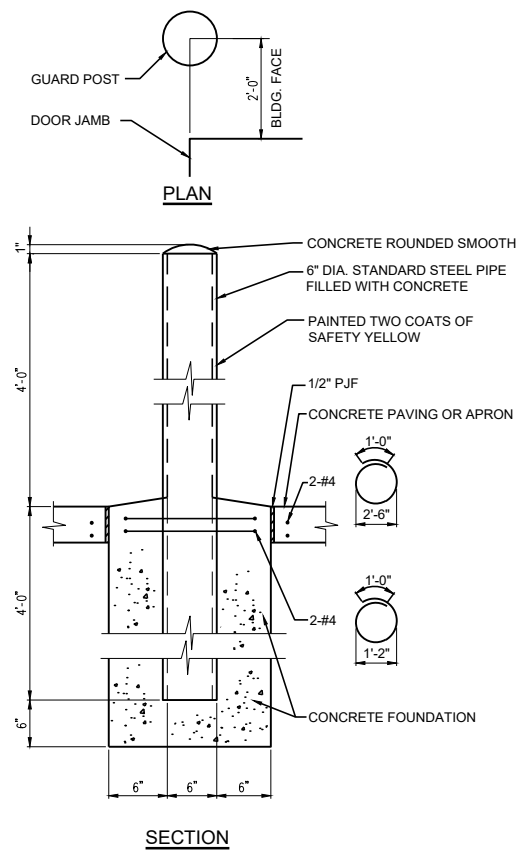




NOTE:
WHEN SAW CUTTING THE PAVEMENT FOR TRENCH RESTORATION FOLLOWING CONSTRUCTION, ALL SAW CUTS SHALL BE MADE PARALLEL, OR PERPENDICULAR, TO THE CENTERLINE OF THE TRENCH. PARALLEL CUTS SHALL BE A MINIMUM LENGTH OF 20 FT. AND PERPENDICULAR CUTS SHALL BE A MINIMUM OF 3 FT. IN LENGTH.

PAVEMENT SAWCUTTING C199

NTS

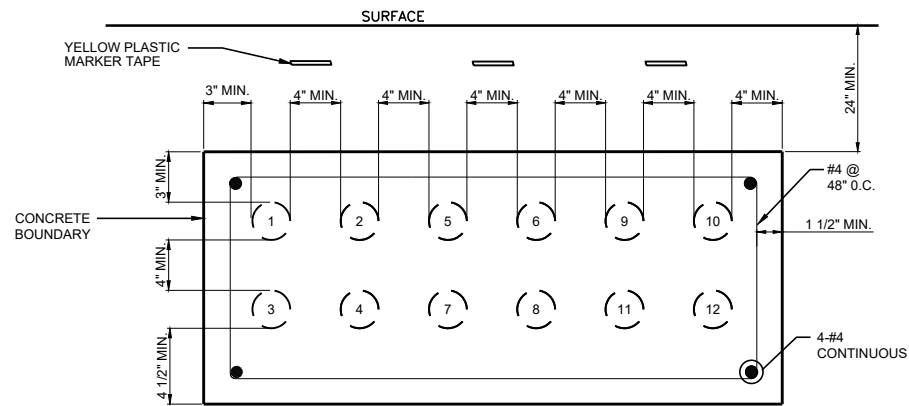


BOLLARD DETAIL **C801**

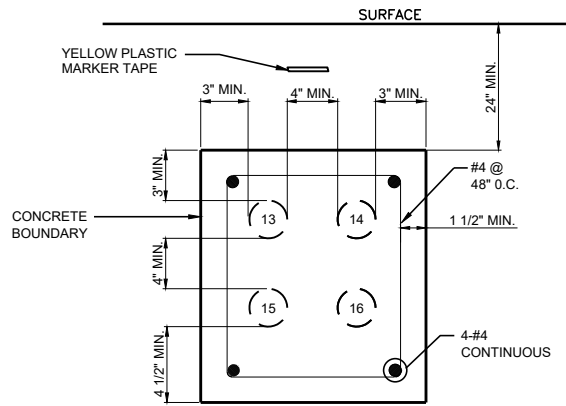
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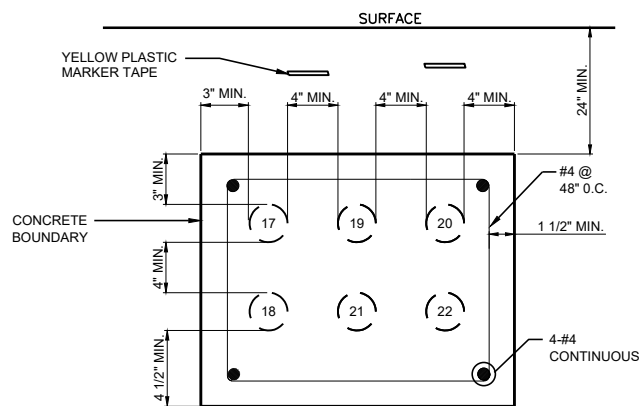




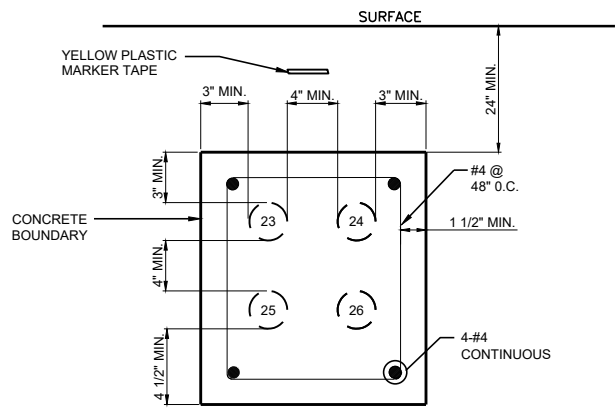
DUCTBANK SECTION A
NTS 002-CEFN-1



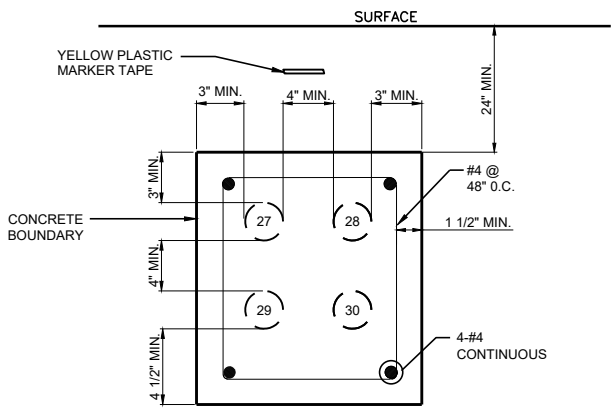
DUCTBANK SECTION B
NTS 002-CEFN-1



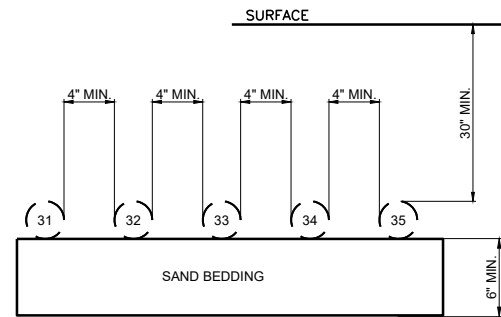
DUCTBANK SECTION C
NTS 002-CEFN-1



DUCTBANK SECTION D
NTS 002-CEFN-1



DUCTBANK SECTION E
NTS 002-CEFN-1



DUCTBANK SECTION F
NTS 002-CEFN-1

- NOTES:
1. CONCRETE ENCASEMENT NOT REQUIRED FOR THIS CONDUIT SEGMENT.
 2. PROVIDE SPACERS FOR CONDUIT.
 3. PROVIDE SAND BEDDING FOR CONDUITS.

NEW DUCTBANK SCHEDULE

NUMBER	SIZE	FROM	TO	CONTENTS	REMARKS
1	4"	UTILITY XFMR	ATS-2204	480V POWER	
2	4"	UTILITY XFMR	ATS-2204	480V POWER	
3	4"	UTILITY XFMR	ATS-2204	480V POWER	
4	4"	UTILITY XFMR	ATS-2204	480V POWER	
5	4"	UTILITY XFMR	ATS-2203	480V POWER	
6	4"	UTILITY XFMR	ATS-2203	480V POWER	
7	4"	UTILITY XFMR	ATS-2203	480V POWER	
8	4"	UTILITY XFMR	ATS-2203	480V POWER	
9	4"	ATS-2204	MCC-P21	480V POWER	VIA XFMR VAULT
10	4"	ATS-2204	MCC-P21	480V POWER	VIA XFMR VAULT
11	4"	ATS-2204	MCC-P21	480V POWER	VIA XFMR VAULT
12	4"	ATS-2204	MCC-P21	480V POWER	VIA XFMR VAULT
13	4"	UTILITY XFMR	ATS-2203	480V POWER	
14	4"	UTILITY XFMR	ATS-2203	480V POWER	
15	4"	UTILITY XFMR	ATS-2203	480V POWER	
16	4"	UTILITY XFMR	ATS-2203	480V POWER	
17	2"	ATS-2203	WW-2203	CONTROLS	ATS MONITORING
18	2"	ATS-2203	WW-2203	120V POWER	ENCLOSURE HEATER
19	4"	ATS-2203	WW-2203	480V POWER	
20	4"	ATS-2203	WW-2203	480V POWER	
21	4"	ATS-2203	WW-2203	480V POWER	
22	4"	ATS-2203	WW-2203	SPARE	
23	4"	GEN-2203/4	ATS-2204	480V POWER	
24	4"	GEN-2203/4	ATS-2204	480V POWER	
25	4"	GEN-2203/4	ATS-2204	480V POWER	
26	4"	GEN-2203/4	ATS-2204	SPARE	
27	4"	GEN-2203/4	GENCC-2203	480V POWER	
28	4"	GEN-2203/4	GENCC-2203	480V POWER	
29	4"	GEN-2203/4	GENCC-2203	480V POWER	
30	4"	GEN-2203/4	GENCC-2203	SPARE	
31	2"	GEN-2203/4	ES-2203/4	CONTROLS	ESTOP
32	2"	PB2	GEN-2203/4	NETWORK	GENERATOR MONITORING
33	2"	PB3	GEN-2203/4	120V, 208V POWER	GEN ACCESSORY POWER
34	2"	PB3	PB1	120V POWER	ATS AND GENCC ENC. HEATERS
35	2"	PB3	PB1	120V, 208V POWER	ATS B MONITORING

CITY OF BLOOMINGTON
DRINKING WATER SYSTEM
ELECTRICAL IMPROVEMENTS
FORT JESSE PUMP STATION

ELECTRICAL
DETAILS



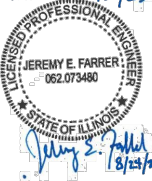
Sheet No. 21

Drawing No.

999-E-2

617

EXPIRES: 11/30/23



GENERAL

1. THE GENERAL STRUCTURAL NOTES AND STANDARD STRUCTURAL DETAILS APPLY TO THE ENTIRE PROJECT UNLESS SPECIFICALLY NOTED OTHERWISE.

DESIGN CRITERIA

1. DESIGN AND CONSTRUCT IN CONFORMANCE WITH THE INTERNATIONAL BUILDING CODE, 2015 EDITION WITH TOWN OF NORMAL AMENDMENTS.

2. SUPERIMPOSED DESIGN LOADS

- A. ELECTRICAL EQUIPMENT VERIFY WITH MFR

FOUNDATIONS

1. PLACE FOOTINGS ON NATURAL UNDISTURBED EARTH OR STRUCTURAL FILL.

REINFORCEMENT

1. REINFORCEMENT STEEL
 - A. DEFORMED BARS: ASTM A615 - GRADE 60
 - B. WELDED WIRE FABRIC (WWF): ASTM A1064
2. UNLESS NOTED OTHERWISE PROVIDE CLEAR COVER FOR REINFORCEMENT AS FOLLOWS:
 - A. CAST AGAINST:
 1. EARTH: 3 INCHES
 - B. EXPOSED TO EARTH, WEATHER, OR WATER
 1. SLABS
 - A. #5 BARS OR SMALLER: 1 1/2 INCHES
 - B. #6 THROUGH #11 BARS: 2 INCHES
3. PLACE DOWELS BEFORE PLACING CONCRETE.
4. DO NOT FIELD WELD OR FIELD BEND REINFORCING BARS.

CONCRETE

1. DESIGN STRENGTH

A. GUARD POST PIERS AND WHERE SPECIFICALLY NOTED, CLASS B:	F'C = 3000 PSI
B. ALL LOCATIONS, EXCEPT WHERE CLASS B SPECIFIED, CLASS A:	F'C = 4500 PSI
2. BEFORE CONCRETE IS PLACED, CONSTRUCTION JOINTS SHALL BE CLEANED, LAITANCE REMOVED, AND SURFACE WETTED. REMOVE STANDING WATER.
3. CONSTRUCTION JOINTS SHALL HAVE ROUGHENED SURFACES. SURFACE SHALL HAVE AMPLITUDE OF 1/4 IN. MIN.
4. PROVIDE 3/4 IN. CHAMFER ON EXTERNAL CORNERS OF EXPOSED EDGES OF CONSTRUCTION JOINTS.
5. VERIFY EQUIPMENT PAD AND CURB LOCATIONS, DIMENSIONS, AND ELEVATIONS WITH EQUIPMENT MANUFACTURERS.

MISCELLANEOUS

1. VERIFY PERTINENT EXISTING CONDITIONS AND DIMENSIONS BEFORE STARTING CONSTRUCTION AND/OR FABRICATION.
2. FOR ADDITIONAL OPENINGS, ANCHORS, AND EMBEDDED ITEMS SEE ELECTRICAL DRAWINGS.

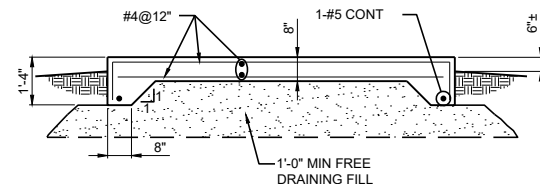
REMOVALS

1. REMOVE ALL CONCRETE ANCHORS, ANCHOR BOLTS AND OTHER EMBEDMENTS A MINIMUM OF 1" BEYOND FINISHED SURFACE AND PATCH SURFACE WITH PATCHING MORTAR TO MATCH EXISTING.
2. REMOVE EXISTING CONCRETE PADS OF ANY EQUIPMENT BEING REMOVED. REMOVE CONCRETE AND REINFORCEMENT A MINIMUM OF 1" BEYOND FINISHED SURFACE AT ANY LOCATION WHERE NEW CONCRETE PAD WILL NOT COVER ROUGH SURFACE OF REMOVAL. PATCH BACK TO FINISHED SURFACE WITH PATCHING MORTAR.
3. SAWED AND REMOVE CONCRETE TO LIMITS NOTED. REMOVE CONCRETE AND REINFORCEMENT A MINIMUM 1" BEYOND FINISHED SURFACE AT ANY LOCATION WHERE NEW CONCRETE WILL NOT COVER ROUGH SURFACE OF REMOVAL. PATCH BACK TO FINISHED SURFACE WITH PATCHING MORTAR.

BAR SIZE	LAPPED SPlice LENGTH		EMBEDMENT LENGTH		COMPRESSION LAP LENGTH
	TOP BARS	OTHERS	TOP BARS	OTHERS	
3	24	19	19	15	12
4	32	25	25	19	15
5	40	31	31	24	19
6	48	37	37	29	23
7	70	54	54	42	26
8	80	62	62	48	30
9	91	70	70	54	34
10	102	78	78	61	38
11	113	87	87	67	42

NOTES:

1. TOP BARS ARE HORIZONTAL BARS SO PLACED THAT MORE THAN 12" OF CONCRETE IS CAST IN THE MEMBER BELOW THE BAR.
2. FOR BARS SPACED LESS THAN 6 BAR DIAMETER OC INCREASE LENGTH BY 25%.
3. WHEN LAPPING TWO DIFFERENT SIZE BARS USE THE LAP LENGTH OF THE SMALLER BAR UNLESS NOTED OTHERWISE.
4. EMBEDMENT LENGTH IS MINIMUM LENGTH OF EMBEDMENT FOR STRAIGHT DOWELS WHERE END HOOK IS NOT SHOWN, UNLESS OTHERWISE NOTED.
5. COMPRESSION LAP LENGTH FOR VERTICAL COLUMN BARS ONLY.
6. HOOKS SHALL BE ACI STANDARD UNLESS OTHERWISE NOTED.
7. FOR EPOXY COATED REINFORCEMENT, INCREASE LENGTH BY 20% FOR TOP BARS AND 50% FOR OTHERS.

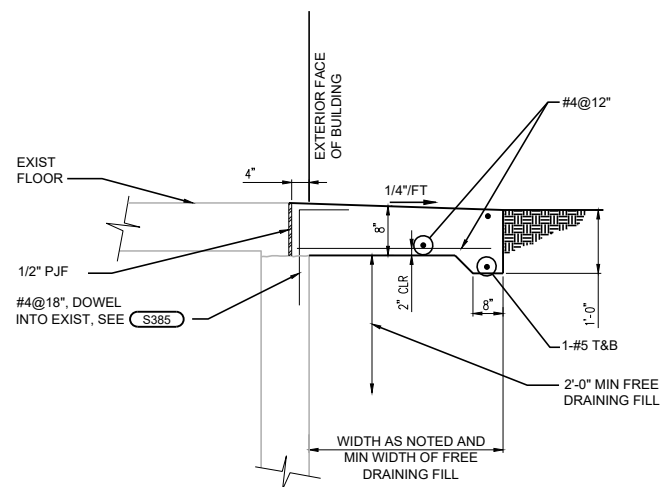


NOTES :

1. AT CONTRACTORS OPTION, PAD CAN BE PLACED FULL THICKNESS THROUGHOUT

EQUIPMENT PAD DETAIL S346

NTS

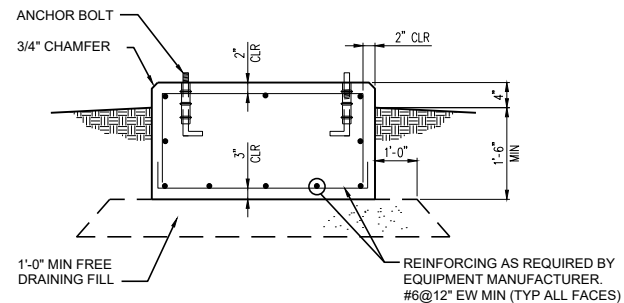


NOTES:

1. FREE DRAINING FILL MUST BE KEPT CLEAN UNTIL SLAB IS POURED.

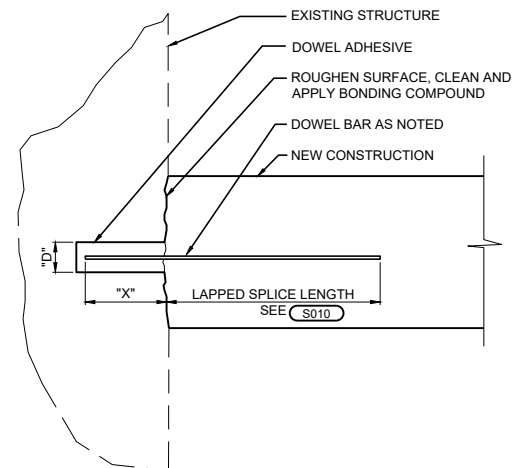
APPROACH SLAB DETAIL **S365**

NTS



EQUIPMENT PAD DETAIL S348

NTS



NOTES:

1. EMBEDMENT "X"=16 BAR DIAMETERS MIN.
2. HOLE DIAMETER "D"=PER EPOXY MFR.

DRILLED IN DOWEL DETAIL S385

NTS

[illegible]

**CITY OF BLOOMINGTON
DRINKING WATER SYSTEM
ELECTRICAL IMPROVEMENTS
FORT JESSE PUMP STATION**

STRUCTURAL DETAILS

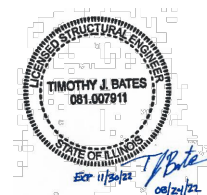


Sheet No. _____

22

Drawing No.

999-S-1



5. PRICING PROPOSAL

FT JESSE GENERATOR AND ELECTRICAL IMPROVEMENT - BASE BID

Bidder must submit a bid for all of the bid line items including alternates or the bid submission will be considered to be non-responsive and not considered for award of the project. The City retains the right to choose all, none or some of the bid line items as is in the best interest of the City. Bidder agrees to hold all pricing for ninety (90) days from the bid due date not including the day of the bid opening.

Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total
1	All Work Except for Item No 2 and Alternates 1 through 3 listed below. All Sections.	1	LS		
2	Contingency (10% of Item No. 1) Section: General Conditions 11.05 and 01 21 00	1	LS		
TOTAL					

FT JESSE GENERATOR AND ELECTRICAL IMPROVEMENTS

Alternate 1 - Concrete Removal

Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total
1	Concrete removal. Section 01 23 00	1	LS		
TOTAL					

FT JESS GENERATOR AND ELECTRICAL IMPROVEMENTS

Alternate 2 - Generator Access Platform

Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total
1	Alternate 2 - Generator Access Platform	1	LS		
TOTAL					

FT JESSE GENERATOR AND ELECTRICAL IMPROVEMENTS

Alternate 3 - Portable Generator for Station A Emergency Circuit

Line Item	Description	Quantity	Unit of Measure	Unit Cost	Total
1	Alternate 3 - Portable Generator for Station A Emergency Circuit	1	LS		
TOTAL					

6. INSURANCE REQUIREMENTS

6.1. Insurance - Public Works Projects

Prior to the commencement of work governed by any contract between the CITY and any Third Party, the Third Party shall provide the CITY satisfactory evidence of insurance coverage via a valid Certificate of Insurance showing coverage provided by a carrier who has no less than an A- VIII rating with AM Best's Rating. The Certificate must list the CITY, its employees, and officials as additional named insured's. The Certificate must also list coverage as primary and non-contributory, include a waiver of subrogation, and include a thirty (30) days cancellation notice.

All coverage, as follows shall be maintained through the life of the contract and include, as a minimum:

- A. General Liability – \$2,000,000 per occurrence/\$4,000,000 aggregate Bodily Injury and Property Damage
- B. Products & Completed – \$2,000,000
- C. Worker's Compensation – \$1,000,000 Each Accident/\$1,000,000 Disease-Each Employee/\$1,000,000 Disease-Policy Limit
- D. Automobile Liability – \$2,000,000 with \$5,000 medical payments
- E. Umbrella/Excess Liability – \$5,000,000
- F. Errors & Omissions – \$2,000,000
 - 1. Required for contracts with Consultants for Professional Services
- G. Crime & Theft Coverage – \$2,000,000
 - 1. Required when Third Party will have access to City property

Insurance: Vendors providing a service or installing equipment on or about City property shall provide to the City Clerk evidence of Comprehensive, Liability, and Workman's Compensation insurance prior to commencement of work on City property. The vendor guarantees to save the City, its agents or employees, harmless from liability of any nature or kind, for use of any copyright, composition, secret process, patented or unpatented invention, articles or appliances furnished or used in the performance of the contract, or which the vendor is not the patentee, assignee, or licensee.

Furthermore, the vendor hereby agrees to save and hold harmless and indemnify the City from and against all injury, death, damage, loss, claims and liability caused by or arising out of the performance of this agreement by the Vendor, its employees, agents or sub-vendors. This agreement extends to all claims, of any nature, whether made by the Vendor's employees or third parties.

7. TERMS AND CONDITIONS

7.1. No Bid

Bidders/Consultants who are not able to submit a bid for this service, but wish to receive bid tabulation should "Follow" the project to receive automated notifications pertaining to this solicitation.

7.2. Ex Parte Communication

Please note that to insure the proper and fair evaluation of a proposal or bid, the City of Bloomington prohibits ex parte communication (i.e., unsolicited) initiated by the Bidder to a City Official (i.e. City Aldermen, Mayor, etc.) or Employee evaluating or considering the proposal/bid prior to the time a selection has been made. Communication includes but is not limited to fax, phone calls, email and personal visit. Communication between Bidder and the City shall be directed in writing to the Procurement Manager or designated contact person only. The Procurement Manager will obtain the information or clarification needed. Ex parte communication may be grounds for disqualifying the offending Bidder from consideration or award of the proposal/bid and repeat offenders may be disqualified from future projects.

7.3. Delivery

F.O.B. Bloomington, IL FREIGHT PREPAID.

Delivery will be considered in making the award and the Bidders/Consultants shall state, in the spaces provided, expected delivery after receipt of Purchase Order. Failure to meet said delivery promises without prior consent of the City Procurement Manager may be considered a breach of faith.

7.4. Full Pricing and Contingencies

Please quote your best net price including delivery and discounts to meet the approval of the City. Prices shall be stated in units of quantity specified. No additional charges shall be passed to the City, including any applicable taxes, delivery or surcharges. Prices quoted shall be the final cost to the City. The City shall hold the successful Bidder/Consultant to the bid pricing. Additional charges for contingencies discovered by the Bidder/Consultant at any time after the date of the opening of this bid may not be considered for payment by the City.

7.5. Payment Terms

If payment terms are not indicated, terms of NET 45 days shall be applied by the City. Payment terms to apply after receipt of invoice or final acceptance of the products/services, whichever is later. Payment terms offering less than 20 days for payment will not be considered.

7.6. Bid Evaluation

Bids will be evaluated and awarded to the lowest responsible, responsive Bidder. The quality of the services, conformity with the specifications, suitability to the requirements, delivery terms including length of time for delivery, qualifications and references will be taken into consideration in making an award. The City will be the sole judge of acceptability of any products offered.

7.7. Recourse for Unsatisfactory Materials

Payment shall be contingent upon the City's inspection of and satisfaction with completed work. Any defective work or materials, non-conformance to bid specifications, damaged materials, or unsatisfactory installation shall be corrected to the City's satisfaction by the successful bidder/consultant at no additional charge.

7.8. Proof of License, Permit, Etc.

Consultants must provide proof of conformance with any applicable Federal/State/Local permits, licenses, certifications, etc., as stated in the scope of work/specifications section. It is the Consultant's responsibility to inquire about requirements of performing the job with the requesting department contact person.

7.9. Investigation

Bidders must acquaint themselves with the policies of the City, and may do so by contacting the Procurement Manager. All questions as to the meaning of the scope of work must be resolved prior to the bid submission deadline.

Bidder shall examine the plans and specifications for the work, and also the ground, and judge for themselves all circumstances affecting the cost and nature of the work, and must also examine the maps, plans, profiles and specifications as provided for in this solicitation.

Bidder is required to inform themselves fully of the conditions relating to construction and labor under which the work will be or is now being performed. The Contractor must employ, insofar as possible, such methods and means in carrying out the work as will not cause any interruption or any interference with any other contractor.

Any interpretation of the specifications will be made only by addendum duly issued and a copy of such addendum will be e-mailed to each person on record as following this project. The City will not be responsible for any explanation or interpretation other than the addendum.

It is the Bidder's responsibility to check the City's e-Procurement Portal prior to submitting their bid to ensure that they have received all Addenda issued.

7.10. Bid Form

The entire package shall be electronically returned complete and intact with all information requested and all questions answered. Failure to do so may be considered grounds for rejection of the bid. The amount of the bid shall be stated in the pricing table within ProcureNow.

7.11. Specifications

The Specification may, in some areas, be unique to a particular brand of product or type of service. If this situation exists, equal consideration will be given to all Bidders/Consultants whose items, in the opinion of the City, meets or exceeds performance in these areas.

7.12. Equals or Substitutes

Or Equal

Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the Contract Price has been based upon Contractor furnishing such item as specified. The specification or description of such an item is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or equal" item is permitted, Contractor may request that Engineer / Project Manager authorize the use of other items of material or equipment, or items from other proposed suppliers under the circumstances described below.

If Engineer / Project Manager in its sole discretion determines that an item of material or equipment proposed by Contractor is functionally equal to that named and sufficiently similar so that no change in related Work will be required, Engineer / Project Manager shall deem it an "or equal" item. For the purposes of this paragraph, a proposed item of material or equipment will be considered functionally equal to an item so named if:

In the exercise of reasonable judgment Engineer / Project Manager determines that:

1. It is at least equal in materials of construction, quality, durability, appearance, strength, and design characteristics;
2. It will reliably perform at least equally well the function and achieve the results imposed by the design concept of the completed Project as a functioning whole;
3. It has a proven record of performance and availability of responsive service; and
4. It is not objectionable to Owner.

Contractor certifies that, if approved and incorporated into the Work:

1. There will be no increase in cost to the Owner or increase in Contract Times;
2. It will conform substantially to the detailed requirements of the item named in the Contract Documents.

Contractor's Expense: Contractor shall provide all data in support of any proposed "or equal" item at Contractor's expense.

Engineer / Project Manager's Evaluation and Determination: Engineer / Project Manager will be allowed a reasonable time to evaluate each "or-equal" request. Engineer / Project Manager may require Contractor to furnish additional data about the proposed "or-equal" item. Engineer / Project Manager will be the sole judge of acceptability. No "or-equal" item will be ordered, furnished, installed, or utilized until Engineer / Project Manager's review is complete and Engineer / Project Manager determines that the proposed item is an "or-equal", which will be evidenced by an approved Shop Drawing or other written communication. Engineer / Project Manager will advise Contractor in writing of any negative determination.

Substitutes

Unless the specification or description of an item of material or equipment required to be furnished under the Contract Documents contains or is followed by words reading that no substitution is

permitted, Contractor may request that Engineer / Project Manager authorize the use of other items of material or equipment under the circumstances described below. To the extent possible such requests shall be made before commencement of related construction at the Site.

Contractor shall submit sufficient information as provided below to allow Engineer / Project Manager to determine if the item of material or equipment proposed is functionally equivalent to that named and an acceptable substitute therefor. Engineer / Project Manager will not accept requests for review of proposed substitute items of material or equipment from anyone other than Contractor.

The requirements for review by Engineer / Project Manager will be as set forth below, as supplemented by the Specifications, and as Engineer / Project Manager may decide is appropriate under the circumstances.

Contractor shall make written application to Engineer / Project Manager for review of a proposed substitute item of material or equipment that Contractor seeks to furnish or use. The application:

a. shall certify that the proposed substitute item will:

1. perform adequately the functions and achieve the results called for by the general design,
2. be similar in substance to that specified, and
3. be suited to the same use as that specified.

b. will state:

1. the extent, if any, to which the use of the proposed substitute item will necessitate a change in Contract Times,
2. whether use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with Owner for other work on the Project) to adapt the design to the proposed substitute item, and
3. whether incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty.

c. will identify:

1. all variations of the proposed substitute item from that specified, and
2. available engineering, sales, maintenance, repair, and replacement services.

d. shall contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including but not limited to changes in Contract Price, shared savings, costs of redesign, and claims of other contractors affected by any resulting change.

Engineer / Project Manager's Evaluation and Determination: Engineer / Project Manager will be allowed a reasonable time to evaluate each substitute request, and to obtain comments and direction from Owner. Engineer / Project Manager may require Contractor to furnish additional data about the proposed substitute item. Engineer / Project Manager will be the sole judge of acceptability. No substitute will be ordered, furnished, installed, or utilized until Engineer / Project Manager's review is

complete and Engineer / Project Manager determines that the proposed item is an acceptable substitute. Engineer / Project Manager's determination will be evidenced by a Field Order or a proposed Change Order accounting for the substitution itself and all related impacts, including changes in Contract Price or Contract Times. Engineer / Project Manager will advise Contractor in writing of any negative determination.

Special Guarantee: Owner may require Contractor to furnish at Contractor's expense a special performance guarantee or other surety with respect to any substitute.

Contractor's Expense: Contractor shall provide all data in support of any proposed substitute at Contractor's expense.

7.13. Brand Name, Model, Scope of Work

All Bidders/Consultants shall include with their bid brand names, models, catalog numbers, and complete information about the items they are offering. Safety Data Sheets, SDS, are required for all chemical Bids. Failure to do so may be considered grounds for rejection of the bid.

7.14. Default By Bidders/Consultants/Contractor

In the event of default by Bidder/Consultants/Contractor, the City reserves the right to procure the services from other sources, and hold the Bidders/Consultants liable for any excess costs occasioned thereby. Additionally, a contract shall not be assignable by the Bidders/Consultants in whole or in part without the written consent of the City of Bloomington.

7.15. Performance Bond & Payment Bonds

The contract shall be deemed to have been awarded when the NOTICE OF AWARD shall have been given to the bidder by some officer or agent of the City. The successful bidder will be required to provide Performance and Payment Bonds in the amount equal to 100% of the contract price within ten (10) business days after the bid award. The Performance Bond and Payment Bond shall be duly authorized by a company licensed to do business in the State of Illinois.

If the bidder to whom the award is made shall fail to enter into a contract for the performance of the work, or furnish a performance bond, or provide certificates of insurance as described below within ten (10) days after notice of such award, the bidder shall forfeit all claims to the work, and the amount represented by the bid deposit or bid bond accompanying the bid shall become the property of the City as the agreed and liquidated amount of damages caused by such failure.

7.16. Bid Bond

Bids in excess of \$10,000 must be accompanied by a Bid guaranty which shall not be less than ten percent (10%) of the amount of the Bid. At the option of the Bidder, the guaranty may be a cashier's check, money order, certified bank check or a surety bond. All guaranties, except surety bonds, will be deposited and reimbursement checks and surety bonds will be issued to unsuccessful bidders following the bid award. The Bid bond shall be secured by a guaranty or a surety company listed in the latest issue of U.S. Treasury Circular 570. The amount of such Bid bond shall be within the maximum amount specified for such Company in said Circular 570. No Bid will be considered complete unless it is accompanied by the required guaranty of a cashier's check, money order, certified bank check made

payable to the City of Bloomington; or a surety bond. The Bid guaranty shall insure the execution of the Agreement and the furnishings of the surety bond or bonds by the successful Bidder, all as required by the Contract Documents.

Revised Bids submitted before the opening of Bids, whether forwarded by mail or telegram, if representing an increase in excess of two percent (2%) of the original Bid, must have the Bid guaranty adjusted accordingly; otherwise the Bid will not be considered.

7.17. Cancellation

Failure to comply with the terms and conditions as herein stated shall be cause for cancellation of the contract. The City will provide a written notice of unsatisfactory performance and the Bidder/Consultant or Bidders/Consultants will be allowed adequate time, typically thirty (30) days, to take corrective action and accomplish satisfactory control. If at the end of the stated time to correct, the City may deem that the Bidder/Consultant or Bidders'/Consultants' performance is still unsatisfactory, the contract may be canceled. The exercise of its right of cancellation shall not limit the City's right to seek any other remedies allowed by law.

7.18. Rejection of Bids, Waivers or Irregularity

The City reserves the right to reject any or all bids, to waive irregularities, and to accept that bid which is considered to be in the best interest of the City. Any such decision shall be final.

7.19. Protests

Any actual or prospective Bidder/Offeror/Consultant who is aggrieved in connection with this proposal or award may protest to the City Manager within ten (10) days of the award. The protest must be submitted in writing to the Office of the City Clerk immediately after such aggrieved person knows or should have known of the facts.

7.20. Prevailing Wage

The State of Illinois requires under public works contracts that the general prevailing rate of wages in this locality be paid for each craft or type of worker hereunder. This requirement is in accordance with the Prevailing Wage Act (820 ILCS 130) as amended. This shall include payment of the general prevailing rate for legal holiday and overtime work. It shall be mandatory upon the subcontractor under the Contract. A copy of the most current monthly prevailing wage rates by County is posted on the Illinois Department of Labor website at <https://www2.illinois.gov/idol/Laws-Rules/CONMED/Pages/prevailing-wage-rates.aspx>. This also acknowledges Public Act 100-1177 effective June 1, 2019. Prevailing Wage rates change monthly, and it is the contractor's responsibility to ensure the correct wage is paid.

As a prerequisite of awarding construction contracts in excess of \$100,000.00, contractor(s) will provide proof of participation in apprenticeship and training programs approved and registered with the United States Department of Labor's Bureau of Apprenticeship and Training.

7.21. Certified Payroll Requirements (820 ILCS 130/5 & 820 ILCS 130/5.1)

Contractors and subcontractors on public works projects must submit certified payroll records on a monthly basis to the Illinois Department of Labor Certified Transcript of Payroll Portal, that the wages

paid to each worker are not less than the required prevailing rate for that County and that the contractor is aware that filing records he or she knows to be false is a Class B misdemeanor. The certified payroll records must include for every worker employed on the public works project, the name, address, telephone number, social security number, job classification, hourly wages paid in each period, number of hours worked each day, and starting and ending time of each work day. These certified payroll records are considered public records and public bodies must make these records available to the public under the Freedom of Information Act, with the exception of the employee's address, telephone number and social security number. Any contractor who fails to submit a certified payroll or knowingly files a false certified payroll is guilty of a Class B misdemeanor.

7.22. OSHA Requirements

The Occupational Safety and Health Act of 1970 (OSHA), "guarantees workers the right to a safe and healthful workplace." Under Section 5(a) (1) of the OSHA Act, the employer must "furnish to each of his employees' employment and place of employment which are free from recognized hazards that are causing or likely to cause death or serious physical harm to its employees."

There are times when the City must hire entities and individuals (contractors) to perform services. To this end, contractors hired by the City must perform their duties in a manner that is compliant with all State and Federal health and safety laws and industry guidelines. It is the responsibility of the contractor to ensure that their personnel and subcontractors comply with all State and Federal health and safety laws, regulations and industry guidelines, including, but not limited to those set forth by: OSHA and related regulations, the Safety Inspection and Education Act, the Health and Safety Act, the National Institute of Occupational Safety and Health, the National Fire Protection Association, the Centers for Disease Control, American Industrial Hygiene Association, the American Council of Governmental Industrial Hygienists, the Environmental Protection Agency, and the Department of Transportation.

7.23. Local preference Policy

The City of Bloomington has adopted a Local Preference Purchasing Policy that is applicable in the City's competitive bidding processes, except in situations where external funding sources do not permit local preference purchasing allowances, in situations where the goods or services being purchased are available through a cooperative purchasing program, or where waived by the City. Bidders/Consultants should complete the Local Preference Purchasing Policy Certificate if Bidder/Consultant qualifies as a local Bidder/Consultant under the Policy. The Policy is in place to address, in part, responsiveness and related concerns of the City.

7.24. Substance abuse Prevention on Public Works Projects Act

The successful bidder must be in compliance with the State of Illinois HB-1855 (Public Act 095-0635), which amends the Prevailing Wage Act. Before an employer commences work on a public works project, the employer shall have in place a written program, which meets or exceeds the program requirements in this Act, to be filed with the public body engaged in the construction of the public works and made available to the general public, for the prevention of substance abuse among its employees. The testing must be performed in a laboratory that is certified for Federal Workplace Drug Testing Programs by the Substance Abuse and Mental Health Service Administration of the U.S. Department of Health and Human Services.

7.25. Security

The Bidder/Consultant represents and warrants to the City that neither it nor any of its principals, shareholders, members, partners or affiliates, as applicable, is a person or an entity named as a Specially Designated National and Blocked Person (as defined in Presidential Executive Order 13224) and that it is not acting, directly or indirectly, for or on behalf of a Specially Designated or Blocked Person. The Bidder/Consultant further represents and warrants to the City that the Bidder/Consultant and its principals, shareholders, members, partners, or affiliates as applicable, are not directly or indirectly, engaged in, and are not facilitating, the transactions contemplated by this Agreement on behalf of any person or entity named as Specially Designated National and Blocked Person. The Bidder/Consultant hereby agrees to defend, indemnify and hold harmless the City of Bloomington, and all City elected or appointed officials, officers, employees, agents, representatives, engineers and attorneys, from and against any and all claims, damages, losses, risks, liabilities, and expenses (including reasonable attorneys' fees and costs) arising from or related to any breach of the foregoing representation and warranties.

7.26. Indemnification

Bidder/Consultant shall indemnify, defend with counsel approved by City, and hold harmless City, its officers, officials, employees and volunteers from and against all liability, loss, damage, expense, cost (including without limitation reasonable attorney's fees, expert fees and all other costs and fees of litigation) of every nature arising out of or in connection with Consultant's performance of work hereunder or its failure to comply with any of its obligations contained in this Agreement, regardless of City's passive negligence, but excepting such loss or damage which is caused by the sole active negligence or willful misconduct of the City. Should City in its sole discretion find Bidder's/Consultant's legal counsel unacceptable, then Bidder/Consultant shall reimburse the City its costs of defense, including without limitation reasonable attorney's fees, expert fees and all other costs and fees of litigation. The Bidder/Consultant shall promptly pay any final judgment rendered against the City (and its officers, officials, employees and volunteers) covered by this indemnity obligation. It is expressly understood and agreed that the foregoing provisions are intended to be as broad and inclusive as is permitted by the law of the State of Illinois and will survive termination of this Agreement.

8. VENDOR QUESTIONNAIRE

8.1. Authorized Person(s)*

By submitting a response to this solicitation, the bidder certifies that this Quote is made without prior understanding, agreement, or connection with any corporation, firm, or person submitting a quote for the same services, materials, supplies, or equipment, and is in all respect fair and without collusion and fraud. The bidder agrees to abide by all conditions of this quote and certifies that they are authorized to submit this quote.

*Response required

8.2. Bid Bond *

Each bid shall be accompanied by a certified cashier's check, or bid bond, in the amount of ten percent (10%) of the total bid price, payable to City of Bloomington, Illinois, as a guarantee that the bidder, if its bid is accepted, will promptly execute the Agreement. The bidder shall guarantee the total bid price for a period of 60 days from the date of the bid opening.

Please upload a copy of your bid bond/cashier's check. Bidder must also submit an original copy of the bid guarantee to be received no later than the bid due time on Wednesday, September 21, 2022 addressed to:

**City of Bloomington Legal Department
Carla Murillo - Procurement
115 E. Washington St., Suite 403
Bloomington, IL 61701**

Please have the Bidder Name, Contract Title ("Ft Jesse Generator and Electrical Improvements"), and Contract Number ("Bid #2023-09") listed clearly on the outside of the envelope.

*Response required

8.3. Contractors Certification of Compliance with Gift Ban Act*

The undersigned firm certifies its officers, employees and agents, have not made any gifts to officers or employees of the City of Bloomington in violation of Illinois Compiled Statutes, 5 ILCS 430/Article 10, State Officers and Employees Ethics Act (commonly known as the "Gift Ban Act").

The Act is available online at:

<http://www.ilga.gov/legislation/ilcs/ilcs4.asp?DocName=000504300HArt%2E+10&ActID=2529&ChapterID=2&SeqStart=1700000&SeqEnd=2200000>.

I further certify that as a bidder, I have not violated the Bloomington City Code Chapter 2, Administration; Article I, Section 8: Officers and Employees Generally: Section 8a Prohibition on the Solicitation and Acceptance of Gifts; and 8b State Officials and Employees Ethics Act. This section of the Bloomington City Code is available online at <http://www.cityblm.org/code.asp?show=section&id=3450>.

☐ Please confirm

*Response required

8.4. Substance Abuse Prevention Program - Public Act 95-0635*

Before the Contractor and any Subcontractor commences work, the Contractor and any Subcontractor shall have in place a written Substance Abuse Prevention Program for the prevention of substance abuse among its employees which meets or exceeds the requirements in Public Act 95-0635 or shall have a collective bargaining agreement in effect dealing with the subject matter of Public Act 95-0635.

The Contractor and any Subcontractor shall file with the CITY: a copy of the substance abuse prevention program along with a cover letter certifying that their program meets the requirements of the Act, or a letter certifying that the Contractor or a Subcontractor has a collective bargaining agreement in effect dealing with the subject matter of this Act.

☐ Please confirm

*Response required

8.5. Contractors Certification of Compliance with Public Act 85-1295*

The vendor certifies by signing this statement that this bid is made without prior understanding, agreement or accord with any other person submitting a bid for the same product or service and that this bid is in all respects bona fide, fair and not the result of any act of fraud or collusion with another person engaged in the same line of business or commerce. Furthermore, the firm certifies that it is not barred from bidding on this contract as a result of a conviction for the violation of State laws prohibiting bid-rigging or bid-rotating. Any false statement hereunder constitutes a felony and can result in a fine and imprisonment as well as civil damages. The vendor also understands that failure to sign this statement will make the bid non-responsive and unqualified for award.

☐ Please confirm

*Response required

8.6. Contractors Certification of Compliance with 2CFR180*

The undersigned firm certifies that it is not barred or suspended by the federal government under the provisions of 2CFR180.

☐ Please confirm

*Response required

8.7. Insurance*

Vendors providing a service or installing equipment on or about City property shall provide to the City Clerk evidence of Comprehensive, Liability, and Workman's Compensation insurance prior to commencement of work on City property. The vendor guarantees to save the City, its agents or employees, harmless from liability of any nature or kind, for use of any copyright, composition, secret process, patented or unpatented invention, articles or appliances furnished or used in the performance of the contract, or which the vendor is not the patentee, assignee, or licensee.

Furthermore, the vendor hereby agrees to save and hold harmless and indemnify the City from and against all injury, death, damage, loss, claims and liability caused by or arising out of the performance of this agreement by the Vendor, its employees, agents or sub-vendors. This agreement extends to all claims, of any nature, whether made by the Vendor's employees or third parties.

☐ Please confirm

*Response required

8.8. [Certificate of Insurance*](#)

Please upload a copy of your Certificate of Insurance.

*Response required

8.9. [Non-Discrimination*](#)

The City of Bloomington requires all Vendors doing business with the City not to discriminate against anyone on the basis of race, age, color, religion, gender, ancestry, national origin, marital status, mental or physical disability unrelated to ability, familial status or sexual orientation.

Vendors shall comply with the Illinois Human Rights Act, 775 ILCS 5/101 et seq., as amended and any rules and regulations promulgated in accordance therewith, including, but not limited to the Equal Employment Opportunity Clause, Illinois Administrative Code, Title 44, Part 750 (Appendix A), 775 ILCS 5/1-102 and constituting of a written EEO policy and a workforce profile that demonstrates its EEO practices. Furthermore, the Vendor or Vendors shall comply with the Public Works Employment Discrimination Act, 775 ILCS 10/0.01 et seq., as amended. The Vendor or Vendors must have a written sexual harassment policy, which meets Illinois Compiled State Statutes, 775 ILCS, 15/3.

☐ Please confirm

*Response required

8.10. [Equal Opportunity Guidelines*](#)

The City requires all Vendors doing business with the City not to discriminate against anyone on the basis of race, age, color, religion, gender, sexual orientation, ancestry, national origin, and non-job-related disabilities. This program was approved by the City Council on May 27, 1974. In accordance with this program, the City shall require that the Vendor or Vendors be familiar and comply in every respect with the provisions of this program. Information regarding the program may be obtained by contacting the Human Relations Department 309-434-2218.

☐ Please confirm

*Response required

8.11. [Local Preference Purchasing Policy Consideration*](#)

The City of Bloomington has adopted a local preference purchasing policy. Under the terms of the policy local Consultants may be granted a pre-determined preference in competitive bidding situations. Bids from qualified local Consultants may receive the following adjustment to the submitted bid:

- A. 5% up to a maximum of \$2,500 on bids of \$10,000 up to \$50,000;
- B. 4% up to a maximum of \$10,000 on bids of up to \$250,000;
- C. 3% up to a maximum of \$30,000 on bids of up to \$1,000,000; and
- D. \$50,000 on bids of over \$1,000,000.

For purposes of comparison and consideration in awarding contracts the preferential discount will be applied to the low bid of all qualified local Consultants when determining the lowest responsible bid. The City Council reserves the right to waive or amend the local preference purchasing policy in connection with any bid, when it deems it in the best interest of the citizens of Bloomington.

A Local Consultant is defined as any business that meets all of the following criteria:

- A. The business has established and maintained a physical presence within the County of McLean, via the ownership or lease of a building or a portion of a building for a period of not less than 12 consecutive months; and
- B. The business employs a minimum of two full time employees at the McLean County location and those employees spend the majority of their work day and work week at the McLean County location; and
- C. The business is legally authorized to conduct business within the State of Illinois and the County of McLean.

Select all that apply

- ☐ The undersigned hereby certifies to the City of Bloomington that it is a Local Consultant as defined above and qualifies for the Local Consultant Preference pursuant to the City of Bloomington Local Preference Purchasing Policy.
- ☐ The undersigned acknowledges the firm does not qualify for the Local Preference consideration.

*Response required

8.12. General Save and Hold Harmless*

Vendor hereby agrees to save, hold harmless, and indemnify the City from and against all injury, death, damage, loss, claims, and liability caused by or arising out of the performance of this agreement by the Vendor, its employees, agents, or sub-vendors. This agreement extends to all claims, of any nature, whether made by the Vendor's or third parties.

- ☐ Please confirm

*Response required

8.13. References*

Please provide a minimum of three (3) references to include the following for each reference:

Company Name
Contact Person
Address
Telephone Number
Email
Scope of work performed

*Response required

8.14. Bid Form*

Bid Bid #2023-09
Ft Jesse Generator and Electrical Improvements

By submitting a response to this solicitation, we, the authorized person(s) for this organization, agree to the terms and conditions used by the City of Bloomington, Illinois, at the bid price submitted, and to supply all services and/or commodities as required in the requirements and Instructions to Bidders. We further agree to deliver the commodity and/or services as outlined with in this document, FOB Bloomington, Illinois, freight prepaid.

The bidder certifies that it has not been barred from contracting with a unit of State or Local government in the State of Illinois as a result of a violation of Section 33E-3 or 33E-4 of the Criminal Code of 1961, as amended.

We further agree to complete all of the work, as required in this solicitation, in a complete, neat, and workmanlike manner.

☐ Please confirm

*Response required

8.15. Substantial and Final Completion Expectations*

Upon the contract being fully executed and the Notice to Proceed signed by both parties, the contractor will be expected to meet the established substantial and final completion dates listed below.

Substantial Completion: 730 day (24 months)

Final Completion: 790 days (26 months)

☐ Please confirm

*Response required

8.16. Apprenticeship Training*

If bid is in excess of \$100,000.00, contractor(s) will provide, with their bid submission, proof of participation in apprenticeship and training programs approved and registered with the United States Department of Labor's Bureau of Apprenticeship and Training. This can be attached in the Other Documentation section in the Vendor Questionnaire.

☐ Please confirm

*Response required

8.17. [Apprenticeship Training Documentation*](#)

Please provide your Apprenticeship Training Documentation.

*Response required

8.18. [Prevailing Wage*](#)

By submitting a response to this solicitation the vendor has read, understands and agrees to the requirements of Prevailing Wage as provided for in this solicitation.

☐ Please confirm

*Response required

8.19. [Minority Owned, Women Owned, Veteran Owned, Small Business Certifications*](#)

Please select the categories that pertain to your organization. Select all that apply.

Select all that apply

☐ Minority Owned Business

☐ Women Owned Business

☐ Veteran Owned Business

☐ Small Business Enterprise

☐ None of the Above Apply

*Response required

8.20. [Subcontractor - Category Information*](#)

By submitting a response to this solicitation, the authorized person(s) agrees to provide category information for the subcontractors utilized if they are the selected vendor on this project.

☐ Please confirm

*Response required

8.21. [Other Documentation](#)

Please upload any additional required certificates, permits, etc. pertaining to this solicitation as a single PDF file.

8.22. [Equal Opportunity Plan](#)

8.22.1. [Equal Employment Opportunity*](#)

In the event of the bidder's non-compliance with the provisions of this Equal Opportunity Clause, the Illinois Human Rights Act or the Rules and Regulations of the Illinois Department of Human Rights ("Department"), or the City of Bloomington's Contract Compliance Program, the bidder may be declared ineligible for future contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations, including the City of Bloomington, and the contract may be canceled or voided in whole or in part, and such other sanctions or penalties may be imposed or remedies invoked as provided by statute, ordinance or regulation. During the performance of this contract, the bidder agrees as follows:

- A. That it will not discriminate against any employee or applicant for employment because of race, color, religion, gender, sexual orientation, marital status, national origin or ancestry, age, physical or mental disability unrelated to ability, or an unfavorable discharge from military service; and further that it will examine all job classifications to determine if minority persons or women are underutilized and will take appropriate affirmative action to rectify any such underutilization.
- B. That, if it hires additional employees in order to perform this bidder any portion thereof, it will determine the availability (in accordance with the Department's Rules and Regulations or those of the Human Relations Commission) of minorities and women in the area(s) from which it may reasonably recruit and it will hire for each job classification for which employees are hired in such a way that minorities and women are not underutilized.
- C. That, in all solicitations or advertisements for employees placed by it or on its behalf, it will state that all applicants will be afforded equal opportunity without discrimination because of race, color, religion, gender, sexual orientation, marital status, national origin or ancestry, age, physical or mental disability unrelated to ability, familial status, or an unfavorable discharge from military service.
- D. That it will send to each labor organization or representative of workers with which it has or is bound by a collective bargaining or other agreement or understanding, a notice advising such labor organization or representative of the bidder's obligations under the Illinois Human Rights Act and the Department's Rules and Regulations. If any such labor organization or representative fails or refuses to cooperate with the bidder in its efforts to comply with such Act and Rules and Regulations, the bidder will promptly so notify the Department and Human Relations Commission and the contracting agency and will recruit employees from other sources when necessary to fulfill its obligations thereunder.
- E. That it will submit reports as required by the Department's Rules and Regulations and Human Relations Commission, furnish all relevant information as may from time to time be requested by the Department or the contracting agency, and in all respects comply with the Illinois Human Rights Act and the Department's Rules and Regulations and those of the City of Bloomington's Contract Compliance Program.

- F. That it will permit access to all relevant books, records, accounts and work sites by personnel of the contracting agency and the Department for purposes of investigation to ascertain compliance with the Illinois Human Rights Act and the Department's Rules and Regulations and those of the City of Bloomington's Contract Compliance Program.
- G. That it will include verbatim or by reference the provisions of this clause in every subcontract it awards under which any portion of the contract obligations are undertaken or assumed, so that such provisions will be binding upon such subbidder. In the same manner as with other provisions of this contract, the bidder will be liable for compliance with applicable provisions of this clause by such subbidders; and further it will promptly notify the contracting agency, the Department and the Human Relations Commission in the event any subbidder fails or refuses to comply therewith. In addition, the bidder will not utilize any subbidder declared by the Illinois Human Rights Commission or Human Relation Commission to be ineligible for contracts or subcontracts with the State of Illinois or any of its political subdivisions or municipal corporations including the City of Bloomington.

Failure to properly complete questions pertaining to the Equal Opportunity Plan as required as part of the submission with bid or proposal will result in your submission not being considered responsive and result in the denial of eligibility to bid or do business with the City of Bloomington for this project/services/goods. A copy of the Equal Opportunity plan for your firm should be included with this response.

☐ Please confirm

*Response required

8.22.2. Business Classification*

Please select one of the following:

- ☐ Corporation
- ☐ Partnership
- ☐ Individual Proprietorship
- ☐ Limited Liability Corporation

*Response required

8.22.3. Principal Office*

Provide the following information for your Company's principal office:

Name

Address

City, State, Zip

Major Activity of your company (product or service)

*Response required

8.22.4. EEO Policies and Practices - 1*

Is it the Company's policy to recruit, hire, train, upgrade, and discipline persons without regard to race, sex, color, religion, national origin, age, mental and/or physical disability, and sexual orientation?

☐ Yes

☐ No

*Response required

8.22.5. EEO Policies and Practices - 2*

Has someone been assigned to develop procedures, which will assure that the EO policy is implemented and enforced by managerial, administrative, and supervisory personnel? If so, please indicate the name and title of the charged with this responsibility. If not, please type "N/A".

*Response required

8.22.6. EEO Policies and Practices - 3*

Has the Company developed a written Equal Opportunity Plan? Note: A copy of the Equal Opportunity Plan must be submitted with this form in order to be considered eligible to do business with the /city of Bloomington. If you would need technical assistance in developing your plan, please contact the Community Relations Office at: (309) 434-2215.

*Response required

8.22.7. EEO Policies and Practices - 4*

Has the Company developed a written policy statement prohibiting Sexual Harassment? Please attach a copy of the policy statement.

*Response required

8.22.8. EEO Policies and Practices - 5*

Have all recruitment sources been notified that the Company will consider all qualified applicants without regard to race, color, age, sex, national origin, religion, mental and/or physical disability, or sexual orientation?

☐ Yes

☐ No

*Response required

8.22.9. EEO Policies and Practices - 6*

If advertising is used, does it specify that all qualified applicants will be considered for employment without regard to race, color, age, sex, national origin, religion, mental and/or physical disability, or sexual orientation?

☐ Yes

☐ No

*Response required

8.22.10. EEO Policies and Practices - 7*

Has the bidder notified all of its sub-bidders of their obligations to comply with the Equal Opportunity requirements either in writing, by inclusion in subbidders or purchase orders?

☐ Yes

☐ No

*Response required

8.22.11. EEO Policies and Practices - 8*

Is the Company a state certified minority/female owned business? If yes, please attach a copy of the state certification. If not, please provide a document stating that your company is not a state certified minority/female owned business.

*Response required

8.22.12. EEO Policies and Practices - 9*

Does the Company have collective bargaining agreements with labor organizations?

☐ Yes

☐ No

*Response required

8.22.13. EEO Policies and Practices - 10*

Has the labor organization been notified of the Company's responsibility to comply with the Equal Employment Opportunity requirements in all contracts by the City of Bloomington?

☐ Yes

☐ No

*Response required

8.22.14. Employment Information*

Identify the geographical area(s) from which the company may reasonably recruit employees (use city, county, SMSA, or distance in miles from your company location).

*Response required

8.22.15. Under-Utilized Workforce*

If minorities and women are currently under-utilized in your workforce, please attach a copy of an explanation for your plan to recruit and hire minorities and women. If this does not pertain to your organization, please provide documentation stating that.

*Response required

*8.22.16. Workforce Analysis Form**

Please download the below documents, complete, and upload.

- [Workforce Analysis Form.pdf](#)

*Response required

*8.22.17. Certification**

The Company certifies that it has answered all of the foregoing questions truthfully to the best of its knowledge and belief. The Company also agrees that it will comply and abide by the City of Bloomington's Contract Compliance Ordinance and the City of Bloomington Human Relations Ordinance.

☐ Please confirm

*Response required



ADDENDUM NUMBER 1: September 16, 2022

BID #2023-09

FT. JESSE GENERATOR & ELECTRICAL IMPROVEMENTS

- 1. Will the Town of Normal or the City of Bloomington perform the electrical inspection(s) for this project?**

The City of Bloomington will perform all electrical inspections.

- 2. What is the KW of the existing generator?**

See attached photo of the existing generator nameplate. (Exhibit A)

- 3. Can the existing generator be used to power Pump Station A during construction?**

The existing generator can be used to power Pump Station A during construction, with the following requirements and restrictions:

- a. The City has consulted the City Electrical Inspector and temporary conductors, in PVC conduit, may be run above grade from the existing generator to Pump Station A for up to 2 weeks.
- b. The use of the existing generator used to provide temporary power to Station A should be minimized to keep diesel fuel costs down. Work shall be sequenced to limit existing generator use to a total runtime of 48 hours during the 2 week temporary period.
- c. The City Electrical Inspector shall be notified to inspect temporary power installation before Station A is powered from existing generator directly using the temporary power arrangement. The City Electrical Inspector shall qualify the temporary installation as safe before temporary circuit is energized and used.

- 4. See attached Drawing 002-CR-1 and 002-CEFN-1. (Exhibit B)**

- 5. Refer to drawing sheet 007-E-3, revise Plan Notes as follows:**

- a. Revise Plan Note 5 to "NOT USED"
- b. Revise Plan Note 6 to "NOT USED"
- c. Revise Plan Note 7 to "NOT USED"

- d. Revise Plan Note 8 referring to SEC 2 of MCC-P22 to read as follows:
“Existing 1200A circuit breaker Long-Time Pick-Up Setting shall be adjusted down to 800A”.

PLEASE NOTE: Failure to acknowledge the addendum in OpenGov may result in disqualification.

Carla A Murillo, Procurement Manager
9/16/2022

EXHIBIT A

CATERPILLAR®

3512 GENERATOR SET

RATING 1418 KVA 1135 KW .8 COS ϕ

PRIME STANDBY 60 HERTZ

PRIME PLUS 10 PERCENT

GENERATOR DATA

3 PHASE  4 WIRE YEAR

XXX WYE DELTA ZIG ZAG

CONNECTION XXX SERIES PARALLEL

GENERATOR 480 VOLTS 1705 AMPS

EXCITATION 38 VOLTS 8.9 AMPS

6694 FRAME 1800 REV / MIN

MAXIMUM TEMPERATURE RISE 105 °C BY RESISTANCE

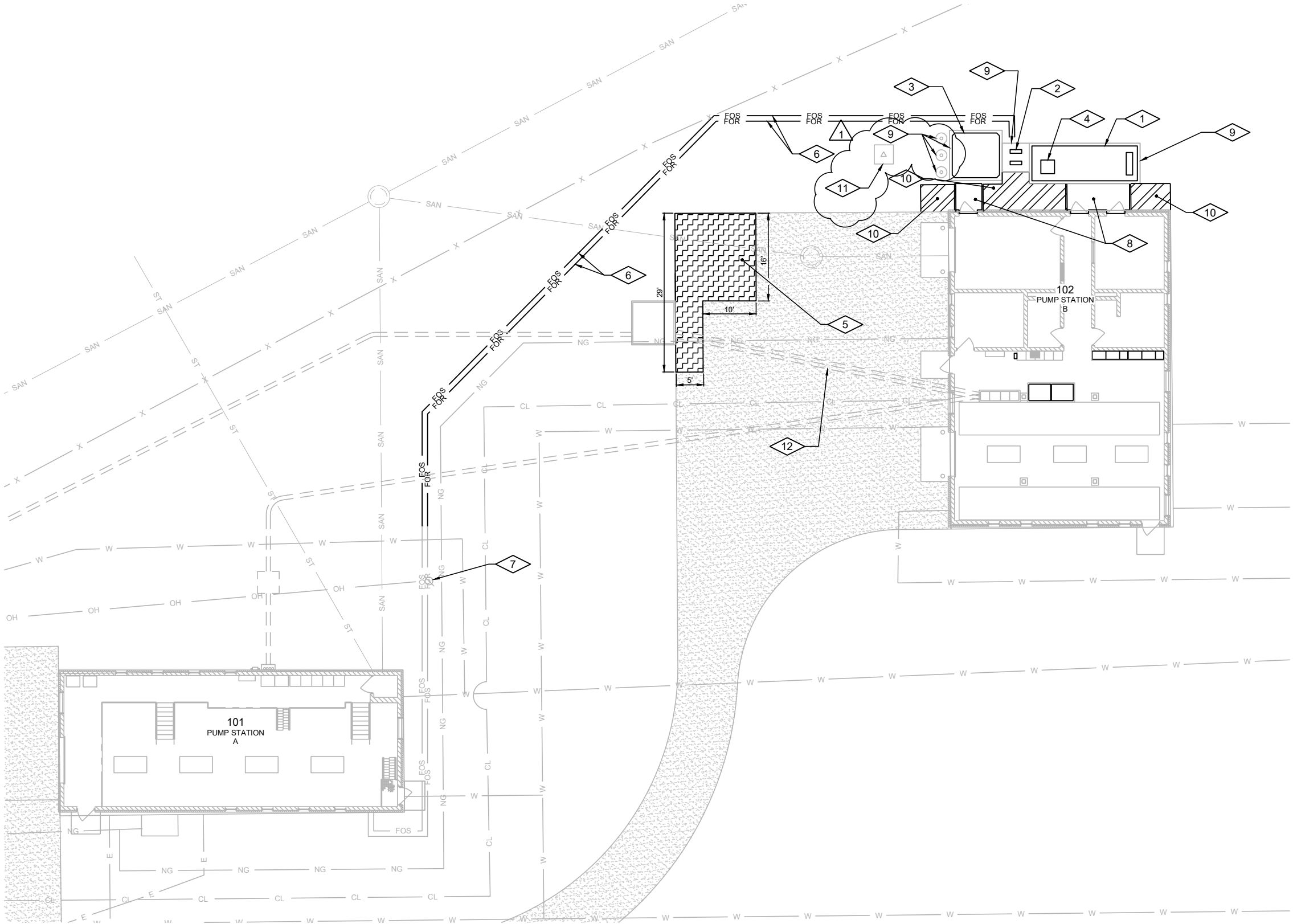
CLASS F INSULATION

ENCLOSURE TYPE

INCLUDE SERIAL NUMBER AND GENERATOR PART NUMBER FROM
GENERATOR SERIAL NUMBER PLATE WHEN ORDERING PARTS AND IN
CORRESPONDENCE.

GENERATOR FRAME SHOULD BE GROUNDED. 7W0096 2

EXHIBIT B



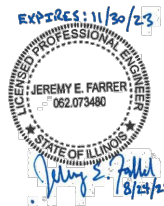
PARTIAL REMOVAL SITE PLAN

GENERAL NOTES:

1. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS, DIMENSIONS, AND ELEVATIONS PRIOR TO CONSTRUCTION AND/OR FABRICATION. EXISTING SITE FACILITIES AND GRADING AS SHOWN ARE BASED ON EXISTING DRAWINGS.
2. DIMENSIONS PROVIDED ARE BASED ON EXISTING RECORD DRAWINGS AND ARE INTENDED FOR REFERENCE ONLY.
3. CALL AND LOCATE ALL UNDERGROUND UTILITIES BEFORE COMMENCING ANY EARTH WORK.
4. FULL TONE COMPONENTS TO BE REMOVED.
5. SAWCUT AND REMOVE CONCRETE TO THE LIMITS NOTED. IN EXPOSED AREAS NOT COVERED BY NEW CONSTRUCTION, REMOVE REINFORCEMENT AND EMBEDMENTS 1" BEYOND FINISHED SURFACE AND PATCH SURFACE WITH PATCHING MORTAR TO MATCH ADJACENT FINISHED SURFACE.
6. REMOVE CONCRETE ANCHORS, ANCHOR BOLTS, AND OTHER EMBEDMENTS FOR MATERIALS AND EQUIPMENT BEING REMOVED. IN EXPOSED AREAS NOT COVERED BY NEW CONSTRUCTION, REMOVE CONCRETE ANCHORS, ANCHOR BOLTS, AND OTHER EMBEDMENTS 1" BEYOND FINISHED SURFACE AND PATCH SURFACE WITH PATCHING MORTAR. FINISH SURFACE TO MATCH ADJACENT FINISHED SURFACE.
7. WHERE EQUIPMENT IS INDICATED TO BE REMOVED, REMOVE ALL ASSOCIATED POWER AND CONTROL WIRING AND CONDUIT BACK TO SOURCE. REMOVE JUNCTION BOXES AND PULL BOXES ASSOCIATED WITH THE REMOVED CONDUITS. WHERE CONDUIT SYSTEM CONTAINS CIRCUITS TO OTHER EQUIPMENT THAT REMAINS, RETAIN THESE CIRCUITS AND RELOCATE EXISTING CONDUIT AND EXTEND EXISTING CIRCUITS AS REQUIRED FOR THE INSTALLATION OF NEW EQUIPMENT.
8. REMOVE ALL SUPPORTS ASSOCIATED WITH REMOVED PIPING, DUCTWORK, CONDUIT, AND EQUIPMENT. REMOVE RODS AND FASTENERS FROM CEILINGS, FLOORS, AND WALLS WITH CARE. WHERE SURFACE HAS BEEN MARRED, CHIPPED, SPAWLED, ETC. AS A RESULT OF REMOVAL, PATCH SURFACE WITH PATCHING MORTAR AND FINISH TO MATCH ADJACENT FINISHED SURFACE.
9. WHERE OPENINGS ARE LEFT IN WALLS, SLABS, OR CEILINGS DUE TO REMOVED PIPING, DUCTWORK, EQUIPMENT, OR OTHER WORK, PATCH OPENING TO MATCH ADJACENT SURFACES UNLESS NOTED OTHERWISE.
10. OWNER SHALL HAVE FIRST RIGHT REFUSAL ON ALL REMOVED EQUIPMENT.

PLAN NOTES:

1. REMOVE GENERATOR AND ENCLOSURE.
2. REMOVE OIL FUEL PUMPS.
3. REMOVE FUEL TANK.
4. REMOVE AUTOMATIC TRANSFER SWITCH.
5. REMOVE AND REPLACE EXISTING ASPHALT PAVEMENT.
6. REMOVE PREVIOUSLY ABANDONED FUEL LINES TO THE EXTENTS SHOWN.
7. PROTECT EXISTING UTILITY POLE.
8. REMOVE CONCRETE STOOPS. SEE STRUCTURE 102 DRAWINGS FOR ADDITIONAL INFORMATION.
9. IF OWNER ACCEPTS ALTERNATE 1, REMOVE CONCRETE EQUIPMENT PADS.
10. REMOVE AND REPLACE CONCRETE SIDEWALK.
11. REMOVE EXISTING RADIO TOWER AND FOUNDATION IF OWNER ACCEPTS ALTERNATE 1. PROTECT EXISTING RADIO TOWER AND PAD IF OWNER DECLINES ALTERNATE 1.
12. EXISTING ELECTRICAL DUCT BANK TO REMAIN. PROTECT DUCT BANK, CONDUIT, AND WIRING FOR REUSE.



CITY OF BLOOMINGTON
DRINKING WATER SYSTEM
ELECTRICAL IMPROVEMENTS
FORT JESSE PUMP STATION
REMOVAL
SITE PLAN

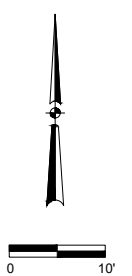
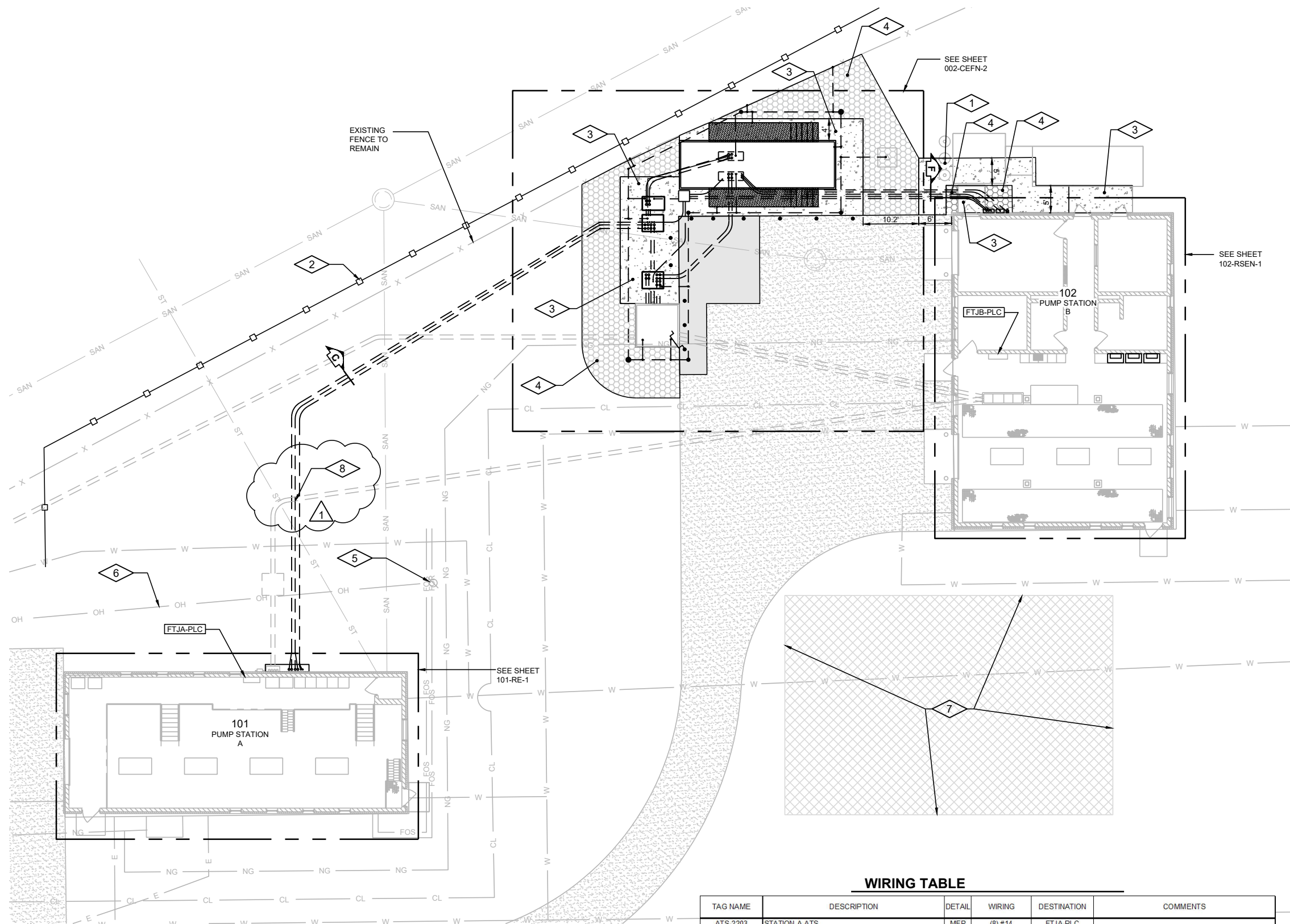


DONOHUE

Sheet No. 7

Drawing No.

002-CR-1



GENERAL NOTES:

1. CONTRACTOR TO FIELD VERIFY EXISTING CONDITIONS, DIMENSIONS, AND ELEVATIONS PRIOR TO CONSTRUCTION AND/OR FABRICATION. EXISTING SITE FACILITIES AND GRADING AS SHOWN ARE BASED ON EXISTING DRAWINGS.
2. DIMENSIONS PROVIDED ARE BASED ON EXISTING RECORD DRAWINGS AND ARE INTENDED FOR REFERENCE ONLY.
3. CALL AND LOCATE ALL UNDERGROUND UTILITIES BEFORE COMMENCING ANY EARTH WORK.
4. CONTRACTOR SHALL LOCATE, PROTECT, AND KEEP IN SERVICE ALL EXISTING NATURAL GAS, SEWER, WATER AND OTHER UTILITY SERVICES.
5. ALL DISTURBED AREAS NOT COVERED BY PAVING OR OTHERWISE NOTED SHALL BE RESTORED WITH TOPSOIL, MULCH AND SEED. SEE DETAIL C050.
6. MAINTAIN MINIMUM 12" DISTANCE BETWEEN NEW UTILITY PRIMARY CONDUITS AND EXISTING UTILITIES.
7. SEE DRAWING 999-E-2 FOR ALL DUCTBANK SECTIONS SHOWN ON THIS SHEET.
8. CONTRACTOR TO CONSTRUCT SIDEWALK TO GRADE AWAY FROM BUILDING AND EQUIPMENT PADS.

PLAN NOTES:

1. CONCRETE SIDEWALK, SEE DETAIL C150.
2. SILT FENCE, SEE DETAIL C031.
3. CONCRETE DOOR STOOP. SEE STRUCTURE 102 DRAWINGS FOR ADDITIONAL INFORMATION.
4. LANDSCAPE STONE ON GEOTEXTILE FABRIC WITH EDGING PLACED ADJACENT TO GRASS.
5. EXISTING 35KV POLE TO BE UPGRADED BY AMEREN.
6. EXISTING 35KV OVERHEAD PRIMARY TO BE MODIFIED BY AMEREN.
7. CONTRACTOR LAYDOWN AREA.
8. PROTECT EXISTING DUCT BANK WHILE STILL IN SERVICE. WHERE NEW DUCT BANK CONFLICTS WITH EXISTING DUCT BANK, CONTRACTOR MAY PASS NEW DUCT BANK ABOVE OR BELOW EXISTING. PROVIDE A MINIMUM BURY DEPT OF 12 INCHES ON NEW DUCT BANK.

PARTIAL SITE PLAN

WIRING TABLE

TAG NAME	DESCRIPTION	DETAIL	WIRING	DESTINATION	COMMENTS
ATS-2203	STATION A ATS	MFR	(8) #14	FTJA-PLC	
ES-2203/4	GENERATOR ESTOP	MFR	(2) #14	GEN-2203/4	
FTJA-PLC	STATION A PLC	N/A	-	-	EXISTING
FTJB-PLC	STATION B PLC	N/A	-	-	EXISTING
GEN-2203/4	GENERATOR	MFR	CAT 6	FTJB-PLC	
ATS-2204	STATION B ATS	MFR	(8) #14	FTJB-PLC	

Provide ground conductor (not shown) as needed. See General Notes on sheet 001-G-5.



CITY OF BLOOMINGTON
DRINKING WATER SYSTEM
ELECTRICAL IMPROVEMENTS
FORT JESSE PUMP STATION
CIVIL, ELECTRICAL, AND STRUCTURAL
SITE PLAN



Sheet No. 8

Drawing No.

002-CEFN-1

ORDINANCE NO. 2022 - ____

AN ORDINANCE AMENDING THE BUDGET ORDINANCE
FOR THE FISCAL YEAR ENDING APRIL 30, 2023

WHEREAS, on April 11, 2022 by Ordinance Number 2022-26, the City of Bloomington passed a Budget and Appropriation Ordinance for the Fiscal Year Beginning May 1, 2022 and Ending April 30, 2023, City of Bloomington, which Ordinance was approved by Mayor Mboka Mwilambwe on April 13, 2022; and

WHEREAS, a Budget Amendment is needed amending the Fiscal Year 2023 Budget to utilize \$540,800 in Water Fund Reserves (Fund Balance) for the Fort Jesse Generator and Electrical Improvements Project.

NOW, THEREFORE, BE IT ORDAINED BY THE City Council of the City of Bloomington, McLean County, Illinois, as follows:

SECTION 1. Ordinance Number 2022-26 (the Budget and Appropriation Ordinance for the Fiscal Year Ending April 30, 2023) is further hereby amended by inserting the following line items and amount presented in the Exhibit and in the appropriate place in said Ordinances.

SECTION 2. Except as provided for herein, Ordinance Number 2022-26 shall remain in full force and effect, provided, that any budgeted or appropriated amounts which are changed by reason of the amendments made in Section One of this Ordinance shall be amended in Ordinance Number 2022-26.

SECTION 3. This Ordinance shall be in full force and effect upon its passage and approval and publication as required by law.

PASSED this 14th day of November 2022.

APPROVED this ____ day of November 2022.

CITY OF BLOOMINGTON

ATTEST

Mboka Mwilambwe, Mayor

Leslie Smith-Yocum, City Clerk

FY 2023 Budget Amendment-Exhibit

Account #	Fund	Account Description	Amount	Comments
50100110-40000	Water	Use of Fund Balance	\$ (540,800.00)	
501000160-72620	Water	Other Capital Improvement	\$ 540,800.00	
		Net Transaction:	\$ -	



CONSENT AGENDA ITEM NO. 7.G

FOR COUNCIL: November 14, 2022

WARD IMPACTED: City-Wide Impact

SUBJECT: Consideration and action to approve an Agreement with Donoghue & Associates, Inc., for Fort Jesse Generator and Electrical Improvements Construction Observation, in the amount of \$76,800, as requested by the Public Works Department.

RECOMMENDED MOTION: The proposed Agreement be approved.

STRATEGIC PLAN LINK:

Goal 2. Upgrade City Infrastructure and Facilities

STRATEGIC PLAN SIGNIFICANCE:

Objective 2d. Well-designed, well maintained City facilities emphasizing productivity and customer service

BACKGROUND: The Fort Jesse Pump station is located at 1513 Fort Jesse Road in Normal. The site includes two pump stations. Fort Jesse "A" was built in 1973, and Fort Jesse "B" was built in 1992. This facility is critical in maintaining water pressure and demand throughout the City and is designed with a generator that will run both stations during power outages. On average, generators have a life expectancy of 25 years. The Fort Jesse generator will reach 30 years in FY23.

While evaluating the electrical equipment at this site, it was discovered that when "B" was built, both shore and generator power were connected to "B" and then extended to "A," leaving one path of power. This creates an issue where "A" is dependent on "B" for power. If there were a catastrophic failure to the building or electrical system causing "B" to be inoperable, "A" would also be inoperable. In this situation, storage and critical valves would also be inoperable. The combination of inoperable components at this site during a catastrophic failure could cause pressure and water supply issues across the City.

The proposed construction project, which is also on the agenda (see Item 7.F.), includes the installation of a new generator located outside the building, two new automatic transfer switches (one for each facility), conduit, wiring, and other electrical components needed to ensure both facilities are fully independent and operational on both utility and emergency backup power supplies.

On December 31, 2021, City Council approved a Professional Services Contract with Donohue & Associates for Fort Jesse Generator and Electrical Improvement design services. Under the new agreement being proposed, Donoghue & Associates will provide consulting services and act as the City's representative during all phases of the construction project. This will include conducting a pre-construction meeting, perform site visits to observe progress and quality of work, determining if the construction contractor's work is proceeding in accordance with the contract documents, review pay orders, and keeping the City informed

of all imminent safety concerns, dangerous situations, or safety threats.

Through Request for Qualifications (RFQ) 2022-25 (Resolution 2022-13), the City Council approved a list of prequalified vendors for Architectural and Engineering Services. RFQ 2022-25 established ten categories of professional services and identified qualified vendors to provide services in each category by project cost. For each category, small projects cost less than \$50,000, and large projects cost \$50,000 or more. City staff reviewed the nine selected firms under the Utility (Large) category, which is the key service for the project as described above, and determined Donohue & Associates, Inc. to be the most qualified firm to do the work that best meets the City's needs. Based on Donohue & Associates, Inc.'s selection under RFQ 2022-25 and their experience with the design of the electrical upgrades, Donohue & Associates, Inc. was asked to submit a proposal for scope and fees associated with Fort Jesse Generator and Electrical upgrades construction observation. The vendor chosen for this project utilized a qualifications-based selection process, and, therefore, the City's local preference policy does not apply.

COMMUNITY GROUPS/INTERESTED PERSONS CONTACTED: N/A

FINANCIAL IMPACT: If approved, \$76,800.00 will be utilized for construction observation paid out of the Water Mechanical Maintenance-Architectural & Engineering Services for Capital account (50100160-70051) and budgeted funds totaling \$76,800 will be transferred from the Water Mechanical Maintenance-Repair/Maintenance Equipment Other than Office account (50100160-70540) to fund the construction observation. Stakeholders can locate this in the FY 2023 Budget Book titled "Other Funds & Capital Improvement" on page 138.

AMERICAN RESCUE PLAN FUNDING IMPACT: N/A

COMMUNITY DEVELOPMENT IMPACT: This request meets the following goals and objectives of the Bloomington Comprehensive Plan 2035: Goal UEW-1. Provide quality public infrastructure within the City to protect public health, safety, and the environment, UEW-1.5 Reliable water supply and distribution system that meets the needs of the current and future residents.

Respectfully submitted for consideration.

Prepared by: Aaron Kinder, Superintendent of Mechanical Maintenance

ATTACHMENTS:

[PW 2B Contract](#)

**CITY OF BLOOMINGTON AGREEMENT WITH
DONOHUE & ASSOCIATES, INC.
FOR
ARCHITECTURAL & ENGINEERING SERVICES**

THIS AGREEMENT, dated this day of September, 2022, is between the City of Bloomington, IL (hereinafter "CITY") and Donohue & Associates, Inc. (hereinafter "VENDOR"). CITY and VENDOR may hereinafter collectively be referred to as the "PARTIES" and individually as the "PARTY".

NOW THEREFORE, the PARTIES agree as follows:

Section 1. Recitals. The recitals set forth above are incorporated into this Section 1 as if specifically stated herein.

Section 2. Description of Services. VENDOR shall provide the services/work identified on Exhibit A, attached hereto and incorporated herein.

Section 3. Incorporation of Bid/RFP/RFQ & Proposal Terms. The following shall apply to this Agreement:

_____ This Agreement was not subject to a formal solicitation process by the CITY.

X This Agreement was subject to the following procurement initiative by the CITY:
"RFQ #2019-34 FY19 Multi-Year Professional A&E Services" (hereinafter "REQUEST").
 Accordingly, the provisions of the REQUEST and the proposal submitted by VENDOR (hereinafter collectively referred to as "PROCUREMENT DOCUMENTS" and attached hereto), shall be incorporated into this Agreement and made a part thereof and shall be considered additional contractual requirements that must be met by VENDOR. In the event of a direct conflict between the provisions of this Agreement and the incorporated PROCUREMENT DOCUMENTS, the provisions of this Agreement shall prevail.

_____ This Agreement was not subject to a formal solicitation process by the CITY, but includes the other required proposal/documents attached hereto in Exhibit C.

Section 4. Payment. For the work performed by VENDOR under this Agreement, the City shall pay VENDOR one of the following:

_____ A flat fee of \$_____ as set forth in the Payment Terms attached as Exhibit B, attached hereto and incorporated herein.

X Fees as set forth in the Payment Terms attached as Exhibit B, attached hereto and incorporated herein not to exceed \$76,800.00.

Section 5. Requirement for Payment & Performance Bond. The following shall further apply to this Agreement:

X This Agreement does not require the furnishment of any bonds by the VENDOR.

— This Agreement is subject to bonding requirements.

- i. It is therefore understood that the VENDOR will furnish, at no expense to the CITY, Payment and Performance Bonds to the CITY in the amount of the contract as stated in Section 4 executed by the VENDOR and at least two sureties as set forth under the Laws of the State of Illinois, as a guarantee that the VENDOR will timely and faithfully perform the work outlined herein.
- ii. Said bond shall be conditioned to save and keep harmless said CITY from any and all claims, demands, losses, suits, costs, expenses, and damages which may be brought, sustained, or recovered against said CITY by reason of any negligence, default, or failure of the said VENDOR in designing, building, constructing, or completing said improvement and its appurtenances, or any part thereof, and that said improvement when constructed shall be free from all defects and remain in good order and condition for one year from its completion and acceptance by the CITY, ordinary wear and tear, and damage resulting from accident or willful destruction excepted; which bond is attached hereto and made a part hereof.

Section 6. Default. Either PARTY shall be in default if it fails to perform all or any part of this Agreement. If either PARTY is in default, the other PARTY may terminate this contract upon giving written notice of such termination to the PARTY in default. Such notice shall be in writing and provided thirty (30) days prior to termination. The non-defaulting PARTY shall be entitled to all remedies as set forth in Section 9 herein, upon the default or violation of this Agreement.

Section 7. Termination for Cause. The CITY may, at any time, terminate this Agreement, in whole or in part, for any of the following reasons effective immediately:

- i. VENDOR is found to be in violation of any term or condition of this Agreement.
- ii. VENDOR engages in any fraudulent, felonious, grossly negligent, or other illegal acts or behavior.
- iii. VENDOR declares bankruptcy or becomes insolvent.
- iv. CITY determines, in its sole discretion, that VENDOR is no longer able to fulfill VENDOR's obligations under this Agreement or PROCUREMENT DOCUMENTS.

Upon such termination, CITY shall be entitled to all remedies laid out in Section 9, as well as reimbursement of reasonable attorney's fees and court costs.

Section 8. Force Majeure. The CITY shall not be in default of this Agreement and shall not be held liable for any losses, failure, or delay in performance of its obligations under this Agreement or any Agreement, Amendment, Exhibit, or Attachment hereto arising out of or caused, directly or indirectly, by an event of Force Majeure. Force Majeure is defined as circumstances beyond the CITY's reasonable control, including, without limitation, acts of God; earthquakes; fires; floods; wars; civil or military disturbances; acts of terrorism; sabotage; strikes; epidemics; pandemics; riots; power failures; computer failure and any such circumstances beyond its reasonable control as may cause interruption, loss or malfunction of utility, transportation, computer (hardware or software) or telephone communication service; accidents; labor disputes; acts of civil or military authority; governmental actions; or inability to obtain labor, material, equipment or transportation.

Section 9. Remedies. In the event of a default or a violation of this Agreement, the non-defaulting PARTY shall be entitled to all remedies, whether in law or equity.

Section 10. Indemnification. To the fullest extent permitted by law, VENDOR shall indemnify and hold harmless CITY, its officers, officials, agents, and employees from claims, demands, causes of action, and liabilities of every kind and nature whatsoever to the proportionate extent caused by VENDOR's negligent acts, errors, or omissions performed under this Agreement, except for loss, damage, or expense arising from the sole gross negligence or willful misconduct of the CITY or the CITY's agents, servants, or independent VENDORS who are directly responsible to CITY. This indemnification shall extend to all claims occurring after this Agreement is terminated as well as while it is in force. The indemnity shall apply regardless of any concurrent negligence, whether active or passive, of the CITY or CITY's officers, officials, agents, employees, or any other persons or entities.

Section 11. Reuse of Documents. All documents, including but not limited to, reports, drawings, specifications, and electronic media furnished by VENDOR pursuant to this Agreement are instruments of the VENDOR's services. Nothing herein, however, shall limit the CITY's right to use the documents for municipal purposes, including but not limited to the CITY's right to use documents in an unencumbered manner for purposes of remediation, remodeling, and/or construction. VENDOR further acknowledges any such documents may be subject to release under the Illinois Freedom of Information Act. Any reuse or alteration of the documents for any purpose other than that for which such documents were originally prepared shall be at CITY's sole risk and VENDOR assumes no responsibility for the alteration or reuse of those documents.

Section 12. Standard of Care. Services performed by VENDOR under this Agreement will be conducted in a manner consistent with that level of care and skill ordinarily exercised by members of the same or similar profession currently practicing under the same or similar conditions.

Section 13. Representations of VENDOR. VENDOR hereby represents it is legally able to perform the work that is subject to the Agreement.

Section 14. Compliance with Local, State, and Federal Laws. VENDOR agrees that any and all work by VENDOR shall at all times comply with all laws, ordinances, statutes, and governmental rules, regulations and codes.

Section 15. Compliance with Prevailing Wage. The following shall apply to this Agreement:

X This Agreement is not for "public works" and therefore Prevailing Wage does not apply.

— This Agreement calls for the construction of "public works," within the meaning of the Illinois Prevailing Wage Act, 820 ILCS 130.01 et seq. (hereinafter "ACT"). The ACT requires contractors and subcontractors to pay laborers, workers, and mechanics performing services on public works projects no less than the current "prevailing rate of wages" (hourly cash wages plus an amount for fringe benefits) in the county where the work is performed. The Illinois Department of Labor (hereinafter "DEPARTMENT") publishes the prevailing wage rates on its website at <http://labor.illinois.gov/>. The DEPARTMENT revises the prevailing wage rates and the contractor/subcontractor has an obligation to check the DEPARTMENT's website for revisions to prevailing wage rates. For information regarding current prevailing wage rates, please refer to the DEPARTMENT's website. All contractors and subcontractor rendering services under this Agreement must comply with all requirements of the ACT, including but not limited to all wage requirements and notice and record keeping duties.

Section 16. Equal Opportunity Employment. During the performance of this Agreement, the VENDOR agrees as follows:

- i. The VENDOR will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The VENDOR will take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following: Employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The VENDOR agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
- ii. The VENDOR will, in all solicitations or advertisements for employees placed by or on behalf of the VENDOR, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
- iii. The VENDOR will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the VENDOR's legal duty to furnish information.
- iv. The VENDOR will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding, a notice to be provided advising the said labor union or workers' representatives of the VENDOR's commitments under this section, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

Section 17. Access to Records. The following access to records requirements apply to this Agreement:

- i. The VENDOR agrees to provide CITY, or any of their authorized representatives access to any books, documents, papers, and records of the VENDOR which are directly pertinent to this Agreement for the purposes of making audits, examinations, excerpts, and transcriptions.
- ii. The VENDOR agrees to permit any of the foregoing parties to reproduce by any means whatsoever or to copy excerpts and transcriptions as reasonably needed.

Section 18. Compliance with FOIA Requirements. VENDOR further explicitly agrees to furnish all records related to this Agreement and any documentation related to CITY required under the Illinois Freedom of Information Act (ILCS 140/1 et seq.) (hereinafter "FOIA") request within five (5) business days after CITY issues notice of such request to VENDOR. VENDOR agrees to not apply any costs or charge any fees to the CITY regarding the procurement of records required pursuant to a FOIA request. VENDOR agrees to defend, indemnify, and hold harmless CITY, and agrees to pay all reasonable costs connected therewith (including, but not limited to, reasonable attorney's and witness fees, filing fees, and any other expenses) for CITY to defend any and all causes,

actions, causes of action, disputes, prosecutions, of conflicts arising from VENDOR actual or alleged violation of FOIA, or VENDOR failure to furnish all documentation related to a request within five (5) business days after CITY issues notice of request. Furthermore, should VENDOR request that CITY utilize a lawful exemption under FOIA in relation to any FOIA request, thereby denying that request, VENDOR agrees to pay all costs connected therewith (such as reasonable attorney's and witness fees, filing fees, and any other expenses) to defend the denial of the request. The defense shall include, but not be limited to, challenged or appealed denials of FOIA requests to either the Illinois Attorney General or a court of competent jurisdiction. VENDOR agrees to defend, indemnify, and hold harmless CITY, and agrees to pay all costs connected therewith (such as reasonable attorney's and witness fees, filing fees, and any other expenses) to defend any denial of a FOIA request by VENDOR request to utilize a lawful exemption to CITY.

Section 19. Notices. All legal notices given in connection with this Agreement shall be made in writing and deemed complete by way of (a) hand delivery; (b) registered mail, postage prepaid; or (c) electronic mail with notice of receipt by the other PARTY at the following addresses or at such other address for a PARTY as shall be specified by like notice:

If to VENDOR:

Donohue & Associates, Inc.
Attn: Terry Boyer
1605 S. State Street, Suite 1C
Champaign, IL 61820
tboyer@donohue-associates.com

Copy to:
Donohue & Associates, Inc.
Attn: Craig Brunner
3311 Weeden Creek Road
Sheboygan, WI 53081
cbrunner@donohue-associates.com

If to CITY:

City of Bloomington
Attn: City Manager
115 E. Washington St., Suite 103
Bloomington, IL 61701
admin@cityblm.org

Copy to:
City of Bloomington
Attn: Legal Department
115 E. Washington St., Suite 103
Bloomington, IL 61701
legal@cityblm.org

Section 20. Insurance. VENDOR shall, at a minimum, maintain insurance as required in the PROCUREMENT DOCUMENTS or as agreed upon with the City Procurement Manager. Certificates of insurance shall be provided to the CITY and CITY shall be named as additional insured under the policy(ies).

Section 21. Assignment. No PARTY may assign this Agreement, of the proceeds thereof, without prior written consent of the other PARTY.

Section 22. Changes or Modifications. This Agreement, its method of completion, its scope of work, nor its pricing may be modified or changed in any manner without the express written consent of both PARTIES via an Amendment fully executed by both PARTIES.

Section 23. Governing Law. This Agreement shall be governed by and interpreted pursuant to the laws of the State of Illinois, County of McLean.

Section 24. Joint Drafting. The PARTIES expressly agree that this Agreement was jointly drafted, and that both had the opportunity to negotiate its terms and to obtain the assistance of counsel in reviewing its terms

prior to execution. Therefore, this Agreement shall be construed neither against nor in favor of either PARTY but shall be construed in a neutral manner.

Section 25. Attorney's Fees. In the event that any action is filed in relation to this Agreement, the unsuccessful PARTY in the action shall pay to the successful PARTY, in addition to all the sums that either PARTY may be called on to pay, a reasonable sum for the successful PARTY's attorney's fees (including expert witness fees). For purposes of this Agreement, a party is "successful" if it recovers 75 percent or more of what it sought in such proceeding, or if it successfully defends against 75 percent or more of what was claimed against it. If neither percentage is met, the parties bear their own respective attorney's fees.

Section 26. Paragraph Headings. The titles to the paragraphs of this agreement are solely for the convenience of the PARTIES and shall not be used to explain, modify, simplify, or aid in the interpretation of the provisions of this Agreement.

Section 27. Term. The term of this Agreement shall be:

X Until all of the services and/or deliverables required to be provided within this Agreement are completed and accepted by CITY.

____ From _____ year(s) from the date of this Agreement listed above.

____ By the date state in the PROCUREMENT DOCUMENTS or no later than _____.

____ This Agreement shall also be subject to the following renewal terms, if any: _____.

Notwithstanding anything herein, the provisions in Sections 10 and 18 shall survive termination.

Section 28. Counterparts. This Agreement may be executed in any number of counterparts, including electronically, each of which shall be deemed to be an original, but all of which together shall constitute the same instrument.

IN WITNESS WHEREOF, the PARTIES hereto have executed this Space Sharing Agreement as of the date first above written.

CITY OF BLOOMINGTON

By: _____
Its City Manager

ATTEST:

By: _____
Its City Clerk

VEND

By: _____

Its

PRESIDENT

By: _____

Its

Vice President



EXHIBIT A

PROJECT DESCRIPTION/SCOPE OF SERVICES/TIMING

A. PROJECT DESCRIPTION

The City (Owner) is retaining Donohue & Associates, Inc. to provide Construction-Related Services for the Ft Jesse Generator and Electrical Improvements project which consist of replacement of the diesel generator and improvement to the electrical topology of the Ft Jesse A and B pump stations.

B. SCOPE OF SERVICES

Basic Services to be provided by Donohue for this Project under this Agreement are as follows:

1. Construction Related Engineering Services

Upon successful completion of the Bidding Phase, and upon award of the Ft Jesse Generator and Electrical improvements construction contract by the Owner, Donohue shall provide the following construction phase contract administration and observation services for the Project:

- 1.1 *General Administration of Construction Contracts.* Consult with Owner and act as Owner's representative as provided in the General Conditions of the Contract Documents as included in the Project Manual. Included in this effort is receipt and incorporation of constructability revisions to the documents, as directed from time to time, by the City.
- 1.2 *Pre-Construction Conference and Progress Meetings.* Conduct one Pre-Construction Conference prior to commencement of the Work at the Project site and prepare and distribute minutes. Donohue's project manager shall also attend a total of six (6) Construction Pay/Progress Meetings over the course of the 24-month construction duration from Notice-To-Proceed to Substantial Completion. It is understood that, as per the Construction Contract, the Construction Contractor shall conduct the progress meetings and prepare the agenda for the meetings. Donohue is to prepare and distribute minutes for Pre-Construction Conference, and Construction Contractor is to prepare and distribute all progress meeting minutes. Owner will review said minutes for accuracy.
- 1.3 *Visits to Site and Observation of Construction.* Perform the following services in connection with observations of the Construction Contractor's work-in-progress:
 - 1.3.1 Donohue will provide to the project a Resident Project Representative (RPR) who will make visits to the Project Site at intervals and frequencies as described herein, as appropriate for the various stages of construction in order to observe the progress and quality of the Work. Such visits and observations by Donohue are not intended to be exhaustive or to extend to every aspect of a Construction Contractor's work-in-progress or to involve detailed inspections of a Construction Contractor's work-in-progress

beyond the responsibilities specifically assigned to Donohue in this Agreement and the Contract Documents, but rather are to be limited to spot checking, selective sampling, and similar methods of general observation of the work based on Donohue's exercise of professional judgment.

Based on information obtained during such visits and observations, Donohue will determine in general if the Construction Contractor's work is proceeding in accordance with the Contract Documents, and Donohue shall keep the Owner informed of the progress of the construction work. The Contract Document requires that the Construction Contractor be responsible for staking and layout of the work to be constructed. Therefore, it is agreed that Donohue's observation services specified herein do not include staking or layout of the work to be constructed. However, Donohue will provide to the Construction Contractor the coordinate points, benchmarks and control points used to design the Work, which is so stated in the Project Manual

- 1.3.2 Under the fee prescribed for in this Agreement, Donohue's RPR will provide a limited level of construction observation efforts. To this end, Donohue will provide up to **148 hours of observation work**, including travel time and vehicle expense to and from the site within the overall 24-month Construction Contract duration.
- 1.3.3 The purpose of Donohue's visits to the Site will be to enable Donohue to provide the Owner a greater degree of confidence that the completed work is in general conformance with the Contract Documents and that the integrity of the design concept of the completed Project, as functioning as a whole system. Donohue's RPR will not have authority over or responsibility for supervising the Construction Contractor's workers or the Owner's staff. Donohue's RPR will not, during such visits or as result of such observations of the work supervise, direct, or have control over any Construction Contractor's work, nor shall Donohue have authority over or responsibility for the means, methods, techniques, sequences or procedures of construction selected by any Construction Contractor, for safety precautions and programs incident to the Construction Contractor's work or for any failure of any Construction Contractor to comply with laws and regulations applicable to Construction Contractor's furnishing and performing the work. However, Donohue will quickly report its observations to the Owner when it observes a situation at the construction site that is an obvious and apparent imminent safety concern, a dangerous situation, or a safety threat. Donohue does not guarantee the performance of any Construction Contractor nor assume the responsibility for any Construction Contractor's failure.
- 1.4 *Defective Work.* Donohue will recommend to Owner whether a Construction Contractor's work be disapproved and rejected while it is in progress if, on the basis of such observations, Donohue believes that such work will not produce a completed Project that conforms generally to the Contract Documents or that it will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated in the Contract Documents.

- 1.5 *Clarifications and Interpretations and Field Orders.* Donohue will issue within a reasonable time period, upon Construction Contractor's written Request for Information (RFI) for the Construction Contract, the necessary clarifications and interpretations of the Contract Documents as appropriate to the orderly completion of each Construction Contractor's work. Such clarifications and interpretations will be consistent with the intent of and interpretations reasonably inferable from the Contract Documents. Donohue may also issue Field Orders authorizing minor variations from the requirements of the Contract Documents, which the Owner and Construction Contractor agree do not affect contract time of completion or the value of work. Donohue will respond to RFI's and Field Orders to the Owner's project manager at the same time that said documents are issued to the Construction Contractor. It is assumed there will be no more than 30 RFI's.
- 1.6 *Change Orders and Work Change Directives.* For the Construction Contract, Donohue will recommend Change Orders and Work Change Directives to the Owner, as appropriate, and prepare Change Orders and Work Change Directives as required. Donohue will prepare support documentation related to said Change Orders and Work Change Directives and furnish change order documents to the Owner in advance of its regular month meetings.
- 1.7 *Shop Drawings and Samples.* Donohue will complete a technical review of shop drawings, product literature, and other submittals for the project's structural systems, electrical, process equipment, SCADA system components, piping systems, and other required items to determine general conformance to the design intent of the project's plans and specifications. It is assumed there will be no more than 20 shop drawings.
- 1.8 *Substitutes and "or-equal."* Donohue will evaluate Construction Contractor's substitution requests for determination of acceptability. Donohue will forward its evaluation of acceptability to Owner for action and Donohue will forward Owner's determination of acceptability to the Construction Contractor.
- 1.9 *Applications for Payment.* Donohue will review the Construction Contractor's application for Payment and accompanying supporting documentation. Such recommendations of payment will be in writing and will constitute Donohue's representation to Owner that, to the best of Donohue's knowledge, information and belief that the Construction Contractor's work has progressed to the point indicated and the quality of such work is generally in accordance with the Contract Documents.
- 1.10 *Startup Services.* Provide start-up assistance to Owner, for initial start-up of the Ft Jesse Generator and Electrical improvements. Start-Up assistance is limited to 22 hours including trips to the site.
- 1.11 *Substantial Completion.* Promptly after notice from Construction Contractor that he or she considers the entire work ready for its intended use, in company with the Owner and Construction Contractor, Donohue shall conduct a visit to the site to determine if the work is Substantially Complete. If after considering any objections of the Owner, Donohue considers the work to be Substantially Complete; Donohue shall deliver a Certificate of Substantial Completion to the Owner and the respective Construction Contractor.

- 1.12 *Record Documents.* Receive and review annotated "red-lined" record documents for the City's Construction Contract. These annotated record documents are to be assembled by the Construction Contractor in accordance with the Contract Documents to obtain final payment. Prepare Record Drawings showing appropriate record information based on the Project annotated record documents received from the Construction Contractor. Donohue will forward to the Owner the completed Record Drawing deliverables in the form of AutoCAD files and three 11" x 17" size printed-paper sets. Donohue takes no responsibility for the quality, thoroughness, and accuracy of the "red-lined" record documents provided by the Construction Contractor.

C. PROJECT TIMING

Donohue shall be authorized to commence the services as set forth herein upon execution of this Agreement. Construction related services will be rendered as dictated by the construction activities as they progress based upon twenty-four (24) months of construction duration, which is from Notice To Proceed to Substantial Completion.

PART II OWNER RESPONSIBILITIES

- A. In addition to other responsibilities of Owner set forth in this Agreement, Owner shall:
1. Identify a person authorized to act as the Owner's representative to respond to questions and make decisions on behalf of Owner, accept completed documents, approve payments to Donohue, and serve as liaison with Donohue as necessary for Donohue to complete its Services.
 2. Furnish to Donohue copies of existing documents and data pertinent to Donohue's Scope of Services, including but not limited to and where applicable: design and record drawings for existing facilities, surveys, geotechnical and environmental studies, or assessments.
 3. Provide to Donohue existing information regarding the existence and locations of utilities and other underground facilities.
 4. Provide Donohue safe access to premises necessary for Donohue to provide the Services.

PART III COMPENSATION, BILLING AND PAYMENT

- A. Compensation for the work as defined in the Scope of Services (Part I) of this Agreement shall be in accordance with Donohue's standard chargeout rates in effect at the time the Services are performed. Routine expenses will be billed at cost and subconsultant costs will include a 10% markup. The total cost for these basic Services will not exceed \$76,800 without prior written approval from Owner.

- B. Donohue will bill Owner monthly, with net payment due in 30 days.
- C. Donohue will notify Owner if Project scope changes require modifications to the above-stated contract value. Services relative to scope changes will not be initiated without authorization from Owner.

Ft Jesse Electrical Rehab - Construction Phase Services
City of Bloomington, Illinois
2022 Fee Estimate Summary
Donohue & Associates

IDOT OH Rate 1.4794 14 500%

PM Elect Civil Struct

Task Description	ENG VIII	ENG VI	ENG III	ENG V	Total Hours	Total Direct Labor	IHDC	SBO	O' Hxdl	FF	Total Cost	Subtotals	
Construction Phase Services													
301 Construction Admin's ration	32	12			44	\$ 3 661	\$ 750		\$ 5 415 91	\$ 1 425	\$ 11,252		
302 RFI's	6	16	4	4	30	\$ 2 091			\$ 3 093 66	\$ 752	\$ 5,937		
303 Shop Drawings	6	52	10	10	78	\$ 5,242			\$ 7 755 37	\$ 1,885	\$ 14,882		
304 Construction Observation	12	68	60	8	148	\$ 9 542	\$ 1 850		\$ 14,116.20	\$ 3,699	\$ 29,207		
305 Startup Assistance	4	18			22	\$ 1 578			\$ 2 334 43	\$ 567	\$ 4,480		
306 Record Drawings	2	18	4	4	28	\$ 1,871			\$ 2 768 25	\$ 673	\$ 5,312		
307 Change Order Preparation	8	12	4	4	28	\$ 1 997			\$ 2 955 01	\$ 718	\$ 5 671		
Total	70	196	82	30	378	\$ 25 983	\$ 2 600	\$ -	\$ 38 439	\$ 9 718	\$ 76,740	\$ 76,740	
Total Direct Labor Dollars by Staff	\$ 6 226	\$ 13 308	\$ 4 597	\$ 1 852							TOTAL	\$ 76,800	



CONSENT AGENDA ITEM NO. 7.H

FOR COUNCIL: November 14, 2022

WARD IMPACTED: City-Wide Impact

SUBJECT: Consideration and action on an Ordinance Amending the Budget Ordinance for the Fiscal Year Ending April 30, 2023, to increase the Community Development Block Grant (CDBG) budget by \$159,584.00, as requested by the Economic & Community Development Department.

RECOMMENDED MOTION: The proposed Ordinance be approved.

STRATEGIC PLAN LINK:

Goal 4. Strong Neighborhoods

STRATEGIC PLAN SIGNIFICANCE:

Objective 4b. Upgraded quality of older housing stock

BACKGROUND: As an entitlement community, the City is eligible for funding from the United States Department of Housing and Urban Development (HUD) for the provision of the Community Development Block Grant (CDBG) program. In recent years, HUD has not notified the City of its annual allocation until after the City's annual budget is approved. Therefore, the budget that staff develops each year is based on estimates using average allocations from previous fiscal years and current federal budget information. For FY2023, the City annual allocation from HUD was \$535,422, which is \$19,939 less than the previous year.

Unspent funds from previous annual allocations are known as carry-forward funds. Carry-forward funds result from a variety of factors such as projects coming under budget, or the number of activities completed being lower than estimates. The City typically carries some carry-forward funding so expenses can be paid if costs occur before HUD has not released the annual allocation to the City. Due to COVID-19 Pandemic related CDBG project delays, the City has a larger amount of carry-forward funds than we would typically carry. Thus, the City is planning to spend more than our annual allocation in this program year (and future program years) to reduce the carry-forward amount to normal levels. This ordinance reflects the HUD approved Annual Action Plan spending levels for this fiscal year.

COMMUNITY GROUPS/INTERESTED PERSONS CONTACTED:

These funds were included in the Program Year 2022 (May 1, 2022-April 30, 2023) Annual Action Plan, which was available for public review and comment from May 6, 2022 through June 9, 2022. A public hearing was held on May 9, 2022. Significant public outreach was conducted throughout the development process for the 2020-2024 CDBG Consolidated Plan, which includes the Program Year 2022 Annual Action Plan.

FINANCIAL IMPACT: If this amendment is approved, revenues will increase in direct relation to expenditures by \$159,584 resulting in a "net zero" financial impact to the City's General Fund. Failure to approve the FY 2023 Budget Amendment request will result in the loss of

use of \$159,584 in federal funding. See the "Exhibit" for specific detail on the accounts be adjusted.

AMERICAN RESCUE PLAN FUNDING IMPACT: N/A

COMMUNITY DEVELOPMENT IMPACT: This request meets the following goals and objectives of the **Bloomington Comprehensive Plan 2035**: Goal N-1.2: Prioritize, with urgency, the revitalization of the neighborhoods in the Regeneration Area, Objective a: City should continue to use CDBG grants to support partner organizations such as the West Bloomington Revitalization Project to have a collective impact on revitalization; Goal H-1.2: Ensure an adequate supply of affordable housing for low to moderate income households, Objective H-1.2b: Work with community partners like Habitat for Humanity, MCCA and Bloomington Housing Authority to have a collective impact on affordable housing issues; Goal H-1.3: Create a life-long community by fostering housing stock that meets the needs of residents of all ages and abilities, Objective H-1.3e: Ensure neighborhoods are walkable and have access to alternative modes of transportation and other amenities to make them attractive to aging populations; Goal H-2.3: Rehabilitate housing in the designated Regeneration Area, Objective H-2.3b: Develop and maintain programs that identify substandard housing and provide a wide spectrum of options to correct housing code violations/Objective H-2.3h: Carefully evaluate the rehabilitation potential of vacant/abandoned homes before demolition; Goal HL-1.2 Protect, enhance and maintain parks and green space equitably throughout the City, Objective HL-1.2b: Update older equipment in various City parks as identified in the City's Parks Plan; Goal CWB-1: End chronic homelessness and reduce the severity of situational homelessness, Objective a: The City of Bloomington should actively partner with groups such as McLean County Continuum of Care and Human Service Council to address factors contributing to homelessness; Goal TAQ-1.4: Pedestrian safety for users of all transportation facilities, Objective TAQ-1.4b: Provide a sidewalk system that provides safe routes to schools/Objective TAQ-1.4c: Provide pedestrians with safe access throughout the transportation network, facilitating access to facilities such as transit, businesses, parks and neighborhood centers.

Respectfully submitted for consideration.

Prepared by: William Bessler, Grant Coordinator

ATTACHMENTS:

[E&CD 1A HUD Award Letter](#)

[E&CD 1B Budget Ordinance](#)

[E&CD 1C CDBG FY2023 Budget Amendment Exhibit](#)

Funding Approval/Agreement

Title I of the Housing and Community
Development Act (Public Law 930383)
HI-00515R of 20515R

U.S. Department of Housing and Urban Development

Office of Community Planning and Development
Community Development Block Grant Program

OMB Approval No. 2506-0193
exp 1/31/2025

1. Name of Grantee (as shown in item 5 of Standard Form 424) Bloomington	3a. Grantee's 9-digit Tax ID Number 376001563	3b. Grantee's 9-digit DUNS Number KYUDEBKLLFW5 (UEI)
2. Grantee's Complete Address (as shown in item 5 of Standard Form 424) 109 East Olive Street PO Box 3157 Bloomington, IL 61702-3157	4. Date use of funds may begin 05/01/2022	
	5a. Project/Grant No. 1 B-22-MC-17-0004	6a. Amount Approved \$535,422
	5b. Project/Grant No. 2	6b. Amount Approved

Grant Agreement: This Grant Agreement between the Department of Housing and Urban Development (HUD) and the above named Grantee is made pursuant to the authority of Title I of the Housing and Community Development Act of 1974, as amended, (42 USC 5301 et seq.). The Grantee's submissions for Title I assistance, the HUD regulations at 24 CFR Part 570 (as now in effect and as may be amended from time to time), and this Funding Approval, including any special conditions, constitute part of the Agreement. Subject to the provisions of this Grant Agreement, HUD will make the funding assistance specified here available to the Grantee upon execution of the Agreement by the parties. The funding assistance specified in the Funding Approval may be used to pay costs incurred after the date specified in item 4 above provided the activities to which such costs are related are carried out in compliance with all applicable requirements. Pre-agreement costs may not be paid with funding assistance specified here unless they are authorized in HUD regulations or approved by waiver and listed in the special conditions to the Funding Approval. The Grantee agrees to assume all of the responsibilities for environmental review, decision making, and actions, as specified and required in regulations issued by the Secretary pursuant to Section 104(g) of Title I and published in 24 CFR Part 58. The Grantee further acknowledges its responsibility for adherence to the Agreement by sub-recipient entities to which it makes funding assistance hereunder available.

U.S. Department of Housing and Urban Development (By Name) Donald G. Kathan		Grantee Name (Contractual Organization) Bloomington (Bloomington Ha)	
Title CPD Director		Title Mayor	
Signature DONALD KATHAN x	Digitally signed by: DONALD KATHAN DN: CN = DONALD KATHAN C = US O = U. S. Government OU = Department of Housing and Urban Development, Office of Community Planning and Development Date: 2022.09.07 19:07:32 -05'00'	Signature x <i>Moise Murbauer</i>	Date (mm/dd/yyyy) 9/8/2022 4:47 PM

7. Category of Title I Assistance for this Funding Action: Entitlement, Sec 106(b)	8. Special Conditions (check one) ☐ None ☒ Attached	9a. Date HUD Received Submission (mm/dd/yyyy)	10. check one ☒ a. Orig. Funding Approval ☐ b. Amendment Amendment Number
		9b. Date Grantee Notified (mm/dd/yyyy)	
		9c. Date of Start of Program Year 5/1/2022	
11. Amount of Community Development Block Grant			
a. Funds Reserved for this Grantee		FY 2022	
b. Funds now being Approved		\$535,422	
c. Reservation to be Cancelled (11a minus 11b)			

12a. Amount of Loan Guarantee Commitment now being Approved N/A	12b. Name and complete Address of Public Agency
Loan Guarantee Acceptance Provisions for Designated Agencies: The public agency hereby accepts the Grant Agreement executed by the Department of Housing and Urban Development on the above date with respect to the above grant number(s) as Grantee designated to receive loan guarantee assistance, and agrees to comply with the terms and conditions of the Agreement, applicable regulations, and other requirements of HUD now or hereafter in effect, pertaining to the assistance provided it.	12c. Name of Authorized Official for Designated Public Agency
	Title
	Signature x _____

HUD Accounting use Only

Batch	TAC	Program	Y	A	Reg	Area	Document No.	Project Number	Category	Amount	Effective Date (mm/dd/yyyy)	F
	1 5 3											
	1 7 6											
			Y					Project Number		Amount		
			Y					Project Number		Amount		

Date Entered PAS (mm/dd/yyyy)	Date Entered LOCCS (mm/dd/yyyy)	Batch Number	Transaction Code	Entered By	Verified By
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8. Special Conditions.

- (a) The period of performance and single budget period for the funding assistance specified in the Funding Approval (“Funding Assistance”) shall each begin on the date specified in item 4 and shall each end on September 1, 2029. The Grantee shall not incur any obligations to be paid with such assistance after September 1, 2029.
- (b) The Recipient shall attach a schedule of its indirect cost rate(s) in the format set forth below to the executed Agreement that is returned to HUD. The Recipient shall provide HUD with a revised schedule when any change is made to the rate(s) described in the schedule. The schedule and any revisions HUD receives from the Recipient shall be incorporated herein and made a part of this Agreement, provided that the rate(s) described comply with 2 CFR part 200, subpart E.

<u>Administering Department/Agency</u>	<u>Indirect cost rate</u>	<u>Direct Cost Base</u>
_____	_____ %	_____
_____	_____ %	_____
_____	_____ %	_____
_____	_____ %	_____
_____	_____ %	_____

Instructions: The Recipient must identify each agency or department of the Recipient that will carry out activities under the grant, the indirect cost rate applicable to each department/agency (including if the de minimis rate is used per 2 CFR §200.414(f)), and the type of direct cost base to which the rate will be applied (for example, Modified Total Direct Costs (MTDC)). Do not include indirect cost rates for subrecipients.

- (c) In addition to the conditions contained on form HUD 7082, the grantee shall comply with requirements established by the Office of Management and Budget (OMB) concerning the Dun and Bradstreet Data Universal Numbering System (DUNS); the System for Award Management (SAM.gov.); the Federal Funding Accountability and Transparency Act as provided in 2 CFR part 25, Universal Identifier and General Contractor Registration; and 2 CFR part 170, Reporting Subaward and Executive Compensation Information.
- (d) The grantee shall ensure that no CDBG funds are used to support any Federal, State, or local projects that seek to use the power of eminent domain, unless eminent domain is employed only for a public use. For the purposes of this requirement, public use shall not be construed to include economic development that primarily benefits private entities. Any use of funds for mass transit, railroad, airport, seaport or highway projects as well as utility projects which benefit or serve the general public (including energy-related, communication-related, water- related and wastewater-related infrastructure), other structures

designated for use by the general public or which have other common-carrier or public-utility functions that serve the general public and are subject to regulation and oversight by the government, and projects for the removal of an immediate threat to public health and safety or brownfield as defined in the Small Business Liability Relief and Brownfields Revitalization Act (Public Law 107–118) shall be considered a public use for purposes of eminent domain.

- (e) The Grantee or unit of general local government that directly or indirectly receives CDBG funds may not sell, trade, or otherwise transfer all or any such portion of such funds to another such entity in exchange for any other funds, credits or non-Federal considerations, but must use such funds for activities eligible under title I of the Act.
- (f) E.O. 12372-Special Contract Condition - Notwithstanding any other provision of this agreement, no funds provided under this agreement may be obligated or expended for the planning or construction of water or sewer facilities until receipt of written notification from HUD of the release of funds on completion of the review procedures required under Executive Order (E.O.) 12372, Intergovernmental Review of Federal Programs, and HUD's implementing regulations at 24 CFR Part 52. The recipient shall also complete the review procedures required under E.O. 12372 and 24 CFR Part 52 and receive written notification from HUD of the release of funds before obligating or expending any funds provided under this agreement for any new or revised activity for the planning or construction of water or sewer facilities not previously reviewed under E.O. 12372 and implementing regulations.
- (g) CDBG funds may not be provided to a for-profit entity pursuant to section 105(a)(17) of the Act unless such activity or project has been evaluated and selected in accordance with Appendix A to 24 CFR 570 - “Guidelines and Objectives for Evaluating Project Costs and Financial Requirements.” (Source - P.L. 113-235, Consolidated and Further Continuing Appropriations Act, 2015, Division K, Title II, Community Development Fund).

ORDINANCE NO. 2022 - ____

AN ORDINANCE AMENDING THE BUDGET ORDINANCE
FOR THE FISCAL YEAR ENDING APRIL 30, 2023

WHEREAS, on April 11, 2022 by Ordinance Number 2022-26, the City of Bloomington passed a Budget and Appropriation Ordinance for the Fiscal Year Beginning May 1, 2022 and Ending April 30, 2023, City of Bloomington, which Ordinance was approved by Mayor Mboka Mwilambwe on April 13, 2022; and

WHEREAS, a Budget Amendment is needed amending the Fiscal Year 2023 Budget, in the amount of \$159,584.00, to increase the budget for the Community Development Block Grant Budget, as requested by the Economic and Community Development Department.

NOW, THEREFORE, BE IT ORDAINED BY THE City Council of the City of Bloomington, McLean County, Illinois, as follows:

Section One: Ordinance Number 2022-26 (the Budget and Appropriation Ordinance for the Fiscal Year Ending April 30, 2023) is further hereby amended by inserting the following line items and amount presented in the Exhibit and in the appropriate place in said Ordinances.

Section Two: Except as provided for herein, Ordinance Number 2022-26 shall remain in full force and effect, provided, that any budgeted or appropriated amounts which are changed by reason of the amendments made in Section One of this Ordinance shall be amended in Ordinance Number 2022-26.

Section Three: This Ordinance shall be in full force and effect upon its passage and approval and publication as required by law.

PASSED this ____ day of November 2022.

APPROVED this ____ day of November 2022.

CITY OF BLOOMINGTON

ATTEST

Mboka Mwilambwe, Mayor

Leslie Smith-Yocum, City Clerk

FY 2023 Budget Amendment-Exhibit

Account #	Fund	Account Description	Amount	Comments
22402450-79130-53000	Community Development	CD COMM SVC GRANTS-PUB SVC	\$ 500.00	
22402430-79130-51000	Community Development	CD REHAB GRANTS	\$ 44,064.00	
22402440-72560-52000	Community Development	CD CAP IMP Sidewalk Const and Im	\$ 85,120.00	
22402440-79130-52000	Community Development	CD CAP IMP Grants	\$ 30,000.00	
22402410-70631-50000	Community Development	CD ADMIN Membership Dues	\$ (100.00)	
22402410-53110-51000	Community Development	CD REHAB Federal Grants	\$ (102,507.00)	
22402410-53110-52000	Community Development	CD Federal Grants Cap Imp	\$ (110,081.00)	
22402410-53110-53000	Community Development	CD Federal Grants Community Sv	\$ 72,704.00	
22402410-53110-50000	Community Development	CD Federal Grants Gen Admin	\$ (19,700.00)	
Net Transaction:			\$ -	



CONSENT AGENDA ITEM NO. 7.I

FOR COUNCIL: November 14, 2022

WARD IMPACTED: Ward 2

SUBJECT: Consideration and action on an Ordinance Approving the Final Plat of The Villas at Prairie Vista P.U.D. (Planned Unit Development), as requested by the Public Works Department.

RECOMMENDED MOTION: The proposed Ordinance be approved.

STRATEGIC PLAN LINK:

Goal 5. Great Place - Livable, Sustainable City

STRATEGIC PLAN SIGNIFICANCE:

Objective 5a. Well-planned City with necessary services and infrastructure

Objective 5b. City decisions consistent with plans and policies

BACKGROUND: The proposed plat is to prepare the property for a development to be constructed on the property described by the final plat.

This Planned Unit Development (PUD) residential subdivision is located east of US 51/South Main Street and south of Southgate Drive. The Final Plat is generally in conformance with the Preliminary Development Plan approved by Council on March 22, 2021. The proposed final plat vacates easements previously granted by Document 2006-00032000. Signoffs from the various utility companies are attached. Existing private utilities will be relocated at the expense of the developer per previous easement vacation documents (Ordinance 2021 - 41; documents attached). There are no tap-on fees due for this subdivision.

The proposed final plat consists of one lot. The existing Parcel Identification Numbers (PINs) for the property are 21-16-405-002, 21-16-405-003, 21-16-451-009, 21-16-451-024, 21-16-451-025, and 21-16-451-027.

The zoning in this area is C-1, Office District. Approval of this final plat will facilitate construction of Single-Family Attached Homes (48 Dwelling Units). The proposed use is permitted via a PUD and Special Use (Ordinance 2021 - 20). The final plat complies with City engineering standards (Manual of Practice and Chapter 24 of City Code). City staff has no objections to the plat.

COMMUNITY GROUPS/INTERESTED PERSONS CONTACTED: The Villas at Prairie Vista, Limited Partnership.

FINANCIAL IMPACT: The Villas at Prairie Vista, Limited Partnership paid all survey and plat costs. Sureties are due as part of this development. See tap-on/surety attachment for additional information. Approval of the Final Plat will facilitate the construction of new residential housing. This could result in additional property tax revenues for the City.

AMERICAN RESCUE PLAN FUNDING IMPACT: N/A

COMMUNITY DEVELOPMENT IMPACT: This request meets the following goals and objectives of the Bloomington Comprehensive Plan 2035: Goal, H-1. Ensure the availability of safe, attractive and high-quality housing stock to meet the needs of all current and future residents of Bloomington. Objective, H-1.1 Ensure that the housing to accommodate the new growth is a broad range (of types, sizes, ages, densities, tenancies and costs) equitably distributed throughout the City recognizing changing trends in age-group composition, income, and family living habits. Objective UEW-1.2b Prioritize new development where City services are available or can be extended efficiently and economically.

Respectfully submitted for consideration.

Prepared by: Steven Law, Civil Engineer II

ATTACHMENTS:

[PW 1B Ordinance](#)

[PW 1C Final Plat](#)

[PW 1D Owners Petition](#)

[PW 1E County Clerks Certificate 11142022](#)

[PW 1F Owners Certificate 11142022](#)

[PW 1G School District Certificate 11142022](#)

[PW 1H Final Plat Checklist 11142022](#)

[PW 1I Final Plat Map 11142022](#)

[PW 1J Tap On Memo 11142022](#)

[PW 1K Drainage Statement 11142022](#)

[PW 1L Utility Letters 11142022](#)

[PW 1M Ordinance 2021-41 11142022](#)

ORDINANCE NO. 2022 - _____

AN ORDINANCE APPROVING THE FINAL PLAT OF
THE VILLAS AT PRAIRIE VISTA P.U.D.

WHEREAS, there was heretofore filed with the City Clerk of the City of Bloomington, McLean County, Illinois, a Petition for approval of the Final Plat of The Villas at Prairie Vista P.U.D. dated October 30, 2022, legally described in Exhibit A attached hereto and made a part hereof by this reference; and

WHEREAS, said Petition requests no exemptions or variations from the provisions of the Bloomington City Code; and

WHEREAS, said Petition is valid and sufficient and conforms to the requirements of the statutes in such cases made and provided and the Final Plat attached to said Petition was prepared in compliance with the requirements of the Bloomington City Code;

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF BLOOMINGTON, MCLEAN COUNTY, ILLINOIS:

SECTION 1. The above recitals are incorporated into and made a part of this Ordinance as though fully set forth herein.

SECTION 2. The Final Plat of The Villas at Prairie Vista P.U.D. dated October 30, 2022, is hereby approved. However, the Final Plat shall not be recorded until the City receives the Performance Guarantee for public improvements in the amount of \$503,787.90. If the City does not receive the Performance Guarantee within 90 days of passage, or title to the property is not transferred to the Villas at Prairie Vista, Limited Partnership within said timeframe, this approval shall become null and void in accordance with Section 24-305 of the City Code.

SECTION 3. This Ordinance is enacted pursuant to the home rule authority of the City of Bloomington granted by Article 7, Section 6 of the 1970 Illinois Constitution.

SECTION 4. The City Clerk is hereby authorized to publish this Ordinance in pamphlet form as provided by law.

SECTION 5. This Ordinance shall be effective immediately after its approval and publication as required by law.

PASSED this 14th day of November 2022.

APPROVED this _____ day of November 2022.

CITY OF BLOOMINGTON

ATTEST

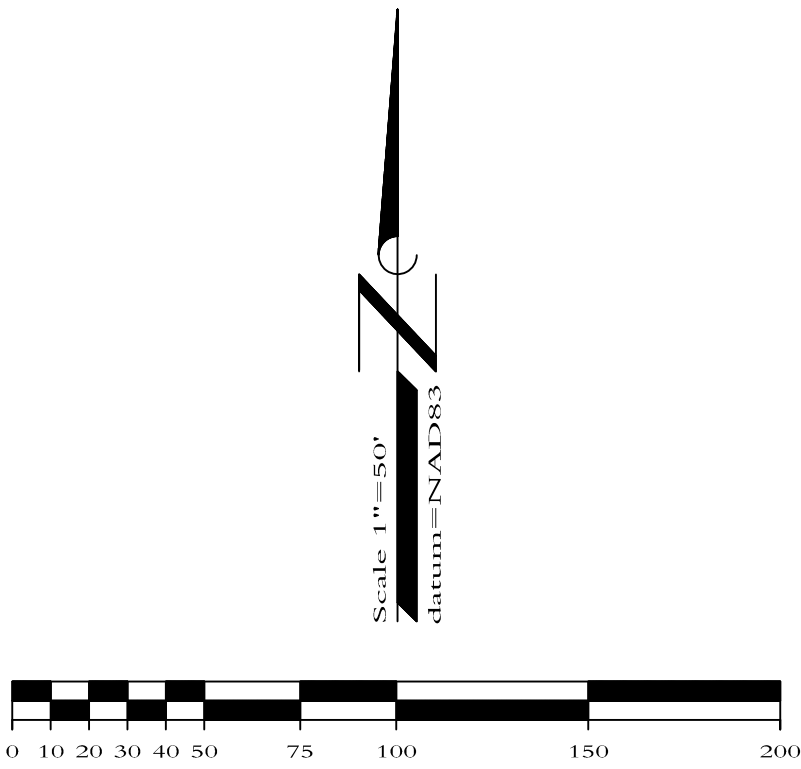
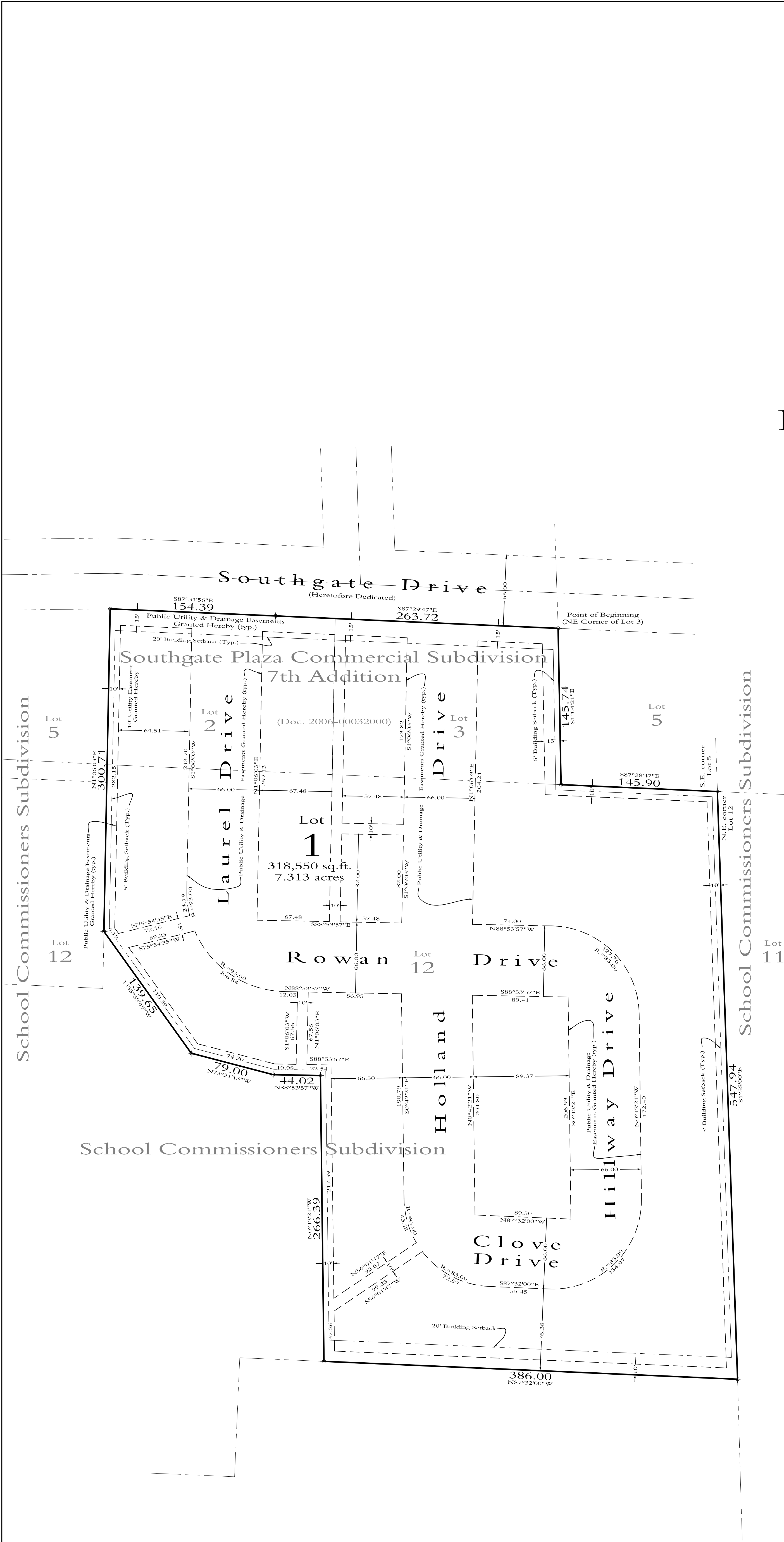
Mboka Mwilambwe, Mayor

Leslie Smith-Yocum, City Clerk

EXHIBIT A

Description of Property

Lots 2 and 3 in Seventh Addition to Southgate Commercial Plaza Subdivision, and a part of Lot 12 in School Commissioners Subdivision, all in the SE¼ of Section 16, Township 23 North, Range 2 East of the Third Principal Meridian, City of Bloomington, McLean County, Illinois, more particularly described as follows: Beginning at the northeast corner of Lot 3 in Seventh Addition to Southgate Commercial Plaza Subdivision according to the Plat thereof recorded as Document No. 2006-32000 in the McLean County Recorder of Deeds Office; thence S1°04'21"E, 145.74 feet to the southeast corner of said Lot 3, on the north line of Lot 12 in School Commissioners Subdivision; thence S87°28'47"E, 145.90 feet to the northeast corner of said Lot 12; thence S1°58'00"E, 547.94 feet on the east line of said Lot 12; thence N87°32'00"W, 386.00 feet to the point of intersection with the southerly extension of an existing fence; thence N0°42'21"W, 266.39 feet along the southerly extension of said fence and the northerly extension thereof; thence N88°53'57"W, 44.02 feet; thence N75°21'13"W, 79.00 feet; thence N35°39'45"W, 139.65 feet to the point of intersection with the southerly extension of the west line of Lot 2 in said Seventh Addition to Southgate Commercial Plaza Subdivision; thence N1°06'03"E, 300.71 feet to the northwest corner of said Lot 2; thence S87°31'56"E, 154.39 feet on the north line of said Lot 2; thence S87°29'47"E, 263.72 feet to the Point of Beginning.



Plat
of
The Villas
at
Prairie Vista P.U.D.

Being a resubdivision of part of the Southeast Quarter of Section 16,
Township 23 North, Range 2 East of the Third Principal
Meridian in the City of Bloomington, McLean County, Illinois.



- P.I.N.s
- 21-16-405-002
 - 21-16-405-003
 - 21-16-451-009
 - 21-16-451-024
 - 21-16-451-025
 - 21-16-451-027

Public Utility and Drainage Easement Declaration

A permanent, non-exclusive easement is hereby reserved for and granted to the City of Bloomington, Illinois, Ameren, and other public utilities now holding or in the future receiving a franchise from the City of Bloomington and their respective successors and assigns ("Grantee," "Grantees") under, upon and across the areas shown on the annexed Plat "Public Utility and Drainage Easements Granted Hereby" ("Easement Premises") to construct, install, reconstruct, repair, remove, replace, inspect, maintain and operate transmission and distribution systems and appurtenances on and under the surface of the Easement Premises, including without limitation for water, sanitary sewers, electronic communication systems, natural gas supply systems and electricity supply systems together with the right of access for all personnel and equipment necessary and required for all such uses and purposes and together with the right to install all required subsurface service connections.

Grantees are hereby granted the right to cut, trim or remove any trees, shrubs or other plantings within the Easement Premises which interfere with the exercise of any rights herein granted. No permanent buildings, structures or other obstructions shall be placed within the Easement Premises, but such areas may be used for landscaping, plantings, paved surfaces or other related uses that do not unreasonably interfere with the rights herein granted.

The occupation and use of the Easement Premises by any Grantee in the exercise of the rights herein granted shall be performed in such a manner as not to preclude or interfere with the occupation and use of the Easement Premises by any other Grantee in exercise of the rights herein granted. The crossing and re-crossing of the Easement Premises by Grantees with installations shall be performed in such a manner as to not interfere with, damage or disturb any other installations placed within the Easement Premises by any other Grantee pursuant to the rights herein granted. No occupation or use of the Easement Premises by any Grantee pursuant to the rights herein granted shall cause any change in grade or impair or change the surface drainage patterns which obtain at the commencement of such occupation or use.

Following any work by Grantees, Grantees shall restore the surface area which was disturbed or damaged, including the restoration, repair or replacement of pavement, curbs, gutters, plantings and landscaping. Grantees shall, following any such work, backfill and mound all trenches created so as to retain suitable drainage and to remove all excess debris and spoil and to leave the work area in a clean and workmanlike condition

Notes:

Lands delimited and labeled herein as Laurel Drive, Holland Drive, Rowan Drive, Hillway Drive and Clover Drive are for private ingress/egress and are not public rights-of-way.

All utility easement rights that may be construed to have been granted to the City of Bloomington, McLean County Illinois by Document 2006-00032000 are hereby extinguished.

Plat of Resubdivision

Prepared for:
Domera Development LLC



Craig R. Knoche & Associates
Civil Engineers, P.C.
Registered Design Firm 3763
24 North Bennett Street • Geneva, Illinois 60134 • phone (630) 845-1270 • fax (630) 845-1275

- Civil Engineers
- Surveyors
- Land Planners

Date:	11-4-2022
File:	22-028RP9
Job:	22-028

Sheet	1
of	2

Plat
of
The Villas
at
Prairie Vista P.U.D.

Surveyor's Certificate

State of Illinois }
County of DuPage } S.S.

This is to certify that I, John Cole Helfrich, an Illinois Professional Land Surveyor, have surveyed, resubdivided and platted as The Villas at Prairie Vista P.U.D. for the uses and purposes therein set forth the following described lands:

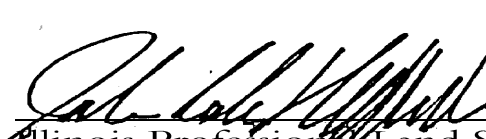
Lots 2 and 3 in Seventh Addition to Southgate Commercial Plaza Subdivision, and a part of Lot 12 in School Commissioners Subdivision, all in the SE¼ of Section 16, Township 23 North, Range 2 East of the Third Principal Meridian, City of Bloomington, McLean County, Illinois, more particularly described as follows: Beginning at the northeast corner of Lot 3 in Seventh Addition to Southgate Commercial Plaza Subdivision according to the Plat thereof recorded as Document No. 2006-32000 in the McLean County Recorder of Deeds Office; thence S1°04'21" E, 145.74 feet to the southeast corner of said Lot 3, on the north line of Lot 12 in School Commissioners Subdivision; thence S87°28'47" E, 145.90 feet to the northeast corner of said Lot 12; thence S1°58'00" E, 547.94 feet on the east line of said Lot 12; thence N87°32'00" W, 386.00 feet to the point of intersection with the southerly extension of an existing fence; thence N0°42'21" W, 266.39 feet along the southerly extension of said fence and the northerly extension thereof; thence N88°53'57" W, 44.02 feet; thence N75°21'13" W, 79.00 feet; thence N35°39'45" W, 139.65 feet to the point of intersection with the southerly extension of the west line of Lot 2 in said Seventh Addition to Southgate Commercial Plaza Subdivision; thence N1°06'03" E, 300.71 feet to the northwest corner of said Lot 2; thence S87°31'56" E, 154.39 feet on the north line of said Lot 2; thence S87°29'47" E, 263.72 feet to the Point of Beginning.

I further certify that I have subdivided the same into 1 Lot and further certify that it contains 7.313 acres.

Iron pins identify all lot corners as shown on said plat and all measurements are given in feet and decimals thereof and are correct at 68° Fahrenheit.

I further certify that the lands described above do not fall in a designated Flood Hazard Area as defined by the Federal Emergency Management Agency.

Given under my Hand and Seal this 30th day of October, A.D.2022.



Illinois Professional Land Surveyor 2967
expires 11/30/22



City Engineer's Certificate

State of Illinois }
County of McLean } S.S.

I, Craig Shonkwiler, City Engineer for the City of Bloomington, hereby certify that the land improvements described in the annexed plat and the plans and specifications therefor meet the minimum requirements for said City of Bloomington outlined in Chapter 24 of the Bloomington City code.

Dated at Bloomington, Illinois, this _____ day of _____, 2022.

Craig Shonkwiler
City Engineer
Bloomington, Illinois

City Clerk's Certificate

State of Illinois }
County of McLean } S.S.

I, Leslie Smith-Yocum, City Clerk of the City of Bloomington, Illinois, do hereby certify that the foregoing is a true and complete copy of an original Plat of The Villas at Prairie Vista P.U.D., presented, passed and approved at a regular meeting of said City Council, held on the _____ day of _____, 2022, by an affirmative vote of the majority of all members of said council, the vote having been taken by yeas and nays and entered on the record of the proceedings of said Council.

Witness my hand and seal of said City of Bloomington,
this _____ day of _____, 2022.

City Clerk

Plat of Resubdivision

Prepared for:
Domera Development LLC



Craig R. Knoche & Associates
Civil Engineers, P.C.

Registered Design Firm 3763
24 North Bennett Street • Geneva, Illinois 60134 • phone (630) 845-1270 • fax (630) 845-1275

- Civil Engineers
- Surveyors
- Land Planners

Date: 11-4-2022
File: 22-028RP10
Job: 22-028

Sheet
2
of
2

Petition for Approval of Final Plat

State of Illinois)

County of McLean) S.S.

To: The Honorable Mayor and City Council of the City of Bloomington, McLean County, Illinois:

Now comes Meggann Bell, as Chief Executive Officer of Villas at Prairie Vista GP, Inc., an Illinois corporation, as General Partner of The Villas at Prairie Vista, Limited Partnership, an Illinois limited partnership, hereinafter referred to as your Petitioner respectfully representing and requesting as follows:

1. That your Petitioner is the owner of the freehold or lesser estate therein of the premises hereinafter legally described in Exhibit A, which is attached hereto and made a part hereof by this reference and is the duly authorized agent for all entities having proprietary interest in said premises;
2. That your Petitioner seeks approval of the Final Plat for the subdivision of said premises to be known and described as The Villas of Prairie Vista P.U.D.

Wherefore, your Petitioner respectfully prays that said Final Plat of The Villas of Prairie Vista P.U.D. submitted herewith be approved with the exemptions or variations as requested herein.

Respectfully submitted:

Villas at Prairie Vista GP, Inc., an Illinois corporation,
as General Partner of The Villas at Prairie Vista, Limited
Partnership, An Illinois limited partnership

By: 

Meggann Bell, Chief Executive Officer

Exhibit "A"

Description of subject premises

Lots 2 and 3 in Seventh Addition to Southgate Commercial Plaza Subdivision, and a part of Lot 12 in School Commissioners Subdivision, all in the SE¼ of Section 16, Township 23 North, Range 2 East of the Third Principal Meridian, City of Bloomington, McLean County, Illinois, more particularly described as follows: Beginning at the northeast corner of Lot 3 in Seventh Addition to Southgate Commercial Plaza Subdivision according to the Plat thereof recorded as Document No. 2006-32000 in the McLean County Recorder of Deeds Office; thence S1°04'21"E, 145.74 feet to the southeast corner of said Lot 3, on the north line of Lot 12 in School Commissioners Subdivision; thence S87°28'47"E, 145.90 feet to the northeast corner of said Lot 12; thence S1°58'00"E, 547.94 feet on the east line of said Lot 12; thence N87°32'00"W, 386.00 feet to the point of intersection with the southerly extension of an existing fence; thence N0°42'21"W, 266.39 feet along the southerly extension of said fence and the northerly extension thereof; thence N88°53'57"W, 44.02 feet; thence N75°21'13"W, 79.00 feet; thence N35°39'45"W, 139.65 feet to the point of intersection with the southerly extension of the west line of Lot 2 in said Seventh Addition to Southgate Commercial Plaza Subdivision; thence N1°06'03"E, 300.71 feet to the northwest corner of said Lot 2; thence S87°31'56"E, 154.39 feet on the north line of said Lot 2; thence S87°29'47"E, 263.72 feet to the Point of Beginning.

COUNTY CLERK'S CERTIFICATE

STATE OF ILLINOIS)
) SS.
COUNTY OF McLEAN)

I, Kathy Michael, County Clerk of McLean County, State of Illinois, do hereby certify that I have this day examined the tax records of the property shown on the attached plat and find no delinquent general taxes, unpaid current general taxes, delinquent special assessments, or unpaid current special assessments against the tract of land described in said plat, given under my hand and seal of this County on the 31st day of October 2022.

21-16-405-002
21-16-405-003
21-16-451-009
21-16-451-024
21-16-451-025
21-16-451-027

Kathy Michael

Kathy Michael, County Clerk
McLean County, Illinois

Owner's Certificate

State of Illinois)

County of Sangamon) S.S.

This is to certify that The Villas at Prairie Vista, Limited Partnership, an Illinois limited partnership, is the owner of record of the lands shown and described herein and, as such owner, has caused the same to be platted as The Villas at Prairie Vista P.U.D., a Resubdivision of the City of Bloomington, McLean County, Illinois and is laid out in one Lot by Illinois Professional Land Surveyor John Cole Helfrich, P.L.S. 2967, for the uses and purposes therein set forth and does hereby acknowledge and adopt the same under the style and title thereon shown.

Dated at Springfield, Illinois this 1st day of Nov., A.D.2022.

The Villas at Prairie Vista, Limited Partnership, An Illinois limited partnership

By: Villas at Prairie Vista GP, Inc., an Illinois corporation,
its General Partner

By: _____

Meggan O'Neil

Its Chief Executive Officer

for:

The Villas at Prairie Vista, Limited Partnership
c/o Christian County Integrated Community Services
3028 Happy Landing Drive, Springfield, IL 62711

Notary's Certificate

State of Illinois)

County of Sangamon)S.S.

I, Nancy M Blunk, a notary public in and for the County and State aforesaid do hereby certify that Meggann Bell, Chief Executive Officer of Villas at Prairie Vista GP, Inc., General Partner of The Villas at Prairie Vista, Limited Partnership, who is personally known to me to be the same person whose name is subscribed to the forgoing instrument as such Chief Executive Officer, appeared before me this day in person and acknowledged that they signed and delivered the said instrument as being pursuant to authority given and as their own free and voluntary act and as the free and voluntary act of said corporation as said General Partner for the uses and purposes therein set forth.

Given under my hand and notarial seal this 1st day of Nov, A.D.2022.

[Redacted Signature]

notary public



School District Certificate

State of Illinois)

County of Sangamon) S.S.

This is to certify that The Villas at Prairie Vista, Limited Partnership, an Illinois limited partnership, is the owner of record of the lands shown and described herein and, as such owner, has caused the same to be platted as The Villas at Prairie Vista P.U.D., a Resubdivision of the City of Bloomington, McLean County, Illinois and does hereby certify that the lands platted herein fall within the boundaries of McLean County Unit District No, 5.

Dated at Springfield, Illinois this 2nd day of Nov, A.D.2022.

The Villas at Prairie Vista, Limited Partnership, An Illinois limited partnership

By: Villas at Prairie Vista GP, Inc., an Illinois corporation,
its General Partner

By: 

Meggann Bell
Its Chief Executive Officer

for:

The Villas at Prairie Vista, Limited Partnership
c/o Christian County Integrated Community Services
3028 Happy Landing Drive, Springfield, IL 62711

Notary's Certificate

State of Illinois)

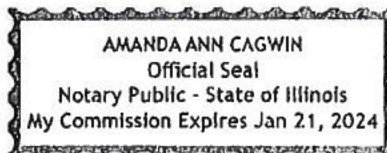
County of Sangamon)S.S.

I, Amanda Cagwin, a notary public in and for the County and State aforesaid do hereby certify that Meggann Bell, Chief Executive Officer of Villas at Prairie Vista GP, Inc., General Partner of The Villas at Prairie Vista, Limited Partnership, who is personally known to me to be the same person whose name is subscribed to the forgoing instrument as such Chief Executive Officer, appeared before me this day in person and acknowledged that they signed and delivered the said instrument as being pursuant to authority given and as their own free and voluntary act and as the free and voluntary act of said corporation as said General Partner for the uses and purposes therein set forth.

Given under my hand and notarial seal this 2nd day of November A.D. 2022.

[Redacted Signature]

notary public





The Villas at Prairie Vista, Limited Partnership (The Villas at Prairie Vista)

Date Prepared: 11/1/2022

Shown on Final Plat:		Initial
	Easements shown for all public improvements	SJL
	City Engineer's Signature Block	SJL
	Clerk's Signature Block	SJL
	Areas or facilities to be dedicated to the public	SJL
	Railroad Right of Ways	N/A
	Subdivision Boundaries	SJL
	References to nearest street lines, Township, Sections lines, or monuments.	SJL
	Name of Subdivision	SJL
	Legal Description	SJL
	Existing Parcel Id Number (PIN)	SJL
	Surveyor's statement regarding any Special Flood Hazard Areas.	SJL
	Total Acreage	SJL
	Street Names	SJL
	Proposed Lot numbers (consecutively numbered)	SJL
	Front Yard Setbacks	SJL
The following shall be provided:		
	School District Certificate	SJL
	County Clerk's Certificate	SJL
	Owner's Certificate	SJL
	Drainage Statement	SJL
	Owner's Petition	SJL
	Ordinance	SJL
	Utility Company Signoffs	SJL
	Digital PDF Submittal provided to Public Works	SJL
	Digital CAD format submittal provided to Public Works	Not yet
	2 Mylar Copies	
	12 Paper Copies	
The following requirements shall be met:		
	Final plat retains the design characteristics of a valid Preliminary Plan that has not expired	SJL
	Retains the design characteristics of approved public improvement engineering plans and specifications.	SJL
	Final Plat is signed by IL licensed surveyor	SJL
	Plans for all public improvements approved by Public Works	SJL

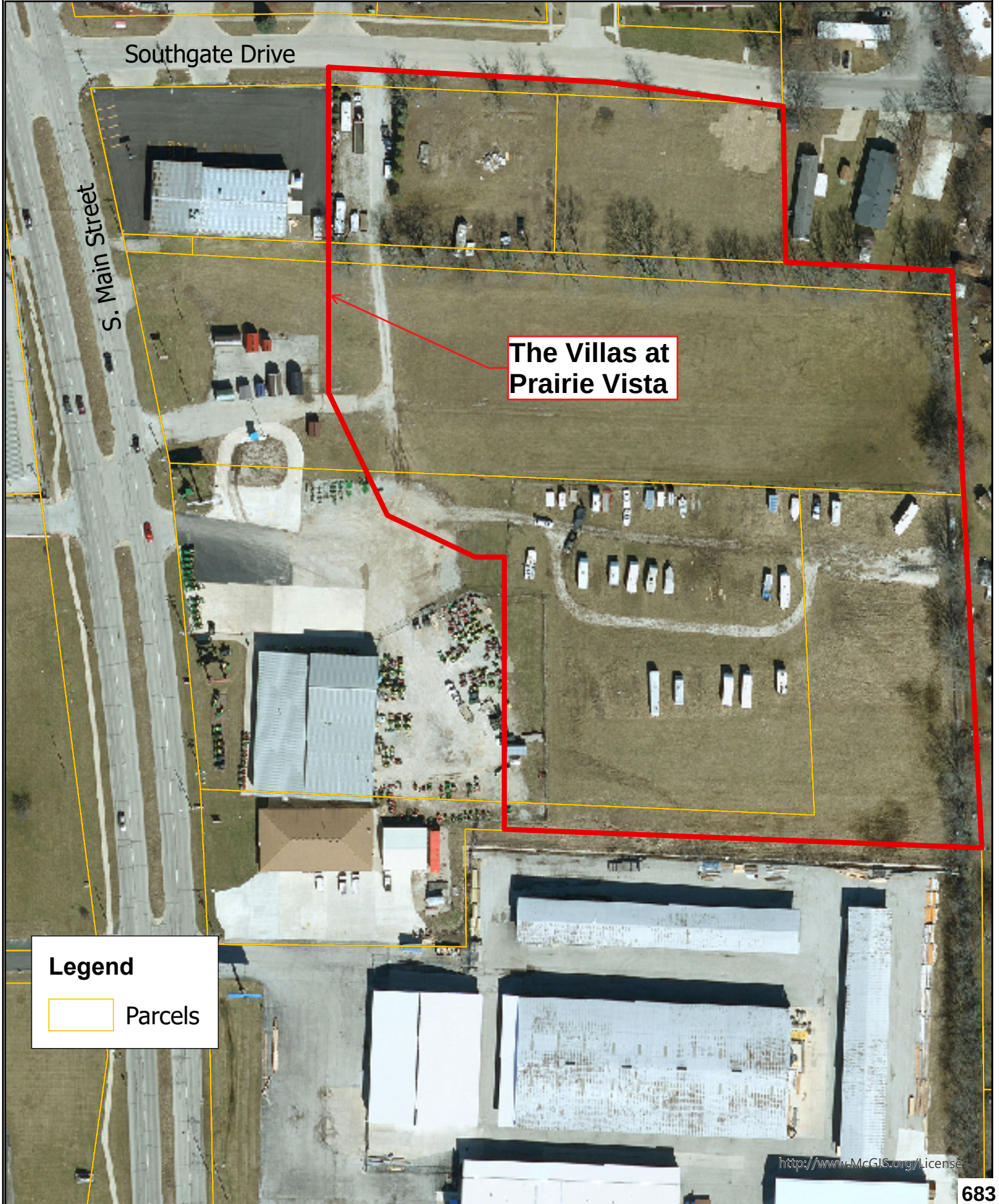
The Villas at Prairie Vista



0 75 150

Feet

Date: 10/27/2022



Legend



Parcels

MEMORANDUM

November 1, 2022

To: Glen Wetterow, City Planner
From: Steven J. Law P.E., Civil Engineer II
Subject: The Villas at Prairie Vista P.U.D.
Performance Guarantees and Tap-On Fees

The following are the Performance Guarantee and Tap On fees required from the developer before releasing for recording the final plat: **The Villas at Prairie Vista P.U.D.**. The final plat will be considered for approval by the City Council at the November 14, 2022 meeting.

A. Performance Guarantee:

110% of all uncompleted public improvement construction costs:	\$503,787.90
Total Bond Amount Required	\$503,787.90

Bond/Guarantee must be in the form(s) and language provided by City Code.

B: Tap-On Fees:

No tap-on fees are due as associated with this development.

C: Guarantee Substandard Street Improvement:

Not Applicable

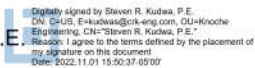
cc: Kevin Kothe, Director of Public Works
Craig Shonkwiler, City Engineer
Chris Tomerlin
file

Drainage Statement

State of Illinois)

County of Kane) S.S.

I, Steven R. Kudwa, Registered Professional Engineer, and Meggann Bell, being the owner of the premises heretofore platted by John Cole Helfrich, Illinois Professional Land Surveyor 2967 to be and become The Villas at Prairie Vista P.U.D., a Subdivision in the City of Bloomington, McLean County, Illinois do hereby certify that to the best of their knowledge and belief, the drainage of surface waters will not be changed by the construction of said Subdivision or Planned Unit Development, or any part thereof; or that if such surface water drainage will be changed, reasonable provisions have been made for collection and diversion of such surface waters into public areas or drains which the Owner has a right to use and that such surface waters will be planned for in accordance with generally accepted engineering practices so as to reduce the likelihood of damage to the adjoining property because of the construction of the Subdivision or Planned Unit Development. I further certify that all or portions of Lots are not within the Special Flood Hazard Area, as identified by the Federal Emergency Management Agency.

Steven R. Kudwa, P.E. 
Digitally signed by Steven R. Kudwa, P.E.
DN: cn=US, e=kudwas@crk-eng.com, ou=Knoche
Engineering, cn="Steven R. Kudwa, P.E."
Reason: I agree to the terms defined by the placement of
my signature on this document
Date: 2022.11.01 15:50:37 -05'00'

Registered Professional Engineer

Meggann Bell

OWNER: Villas at Prairie Vista, Limited Partnership

From: Miller, Kelli A <KMiller20c774@ameren.com>
Sent: Thursday, September 15, 2022 7:58 AM
To: Matt Ervin
Cc: Kassing, Sam; Frey, Andrew T
Subject: Residential Subdivision - 111 Southgate Drive - Bloomington, IL JULIE Ticket #X222572409
Attachments: [111 Southgate Drive - Bloomington, IL.zip](#)

Matthew Ervin:

Per your request regarding Ameren Illinois facilities near your project, I've created attachment(s) showing our gas **and/or** electric facilities. These attachment(s) do not show any dimensions from a point. They mainly show you which side of street and a broad idea of what is there.

I've also included a document explaining how to contact our **contract locator**, in case there is a **need for a physical locate** before construction begins. There will be a charge (from them) for their services.

If there is a **conflict with any of our facilities, please call (888) 659-4540 to speak to Ameren's Construction Department**. An appointment can be made with one of our local field-engineering representatives to discuss options. Ameren's Construction Department can help with starting new service(s) as well.

Should you have any map-related questions, please feel free to contact me.

Thank you,

Kelli Miller :: Distribution Design Center :: CAD Operator
Office: 618.343.8031 :: Email: KMiller20c774@ameren.com
Ameren Illinois :: #6 Executive Drive :: Collinsville, Illinois 62234



This communication and any attachments may be privileged and/or confidential and protected from disclosure, and are otherwise the exclusive property of Ameren Corporation and its affiliates (Ameren) or the intended recipient. If you are not the intended recipient, you are hereby notified that any dissemination, distribution or copying of this communication is strictly prohibited. Note that any views or opinions presented in this message do not necessarily represent those of Ameren. All e-mails are

subject to Ameren policies. If you have received this in error, please notify the sender immediately by replying to the message and deleting the material from any computer.

September 15, 2022

From: Ameren Illinois
Distribution Design Center

Knoche Engineering, P.E.
24 North Bennett Street
Geneva, IL 60134

Attention: Matthew Ervin, P.E.

Re: 111 Southgate Drive – Bloomington, IL

Dear Matthew,

In response to your recent request for Ameren Illinois facility maps for your design project, please find the applicable attachment(s).

Please note that these attachment(s) show the approximate location of our facilities and are not intended to provide exact facility locations. We do not annotate our facilities on other documents.

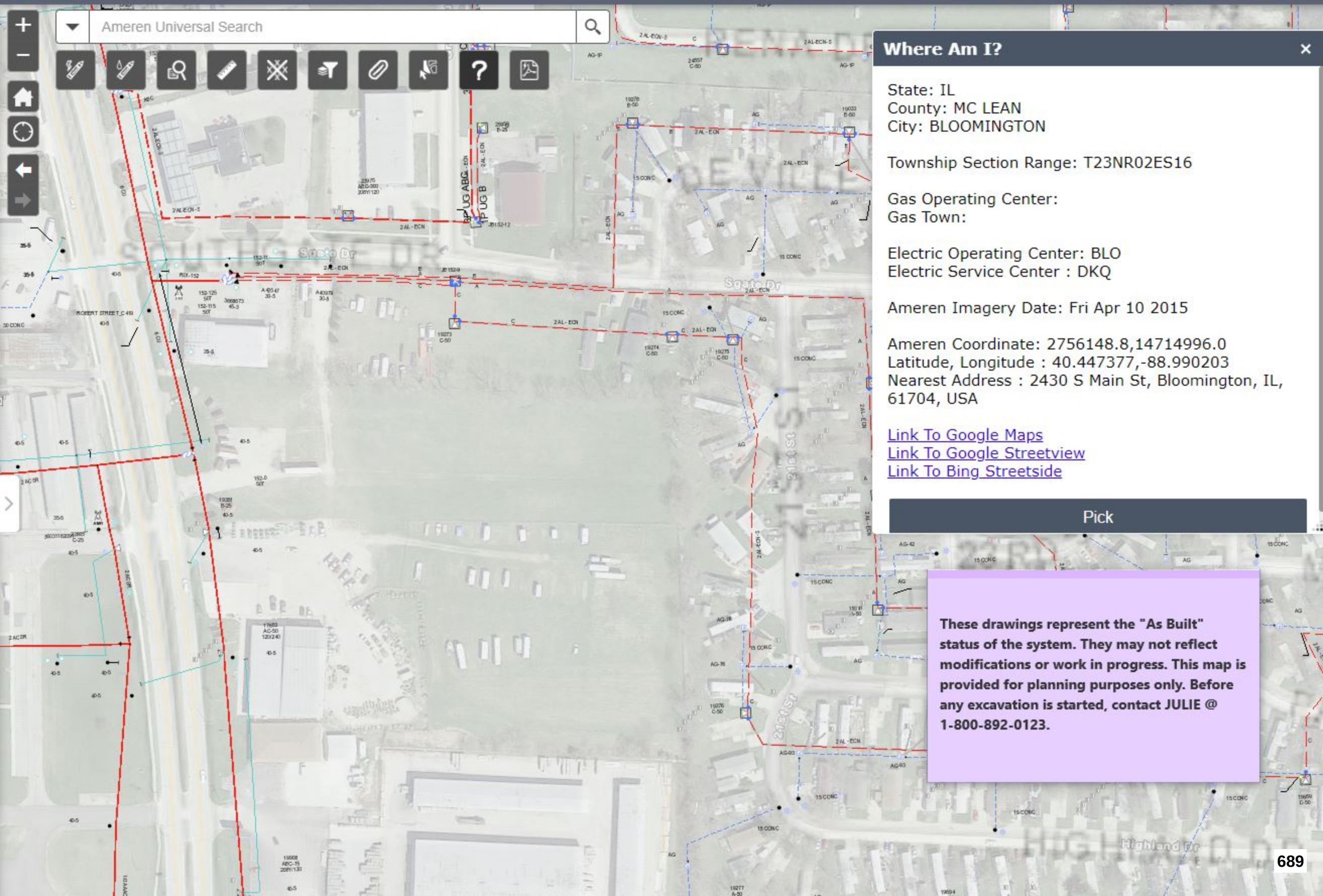
If you require a physical locate, Ameren Illinois offers more exact facility locating for design purposes from our contracted locate providers. Please see the attached map for the Ameren Illinois contracted locate providers that can provide design locates for your particular project. If you have already contacted JULIE regarding this request, please provide the area locate provider with the JULIE design ticket which you were assigned. If you have not contacted JULIE, simply advise the locate provider of your request for facility marking. You will be billed by the locate provider for this service.

Remember that prior to any excavation, you must call JULIE at (800) 892-0123.

If you have any further questions, please contact me at (618) 343-8031 or by Email: KMiller20c774@ameren.com.

Sincerely,

Kelli Miller
CAD Operator
Distribution Design Center
Ameren Illinois



Where Am I?

State: IL
County: MC LEAN
City: BLOOMINGTON

Township Section Range: T23NR02ES16

Gas Operating Center:
Gas Town:

Electric Operating Center: BLO
Electric Service Center : DKQ

Ameren Imagery Date: Fri Apr 10 2015

Ameren Coordinate: 2756148.8,14714996.0
Latitude, Longitude : 40.447377,-88.990203
Nearest Address : 2430 S Main St, Bloomington, IL,
61704, USA

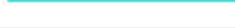
[Link To Google Maps](#)
[Link To Google Streetview](#)
[Link To Bing Streetside](#)

Pick

These drawings represent the "As Built" status of the system. They may not reflect modifications or work in progress. This map is provided for planning purposes only. Before any excavation is started, contact JULIE @ 1-800-892-0123.

Electric Symbols

	POLE (WOOD & COMPANY)
	POLE (NON-WOOD & COMPANY)
	POLE (WOOD & FOREIGN)
	POLE (NON-WOOD & FOREIGN)
	SWITCH (CLOSED)
	SWITCH (OPEN)
	FUSE (CLOSED)
	FUSE (OPEN)
	TRANSFORMER (SINGLE PHASE)
	TRANSFORMER (MULTI PHASE)
	PADMOUNT TRANSFORMER
	GUY (DOWN END SYMBOL)
	GUY (SPAN START SYMBOL)
	GUY (SPAN END SYMBOL)
	CAPACITOR
	RECLOSER (CLOSED)
	RECLOSER (OPEN)
	STREET LIGHT (OH)
	STREET LIGHT (UG)
	STREET LIGHT (OH MUNI)
	STREET LIGHT (UG MUNI)
	STRUCTURE CU (SEC PEDESTAL & METERING)
	STRUCTURE CU (SEC PEDESTAL & ABOVE GROUND)
	STRUCTURE CU (SEC PEDESTAL & BELOW GROUND)
	JUNCTION BOX
	ELECTRIC PREMISE

	SINGLE PHASE OVERHEAD PRIMARY - 4KV AND BELOW
	TWO PHASE OVERHEAD PRIMARY - 4KV AND BELOW
	THREE PHASE OVERHEAD PRIMARY - 4KV AND BELOW
	SINGLE PHASE OVERHEAD PRIMARY - ABOVE 4KV AND BELOW 34KV
	TWO PHASE OVERHEAD PRIMARY - ABOVE 4KV AND BELOW 34KV
	THREE PHASE OVERHEAD PRIMARY - ABOVE 4KV AND BELOW 34KV
	SINGLE PHASE UNDERGROUND PRIMARY (Color by KV above)
	TWO PHASE UNDERGROUND PRIMARY (Color by KV above)
	THREE PHASE UNDERGROUND PRIMARY (Color by KV above)
	PRIMARY OVERHEAD - SPACER CABLE (Width by PHASE, Color by KV above)
	34.5 KV OH SUB-TRANSMISSION 34.5 KV UG SUB-TRANSMISSION
	69 KV OH SUB-TRANSMISSION 69 KV UG SUB-TRANSMISSION
	138 KV OH TRANSMISSION 138 KV UG TRANSMISSION
	230/345 KV OH TRANSMISSION 230/345 KV UG TRANSMISSION
	OVERHEAD - D, T, & O SECONDARY (Map to applicable OH below)
	SINGLE PHASE OVERHEAD SPAN SECONDARY
	THREE PHASE OVERHEAD SPAN SECONDARY
	SINGLE PHASE OVERHEAD SERVICE
	THREE PHASE OVERHEAD SERVICE
	SINGLE PHASE UNDERGROUND SECONDARY & SERVICE
	THREE PHASE UNDERGROUND SECONDARY & SERVICE



November 3, 2022

Matt –

CIRBN is 'all clear' of the proposed subdivision based on the location map you have provided.

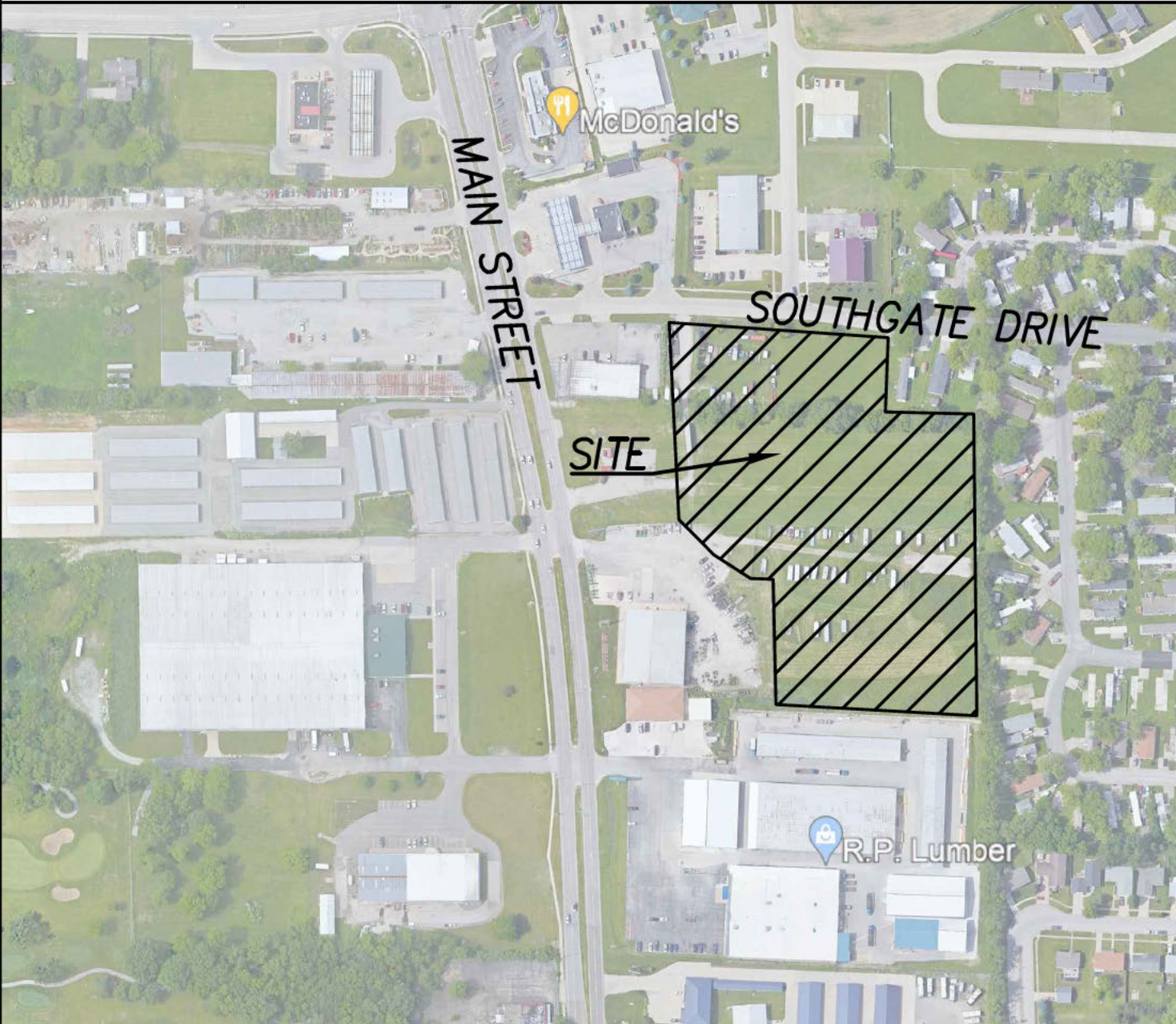
Please reply or call us at 309-820-7321 should you have any questions.

Thank you!

Mark DeKeersgieter

Executive Director
CIRBN, LLC

LOCATION MAP



NOT
TO
SCALE

From: Cole Helfrich <cole@korugroup.com>
Sent: Friday, October 28, 2022 10:32 AM
To: Steve Law
Subject: FW: Bloomington\Southgate Drive

Steve:

Pertinent to Comcast, I have this from them. They have agreed to execute the separate extinguishment (along with Ameren). I have a call out to Ted to see if I can get a letter. My concern is timing.

I came away from our call with Craig with the idea that all these pieces have to be in by Friday 11/4. That is looking like a problem.

I was going to look at the City Council agendas for June '21 to see what might have been submitted on your "vacation" passed then. I can't find that link you sent with all the agendas and packets, but I know it's here somewhere.

Cole

J. Cole Helfrich P.L.S.

Knoche Engineering, P.C.
24 North Bennett Street
Geneva, Illinois 60134
Helfrichc@crk-eng.com
cole@korudev.com
Office: 630-845-1270
Direct: 630-404-1181



From: Wyman, Ted <Ted_Wyman@comcast.com>
Sent: Monday, October 10, 2022 10:48 AM
To: Cole Helfrich <HelfrichC@crk-eng.com>
Subject: RE: Bloomington\Southgate Drive

Cole,

In reviewing the proposed Plats of Resubdivision and Extinguishment, they both look acceptable to Comcast. I understand the Plat of Extinguishment is only a draft and I assume signature blocks will be added for the utilities to sign off on for later, but the actual location of the easement being extinguished is acceptable.

I understand you have been in contact with our construction department, which have indicated they will be removing our pedestals and terminating our underground cable along the easement (within the treeline) as our cable no longer services an active customer.

When the Plat of Extinguishment is completed and you are ready to have it signed off, please contact me and we can schedule a day and time to do so.

If you have any questions in regards to this information, please don't hesitate to contact me.

Sincerely,

Ted Wyman
Comcast Cable
Right-of-Way Engineer
688 Industrial Drive
Elmhurst, IL 60126
Phone: (224) 229-5850 office (847) 652-6074 cell
Fax: (630) 359-5482
Ted_Wyman@comcast.com

From: Cole Helfrich <HelfrichC@crk-eng.com>
Sent: Monday, October 10, 2022 10:01 AM
To: Wyman, Ted <Ted_Wyman@comcast.com>
Subject: [EXTERNAL] Bloomington\Southgate Drive

Ted:

Please accept my apologies for having failed to send a drawing to you as requested showing our design for the development. Please see attached and note that the designated Lots and numbering have been removed. The proposed revised Plat is also attached.

I also attach the draft Extinguishment of Easement we prepared. Your observations on this would be appreciated. Thanks.

Cole

J. Cole Helfrich P.L.S.

*Knoche Engineering, P.C.
24 North Bennett Street
Geneva, Illinois 60134
HelfrichC@crk-eng.com
cole@korudev.com
Office: 630-845-1270
Direct: 630-404-1181*



Websense: Click [here](#) to report this email as spam.



109 E Market St.
Bloomington, IL 61701

November 1, 2022

RE: 111 Southgate Drive – Bloomington, IL JULIE Ticket #X222572409

Dear – Matthew Ervin

In response to your request on September 14th, Frontier has no utilities in the proposed location.

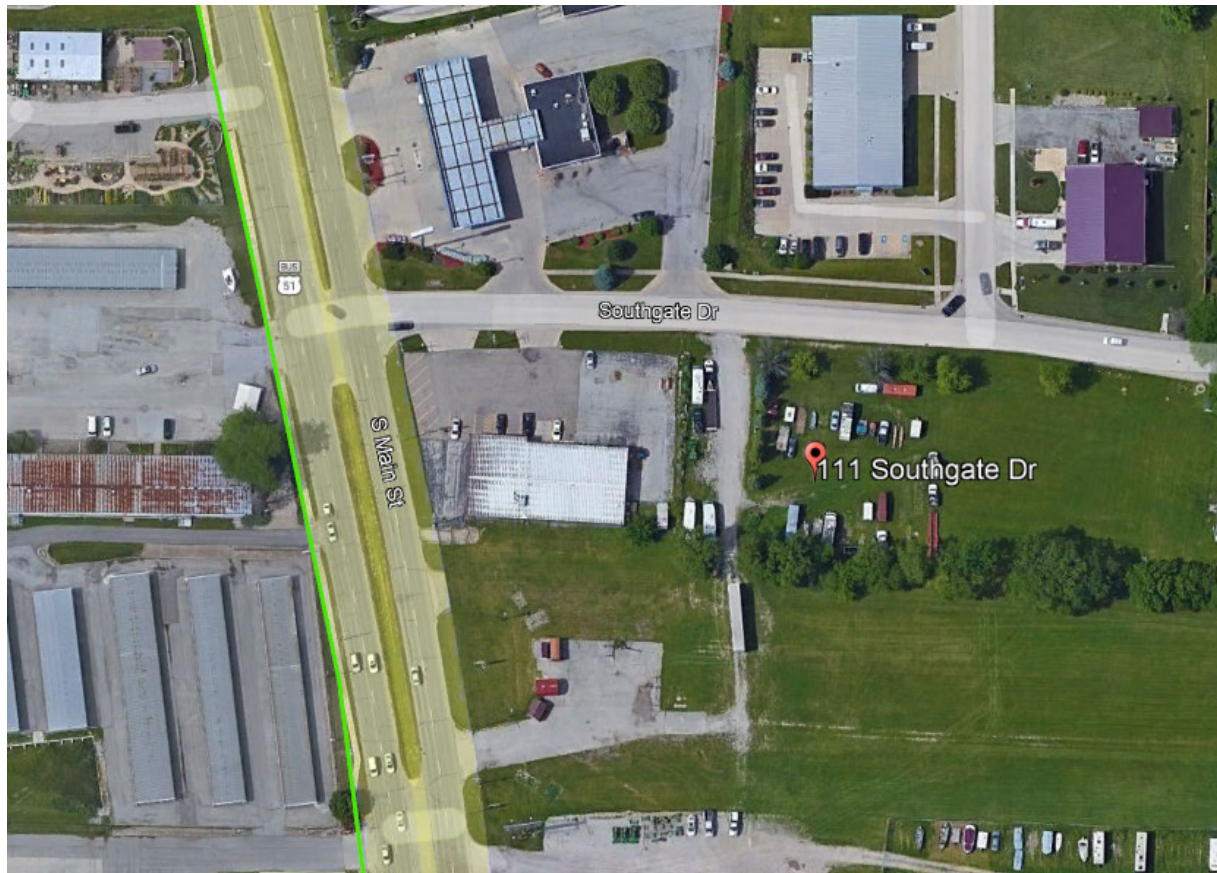
Si

Adam Gangloff
Frontier – Network Engineering
109 E. Market St.
Bloomington, IL 61701

From: Taylor Rich <trich@metrocomm.com>
Sent: Thursday, September 15, 2022 10:18 AM
To: Matt Ervin
Subject: RE: Residential Subdivision - 111 Southgate Drive - Bloomington, IL JULIE Ticket #X222572409

Hi Matt,

Below is a snapshot of our buried fiber optic cable facility near your project area (shown in green). All of our facility is in the western ROW of US-51. Please let me know if you have any questions or need any further information.



Thanks, Taylor

Taylor Rich
GIS Technician I
Metro Communications Co.
8 South Washington St | PO Box 555
Sullivan IL, 61951 | P: 217.728.3608



From: Matt Ervin <ErvinM@crk-eng.com>
Sent: Wednesday, September 14, 2022 5:37 PM
To: Taylor Rich <trich@metrocomm.com>
Subject: Residential Subdivision - 111 Southgate Drive - Bloomington, IL JULIE Ticket #X222572409

Hi Taylor,

We are working on a proposed residential subdivision project located at the above mentioned location. Also, attached is a PDF of a location map showing the limits of the development. We are looking to obtain a copy of your utility atlas for the areas adjacent to this site.

Thanks,

Matthew Ervin, P.E.

*Knoche Engineering, P.C.
24 North Bennett Street
Geneva, Illinois 60134
Direct: 630-845-1273*

From: agt_comm@irth.com
Sent: Thursday, September 15, 2022 6:22 AM
To: Matt Ervin
Subject: Ticket X222572409 - JULIE Response for Metro Communications

=====

To: KNOCHE ENGINEERING Attn: MATT ERVIN
Voice: 6308451270 Fax:
Re: JULIE Response for Metro Communications

Metro Communications is replying to your request to locate our underground facilities per the dig site information provided on the JULIE ticket.

=====

Ticket: X222572409
County: MCLEAN Place: BLOOMINGTON
Address: 111 SOUTHGATE DR

MTRO9A:

You are receiving this message in response to a recent JULIE ticket you have opened. This is a notification that Metro Communications, a fiber optic company, is not in conflict with your area. There may be other utilities in your area. Please wait for other utility responses before you proceed. If you have any additional questions please call 217-728-9056. Goodbye.

=====

If you have any questions, please call 217-728-9056. Thank you.

=====

This message was generated by an automated system. Please do not reply to this email.

From: metronetincprs@korweb.com
Sent: Sunday, September 18, 2022 2:06 PM
To: Matt Ervin
Subject: Ticket X222572409 for MFIB0A - Status Change

Our records indicate you called in dig request **X222572409** at **111 SOUTHGATE DR, BLOOMINGTON CIT, IL**.

This email is a status update relating to ticket number **X222572409** for code **MFIB0A**.

Ticket: **X222572409**
Member
Code: **MFIB0A**
Company: **KNOCHE ENGINEERING**
Done For: **VILLAGE**
Work to
begin on: **3/14/2023 3:03:00 PM**
County: **MCLEAN**
City: **BLOOMINGTON CIT**
Address: **111SOUTHGATE DR**
Contact: **MATT ERVIN**
Phone: **630-845-1270**
Completed
on: **9/18/2022 2:00:00 PM**
Response: **1-CLEAR**

Facility	Work Performed	Action Code
FIBER	CLEARED	

Remarks:

Notes:

This is a positive response by MetroNet Fiber. If you believe the information provided here is incorrect or you have an issue with our response or discover damage to our facilities please report your issue back to 811 immediately or you may contact us directly.

From: Eggen, Paul A. <X2PAEGGE@southernco.com>
Sent: Wednesday, September 21, 2022 8:36 AM
To: Matt Ervin
Subject: JULIE #X222572409; ENG #SC21699
Attachments: SC21699 6512163.pdf; SC21699 6512164.pdf



Your project has been assigned Engineering # SC21699

Please refer to this number in all future correspondence to assist with expediting any future inquiries.

Please find the **attached atlas page(s)** indicating the location of our gas main(s) in the area of your proposed project.

- ☐ **Review and verify that the page(s) attached is the area of your request.** If this is not the page you have requested or you require additional pages, please advise and a correction will be made.
- ☐ **Details are shown in noted 'boxes'.**
 - These details will be provided upon specific request through email if needed.
 - The box title noted on the bottom is required.
 - Note: Nicor does not field mark 'Design' stage tickets and services typically are not shown on atlas sheets.
- ☐ Please feel free to contact me if you need assistance in reading the attached pages.
- ☐ The date of this email represents the date of the attached page(s) most recent version and should be considered the applicable date/time stamp.
- ☐ *Please Note:*
 - *The dimensions and location of Nicor Gas utility facilities as shown on these plans are an estimate for design purposes only and are not intended for use as field locations for construction. Nicor Gas does not guarantee accuracy. These pages are considered confidential. Please handle these pages accordingly.*

If potential conflicts are anticipated:

- ☐ **Please supply us with a large set of pre-final/final plans including right-of-way and cross-sections.**
 - Email directly to:
 - Gasmaps@southernco.com or gasmaps@aglresources.com (both same inbox)
 - Cc: sforah@southernco.com
 - Allow **ample time*** for the design and relocation of our mains and services (if necessary) to adhere to your tentative scheduled letting date.

***Ample time** requires a minimum of 6 months for design and planning. This time does not consider the installation of our mains and services or reimbursable requirements if applicable.

Utility rights are generally documented through permit, license, or easement.

- ☐ In some cases, Nicor Gas may own property.
- ☐ It is up to the requesting/design party(s) to research the existing land rights of their proposed project.
- ☐ Nicor Gas will perform its own investigation to determine if any portion is reimbursable when construction is requested to relocate the gas main.

Please phone JULIE, at 811 OR 1-800-892-0123, a minimum of 48 hours before construction for the location of our facilities within your proposed improvement.

SAKIBUL FORAH
DOT Liaison
Engineering Design
Nicor Gas
1844 Ferry Rd.
Naperville, IL 60563
Office: 630.388.2903

sforah@southernco.com



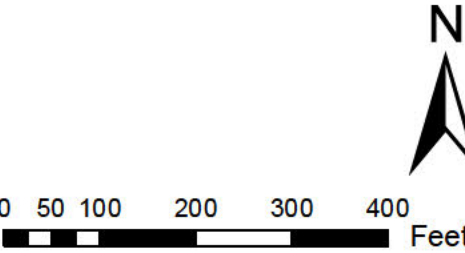
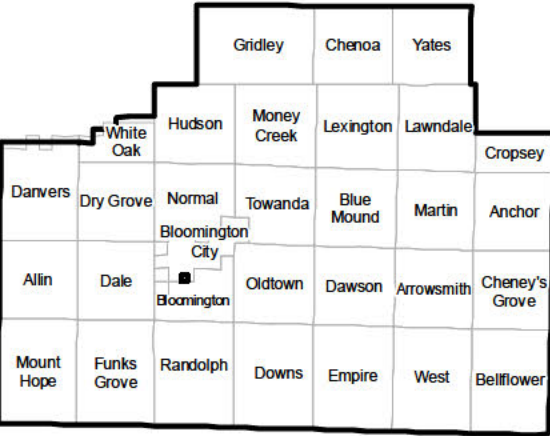
The information contained in this e-mail message and accompanying documents is intended for the confidential use of the recipient only and is the property of Nicor Gas Company. If the reader of this e-mail message is not the intended recipient, or an employee or agent responsible for delivery of this e-mail message to the intended recipient, you are hereby notified that any dissemination, distribution, copying or forwarding of this e-mail message is strictly prohibited. If you received the e-mail in error, please notify me immediately. Thank you.



Facility Legend

- Transmission Main
- MOP Main
- High Pressure Main
- Low Pressure Main
- Service Line
- Foreign Pipeline
- Gas Pipe Casing

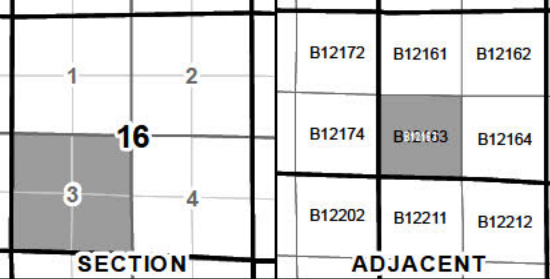
MCLEAN COUNTY



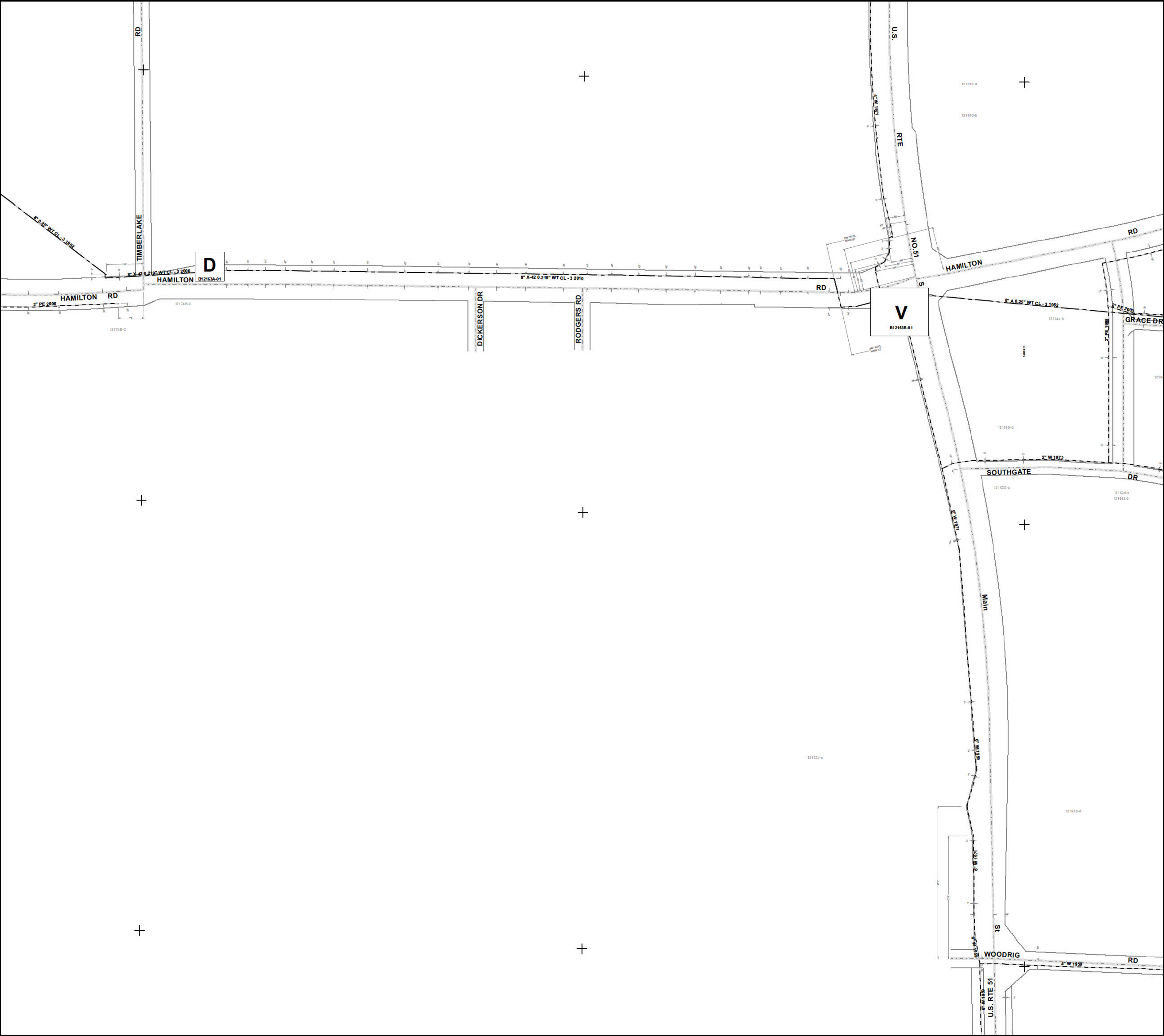
ATLAS SCALE 1" = 200'

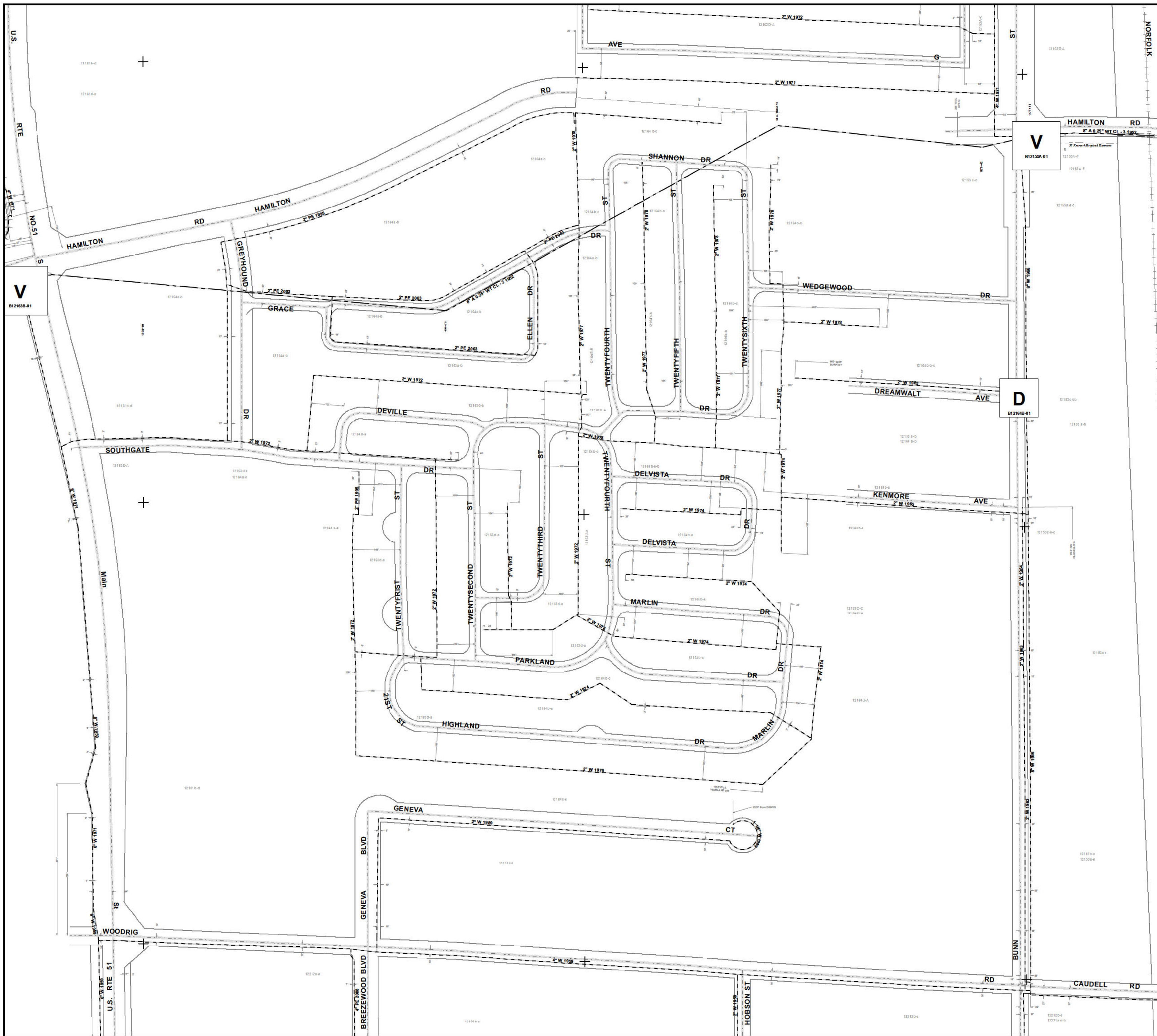
OPERATES 24 Hours 365 Days
CALL JULIE
WITH THE FOLLOWING:
COUNTY _____
CITY - TOWNSHIP _____
SEC. & 1/4 SEC. No.# _____
48 Hours Before You Dig.
EXCLUDING SAT, SUN & HOLIDAYS
NICOR GAS FACILITIES LOCATION
THE DIMENSIONS AND LOCATION OF NICOR GAS' UTILITY FACILITIES AS SHOWN ON THESE PLANS ARE AN ESTIMATE FOR DESIGN PURPOSES ONLY, AND ARE NOT INTENDED FOR USE AS FIELD LOCATIONS FOR CONSTRUCTION. NICOR GAS DOES NOT WARRANT ACCURACY. CALL JULIE 48 HOURS PRIOR TO CONSTRUCTION FOR CONFIRMATION OF CURRENT FACILITY LOCATIONS, 811 OR 1-800-892-0123.

DATE UPDATED: 7/12/2021
COUNTY: MCLEAN
TOWNSHIP: BLOOMINGTON CITY



T23N R02E 3PM
B12163

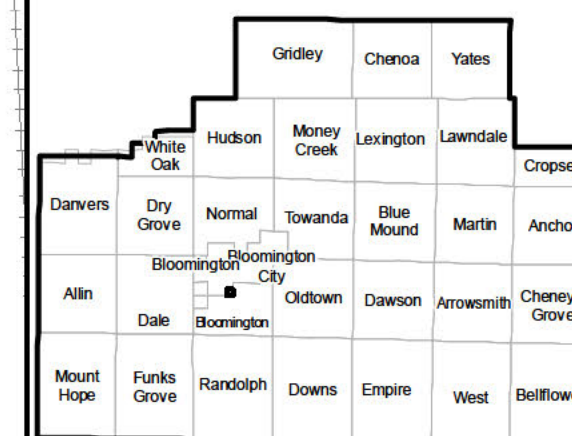




Facility Legend

- Transmission Main
- MOP Main
- High Pressure Main
- Low Pressure Main
- Service Line
- Foreign Pipeline
- Gas Pipe Casing

MCLEAN COUNTY



0 50 100 200 300 400 Feet
ATLAS SCALE 1" = 200'

OPERATES 24 Hours 365 Days
 CALL JULIE WITH THE FOLLOWING:
COUNTY _____
CITY - TOWNSHIP _____
SEC. & 1/4 SEC. No.# _____
48 Hours Before You Dig.
EXCLUDING SAT, SUN & HOLIDAYS
NICOR GAS FACILITIES LOCATION
THE DIMENSIONS AND LOCATION OF NICOR GAS' UTILITY FACILITIES AS SHOWN ON THESE PLANS ARE AN ESTIMATE FOR DESIGN PURPOSES ONLY, AND ARE NOT INTENDED FOR USE AS FIELD LOCATIONS FOR CONSTRUCTION. NICOR GAS DOES NOT WARRANT ACCURACY. CALL JULIE 48 HOURS PRIOR TO CONSTRUCTION FOR CONFIRMATION OF CURRENT FACILITY LOCATIONS, 811 OR 1-800-892-0123.

DATE UPDATED: 12/8/2016
COUNTY: MCLEAN
TOWNSHIP: BLOOMINGTON CITY

1	2	B12161	B12162	B12151
16	3	B12163	B12164	B12153
4	3	B12211	B12212	B12221
SECTION		ADJACENT		

T23N R02E 3PM
B12164

From: Verizon Design Ticket Info . <verizon.design.ticket.info@verizon.com>
Sent: Wednesday, September 14, 2022 10:16 PM
To: Matt Ervin
Subject: Verizon design ticket X222572409 - Bloomington, IL

Verizon Business (MCI) has no facilities at any of the locations.

--

This is not a monitored email box- PLEASE DO NOT RESPOND TO THIS EMAIL.

From: vztpositivenotification@verizon.com
Sent: Wednesday, September 14, 2022 10:17 PM
To: Matt Ervin
Subject: X222572409 for Verizon Member Code MCI0A

Dear Excavator,

Your request to locate Verizon facilities for the ticket identified above has been reviewed. The extent of work described in the request noted above has been compared with our facility records. Verizon has determined that the excavation location and scope of work you have identified does not conflict with our underground facilities. If you have questions or have additional information where you feel Verizon's underground facilities are in the excavation area, do not hesitate to contact our National Facility Locate Call Center at 800-492-3100.

Thank you and remember to dig safely!

Please do not reply to this email as the account is not monitored.

ORDINANCE NO. 2021 - 41

**AN ORDINANCE APPROVING THE VACATION OF AN EASEMENT
IN SOUTHGATE COMMERCIAL PLAZA SUBDIVISION**

WHEREAS, there was heretofore filed with the Economic and Community Development Department of the City of Bloomington, McLean County, Illinois, a petition requesting the vacation of an easement legally described in Exhibit A, attached hereto and made a part hereof by this reference; and

WHEREAS, said Petition is valid and sufficient and conforms to the requirements of the statutes in such cases made and provided, and the Easement Vacation Plat attached to said Petition was prepared in compliance with requirements of the Bloomington City Code; and

WHEREAS, the City Council of said City has the power to pass this Ordinance and grant said vacation; and

WHEREAS, it is reasonable and proper to vacate said easement as requested in this case

NOW, THEREFORE, BE IT ORDAINED by the City Council of the City of Bloomington, McLean County, Illinois:

SECTION 1. The above recitals are incorporated herein by this reference as if specifically stated in full.

SECTION 2. That the easement as shown on the easement vacation plat dated February 10, 2021 and described in Exhibit A is hereby vacated.

SECTION 3. That said vacation of easement is reasonable and proper because said easement is not needed for public use by said City.

SECTION 4. Except as provided herein, the Bloomington City Code, 1960, as amended shall remain in full force and effect.

SECTION 5. This Ordinance shall be effective immediately after its passage and approval.

SECTION 6. This Ordinance is passed and approved pursuant to the home rule authority granted by Article VII, Section 6 of the 1970 Illinois Constitution.

PASSED this 14th day of June 2021.

APPROVED this 15th day of June 2021.

CITY OF BLOOMINGTON

Mboka Mwilambwe
Mboka Mwilambwe, Mayor

ATTEST

Leslie Smith-Yocum
Leslie Smith-Yocum, City Clerk



EXHIBIT A

Legal Description - Easement Vacation

The South 10 feet of Lots 2 and 3 in Southgate Commercial Plaza Subdivision 7th Addition according to the Plat thereof recorded as Document No. 2006-32000 in the Mclean County Recorder of Deeds Office, being a part of Lot 5 in School Commissioners Subdivision in the SE $\frac{1}{4}$ of Section 16, Township 23 North, Range 2 East of the Third Principal Meridian, City of Bloomington, Mclean County, Illinois.

CITY OF BLOOMINGTON

2021 - 41

**AN ORDINANCE APPROVING THE VACATION OF AN EASEMENT IN SOUTHGATE
COMMERCIAL PLAZA SUBDIVISION**

**Adopted by the City Council
of the City of Bloomington
on June 14, 2021**

Published in pamphlet form by authority of the City Council of the
City of Bloomington, McLean County, Illinois, on June 16, 2021.

STATE OF ILLINOIS)

) ss.

COUNTY OF MCLEAN)

CERTIFICATE

I, Leslie Smith-Yocum, certify that I am the duly appointed and qualified municipal clerk of the City of Bloomington, County of McLean, Illinois.

I further certify that on the Corporate Authorities of the above municipality passed and approved Ordinance No. 2021 - 41, entitled, an Ordinance Approving the Vacation of an Easement in Southgate Commercial Plaza Subdivision, which provided by its terms that it should be published in pamphlet form.

The pamphlet form of this Ordinance, including the Ordinance and cover sheet thereof, was prepared, and a copy of the Ordinance was posted in the municipal building, commencing on June 16, 2021 and continuing for at least ten days thereafter. Copies of the Ordinance were also available for public inspection upon request in the office of the municipal clerk.

Dated at Bloomington, Illinois, on 06/ 16 /2021

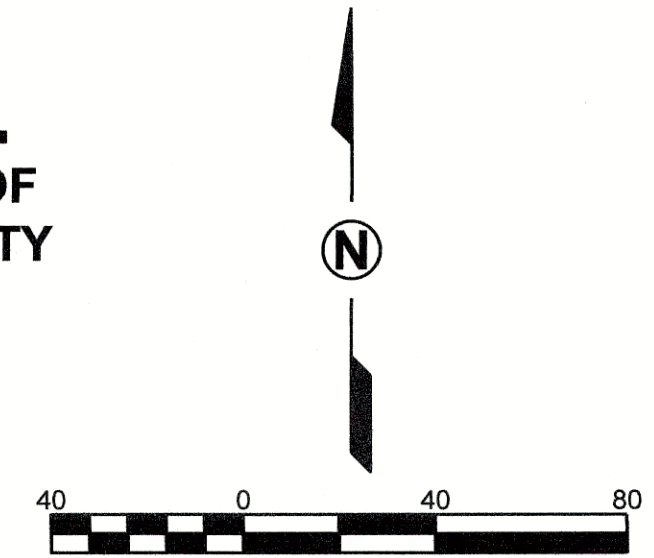
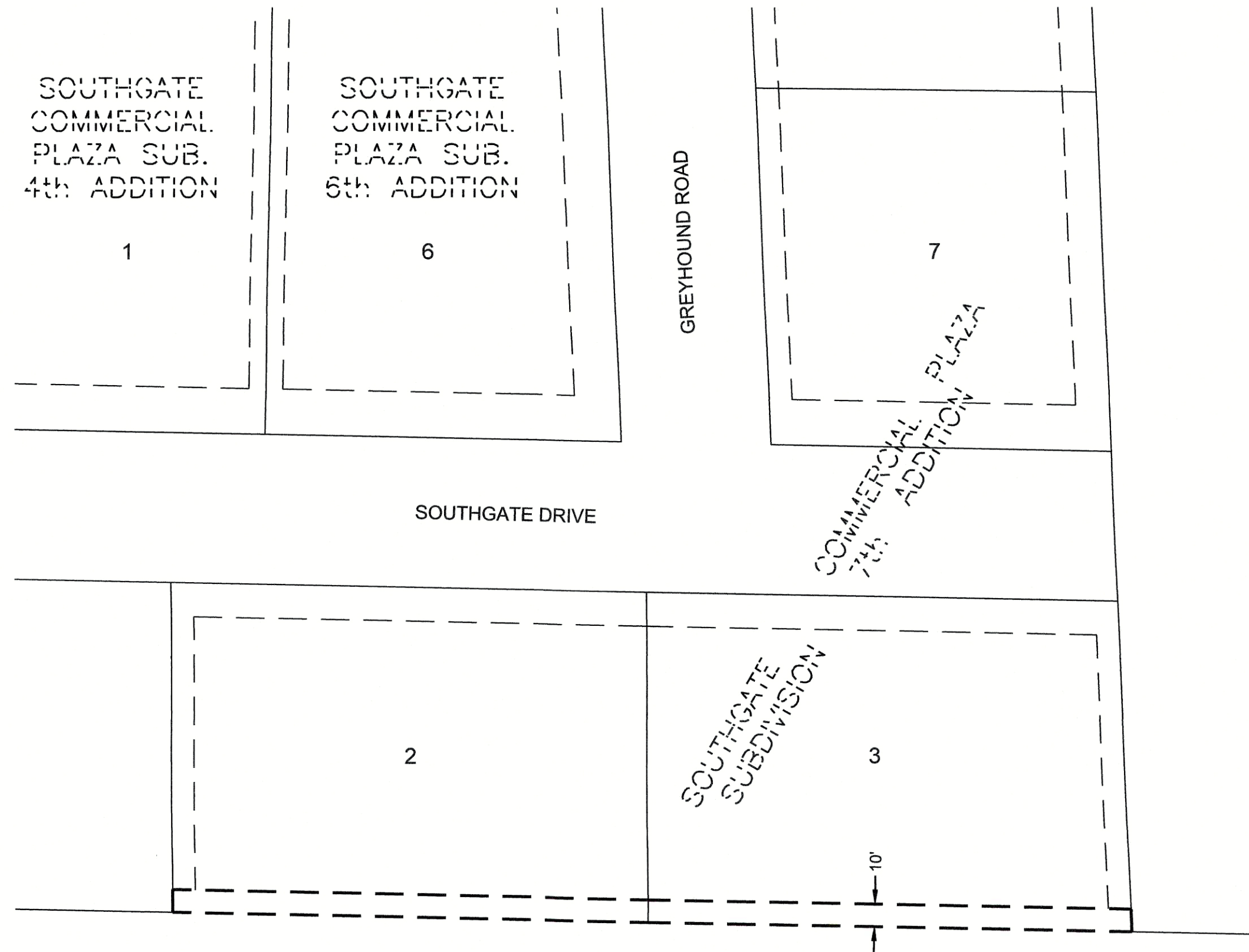
Leslie Smith-Yocum

Leslie Smith-Yocum
City Clerk



EASEMENT VACATION PLAT

PART OF LOTS 2 & 3 IN SOUTHGATE COMMERCIAL PLAZA SUBDIVISION 7th ADDITION IN PART OF LOT 5 IN SCHOOL COMMISSIONERS SUBDIVISION IN THE SE ¼ OF SEC. 16, T.23N., R.2E., 3 P.M., CITY OF BLOOMINGTON, McLEAN COUNTY, ILLINOIS

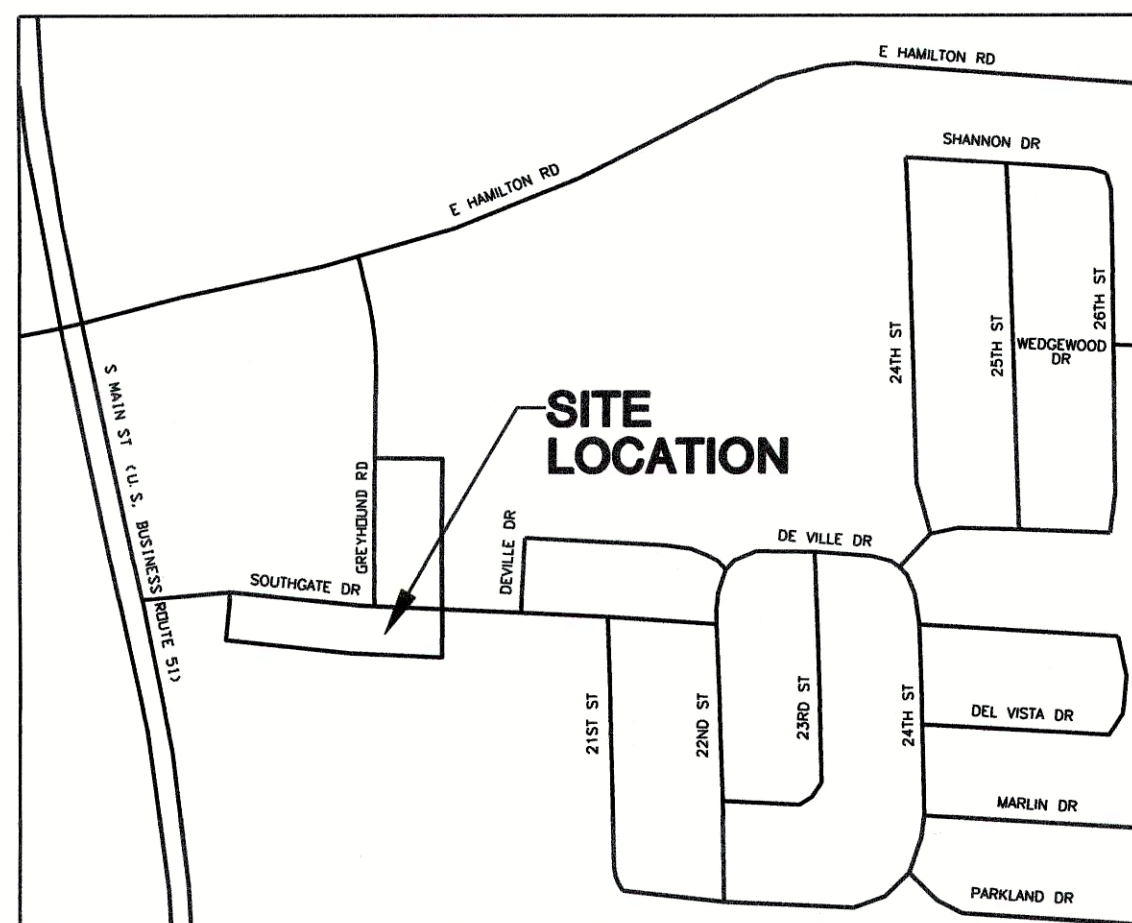


LEGEND

- LOT LINES
- EASEMENT LIMITS
- VACATION OF EASEMENT LIMITS

Legal Description – Easement Vacation

The South 10 feet of Lots 2 and 3 in Southgate Commercial Plaza Subdivision 7th Addition according to the Plat thereof recorded as Document No. 2006-32000 in the McLean County Recorder of Deeds Office, being a part of Lot 5 in School Commissioners Subdivision in the SE¼ of Section 16, Township 23 North, Range 2 East of the Third Principal Meridian, City of Bloomington, McLean County, Illinois.



LOCATION MAP
NTS

Surveyor's Certificate

I, Jason T. Stephens, Illinois Professional Land Surveyor No. 3859, do hereby certify that to the best of my knowledge and belief the plat shown hereon is an accurate representation of easement lands to be vacated prepared under my direction.

2/10/21
Date

Jason T. Stephens
Jason T. Stephens
Illinois Professional Land Surveyor No. 3859
License Expires 11/30/2022



LYB
www.lybinc.com

REVISED	-
-	-
-	-
BK.	434
DRN.	MB
DSN.	
APP.	JTS

EASEMENT VACATION
PART OF LOTS 2 & 3
SOUTHGATE COMMERCIAL PLAZA
SUBDIVISION 7th ADDITION
BLOOMINGTON, ILLINOIS

Lewis, Yockey & Brown, Inc.
Consulting Engineers & Land Surveyors
Professional Design Firm Registration #184-000806
505 North Main Street, Bloomington, Illinois
Ph. (309) 829-2552

SHEET
1
OF: 1
JOB #:
45139.01



March 16, 2021

Lewis, Yockey & Brown, Inc.
505 N. Main Street
Bloomington, IL 61701
Attention: Jason Stephens, Professional Land Surveyor

Re: Seventh Addition Southgate Commercial Plaza Subdivision
Part of Lot 2 and 3 (Greyhound Rd. and Southgate Dr.) Bloomington, IL. 61701
Vacation Approval Letter

Dear Mr. Stephens,

Ameren has electrical facilities within the easement proposed to be vacated in your Seventh Addition Southgate Commercial Plaza Subdivision Easement Vacation Plat dated February 10, 2021. Therefore, Ameren has no objection to the vacation of said easement with the understanding that the developer is responsible for any relocation of existing facilities.

If you have any further questions, please feel free to contact me.

Regards,

[Redacted signature block]

Dean Thompson
Supervisor of Distribution Design
North Region, Ameren Illinois
T:(309)823-9227
E: dthompson5@ameren.com



Siyan Lucas
Land Management Agent

1844 Ferry Road
Naperville, IL 60563
630 388 2036 tel
s.lucas@southernco.com

February 24, 2021

Jason T. Stephens, PLS
Lewis, Yockey & Brown, Inc.
505 N. Main Street
Bloomington, IL 61701

Subject: 111 Southgate Drive, Bloomington, IL – Easement Vacation
Nicor Atlas Page Reference: B12164

Mr. Stephens:

This letter is sent in response to your recent inquiry regarding the easement vacation which extends into the utility easement lying in the following described property:

PART OF LOTS 2 & 3 IN SOUTHGATE COMMERCIAL PLAZA
SUBDIVISION 7TH ADDITION IN PART OF THE LOT 5 IN SCHOOL
COMMISSIONERS SUBDIVISION IN THE SOUTHEAST QUARTER OF
SECTION 16, TOWNSHIP 23 NORTH, RANGE 2 EAST, THIRD PRINCIPAL
MERIDIAN, CITY OF BLOOMINGTON, MCLEAN COUNTY, ILLINOIS.

Based on the information you provided, including a copy of the above referenced subject addressed easement vacation plat, Nicor Gas has no objection to the vacation of an easement lying partially in Lot 2, and Lot 3 of the 7th Addition Southgate Commercial Plaza Subdivision.

This is not a release or waiver of any rights Nicor Gas may have in or to the utility easement. Further, any future expense Nicor Gas may incur in exercising its rights in the utility easement shall be borne by the property owner.

Notify JULIE at 1-800-892-0123 at least 48 hours prior to commencing construction activities. Nicor Gas may have gas service pipes providing gas service to the described property. The gas service pipes are neither covered by recorded easement nor are their locations mapped.

Very truly yours,

Siyan Lucas
Land Management Agent
Land Services Department



109 E Market St.
Bloomington, IL 61701

February 18, 2021

RE: Easement Vacation Part of Lots 2 & 3 in Southgate Commercial Plaza Subdivision
7th Addition

Dear – Jason T. Stephens

In response to your request on February 18th 2021, Frontier has no objections to vacate the 2x10' easement described on the Vacation Plat of Lot 2 & 3.

Sincerely,

Adam Gangloff
Frontier – Network Engineering
109 E. Market St.
Bloomington, IL 61701



May 12, 2021

Lewis, Yockey & Brown, Inc.
505 North Main Street
Bloomington, IL 61701
Attention: David Brown, PLS, President

Re: Easement Vacation Plat
Lots 2 & 3 in Southgate Commercial Plaza Subdivision 7th Addition
Bloomington, IL

Mr. Brown:

Comcast has no objection to the proposed vacation of the easements that are part of Lots 2 and 3 of the Southgate Commercial Plaza Subdivision 7th Addition.

If you have any questions in regard to this information, please don't hesitate to contact me.

Sincerely,

[Redacted Signature]

Robert L. Schulter, Jr.
Central Division Director of Construction
(630) 600-6352

By: [Redacted Signature]

Ted Wyman
Right-of-Way
(847) 652-6074
Ted_Wyman@comcast.com



115 E. Washington St.
Bloomington, IL 61702-3157
www.cityblm.org/publicworks
Phone: (309) 434-2225
Fax: (309) 434-2201

May 25, 2021

Jason Stephens, PLS
Lewis Yockey, & Brown, Inc.
505 N Main Street
Bloomington, IL 61701

Subject: Utility Easement Vacation, Lots 2 and 3, Southgate Commercial Plaza Subdivision

Dear MR. Stephens:

City of Bloomington Public Works department has reviewed the proposed vacation of a portion of the easement in lots 2 and 3 of Southgate Commercial Plaza Subdivision. in Bloomington Illinois.

The City of Bloomington does not have any facilities in the portion of the easement to be vacated. The Public Works Department does not object to the vacation of the utility easement as described on the submitted easement vacation plat.

Should you have any questions, please contact us.

Sincerely,

A handwritten signature in blue ink that reads 'Anthony Meizelis'.

Anthony J. Meizelis, P.E.
Civil Engineer I

cc: Kevin Kothe, Director of Public Works
Craig Shonkwiler, City Engineer
Bob Yehl, Assistant Director of Public Works
Brett Lueschen, Operations Manager
File



CONSENT AGENDA ITEM NO. 7.J

FOR COUNCIL: November 14, 2022

WARD IMPACTED: City-Wide Impact

SUBJECT: Consideration and action on an Ordinance Amending Section 30 of Chapter 1 of the City Code regarding the Schedule of Fees, as requested by the Fire Department.

RECOMMENDED MOTION: The proposed Ordinance be approved.

STRATEGIC PLAN LINK:

Goal 1. Financially Sound City Providing Quality Basic Services

STRATEGIC PLAN SIGNIFICANCE:

Objective 1d. City services delivered in the most cost-effective, efficient manner

BACKGROUND: The Fire Department in 2019 entered into an Intergovernmental Agreement ("IGA") with the State of Illinois through the Department of Healthcare and Family Services ("IDHFS"), to participate in the Ground Emergency Medical Transport ("GEMT") program. The Illinois GEMT program was established in 2019 as a federal funding opportunity to allow Illinois agencies that provide emergency medical transportation service for Medicaid patients to receive supplemental reimbursement for unrecovered costs associated with serving those patients. The State of Illinois Medicaid cost schedule sets reimbursement rates far below the actual costs of service delivery. The GEMT program provides federal funding to bridge a portion of the difference between Medicaid reimbursement rates and actual costs of service delivery to Medicaid patients.

As a participant in the GEMT program, the City is required to submit annual budgetary information to IDHFS using the Centers for Medicare and Medicaid Services ("CMS") cost report. This cost report calculates the estimated actual cost of providing emergency medical transportation services.

On June 13, 2022, City Council approved an ordinance amending the City Code to allow for and update Ambulance Billing Fees directly related to the cost of services computed by the IDHFS considering the City's participation in the GEMT program.

When the ordinance was drafted and then later approved in June, the Schedule of Fees language applicable to fees for mileage, oxygen, and treatment when not transported to the hospital were inadvertently left out. Because these fees are not associated to the items included in the required cost reports and are not set on an annual basis by IDHFS, it is important to include them within the City Code. The proposed Ordinance, if approved, will amend Section 30 of Chapter 1 in the Schedule of Fees to update the actual cost of Emergency Medical Services to the current rate of \$1,949.41 as determined by IDHFS, and will reinstate the 3% annual increase for mileage, oxygen, and Treat No-Transport fees.

COMMUNITY GROUPS/INTERESTED PERSONS CONTACTED: N/A

FINANCIAL IMPACT: If approved, the emergency medical services fees will increase to \$1,949.41 and then increase by 3% annually including mileage, oxygen, and treatment of a patient with no transport. The revenue generated by ambulance fees is recorded in the Fire-Account/Program Income account (10015210-54910). Stakeholders can locate this in the FY 2023 Budget Book titled "Budget Overview & General Fund" on page 237.

AMERICAN RESCUE PLAN FUNDING IMPACT: N/A

COMMUNITY DEVELOPMENT IMPACT: This request meets the following goals and objectives of the Bloomington Comprehensive Plan 2035: N/A

Respectfully submitted for consideration.

Prepared by: Eric West, Fire Chief

ATTACHMENTS:

[FIRE 1B Ordinance](#)

ORDINANCE NO. 2022 - _____

AN ORDINANCE AMENDING SECTION 30 OF CHAPTER 1 OF THE CITY CODE
REGARDING THE SCHEDULE OF FEES

WHEREAS, the City of Bloomington, McLean County, Illinois (hereinafter "City") is an Illinois home-rule municipality; and

WHEREAS, the City currently has in place in its City Code provisions for the imposition of fees for Emergency Medical Services (hereafter "EMS") and related transportation provided by the City which is contained in the Schedule of Fees; and

WHEREAS, the City participates in the Ground Emergency Medical Transportation (hereafter "GEMT") Program through the Illinois Department of Healthcare and Family Services (hereafter "HFS"); and

WHEREAS, the City is required to submit an annual cost report to HFS pursuant to its participation in the GEMT Program; and

WHEREAS, the annual cost report provides the actual cost incurred for EMS services provided by the City; and

WHEREAS, the 2021 cost report reflects that the City's actual cost of EMS services is \$1949.41, which accordingly needs to be updated in the Schedule of Fees; and

WHEREAS, the costs for mileage, oxygen, and medical treatment with no transport are not included in the cost report and therefore should increase annually by 3%; and

WHEREAS, the costs for mileage, oxygen, and medical treatment with no transport are outdated and accordingly need to be updated in the Schedule of Fees; and

WHEREAS, the City Council desires to update the Schedule of Fees to provide corrected actual cost for EMS services and corrected actual cost including an annual 3% increase for mileage, oxygen, and medical treatment with no transport.

NOW, THEREFORE, BE IT ORDAINED by the Mayor and City Council of the City of Bloomington, McLean County, Illinois, as follows:

SECTION 1. The above recitals are incorporated herein by this reference as if specifically stated in full.

SECTION 2. That Chapter 1, Section 30, the Schedule of Fees, shall be amended as set forth on Exhibit A.

SECTION 3. Except as provided herein, the Bloomington City Code, 1960, as amended

shall remain in full force and effect.

SECTION 4. In the event that any section, clause, provision, or part of this Ordinance shall be found and determined to be invalid by a court of competent jurisdiction, all valid parts that are severable from the invalid parts shall remain in full force and effect.

SECTION 5. The City Clerk is hereby authorized to publish this ordinance in pamphlet form as provided by law.

SECTION 6. This Ordinance is enacted pursuant to the authority granted to the City as a home rule unit by Article VII, Section 6 of the 1970 Illinois Constitution.

SECTION 7. This Ordinance shall be effective 10 days after its passage, approval, and publication as required by law.

PASSED this ____ day of November 2022.

APPROVED this ____ day of November 2022.

CITY OF BLOOMINGTON

ATTEST

Mboka Mwilambwe, Mayor

Leslie Smith-Yocum, City Clerk

EXHIBIT A

SCHEDULE OF FEES

FIRE DEPARTMENT AND FIRE PREVENTION (CHAPTER 17)

A.	Emergency Medical Services and Transportation	(17-92(b))
1.	Fee for Emergency Medical Services and Transportation	
	(a) Emergency Medical Services and Transportation, including Basic Life Support, Advanced Life Support, and Advanced Life Support 2	\$1891.00* <u>\$1949.41*</u>
	(b) Mileage	\$15.66* <u>\$17.62**</u> per
	Mile	
	(c) Medical Treatment with No Transport	\$195.71* <u>\$220.28**</u>
	(d) Oxygen	\$19.00* <u>\$21.38**</u>

*The charges for the foregoing emergency medical and transportation services shall be adjusted on January 1 of every year beginning in 2023, without further City Council action, in accordance with the annual Cost Report submitted for the previous year to the Illinois Department of Healthcare and Family Services (HFS) and/or the federal Centers for Medicare and Medicaid Services (CMS) reflecting the actual cost incurred for transport of individuals. Ambulance user fees shall be assessed a fee equal to the amount listed in the Cost Report. Such persons shall not be billed for the remaining charges which may exist once final payment has been received from all insurance providers of the person.

** The charges for mileage, medical treatment with no transport, and oxygen shall be adjusted on January 1 of every year by multiplying the then current fee by 1.03 and the product shall be the new fee for such service.



CONSENT AGENDA ITEM NO. 7.K

FOR COUNCIL: November 14, 2022

WARD IMPACTED: City-Wide Impact

SUBJECT: Consideration and action on a Resolution to Authorize a Change Order and the First Amendment to the Agreement for a Time Extension of 175 Days for the Contract Between the City of Bloomington and G.A. Rich & Sons, Inc., for the Settled Water Improvements Project, as requested by the Public Works Department.

RECOMMENDED MOTION: The proposed Resolution be approved.

STRATEGIC PLAN LINK:

Goal 2. Upgrade City Infrastructure and Facilities

STRATEGIC PLAN SIGNIFICANCE:

Objective 2b. Quality water for the long term

BACKGROUND: On January 24, 2022, Council approved an Ordinance Authorizing a Construction Contract with G.A. Rich & Sons for Settled Water Piping Improvements project (Bid #2022-18), in the amount of \$301,900. On June 13, 2022, Council approved a change order in the amount of \$85,607.61 for additional work that was discovered during construction. This project consists of piping modifications to allow access for cleaning equipment and removal of the lime scale from discharge piping from all four ClariCones.

This project is broken into several phases. During each phase, the Water Treatment Plant must be completely shut down to allow for repairs, replacement, and cleaning of both piping and valves. These shutdowns can last from six to ten hours each and can only happen when customer demand is low. Each shutdown results in the depletion of several million gallons of potable/fire storage water that takes several days to replenish.

Staff delayed the project because customer demand was higher than normal, due in part to a dry summer. Staff did not feel that a safe level of system storage could be maintained. Due to this delay, G.A. Rich will not be able to complete the surface restoration phase of the project within the original contract terms and because the local asphalt plant shuts down during winter months. Both parties have agreed to extend the contract completion date to June 1, 2023, which is an extension of 175 days. This will not impact the cost of the contract.

COMMUNITY GROUPS/INTERESTED PERSONS CONTACTED: N/A

FINANCIAL IMPACT: N/A

AMERICAN RESCUE PLAN FUNDING IMPACT: N/A

COMMUNITY DEVELOPMENT IMPACT: This request meets the following goals and objectives of the Bloomington Comprehensive Plan 2035: Goal UEW-1. Provide quality

public infrastructure within the City to protect public health, safety and the environment, Objective UEW-1.5. Reliable water supply and distribution system that meets the needs of current and future residents.

Respectfully submitted for consideration.

Prepared by: Aaron Kinder, Superintendent of Mechanical Maintenance

ATTACHMENTS:

[PW 1B Resolution](#)

[PW 1C Proposal](#)

[PW 1D G.A. Rich Sons Inc. Agreement Amendment](#)

RESOLUTION NO. 2022 - _____

A RESOLUTION TO AUTHORIZE A CHANGE ORDER AND A FIRST AMENDMENT TO
AGREEMENT FOR A TIME EXTENSION OF 175 DAYS FOR THE CONTRACT BETWEEN THE
CITY OF BLOOMINGTON AND G.A. RICH & SONS, INC.,
FOR THE SETTLED WATER IMPROVEMENTS PROJECT

WHEREAS, the City of Bloomington ("CITY") previously authorized a contract with G.A. Rich & Sons, Inc., for the construction of the Settled Water Piping Improvements (Bid #2022-18) at the Lake Bloomington Water Treatment Facility in the amount of \$301,900; and

WHEREAS, the CITY authorized a change order to the contract with G.A. Rich & Sons, Inc., for the construction of the Settled Water Piping Improvements (Bid #2022-18) at the Lake Bloomington Water Treatment Facility in the amount of \$85,607.61; and

WHEREAS, the CITY delayed the project due to high customer demands and the inability to shut the Water Treatment Plant down for extended periods of time during repairs, replacement and cleaning; and

WHEREAS, G.A. Rich & Sons, Inc., was unable to complete the surface restoration phase of the project as asphalt factory's shutdown during the winter months and both parties are agreeable to extending the completion date by 175 days from December 8, 2022, to June 1, 2023; and

WHEREAS, the change order is germane to the original contract as signed and is in the best interest of the City and authorized by law; and

WHEREAS, the parties desire to enter into a First Amendment to the Agreement to reflect the new completion date.

NOW THEREFORE, BE IT RESOLVED by the City Council of the City of Bloomington, McLean County, Illinois:

That the recitals set forth above are incorporated herein, the First Amendment to Agreement for the Settled Water Improvements Project Agreement between the City of Bloomington and G.A. Rich & Sons Inc. is approved, and the City Manager, or designated representatives, are authorized to secure the Change Order, and any other necessary documents.

PASSED this 14th day of November 2022.

APPROVED this ____ day of November 2022.

CITY OF BLOOMINGTON

ATTEST

Mboka Mwilambwe, Mayor

Leslie Smith-Yocum, City Clerk

CONTRACTOR'S PROPOSAL

FROM:
G A Rich & Sons, Inc.
P O Box 50
Deer Creek, IL 61733

PROJECT: Bloomington Settled Water

JOB NUMBER: 21513
RFP#: 1.

CONTRACT WORK: Plumbing

I DESCRIPTION OF CHANGE:
Time extension for surface replacement

II SUMMARY OF DETAILED BREAKDOWN:

	Additions	Deletions	Net Total
A. MATERIAL	\$0.00	\$0.00	\$0.00
B. LABOR	\$0.00	\$0.00	\$0.00
C. EQUIPMENT	\$0.00	\$0.00	\$0.00
D. OTHER COSTS			
1 SAFETY	(1% of LABOR) - Deletion -0-		\$0.00
2 EXPENDABLE TOOLS	(2.5% of LABOR) - Deletion -0-		\$0.00
E. SUB TOTAL	(A+B+C+D1+D2)		\$0.00
F. OVERHEAD AND PROFIT	(E x 15%) - Deletion -0-		\$0.00
G. TOTAL	(E + F)		\$0.00

III CONTRACTOR'S MARK-UP ON WORK OF SUBCONTRACTORS

Detailed Breakdowns and Summaries from each Sub-Contractor must be attached.

SUBCONTRACTOR: Firm Name	CONTRACT WORK: Description	PROPOSAL
1		
2		
3		
4		
H SUBTOTAL of all work performed by contractor's subcontractors		
I CONTRACTOR'S MARK-UP on work of subcontractors	(H x 6%) - Deletion -0-	

IV FINAL SUMMARY

J PROPOSAL	(G+H+I)	\$0.00
K BONDS	(2.5% of PROPOSAL) - Deletion -0-	\$0.00
L BUILDER'S RISK INSURANCE (if applicable)	(0.3% of PROPOSAL) - Deletion -0-	
M TOTAL PROPOSAL for subject RFP increase (decrease) in contract amount		\$0.00
N Time added to contract	175 Calendar Days	

**CONTRACTOR
SIGNATURE**

TITLE

Project Manager

DATE 10/28/22

**FIRST AMENDMENT TO AGREEMENT
FOR THE SETTLED WATER IMPROVEMENTS PROJECT AGREEMENT BETWEEN
THE CITY OF BLOOMINGTON AND
G.A. RICH & SONS INC.**

This First Amendment, made and entered into this ____ day of November 2022, by and between THE CITY OF BLOOMINGTON, ILLINOIS, (hereinafter "CITY"), and G.A. RICH & SONS, INC., (hereinafter "RICH"), WITNESSETH that:

WHEREAS, on January 25, 2022, an Agreement for the Settled Water Piping Improvements ("Agreement") approved by the City Council and RICH for work on the water improvements; and

WHEREAS, this included all specifications from Bid #2022-18 – Settled Water Improvements (Procurement Documents); and

WHEREAS, through incorporation of the Procurement Documents, the original agreement had a substantial completion date of 270 days and full completion date of 300 days and substantial completion has been met; and

WHEREAS, the parties desire to amend the agreement by extending the completion date by 175 days to June 1, 2023 due to high customer demands not allowing for the City to shut the Water Treatment Plant down for the extended period that would be needed to meet the original full completion date; and

WHEREAS, the parties desire to amend the Agreement, as set forth herein and it is in the City's best interest.

NOW, THEREFORE, in consideration of the foregoing and the mutual covenants set forth herein, the parties hereto, intending legally to be bound, agree to incorporate the above recitals as if fully restated herein and further agree as follows:

1. Recitals. The recitals set forth above shall be incorporated into the terms and conditions of this First Amendment as if fully set forth herein.
2. Amendment to Agreement. The Procurement Documents of the Agreement shall be amended as follows:

Vendor Questionnaire
Section 15 Contract Time.

The undersigned hereby agrees that the Contract Time shall commence twenty (20) days following the effective date of the Agreement.

Substantial completion shall be completed within two-hundred and seventy (270) days, and work shall be fully completed (Final Completion) with ~~three-hundred (300)~~ four hundred seventy-five (475) days, or no later than June 1, 2023, and in accordance with the terms as stated in the Agreement.

3. In all other respects the Agreement for the Settle Water Improvements Project shall remain unchanged and in full force and effect.

IN WITNESS WHEREOF, the parties hereto have executed this Amendment to the Agreement for the Settled Water Piping Improvement Project in duplicate this day and year first above written.

CITY OF BLOOMINGTON

By: _____
Its City Manager

ATTEST:

By: _____
Its Clerk

G.A. RICH & SONS INC.

By: _____
Its Representative

ATTEST:

By: _____
Its Secretary



CONSENT AGENDA ITEM NO. 7.L

FOR COUNCIL: November 14, 2022

WARD IMPACTED: Ward 7

SUBJECT: Consideration and action on an Application from Sport & Bait Lounge Tavern, Inc., d/b/a Sport & Bait Lounge Tavern, located at 304 N. Morris Ave., requesting an approval of a change of ownership for their Class TAPS (Tavern, All Types of Alcohol, Packaged and Sunday Sales) Liquor License, as requested by the City Clerk Department.

RECOMMENDED MOTION: The proposed Change of Ownership be approved.

STRATEGIC PLAN LINK:

Goal 3. Grow the Local Economy

Goal 5. Great Place - Livable, Sustainable City

STRATEGIC PLAN SIGNIFICANCE:

Objective 3a. Retention and growth of current local businesses

Objective 5d. Appropriate leisure and recreational opportunities responding to the needs of residents

BACKGROUND: Sport & Bait Lounge Tavern, Inc., Applicant, located at 304 N. Morris Ave., holds a Class TAPS (Tavern, All Types of Alcohol, Packaged and Sunday Sales) liquor license. 100% of the corporate license holder will be purchased by a different individual. The City of Bloomington Code requires that whenever there has been more than a 5% change in ownership of a corporate license holder, the change must be approved by the Liquor Commission. The proposed corporate license holder is now seeking approval of this change as the sale is contingent upon the approval of a liquor license.

The ownership structure changes are reflected below:

Current Ownership Structure: Ronald Hinchee and Zeldia Hinchee, 100% Owners

Proposed Ownership Structure: James D. Sample, 100% Owner and President

The Applicant appeared before the Liquor Commission on October 11, 2022, (draft minutes attached) where the Commission voted to positively recommend approval of the change of ownership to Council. All license creations, amendments or transfers are contingent upon compliance with all building, health, and safety codes.

COMMUNITY GROUPS/INTERESTED PERSONS CONTACTED: In accordance with City Code, on September 28, 2022, a public notice was published in *The Pantagraph*. 12 notices were mailed to properties adjacent to the applicant property.

FINANCIAL IMPACT: The current annual license fee for a Class TAPS liquor license is \$3,300, which will be recorded in the Non-Departmental-Liquor Licenses account (10010010-51010). Stakeholders can locate this in the FY 2023 Budget Book titled "Budget Overview & General Fund" on page 132. It is also the establishment's responsibility to collect and pay all

applicable taxes including State Sales Tax, Home Rule Tax, and Food and Beverage Tax.

AMERICAN RESCUE PLAN FUNDING IMPACT: N/A

COMMUNITY DEVELOPMENT IMPACT: This request meets the following goals and objectives of the Bloomington Comprehensive Plan 2035: ED-1 Ensure a broad range of employment opportunities for all residents. ED-1.1 Focus on retention and expansion of existing businesses.

Respectfully submitted for consideration.

Prepared by: Amanda Stutsman, Deputy City Clerk

ATTACHMENTS:

[CLK 2B Application](#)

[CLK 2C Site Plan](#)

[CLK 2D 10-11-2022 Liquor Commission Minutes](#)

November 1, 2022

City Clerk Requirement Verification Memo

To: City Council Review

Re: Legal Name: Sport & Bait Lounge Tavern, Inc.

D/B/A Name: Sport & Bait Lounge Tavern

Dear Reviewer,

The City Clerk Department has reviewed the application of the above-mentioned applicant's submission. The required documents below were reviewed and considered suitable.

- Articles of Incorporation
- Proof of Good Standing with the State of Illinois
- A Purchase Agreement between Ronald Hinchee and Zelda Hinchee (Sellers) and Derek Sample (Buyer) of Sport & Bait Lounge Tavern Inc.
- A Contract of Sale Agreement between Ronald Hinchee and Zelda Hinchee (Sellers) and Derek Sample (Buyer) dated 09/27/2022.

The documents listed above are available for review upon request. If you have any questions or concerns, please feel free to reach out.

Respectfully,

Amanda Stutsman
Deputy City Clerk



Liquor License Application

Applicant Business Contact Information: Please fill in your business information completely and legibly.

Legal Entity Name (Corporate/LLC Name)	Sport & Bait Lounge Tavern Inc
Doing Business As (DBA) OR Establishment Name <i>(Assumed names must be registered with the State of Illinois)</i>	Sport & Bait Lounge
Legal Entity Address <i>(including City, State, and Zip)</i>	304 N morris Ave. Bloomington, IL 61701
Legal Entity Phone Number	3098218066
Legal Entity Email Address	dsample1989@yahoo.com
Establishment Address including Zip	304 N morris Ave. Bloomington, IL 61701
Establishment Phone Number	3098218066
Establishment Email Address	dsample1989@yahoo.com
*Email Address for <u>ALL</u> City Communications:	dsample1989@yahoo.com

*Note, that all City communications related to this Application and/or the resulting license, if approved, will be sent by email to the email designated for all City Communications. It is the responsibility of the business to notify the City of any changes.

BELOW PLEASE LIST THOSE RESPONSIBLE FOR LICENSING THE ESTABLISHMENT

Primary Contact:

Name (First & Last)	City	State	Zip
James "Derek" Sample	Bloomington	Illinois	61701
Phone Number	Email Address		

Contact Information for the Legal Entity's Agent: *(If applicable)*

Name (First & Last)	City	State	Zip
James "Derek" Sample	Bloomington	Illinois	61701
Phone Number	Email Address		

Contact Information for the Establishment's General Manager: *(If different than above)*

Name (First & Last)	City	State	Zip
Phone Number	Email Address		

Applicants should review Chapter 6: Alcoholic Beverages (<https://ecode360.com/34403863>) of the Bloomington City Code for all requirements, obligations and information on liquor licensing.

Liquor License Fee Chart					
Class	Description	2020 Fees		2021 Fees	
		Semi	Annual	Semi	Annual
PA	Package Sales – All Types of Liquor <i>(Fee applies to all except CA, EA, RA, or TA)</i>	\$600	\$1,200	\$650	\$1,300
PB	Package Sales – Beer and Wine Only <i>(Package Sales fee for CB, EB, RB, or TB, but no Package Sales fee applies to CA, EA, RA, or TA)</i>	\$450	\$900	\$500	\$1,000
S	Sunday <i>(Fee applies to all except CA & CB)</i>	\$275	\$550	\$300	\$600
	Curbside Pick-Up and Delivery of Alcohol	-	-	-	-
	Outdoor Consumption Area	-	-	-	-

Liquor License Fee Chart (cont.)					
Class	Description	2020 Fees		2021 Fees	
		Semi	Annual	Semi	Annual
CA	Clubs – All Types of Liquor	\$1,200	\$2,400	\$1,350	\$2,700
CB	Clubs – Beer and Wine Only	\$400	\$800	\$450	\$900
EA	Entertainment/Recreational Sports Venue – All Types of Liquor	\$1,200	\$2,400	\$1,350	\$2,700
EB	Entertainment/Recreational Sports Venue – Beer and Wine Only	\$400	\$800	\$450	\$900
GPB	Convenience Store (Package) – Beer and Wine Only	\$450	\$900	\$500	\$1,000
MA	Hotel/Motel – All Types of Liquor	\$600	\$1,200	\$650	\$1,300
MB	Hotel/Motel – Beer and Wine Only	\$375	\$750	\$425	\$850
RAP	Restaurant, All Types of Liquor, and Package Sales	\$1,200	\$2,400	\$1,350	\$2,700
RBP	Restaurant, Beer & Wine Only, and Package Sales	\$512.50	\$1,025	\$750	\$1,200
RA	Restaurant – All Types of Liquor	\$1,200	\$2,400	\$1,350	\$2,700
RB	Restaurant – Beer and Wine Only	\$400	\$800	\$450	\$900
ST	Stadium – All Types of Liquor	\$1,200	\$2,400	\$1,350	\$2,700
TAP	Tavern, All Types of Liquor, and Package Sales	\$1,200	\$2,400	\$1,350	\$2,700
TBP	Tavern, Beer and Wine Only, and Package Sales	\$512.50	\$1,025	\$750	\$1,200
TA	Tavern – All Types of Liquor	\$1,200	\$2,400	\$1,350	\$2,700
TB	Tavern – Beer and Wine Only	\$400	\$800	\$450	\$900

The questions contained in this Application apply equally to all business owners, partners, officers, or members of the applicant business. If more space is needed to answer any question completely, please attach the additional information.

Status of Business Information:

- Check the applicable box which corresponds to your business's filing with the Illinois Secretary of State.

☒ **Sole Proprietorship**

☐ **Limited Liability Company (LLC)**
A copy of the Articles of Organization must be attached.

☐ **Partnership** (Date of Formation: _____)

☐ **Corporation** (Inc. or Corp.)
A copy of the Articles of Incorporation must be attached.
- Attach a list including the name, age, address, and percent of ownership/stock for each owner/partner/member.
- ☐ Yes **If Applicant is a Corporation or LLC:** Is any individual owning more than 5% of stock in the applicant business ineligible to hold a liquor license for any reason other than citizenship or residence? *If yes, please identify the individual(s) and explain:* _____
☒ No
☐ N/A

Business Owner/Operator: (Please circle Yes (Y) or No (N) where applicable.)

- I verify that all owners, partners, officers, members, and majority stockholders:

☒ Yes ☐ No Are 21 years of age or older.

☒ Yes ☐ No Are citizens of the United States.

☒ Yes ☐ No Have never been convicted of any felony, or of the violation of any law relating to the prohibition of the sale of alcoholic liquor, or any other crime or misdemeanor (except minor traffic violations).

☒ Yes ☐ No Have never been convicted of a violation of any federal or state law concerning the manufacture, possession, or sale of alcoholic liquor.

☒ Yes ☐ No Have never been convicted of pandering or any other crime opposed to decency and morality.
- Illinois Liquor Law states the applicant individual must be a resident of the city, village or county in which the premises covered by the license is located. 235ILCS 5/6-2(a)(1)

2A ☒ Yes ☐ No Are any of the persons listed under ownership a resident of McLean County?

2B ☒ Yes ☐ No Is the General Manager a resident of McLean County?
- ☐ Yes ☒ No Is the General Manager of the establishment unable to hold a liquor license for any reason other than citizenship or residence?
- ☐ Yes ☒ No Is the establishment located within 100 feet of any church, school, hospital, home for aged, indigent persons, or war veterans and/or their wives or children?



5. ☒ Yes ☐ No Is the premises for which the license is sought owned?
 5A ☐ Yes ☒ No If not, does a valid lease to the premises for which the license is sought exist?
If so, a copy of the lease is required.
☐ Yes ☒ No Do you know of any reason whether stated in the above questions or not, that this application does not comply with the laws of the State of Illinois, or the Bloomington City Code in connection with the proposed sale of alcoholic beverages? *If yes, please explain:* _____

Nature of License:

- What type of establishment is intended to be operated with this license? (e.g. lounge, tavern, restaurant, wine & cheese shop) Tavern
- What class of liquor license is being sought? (See descriptions beginning on page 1.) TAP
- ☒ Yes ☐ No Will the establishment offer Sunday Sales?
- ☒ Yes ☐ No Will the establishment offer Curbside Pick-Up & Delivery of Alcohol? (Package License Holders Only)
 See City Code Ch. 6 Sec. 32 for more details. <https://ecode360.com/34837503>
- ☐ Yes ☒ No Will the establishment offer an Outdoor Dining Area?
- State the reason the applicant desires a liquor license for the establishment: _____
I am seeking a liquor license so that I can continue providing the current services.
- If approved, how would the liquor license benefit the City and its residents? _____
It would keep the Sport & Bait open for business and well maintained
- ☐ Yes ☒ No Will the establishment offer live entertainment in the establishment? *If yes, please explain:* _____
- ☒ Yes ☐ No Will the proposed or current establishment sell food?
- ☐ Yes ☒ No Will most of the establishment's gross revenue come from sources other than the sale of alcohol?
If yes, what sources will such revenue be derived? _____
- If approved, what license renewal billing cycle would be preferred? ☐ Annual ☒ Semi-Annual

Impact of Establishment:

- What are the proposed hours of operation?

Day	Time Open	Time Close
Monday:	7am	1am
Tuesday:	7am	1am
Wednesday:	7am	1am
Thursday:	7am	1am
Friday:	7am	2am
Saturday:	7am	2am
Sunday:	7am	1am
- Describe the surrounding neighborhood within 500 ft. of the establishment (e.g. residential, commercial, mixed, etc.)
Mixed
 2A. If there are office or commercial buildings nearby, approximately what are their hours of operation?
Rexroad Associates- Thursday 8AM-6PM Friday 8AM-6PM Saturday 9AM-3PM Sunday Closed Monday 8AM
 2B. Is the area predominately residential, are they single or multi-family homes?
It has both.
- Describe any and all streets immediately surrounding the establishment: (e.g. approximate width, one-way, two-way, parking restrictions, etc.) _____
Two-way Morris Ave.
- How much additional traffic is expected to be generated with a liquor license? _____
The businesses is already operating so it should not affect the traffic from where it is now
- Describe any and all on- and off-street parking: _____
approximately 25-30 parking spots in the front and back parking lot.
- How many establishments with liquor licenses are located within 500 ft. of the establishment? 0

**Responsibility:**

1. If the establishment is presently in operation, attach a financial statement of the establishment's last fiscal year.
2. If the establishment is not presently in operation, attach a financial statement showing ownerships personal assets and liabilities (or the entity's assets and liabilities).
3. ☒ Yes ☐ No Is the establishment eligible for a State of Illinois retail liquor dealer's license?
4. ☒ Yes ☐ No Has any owner, partner, officer, member, or majority stockholder ever held a liquor license?
4A If yes, please explain: the current owner holds the license and I am purchasing it. I currently have 3
5. ☐ Yes ☒ No If yes, has any owner, partner, officer, member, or majority stockholder ever been found guilty of violating Bloomington's Liquor Ordinance? *If yes, please explain:* _____
6. ☐ Yes ☒ No Has any owner, partner, officer, member, or majority stockholder ever had a liquor license revoked? *If yes, please explain:* _____
7. ☐ Yes ☒ No Has a similar application made by any of the persons of ownership ever been denied? *If yes, please explain:* _____
8. ☐ Yes ☒ No Has any other license type ever been revoked from any owner, partner, officer, member, or majority stockholder? *If yes, please explain:* _____

Please provide any additional information significant to this application:

I am going through the process of purchasing Sport & Bait Lounge from Butch H. If there is anything else that i can do to help please feel free to reach out. Thank you as always!

Additional License Interests:

Are any of the below additional licenses of interest to the establishment?

- ☐ Yes ☒ No **Sidewalk Café License** (*Downtown Area Only*) Allows use of public sidewalk for serving food and beverages on the sidewalk immediately adjacent to the establishment.
- ☐ Yes ☒ No **Catering Liquor License** Allows liquor license holders to provide catering services to private parties.
- ☒ Yes ☐ No **Video Gaming License** Allows an establishment to have video gaming terminals and to conduct video gaming on the premises as defined by the Illinois Video Gaming Act.
- ☐ Yes ☒ No **Public Dancing License** Allows a for-profit establishment to offer dance privileges to the public.
- ☐ Yes ☒ No **Tobacco License** Allows retail sale of any cigar, cigarette, snuff, chewing tobacco, manufactured product of tobacco or tobacco in any form.

Please note that each of the above-mentioned licenses requires a separate application and most require additional documentation. Applications available via the City Clerk Department.

I, the undersigned, swear or affirm that:

1. I am authorized to sign as an owner, officer, or authorized agent, of the above listed establishment;
2. I declare that all the information included in this application, and any attachment hereto, is true and accurate to the best of my information, knowledge, and belief;
3. All applicants of the establishment are qualified and eligible to obtain the license applied for;
4. I have read and understand the requirements of the City of Bloomington Code pertaining to **Chapter 6: Alcoholic Beverages** <https://ecode360.com/34403863>; and
5. If approved, I certify in accordance with 235 ILCS 5/6-27.1 and City Code Chapter 6: Section 29, that all employees required to check IDs will become BASSET certified within 120 days of employment, that at least one BASSET Certified employee will be on the premises at all times, that all certifications will be kept on premises, and that all certifications will immediately be made available upon request by any law enforcement personnel.

James D Sample

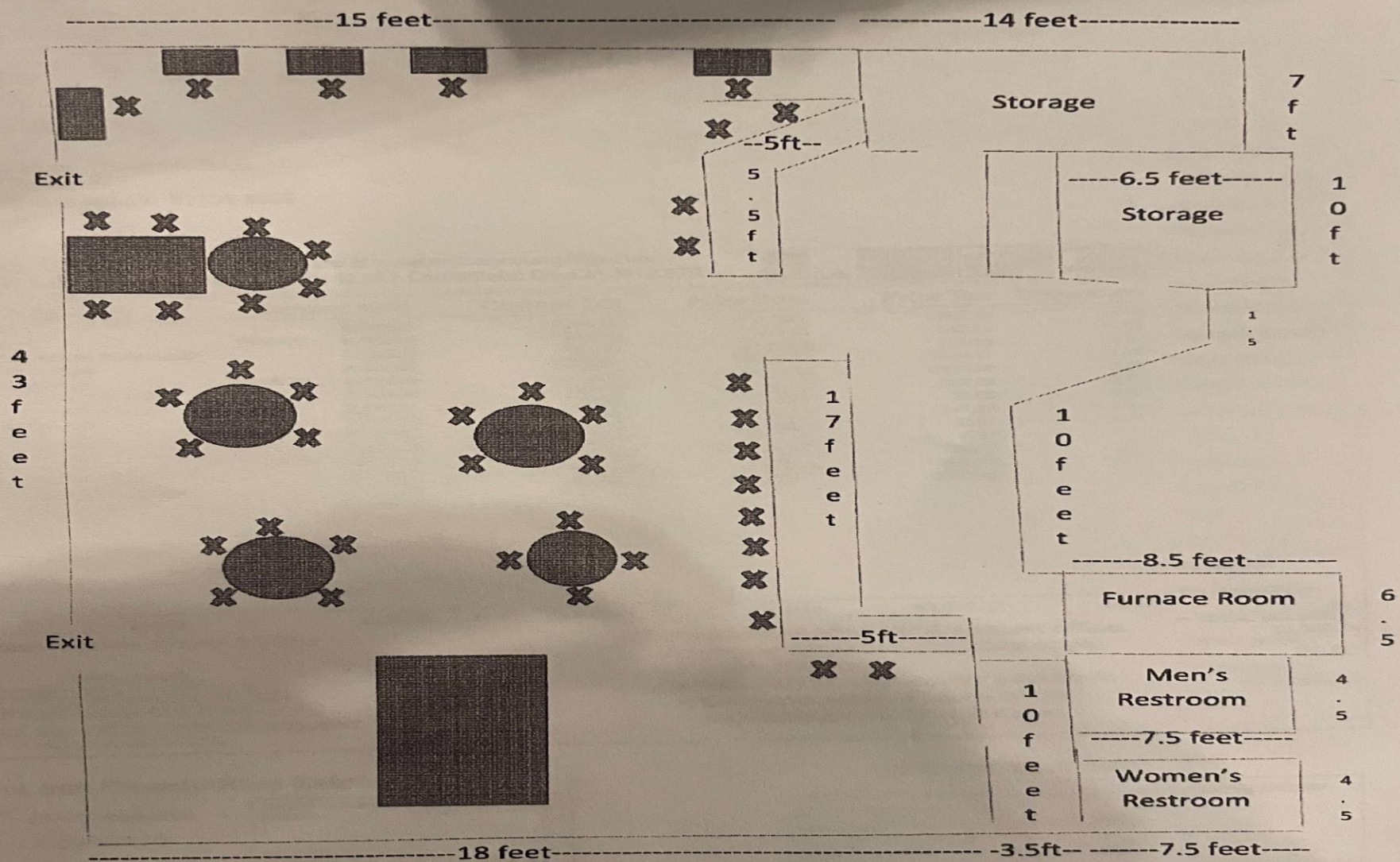
Purchasing Owner

Title

08/25/2022

Date

Signature



Commissioner Mwilambwe directed the Clerk to call roll:

AYES: Meister, Mwilambwe

Motion carried.

Commissioner Mwilambwe closed the public hearing at 4:33 p.m.

The following item was presented:

Item 5.B. Public Hearing and action on an Application from Sport & Bait Lounge Tavern, Inc., d/b/a Sport & Bait Lounge Tavern, located at 304 N. Morris Ave., requesting an approval of a change of ownership for their Class TAPS (Tavern, All Types of Alcohol, Packaged and Sunday Sales) Liquor License, as requested by the City Clerk Department.

Commissioner Mwilambwe opened the public hearing at 4:34 p.m.

James Sample, potential new owner for Sport & Bait Lounge Tavern, after being sworn, addressed the Commission. He stated he hopes to be approved for the liquor license to carry on the establishment as it's been run. He shared that since 2016 he has been in management and had ownership since 2018 of Daddio's, Elroy's, and Reality Bites in Downtown Bloomington.

Zelda Hinchee, Secretary, and current Owner of Sport & Bait Lounge Tavern, after being sworn, addressed the Commission. She stated they have been in business for 42 years and since losing their gaming license, they have been losing business. She explained that once they had the chance to sell, they wanted to do so.

Assistant Police Chief Ken Bays stated that he had no concerns.

George Boyle, Asst. Corporation Counsel stated he had no concerns or comments.

Commissioner Mwilambwe asked if there was anyone present to speak for or against the application. No individuals stepped forward.

Commissioner Mwilambwe closed the public hearing at 4:38 p.m.

Commissioner Meister made a motion, seconded by Commissioner Mwilambwe to positively recommend the Item to Council.

Commissioner Mwilambwe directed the Clerk to call roll:

AYES: Meister, Mwilambwe

Motion carried.

The following item was presented:

Item 5.C. Consideration and action to approve an Application from Toastman Group II, LLC, d/b/a Egg Republic, to be located at 511 Chancellor Dr., requesting a Class RAS (Restaurant, All Types of Alcohol, and Sunday Sales) Liquor License, as requested by the City Clerk Department.

Commissioner Mwilambwe opened the public hearing at 4:39 p.m.

Yiber "John" Pinjolli, Owner of Toastman Group II, LLC, and Mirie Pinjolli, Owner of Toastman Group II, LLC, after being sworn in, addressed the Commission. Mr. Pinjolli stated they were excited to open in Bloomington and explained he and his family have operated a restaurant in LeRoy (Jack's Café) since 2008 that was family-orientated and community-



REGULAR AGENDA ITEM NO. 8.A

FOR COUNCIL: November 14, 2022

WARD IMPACTED: City-Wide Impact

SUBJECT: Presentation of the FY2022 Annual Comprehensive Financial Report, delivered by the audit firm of Baker Tilly Virchow Krause LLP, as requested by the Finance Department.

RECOMMENDED MOTION: Presentation only.

STRATEGIC PLAN LINK:

Goal 1. Financially Sound City Providing Quality Basic Services

STRATEGIC PLAN SIGNIFICANCE:

Objective 1c. Engaged residents that are well informed and involved in an open governance process

BACKGROUND:

The City's Annual Comprehensive Financial Report for the fiscal year ending April 30, 2022, was finalized October 29, 2022. The audit was conducted by an independent audit firm Baker Tilly Virchow Krause LLP, a firm of licensed certified public accountants. The fiscal year 2022 City audit resulted in a clean or unmodified opinion.

Baker Tilly conducted the audit in accordance with auditing standards generally accepted in the United States of America and the standards applicable to financial audits contained in Government Auditing Standards, issued by the Comptroller General of the United States.

As noted in the Independent Auditor's Report, Baker Tilly relied on the audits conducted by other auditors of various component units that are incorporated in the City's financial statements.

The Annual Comprehensive Financial Report can be found on the City's website at: <http://www.cityblm.org/government/departments/finance/financial-statements>

Several other reports are also issued as a result of or in connection with the City audit. Examples include the Federal Single Audit, TIF Report, Annual Financial Report and the Police and Fire Pension Fund Audits. Links or copies of applicable reports have been forwarded to Council.

COMMUNITY GROUPS/INTERESTED PERSONS CONTACTED: N/A

FINANCIAL IMPACT: An unmodified audit opinion provides assurance that the finances of the City are materially correct.

AMERICAN RESCUE PLAN FUNDING IMPACT: N/A

COMMUNITY DEVELOPMENT IMPACT: This request meets the following goals and objectives of the Bloomington Comprehensive Plan 2035: N/A

Respectfully submitted for consideration.

Prepared by: Scott Rathbun, Finance Director