

Rock Cut Road Transfer Station Building 2 Optimization  
5808 Rock Cut Road, Jamesville NY 13078  
Onondaga County Resource Recovery Agency

**Addendum No. 1 to Contract Documents**

Contracts 1, 2 and 3

November 30, 2021

Contractors submitting proposals for the above-named project shall take note of the following changes, additions, deletions, clarifications, etc., in the Contract Documents, which shall become a part of and have precedence over anything contrarily shown or described in the Contract Documents, and all such shall be taken into consideration and be included in the Contractor's Bid Proposal.

This Addendum must be acknowledged in the Contractor's Bid Proposal.

Item No. 1:

This Addendum includes additional information to the Contract Documents, dated November 2021, required for bidding including all questions submitted to OCRRA before November 23, 2021, 2 p.m. As described herein, the following attachments are included with this Addendum:

<u>Attachment No.</u>	<u>Description</u>
1	Technical Specifications (revised complete Sections as noted on the Table of Contents)
2	Construction Plans (revised as "clouded" on sheets)

Item No. 2:

Table of Contents. **DELETE AND REPLACE** the list of technical provisions as follows:

**TECHNICAL SPECIFICATIONS**

**Division 01 – General Requirements**

01 10 00	Summary of Work
01 20 00	Price and Payment Procedures
01 25 00	Substitution Procedures
01 30 00	Administrative Requirements
01 32 16	Construction Progress Schedule
01 33 00	Submittal Procedures
01 40 00	Quality Requirements
01 50 00	Temporary Facilities and Controls
01 50 01	Health and Safety Provisions
01 60 00	Product Requirements
01 70 00	Execution and Closeout Requirements
01 90 00	Reference Standards

**Division 02 – Existing Conditions**

02 41 19	Selective Structure Demolition
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**Division 03 – Concrete**

03 30 00 Cast-in-Place Concrete

**Division 05 – Metals**

05 12 00 Structural Steel Framing

**Division 07 – Thermal and Moisture Protection**

07 92 00 Joint Sealants

**Division 08 – Openings**

08 33 23 Overhead Coiling Doors

**Division 21 – Fire Suppression**

21 05 00 Common Work Results for Fire Suppression

21 13 16 Dry-Pipe Sprinkler Systems

**Division 22 – Plumbing**

22 05 11 Common Work Results for Plumbing

22 05 17 Sleeves and Sleeve Seals for Plumbing Piping

22 05 29 Hangers and Supports for Plumbing Piping and Equipment

22 07 00 Plumbing Insulation

22 11 16 Non-Potable Water Piping

**Division 26 – Electrical**

26 05 00 Common Work Results for Electrical

26 05 19 Low Voltage Electrical Power Conductors and Cables

26 05 26 Grounding and Bonding For Electrical Systems

26 05 29 Hangers and Supports For Electrical Systems

26 05 33 Raceway and Boxes For Electrical Systems

26 05 53 Identification For Electrical Systems

Item No. 3:

Exhibit L. **DELETE AND REPLACE** the list of sheet numbers and titles as follows:

- a. Cover Sheet
- b. Sheet C1, General Notes
- c. Sheet C2, Existing Site Conditions & Operations Plan
- d. Sheet A-1, Code Sheet
- e. Sheet A-2, Basement Life Safety Plan
- f. Sheet A-3, First Floor Life Safety Plan
- g. Sheet A-4, Existing Basement Plan
- h. Sheet A-5, Existing First Floor Plan
- i. Sheet A-6, Basement Demo Plan
- j. Sheet A-7, First Floor Demo Plan
- k. Sheet A-8, Basement Floor Plan
- l. Sheet A-10, First Floor Plan
- m. Sheet S001, Title Sheet
- n. Sheet S101, Partial Demolition Plan at Foundation
- o. Sheet S102, Partial Demolition Plan at Tipping Floor
- p. Sheet S103, Partial Foundation Plan
- q. Sheet S104, Partial Framing Plan at Tipping Floor
- r. Sheet S105, Pushwall Framing Plan
- s. Sheet S201, Sections
- t. Sheet S202, Sections
- u. Sheet S203, Sections
- v. Sheet S204, Sections
- w. Sheet S301, Details

- x. Sheet S401, Special Inspections
- y. Sheet FP1, Fire Protection: Basement Floor Plans
- z. Sheet FP2, Fire Protection: First Floor Demo Plan
- aa. Sheet FP3, Fire Protection: First Floor Plan
- bb. Sheet P1, Plumbing: Basement Floor Plans
- cc. Sheet E1, Electrical: First Floor Demo Plan
- dd. Sheet E2, Electrical: First Floor Plan

Item No. 4:

**REPLACE** the Technical Specifications/Provisions (Attachment No. 1) in their entirety. Revisions of select Technical Specifications are noted on the Table of Contents included in the Technical Specifications.

Item No. 5:

**REPLACE** the Construction Plans (Attachment No. 2) in their entirety. Specific revisions to select Construction Plans are “clouded” for easy identification on each respective Sheet that has been revised.

Item No. 6:

Question received during bidding: Are Minerallac Conduit hangers acceptable in lieu of Clevis hangers?

*Response* – As detailed within Technical Specification Section 01 25 00 “Substitution Procedures”, the Contractor may submit requests for substitutions and these requests may be considered for a product considered to offer equivalent performance to the specified product. This specific substitution request will be reviewed as part of the submittals review prior to construction of the item, provided that specifications are provided to demonstrate equivalency.

**ADDENDUM NO. 1**

**ATTACHMENT NO. 1**

# Contract Documents and Technical Specifications

## Onondaga County Resource Recovery Agency Rock Cut Road Transfer Station Building 2 Optimization

NOVEMBER 2021

 ADDENDUM 1 – NOVEMBER 30, 2021

### **PRESENTED TO**

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**Onondaga County Resource Recovery Agency**

100 Elwood Davis Road  
North Syracuse, NY 13212-4312

### **SUBMITTED BY**

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Cornerstone Engineering and Geology, PLLC  
100 Crystal Run Road, Suite 101  
Middletown, NY 10941

P +1.877.294.9070  
F +1.877.845.1456  
tetrattech.com

## REPORT CERTIFICATION

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### Technical Specifications (Division 1)

**Onondaga County Resource Recovery Agency  
Rock Cut Road Transfer Station Building 2 Optimization  
Jamesville, New York 13078**

These Technical Specifications were prepared under the supervision and direction of the undersigned, whose seal as a registered professional engineer is affixed below.

**Cornerstone Engineering and Geology, PLLC**



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Robert A. Holmes, P.E.  
N.Y.P.E. License No. 077317



## REPORT CERTIFICATION

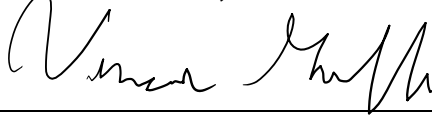
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### Technical Specifications

**Onondaga County Resource Recovery Agency  
Rock Cut Road Transfer Station Building 2 Optimization  
Jamesville, New York 13078**

These Technical Specifications were prepared under the supervision and direction of the undersigned, whose seal as a registered professional engineer is affixed below.

**E.D. Pons Associates, P.C.**



Vincent A. Griffin, P.E.  
N.Y.P.E. License No. 096942-1



11-30-21

## REPORT CERTIFICATION

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### Technical Specifications

**Onondaga County Resource Recovery Agency  
Rock Cut Road Transfer Station Building 2 Optimization  
Jamesville, New York 13078**

These Technical Specifications were prepared under the supervision and direction of the undersigned, whose seal as a registered professional engineer is affixed below.

**Anderson Design Group**



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Jason T. Anderson, R.A.  
N.Y. License No. 033127

## REPORT CERTIFICATION

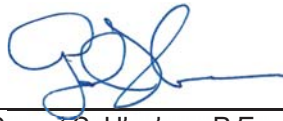
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### Technical Specifications

**Onondaga County Resource Recovery Agency  
Rock Cut Road Transfer Station Building 2 Optimization  
Jamesville, New York 13078**

These Technical Specifications were prepared under the supervision and direction of the undersigned, whose seal as a registered professional engineer is affixed below.

**Gerard Associates Consulting Engineers, P.C.**



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Gerard S. Hluchan, P.E.  
N.Y.P.E. License No. 069684



## TABLE OF CONTENTS

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### Division 01 – General Requirements

△	01 10 00	Summary of Work
	01 20 00	Price and Payment Procedures
	01 25 00	Substitution Procedures
	01 30 00	Administrative Requirements
	01 32 16	Construction Progress Schedule
	01 33 00	Submittal Procedures
	01 40 00	Quality Requirements
	01 50 00	Temporary Facilities and Controls
	01 50 01	Health and Safety Provisions
	01 60 00	Product Requirements
	01 70 00	Execution and Closeout Requirements
	01 90 00	Reference Standards

### Division 02 – Existing Conditions

△	02 41 19	Selective Structure Demolition
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### Division 03 – Concrete

△	<del>03 05 16</del>	<del>Underslab Vapor Barrier</del>
△	03 30 00	Cast-in-Place Concrete
△	<del>03 35 11</del>	<del>Concrete Floor Finishes</del>

### Division 05 – Metals

△	05 12 00	Structural Steel Framing
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### Division 07 – Thermal and Moisture Protection

	07 92 00	Joint Sealants
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### Division 08 – Openings

△	08 33 23	Overhead Coiling Doors
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### Division 21 – Fire Suppression

	21 05 00	Common Work Results for Fire Suppression
	21 13 16	Dry-Pipe Sprinkler Systems

### Division 22 – Plumbing

	22 05 11	Common Work Results for Plumbing
	22 05 17	Sleeves and Sleeve Seals for Plumbing Piping
	22 05 29	Hangers and Supports for Plumbing Piping and Equipment
	22 07 00	Plumbing Insulation
	22 11 16	Non-Potable Water Piping

### Division 26 – Electrical

	26 05 00	Common Work Results for Electrical
	26 05 19	Low Voltage Electrical Power Conductors and Cables
	26 05 26	Grounding and Bonding For Electrical Systems
	26 05 29	Hangers and Supports For Electrical Systems

26 05 33	Raceway and Boxes For Electrical Systems
26 05 53	Identification For Electrical Systems

## 1.0 LIMITATIONS

The work product included in the attached was undertaken in full conformity with generally accepted professional consulting principles and practices and to the fullest extent as allowed by law we expressly disclaim all warranties, express or implied, including warranties of merchantability or fitness for a particular purpose. The work product was completed in full conformity with the contract with our client and this document is solely for the use and reliance of our client and this document is solely for the use and reliance of our client and the New York State Department of Environmental Conservation (*unless previously agreed upon that a third party could rely on the work product*) and any reliance on this work product by an unapproved outside party is at such party's risk.

The work product herein (*including opinions, conclusions, suggestions, etc.*) was prepared based on the situations and circumstances as found at the time, location, scope and goal of our performance and thus should be relied upon and used by our client and the New York State Department of Environmental Conservation recognizing these considerations and limitations. Cornerstone shall not be liable for the consequences of any change in environmental standards, practices, or regulations following the completion of our work and there is no warrant to the veracity of information provided by third parties, or the partial utilization of this work product.

## **DIVISION 01 – GENERAL REQUIREMENTS**

**SECTION 01 1000**  
**SUMMARY OF WORK**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Contract Description.
- B. Bid Alternates.
- C. Owner-Furnished Products.
- D. Work by Owner.
- E. Contractor's Use of Site and Premises.
- F. Supervision by Contractor.
- G. Permits.
- H. Involved Agencies.
- I. Weekend or Night Work.
- J. Maintenance of Traffic.
- K. Specification Conventions.

**1.2 RELATED SECTIONS**

- A. All Divisions and Sections referenced in this Section
- B. Division 00 – Procurement and Contracting Requirements
- C. Section 00 7000 - General Conditions
- D. Section 01 2000 – Price and Payment Procedures
- E. Section 01 3000 – Administrative Requirements
- F. Section 01 9000 – Reference Standards

**1.3 CONTRACT DESCRIPTION**

- A. The Work is identified on the Construction Plans and in the Technical Specifications.

- B. It is the intent of the Construction Plans and Technical Specifications to provide alterations and/or new construction as indicated to provide complete systems in every respect, capable of operating as designed. It is not intended that every fitting, minor detail or feature be shown on Construction Plans or detailed within the Technical Specifications. The Contractor shall be responsible for any additional detail necessary for completion of these systems in accordance with good practice. Installation shall be executed so as to contribute to efficiency of operation, proper and safe functioning of the construction and its equipment, minimum maintenance, accessibility, and sightliness. The requirements specified herein shall govern applicable portions of all Sections whether so stated herein or not.
- C. Comply with applicable regulatory requirements and various codes. Where conflicts exist between local, State, and/or Federal regulatory requirements, codes, or these Technical Specifications, Contractor shall advise the Architect-Engineer or Owner. The Architect-Engineer will assist in resolving the conflicts to the satisfaction of the regulatory agencies prior to commencing the Work.
- D. All Work shall comply with OSHA and PESH (site specific safety plans required), the New York State Uniform Fire Prevention and Building Code (the "Uniform Code"), which includes the current editions, Part 1221 (Building Code), Part 1222 (Plumbing Code), Part 1223 (Mechanical Code), Part 1224 (Fuel Gas Code), Part 1225 (Fire Code), Part 1226 (Property Maintenance Code), Part 1227 (Existing Building Code), and Part 1240 (New York State Energy Conservation).
- E. The Contractor shall be advised that where noted, the use of a brand name is for the purpose of describing the standard of quality, performance and characteristics desired and is in no way intended to limit or restrict competition.
- F. The Contractor shall furnish all material, labor, equipment, incidentals, and appurtenances required to perform the work under the Contract for construction of Rock Cut Road Transfer Station Building 2 Optimization including, but not limited to, the following:

## **CONTRACT NO. 1 – General Transfer Station Building 2 Optimization**

### **Division 01 – General Requirements**

- General Conditions, including supervision and management, ongoing project related expenses such as site health and safety, utilities, dust control, bonds and insurances, obtaining necessary permits and compliance with any and all requirements of regulatory agencies and utility companies pertaining to the work, and any other item not covered in the other paragraphs of this Section.

- Mobilization and Demobilization of all parts, material, and equipment to and from the Site that are necessary to complete the Work, as well as connection and disconnection of Contractor-provided utilities, Facility restoration, and final Facility cleaning.
- Temporary Construction Facilities and Controls, including Contractor's facilities, furnishings, and their related expenses, etc.; vehicles and related maintenance including supplies such as fuel; temporary services; preparation and submission of Submittals, Shop Drawings, and operations and maintenance manuals, etc.; protection of existing facilities to remain; protection of completed work; and any other requirements as identified and described in Section 01 5000 Temporary Facilities and Controls.
- Third Party Quality Assurance services (testing) by a certified, independent testing laboratory and service to perform specified testing such as concrete and structural and inspection such as fire protection, plumbing, and electrical, as required by the Construction Plans, Technical Specifications, and permits. Testing laboratory will perform tests, inspections, Special Inspections required by code, and other services specified in individual Technical Specification sections and as required by Architect-Engineer, Owner, and Authorities Having Jurisdiction.
- 3D scanning services and subsequent “point cloud” deliverable to establish all lines, elevations, and reference marks necessary to complete the Work and preparation of Record As-Built Survey and Record Drawings suitable for use by Architect-Engineer and Owner for Facility Certification with the NYSDEC and Authorities Having Jurisdiction, as required by the Contractor and Architect-Engineer during the progress of the Work, and from time to time to verify original construction stakeout and resetting of reference points for interim checks to allow accurate and satisfactory construction and completion of all Work in accordance with the requirements of the Construction Plans and Technical Specifications.

Specifically, Record As-Built Survey and Record Drawings will be required as identified and described in Section 01 7000 Execution and Closeout Requirements.

## **Division 02 – Existing Conditions**

- Provide all labor, materials, equipment, incidentals and appurtenances necessary to perform the Demolition and Removal of the Building 2 Conveyor, Hydraulic Pushplates/Rams in the Building 2 Push Pit, Building 2 Push Pit Knee Wall, Building 2 Loadout Knee Wall (to 12" height), Building 2 Loadout Steel Components (Spill Shield and Cap), and Building 2 Basement Overhead Door, perform wall and steel penetrations as required for Contract No. 2, and provide openings in structural slab for the proposed Push Wall as required in accordance with the Construction Plans and Technical Specifications.

### **Division 03 – Concrete**

- Provide all labor, materials, equipment, incidentals and appurtenances necessary to install the reinforced Concrete for the Building 2 Tipping Floor slab, the Push Wall concrete columns, any other miscellaneous concrete installations, and testing as required to complete the Work in accordance with the Construction Plans and Technical Specifications.

### **Division 05 – Metals**

- Provide all labor, materials, equipment, incidentals and appurtenances necessary to install all Metals necessary including, but not limited to, the Building 2 Push Wall (including framing and steel plate), the Tipping Floor slab framing within the existing Push Pit, the steel cap for the Building 2 Loadout Knee Wall modification, and any other miscellaneous steel installations as required to complete the Work in accordance with the Construction Plans and Technical Specifications.

### **Division 07 – Thermal and Moisture Protection**

- Provide all labor, materials, equipment, incidentals and appurtenances necessary to install the Joint Sealants as required to complete the Work in accordance with the Construction Plans and Technical Specifications.

### **Division 08 – Openings**

- Provide all labor, materials, equipment, incidentals and appurtenances necessary to install the Roll Up Door and new Door Opening as required to complete the Work in accordance with the Construction Plans and Technical Specifications.

## **CONTRACT NO. 2 – Plumbing & Fire Suppression Building 2 Optimization**

### **Division 01 – General Requirements**

- General Conditions, including supervision and management, ongoing project related expenses such as site health and safety, utilities, dust control, bonds and insurances, obtaining necessary permits and compliance with any and all requirements of regulatory agencies and utility companies pertaining to the work, and any other item not covered in the other paragraphs of this Section.
- Mobilization and Demobilization of all parts, material, and equipment to and from the Site that are necessary to complete the Work, as well as connection and disconnection of Contractor-provided utilities, Facility restoration, and final Facility cleaning.
- Temporary Construction Facilities and Controls, including Contractor's facilities, furnishings, and their related expenses, etc.; vehicles and related maintenance including supplies such as fuel; temporary services; preparation and submission of Submittals,

Shop Drawings, and operations and maintenance manuals, etc.; protection of existing facilities to remain; protection of completed work; and any other requirements as identified and described in Section 01 5000 Temporary Facilities and Controls.

- Third Party Quality Assurance services (testing) by a certified, independent testing laboratory and service to perform specified testing such as concrete and structural and inspection such as fire protection, plumbing, and electrical, as required by the Construction Plans, Technical Specifications, and permits. Testing laboratory will perform tests, inspections, Special Inspections required by code, and other services specified in individual Technical Specification sections and as required by Architect-Engineer, Owner, and Authorities Having Jurisdiction.
- 3D scanning services and subsequent “point cloud” deliverable to establish all lines, elevations, and reference marks necessary to complete the Work and preparation of Record As-Built Survey and Record Drawings suitable for use by Architect-Engineer and Owner for Facility Certification with the NYSDEC and Authorities Having Jurisdiction, as required by the Contractor and Architect-Engineer during the progress of the Work, and from time to time to verify original construction stakeout and resetting of reference points for interim checks to allow accurate and satisfactory construction and completion of all Work in accordance with the requirements of the Construction Plans and Technical Specifications.

Specifically, Record As-Built Survey and Record Drawings will be required as identified and described in Section 01 7000 Execution and Closeout Requirements.

## **Division 02 – Existing Conditions**

- Provide all labor, materials, equipment, incidentals and appurtenances necessary to perform the Demolition and Removal of the Building 2 Basement Sprinkler Pipe and Fire Department Connection Pipe, the Building 2 First Floor Sprinkler Pipe, Sprinkler Heads, and fittings, and the Building 2 & Building 3 Non-Potable Water Piping (Dust Suppression) as required in accordance with the Construction Plans and Technical Specifications.

## **Division 21 – Fire Suppression**

- Provide all labor, materials, equipment, incidentals, testing, and appurtenances necessary to install the Building 2 Basement Sprinkler Pipe and Fire Department Connection Pipe (including piping, hangers, and connections to existing piping system), Building 2 First Floor Sprinkler Supply Pipe, Sprinkler Heads, fittings, and hangers, equipment/safety, testing, and additional components as required to complete the Work in accordance with the Construction Plans and Technical Specifications.

## **Division 22 – Plumbing**

- Provide all labor, materials, equipment, incidentals, testing, and appurtenances necessary to install the Building 2 & Building 3 Non-Potable Water Piping, fittings, and hangers, the Building 2 & Building 3 Non-Potable Water Valve and Hose Connection (with insulation), and additional components as required to complete the Work in accordance with the Construction Plans and Technical Specifications.

## **CONTRACT NO. 3 – Electrical Building 2 Optimization**

### **Division 01 – General Requirements**

- General Conditions, including supervision and management, ongoing project related expenses such as site health and safety, utilities, dust control, bonds and insurances, obtaining necessary permits and compliance with any and all requirements of regulatory agencies and utility companies pertaining to the work, and any other item not covered in the other paragraphs of this Section.
- Mobilization and Demobilization of all parts, material, and equipment to and from the Site that are necessary to complete the Work, as well as connection and disconnection of Contractor-provided utilities, Facility restoration, and final Facility cleaning.
- Temporary Construction Facilities and Controls, including Contractor's facilities, furnishings, and their related expenses, etc.; vehicles and related maintenance including supplies such as fuel; temporary services; preparation and submission of Submittals, Shop Drawings, and operations and maintenance manuals, etc.; protection of existing facilities to remain; protection of completed work; and any other requirements as identified and described in Section 01 5000 Temporary Facilities and Controls.
- Third Party Quality Assurance services (testing) by a certified, independent testing laboratory and service to perform specified testing such as concrete and structural and inspection such as fire protection, plumbing, and electrical, as required by the Construction Plans, Technical Specifications, and permits. Testing laboratory will perform tests, inspections, Special Inspections required by code, and other services specified in individual Technical Specification sections and as required by Architect-Engineer, Owner, and Authorities Having Jurisdiction.
- 3D scanning services and subsequent “point cloud” deliverable to establish all lines, elevations, and reference marks necessary to complete the Work and preparation of Record As-Built Survey and Record Drawings suitable for use by Architect-Engineer and Owner for Facility Certification with the NYSDEC and Authorities Having Jurisdiction, as required by the Contractor and Architect-Engineer during the progress of the Work, and from time to time to verify original construction stakeout and resetting of reference points for interim checks to allow accurate and satisfactory construction and completion

of all Work in accordance with the requirements of the Construction Plans and Technical Specifications.

Specifically, Record As-Built Survey and Record Drawings will be required as identified and described in Section 01 7000 Execution and Closeout Requirements.

## **Division 02 – Existing Conditions**

- Provide all labor, materials, equipment, incidentals and appurtenances necessary to perform the Demolition and Removal of Building 2 First Floor electrical conduit, wiring, hangers, supports, and appurtenances, and Building 2 First Floor out of service fixtures, conduit, boxes, and supports as required in accordance with the Construction Plans and Technical Specifications.

## **Division 26 – Electrical**

- Provide all labor, materials, equipment, incidentals and appurtenances necessary to install Building 2 First Floor Junction/Pull Boxes, electrical conduit, wiring, hangers, supports, and appurtenances, temporary power, testing and troubleshooting, and additional components as required to complete the Work in accordance with the Construction Plans and Technical Specifications.
- G. Place all facilities and equipment for functional operation, including all associated and necessary services.
- H. All fees, labor, material, and consultation from manufacturers and manufacturer's representatives during construction and during one (1) year warranty period shall be borne by Contractor as may be required to accomplish intent of Contract Documents and functional service thereof. Warranty period shall commence upon date of issuance of Final Payment.
- I. Confirm all existing utility locations and elevations prior to construction. Contractor is responsible for protecting all utilities and existing features during the course of construction.
- J. All Work shall be complete, tested, and proper operations demonstrated. Contractor shall present certificates of inspection as required to the Architect-Engineer for approval and demonstrate that installation and testing was performed in accordance with the Construction Plans, Technical Specifications, and applicable permits.
- K. The Work to be done shall include all Work shown on the Construction Plans and specified herein. All Work shall be in accordance with the Construction Plans and the requirements of the Technical Specifications and addenda (if any).
- L. The foregoing is a general description only and shall not be construed as a complete description of the Work to be performed. The Contractor is responsible for

performing all Work required to complete the Work as detailed on the Construction Plans and Technical Specifications.

- M. All electrical Work shall be coordinated with the local utility and Owner.
- N. Temporary facilities and utilities shall be provided and maintained as indicated in Section 01 5000.
- O. Provide a one (1) year warranty onto all parts and workmanship with no portal to portal charges for any warranty work performed.

#### **1.4 BID ALTERNATES**

- A. None.

#### **1.5 OWNER-FURNISHED PRODUCTS**

- A. None.

#### **1.6 WORK BY OWNER**

- A. None.

#### **1.7 CONTRACTOR'S USE OF SITE AND PREMISES**

- A. The Contractor shall anticipate continued use of the Site and Facility to allow:
  - 1. Owner occupancy and continued operation of the existing Rock Cut Road Transfer Station within all areas outside of the Limit of Work.
  - 2. Work by Others.
  - 3. Access to and use of Rock Cut Road Transfer Station by the public within all areas outside of the Limit of Work.
- B. The Contractor's access to the Project area will be via Contractor Entrance and Contractor Exit. The Owner and the public will primarily utilize the Facility Entrance and Facility Exit. Regardless, due to the on-going occupancy and continued operation of the existing Rock Cut Road Transfer Station during the Work, the Contractor shall anticipate vehicular traffic outside the Limit of Work.
- C. The Contractor shall be aware the permitted hours of operation at the existing Rock Cut Road Transfer Station are as follows:
  - 1. Waste Acceptance:
    - a. Monday through Saturday: 6:30 AM to 4:30 PM.

2. Waste Operations:
    - a. Monday through Saturday: 4:00 AM to 9:00 PM .
  3. Sunday: Closed.
- D. Construction Operations: The Contractor shall confine Contractor's materials and their storage, and the operation of Contractor's workers to limits depicted within the Contract Documents, indicated by laws, ordinances permits, and directions of the Owner and/or Architect-Engineer, and will not unreasonably encumber the premises with such materials, but shall store them in orderly fashion so that they will not interfere with the Work under this Contract or other contracts, or with the operation of the Rock Cut Road Transfer Station. The Contractor shall not load nor permit any part of the Work to be loaded with a weight that will endanger its safety or unduly affect the structure or any part thereof. The Contractor shall enforce the instructions of the Owner regarding signs, fires, and smoking.
- E. Contractor staging areas and stockpiles of material shall be coordinated by the Contractor and off-site areas reviewed, and on-site areas approved by the Owner.
- F. Neither the Contractor nor any of the Contractor's employees shall park any vehicle anywhere on the site, except at such locations as shown or as specifically approved by the Owner for the purpose.
- G. Construction Plan: Before start of construction, submit three (3) copies of the Construction Plan regarding access to Work, use of Site, staging and stockpile areas, and utility outages for acceptance by the Owner. After acceptance of the Plan, construction operations shall comply with accepted the Plan unless deviations are accepted by the Owner in writing.

## **1.8 SUPERVISION BY CONTRACTOR**

- A. The Contractor shall supervise and direct the Work using best skill and attention. The Contractor shall be solely responsible for all construction means, methods, techniques, sequences, procedures, and safety precautions employed for the Work under the Contract.
- B. The Contractor shall employ at the Site during the performance of the Work or any part thereof, a competent superintendent or foreman who shall be satisfactory to the Owner and Architect-Engineer, and who shall not be replaced except with the written consent of the Owner and Architect-Engineer, unless the superintendent or foreman ceases to be an employee of the Contractor. Such superintendent or foreman shall represent and have full authority to act for their Contractor in his absence and all directions given to such superintendent or foreman shall be as binding as if given to the Contractor.

## **1.9 PERMITS**

- A. The Contractor shall furnish necessary permits for construction of Work including, but not limited to, the following:
  - 1. Electrical Permit.
- B. The Contractor shall provide, to the satisfaction of the Owner and the Authorities Having Jurisdiction, the tests, inspections, and subsequent Record Documents to support Owner procurement and closeout of any additional permits for the Work as required by the Authorities Having Jurisdiction. The Owner will provide the list of required tests, inspections, and subsequent Record Documents at the Site Mobilization Meeting as detailed within Section 01-30-00.
- C. The Owner has obtained the NYSDEC Permit for operation of Rock Cut Road Transfer Station. All construction is to be in accordance with the requirements of the NYSDEC Permit.

## **1.10 INVOLVED AGENCIES**

- A. The following agencies shall be involved in the Work:
  - 1. Onondaga County Resource Recovery Agency (OCRRA).
  - 2. New York State Department of Environmental Conservation.
  - 3. Onondaga County Department of Emergency Management.
- B. Electric – the Contractor is required to obtain certification and approval for all electric services from a certified UL Underwriter to ensure that all Work has been constructed in accordance with all local, State, and Federal codes. In addition, all service connections shall be coordinated with the local utility provider.

## **1.11 WEEKEND OR NIGHT WORK**

- A. If it becomes necessary to perform Work at night or on Saturdays, Sundays or legal holidays, the Contractor shall submit written notice to the Owner at least ten (10) days in advance of the need for such Work and approval from the Owner and/or Owner's Representative. Contractor shall provide personnel to monitor the Contractor and Facility Entrances and Exits. Work at night is subject to review by the Owner and is not guaranteed. If approved, Work at night may be subject to Owner provided conditions.
- B. The Contractor may be responsible for covering the costs of all personnel provided by the Owner and/or Owner's Representative.

- C. Good lighting and all other necessary facilities for carrying out and observing the Work shall be provided and maintained where such Work is being performed at night.
- D. Any extension of hours beyond an eight (8) hour day shall be subject to the Contractor recovery approval for the New York State Department of Labor.
- E. Weekend Work may be allowed, but is not guaranteed, by the Owner. Hours of operation will be established at the Pre-Construction Meeting.

#### **1.12 MAINTENANCE OF TRAFFIC**

- A. The Contractor shall use the Contractor Entrance and Exit, located off Rock Cut Road. The entrance is located approximately 1,000 feet east of Exit 1 off of the northbound lane of Interstate 481.
- B. The Contractor shall provide flagmen as necessary during the delivery or retrieval of construction equipment and materials at no additional cost to the Owner.

#### **1.13 SPECIFICATION CONVENTIONS**

- A. These Technical Specifications are written in imperative mood and streamlined form. This imperative language is directed to Contractor unless specifically noted otherwise. The words "shall be" are included by inference where a colon (:) is used within sentences or phrases.

#### **PART 2 PRODUCTS - Not Used**

#### **PART 3 EXECUTION - Not Used**

**END OF SECTION**

## **SECTION 01 20 00**

### **PRICE AND PAYMENT PROCEDURES**

#### **PART 1 GENERAL**

##### **1.1 SECTION INCLUDES**

- A. Testing and Inspection.
- B. Schedule of Values.
- C. Application for Payment.
- D. Change Procedures.
- E. Defect Assessment.
- F. Alternates.

##### **1.2 RELATED SECTIONS**

- A. All Divisions and Sections referenced in this Section.
- B. Division 00 – Procurement and Contracting Requirements

##### **1.3 TESTING AND INSPECTION**

- A. Costs borne by the Contractor and to be included in Division 01 - General Requirements, as summarized in Section 01 10 00 – Summary of Work, and further detailed within the remainder of the Contract Documents:
  - 1. Cost of engaging testing and inspecting agency.
  - 2. Execution of tests and inspecting.
  - 3. Reporting results.
  - 4. Costs of incidental labor and facilities required to assist testing or inspecting agency.
  - 5. Costs of testing services used by Contractor separate from Contract Document requirements.
  - 6. Costs of retesting upon failure of previous tests as determined by Architect-Engineer.

## **1.4 SCHEDULE OF VALUES**

- A. Submit printed schedule on AIA G703 - Continuation Sheet for G702.
- B. Submit Schedule of Values in duplicate within fifteen (15) days after date of commencement of Contract.
- C. Format: Use the line items from the Bid Form. Identify each line item with Item # consistent with Bid Form and Section 01 10 00 – Summary of Work.
- D. Include in each line item the amount of allowances as specified in this Section.
- E. Revise Schedule of Values to list approved Change Orders with each Application for Payment.

## **1.5 APPLICATION FOR PAYMENT**

- A. Submit one (1) original and two (2) copies of each of the following in accordance with requirements of Division 00 – Procurement and Contracting Requirements, as applicable:
  - 1. Application for Payment on AIA G702.
  - 2. Continuation Sheet for G702 (if required).
  - 3. Application and Certificate for Payment on AIA G703.
  - 4. Certified payrolls.
- B. Content and Format: Use Schedule of Values for listing items in Application for Payment.
- C. Submit updated Construction Progress Schedule with each Application for Payment.
- D. Payment Period: Submit at intervals specified in Division 00 – Procurement and Contracting Requirements.
- E. Submit Submittals with transmittal letter as specified in Section 01 33 00 – Submittal Procedures.
- F. Substantiating Data: When Architect-Engineer requires substantiating information, submit data justifying dollar amounts in question. Include the following with Application for Payment:
  - 1. Current construction photographs specified in Section 01 33 00 – Submittal Procedures.

2. Partial release of liens from major Subcontractors and vendors.
3. Record Documents as specified in Section 01 7000 – Execution and Closeout Requirements, for review by Owner, which will be returned to Contractor.
4. Affidavits attesting to off-site stored products.
5. Construction Progress Schedule, revised and current as specified in Section 01 32 16 – Construction Progress Schedule.

## **1.6 CHANGE PROCEDURES**

- A. See Division 00 – Procurement and Contracting Requirements
- B. Document requested substitutions according to Section 01 25 00 – Substitution Procedures.

## **1.7 DEFECT ASSESSMENT**

- A. Replace the Work, or portions of the Work, not conforming to specified requirements in accordance with Division 00 – Procurement and Contracting Requirements.
- B. If, in the opinion of Architect-Engineer, it is not practical to remove and replace the Work, Architect-Engineer will direct appropriate remedy or adjust payment.
- C. Individual Technical Specifications Sections may modify these options or may identify specific formula or percentage sum/price reduction.
- D. Authority of Architect-Engineer and/or Owner to assess defects and identify payment adjustments is final.
- E. Payment will not be made for rejected products for any of the following reasons:
  1. Products wasted or disposed of in a manner that is not acceptable.
  2. Products determined as unacceptable before or after placement.
  3. Products not completely unloaded from transporting vehicle.
  4. Products placed beyond lines and levels of the required Work.
  5. Products remaining on hand after completion of the Work.

## **1.8 ALTERNATES**

- A. Alternates quoted on Bid Form will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Contract. The Contract may identify certain Alternates to remain an Owner option for a stipulated period of time.
- B. Coordinate related Work and modify surrounding Work. Description for each Alternate is recognized to be abbreviated but requires that each change shall be complete for scope of Work affected.
  - 1. Coordinate related requirements among Technical Specifications Sections as required.
  - 2. Include as part of each Alternate: Miscellaneous devices, appurtenances, and similar items incidental to or necessary for complete installation.
  - 3. Coordinate Alternate with adjacent Work and modify or adjust as necessary to ensure integration.

### **PART 2 PRODUCTS - Not Used**

### **PART 3 EXECUTION - Not Used**

END OF SECTION

**SECTION 01 25 00**  
**SUBSTITUTION PROCEDURES**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Quality Assurance.
- B. Product Options.
- C. Product Substitution Procedures.
- D. Installer Substitution Procedures.

**1.2 RELATED SECTIONS**

- A. All Divisions and Sections referenced in this Section.
- B. Division 00 - Procurement and Contracting Requirements
- C. Section 01 20 00 – Price and Payment Procedures
- D. Section 01 33 00 – Submittal Procedures
- E. Section 01 40 00 – Quality Requirements
- F. Section 01 60 00 – Product Requirements
- G. Section 01 70 00 – Execution and Closeout Requirements
- H. Section 01 90 00 – Reference Standards

**1.3 QUALITY ASSURANCE**

- A. Contract is based on products and standards established in Contract Documents without consideration of proposed substitutions.
- B. Products specified define standard of quality, type, function, dimension, appearance, and performance required.
- C. Substitution Proposals: Permitted for specified products except where specified otherwise. Do not substitute products unless substitution has been accepted and approved in writing by Owner and Architect-Engineer.

## **1.4 PRODUCT OPTIONS**

- A. See Section 01 60 00 - Product Requirements.

## **1.5 PRODUCT SUBSTITUTION PROCEDURES**

- A. Contractor shall submit requests for substitutions in a timely manner to allow for appropriate review by the Architect-Engineer and Owner.
- B. Substitutions may be considered when a product becomes unavailable through no fault of Contractor; when another product is deemed to offer a performance advantage compared to the specified product; or when another product is deemed to offer equivalent performance to the specified product but at a savings in cost and/or schedule to the Owner.
- C. Document each request with complete data, substantiating compliance of proposed substitution with Contract Documents, including:
  - 1. Reason for the proposed substitution.
  - 2. Manufacturer's name and address, product, trade name, model, or catalog number, performance and test data, and reference standards.
  - 3. Itemized point-by-point comparison of proposed substitution with specified product, listing variations in quality, performance, and other pertinent characteristics.
  - 4. Reference to article and paragraph numbers in relevant Technical Specifications Section.
  - 5. Cost data comparing proposed substitution with specified product and amount of net change to Contract Sum.
  - 6. Changes required in other Work.
  - 7. Availability of maintenance service and source of replacement parts as applicable.
  - 8. Certified test data to show compliance with performance characteristics specified.
  - 9. Samples when applicable or requested.
  - 10. Other information as necessary to assist Architect-Engineer's evaluation.
- D. A request constitutes a representation that Contractor:
  - 1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product. The Contractor shall furnish in writing along with his request, a detailed comparison of the substituted product to the specified product

showing the substituted product's ability to meet or exceed all performance criteria of the originally specified product.

2. Will provide same Warranty for Substitution as for specified product.
  3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
  4. Waives claims for additional costs or time extension relating to use of proposed product that may subsequently become apparent.
  5. Will coordinate installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.
  6. Will reimburse Owner and Architect-Engineer for review or redesign services associated with reapproval by authorities having jurisdiction.
- E. Substitution will not be considered unless all conditions in Paragraphs C and D above are met and included within a Request for Substitution.
- F. Substitutions will not be considered when they are indicated or implied on Shop Drawing or Product Data Submittals without separate written request or when acceptance will require revision to Contract Documents.
- G. Substitution Submittal procedure:
1. Submit three (3) hard copies or one (1) electronically of Request for Substitution for consideration. Limit each request to one (1) proposed Substitution.
  2. Submit Shop Drawings, Product Data, and certified test results attesting to proposed product equivalence. Burden of proof is on the Contractor.
  3. Architect-Engineer will notify Contractor in writing of decision to accept or reject request.

## **1.6 INSTALLER SUBSTITUTION PROCEDURES**

- A. Contractor shall submit Requests for Substitutions in a timely manner to allow for appropriate review by the Architect-Engineer.
- B. Document each request with:
1. Reason for the proposed Substitution.
  2. Installer's qualifications.
  3. Installer's experience in Work similar to that specified.

4. Other information as necessary to assist Architect-Engineer's evaluation.

C. Substitution Submittal Procedure:

1. Submit three (3) hard copies or one (1) electronically of Request for Substitution for consideration. Limit each request to one (1) proposed substitution.
2. Architect-Engineer will notify Contractor in writing of decision to accept or reject request.

**PART 2 PRODUCTS - Not Used**

**PART 3 EXECUTION - Not Used**

END OF SECTION

**SECTION 01 30 00**  
**ADMINISTRATIVE REQUIREMENTS**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Contractor Coordination and Project Conditions.
- B. Pre-construction Meeting.
- C. Site Mobilization Meeting.
- D. Construction Progress Meetings.
- E. Pre-installation Meetings.
- F. Closeout Meeting

**1.2 RELATED SECTIONS**

- A. All Divisions and Sections referenced in this Section
- B. Division 00 - Procurement and Contracting Requirements
- C. Section 01 70 00 – Execution and Closeout Requirements

**1.3 CONTRACTOR COORDINATION AND PROJECT CONDITIONS**

- A. Contract Administrator: See Division 00 - Procurement and Contracting Requirements.
- B. Architect-Engineer: See Division 00 - Procurement and Contracting Requirements.
- C. Owner: Division 00 - Procurement and Contracting Requirements.
- D. Coordinate Scheduling, Submittals, and Work of various Sections of Project to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.
- E. Verify that requirements and characteristics of installed equipment are compatible with utilities. Coordinate Work of various Sections having interdependent responsibilities for installing, connecting to, and placing installed equipment in service.
- F. Coordinate space requirements, supports, sequence, and installation of site, structural, mechanical, electrical, and plumbing Work indicated diagrammatically on Construction Plans. Follow routing shown for pipes and conduit as closely as practical; place runs

parallel with lines of structures unless depicted otherwise. Use spaces efficiently to maximize accessibility for other installations (whether present or future), for maintenance, and for repairs.

1. Coordination Drawings: Prepare as required to coordinate all portions of Work. Show relationship and integration of different construction elements that require coordination during fabrication or installation to fit in space provided or to function as intended. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are important.
- G. Coordination Meetings: In addition to other meetings specified in this Section, hold Coordination Meetings with personnel and Subcontractors to ensure coordination of Work.
- H. Coordinate locations of signage, equipment, operators/switches, fixtures and outlets with Owner, Architect-Engineer, and Subcontractors to ensure robust, future operations as a solid waste transfer station and accommodation of finish elements.
- I. Coordinate completion and clean-up of Work of separate Sections in preparation for substantial completion and for portions of Work designated for Owner's partial occupancy and for portions of Work designated for Owner's occupancy.
- J. After Owner's occupancy of premises, coordinate access to Site for correction of defective Work and Work not complying with Contract Documents, to minimize disruption of Owner's activities.

#### **1.4 PRE-CONSTRUCTION MEETING**

- A. Contract Administrator will schedule and preside over meeting after notice of award.
- B. Attendance required by Architect-Engineer, Owner, and Contractor.
- C. Minimum agenda:
  1. Distribution of Contract Documents.
  2. Contractor submission of list of Subcontractors, list of products, Preliminary List of Proposed Submittals, Schedule of Values, and Construction Progress Schedule.
  3. Designation of personnel representing parties in Contract and Architect-Engineer.
  4. Communication procedures.
  5. Procedures and processing of requests for interpretations, field decisions, field orders, Submittals, Substitutions, Applications for Payments, Proposed Change

Order Requests, Change Orders, Construction Change Directives and Contract Closeout procedures.

6. Construction Progress Scheduling.

7. Critical Work sequencing.

D. Contract Administrator will record minutes and distribute copies to participants within five (5) weekdays after meeting.

## **1.5 SITE MOBILIZATION MEETING**

A. Contract Administrator will schedule and preside over the meeting at Project Site prior to Contractor occupancy.

B. Attendance required by Architect-Engineer, Owner, Contractor, Contractor's Superintendent, and major Subcontractors.

C. Minimum agenda:

1. Use of premises by Owner and Contractor.

2. Owner's requirements and partial occupancy, if required.

3. Construction facilities and controls provided by Owner.

4. Temporary utilities provided by Contractor.

5. Survey layout.

6. Construction certification requirements.

7. Security and housekeeping procedures.

8. Contractor submission of Final List of Submittals.

9. Schedules.

10. Procedures for Quality Assurance Testing, including both source and field quality control.

11. Owner submission of a Lists of tests, inspections, and subsequent Record Documents required by the Authorities Having Jurisdiction.

12. Procedures for maintaining Record Documents.

13. Requirements for startup of equipment.

14. Inspection and acceptance of equipment put into service during construction period.
- D. Contract Administrator will record minutes and distribute to participants within five (5) weekdays after meeting.

## **1.6 CONSTRUCTION PROGRESS MEETINGS**

- A. Schedule and administer meetings throughout progress of the Work at maximum every other week intervals.
- B. Contract Administrator will make arrangements for meetings, prepare agenda with copies for participants, and preside over meetings.
- C. Attendance required by Contractor's Superintendent, major Subcontractors, Architect-Engineer, and Owner, as appropriate to agenda topics for each meeting.
- D. Minimum agenda:
  1. Review minutes of previous meetings.
  2. Review of Work progress.
  3. Maintenance of Record Documents
  4. Field observations, problems, and decisions.
  5. Identification of problems impeding planned progress.
  6. Review of Submittal schedule and status of Submittals.
  7. Review of off-site fabrication and delivery schedules.
  8. Maintenance of Construction Progress Schedule.
  9. Corrective measures, as necessary, to regain projected schedules.
  10. Planned progress during succeeding Work period.
  11. Coordination of projected progress.
  12. Inspections by Authorities Having Jurisdiction.
  13. Maintenance of quality and Work standards.
  14. Effect of proposed changes on Construction Progress Schedule and coordination.
  15. Other business relating to Work.

- E. Contract Administrator will record minutes and distribute to participants within five (5) weekdays after meeting.

## **1.7 PRE-INSTALLATION MEETINGS**

- A. When required in individual Technical Specifications Sections, Contractor to convene Pre-installation Meeting(s) at Site before starting Work of specific Section.
- B. Require attendance of parties directly affecting, or affected by, Work of specific Section.
- C. Notify Owner and Architect-Engineer five (5) Working Days in advance of meeting date.
- D. Contractor to prepare agenda and preside over meeting:
  - 1. Review conditions of installation, preparation, and installation procedures.
  - 2. Review coordination with related Work.
- E. Contract Administrator will record minutes and distribute to participants within five (5) Working Days after meeting.

## **1.8 CLOSEOUT MEETING**

- A. Contractor to schedule Project Closeout Meeting with sufficient time to prepare for requesting substantial completion.
- B. Attendance required by Contractor's Superintendent, major Subcontractors, Architect-Engineer, Owner, and others appropriate to agenda.
- C. Notify Contract Administrator five (5) Working Days in advance of meeting date.
- D. Minimum agenda:
  - 1. Start-up of facilities and systems.
  - 2. Operations and maintenance manuals.
  - 3. Testing, adjusting, and balancing.
  - 4. System demonstration and observation.
  - 5. Operation and maintenance instructions for Owner's personnel.
  - 6. Contractor's inspection of Work.
  - 7. Contractor's preparation of an Initial Punch List.

8. Procedure to request Architect-Engineer inspection to determine date of substantial completion.
  9. Completion time for correcting deficiencies.
  10. Inspections by Authorities Having Jurisdiction.
  11. Certificate of Occupancy (if needed) and transfer of insurance responsibilities.
  12. Final Cleaning.
  13. Preparation for final inspection of construction.
  14. Closeout Submittals:
    - a. Project Record Documents, including Record As-Built Drawings.
    - b. Operating and maintenance documents.
    - c. Operating and maintenance materials.
    - d. Affidavits.
- E. Contract Administrator will record minutes and distribute to participants within five (5) weekdays after meeting.

**PART 2 PRODUCTS – Not Used**

**PART 3 EXECUTION – Not Used**

**END OF SECTION**

## **SECTION 01 32 16**

### **CONSTRUCTION PROGRESS SCHEDULE**

#### **PART 1 GENERAL**

##### **1.1 SECTION INCLUDES**

- A. Submittals.
- B. Quality Assurance.
- C. Format for Construction Progress Schedule.
- D. Construction Progress Schedule.
- E. Review and Evaluation.
- F. Updating Schedules.
- G. Distribution.

##### **1.2 RELATED SECTIONS**

- A. All Divisions and Sections referenced in this Section
- B. Division 00 - Procurement and Contracting Requirements
- C. Section 01 30 00 – Administrative Requirements
- D. Section 01 33 00 – Submittal Procedures

##### **1.3 SUBMITTALS**

- A. Within ten (10) Working Days of the Pre-construction Meeting and prior to the Site Mobilization Meeting, submit proposed preliminary network diagram defining planned operations for the completion of Work and date of substantial completion.
- B. Participate in review of preliminary and complete network diagrams jointly with Architect-Engineer.
- C. Within five (5) Working Days of joint review, submit written certification that major Subcontractors have reviewed and accepted proposed schedule along with a complete Construction Progress Schedule consisting of network diagrams and mathematical analyses (as required).
- D. Submit updated Construction Progress Schedules at each Construction Progress Meeting.

- E. Submit number of opaque reproductions Contractor requires, plus two (2) copies Architect-Engineer will retain.
- F. Submit Construction Progress Schedules under transmittal letter form specified in Section 01 33 00 - Submittal Procedures.
- G. Construction Progress Schedule updates:
  - 1. Overall percent complete, projected and actual.
  - 2. Completion progress by listed activity and subactivity, to within five (5) Working Days prior to submittal.
  - 3. Changes in Work scope and activities modified since submittal.
  - 4. Delays in Submittals or Resubmittals, deliveries, or Work.
  - 5. Adjusted or modified sequences of Work.
  - 6. Other identifiable changes.
  - 7. Revised projections of progress and completion.
- H. Narrative Progress Report:
  - 1. Submit with each submission of Construction Progress Schedule.
  - 2. Summary of Work completed during the past period between Reports.
  - 3. Work planned during the next period.
  - 4. Explanation of differences between summary of Work completed and Work planned in previously submitted Narrative Progress Report.
  - 5. Current and anticipated delaying factors and estimated impact on other activities and completion milestones.
  - 6. Corrective action taken or proposed.

#### **1.4 QUALITY ASSURANCE**

- A. Scheduler: Contractor's personnel specializing in critical path method (CPM) scheduling with three (3) years' minimum experience in scheduling construction work of complexity comparable to the Project and having use of computer facilities capable of delivering detailed graphic printout within forty-eight (48) hours of request.

- B. Contractor's Administrative Personnel: three (3) years' minimum experience in using and monitoring CPM schedules on comparable Projects.

## **1.5 FORMAT FOR CONSTRUCTION PROGRESS SCHEDULE**

- A. Listings: Reading from left to right, in ascending order for each activity. Identify each activity with applicable Technical Specification Section number.
- B. Diagram sheet size: 24 inches high x 36 inches wide required.
- C. Scale and spacing: To allow for notations and revisions.

## **1.6 CONSTRUCTION PROGRESS SCHEDULES**

- A. Prepare Construction Progress Schedule diagrams and supporting mathematical analyses (as required) using CPM.
- B. Illustrate order and interdependence of activities and sequence of Work; how start of given activity depends on completion of preceding activities, and how completion of activity may restrain start of subsequent activities.
- C. Illustrate complete sequence of construction by activity, identifying Work of separate stages. Indicate dates for submittals, including dates for Owner-furnished items, and return of Submittals; dates for procurement and delivery of critical products; and dates for installation and provision for testing. Include legend for symbols and abbreviations used.
- D. Mathematical analysis: Tabulate each activity of detailed network diagrams using calendar dates, and identify for each activity:
  - 1. Preceding and following event numbers.
  - 2. Activity description.
  - 3. Estimated duration of activity, in maximum fifteen (15) day intervals.
  - 4. Status of critical activities.
  - 5. Earliest start date.
  - 6. Earliest finish date.
  - 7. Actual start date.
  - 8. Actual finish date.
  - 9. Latest start date.

10. Latest finish date.
  11. Total and free float; accrue float time to Owner and to Owner's benefit.
  12. Monetary value of activity, keyed to Schedule of Values.
  13. Percentage of activity completed.
  14. Responsibility.
- E. Analysis program: Capable of compiling monetary value of completed and partially completed activities, of accepting revised completion dates, and of recomputing of scheduled dates and float.
- F. Required sorts: List activities in sorts or groups:
1. By preceding Work item or event number from lowest to highest.
  2. By longest float, then in order of early start.
  3. By responsibility in order of earliest possible start date.
  4. In order of latest allowable start dates.
  5. In order of latest allowable finish dates.
  6. Contractor's periodic payment request sorted by specification sections.
  7. List of basic input data-generating report.
  8. List of activities on critical path.
- G. Prepare subschedules for each stage of Work and sequencing of Construction Plan identified in Section 01 10 00 – Summary of Work.
- H. Coordinate contents with Schedule of Values in Section 01 33 00 – Submittal Procedures.

## **1.7 REVIEW AND EVALUATION**

- A. Participate in joint review and evaluation of schedules with Architect-Engineer at each Submittal.
- B. Evaluate Project status to determine Work behind schedule and Work ahead of schedule.
- C. After review, revise schedules incorporating results of review, and resubmit at the next Construction Progress Meeting.

## **1.8 UPDATING SCHEDULES**

- A. Maintain Construction Progress Schedule to record actual start and finish dates of completed activities.
- B. Indicate progress of each activity to date of revision, with projected completion date of each activity. Update Construction Progress Schedule to depict current status of Work.
- C. Identify activities modified since previous Submittal, major changes in Work, and other identifiable changes.
- D. Upon approval of a Change Order, include the change in the next Construction Progress Schedule Submittal.
- E. Indicate changes required to maintain date of substantial completion.
- F. Submit sorts as required to support recommended changes.
- G. Prepare Narrative Report to define problem areas, anticipated delays, and impact on Construction Progress Schedule. Report corrective action taken or proposed and its effect including effects of changes on schedules of separate Subcontractors.

## **1.9 DISTRIBUTION**

- A. Following joint review, distribute copies of updated Construction Progress Schedule to Contractor's Project Site file, to Subcontractors, suppliers, Architect-Engineer, Owner, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

## **PART 2 PRODUCTS - Not Used**

## **PART 3 EXECUTION - Not Used**

END OF SECTION

**SECTION 01 33 00**  
**SUBMITTAL PROCEDURES**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. General Submittal Requirements.
- B. Product Data Submittals.
- C. Shop Drawing Submittals.
- D. Samples.
- E. Other Submittals.
- F. Certified Shop Test Reports.
- G. Test Reports.
- H. Certificates.
- I. Manufacturer's Instructions.
- J. Manufacturer's Field Reports.
- K. Erection Drawings.
- L. Construction Photographs.
- M. Contractor Review.
- N. Architect-Engineer Review.
- O. Reliance on Electronic CAD Files of Construction Plans.

## **1.2 RELATED SECTIONS**

- A. All Divisions and Sections referenced in this Section
- B. Division 00 - Procurement and Contracting Requirements
- C. Section 01 20 00 – Price and Payment Procedures
- D. Section 01 25 00 – Substitution Procedures
- E. Section 01 30 00 – Administrative Requirements
- F. Section 01 32 16 – Construction Progress Schedule
- G. Section 01 40 00 – Quality Requirements
- H. Section 01 50 00 – Temporary Facilities and Controls
- I. Section 01 70 00 – Execution and Closeout Requirements
- J. Section 01 900 0 – Reference Standards

## **1.3 GENERAL SUBMITTAL REQUIREMENTS**

- A. The Contractor shall prepare a Preliminary List of Proposed Submittals which will be provided to the Architect-Engineer for review and approval at the Pre-construction Meeting, prior to the commencement of construction activities. Shop Drawings for all materials, products, and fabrications included on the approved, Final List of Submittals, provided to the Architect-Engineer at the Site Mobilization Meeting, shall be submitted to the Architect-Engineer for review and approval. The Final List of Submittals shall identify each Submittal with a unique identification code and the reference in the Technical Specifications which require the Submittal. The Final List of Submittals shall contain spaces to insert the following information:
  - 1. Anticipated and actual date when Submittals will be/were transmitted to Architect-Engineer for review.
  - 2. Date on which Submittals are returned by Architect-Engineer.
  - 3. Subsequent dates of transmittal and returns for Submittals requiring revision or resubmission, as appropriate.
  - 4. Status of Submittal (i.e., Accepted, Accepted as Noted, Revise and Resubmit, or Rejected) based on Architect-Engineer's latest review.
- B. The Contractor shall maintain an updated Final List of Submittals to identify the status of Submittals and shall bring the current list to Construction Progress Meetings and transmitted to the Architect-Engineer upon request. Receipt of the updated Final List of

Submittals shall also be a prerequisite to any partial estimate made for items for which Submittals are required.

- C. Transmit each Submittal with AIA G810 - Transmittal Letter.
- D. Each transmittal form shall indicate unique identification code from the Final List of Submittals. Mark revised Submittals with original number and sequential alphabetic suffix.
- E. Apply Contractor's stamp, signed or initialed, certifying that review, approval, verification of products required, field dimensions, adjacent construction Work, and coordination of information is according to requirements of the Work and Contract Documents.
- F. Submit number of copies Contractor requires, plus one (1) electronic copy to the Architect-Engineer and one (1) electronic copy to the Owner.
- G. Each Submittal shall have a space for the Architect-Engineer's stamp. The space shall be at least 3-1/2 inches wide by 5 inches high.
- H. Schedule Submittals to expedite project and email a PDF file to Architect-Engineer at email address and/or cloud-based file sharing platform (e.g. SharePoint, etc.) provided at the Pre-construction Meeting. Coordinate submission of related items.
- I. Identify variations in Contract Documents and product or system limitations that may be detrimental to successful performance of completed Work.
- J. Complete Submittals for each item are required. Delays resulting from incomplete Submittals are not the responsibility of Architect-Engineer.
- K. Allow ten (10) business days for Architect-Engineer's review of each Submittal, starting from the date the Submittal is received by Architect-Engineer.
- L. After review, produce copies and distribute according to "Submittal Procedures" Article and for Record Documents described in Section 01 70 00 - Execution and Closeout Requirements.

#### **1.4 PRODUCT DATA SUBMITTALS**

- A. Submit to Architect-Engineer for review for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

- C. Indicate product utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

## **1.5 SHOP DRAWINGS SUBMITTALS**

- A. Submit to Architect-Engineer for assessing conformance with information given and design concept expressed in Contract Documents.
- B. The Contractor, on approval from the Architect-Engineer, may submit manufacturer's literature as a substitute for, or supplement to, the Shop Drawings. The minimum size for any submission shall be 8½ inches by 11 inches, and the maximum size shall not exceed 24 inches by 36 inches.
- C. Shop Drawings or printed matter shall give all dimensions and sizes to enable the Architect-Engineer to pass on the suitability of the material or layout for the purpose intended. The Shop Drawings shall, where needed for clarity, include outline and sectional views, and detailed working dimensions and designations of the kind of materials and kinds of machine work and finishes required. Shop Drawings for submission shall be coordinated by the Contractor with Shop Drawings previously submitted, with Shop Drawings being prepared, and with the design and function of any equipment or structure.
- D. If the Shop Drawings show variances from the requirements of the Contract Documents because of standard shop practice or other reason, the Contractor shall make specific mention of such variation in the Transmittal Letter in order that, if acceptable, suitable action may be taken for proper adjustment; otherwise the Contractor will not be relieved of the responsibility for executing the Work in accordance with the Contract Documents even though such Shop Drawings have been accepted by the Architect-Engineer.
- E. When required by individual Technical Specification Sections, provide Shop Drawings signed and sealed by a professional Architect-Engineer licensed in the State of New York responsible for designing components shown on Shop Drawings.
  - 1. Include signed and sealed calculations to support design.
  - 2. Submit Shop Drawings and calculations in form suitable for submission to and approval by authorities having jurisdiction.
- F. Indicate special utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
- G. Material shall not be purchased or fabricated for equipment or structures until the Architect-Engineer has reviewed the Shop Drawings, which shall represent all materials and Work involved in the construction. No materials or equipment for which a Submittal of a Shop Drawing is required shall be delivered to the Site unless they are in

conformance with the Shop Drawings which have been "Accepted" or "Accepted as Noted."

- H. Work shall not be done upon any part of a structure, the design or construction of which is dependent upon the design of equipment or other features, for which approval is required, until such approval has been received from the Architect-Engineer.
- I. For all major construction items, essential for the operation of the facility, Shop Drawing, Samples and Other Submittals shall be submitted to the Architect-Engineer sufficiently in advance of construction of each item to afford adequate time for review and revisions if necessary.

## **1.6 SAMPLES**

- A. Submit to Architect-Engineer for assessing conformance with information given and design concept expressed in Contract Documents.
- B. Samples for selection as specified in Product Sections:
  - 1. Submit to Architect-Engineer for aesthetic, color, and finish selection.
  - 2. Submit Samples of finishes, textures, and patterns for Architect-Engineer selection.
- C. Submit Samples to illustrate functional and aesthetic characteristics of products, with integral parts and attachment devices. Coordinate Sample Submittals for interfacing Work.
- D. Include identification on each Sample, with full Project information.
- E. Submit number of Samples specified in individual Technical Specification Sections; Architect-Engineer will retain one (1) Sample.
- F. Reviewed Samples that may be used in the Work are indicated in individual Technical Specification Sections.
- G. Samples will not be used for testing purposes unless specifically stated in Technical Specification Section.
- H. After review, produce copies and distribute according to "Submittal Procedures" Article and for Record Documents described in Section 01 70 00 - Execution and Closeout Requirements.

## **1.7 OTHER SUBMITTALS**

- A. Closeout Submittals: Comply with Section 01 70 00 - Execution and Closeout Requirements.

- B. Submit information for assessing conformance with information given and design concept expressed in Contract Documents.

## **1.8 CERTIFIED SHOP TEST REPORTS**

- A. Each piece of equipment for which pressure, duty, capacity, rating, efficiency, performance, function or special requirements are specified shall be tested in the shop of the manufacturer in a manner which shall conclusively prove that its characteristics comply fully with the requirements of the Contract Documents. Tests shall be conducted in accordance with the test codes of the ASME, NEMA, ASTM, and other applicable standards.
- B. Equipment shall not be shipped to the Work until the Architect-Engineer notified the Contractor in writing that the results of the shop tests are acceptable.
- C. When the Technical Specifications require witness shop tests at the point of manufacture, the only tests which will be accepted are those made in the presence of the Architect-Engineer or their representative. The Contractor shall give the Architect-Engineer written notice ten (10) business days in advance of the time when the equipment will be ready for the witness shop tests, or as required by the Technical Specifications. This notification shall include a diagram of the testing setup and a list of the instruments the manufacturer proposes to use for the tests. All instruments shall be ranges suitable for the quantities to be measured, with approved laboratory calibration. Five (5) copies of the witness shop test data and interpreted results thereof, accompanied by a certificate of authenticity sworn to by a responsible official of the manufacturing company, shall be forwarded to the Architect-Engineer.

## **1.9 TEST REPORTS**

- A. Submit test reports for assessing conformance with performance requirements contained in the Contract Documents.

## **1.10 CERTIFICATES**

- A. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- B. Certificates may be recent or previous test results on material or product but must be acceptable to Architect-Engineer.

## **1.11 MANUFACTURER'S INSTRUCTIONS**

- A. Submit printed instructions for delivery, storage, assembly, installation, startup, adjusting, and finishing, to Architect-Engineer in quantities specified for product data.

- B. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

#### **1.12 MANUFACTURER'S FIELD REPORTS**

- A. Submit reports within five (5) business days of observation for assessing conformance with information given and design concept expressed in Contract Documents.

#### **1.13 ERECTION DRAWINGS**

- A. Submit drawings for information assessing conformance with information given and design concept expressed in Contract Documents.
- B. Data indicating inappropriate or unacceptable Work may be subject to action by Architect-Engineer or Owner.

#### **1.14 CONSTRUCTION PHOTOGRAPHS**

- A. Provide photographs of Site and for each construction element throughout progress of Work produced by an experienced photographer acceptable to Architect-Engineer.
- B. Submit photographs during Construction Progress Meetings.
- C. Take five (5) time stamped Site photographs from different locations indicating relative progress of the Work, two (2) days maximum before submitting.
- D. Take photographs as evidence of Work performed since prior Construction Progress Meeting to depict existing project conditions as follows:
  - 1. Interior views: minimum ten (10) photos.
- E. Identify each print on front. Identify name of Project, Contract number orientation of view, subject of photo, date and time of view, name and address of photographer, and photographer's numbered identification of exposure.
- F. Digital Images: Deliver complete set of digital image electronic files on CD-ROM, USB Drive, or similar external storage device to Owner with Project Record Documents. Identify electronic media with date photographs were taken. Submit images that have same aspect ratio as sensor, uncropped.
  - 1. Digital Images: Uncompressed TIFF or JPEG format, produced by digital camera with minimum sensor size of 4.0 megapixels, and image resolution of not less than 1600 by 1200 pixels.
  - 2. Date and Time: Include date and time in filename for each image.

### **1.15 CONTRACTOR REVIEW**

- A. Review for compliance with Contract Documents and approve Submittals before transmitting to Architect-Engineer.
- B. Contractor shall be responsible for:
  - 1. Determination and verification of materials including manufacturer's catalog numbers.
  - 2. Determination and verification of field measurements and field construction criteria.
  - 3. Checking and coordinating information in Submittal with requirements of Work and of Contract Documents.
  - 4. Determination of accuracy and completeness of dimensions and quantities.
  - 5. Confirmation and coordination of dimensions and field conditions at Site.
  - 6. Construction means, techniques, sequences, and procedures.
  - 7. Safety precautions.
  - 8. Coordination and performance of Work of all trades.
- C. Stamp, sign or initial, and date each Submittal to certify compliance with requirements of Contract Documents.
- D. Do not fabricate products or begin Work for which Submittals are required until approved Submittals have been received from Architect-Engineer.

### **1.16 ARCHITECT-ENGINEER REVIEW**

- A. To reduce delays and costs, Submittals shall be made electronically (via PDF file format) whenever possible to the Architect-Engineer and Owner.
- B. The Contractor shall review all Shop Drawings or literature submitted, and those submitted on behalf of Subcontractors and manufacturers, for correctness and adequacy of data prior to submitting such Shop Drawings and literature to the Architect-Engineer for approval. The Contractor shall be responsible for the prompt transmission of Submittals to the Architect-Engineer, so that there shall be no delay to the Work due to the absence of such drawings.
- C. The Architect-Engineer's review will be performed to assess conformance with the design concept of the Project and with the information given in the Contract Documents.

- D. Marked Submittals will be retained by the Architect-Engineer and the Owner and will be emailed back to, or placed on a cloud-based file sharing platform accessible by, the Contractor. Following review by the Architect-Engineer, all Submittals will be marked by the Architect-Engineer in one of the following ways, all subject to Contract requirements:
1. "Accepted," which means that no exceptions are taken. Any approval by the Architect-Engineer of such, or part of such, Shop Drawings, manufacturer's literature, or other data relative to the Work or material to be furnished for the Contract shall not be construed in any way as relieving the Contractor from its responsibility for errors or omissions in the Shop Drawings or from any of its other responsibilities under the terms of the Contract, but shall be interpreted only to mean that an examination of the exhibits has been made, that no variation from the Contract requirements has been discovered, and that no criticism is offered. The Architect-Engineer's approval of a separate item shall not indicate approval of an assembly in which the item functions.
  2. "Accepted as Noted," which means that minor corrections as noted and/or indicated on the Submittal shall be made. Resubmittal is not required as long as the material for which the Submittal was made is produced, delivered, and installed as notated by the Architect-Engineer.
  3. "Revise and Resubmit," which means that major corrections are noted and/or indicated on the Submittal and resubmittal is required.
  4. "Rejected," which means that the Submittal is completely rejected and a resubmittal is required. The Contractor shall direct specific attention, in writing or on resubmittals, to revisions other than the corrections noted and/or indicated by the Architect-Engineer on previous submission.
- E. When revised for resubmission, identify changes made since previous submission.
- F. Distribute copies of reviewed Submittals as appropriate. Instruct parties to promptly report inability to comply with requirements.
- G. The Contractor shall be responsible for the prompt submission of all Shop Drawings, so that there shall be no delay to the Work due to the absence of Shop Drawings.
- H. Any approval by the Architect-Engineer of a Submittal shall not be construed in any way as relieving the Contractor from its full responsibilities under the terms of the Contract, but shall be interpreted only to mean that an examination of the exhibits has been made, that no variation from the Contract requirements has been discovered, and that no criticism is offered. Approval of a separate item shall not indicate approval of an assembly in which the item functions.

- I. Do not make "Mass Submittals" to Architect-Engineer. "Mass Submittals" are defined as six (6) or more Submittals or items in one (1) day or twenty (20) or more Submittals or items in one (1) week. If "Mass Submittals" are received, Architect-Engineer's review time stated above will be extended as necessary to perform proper review. Architect-Engineer will review "Mass Submittals" based on priority determined by Architect-Engineer after consultation with Owner and Contractor.
- J. Submittals made by Contractor that are not required by Contract Documents may be returned without action. Submittal and/or return of such non-required Submittals shall not be construed by the Contractor as an approval, unless specifically marked by the Architect-Engineer with a review stamp and disposition.
- K. Submittal approval does not authorize changes to Contract requirements unless accompanied by Change Order.
- L. Owner may withhold monies due to Contractor to cover additional costs beyond the second Submittal review.

#### **1.17 RELIANCE ON ELECTRONIC CAD FILES OF CONSTRUCTION PLANS**

- A. Electronic CAD Files of Construction Plans: May only be used to expedite production of Shop Drawings for the Project. Use for other projects or purposes is not allowed.
- B. Electronic CAD Files of Construction Plans: Distributed only under the following conditions:
  - 1. Use of CAD files is solely at receiver's risk. Architect-Engineer and Owner do not warrant accuracy of CAD files. Receiving CAD files in electronic form does not relieve receiver of responsibilities for measurements, dimensions, and quantities set forth in Contract Documents. In the event of ambiguity, discrepancy, or conflict between information in CAD files and that in Contract Documents, notify Architect-Engineer and Owner of discrepancy and use information in PDF or hard-copy Construction Plans and Technical Specifications.
  - 2. CAD files may not necessarily represent the latest Contract Documents, existing conditions, and as-built conditions. Receiver is responsible for determining and complying with these conditions and for incorporating addenda and modifications.
  - 3. User is responsible for removing information not normally provided on Shop Drawings and removing references to Contract Documents. Shop Drawings submitted with information associated with other trades or with references to Contract Documents will not be reviewed and will be immediately returned.
  - 4. Receiver shall not hold Architect-Engineer or Owner responsible for data or file clean-up required to make CAD files usable, nor for error or malfunction in translation, interpretation, or use of this electronic information.

5. Receiver shall understand that, even though Architect-Engineer and Owner have computer scanning software to detect presence of computer viruses and other malware, there is no guarantee that computer viruses or other malware are not present in files or in electronic media used to transmit CAD or PDF files.
6. Receiver shall not hold Architect-Engineer or Owner responsible for viruses or other malware or their consequences and shall hold Architect-Engineer and Owner harmless against costs, losses, or damage caused by presence of computer virus or other malware in files or media.

**PART 2 PRODUCTS - Not Used**

**PART 3 EXECUTION - Not Used**

END OF SECTION

**SECTION 01 40 00**  
**QUALITY REQUIREMENTS**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Quality Control.
- B. Tolerances.
- C. References.
- D. Labeling.
- E. Mock-up Requirements.
- F. Testing and Inspection Services Requirements.
- G. Testing and Inspection Services.
- H. Manufacturers' Field Services.

**1.2 RELATED SECTIONS**

- A. All Divisions and Sections referenced in this Section
- B. Division 00 - Procurement and Contracting Requirements
- C. Section 01 33 00 – Submittal Procedures
- D. Section 01 90 00 – Reference Standards

**1.3 QUALITY CONTROL**

- A. Contractor shall employ and pay for all services of an independent testing agency and laboratory acceptable to Owner to perform specified testing. Independent firm will perform tests, inspections, special inspections required by code, and other services specified in individual Technical Specifications Sections and as required by Architect-Engineer, Owner and Authorities Having Jurisdiction.
- B. Monitor quality control over suppliers, manufacturers, products, services, Site conditions, and workmanship, to produce Work of specified quality.
- C. Comply with specified standards as the minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

- D. Perform Work using persons qualified and equipment designed and maintained to produce required and specified quality.
- E. Products, materials, and equipment may be subject to inspection by Architect-Engineer and Owner at place of manufacture or fabrication. Such inspections shall not relieve Contractor of complying with requirements of Contract Documents.
- F. Supervise performance of Work in such manner and by such means to ensure that Work, whether completed or in progress, will not be subjected to harmful, dangerous, damaging, or otherwise deleterious exposure during construction period.

#### **1.4 TOLERANCES**

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate or “stack”.
- B. Comply with manufacturers' recommended tolerances and tolerance requirements in reference standards. When such tolerances conflict with Contract Documents, request clarification from Architect-Engineer before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

#### **1.5 REFERENCES**

- A. ANSI/ASTM D3740 – Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction.
- B. ANSI/ASTM E329 – Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction.
- C. 2020 Building Code of New York State, Chapter 17 Special Inspections and Tests.
- D. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard except when more rigid requirements are specified or are required by applicable codes.
- E. Conform to reference standard by date of issue current as of date of Contract Documents except where specific date is established by code.
- F. Obtain copies of standards and maintain on Site when required by product Technical Specifications Sections.
- G. When requirements of indicated reference standards conflict with Contract Documents, request clarification from Architect-Engineer before proceeding.

- H. Neither contractual relationships, duties, or responsibilities of parties in Contract nor those of Architect-Engineer shall be altered from Contract Documents by mention or inference in reference documents.

## **1.6 LABELING**

- A. Attach label from agency approved by Authorities Having Jurisdiction for products, assemblies, and systems required to be labeled by applicable code.
- B. Include manufacturer's or fabricator's identification, approved agency identification, and the following information, as applicable, on each label:
  - 1. Model number.
  - 2. Serial number.
  - 3. Performance characteristics.
- C. Manufacturer's Nameplates, Trademarks, Logos, and Other Identifying Marks on Products: Not allowed on surfaces exposed to view in public areas, interior or exterior.

## **1.7 MOCK-UP REQUIREMENTS**

- A. Tests will be performed under provisions identified in this Section and identified in individual product Technical Specifications Sections.
- B. Assemble and erect specified or indicated items with specified or indicated attachment and anchorage devices, flashings, seals, and finishes.
- C. Accepted mockups shall be comparison standard for remaining Work.
- D. Where mockup has been accepted by Architect-Engineer and is specified in product Technical Specifications Sections to be removed, remove mockup and clear area when directed to do so by Architect-Engineer.

## **1.8 TESTING AND INSPECTION SERVICES REQUIREMENTS**

- A. Inspection – The Contractor agrees to a thorough inspection of the Work, including all labor performed and materials furnished, delivered, or intended to be used in the Work, and including manufacture, preparations and testing at such times as the Owner, Architect-Engineer, or the Authorities Having Jurisdiction desire. The Contractor shall not use any material which has not been inspected or tested and accepted. The Contractor shall keep the Architect-Engineer advised of the progress of the Work away from the Site requiring inspection or witnessing of tests, so that arrangements may be made for inspection at the proper time.

- B. Inspection, tests, or acceptance of any material prior to shipment shall not be deemed as a final acceptance of the materials. The Architect-Engineer may inspect or require tests or analyses of any portion of the materials at any time after delivery to the Site either before or after installation, and any material which is found to be defective or which does not otherwise conform to the requirements of the Contract Documents will be rejected and shall be removed forthwith from the site, as provided in the Contract.
- C. The performance of such inspections and acceptance of the Work by the Owner or the Architect-Engineer will in no way release the Contractor of its complete responsibility for construction means, methods and techniques, and for performing the Work in accordance with the Contract Documents.
- D. No Work shall be closed or covered up until it has been duly inspected and approved by the Architect-Engineer and/or the Authorities Having Jurisdiction. Should unapproved Work be covered, the Contractor shall, at its own expense, uncover all Work so that it can be properly inspected, properly repair and replace all such Work if found defective, and shall close or cover the approved Work according to project requirements.
- E. Significance of Tests - Test results shall be binding on both the Contractor and the Owner, and shall be considered irrefutable evidence of compliance or non-compliance with the Technical Specification requirements, unless supplementary testing shall prove, to the satisfaction of the Architect-Engineer and the Authorities Having Jurisdiction, that the initial samples were not representative of actual conditions.
- F. Supplementary and Other Testing - Nothing shall restrict the Contractor from conducting tests they may require. If the Contractor at any time requests that the Owner consider such test results, the test reports shall be certified by an independent testing laboratory acceptable to the Owner. Testing of this nature shall be conducted at the Contractor's expense.
- G. In the event of a conflict between initial and supplementary testing to determine the acceptability of the Work with respect to project requirements, a third set of testing shall be performed to determine the acceptability of the Work. Absent this third set of testing, the Work represented by such testing shall be considered to be nonconforming and shall be remedied to the satisfaction of the Architect-Engineer and the Authorities Having Jurisdiction and subsequently retested.

## **1.9 TESTING AND INSPECTION SERVICES**

- A. Employ and pay for services of an independent testing agency or laboratory acceptable to Owner to perform specified testing. Testing laboratory will perform tests, inspections, Special Inspections required by code, and other services specified in individual Technical Specifications Sections and as required by Architect-Engineer, Owner, and Authorities Having Jurisdiction.

1. A list of the tests, inspections, and subsequent Record Documents required by the Authority Having Jurisdiction will be provided to the Contractor by the Owner during the Site Mobilization Meeting.
  2. Before starting Work, submit all testing laboratory names, addresses, and telephone numbers, to the Owner for approval prior to commencement of Work.
  3. Submit copy of report of laboratory facilities' inspection made by Material Measurement Laboratory of National Institute of Standards and Technology (NIST) during most recent inspection, with memorandum of remedies of deficiencies reported by inspection.
  4. Employment of testing laboratory shall in no way relieve Contractor of obligation to perform Work in accordance with requirements of Contract Documents.
- B. Inspection or testing performed exclusively for the Contractor's convenience and its own quality assurance shall be the sole responsibility of the Contractor.
- C. Independent firm will perform tests, inspections, Special Inspections required by code, and other services specified in individual Technical Specifications Sections and as required by Architect-Engineer, Owner, and Authorities Having Jurisdiction.
1. Comply with requirements of GAI-LAP, ANSI/ASTM E329, and ANSI/ASTM D3740.
  2. Laboratory: Authorized to operate in State of New York.
  3. Laboratory Staff: Maintain full-time Professional Engineer or specialist on staff to review services, as required by the Contract Documents.
  4. Testing Equipment: Calibrated at reasonable intervals with devices of an accuracy traceable to National Bureau of Standards (NBS) or accepted values of natural physical constants.
  5. Laboratory Responsibilities:
    - a. Test samples of materials submitted by Contractor and/or Owner.
    - b. Provide qualified personnel. Cooperate with Architect-Engineer and Contractor in performance of services.
    - c. Perform specified inspection, sampling, and testing of products in accordance with specified standards.
    - d. Ascertain compliance of materials and mixes with requirements of Contract Documents.

- e. Promptly notify Architect-Engineer and Contractor of observed irregularities or non-conformance of Work or Products.
  - f. Perform additional inspections and tests required by Architect-Engineer.
- D. Testing, inspections, and source quality control may occur on or off project Site. Perform off-site testing as required by Architect-Engineer or Owner.
- E. Laboratory Reports:
  - 1. Reports shall be submitted by independent firm to Architect-Engineer, Contractor, and Authorities Having Jurisdiction, in duplicate, indicating observations and results of tests and compliance or noncompliance with Contract Documents.
  - 2. Include:
    - a. Date issued.
    - b. Project title and number.
    - c. Name of inspector.
    - d. Date and time of sampling or inspection.
    - e. Identification of product and Technical Specifications Section.
    - f. Location in the Project.
    - g. Type of inspection or test.
    - h. Date of test.
    - i. Results of tests.
    - j. Conformance with Contract Documents.
  - 3. When requested by Architect-Engineer, provide interpretation of test results.
  - 4. Submit final report indicating correction of Work previously reported as noncompliant.
- F. Cooperate with independent firm; provide access to the Work, furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.

1. Notify Architect-Engineer and independent firm minimum of forty-eight (48) hours (not including Saturday, Sunday, or Holidays), prior to expected time for operations requiring inspection and testing services.
  2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.
  3. Provide incidental labor and facilities to provide access to Work to be tested, to obtain and handle samples at the site or at source of products to be tested, to facilitate tests and inspections, storage and curing of test samples.
  4. Notify Architect-Engineer and laboratory a minimum of forty-eight (48) hours (not including Saturday, Sunday, or Holidays), prior to expected time for operations requiring inspection and testing services.
- G. Employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work according to requirements of Contract Documents.
- H. Retesting or re-inspection required because of nonconformance with specified or indicated requirements shall be performed by same independent firm on instructions from Architect-Engineer. Payment for retesting or re-inspection will be charged to Contractor by deducting testing charges from Contract Sum/Price.
- I. Testing Agency responsibilities:
1. Test samples of mixes submitted by Contractor.
  2. Provide qualified personnel at Site. Cooperate with Architect-Engineer, the Authorities Having Jurisdiction, and Contractor in performance of services.
  3. Perform indicated sampling and testing of products according to specified standards.
  4. Ascertain compliance of materials and mixes with requirements of Contract Documents.
  5. Promptly notify Architect-Engineer and Contractor of observed irregularities or nonconformance of Work or products.
  6. Perform additional tests required by Architect-Engineer and/or the Authorities Having Jurisdiction.
  7. Attend Preconstruction Meeting, Site Mobilization Meeting and Construction Progress Meetings.

J. Agency reports: After each test, promptly submit two (2) copies of report to Architect-Engineer, Contractor, and Owner. When requested by Architect-Engineer, provide interpretation of test results. Include the following:

1. Date issued.
2. Project title and number.
3. Name of inspector.
4. Date and time of sampling or inspection.
5. Identification of product and Technical Specifications Section.
6. Location in Project.
7. Type of inspection or test.
8. Date of test.
9. Results of tests.
10. Conformance with Contract Documents.

K. Limits on Testing Authority:

1. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency or laboratory may not approve or accept any portion of the Work.
3. Agency or laboratory may not assume duties of Contractor nor the Architect-Engineer.
4. Agency or laboratory has no authority to stop the Work.

#### **1.10 MANUFACTURER'S FIELD SERVICES**

- A. When specified in individual Technical Specification Sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe Site conditions, conditions of surfaces and installation, quality of workmanship, startup of equipment, testing, adjusting, and balancing of equipment commissioning, and to initiate instructions when necessary.
- B. Submit qualifications of observer to Architect-Engineer thirty (30) days in advance of required observations. Observer is subject to approval of Architect-Engineer.

C. Report observations and Site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturer's written instructions.

D. Refer to Section 01 3300 – Submittal Procedures, "Manufacturer's Field Reports" Article.

**PART 2 PRODUCTS – Not Used**

**PART 3 EXECUTION – Not Used**

END OF SECTION

## **SECTION 01 50 00**

### **TEMPORARY FACILITIES AND CONTROLS**

#### **PART 1 GENERAL**

##### **1.1 SECTION INCLUDES**

- A. References.
- B. Applicable Regulations.
- C. Temporary Electricity.
- D. Temporary Heating.
- E. Temporary Cooling.
- F. Temporary Ventilation.
- G. Temporary Communication Services.
- H. Temporary Water Service.
- I. Temporary Sanitary Facilities.
- J. First Aid Facilities and Accidents
- K. Field Offices.
- L. Vehicular Access.
- M. Parking.
- N. Progress Cleaning and Waste Removal.
- O. Traffic Regulation.
- P. Security.
- Q. Protection of Existing Facility
- R. Maintenance.
- S. Dust Control.
- T. Noise Control.

- U. Water Control.
- V. Pest and Rodent Control.
- W. Pollution Control.
- X. Removal of Utilities, Facilities, and Controls.

## **1.2 RELATED SECTIONS**

- A. All Divisions and Sections referenced in this Section
- B. Section 01 70 00 – General Conditions
- C. Section 01 50 01 – Health and Safety Provisions

## **1.3 REFERENCES**

- A. ASTM International:
  - 1. ASTM E 119 - Standard Test Methods for Fire Tests of Building Construction and Materials.

## **1.4 APPLICABLE REGULATIONS**

- A. In order to prevent environmental pollution and to provide for environmental protection arising from construction activities related to the performance of this Contract, the Contractor and Subcontractors shall comply with all applicable Federal, State, and local laws and regulations concerning environmental protection, as well as the specific requirements in this Section and elsewhere in the Technical Specifications.

## **1.5 TEMPORARY ELECTRICITY**

- A. The Contractor shall be responsible for providing temporary portable electric power or electric utility service for construction and to provide uninterrupted power to the existing Facility as detailed within the Contract Documents. Contractor shall coordinate requirements of other Subcontractors, arrange for payments, and contact the electric utility (as necessary) to provide the service for the temporary power.
- B. If required by the Owner, the Contractor shall install a meter and pay for all expenses for electrical service used during the course of the Work.

## **1.6 TEMPORARY HEATING**

- A. It is the responsibility of the Contractor to provide any temporary heat services required during the course of construction including fuel and electric to protect installed materials, equipment, and facilities to meet the requirements of the Contract Documents.

## **1.7 TEMPORARY COOLING**

- A. It is the responsibility of the Contractor to provide any temporary cooling services required during the course of construction including fuel and electric to protect installed materials, equipment, and facilities to meet the requirements of the Contract Documents.

## **1.8 TEMPORARY VENTILATION**

- A. Ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

## **1.9 TEMPORARY COMMUNICATION SERVICES**

- A. Internet Service: The Contractor shall arrange with appropriate communications provider to provide internet service to the Site for construction needs at field offices and other locations as required to provide services for Owner, Architect-Engineer, and Contract Administrator.

## **1.10 TEMPORARY WATER SERVICE**

- A. It is the responsibility of the Contractor to provide the temporary water service for construction, sanitary facilities, fire protection, and for required cleaning. Potable water shall be furnished for construction personnel by portable containers provided by the Contractor.
- B. The Contractor shall pay for all expenses associated with temporary water service during the course of the Work.
- C. Comply with all applicable codes and arrange for all necessary inspections and approvals.
- D. Upon completion of the Work, the Contractor shall remove all temporary water service appurtenances.

## **1.11 TEMPORARY SANITARY FACILITIES**

- A. Contractor shall provide at the Site, suitable enclosed toilet facilities for the use of construction personnel. The Contractor shall observe and enforce all sanitary regulations and maintain satisfactory sanitary conditions around and on all parts of the Work.
- B. Adequate washing facilities shall be provided for the construction personnel.
- C. Installation:
  - 1. Install temporary sanitary facilities required for Contractor's use, ready for occupancy, five (5) Working Days after date of Notice to Proceed.

- D. Contractor shall maintain service and clean and disinfect facilities in a satisfactory manner and enforce proper use of the sanitary facilities.
- E. Contractor shall pay for all expenses associated with temporary sanitary facilities during the course of the Work, including furnishing all necessary permits and fees required for temporary sanitary facilities.
- F. Comply with all applicable codes and arrange for all necessary inspections and approvals.

## **1.12 FIRST AID FACILITIES AND ACCIDENTS**

### **A. First aid facilities.**

- 1. The Contractor shall provide, at the Site, such equipment and facilities as are necessary to supply first aid to Contractor's personnel who may be injured in connection with the Work.

### **B. Accidents.**

- 1. Contractor shall comply with all requirements of the Site-Specific Health and Safety Plan (HASP) developed in conformance with the requirements of Section 01 50 01 – Health and Safety Provisions.
- 2. The Contractor shall within twenty-four (24) hours report in writing to the Owner all accidents and incidents arising out of, or in connection with, the performance of the Work, whether on or adjacent to the Site, which cause death, personal injury or property damage, giving full details and statements of witnesses.
- 3. If death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to both the Owner, the Architect-Engineer, and all appropriate regulatory agencies.
- 4. If any claim is made by anyone against the Contractor or a Subcontractor on account of any accidents, the Contractor shall promptly report the facts in writing to the Owner, giving full details of the claim.

## **1.13 FIELD OFFICES**

- A. Owner will provide a portion of the third floor of Building 1 for use by the Contractor as field offices. A separate portion of this location will also be utilized by the Contract Administrator/Architect-Engineer/Owner.
  - 1. Due to the requirement that the existing Rock Cut Road Transfer Station Facility remain operational during the Work, combined with limited Site space, Contractor

temporary installation and use of separate field office(s) will remain at the discretion of the Owner.

- B. Contractor shall have their identified Superintendent on-site at all times when their forces or Subcontractor(s) are performing Work.
- C. Construction meetings will be conducted either virtual and/or in the portion of the third floor of Building 1 reserved for the Contract Administrator/Architect-Engineer/Owner.
- D. Contractor material storage and staging area will be provided within the Building 2 Tipping Floor, Building 2 Basement, unencumbered area of the Building 2 Conveyor/Compactor Area, and outdoor storage limited to the areas depicted within the Construction Plans.
  - 1. Due to the requirement that the existing Rock Cut Road Transfer Station Facility remain operational during the Work, combined with limited Site space, Contractor material storage and staging areas are expected to consist only of that listed above. Any additional storage and staging locations will remain at the discretion of the Owner. The Owner may require intermittent or short term use of any of the designated Contractor material storage and staging areas when not actively in use for this purpose by the Contractor.
- E. Contractor facilities and parking location shall be coordinated with the Owner.
  - 1. Due to the requirement that the existing Rock Cut Road Transfer Station Facility remain operational during the Work, combined with limited Site space, Contractor parking is expected to consist of that provided on-street. Any additional on-site parking locations will remain at the discretion of the Owner.
- F. Contractor field office and facilities:
  - 1. Telephone/Equipment – Contractor's option.
  - 2. Other Furnishings – Contractor's option but appropriate to accommodate expected use.
- G. Maintenance and cleaning:
  - 1. Daily janitorial services for field offices; periodic cleaning and maintenance for storage and staging areas.
  - 2. Maintain walks free of mud, water, snow, and the like.
- H. At completion of Work remove utility services and debris. Restore areas to same or better condition as original condition.

1. Remove temporary utilities, equipment, facilities, materials, prior to Final Application for Payment inspection.
2. Clean and repair damage caused by installation or use of temporary Work.

#### **1.14 VEHICULAR ACCESS**

- A. Only use existing on-site areas outside of the active operational traffic paths for construction traffic.
- B. The existing Rock Cut Road Transfer Station Facility will remain in operation as depicted on Construction Plan Sheet No. C2 “Existing Site Conditions and Operations Plan” and detailed further within the Contract Documents during the duration of construction.

#### **1.15 PARKING**

- A. Locate on-street or on-site only as approved by the Owner.
- B. If on-street or Owner approved on-site space is not adequate, provide additional off-site parking.
- C. Do not allow heavy vehicles or construction equipment in parking areas.

#### **1.16 PROGRESS CLEANING AND WASTE REMOVAL**

- A. Maintain areas free of waste materials, debris, and rubbish. Maintain Site in clean and orderly condition.
- B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, before enclosing spaces.
- C. Broom and vacuum clean interior areas before starting surface finishing and continue cleaning to eliminate dust.
- D. Contractor shall provide roll-off containers for material disposal.
- E. Burning of rubbish or unused materials will not be permitted.

#### **1.17 TRAFFIC REGULATION**

- A. Traffic cones, drums, flares, and lights shall be as required by the Owner, Authorities Having Jurisdiction, and to protect existing Site operations.
- B. Flag person equipment shall be as required by Owner and Authorities Having Jurisdiction.

- C. Provide trained and equipped flag persons to regulate traffic when construction operations or traffic encroach on public traffic lanes or on the Site's operational traffic.
- D. Use flares and lights during hours of low visibility to delineate traffic lanes and to guide traffic.

## **1.18 SECURITY**

### **A. Security Program:**

1. Protect Work on existing premises and Owner's operations from theft, vandalism, and unauthorized entry.
2. Initiate program in coordination with Owner's existing security system at Project mobilization.
3. Maintain program throughout construction period until Owner occupancy.

### **B. Entry Control:**

1. Restrict entrance of persons and vehicles to Project Site but allow unrestricted access by public to the existing Rock Cut Road Transfer Station Facility during normal operating hours.
2. Maintain log of workers and visitors and make available to Owner on request.

### **C. Restrictions:**

1. Do not allow cameras on Site or photographs to be taken (other than as required by these Technical Specifications) except by written approval of Owner.
2. Do no Work on days or Holidays indicated in the Contract.

## **PART 2 PRODUCTS**

### **2.1 GENERAL**

- A. All materials shall be in accordance with the Construction Plans and the Contractor's plan for environmental protection.

## **PART 3 EXECUTION**

### **3.1 PROTECTION OF EXISTING FACILITY**

- A. General – It is intended that the existing assets and resources within the Project boundaries and outside the Limits of Work performed under this Contract be preserved in their present condition, or be restored to a condition after completion of construction

that matches that prior to the commencement of the Work, and will not detract from the appearance of the Project. The Contractor shall confine its construction activities to areas defined on the Construction Plans or in the Technical Specifications except with written approval of the Owner and the Architect-Engineer.

- B. Post-Construction Cleanup or Obliteration – The Contractor shall obliterate all signs of temporary construction facilities such as work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, or any other vestiges of construction.

### **3.2 MAINTENANCE**

- A. The Contractor shall dispose of all discarded debris, aggregate samples and concrete test samples from any source whatsoever, in a manner approved by the Owner as discussed during Pre-construction Meeting. Toilet facilities shall be kept clean and sanitary at all times. Services shall be performed at such a time and in such a manner to least interfere with the operations. Services shall be accomplished to the satisfaction of the Owner.
- B. The Contractor shall frequently remove materials no longer required on the Site, such as forms, temporary structures and similar materials and equipment so that, at all times, the Site, access routes to the Site and any other areas disturbed by Contractor operations shall present a neat, orderly, workmanlike appearance.
- C. Before substantial completion inspection, the Contractor shall remove all surplus material, false work, temporary structures, including foundations thereof, plant of any description, and put the Site in a neat, orderly condition; and restore all areas which have been used for storage of materials and equipment, and all areas which have been disturbed by its operations, to their original condition or to a condition satisfactory to and approved by the Owner

### **3.3 DUST CONTROL**

- A. The Contractor shall maintain all Work areas within or without the Project boundaries free from dust which would cause a hazard or nuisance to others.
- B. The Contractor shall, at its own expense, keep dust under control at all times on all areas adjacent to the Work by the use of motor sweepers, vacuums, spraying water, dust suppressants, or a combination of these methods.
- C. Dust control shall be performed daily as the Work proceeds and whenever a dust nuisance or hazard occurs.
- D. All areas undergoing filling, cutting, or subject to other dust-producing activities by vehicles should be subjected to dust inhibiting practices.

### **3.4 NOISE CONTROL**

- A. The Contractor shall use every effort and means possible to minimize or eliminate noise caused by its operation which the Owner and/or Architect-Engineer may consider objectionable. The Contractor shall provide working machinery, designed to operate with the least possible noise. The Contractor is responsible for maintaining compliance with all applicable noise regulations and all County and local noise ordinances.

### **3.5 WATER CONTROL**

- A. Maintain excavations free of water. Provide, operate, and maintain necessary pumping equipment.

### **3.6 PEST AND RODENT CONTROL**

- A. Provide methods, means, and facilities to prevent pests and insects from damaging the Work or infesting the Site.
- B. Provide methods, means, and facilities to prevent rodents from accessing or invading premises.
  - 1. Where infestation of any kind is discovered, immediately notify Owner and advise him as to what steps will be immediately taken to eliminate the infestation and what periodic preventative means will be employed to prevent future infestations.
  - 2. Submit a detailed plan for eliminating the infestation for review by the Owner. Follow procedures for submittals as described in Section 01 3300 – Submittal Procedures.
  - 3. Do not use any chemicals to treat any infestation without obtaining the Owner's written approval.
  - 4. Use only methods and materials, which have been submitted and accepted by the Owner.

### **3.7 POLLUTION CONTROL**

- A. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances and pollutants produced by construction operations.
- B. Comply with pollution and environmental control requirements of Federal, State, County, and Municipal laws.

### **3.8 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS**

- A. Remove temporary utilities, equipment, facilities, and materials before Final Application for Payment inspection.
- B. Clean and repair damage caused by installation or use of temporary Work.

END OF SECTION

## **SECTION 01 50 01**

### **HEALTH AND SAFETY PROVISIONS**

#### **PART 1 GENERAL**

- 1.1 This Section requires compliance with applicable safety codes, standards and regulations, including but not limited to OSHA, PESH, Building Code of New York State, Fire Code of New York State, and Facility Regulations.

#### **1.2 SECTION INCLUDES**

- A. General Requirements.
- B. Use of Hazardous Materials.

#### **1.3 RELATED SECTIONS**

- A. All Divisions and Sections referenced in this Section
- B. Division 00 - Procurement and Contracting Requirements
- C. Section 01 50 00 – Temporary Facilities and Controls
- D. Section 01 90 00 – Reference Standards

#### **1.4 GENERAL REQUIREMENTS**

- A. Contractor shall prepare a Site-Specific Health and Safety Plan (HASP) to provide specific guidelines and establish procedures for the protection of personnel performing the scope of activities, as described in the Contract Documents. The information in the HASP shall be developed in accordance with applicable standards, including but not limited to Section 01 90 00 – Reference Standards, Title 29, Code of Federal Regulations, Parts 1910 and 1926, and to the extent possible, on previous studies and information available to date. The HASP is intended to be a working document in that it shall continually evolve as site conditions and knowledge of the Site Work activities develop further. Adherence to the HASP as drafted alone shall provide the guidance necessary to initiate the Work and allow monitoring of site conditions to determine the required protection. The Contractor shall update the HASP based upon consistent monitoring and implementation of the document to reflect lessons learned and to mitigate risks as they are identified during the course of the Work.
- B. The Contractor shall be solely responsible for the content and implementation of the HASP as far as its personnel and any Subcontractors are concerned. All of the Contractor's personnel and Subcontractors working on-Site shall be required to read and sign a statement attesting that they have read and agree to abide by the requirements of the Contractor's HASP.

C. The Contractor agrees to comply with all the requirements and procedures contained in the HASP document. The requirements and procedures are as follows:

1. The Contractor shall be responsible for maintaining a safe workplace and taking all prudent environmental, health and safety precautions to protect its employees, all other workers, and the public.
2. Comply with all applicable Federal, State, municipal, local, and any other applicable occupational safety and health regulations and requirements issued imposed by any governmental authority (including, but not limited to, Section 01 90 00 – Reference Standards, Title 29, Code of Federal Regulations Parts 1910 and 1926).
3. The Contractor agrees to monitor working conditions at all times during construction and, as necessary, to provide appropriate protective clothing, equipment and facilities for its personnel, and/or to establish workplace procedures to ensure their safety. Any personnel on Site shall comply with the PPE requirements listed within the Contractor supplied HASP.
4. If, at any time, the Owner or the Architect-Engineer is apprised of a safety hazard which demands immediate attention due to potential for harm to the public, persons on or about the Work, or public or private property, the Owner or the Architect-Engineer shall have the right to order such safeguards to be erected and such precautions to be taken as necessary, and the Contractor shall comply with such orders. If, under such circumstances the Contractor does not or cannot immediately put the Work into proper and approved condition, or if the Contractor or its representative is not upon the Site so that it can be notified immediately of the insufficiency of safety precautions, then the Owner may put the Work into such a condition that it shall be, in its opinion, in all respects safe, and the Contractor shall pay all expenses of such labor and materials as may have been used for this purpose by Contractor or by Owner.

The fact that the Owner or the Architect-Engineer may not observe a safety hazard or does not order the Contractor to take remedial measures, shall in no way relieve the Contractor of the entire responsibility for any costs or claims for loss, damage or injury, by or against any party sustained on account of the insufficiency of the safety precautions taken by him or by the Owner acting under authority of this Section.

5. It is the responsibility of the Contractor to take appropriate safety precautions to meet where conditions of hazard may be present during the performance of the Work, and whether or not reasonably foreseeable. The Contractor is alerted to the fact that it shall be his sole responsibility to anticipate and provide such additional safety precautions, facilities, personnel, and equipment as shall be necessary to protect life and property from whatsoever conditions of hazard are present or may be present.

## **1.5 USE OF HAZARDOUS MATERIALS**

- A. The Contractor personnel shall not bring any hazardous substances (as defined by OSHA) onto the site premises unless accompanied by a Safety Data Sheets (SDS). SDS' must be maintained at the job site.
- B. Contractor shall ensure all containers of hazardous materials are labeled in compliance with State and Federal OSHA regulations with the product name, appropriate hazard warnings, and the name and address of the manufacturer.
- C. Contractor shall ensure its employees are trained in the safe handling and use of hazardous materials in accordance with Title 29 CFR 1910.1200 - Hazard Communication.
- D. Contractor shall ensure that all applicable employees are medically qualified (as defined by OSHA) to perform the Work assigned.
- E. Contractor shall coordinate for proper disposal of any and all hazardous materials as per details of the Pre-construction Meeting.

## **1.6 ADDITIONAL SAFETY POLICIES THAT WILL BE ADHERED TO THROUGHOUT THE CONSTRUCTION PHASE**

- A. Seatbelts shall be utilized when operating all vehicles and heavy equipment designed to be operated in a seated position.
- B. Inspections of scaffolding prior to use, and excavations prior to entry shall be documented by the Contractor's on-site competent person. Documented inspection will be available on-site for review by the Architect-Engineer.
- C. All heavy equipment being utilized on site shall have a fire extinguisher of suitable size/rating within reach of operator.
- D. Any fuel-powered equipment shall have a fire extinguisher of suitable size/rating no closer than ten (10) feet and no further than twenty-five (25) feet from the equipment.
- E. All electrical Work shall be done when panels/lines/boxes have been de-energized and locked out, unless otherwise approved in writing by the Architect-Engineer.
- F. An applicable sized Spill Kit shall be available where heavy equipment is being utilized.

**PART 2 PRODUCTS – Not Used**

**PART 3 EXECUTION – Not Used**

END OF SECTION

**SECTION 01 60 00**  
**PRODUCT REQUIREMENTS**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Products.
- B. Product Delivery Requirements.
- C. Product Storage and Handling Requirements.

**1.2 RELATED SECTIONS**

- A. All Divisions and Sections referenced in this Section
- B. Division 00 - Procurement and Contracting Requirements
- C. Section 01 30 00 – Administrative Requirements
- D. Section 01 33 00 – Submittal Procedures
- E. Section 01 70 00 – Execution and Closeout Requirements
- F. Section 01 90 00 – Reference Standards

**1.3 PRODUCTS**

- A. Products – Means new material, machinery, components, equipment, fixtures, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.
- B. At minimum, comply with specified requirements and Reference Standards.
- C. Specified products define standard of quality, type, function, dimension, appearance, and performance required.
- D. Furnish products of qualified manufacturers that are suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise. Confirm that manufacturer's production capacity can provide sufficient product, on time, to meet Project requirements.
- E. Do not use materials and equipment removed from existing premises, except as specifically permitted by the Contract Documents.

- F. Provide interchangeable components of the same manufacturer, for similar components.
- G. Asbestos products or equipment or materials containing asbestos shall not be used.

#### **1.4 PRODUCT DELIVERY REQUIREMENTS**

- A. Transport and handle products according to manufacturer's instructions.
- B. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.
- C. Provide equipment and personnel to handle products; use methods to prevent soiling, disfigurement, or damage.

#### **1.5 PRODUCT STORAGE AND HANDLING REQUIREMENTS**

- A. Store and protect products according to manufacturer's instructions.
- B. Store products with seals and labels intact and legible.
- C. Store sensitive products in weathertight, climate-controlled enclosures in an environment suitable to product.
- D. For exterior storage of fabricated products, place products on sloped supports aboveground.
- E. Provide bonded off-site storage and protection when Site does not permit on-site storage or protection.
- F. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.
- G. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.
- H. Provide equipment and personnel to store products; use methods to prevent soiling, disfigurement, or damage.
- I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

**PART 2 PRODUCTS – Not Used**

**PART 3 EXECUTION - Not Used**

END OF SECTION

## **SECTION 01 70 00**

### **EXECUTION AND CLOSEOUT REQUIREMENTS**

#### **PART 1 GENERAL**

##### **1.1 SECTION INCLUDES**

- A. Field Engineering and Surveying.
- B. Closeout Procedures.
- C. Project Record Documents.
- D. Starting of Systems.
- E. Demonstration and Instructions.
- F. Testing, Adjusting, and Balancing.
- G. Testing of Piping Systems.
- H. Operation and Maintenance Data.
- I. Manual for Materials and Finishes.
- J. Manual for Equipment and Systems.
- K. Spare Parts and Maintenance Products.
- L. Product Warranties and Product Bonds.
- M. Maintenance Service.
- N. Examination.
- O. Preparation.
- P. Execution.
- Q. Cutting and Patching.
- R. Protecting Installed Construction.
- S. Final Cleaning.

## **1.2 RELATED SECTIONS**

- A. All Divisions and Sections referenced in this Section
- B. Division 00 – Procurement and Contracting Requirements
- C. Section 01 10 00 – Summary of Work
- D. Section 01 20 00 – Price and Payment Procedures
- E. Section 01 25 00 – Substitution Procedures
- F. Section 01 30 00 – Administrative Requirements
- G. Section 01 33 00 – Submittal Procedures
- H. Section 01 40 00 – Quality Requirements
- I. Section 01 50 00 – Temporary Facilities and Controls
- J. Section 01 50 01 – Health and Safety Provisions
- K. Section 01 60 00 – Product Requirements
- L. Section 01 90 00 – Reference Standards

## **1.3 FIELD ENGINEERING AND SURVEYING**

- A. Provide field engineering and surveying services. Establish elevations, lines, and levels using recognized engineering and survey/layout practices.
- B. Maintain complete and accurate log of survey/layout work as Work progresses.
- C. Preserve permanent reference points during execution of Work.
- D. Promptly report to Engineer loss or destruction of reference point or relocation required because of Work.
- E. Final As-Built Survey: Prior to Substantial Completion, prepare Final As-Built Survey using 3D-scanning methods to capture “point cloud” information including locations, dimensions, angles, and elevations of buildings, structures, material limits, utilities, and the Work that have resulted from construction and demolition indicating their relationship to reference points.
  - 1. Proposed 3D-scanning technology, methodology, and format(s) of “point cloud” deliverable is to be provided as a Shop Drawing Submittal and approved by the Architect-Engineer prior to implementation.

2. 3D-scan shall capture and “point cloud” shall depict ALL areas within the Limit of Work including constructed features and areas of demolition.
3. Include certification on Final As-Built Survey that principal dimensions, lines, levels, and elevations of Project are accurately shown.

#### **1.4 CLOSEOUT PROCEDURES**

Refer to Division 00 – Procurement and Contracting Requirements.

#### **1.5 PROJECT RECORD DOCUMENTS**

- A. Maintain on Site one (1) set of the following Project Record Documents; record actual revisions to the Work:
  1. Construction Plans.
  2. Technical Specifications.
  3. Addenda.
  4. Change Orders and other modifications to the Contract.
  5. Reviewed Shop Drawings, Product Data, and Samples.
  6. Manufacturer's instruction for assembly, installation, and adjusting.
  7. The tests, inspections, and subsequent Record Documents required by the Authority Having Jurisdiction as per the list provided to the Contractor by the Owner during the Site Mobilization Meeting.
    - a. To they extent that they were not captured in the above, certified documentation of the Special Inspections required by Code.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store Record Documents separate from documents used for construction.
- D. Record information concurrent with construction progress, not less than weekly.
- E. Specifications: Legibly mark and record, at each product section, description of actual products installed, including the following:
  1. Manufacturer's name and product model and number.
  2. Product substitutions or alternates used.

3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction as follows:

1. Include Contract modifications such as Addenda, supplementary instructions, change directives, field orders, minor changes in the Work, and change orders.
2. Include locations of concealed elements of the Work.
3. Identify and locate existing buried or concealed items encountered during Project.
4. Measured depths of foundations in relation to reference points.
5. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
6. Field changes of dimension and detail.
7. Details not on original Construction Plans.

G. Record Drawings:

1. Submit Record Drawings that have been signed and sealed by a Professional Engineer licensed and registered in State of New York to Architect-Engineer within five (5) days of substantial completion.
2. The Record Drawings shall be provided for the following Construction Plans:
  - a. Cover Sheet;
  - b. Sheet C1, General Notes
  - c. Sheet C2, Existing Site Conditions & Operations Plan
  - d. Sheet A1, Code Sheet
  - e. Sheet A9, Basement Floor Plan
  - f. Sheet A10, First Floor Plan
  - g. Sheet S103, Partial Foundation Plan
  - h. Sheet S104, Partial Framing Plan at Tipping Floor
  - i. Sheet S105, Pushwall Framing Plan

- j. Sheet S201, Sections
  - k. Sheet S202, Sections
  - l. Sheet S203, Sections
  - m. Sheet S204, Sections
  - n. Sheet S301, Details
  - o. Sheet FP1, Fire Protection: Basement Floor Plans
  - p. Sheet FP3, Fire Protection: First Floor Plan
  - q. Sheet P1, Plumbing: Basement Floor Plans
  - r. Sheet E2, Electrical: First Floor Plan
  - s. All third-party vendor/Subcontractor drawings for structures and reinforcing.
- 3. Maintain Record Drawings throughout construction.
  - 4. Submit a minimum of two (2) signed and sealed prints for each Record Drawing required, along with the electronic AutoCAD files.
- H. Submit PDF electronic files of Record Drawings to Architect-Engineer with Final Application for Payment.

## **1.6 STARTING OF SYSTEMS**

- A. Coordinate schedule for startup of various equipment and systems.
- B. Notify Engineer five (5) Working Days prior to startup of each item.
- C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.
- D. Verify that tests, meter readings, and electrical characteristics agree with those required by equipment or system manufacturer.
- E. Verify that wiring and support components for equipment are complete and tested.
- F. Execute startup under supervision of manufacturer's representative or Contractors' personnel according to manufacturer's instructions.

- G. When specified in individual Technical Specification Sections, require manufacturer to provide authorized representative who will be present at Site to inspect, check, and approve equipment or system installation prior to startup and will supervise placing equipment or system in operation.
- H. Submit a written report according to Section 01 3300 – Submittal Procedures that equipment or system has been properly installed and is functioning correctly.

## **1.7 DEMONSTRATION AND INSTRUCTIONS**

- A. Demonstrate operation and maintenance of products and equipment to Owner's personnel two (2) weeks prior to Final Completion Inspection by authorized manufacturer's representatives who are knowledgeable about the Project.
- B. For equipment or systems requiring seasonal operation, perform demonstration for other season(s) within six (6) months.
- C. Use operation and maintenance manuals as basis for instruction. Review contents of manual with Owner's personnel in detail to explain all aspects of operation and maintenance.
- D. Demonstrate startup, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at designated location.
- E. Prepare and insert additional data in operations and maintenance manuals when need for additional data becomes apparent during instruction.
- F. Required instruction time for each item of equipment and system is specified in individual Technical Specification Sections.

## **1.8 TESTING, ADJUSTING, AND BALANCING**

- A. Reports will be submitted by independent firm to Engineer indicating observations and results of tests and indicating compliance or noncompliance with requirements of Contract Documents.

## **1.9 TESTING OF PIPING SYSTEMS**

- A. Unless further detailed within subsequent Sections of Technical Specifications, installed piping systems shall be tested in accordance with the below requirements.
- B. Provisions:
  - 1. Provide air compressor flanges, caps, bulkheads and monitoring apparatus as necessary to complete low-pressure air tests via method approved by Engineer.

2. Provide pump, pressure test gauge, plugs, blind flanges, and appurtenances as necessary to complete the hydrostatic tests via method approved by Engineer.

C. General Preparation for Low-pressure Air Testing:

1. Commence test procedures when following conditions have been met.
  - a. Pipe section to be tested is clean and free of dirt, sand or other foreign material.
  - b. Plug pipe outlets with test plugs. Brace each plug securely to prevent blowouts.
  - c. Add air slowly.
  - d. Pressurizing equipment shall include regulator set to avoid over-pressurizing and damaging otherwise acceptable line.
2. Provide necessary piping connections between section of line being tested and air supply, together with test pressure equipment, meters, pressure gauge, and other equipment, materials, and facilities necessary to make specified tests.
3. Furnish and install bulkheads, flanges, valves, bracing, blocking or other temporary sectionalizing devices that may be required.
4. Remove temporary sectionalizing device after tests have been completed.

D. General Testing Equipment for Low-pressure Air Testing:

1. Provide equipment for this testing procedure.
2. Testing Equipment:
  - a. Required adapters as approved by the Engineer to adequately terminate both ends of section to be tested.
  - b. Temperature gauge (0°C to 100°C) tapped and threaded into blind flange.
  - c. Pressure gauge (0 to 15 psig), increment of gauge shall be 1/10 of a psi.
  - d. Inlet valve to facilitate air pressure hose.
  - e. Ball valve to release pipe pressure at test completion.
  - f. Air compressor shall provide adequate air supply for testing.
  - g. Pressurizing equipment shall include a regulator set to avoid over-pressurizing and damaging otherwise acceptable pipe.

- E. Provide verification and results of gauge calibration prior to (less than 60 days) and after Project completion.
- F. Test Reporting:
  - 1. Each test shall be reported in writing.
  - 2. Include following information if failure occurs:
    - a. Location of failure segment.
    - b. Nature of leaks.
    - c. Details of repairs performed.
    - d. Retest results.

#### **1.10 OPERATION AND MAINTENANCE DATA**

- A. Submit in PDF composite electronic indexed file.
- B. Submit data bound in 8-1/2 x 11-inch text pages, three (3) D side ring binders with durable plastic covers.
- C. Prepare binder cover with printed title "OPERATION AND MAINTENANCE INSTRUCTIONS," title of Project, and subject matter of binder when multiple binders are required.
- D. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.
- E. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- F. Contents: Prepare table of contents for each volume, with each product or system description identified, typed on white paper, in three (3) parts as follows:
  - 1. Part 1: Directory, listing names, addresses, and telephone numbers of Engineer, Contractor, Subcontractors, and major equipment suppliers.
  - 2. Part 2: Operation and maintenance instructions arranged by system and subdivided by Technical Specification Section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Include the following:
    - a. Significant design criteria.
    - b. List of equipment.

- c. Parts list for each component.
  - d. Operating instructions.
  - e. Maintenance instructions for equipment and systems.
  - f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
  - g. Safety precautions to be taken when operating and maintaining or Working near equipment.
3. Part 3: Project documents and certificates, including the following:
- a. Shop Drawings and Product Data.
  - b. Certificates.
  - c. Originals of warranties and bonds.

#### **1.11 MANUAL FOR MATERIALS AND FINISHES**

- A. Submit two (2) copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect-Engineer will review draft and return one (1) copy with comments.
- B. For equipment or component parts of equipment put into service during construction and operated by Owner, submit documents within ten (10) days after acceptance.
- C. Submit one (1) copy of completed volumes fifteen (15) days prior to final inspection. Draft copy to be reviewed and returned after final inspection, with Architect-Engineer comments. Revise content of document sets as required prior to final submission.
- D. Submit two (2) sets of revised final volumes within ten (10) days after final inspection.
- E. Submit in PDF composite electronic indexed file of final manual within ten (10) days after final inspection.
- F. Building Products, Applied Materials, and Finishes: Include Product Data, with catalog number, size, composition, and color and texture designations.
- G. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

- H. Moisture Protection and Weather Exposed Products: Include Product Data listing applicable reference standards, chemical composition, and details of installation. Include recommendations for inspections, maintenance, and repair.
- I. Additional Requirements: As specified in individual product Technical Specification Sections.
- J. Include listing in table of contents for design data, with tabbed fly sheet and space for insertion of data.

## **1.12 MANUAL FOR EQUIPMENT AND SYSTEMS**

- A. Submit two (2) copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect-Engineer will review draft and return one (1) copy with comments.
- B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten (10) days after acceptance.
- C. Submit one (1) copy of completed volumes fifteen (15) days prior to final inspection. Draft copy will be reviewed and returned after final inspection, with Architect-Engineer comments. Revise content of document sets as required prior to final submission.
- D. Submit two (2) sets of revised final volumes within ten (10) days after final inspection.
- E. Submit in PDF composite electronic indexed file of final manual within ten (10) days after final inspection.
- F. Each Item of Equipment and Each System: Include description of unit or system and component parts. Identify function, normal operating characteristics, and limiting conditions. Include complete nomenclature and model number of replaceable parts.
- G. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.
- H. Include color-coded wiring diagrams as installed.
- I. Include manufacturer's printed operation and maintenance instructions.
- J. Include sequence of operation by controls manufacturer.
- K. Include original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
- L. Include list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

- M. Additional Requirements: As specified in individual product Technical Specification Sections.
- N. Include listing in table of contents for design data with tabbed dividers and space for insertion of data.

### **1.13 SPARE PARTS AND MAINTENANCE PRODUCTS**

- A. Furnish spare parts, maintenance, and extra products in quantities specified in individual Technical Specification Sections.
- B. Deliver to Owner; obtain receipt prior to final payment.

### **1.14 PRODUCT WARRANTIES AND PRODUCT BONDS**

- A. Obtain warranties and bonds executed in duplicate by responsible Subcontractors, suppliers, and manufacturers within ten (10) days after completion of applicable item of Work.
- B. Execute and assemble transferable warranty documents and bonds from Subcontractors, suppliers, and manufacturers.
- C. Verify documents are in proper form, contain full information, and are notarized.
- D. Co-execute Submittals when required.
- E. Include table of contents and assemble in three (3) D side ring binder with heavy-duty plastic cover.
- F. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of installer.
- G. Identify each binder on the front and spine with the typed or printed title "WARRANTIES", Project name and name of Contractor.
- H. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- I. Submit prior to Final Application for Payment.
- J. Time of Submittals:

1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten (10) days after acceptance.
2. Make other Submittals within ten (10) days after date of Substantial Completion, prior to Final Application for Payment.
3. For items of Work for which acceptance is delayed beyond Substantial Completion, submit within ten (10) days after acceptance, listing date of acceptance as beginning of warranty or bond period.

#### **1.15 MAINTENANCE SERVICE**

- A. Furnish service and maintenance of components indicated in Technical Specification Sections during warranty period.
- B. Examine system components at frequency consistent with reliable operation.
- C. Do not assign or transfer maintenance service to agent or Subcontractor without prior written consent of Owner.

### **PART 2 PRODUCTS - Not Used**

### **PART 3 EXECUTION**

#### **3.1 EXAMINATION**

- A. Verify that existing Site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.
- B. Verify that existing substrate is capable of structural support or attachment of new Work being applied or attached.
- C. Examine and verify specific conditions described in individual Technical Specification Sections.
- D. Verify that utility services are available with correct characteristics and in correct locations.

#### **3.2 PREPARATION**

- A. Clean substrate surfaces prior to applying next material or substance according to manufacturer's instructions.
- B. Seal cracks or openings of substrate prior to applying next material or substance.
- C. Apply manufacturer-required or -recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

### 3.3 EXECUTION

- A. Comply with manufacturer's installation instructions, performing each step in sequence. Maintain one (1) set of manufacturer's installation instructions at Project Site during installation and until completion of construction.
- B. When manufacturer's installation instructions conflict with Contract Documents, request clarification from Architect-Engineer before proceeding.
- C. Verify that field measurements are as indicated on approved Shop Drawings or as instructed by manufacturer.
- D. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.
  - 1. Secure Work true to line and level and within specified tolerances, or if not specified, industry-recognized tolerances.
  - 2. Physically separate products in place, provide electrical insulation, or provide protective coatings to prevent galvanic action or corrosion between dissimilar metals.
  - 3. Exposed Joints: Provide uniform joint width and arrange to obtain best visual effect. Refer questionable visual-effect choices to Architect-Engineer for final decision.
- E. Allow for expansion of materials and structure movement.
- F. Climatic Conditions and Project Status: Install each unit of Work under conditions to ensure best possible results in coordination with entire Project.
  - 1. Isolate each unit of Work from incompatible Work as necessary to prevent deterioration.
  - 2. Coordinate enclosure of Work with required inspections and tests to minimize necessity of uncovering Work for those purposes.
- G. Mounting Heights: Where not indicated, mount individual units of Work at industry recognized standard mounting heights for particular application indicated.
  - 1. Refer questionable mounting heights choices to Architect-Engineer for final decision.
  - 2. Elements Identified as Accessible to Handicapped: Comply with applicable codes and regulations.
- H. Adjust operating products and equipment to ensure smooth and unhindered operation.

- I. Clean and perform maintenance on installed Work as frequently as necessary through remainder of construction period. Lubricate operable components as recommended by manufacturer.

### **3.4 CUTTING AND PATCHING**

- A. Employ skilled and experienced installers to perform cutting and patching.
- B. Submit written request in advance of cutting or altering elements affecting:
  - 1. Structural integrity of element.
  - 2. Integrity of weather-exposed or moisture-resistant elements.
  - 3. Efficiency, maintenance, or safety of element.
  - 4. Visual qualities of sight-exposed elements.
  - 5. Work of Owner or separate contractor.
- C. Execute cutting, fitting, and patching including excavation and fill to complete Work and to:
  - 1. Fit the several parts together, to integrate with other Work.
  - 2. Uncover Work to install or correct ill-timed Work.
  - 3. Remove and replace defective and nonconforming Work.
  - 4. Remove samples of installed Work for testing.
  - 5. Provide openings in elements of Work for penetrations of mechanical, electrical, and plumbing Work.
- D. Execute Work by methods to avoid damage to other Work and to provide proper surfaces to receive patching and finishing.
- E. Cut masonry and concrete materials using masonry saw or core drill.
- F. Restore Work with new products according to requirements of Contract Documents.
- G. Fit Work tight to pipes, sleeves, conduits, and other penetrations through surfaces.
- H. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.

### **3.5 PROTECTING INSTALLED CONSTRUCTION**

- A. Protect installed Work and provide special protection where specified in individual Technical Specification Sections.
- B. Provide temporary and removable protection for installed products. Control activity in immediate Work area to prevent damage.
- C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.
- D. Use durable sheet materials to protect finished floors and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects.

### **3.6 FINAL CLEANING**

- A. Execute final cleaning prior to Final Completion Inspection.
  - 1. Employ experienced personnel or professional cleaning firm.
- B. In addition to the requirements of Division 00 – Procurement and Contracting Requirements:
  - 1. Clean interior and exterior glass and surfaces exposed to view; remove temporary labels, stains, and foreign substances; polish transparent and glossy surfaces.
  - 2. Clean equipment and fixtures to sanitary condition with appropriate cleaning materials.
  - 3. Replace disposable filters and clean permanent filters in all operating equipment.
  - 4. Clean exposed surfaces of diffusers, registers and grills.
  - 5. Clean debris from roofs, gutters, downspouts, and drainage systems.
  - 6. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics and similar spaces.
  - 7. Remove all spills, stains and other foreign deposits.
  - 8. Remove waste and surplus materials, rubbish, and construction tools and equipment from Site.
  - 9. Remove snow and ice to provide safe access to Site and building, as applicable.

END OF SECTION

**SECTION 01 90 00**  
**REFERENCE STANDARDS**

**PART 1 GENERAL**

**1.1 SECTION INCLUDES**

- A. Quality Assurance.
- B. Schedule of References.
- C. Reference Documents.

**1.2 RELATED SECTIONS**

- A. All Divisions and Sections of the Technical Specifications
- B. Division 00 – Procurement and Contracting Requirements

**1.3 QUALITY ASSURANCE**

- A. For products or workmanship specified by association, trade, or Federal Standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Conform to the latest reference standard as of the date of these Contract Documents.
- C. Maintain copy at job site during submittals, planning, and progress of the specific Work, until Substantial Completion.
- D. Should specified reference standards conflict with Contract Documents, request clarification from Architect-Engineer before proceeding.
- E. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

**1.4 SCHEDULE OF REFERENCES**

AA	The Aluminum Association 1400 Crystal Drive Arlington, VA 22202
AASHTO	American Association of State Highway and Transportation Officials 555 12 <sup>th</sup> Street NW, Ste. 1000 Washington, DC 20004

ACI	American Concrete Institute 38800 Country Club Drive  Farmington Hills, MI 48331-3439
AGC	Associated General Contractors of America 2300 Wilson Blvd., Suite 300 Arlington, VA 22201
AI	Asphalt Institute 2696 Research Park Drive Lexington, KY 40511-8480
AIA	American Institute of Architects 1735 New York Avenue, N.W. Washington, DC 20006
AISC	American Institute of Steel Construction 130 East Randolph Suite 2000 Chicago, IL 60601
AISI	American Iron and Steel Institute 25 Massachusetts Avenue NW, Suite 800 Washington, DC 20001
ANSI	American National Standards Institute 25 West 43 <sup>rd</sup> Street New York, NY 10036
ASTM	American Society for Testing and Materials 100 Barr Harbor Drive P.O. Box C700 West Conshohocken, PA 19428-2959
AWS	American Welding Society 8669 NW 36 Street, #130 Miami, FL 33166-6672
CLFMI	Chain Link Fence Manufacturers Institute 10015 Old Columbia R, Ste. B215 Columbia, MD 21046

CRSI	Concrete Reinforcing Steel Institute 933 North Plum Grove Road Schaumburg, IL 60195-4758
EJCDC	Engineers' Joint Contract Documents Committee American Consulting Engineers Council 1015 15th Street, N.W., 8 <sup>th</sup> Floor Washington, DC 20005
EJMA	Expansion Joint Manufacturers Association 25 North Broadway Tarrytown, NY 10591
GSI	Geosynthetic Institute 475 Kedron Avenue Folsom, PA 19033
ICBO	International Code Conference 500 New Jersey Avenue, 6 <sup>th</sup> Floor Washington, DC 20001
IEEE	Institute of Electrical and Electronics Engineers 3 Park Avenue, 17 <sup>th</sup> Floor New York, NY 10016-5997
NEMA	National Electrical Manufacturers' Association 1300 17 <sup>th</sup> St. N #900 Arlington, VA 22209
NFPA	National Fire Protection Association Battery March Park Quincy, MA 02269
NIST	National Institute of Standards and Technology Headquarters 100 Bureau Drive Gaithersburg, MD 20899
OSHA	Occupational Safety and Health Administration U.S. Department of Labor 200 Constitution Avenue NW Washington, DC 20210

PCA	Portland Cement Association 5420 Old Orchard Road Skokie, IL 60077
PCI	Precast/Prestressed Concrete Institute 8770 W. Bryn Mawr Ave, Ste. 1150 Chicago, IL 60631
PPI	Plastics Pipe Institute 105 Decker Ct. #825  Irving, TX 75062
SSPC	Steel Structures Painting Council 800 Trumbull Drive Pittsburgh, PA 15205
UL	Underwriters' Laboratories, Inc. 2500 Dundee Road Northbrook, IL 60062

## 1.5 REFERENCE DOCUMENTS

- A. The following documents are incorporated by reference and made part of these Technical Specifications. All provisions of these documents except as noted herein shall apply.
1. New York State Department of Environmental Conservation, 6 NYCRR Part 360, Solid Waste Management Facilities Title 6 of the Official Compilation of Codes, Rules and Regulations.
  2. New York State Standards and Specifications for Erosion and Sediment Control, November 2016.
  3. 2020 Building Code of New York State.
  4. 2020 Energy Conservation Code of New York State.
  5. 2020 Fire Code of New York State.
  6. 2020 Plumbing Code of New York State.
  7. 2020 Mechanical Code of New York State.
  8. 2020 Energy Conservation Construction Code of New York State.

**PART 2 PRODUCTS - Not Used**

**PART 3 EXECUTION - Not Used**

END OF SECTION

## DIVISION 02 – EXISTING CONDITIONS

## **SECTION 024119**

### **SELECTIVE STRUCTURE DEMOLITION**

#### **PART 1 - GENERAL**

##### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

##### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Demolition and removal of selected portions of building or structure.
  - 2. Salvage of existing items to be reused or recycled.
- B. Related Requirements:
  - 1. Division 01 Section 01 10 00 "Summary of Work" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.
  - 2. Division 01 Section 01 70 00 "Execution and Closeout Requirements" for cutting and patching procedures.

##### **1.3 DEFINITIONS**

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner.
- C. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed, and salvaged, or removed and reinstalled.

##### **1.4 MATERIALS OWNERSHIP**

- A. Unless otherwise indicated, demolition waste becomes property of Contractor.

- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
  - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

## **1.5 PREINSTALLATION MEETINGS**

- A. Predemolition Conference: Conduct conference at Project Site.
  - 1. Inspect and discuss condition of construction to be selectively demolished.
  - 2. Review structural load limitations of existing structure.
  - 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
  - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
  - 5. Review areas where existing construction is to remain and requires protection.

## **1.6 INFORMATIONAL SUBMITTALS**

- A. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control. Indicate proposed locations and construction of barriers.
- B. Schedule of Selective Demolition Activities: Indicate the following:
  - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
  - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
  - 3. Coordination for shutoff, capping, and continuation of utility services.
  - 4. Use of elevator and stairs.
  - 5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- C. Predemolition Photographs or Video: Submit before Work begins.
- D. Warranties: Documentation indicated that existing warranties are still in effect after completion of selective demolition.

## **1.7 CLOSEOUT SUBMITTALS**

- A. Inventory: Submit a list of items that have been removed and salvaged.

- B. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

## **1.8 FIELD CONDITIONS**

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.
- C. Notify Architect/Engineer of discrepancies between existing conditions and Contract Documents before proceeding with selective demolition.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
  - 1. Hazardous materials will be removed by Owner before start of the Work.
  - 2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect/Engineer and Owner. Hazardous materials will be removed by Owner under a separate contract.
- E. Storage or sale of removed items or materials on-site is not permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
  - 1. Maintain fire-protection facilities in service during selective demolition operations.

## **1.9 WARRANTY**

- A. Notify warrantor on completion of selective demolition and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

## **PART 2 - PRODUCTS**

### **2.1 PERFORMANCE REQUIREMENTS**

- A. Regulatory Requirements: Comply with governing EPA notification regulations and those of the authorities having jurisdiction before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ANSI/ASSE A10.6 and NFPA 241.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.
- C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate, and measure the nature and extent of conflict. Promptly submit a written report to Architect/Engineer and Owner.

### **3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS**

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
  - 1. Comply with requirements for existing services/systems interruptions specified in Division 01 Section 01 10 00 "Summary of Work".
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
  - 1. Owner will arrange to shut off indicated Facility services/systems when requested by Contractor.
  - 2. Arrange to shut off indicated utilities with utility companies.
  - 3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
  - 4. Disconnect, demolish, and remove fire-suppression systems, plumbing, and electrical systems, equipment, and components indicated to be removed.
    - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
    - b. Equipment to Be Removed: Disconnect and cap services and remove equipment.
    - c. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.

### **3.3 PREPARATION**

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
  - 1. Comply with requirements for access and protection specified in Division 01 Section 01 50 00 "Temporary Facilities and Controls."
- B. Temporary Facilities: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
  - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
  - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
  - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
  - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
  - 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Division 01 Section 01 50 00 "Temporary Facilities and Controls."
- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
  - 1. Strengthen or add new supports when required during progress of selective demolition.

### **3.4 SELECTIVE DEMOLITION, GENERAL**

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
  - 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
  - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering, and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
  4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
  5. Maintain adequate ventilation when using cutting torches.
  6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
  7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
  8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
  9. Dispose of demolished items and materials promptly.
- B. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect/Engineer, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

### **3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS**

- A. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch (19 mm) at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.
- B. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, then remove concrete between saw cuts.
- C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, then remove masonry between saw cuts.
- D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.

### **3.6 DISPOSAL OF DEMOLISHED MATERIALS**

- A. General: Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them in an EPA and State approved landfill.
  1. Do not allow demolished materials to accumulate on-site.

2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
  3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

### **3.7 CLEANING**

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION

## **DIVISION 03 – CONCRETE**

**SECTION 033000**  
**CAST-IN-PLACE CONCRETE**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Construction Plans and general provisions of the Contract Documents, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:
  - 1. Footings.
  - 2. Foundation walls.
  - 3. Slabs.
- B. Related Sections:
  - 1. Division 03 Section “Concrete Floor Finishes” for slab finishes.

**1.3 DEFINITIONS**

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

**1.4 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
  - 1. Indicate amounts of mixing water to be withheld for later addition at Project Site.
- C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

- D. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork.
  - 1. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and reshoring installation and removal.
- E. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
  - 1. Location of construction joints is subject to approval of the Architect/Engineer.
- F. Qualification Data: For Installer, manufacturer, & testing agency.
- G. Material Certificates: For each of the following (as required), signed by manufacturers:
  - 1. Cementitious materials.
  - 2. Admixtures.
  - 3. Form materials and form-release agents.
  - 4. Steel reinforcement and accessories.
  - 5. Fiber reinforcement.
  - 6. Waterstops.
  - 7. Curing compounds.
  - 8. Floor and slab treatments.
  - 9. Bonding agents.
  - 10. Adhesives.
  - 11. Vapor retarders.
  - 12. Semirigid joint filler.
  - 13. Joint-filler strips.
  - 14. Repair materials.
- H. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
  - 1. Aggregates.
- I. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.
- J. Field quality-control reports.
- K. Minutes of Pre-installation Meeting.

## **1.5 QUALITY ASSURANCE**

- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

- B. **Manufacturer Qualifications:** A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- C. **Testing Agency Qualifications:** An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
  2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.
- D. **Source Limitations:** Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- E. **Welding Qualifications:** Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."
- F. **ACI Publications:** Comply with the following unless modified by requirements in the Contract Documents:
1. ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
  2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- G. **Concrete Testing Service:** Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.
- H. **Pre-installation Meeting:** Conduct at Project Site .
1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
    - a. Contractor's superintendent.
    - b. Independent testing agency responsible for concrete design mixtures.
    - c. Ready-mix concrete manufacturer.
    - d. Concrete subcontractor.
    - e. Special concrete finish subcontractor.

2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, and concrete protection.

## **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
- B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

## **PART 2 - PRODUCTS**

### **2.1 FORM-FACING MATERIALS**

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
  1. Plywood, metal, or other approved panel materials.
  2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
    - a. High-density overlay, Class 1 or better.
    - b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
    - c. Structural 1, B-B or better; mill oiled and edge sealed.
    - d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.
- D. Pan-Type Forms: Glass-fiber-reinforced plastic or formed steel, stiffened to resist plastic concrete loads without detrimental deformation.

- E. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.
- F. Chamfer Strips: Wood, metal, PVC, or rubber strips, 1 by 1 inch, minimum.
- G. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- H. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
  - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- I. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
  - 1. Furnish units that will leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.
  - 2. Furnish ties that, when removed, will leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.
  - 3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

## **2.2 STEEL REINFORCEMENT**

- A. Reinforcing Bars: ASTM A 615, Grade 60, deformed.
- B. Low-Alloy-Steel Reinforcing Bars: ASTM A 706/A 706M, deformed.
- C. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from as-drawn steel wire into flat sheets.

## **2.3 REINFORCEMENT ACCESSORIES**

- A. Joint Dowel Bars: ASTM A 615, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.
- B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
  - 1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.
3. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.

## **2.4 CONCRETE MATERIALS**

- A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
  1. Portland Cement: ASTM C 150, Type V (Tipping Floor Slab).
- B. Silica Fume: ASTM C 1240, amorphous silica.
- C. Normal-Weight Aggregates: ASTM C 33, Class 4S (Tipping Floor Slab) coarse aggregate or better, graded. Provide aggregates from a single source.
  1. Maximum Coarse-Aggregate Size: 1 1/2 inches nominal.
  2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Tipping Floor Slab course aggregate shall be “trap rock” or approved “hard rock”.
  1. “Hard rock” shall be hard, durable igneous rock consisting of crushed/fractured or screened/washed rock consisting of Basalt, Gabbro, Diabase, Peridotite Granite, Granodiorite, or equal. The LA abrasion shall be less than 11%, absorption shall be less than 3%, and Mohs number shall be 7 or greater.
- E. Water: ASTM C 94.

## **2.5 ADMIXTURES**

- A. Air-Entraining Admixture: ASTM C 260.
- B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
  1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
  2. Retarding Admixture: ASTM C 494/C 494M, Type B.
  3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.
  4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.
  5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.
  6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

- C. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C 494/C 494M, Type C.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Axim Italcementi Group, Inc.; CATEXOL CN-CI.
    - b. BASF Construction Chemicals - Building Systems; Rheocrete CNI.
    - c. Euclid Chemical Company (The), an RPM company; ARRMATECT.
    - d. Grace Construction Products, W. R. Grace & Co.; DCI.
    - e. Sika Corporation; Sika CNI.
- D. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.
1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. BASF Construction Chemicals - Building Systems; Rheocrete 222+.
    - b. Cortec Corporation; MCI- 2000.
    - c. Grace Construction Products, W. R. Grace & Co.; DCI-S.
    - d. Sika Corporation; FerroGard 901.
- E. Color Pigment: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, nonfading, and resistant to lime and other alkalis.
1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. ChemMasters.
    - b. Davis Colors.
    - c. Dayton Superior Corporation.
    - d. Hoover Color Corporation.
    - e. Lambert Corporation.
    - f. QC Construction Products.
    - g. Rockwood Pigments NA, Inc.
    - h. Scofield, L. M. Company.
    - i. Solomon Colors, Inc.
  2. Color: As selected by Owner from manufacturer's full range.

## **2.6 FIBER REINFORCEMENT**

- A. Carbon-Steel Fiber: ASTM A 820/A 820M, deformed, minimum of 2 inches long, and aspect ratio of 45 to 50.
  - 1. Products: Subject to compliance with requirements, provide the following:
    - a. Fiber: Type 1, Cold-Drawn Wire:
      - 1) Propex Concrete Systems Corp.; Novocon 1050.
- B. Synthetic Micro-Fiber: Monofilament or fibrillated polypropylene micro-fibers engineered and designed for use in concrete, complying with ASTM C 1116/C 1116M, Type III, 1/2 to 1-1/2 inches long.
  - 1. Products: Subject to compliance with requirements available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Monofilament Micro-Fibers:
      - 1) Axim Italcementi Group, Inc.; Fibrasol II P.
      - 2) Euclid Chemical Company (The), an RPM company; Fiberstrand 150.
      - 3) FORTA Corporation; FORTA Econo-Mono.
      - 4) Grace Construction Products, W. R. Grace & Co.; Grace MicroFiber.
      - 5) Metalcrete Industries; Polystrand 1000.
      - 6) Nycon, Inc.; ProConM.
      - 7) Propex Concrete Systems Corp.; Fibermesh 150.
      - 8) Sika Corporation; Sika Fiber PPM.
    - b. Fibrillated Micro-Fibers:
      - 1) Axim Italcementi Group, Inc.; Fibrasol F.
      - 2) Euclid Chemical Company (The), an RPM company; Fiberstrand F.
      - 3) Grace Construction Products, W. R. Grace & Co.; Grace Fibers.
      - 4) Nycon, Inc.; ProConF.
      - 5) Propex Concrete Systems Corp.; Fibermesh 300.
      - 6) Sika Corporation; Sika Fiber PPF.

## **2.7 LIQUID FLOOR TREATMENTS**

- A. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or silicate materials and proprietary components; odorless; that penetrates, hardens, and densifies concrete surfaces.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. ChemMasters; Chemisil Plus.

- b. ChemTec Int'l; ChemTec One.
- c. Conspec by Dayton Superior; Intraseal.
- d. Curecrete Distribution Inc.; Ashford Formula.
- e. Dayton Superior Corporation; Day-Chem Sure Hard (J-17).
- f. Edoco by Dayton Superior; Titan Hard.
- g. Euclid Chemical Company (The), an RPM company; Euco Diamond Hard.
- h. Kaufman Products, Inc.; SureHard.
- i. L&M Construction Chemicals, Inc.; Seal Hard.
- j. Meadows, W. R., Inc.; LIQUI-HARD.
- k. Metalcrete Industries; Floorsaver.
- l. Nox-Crete Products Group; Duro-Nox.
- m. Symons by Dayton Superior; Buff Hard.
- n. US SPEC, Division of US Mix Products Company; US SPEC Industraseal.
- o. Vexcon Chemicals, Inc.; Vexcon StarSeal PS Clear.

## 2.8 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Axim Italcementi Group, Inc.; CATExOL CimFilm.
    - b. BASF Construction Chemicals - Building Systems; Confilm.
    - c. ChemMasters; SprayFilm.
    - d. Conspec by Dayton Superior; Aquafilm.
    - e. Dayton Superior Corporation; Sure Film (J-74).
    - f. Edoco by Dayton Superior; BurkeFilm.
    - g. Euclid Chemical Company (The), an RPM company; Eucobar.
    - h. Kaufman Products, Inc.; Vapor-Aid.
    - i. Lambert Corporation; LAMBCO Skin.
    - j. L&M Construction Chemicals, Inc.; E-CON.
    - k. Meadows, W. R., Inc.; EVAPRE.
    - l. Metalcrete Industries; Waterhold.
    - m. Nox-Crete Products Group; MONOFILM.
    - n. Sika Corporation; SikaFilm.
    - o. SpecChem, LLC; Spec Film.
    - p. Symons by Dayton Superior; Finishing Aid.
    - q. TK Products, Division of Sierra Corporation; TK-2120 TRI-FILM.
    - r. Unitex; PRO-FILM.
    - s. Vexcon Chemicals, Inc.; Certi-Vex Envio Set.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
  - 1. Products: Subject to compliance with requirements available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Anti-Hydro International, Inc.; AH Curing Compound #2 DR WB.
    - b. BASF Construction Chemicals - Building Systems; Kure 200.
    - c. ChemMasters; Safe-Cure Clear.
    - d. Conspec by Dayton Superior; W.B. Resin Cure.
    - e. Dayton Superior Corporation; Day-Chem Rez Cure (J-11-W).
    - f. Edoco by Dayton Superior; Res X Cure WB.
    - g. Euclid Chemical Company (The), an RPM company; Kurez W VOX; TAMMSCURE WB 30C.
    - h. Kaufman Products, Inc.; Thinfilm 420.
    - i. Lambert Corporation; AQUA KURE - CLEAR.
    - j. L&M Construction Chemicals, Inc.; L&M Cure R.
    - k. Meadows, W. R., Inc.; 1100-CLEAR.
    - l. Nox-Crete Products Group; Resin Cure E.
    - m. Right Pointe; Clear Water Resin.
    - n. SpecChem, LLC; Spec Rez Clear.
    - o. Symons by Dayton Superior; Resi-Chem Clear.
    - p. TK Products, Division of Sierra Corporation; TK-2519 DC WB.
    - q. Vexcon Chemicals, Inc.; Certi-Vex Enviocure 100.
- F. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, nondissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Anti-Hydro International, Inc.; AH Clear Cure WB.
    - b. BASF Construction Chemicals - Building Systems; Kure-N-Seal WB.
    - c. ChemMasters; Safe-Cure & Seal 20.
    - d. Conspec by Dayton Superior; Cure and Seal WB.
    - e. Cresset Chemical Company; Crete-Trete 309-VOC Cure & Seal.
    - f. Dayton Superior Corporation; Safe Cure and Seal (J-18).
    - g. Edoco by Dayton Superior; Spartan Cote WB II.
    - h. Euclid Chemical Company (The), an RPM company; Aqua Cure VOX; Clearseal WB 150.
    - i. Kaufman Products, Inc.; Cure & Seal 309 Emulsion.

- j. Lambert Corporation; Glazecote Sealer-20.
- k. L&M Construction Chemicals, Inc.; Dress & Seal WB.
- l. Meadows, W. R., Inc.; Vocomp-20.
- m. Metalcrete Industries; Metcure.
- n. Nox-Crete Products Group; Cure & Seal 150E.
- o. Symons by Dayton Superior; Cure & Seal 18 Percent E.
- p. TK Products, Division of Sierra Corporation; TK-2519 WB.
- q. Vexcon Chemicals, Inc.; Starseal 309.

## **2.9 RELATED MATERIALS**

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, aromatic polyurea with a Type A shore durometer hardness range of 90 to 95 per ASTM D 2240.
- C. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

## **2.10 CONCRETE MIXTURES, GENERAL**

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
  - 1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials:
  - 1. Fly Ash: 25 percent.
  - 2. Combined Fly Ash and Pozzolan: 25 percent.
  - 3. Ground Granulated Blast-Furnace Slag: 50 percent.
  - 4. Total of Fly Ash or Other Pozzolans, Slag Cement, and Silica Fume: 50 percent by mass, with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
  - 5. Total of Fly Ash or Other Pozzolans and Silica Fume: 35 percent by mass with fly ash or pozzolans not exceeding 25 percent by mass and silica fume not exceeding 10 percent by mass.
- C. Admixtures: Use admixtures according to manufacturer's written instructions.
  - 1. Use water-reducing, high-range water-reducing, or plasticizing admixture in concrete, as required, for placement and workability.
  - 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
  4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
- D. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

## **2.11 CONCRETE MIXTURES FOR BUILDING ELEMENTS**

- A. Footings: Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strength: 4000 psi at 28 days.
  2. Maximum Water-Cementitious Materials Ratio: 0.45.
  3. Slump Limit: 5 inches, plus or minus 1 inch (25 mm).
  4. Air Content: 5 percent, plus or minus 1 percent at point of delivery for 1-1/2-inch (38-mm) nominal maximum aggregate size.
- B. Foundation Walls: Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strength 4000 psi at 28 days.
  2. Maximum Water-Cementitious Materials Ratio: 0.45
  3. Slump Limit 5 inches, plus or minus 1 inch (25 mm).
  4. Air Content: 5 percent, plus or minus 1 percent at point of delivery for 1-1/2-inch (38-mm) nominal maximum aggregate size.
- C. Slabs: Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strength: 6000 psi (Tipping Floor Slab) at 28 days.
  2. Minimum Cementitious Materials Content: 600 lb/cu. yd. for 3/4" nominal maximum aggregate.
  3. Slump Limit: 4 inches, plus or minus 1 inch (25 mm).
  4. Air Content: 6 percent, plus or minus 1 percent at point of delivery for 3/4-inch (38-mm) nominal maximum aggregate size.
  5. Shrinkage: Shrinkage shall not exceed 0.030% at 28 days of drying as tested in accordance with ASTM C157 modified to 7 days of moist curing.

## **2.12 FABRICATING REINFORCEMENT**

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

## **2.13 CONCRETE MIXING**

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.
- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
1. For mixer capacity of 1 cu. yd. (0.76 cu. m) or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
  2. For mixer capacity larger than 1 cu. yd. (0.76 cu. m), increase mixing time by 15 seconds for each additional 1 cu. yd. (0.76 cu. m).
  3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.
- C. Unless otherwise stated, steel fibers shall be introduced at the batch plant during the addition of the aggregates and water at a constant and uniform rate (ribbon fed) and mixed for sufficient time (minimum 5 minutes or 70 revolutions) at full mixing speed to ensure uniform distribution of the fibers throughout the concrete mix.

## **PART 3 - EXECUTION**

### **3.1 FORMWORK**

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:
  1. Class A, 1/8 inch for smooth-formed finished surfaces.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

1. Install keyways, reglets, recesses, and the like, for easy removal.
  2. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

### **3.2 EMBEDDED ITEMS**

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."
  2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
  3. Install dovetail anchor slots in concrete structures as indicated.

### **3.3 REMOVING AND REUSING FORMS**

- A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete. Concrete has to

be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.

- B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect/Engineer.

### **3.4 VAPOR RETARDERS**

- A. Sheet Vapor Retarders: Place, protect, and repair sheet vapor retarder according to ASTM E 1643 and manufacturer's written instructions.
  - 1. Lap joints 6 inches (150 mm) and seal with manufacturer's recommended tape.

### **3.5 STEEL REINFORCEMENT**

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
  - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

### **3.6 JOINTS**

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect/Engineer.
1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
  2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
  3. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
  4. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
  5. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3.2-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
  2. Terminate full-width joint-filler strips not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished concrete surface where joint sealants, specified in Division 07 Section 07 92 00 "Joint Sealants," are indicated.
  3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

### **3.7 WATERSTOPS**

- A. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

### 3.8 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Do not add water to concrete during delivery, at Project Site, or during placement unless approved by Architect/Engineer.
- C. Before test sampling and placing concrete, water may be added at Project Site, subject to limitations of ACI 301.
  - 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.
- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.
  - 1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
  - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
  - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
  - 1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
  - 2. Maintain reinforcement in position on chairs during concrete placement.
  - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
  - 4. Slope surfaces uniformly to drains where required.
  - 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

G. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

### **3.9 FINISHING FORMED SURFACES**

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
  1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
  1. Apply to concrete surfaces exposed to public view and to be covered with a coating or covering material applied directly to concrete.
- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

### **3.10 FINISHING FLOORS AND SLABS**

- A. General: Comply with ACI 302.1R recommendations for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill

low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

1. Apply float finish to surfaces to receive trowel finish and to be covered with fluid-applied or sheet waterproofing
- C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system .
  2. Finish surfaces to the following tolerances, according to ASTM E 1155 (ASTM E 1155M), for a randomly trafficked floor surface:
    - a. Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade.
- D. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.
1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect/Engineer before application.

### **3.11 MISCELLANEOUS CONCRETE ITEMS**

- A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

### **3.12 CONCRETE PROTECTING AND CURING**

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.
- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
  - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
    - a. Water.
    - b. Continuous water-fog spray.
    - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.
  - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
    - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
    - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
    - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.
  - 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
    - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing

compound manufacturer[ unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project].

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

### **3.13 LIQUID FLOOR TREATMENTS**

- A. Penetrating Liquid Floor Treatment: Prepare, apply, and finish penetrating liquid floor treatment according to manufacturer's written instructions.
  1. Remove curing compounds, sealers, oil, dirt, laitance, and other contaminants and complete surface repairs.
  2. Do not apply to concrete that is less than 28 days old.
  3. Apply liquid until surface is saturated, scrubbing into surface until a gel forms; rewet; and repeat brooming or scrubbing. Rinse with water; remove excess material until surface is dry. Apply a second coat in a similar manner if surface is rough or porous.
- B. Sealing Coat: Uniformly apply a continuous sealing coat of curing and sealing compound to hardened concrete by power spray or roller according to manufacturer's written instructions.

### **3.14 JOINT FILLING**

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
  1. Defer joint filling until concrete has aged at least one month. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.
- C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

### **3.15 CONCRETE SURFACE REPAIRS**

- A. Defective Concrete: Repair and patch defective areas when approved by Architect/Engineer. Remove and replace concrete that cannot be repaired and patched to Architect/Engineer's approval.

- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension to solid concrete. Limit cut depth to 3/4 inch (19 mm). Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
  2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
  3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect/Engineer.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
  2. After concrete has cured at least 14 days, correct high areas by grinding.
  3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
  4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
  5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch (6 mm) to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
  6. Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at

least a 3/4-inch (19-mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

7. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Architect/Engineer's approval, using epoxy adhesive and patching mortar.
  - F. Repair materials and installation not specified above may be used, subject to Architect/Engineer's approval.

### **3.16 FIELD QUALITY CONTROL**

- A. Testing and Inspecting: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.
- B. Inspections:
  1. Steel reinforcement placement.
  2. Steel reinforcement welding.
  3. Headed bolts and studs.
  4. Verification of use of required design mixture.
  5. Concrete placement, including conveying and depositing.
  6. Curing procedures and maintenance of curing temperature.
  7. Verification of concrete strength before removal of shores and forms from beams and slabs.
- C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
  1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mixture placed each day.
    - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
  2. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.

3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.
5. Unit Weight: ASTM C 567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
6. Compression Test Specimens: ASTM C 31/C 31M.
  - a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
  - b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.
7. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
  - a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
  - b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
8. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
9. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
10. Test results shall be reported in writing to Architect/Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
11. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect/Engineer but will not be used as sole basis for approval or rejection of concrete.
12. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect/Engineer. Testing and inspecting agency may conduct tests to

determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect/Engineer.

13. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
14. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

- D. Measure floor and slab flatness and levelness according to ASTM E 1155 (ASTM E 1155M) within 24-48 hours of finishing.

### **3.17 PROTECTION OF LIQUID FLOOR TREATMENTS**

- A. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

END OF SECTION

## **DIVISION 05 – METALS**

**SECTION 051200**  
**STRUCTURAL STEEL FRAMING**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Construction Plans and general provisions of the Contract Documents, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section Includes:
  - 1. Structural steel.
- B. Related Sections:
  - 1. Division 01 Section 01 40 00 "Quality Requirements" for independent testing agency procedures and administrative requirements.

**1.3 DEFINITIONS**

- A. Structural Steel: Elements of structural-steel frame, as classified by AISC 303, "Code of Standard Practice for Steel Buildings and Bridges."
- B. Seismic-Load-Resisting System: Elements of structural-steel frame designated as "SLRS" or along grid lines designated as "SLRS" on Drawings, including columns, beams, and braces and their connections.
- C. Heavy Sections: Rolled and built-up sections as follows:
  - 1. Shapes included in ASTM A 6/A 6M with flanges thicker than 1-1/2 inches (38 mm).
  - 2. Welded built-up members with plates thicker than 2 inches (50 mm).
  - 3. Column base plates thicker than 2 inches (50 mm).
- D. Protected Zone: Structural members or portions of structural members indicated as "Protected Zone" on Drawings. Connections of structural and nonstructural elements to protected zones are limited.

- E. Demand Critical Welds: Those welds, the failure of which would result in significant degradation of the strength and stiffness of the Seismic-Load-Resisting System and which are indicated as "Demand Critical" or "Seismic Critical" on Drawings.

## **1.4 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show fabrication of structural-steel components.
  - 1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
  - 2. Include embedment drawings.
  - 3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
  - 4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical high-strength bolted connections.
  - 5. Identify members and connections of the seismic-load-resisting system.
  - 6. Indicate locations and dimensions of protected zones.
  - 7. Identify demand critical welds.
  - 8. For structural-steel connections indicated to comply with design loads, include structural design data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQRs): Provide according to AWS D1.1/D1.1M, "Structural Welding Code - Steel," for each welded joint qualified by testing, including the following:
  - 1. Power source (constant current or constant voltage).
  - 2. Electrode manufacturer and trade name, for demand critical welds.
- D. Qualification Data: For qualified Installer, fabricator, and testing agency.
- E. Welding certificates.
- F. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.
- G. Mill test reports for structural steel, including chemical and physical properties.
- H. Product Test Reports: For the following:
  - 1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
  - 2. Direct-tension indicators.
  - 3. Tension-control, high-strength bolt-nut-washer assemblies.
  - 4. Shear stud connectors.

5. Shop primers.
  6. Nonshrink grout.
- I. Source quality-control reports.

## **1.5 QUALITY ASSURANCE**

- A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD.
- B. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category ACSE.
- C. Shop-Painting Applicators: Qualified according to AISC's Sophisticated Paint Endorsement SSPC-QP 3, "Standard Procedure for Evaluating Qualifications of Shop Painting Applicators."
- D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
1. Welders and welding operators performing work on bottom-flange, demand-critical welds shall pass the supplemental welder qualification testing, as required by AWS D1.8. FCAW-S and FCAW-G shall be considered separate processes for welding personnel qualification.
- E. Comply with applicable provisions of the following specifications and documents:
1. AISC 303.
  2. AISC 341 and AISC 341s1.
  3. AISC 360.
  4. RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- F. Preinstallation Conference: Conduct conference at Project site .

## **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.
1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.
- B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.

1. Fasteners may be repackaged provided Contractor's independent testing and inspecting agency observes repackaging and seals containers.
2. Clean and relubricate bolts and nuts that become dry or rusty before use.
3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F 1852 fasteners and for retesting fasteners after lubrication.

## **1.7 COORDINATION**

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

## **PART 2 - PRODUCTS**

### **2.1 STRUCTURAL-STEEL MATERIALS**

- A. W-Shapes: ASTM A 992 ASTM A 572, Grade 50 ASTM A 529, Grade 50.
- B. Channel and Angle-Shapes: ASTM A 36.
- C. Plate and Bar: ASTM A 36.
- D. Cold-Formed Hollow Structural Sections: ASTM A 500, Grade B, structural tubing.
- E. Welding Electrodes: Comply with AWS requirements.

### **2.2 BOLTS, CONNECTORS, AND ANCHORS**

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325, Type 1, heavy-hex steel structural bolts; ASTM A 563, Grade C, heavy-hex carbon-steel nuts; and ASTM F 436, Type 1, hardened carbon-steel washers; all with plain finish.
  1. Direct-Tension Indicators: ASTM F 959, Type 325 , compressible-washer type with plain finish.
- B. Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.
- C. Headed Anchor Rods: ASTM F 1554, Grade 36, straight.
  1. Nuts: ASTM A 563 heavy-hex carbon steel.

2. Plate Washers: ASTM A 36/A 36M carbon steel.
3. Washers: ASTM F 436 , Type 1, hardened carbon steel.
4. Finish: Plain.

D. Threaded Rods: ASTM A 36.

1. Nuts: ASTM A 563 heavy-hex carbon steel.
2. Washers: ASTM F 436, Type 1, hardened or ASTM A 36 carbon steel.
3. Finish: Plain.

## **2.3 PRIMER**

- A. Primer: Fabricator's standard lead- and chromate-free, non-asphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

## **2.4 GROUT**

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive and non-staining, mixed with water to consistency suitable for application and a 30-minute working time.

## **2.5 FABRICATION**

- A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC 360.
1. Camber structural-steel members where indicated.
  2. Fabricate beams with rolling camber up.
  3. Identify high-strength structural steel according to ASTM A 6/A 6M and maintain markings until structural steel has been erected.
  4. Mark and match-mark materials for field assembly.
  5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.
- B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.
1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.
- C. Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.
- D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

- E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 3, "Power Tool Cleaning."
- F. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.
- G. Steel Wall-Opening Framing: Select true and straight members for fabricating steel wall-opening framing to be attached to structural steel. Straighten as required to provide uniform, square, and true members in completed wall framing.
- H. Welded Door Frames: Build up welded door frames attached to structural steel. Weld exposed joints continuously and grind smooth. Plug-weld fixed steel bar stops to frames. Secure removable stops to frames with countersunk machine screws, uniformly spaced not more than 10 inches (250 mm) o.c. unless otherwise indicated.
- I. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel framing members.
  - 1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
  - 2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
  - 3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

## **2.6 SHOP CONNECTIONS**

- A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
  - 1. Joint Type: Pretensioned.
- B. Weld Connections: Comply with AWS D1.1 for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
  - 1. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

## **2.7 SHOP PRIMING**

- A. Shop prime steel surfaces except the following:
  - 1. Surfaces to be field welded.
  - 2. Surfaces to be high-strength bolted with slip-critical connections.

- B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:
1. SSPC-SP 2, "Hand Tool Cleaning."
  2. SSPC-SP 3, "Power Tool Cleaning."
  3. SSPC-SP 11, "Power Tool Cleaning to Bare Metal."
  4. SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
- C. Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a minimum dry film thickness of 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
  2. Apply two coats of shop paint to surfaces that are inaccessible after assembly or erection. Change color of second coat to distinguish it from first.
- D. Painting: Prepare steel and apply a one-coat, non-asphaltic primer complying with SSPC-PS Guide 7.00, "Painting System Guide 7.00: Guide for Selecting One-Coat Shop Painting Systems," to provide a dry film thickness of not less than 1.5 mils (0.038 mm).

## **2.8 GALVANIZING**

- A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A 123/A 123M.
1. Fill vent and drain holes that will be exposed in the finished Work unless they will function as weep holes, by plugging with zinc solder and filing off smooth.
  2. Galvanize lintels attached to structural-steel frame and located in exterior walls.

## **2.9 SOURCE QUALITY CONTROL**

- A. Testing Agency: Contractor will engage an independent testing and inspecting agency to perform shop tests and inspections and prepare test reports.
1. Provide testing agency with access to places where structural-steel work is being fabricated or produced to perform tests and inspections.
- B. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.
- C. Bolted Connections: Shop-bolted connections will be inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

- D. Welded Connections: In addition to visual inspection, shop-welded connections will be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
1. Liquid Penetrant Inspection: ASTM E 165.
  2. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
  3. Ultrasonic Inspection: ASTM E 164.
  4. Radiographic Inspection: ASTM E 94.
- E. In addition to visual inspection, shop-welded shear connectors will be tested and inspected according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
1. Bend tests will be performed if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
  2. Tests will be conducted on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1/D1.1M.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- A. Verify, with steel Erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.
1. Prepare a certified survey of bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.
1. Do not remove temporary shoring supporting composite deck construction until cast-in-place concrete has attained its design compressive strength.

### **3.3 ERECTION**

- A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
- B. Base Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.
  - 1. Set plates for structural members on wedges, shims, or setting nuts as required.
  - 2. Weld plate washers to top of baseplate.
  - 3. Pretension anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
  - 4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.
- C. Maintain erection tolerances of structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."
- D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.
  - 1. Level and plumb individual members of structure.
  - 2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.
- E. Splice members only where indicated.
- F. Do not use thermal cutting during erection.
- G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.
- H. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

### **3.4 FIELD CONNECTIONS**

- A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
  - 1. Joint Type: Pretensioned.

- B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.
  - 1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
  - 2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
  - 3. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances in AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.

### **3.5 FIELD QUALITY CONTROL**

- A. Testing Agency: Contractor will engage a qualified independent testing and inspecting agency to inspect field welds and high-strength bolted connections.
- B. Bolted Connections: Bolted connections will be inspected according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."
- C. Welded Connections: Field welds will be visually inspected according to AWS D1.1/D1.1M.
  - 1. In addition to visual inspection, field welds will be tested and inspected according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
    - a. Liquid Penetrant Inspection: ASTM E 165.
    - b. Magnetic Particle Inspection: ASTM E 709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
    - c. Ultrasonic Inspection: ASTM E 164.
    - d. Radiographic Inspection: ASTM E 94.
- D. In addition to visual inspection, test and inspect field-welded shear connectors according to requirements in AWS D1.1/D1.1M for stud welding and as follows:
  - 1. Perform bend tests if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
  - 2. Conduct tests on additional shear connectors if weld fracture occurs on shear connectors already tested, according to requirements in AWS D1.1/D1.1M.
- E. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

### **3.6 REPAIRS AND PROTECTION**

- A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A 780.
- B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
  - 1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
- C. Touchup Painting: Cleaning and touchup painting are specified in Division 09 painting Sections.

END OF SECTION

## **DIVISION 07 – THERMAL AND MOISTURE PROTECTION**

## **SECTION 07 92 00 JOINT SEALANTS**

### **PART 1 GENERAL**

#### **1.01 SECTION INCLUDES**

- A. Self-leveling pourable joint sealants.
- B. Joint backings and accessories.

#### **1.02 REFERENCE STANDARDS**

- A. ASTM D624 - Tear Strength Testing of Rubbers and Elastomers
- B. ASTM D638 - Standard Test Method for Tensile Properties
- C. ASTM D1640 - Standard Test Method for Drying, Curing or Film Formation of Organic Coatings.
- D. ASTM D4541 - Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
- E. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer 2015.
- F. ASTM C919 - Standard Practice for Use of Sealants in Acoustical Applications 2018.
- G. ASTM C920 - Standard Specification for Elastomeric Joint Sealants 2018.
- H. ASTM C1193 - Standard Guide for Use of Joint Sealants 2016.
- I. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants 2018.
- J. ASTM C1311 - Standard Specification for Solvent Release Sealants 2014.
- K. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness 2015 (Reapproved 2021).
- L. SCAQMD 1168 - Adhesive and Sealant Applications 1989 (Amended 2017).

#### **1.03 SUBMITTALS**

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data for Sealants: Submit manufacturer's technical data sheets for each product to be used, that includes the following.
  - 1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
  - 2. List of backing materials approved for use with the specific product.
  - 3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
  - 4. Substrates the product should not be used on.
- C. Product Data for Accessory Products: Submit manufacturer's technical data sheet for each product to be used, including physical characteristics, installation instructions, and recommended tools.
- D. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.
- E. Samples for Verification: Where custom sealant color is specified, obtain directions from Architect and submit at least two physical samples for verification of color of each required sealant.

#### **1.04 WARRANTY**

- A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.
- B. Correct defective work within a five year period after Date of Substantial Completion.
- C. Warranty: Include coverage for installed sealants and accessories that fail to achieve watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

## PART 2 PRODUCTS

### 2.01 JOINT SEALANT APPLICATIONS

- A. Scope:
1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to, the following items.
    - a. Wall expansion and control joints.
    - b. Joints between door, window, and other frames and adjacent construction.
    - c. Joints between different exposed materials.
    - d. Openings below ledge angles in masonry.
    - e. Other joints indicated below.
  2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
    - a. Joints between door, window, and other frames and adjacent construction.
    - b. In sound-rated wall and ceiling assemblies, gaps at electrical outlets, wiring devices, piping, and other openings; between wall/ceiling and other construction; and other flanking sound paths.
      - 1) Exception: Such gaps and openings in gypsum board and plaster finished stud walls and suspended ceilings.
      - 2) Exception: Through-penetrations in sound-rated assemblies that are also fire-rated assemblies.
    - c. Other joints indicated below.
  3. Do not seal the following types of joints.
    - a. Intentional weepholes in masonry.
    - b. Joints indicated to be treated with manufactured expansion joint cover or some other type of sealing device.
    - c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
    - d. Joints where installation of sealant is specified in another section.
    - e. Joints between suspended panel ceilings/grid and walls.
- B. Interior Wet Areas: Bathrooms, restrooms, kitchens, food service areas, and food processing areas; fixtures in wet areas include plumbing fixtures, food service equipment, countertops, cabinets, and other similar items.
- C. Sound-Rated Assemblies: Walls and ceilings identified as "STC-rated", "sound-rated", or "acoustical".

### 2.02 JOINT SEALANTS - GENERAL

- A. Sealants and Primers: Provide products having lower volatile organic compound (VOC) content than indicated in SCAQMD 1168.
- B. Colors: As indicated on drawings.

### 2.03 SELF-LEVELING SEALANTS

- A. (07.9200.12) VersaFlex SL/75 is a semi-rigid self-leveling Polyurea joint filler
- B. VersaFlex SL/75 is a semi-rigid self-leveling Polyurea joint filler used to fill interior random cracks, control joints, or new construction joints on horizontal concrete surfaces.
- C. Semi-Rigid Self-Leveling Polyurea Joint Filler: Two-component, 100 percent solids; intended for filling cracks and control joints not subject to significant movement; rigid enough to support concrete edges under traffic.
1. SL/75 is designed specifically for industrial floor applications receiving heavy vehicle traffic, such as a forklift or steel wheeled carts. **SL/75** is flexible, accommodating to small slab movement yet strong enough to protect the vertical edges of concrete from spalling under extreme loading. SL/75 can be used in exterior applications where little joint or crack

movement from thermal cycling will occur. SL/75 is recommended for repair of cracks, damaged control joints or new construction joints in cold storage facilities, freezers, and food processing plants where time and temperature are serious considerations.

2. Physical Properties:

Mix Ratio	1:1
VOC	0
Gel Time, ASTM D1640	~ 1 Minute
Tack Free, ASTM D1640	2 - 3 Minutes
Open to Foot Traffic, ASTM D1640	60 Minutes
Tensile Strength (psi) ASTM D638	600 - 1200
Tensile Elongation (%) ASTM D638	240 - 500
Modulus of Elasticity (psi) ASTM D638	400 - 900
Adhesion to concrete (psi) ASTM D4541	300 - 450
Tear Strength (lb/in) ASTM D624	150 - 300
Shore A Hardness ASTM D2240	≥ 75
Tabor Abrasion, mg wt loss; (1000g, 1000 revs, H-18) ASTM D4060	375 - 500

3. Durometer Hardness, Type A: 75, minimum, after seven days when tested in accordance with ASTM D2240.
4. Color: To be selected by Architect from manufacturer's standard colors.
5. Manufacturers:
  - a. Versa Flex, Inc.; VersaFlex S/L 75: [www.versaflex.com](http://www.versaflex.com)
  - b. Substitutions: See Section 01 60 00 - Product Requirements.

D. (07.9200.13) Polyurethane-Methacrylate (PUMA) Expansion Joint System

E. Polyurethane-Methacrylate (PUMA) Expansion Joint System: Intended for expansion joints in exposed multi-story parking garages, and includes aluminum tape, primer, joint compound material, and top coat.

1. Durometer Hardness, Shore A: 65 to 87, minimum, when tested in accordance with ASTM D2240.
2. Color: To be selected by Architect from manufacturer's standard colors.
3. Manufacturers:
  - a. Tremco Commercial Sealants & Waterproofing; Tremco PUMA Expansion Joint System (EJS): [www.tremcosealants.com/#sle](http://www.tremcosealants.com/#sle).
  - b. Substitutions: See Section 01 60 00 - Product Requirements.

## 2.04 ACCESSORIES

A. (07.9200.14) Backer Rod: Cylindrical cellular foam rod

B. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.

1. Manufacturers:
  - a. ADFAST Corporation; ADSEAL BR-2600 (Backer Rod): [www.adfastcorp.com/#sle](http://www.adfastcorp.com/#sle).
  - b. Nomaco, Inc: [www.nomaco.com/#sle](http://www.nomaco.com/#sle).
  - c. Substitutions: See Section 01 60 00 - Product Requirements.

C. Backing Tape: Self-adhesive polyethylene tape with surface that sealant will not adhere to and recommended by tape and sealant manufacturers for specific application.

## PART 3 EXECUTION

### 3.01 EXAMINATION

- A. Verify that joints are ready to receive work.

- B. Verify that backing materials are compatible with sealants.
- C. Verify that backer rods are of the correct size.

### **3.02 PREPARATION**

- A. Remove loose materials and foreign matter that could impair adhesion of sealant.
- B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.
- C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.
- D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

### **3.03 INSTALLATION**

- A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.
- B. Perform installation in accordance with ASTM C1193.
- C. Install bond breaker backing tape where backer rod cannot be used.
- D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.
- E. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.
- F. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.
- G. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

**END OF SECTION**

## **DIVISION 08 – OPENINGS**

**SECTION 08 33 23  
OVERHEAD COILING DOORS**

**PART 1 GENERAL**

**1.01 SECTION INCLUDES**

- A. Rolling steel doors.

**1.02 RELATED SECTIONS**

- A. Division 26 -- Electrical

**1.03 REFERENCES**

- A. ANSI/DASMA 108 - American National Standards Institute Standard Method For Testing Sectional Garage Doors And Rolling Doors: Determination Of Structural Performance Under Uniform Static Air Pressure Difference.
- B. ANSI/DASMA 203 - American National Standards Institute Specifications for non-rated fire rolling doors published by Door & Access Systems Manufacturers Association International.
- C. ASTM A 123 - Zinc hot-dipped galvanized] coatings on iron and steel products.
- D. ASTM A 229 - Steel wire, oil-tempered for mechanical springs.
- E. ASTM A 653 - Steel sheet, zinc-coated galvanized by the hot-dipped process, commercial quality.
- F. ASTM E 330 - Structural performance of exterior windows, curtain walls, and doors by uniform static air pressure difference.
- G. ASTM E 413 - Classification for Rating Sound Insulation

**1.04 SUBMITTALS**

- A. Submit under provisions of Division 1
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
  - 1. Preparation instructions and recommendations.
  - 2. Storage and handling requirements and recommendations.
  - 3. Installation methods.
- C. Shop Drawings: Include detailed plans, elevations, details of framing members, anchoring methods, required clearances, hardware, and accessories. Include relationship with adjacent construction.
- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) long, representing actual product, color, and patterns.
- F. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- G. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic checking, adjustment and lubrication of components.

**1.05 QUALITY ASSURANCE**

- A. Manufacturer Qualifications: Company specializing in performing Work of this section with a minimum of five years' experience in the fabrication and installation of security closures.
- B. Installer Qualifications: Company specializing in performing Work of this section with minimum three years and an authorized Wayne Dalton installer.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
  - 1. Finish areas designated by Architect.

2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
3. Refinish mock-up area as required to produce acceptable work.

#### **1.06 DELIVERY, STORAGE AND HANDLING**

- A. Store products in manufacturer's unopened packaging with seals and labels intact until ready for installation.
- B. Store materials off the ground in a dry, warm, ventilated weathertight location.

#### **1.07 SEQUENCING**

- A. Ensure that locating templates and other information required for installation of products of this section are furnished to affected trades in time to prevent interruption of construction progress.
- B. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

#### **1.08 PROJECT CONDITIONS**

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

#### **1.09 WARRANTY**

- A. Provide Rolling Steel Service doors and Rolling Steel Fire doors with limited 2 Year Warranty on defects in materials and workmanship on the door; excludes the counterbalance spring and finish.
- B. Provide rolling steel Advanced Performance service doors with limited 5 Year Warranty on all doors system materials and workmanship.
- C. Provide Aluminum Security Shutters, Model 523 with limited 2 Year Warranty on defects in materials and workmanship on the door and components. Provide Powder Coat Finish with a 2 years warranty against excessive fading, cracking, blistering, flaking or peeling.

### **PART 2 PRODUCTS**

#### **2.01 OVERHEAD COILING DOORS -- PRODUCTS**

- A. (08.3322.02) Wayne Dalton Model 800 Rolling Service Doors:

#### **2.02 MANUFACTURERS**

- A. Acceptable Manufacturer: Wayne Dalton; 2501 S. State Highway 121 Business, Suite 200, Lewisville, TX 75067. ASD. Phone: (800) 827-3667; Web Site: [www.wayne-dalton.com](http://www.wayne-dalton.com). Email: [info@wayne-dalton.com](mailto:info@wayne-dalton.com).
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 25 00.

#### **2.03 ROLLING STEEL SERVICE DOORS**

- A. Wayne Dalton Model 800 Rolling Service Doors:
  1. Description:
    - a. Maximum Width: 40 feet
      - 1) Maximum Height: 40 feet
    - b. Curtain: composed of interlocking roll-formed slats.
      - 1) Slat Profiles/Material:
        - (a) No. 14 Flat-faced slat.
        - (1) 16-gauge steel.
      - 2) Ends of alternate slats fitted with metal endlocks/windlocks.
    - c. Bottom Bar: Consists of two equal angles, 0.12 inch minimum thickness, to stiffen curtain, with astragal. Angle shall be:
      - 1) Steel.
    - d. Guides:

- 1) Roll-formed steel channel bolted to three structural angle guide angle assembly forming a slot to retain curtains in guides. Structural grade, three angle assembly fabricated of:
  - (a) Steel.
- 2) Provide with integral windlock bars and removable bottom bar stops.
- e. Brackets: Design to enclose ends of coil and provide support for counterbalance pipe at each end. Fabricate of steel plates, with permanently sealed ball bearings. Thickness shall be:
  - 1) 3/16 inch minimum.
- f. Counterbalance: Curtain to be coiled on a pipe of sufficient size to carry door load with deflection not to exceed 0.033 inch per foot of door span. Curtain to be correctly balanced by helical springs, oil tempered torsion type. Cast iron barrel plugs will be used to anchor springs to tension shaft and pipe.
- g. Hood: Hood to enclose curtain coil and counterbalance mechanism. Hood fabricated of sheet metal, flanged at top for attachment to header and flanged at bottom to provide longitudinal stiffness. Fabricate of:
  - 1) Minimum 24-gauge galvanized steel.
- h. Finish: Shop coat of rust inhibitive primer on non-galvanized surfaces and operating mechanisms. Guides and bracket plates will be coated with a flat black prime paint.
  - 1) Galvanized Steel:
    - (a) Powdercoat finish as selected from manufacturer's RAL color selections.
- i. Operation: Door will be operated by means of:
  - 1) Motor operation with electrical sensing edge attached to bottom bar to stop and reverse door when it contacts an object during the closing cycle.
- j. Motor: Without brake, with 4 poles, controlled by a variable speed drive. Power: 2 HP (larger than 18 sq yd [15 sq m]). Protection degree NEMA 4.
- k. Gearbox: Sized for a motor of 1 HP and gear reduction ratio 1/7.
- l. Door Positioning: Absolute encoder mounted within the drive unit.
- m. Power Supply: Three phase 460 VAC.
- n. Frequency: 50-60 Hz. Circuit breakers to be provided by the customer: 10 A for a motor of 1 HP.
- o. Detectors:
  - 1) An infrared photocell installed inside the side guide and detecting the presence of a pedestrian or a vehicle. Upon activation, it opens the door immediately and keeps it open as long as the presence is detected.
  - 2) Height of photocell: 12 inches (305 mm) from the floor.
  - 3) A bottom edge detector opens the door when it hits an obstacle during the closing cycle. This detector is positioned at the bottom part of the curtain.
2. Space Requirements: All indicated dimensions are net: the additional space necessary for mounting and maintenance has to be taken into account. Reduced dimensions upon request. Refer to drawings.
3. Weatherstripping: Bottom astragal, optional surface guide weatherstrip, and internal hood baffle.
4. Locking:
  - a. Interior slide-bolts suitable for padlocks by others.
    - 1) Electric-motor operation doors provided with lock through the operator gearing.
  - b. Windload: Windload minimum 115 psf per DASMA 102-2012 and as required by local codes.
  - c. Mounting:
    - 1) Steel jambs.

## **PART 3 EXECUTION**

### **3.01 EXAMINATION**

- A. Do not begin installation until substrates have been properly prepared.
- B. Examine conditions of substrates, supports, and other conditions under which this work is to be performed.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

### **3.02 PREPARATION**

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

### **3.03 INSTALLATION**

- A. Install in accordance with manufacturer's instructions.
- B. Install rolling fire doors in accordance with the manufacturer's instructions and in accordance with the requirements of the National Fire Protection Association Standard 80 (NFPA 80).
- C. Install door complete with necessary hardware, jamb and head mold strips, anchors, inserts, hangers, and equipment supports in accordance with final shop drawings, manufacturers instructions, and as specified herein.
- D. Fit, align and adjust rolling door assemblies level and plumb for smooth operation.
- E. Upon completion of final installation, lubricate, test and adjust doors to operate easily, free from warp, twist or distortion and fitting for entire perimeter.

### **3.04 TESTING**

- A. Drop-test rolling steel fire doors in accordance with NFPA 80 and witnessed, attesting to their successful operation at the time of installation.

### **3.05 MAINTENANCE**

- A. Per NFPA 80, paragraph 15-2 4.3: All horizontal or vertical sliding and rolling fire doors shall be inspected and tested annually to check for proper operation and full closure. Resetting of the release mechanism shall be done in accordance with the manufacturers instructions. A written record shall be maintained by the building owner and made available to the authority having jurisdiction.

### **3.06 ADJUSTING**

- A. Test for proper operation and adjust as necessary to provide proper operation without binding or distortion.
- B. Adjust hardware and operating assemblies for smooth and noiseless operation.

### **3.07 CLEANING**

- A. Clean curtain and components using non-abrasive materials and methods recommended by manufacturer.
- B. Remove labels and visible markings.
- C. Touch-up, repair or replace damaged products before Substantial Completion.

### **3.08 PROTECTION**

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

## **END OF SECTION**

## **DIVISION 21 – FIRE SUPPRESSION**

## **SECTION 21 05 00**

### **COMMON WORK RESULTS FOR FIRE SUPPRESSION**

#### **PART 1 GENERAL**

##### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

##### **1.2 WORK INCLUDED**

- A. The installation of the complete, operational and tested automatic fire sprinkler system, including head locations, pipe, fittings, valves, connections, risers, building piping, shall be performed by Contractors currently experienced in this work and having five continuous years of experience herein. The Contractor shall furnish shop drawings based on this Engineer's permitted Bid Documents. These shop drawings shall include additional information to include, but not be limited to, dimensional information, elevations, elevation rises and drops, and adjustments necessary to coordinate the fire sprinkler piping with the building, building structure and equipment/materials of other trades.
- B. Fire Sprinkler Contractor shall review the information contained herein and shall prepare complete fire system installation shop drawings coinciding with hydraulic calculations sealed by a NYS Registered Professional Engineer experienced in the field. The design and details shall conform to NFPA 13, and all local codes and regulations. The Fire Protection Contractor shall be required to provide detailed fire protection construction drawings to be signed and sealed by a NYS Registered Professional Engineer acting as the Delegated Engineer to the Prime Engineer as a part of this scope. These documents shall be considered the Fire Protection System Engineering Documents. Copies of signed and sealed construction drawings shall be submitted to this office for review and comment. When approval is achieved, the Contractor shall submit the necessary number of copies of signed and sealed drawings to Authorities Having Jurisdiction for review and approval.
- C. The intent for the design and installation for the automatic fire sprinkler is to be fully sprinklered within the spaces noted on the drawings. Any exceptions to this (i.e., elevator equipment room, etc.) shall be approved in writing (prior to submission of permit drawings) by the Authority Having Jurisdiction.
- D. This Contractor's shop drawings shall be coordinated with ceilings, air devices, lighting, structural members, etc. The Contractor shall align the sprinkler heads within the center of ceiling tiles. All sprinkler heads in rooms with ceilings shall be concealed type. Any sprinkler heads shown on the performance criteria drawings are to indicate design intent. The Contractor's shop drawings shall be required to comply with the design intent. In certain areas it may be required to install more heads than required by code minimum in order to achieve the ceiling symmetry established in the design intent.

drawings.

- E. Contractor shall furnish a new flow test at any time during the construction of the project if requested in writing by the Authority Having Jurisdiction and/or Engineer of Record.

### **1.3 SUMMARY**

- A. This Section includes the following:
  - 1. Piping materials and installation instructions common to most piping systems.
  - 2. Mechanical sleeve seals.
  - 3. Sleeves.
  - 4. Escutcheons.
  - 5. Grout.
  - 6. Equipment installation requirements common to equipment sections.
  - 7. Painting and finishing.
  - 8. Concrete bases.
  - 9. Supports and anchorages.

### **1.4 DEFINITIONS**

- A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.
- B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
- C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
- D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in chases.
- E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

### **1.5 SUBMITTALS**

- A. Product Data: For the following:
  - 1. Mechanical sleeve seals.

2. Sprinkler heads.

## **1.6 QUALITY ASSURANCE**

- A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."
- B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."
  1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
  2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.

## **1.7 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

## **1.8 COORDINATION**

- A. Arrange for pipe spaces, chases, slots, and openings in building structure during progress of construction, to allow for fire-suppression installations.
- B. Coordinate installation of required supporting devices and set sleeves in poured-in-place concrete and other structural components as they are constructed.
- C. Coordinate requirements for access panels and doors for fire-suppression items requiring access that are concealed behind finished surfaces. Access panels and doors are specified in Division 08 Section "Access Doors and Frames."

## **1.9 CLOSE-OUT DOCUMENTS**

- A. This Contractor shall furnish Operating and Maintenance (O&M) manuals and As-built drawings before final payment will be issued.
  1. O&M manuals shall be submitted in accordance with Division 1, General Requirements, and shall consist of the following (at a minimum):
    - a. All Contractor and Manufacturer warranties.
    - b. List of Contractors and Parts and Equipment Suppliers—complete with contact person, proper company name, address, and telephone numbers.
    - c. Parts list for supplied equipment—including a checklist of recommended components to be stocked on-site.
    - d. Maintenance and replacement parts manuals.
    - e. Start-up and shutdown operating instructions.

- f. Manufacturer's literature describing the equipment, which shall include wiring diagrams and operating specifications.
  - g. Control system sequence of operation, system diagram, and backup disks of the system configuration.
  - h. Sign-in sheet for Owner's training.
- 2. Fire hydrant flow test report.
  - 3. Approval letter from authority having jurisdiction.
  - 4. Electronic copy of Close-Out Documents saved in PDF format on compact disk.

## **PART 2 PRODUCTS**

### **2.1 MANUFACTURERS**

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

### **2.2 PIPE, TUBE, AND FITTINGS**

- A. Refer to individual Division 21 piping Sections for pipe, tube, and fitting materials and joining methods.
- B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

### **2.3 JOINING MATERIALS**

- A. Refer to individual Division 21 piping Sections for special joining materials not listed below.

## **PART 3 EXECUTION**

### **3.1 PIPING SYSTEMS—COMMON REQUIREMENTS**

- A. Install piping according to the following requirements and Division 21 Sections specifying piping systems.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.
- D. Install piping indicated to be exposed and piping in equipment rooms and service areas at

right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

- E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- F. Install piping to permit valve servicing.
- G. Install piping at indicated slopes.
- H. Install piping free of sags and bends.
- I. Install fittings for changes in direction and branch connections.
- J. Install piping to allow application of insulation.
- K. Select system components with pressure rating equal to or greater than system operating pressure.
- L. Install escutcheons for penetrations of walls, ceilings, and floors according to the following:
  - 1. New Piping:
    - a. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, cast-brass type with polished chrome-plated finish.
    - b. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece or split-casting, cast-brass type with polished chrome-plated finish.
- M. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, and concrete floor and roof slabs.

### **3.2 PIPING JOINT CONSTRUCTION**

- A. Join pipe and fittings according to the following requirements and Division 21 Sections specifying piping systems.
- B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- D. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
  - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
  - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded

or damaged. Do not use pipe sections that have cracked or open welds.

- E. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.

### **3.3 ERECTION OF METAL SUPPORTS AND ANCHORAGES**

- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor fire-suppression materials and equipment.
- B. Field Welding: Comply with AWS D1.1.

END OF SECTION

## **SECTION 21 13 16**

### **DRY-PIPE SPRINKLER SYSTEMS**

#### **PART 1 GENERAL**

##### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

##### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Pipes, fittings, and specialties.
  - 2. Fire-protection valves.
  - 3. Sprinkler specialty pipe fittings.
  - 4. Sprinklers.

##### **1.3 DEFINITIONS**

- A. Standard-Pressure Sprinkler Piping: Dry-pipe sprinkler system piping designed to operate at working pressure 175 psig maximum.

##### **1.4 SYSTEM DESCRIPTIONS**

- A. Dry-Pipe Sprinkler System: Automatic sprinklers are attached to piping containing compressed air. Opening of sprinklers releases compressed air and permits water pressure to open dry-pipe valve. Water then flows into piping and discharges from sprinklers that are open.

##### **1.5 PERFORMANCE REQUIREMENTS**

- A. Standard-Pressure Piping System Component: Listed for 175-psig minimum working pressure.
- B. Sprinkler system design shall be approved by authorities having jurisdiction.
  - 1. Margin of Safety for Available Water Flow and Pressure: 10 percent, including losses through water-service piping, valves, and backflow preventers.
  - 2. Sprinkler Occupancy Hazard Classifications:
    - a. Tipping Floor, Transfer Trailer Station: Ordinary-Hazard Group II.
  - 3. Minimum Density for Automatic-Sprinkler Piping Design:

- a. Ordinary-Hazard, Group II Occupancy: 0.2 gpm over 1500 sq. ft. area.
- 4. Maximum Protection Area per Sprinkler: Per UL listing.

## **1.6 SUBMITTALS**

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. Shop Drawings: For dry-pipe sprinkler systems. Include plans, elevations, sections, details, and attachments to other work.
  - 1. Wiring Diagrams: For power, signal, and control wiring.
- C. Delegated-Design Submittal: For sprinkler systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional NYS licensed engineer responsible for their preparation.
- D. Coordination Drawings: Sprinkler systems, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
  - 1. Domestic water piping.
  - 2. Items penetrating finished ceiling including the following:
    - a. Lighting fixtures.
    - b. Air outlets and inlets.
    - c. Fire Alarm Devices.
- E. Approved Sprinkler Piping Drawings: Working plans, prepared according to NFPA 13, that have been approved by authorities having jurisdiction, including hydraulic calculations if applicable.
- F. Field Test Reports and Certificates: Indicate and interpret test results for compliance with performance requirements and as described in NFPA 13. Include "Contractor's Material and Test Certificate for Aboveground Piping."
- G. Field quality-control reports.
- H. Operation and Maintenance Data: For sprinkler specialties to include in emergency, operation, and maintenance manuals.

## **1.7 QUALITY ASSURANCE**

- A. Installer Qualifications:

1. Installer's responsibilities include designing, fabricating, and installing sprinkler systems and providing professional engineering services needed to assume engineering responsibility. Base calculations on results of fire-hydrant flow test.
  - a. Engineering Responsibility: Preparation of working plans, calculations, and field test reports by a qualified professional engineer.
- B. NFPA Standards: Sprinkler system equipment, specialties, accessories, installation, and testing shall comply with the following:
  1. NFPA 13, "Installation of Sprinkler Systems."

## **1.8 COORDINATION**

- A. Coordinate layout and installation of sprinklers with other construction that penetrates ceilings, including light fixtures, HVAC equipment, and partition assemblies.

## **PART 2 PRODUCTS**

### **2.1 PIPING MATERIALS**

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, and fitting materials, and joining methods for specific services, service locations, and pipe sizes.

### **2.2 STEEL PIPE AND FITTINGS**

- A. Standard Weight, Galvanized-Steel Pipe: ASTM A 53/A 53M. Pipe ends may be factory or field formed to match joining method.
- B. Thinwall Galvanized-Steel Pipe: ASTM A 135 or ASTM A 795/A 795M, threadable, with wall thickness less than Schedule 30 and equal to or greater than Schedule 10. Pipe ends may be factory or field formed to match joining method.
- C. Galvanized-Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M, standard-weight, seamless steel pipe with threaded ends.
- D. Galvanized, Steel Couplings: ASTM A 865, threaded.
- E. Galvanized, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.
- F. Malleable- or Ductile-Iron Unions: UL 860.
- G. Cast-Iron Flanges: ASME B16.1, Class 125.
- H. Grooved-Joint, Steel-Pipe Appurtenances:
  1. Pressure Rating: 175 psig minimum.

2. Galvanized, Grooved-End Fittings for Steel Piping: ASTM A 47/A 47M, malleable-iron casting or ASTM A 536, ductile-iron casting; with dimensions matching steel pipe.
3. Grooved-End-Pipe Couplings for Steel Piping: AWWA C606 and UL 213, rigid pattern, unless otherwise indicated, for steel-pipe dimensions. Include ferrous housing sections, EPDM-rubber gasket, and bolts and nuts.

## **2.3 PIPING JOINING MATERIALS**

- A. Pipe-Flange Gasket Materials: AWWA C110, rubber, flat face, 1/8 inch thick.
  1. Class 125, Cast-Iron and Class 150, Bronze Flat-Face Flanges: Full-face gaskets.
  2. Class 250, Cast-Iron and Class 300, Raised-Face Flanges: Ring-type gaskets.
- B. Metal, Pipe-Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.

## **2.4 SPRINKLER SPECIALTY PIPE FITTINGS**

- A. General Requirements for Dry-Pipe-System Fittings: UL listed for dry-pipe service.
- B. Branch Outlet Fittings:
  1. Standard: UL 213.
  2. Pressure Rating: 175 psig minimum.
  3. Body Material: Ductile-iron housing with EPDM seals and bolts and nuts.
  4. Type: Mechanical-T and cross fittings.
  5. Configurations: Snap-on and strapless, ductile-iron housing with branch outlets.
  6. Size: Of dimension to fit onto sprinkler main and with outlet connections as required to match connected branch piping.
  7. Branch Outlets: Grooved, plain-end pipe, or threaded.
- C. Adjustable Drop Nipples:
  1. Standard: UL 1474.
  2. Pressure Rating: 250 psig minimum.
  3. Body Material: Steel pipe with EPDM O-ring seals.
  4. Size: Same as connected piping.

5. Length: Adjustable.
6. Inlet and Outlet: Threaded.

## **2.5 FIRE-DEPARTMENT CONNECTIONS**

### **A. Exposed-Type, Fire-Department Connection:**

1. Standard: UL 405.
2. Type: Exposed, projecting, for wall mounting.
3. Pressure Rating: 175 psig (1200 kPa) minimum.
4. Body Material: Corrosion-resistant metal.
5. Inlets: Brass with threads according to NFPA 1963 and matching local fire-department sizes and threads. Include extension pipe nipples, brass lugged swivel connections, and check devices or clappers.
6. Caps: Brass, lugged type, with gasket and chain.
7. Escutcheon Plate: Round, brass, wall type.
8. Outlet: Back, with pipe threads.
9. Number of Inlets: Two.
10. Escutcheon Plate Marking: Similar to "AUTO SPKR".
11. Finish: Polished chrome plated.
12. Outlet Size: NPS 4 (DN 100).

## **2.6 SPRINKLERS**

### **A. General Requirements:**

1. Standard: UL's "Fire Protection Equipment Directory" listing, or "Approval Guide," published by FM Global, listing.
2. Pressure Rating for Automatic Sprinklers: 175 psig minimum.

### **B. Automatic Sprinklers with Heat-Responsive Element:**

1. Nonresidential Applications: UL 199.
2. Characteristics: Nominal 1/2-inch orifice with discharge coefficient K of 5.6, and for "Ordinary" temperature classification rating unless otherwise indicated or

required by application. Light-Hazard and Ordinary Group I. Ordinary Group II: Nominal 1/2-inch orifice with discharge coefficient K of 8.0.

C. Sprinkler Finishes:

1. Chrome plated.
2. Bronze.
3. Painted.

D. Sprinkler Guards:

1. Standard: UL 199.
2. Type: Wire cage with fastening device for attaching to sprinkler.

## **PART 3 EXECUTION**

### **3.1 PREPARATION**

- A. Perform fire-hydrant flow test according to NFPA 13 and NFPA 291. Use results for system design calculations required in "Quality Assurance" Article.
- B. Report test results promptly and in writing.

### **3.2 PIPING INSTALLATION**

- A. Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping. Install piping as indicated, as far as practical.
  1. Deviations from approved working plans for piping require written approval from authorities having jurisdiction. File written approval with Architect before deviating from approved working plans.
- B. Piping Standard: Comply with requirements in NFPA 13 for installation of sprinkler piping.
- C. Install seismic restraints on piping. Comply with requirements in NFPA 13 for seismic-restraint device materials and installation.
- D. Use listed fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.
- E. Install unions adjacent to each valve in pipes NPS 2 and smaller.
- F. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 and larger end connections.

- G. Install "Inspector's Test Connections" in sprinkler system piping, complete with shutoff valve, and sized and located according to NFPA 13.
- H. Install sprinkler piping with drains for complete system drainage.
- I. Install hangers and supports for sprinkler system piping according to NFPA 13. Comply with requirements in NFPA 13 for hanger materials.
- J. Drain dry-pipe sprinkler piping.
- K. Pressurize and check dry-pipe sprinkler system piping and air-pressure maintenance devices, air compressors.
- L. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Division 21 Section "Sleeves and Sleeve Seals for Fire-Suppression Piping."
- M. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Division 21 Section "Sleeves and Sleeve Seals for Fire-Suppression Piping."
- N. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Division 21 Section "Escutcheons for Fire-Suppression Piping."

### **3.3 JOINT CONSTRUCTION**

- A. Install couplings, flanges, flanged fittings, unions, nipples, and transition and special fittings that have finish and pressure ratings same as or higher than system's pressure rating for aboveground applications unless otherwise indicated.
- B. Install unions adjacent to each valve in pipes NPS 2 and smaller.
- C. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 and larger end connections.
- D. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- E. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- F. Flanged Joints: Select appropriate gasket material in size, type, and thickness suitable for water service. Join flanges with gasket and bolts according to ASME B31.9.
- G. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
  - 1. Apply appropriate tape or thread compound to external pipe threads.

- 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- H. Twist-Locked Joints: Insert plain end of steel pipe into plain-end-pipe fitting. Rotate retainer lugs one-quarter turn or tighten retainer pin.
- I. Steel-Piping, Cut-Grooved Joints: Cut square-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel-pipe joints.
- J. Dissimilar-Material Piping Joints: Make joints using adapters compatible with materials of both piping systems.

### **3.4 SPRINKLER INSTALLATION**

- A. Install dry-type sprinklers with water supply from heated space. Do not install pendent or sidewall, wet-type sprinklers in areas subject to freezing.

### **3.5 IDENTIFICATION**

- A. Install labeling and pipe markers on equipment and piping according to requirements in NFPA 13.
- B. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Division 26 Section "Identification for Electrical Systems."

### **3.6 FIELD QUALITY CONTROL**

- A. Perform tests and inspections.
- B. Tests and Inspections:
  - 1. Leak Test: After installation, charge systems and test for leaks. Repair leaks and retest until no leaks exist.
  - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
  - 3. Flush, test, and inspect sprinkler systems according to NFPA 13, "Systems Acceptance" Chapter.
  - 4. Energize circuits to electrical equipment and devices.
  - 5. Start and run air compressors.
  - 6. Coordinate with fire-alarm tests. Operate as required.
  - 7. Verify that equipment hose threads are same as local fire-department equipment.

- C. Sprinkler piping system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

### **3.7 CLEANING**

- A. Clean dirt and debris from sprinklers.
- B. Remove and replace sprinklers with paint other than factory finish.

### **3.8 PIPING SCHEDULE**

- A. Sprinkler specialty fittings may be used, downstream of control vales, instead of specified fittings.
- B. Standard-pressure, dry-pipe sprinkler system, NPS 2 and smaller, shall be the following:
  - 1. Standard-weight, or schedule 40 galvanized-steel pipe with threaded ends; galvanized, gray-iron threaded fittings; and threaded joints.
- C. Standard-pressure, dry-pipe sprinkler system, NPS 2-1/2 to NPS 4, shall be the following:
  - 1. Standard-weight, galvanized-steel pipe with cut-grooved ends; galvanized, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.

### **3.9 SPRINKLER SCHEDULE**

- A. Use sprinkler types in subparagraphs below for the following applications:
  - 1. Tipping Floor, Transfer Trailer Station: Upright sprinklers.
- B. Provide sprinkler types in subparagraphs below with finishes indicated.
  - 1. Upright Sprinklers: Rough brass.

END OF SECTION

## **DIVISION 22 - PLUMBING**

## **SECTION 22 05 11**

### **COMMON WORK RESULTS FOR PLUMBING**

#### **PART 1 GENERAL**

##### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

##### **1.2 DESCRIPTION**

- A. The requirements of this Section shall apply to all sections of Division 22.

- B. Definitions:

- 1. Exposed: Piping and equipment exposed to view in finished rooms.

- C. Abbreviations/Acronyms:

- 1. CWP: Cold Working Pressure
  - 2. DWV: Drainage, Waste and Vent
  - 3. FD: Floor Drain
  - 4. HOA: Hands-Off-Automatic
  - 5. HP: Horsepower
  - 6. NPS: Nominal Pipe Size
  - 7. NPT: National Pipe Thread
  - 8. OS&Y: Outside Stem and Yoke
  - 9. WOG: Water, Oil, Gas

##### **1.3 APPLICABLE PUBLICATIONS**

- A. The publications listed below shall form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

- B. American Society of Mechanical Engineers (ASME):

- ASME Boiler and Pressure Vessel Code -

- BPVC Section IX-2013.....Welding, Brazing, and Fusing Qualifications

- B31.1-2012.....Power Piping
- C. American Society for Testing and Materials (ASTM):
- A36/A36M-2012.....Standard Specification for Carbon Structural Steel
- A575-96(R2013)e1 .....Standard Specification for Steel Bars, Carbon, Merchant Quality, M-Grades
- E84-2013a .....Standard Test Method for Surface Burning Characteristics of Building Materials
- E119-2012a .....Standard Test Methods for Fire Tests of Building Construction and Materials
- D. Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry, Inc:
- SP-58-2009 .....Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application and Installation
- SP-69-2003 .....Pipe Hangers and Supports - Selection and Application
- E. National Electrical Manufacturers Association (NEMA):
- MG 1-2011 .....Motors and Generators
- F. National Fire Protection Association (NFPA):
- 51B-2014.....Standard for Fire Prevention During Welding, Cutting and Other Hot Work
- 54-2012 .....National Fuel Gas Code
- 70-2011 .....National Electrical Code (NEC)
- G. NSF International (NSF):
- 5-2012 .....Water Heaters, Hot Water Supply Boilers, and Heat Recovery Equipment
- 14-2012 .....Plastic Piping System Components and Related Materials
- 61-2012 .....Drinking Water System Components – Health Effects
- 372-2011 .....Drinking Water System Components – Lead Content

## **1.4 SUBMITTALS**

- A. Submittals, including number of required copies, shall be submitted in accordance with Division 01 – General Requirements.
- B. Contractor shall make all necessary field measurements and investigations to assure that the equipment and assemblies will meet contract requirements and will fit the space available.
- C. If equipment is submitted which differs in arrangement from that shown, provide drawings that show the rearrangement of all associated systems. Approval will be given only if all features of the equipment and associated systems, including accessibility, are equivalent to that required by the contract.
- D. Manufacturer's Literature and Data: Manufacturer's literature shall be submitted under the pertinent section rather than under this section.
  - 1. Equipment and materials identification.
  - 2. Hangers, inserts, supports and bracing. Provide load calculations for variable spring and constant support hangers.
- E. Submittals and shop drawings for interdependent items, containing applicable descriptive information, shall be furnished together and complete in a group. Coordinate and properly integrate materials and equipment in each group to provide a completely compatible and efficient installation. Final review and approvals will be made only by groups.

## **1.5 QUALITY ASSURANCE**

- A. Products Criteria:
  - 1. Standard Products: Material and equipment shall be the standard products of a manufacturer regularly engaged in the manufacture, supply and servicing of the specified products for at least 5 years.
  - 2. All items furnished shall be free from defects that would adversely affect the performance, maintainability and appearance of individual components and overall assembly.
  - 4. The products and execution of work specified in Division 22 shall conform to the referenced codes and standards as required by the specifications. Local codes and amendments enforced by the local code official shall be enforced, if required by local authorities such as the natural gas supplier. If the local codes are more stringent, then the local code shall apply.
  - 5. Multiple Units: When two or more units of materials or equipment of the same type or class are required, these units shall be products of one manufacturer.

6. Assembled Units: Manufacturers of equipment assemblies, which use components made by others, assume complete responsibility for the final assembled product.
  7. Nameplates: Nameplate bearing manufacturer's name or identifiable trademark shall be securely affixed in a conspicuous place on equipment, or name or trademark cast integrally with equipment, stamped or otherwise permanently marked on each item of equipment.
  8. Asbestos products or equipment or materials containing asbestos shall not be used.
- B. Welding: Before any welding is performed, contractor shall submit a certificate certifying that welders comply with the following requirements:
1. Qualify welding processes and operators for piping according to ASME "Boiler and Pressure Vessel Code", Section IX, "Welding and Brazing Qualifications".
  2. Comply with provisions of ASME B31 series "Code for Pressure Piping".
  3. Certify that each welder and welding operator has passed American Welding Society (AWS) qualification tests for the welding processes involved, and that certification is current.
- C. Manufacturer's Recommendations: Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the COR prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material.
- D. Plumbing Systems: International Plumbing Code of New York State. Unless otherwise required herein, perform plumbing work in accordance with the latest version of the International Plumbing Code of New York State.
- E. Cleanliness of Piping and Equipment Systems:
1. Care shall be exercised in the storage and handling of equipment and piping material to be incorporated in the work. Debris arising from cutting, threading and welding of piping shall be removed.
  2. Piping systems shall be flushed, blown or pigged as necessary to deliver clean systems.
  3. The interior of all tanks shall be cleaned prior to delivery. All piping shall be tested in accordance with the specifications and the 2020 Plumbing Code of New York State.
  4. Contractor shall be fully responsible for all costs, damage, and delay arising from failure to provide clean systems.

## **1.6 DELIVERY, STORAGE AND HANDLING**

### **A. Protection of Equipment:**

1. Equipment and material placed on the job site shall remain in the custody of the Contractor. The Contractor is solely responsible for the protection of such equipment and material against any damage.
2. Damaged equipment shall be replaced with an identical unit. Such replacement shall be at no additional cost or additional time to the Owner.
3. Interiors of new equipment and piping systems shall be protected against entry of foreign matter. Both inside and outside shall be cleaned before painting or placing equipment in operation.
4. Existing equipment and piping being worked on by the Contractor shall be under the custody and responsibility of the Contractor and shall be protected as required for new work.

## **1.7 AS-BUILT DOCUMENTATION**

- ### **A.**
- The installing contractor shall maintain as-built drawings of each completed phase for verification; and, shall provide the complete set at the end of the project. As-built drawings are to be provided, and a copy of them on Auto-Cad provided on compact disk or DVD.

## **PART 2 PRODUCTS**

### **2.1 REFER TO SCHEDULES AND EQUIPMENT NOTES ON DRAWINGS FOR BASIS OF DESIGN MATERIALS, MANUFACTURERS AND MODEL NUMBERS.**

### **2.2 MATERIALS FOR VARIOUS SERVICES**

- #### **A.**
- Solder or flux containing lead shall not be used with copper pipe.
- #### **B.**
- Material or equipment containing a weighted average of greater than 0.25 percent lead shall not be used in any potable water system intended for human consumption, and shall be certified in accordance with NSF 61.
- #### **C.**
- In-line devices such as water meters, building valves, check valves, stops, valves, fittings, tanks and backflow preventers shall comply with NSF 61 and NSF 372.

### **2.3 FACTORY-ASSEMBLED PRODUCTS**

- #### **A.**
- Standardization of components shall be maximized to reduce spare part requirements.
- #### **B.**
- Manufacturers of equipment assemblies that include components made by others shall assume complete responsibility for final assembled unit.
1. All components of an assembled unit need not be products of same manufacturer.

2. Constituent parts that are alike shall be products of a single manufacturer.
  3. Components shall be compatible with each other and with the total assembly for intended service.
  4. Contractor shall guarantee performance of assemblies of components, and shall repair or replace elements of the assemblies as required to deliver specified performance of the complete assembly at no additional cost or time to the Owner.
- C. Components of equipment shall bear manufacturer's name and trademark, model number, serial number and performance data on a name plate securely affixed in a conspicuous place, or cast integral with, stamped or otherwise permanently marked upon the components of the equipment.

## **2.4 COMPATIBILITY OF RELATED EQUIPMENT**

- A. Equipment and materials installed shall be compatible in all respects with other items being furnished and with existing items so that the result will be a complete and fully operational system that conforms to contract requirements.

## **2.5 EQUIPMENT AND MATERIALS IDENTIFICATION**

- A. Use symbols, nomenclature and equipment numbers specified, shown on the drawings, or shown in the maintenance manuals. Coordinate equipment and valve identification with facility maintenance staff.
- B. Valve Tags and Lists:
1. Plumbing: All valves shall be provided with valve tags and listed on a valve list.

## **2.5 PIPE PENETRATIONS**

- A. Pipe penetration sleeves shall be installed for all pipe other than rectangular blocked out floor openings for risers in mechanical bays.
- B. Pipe penetration sleeve materials shall comply with all firestopping requirements for each penetration.
- C. Penetrations are not allowed through beams or ribs, but may be installed in concrete beam flanges, with structural engineer prior approval.

## **2.6 ASBESTOS**

- A. Materials containing asbestos are not permitted.

## **PART 3 EXECUTION**

### **3.1 ARRANGEMENT AND INSTALLATION OF EQUIPMENT AND PIPING**

- A. Location of piping, sleeves, inserts, hangers, and equipment, access provisions shall be coordinated with the work of all trades. Piping, sleeves, inserts, hangers, and equipment shall be located clear of windows, doors, openings, light outlets, and other services and utilities. Equipment layout drawings shall be prepared to coordinate proper location and personnel access of all facilities. The drawings shall be submitted for review.
- B. Manufacturer's published recommendations shall be followed for installation methods not otherwise specified.
- C. Operating Personnel Access and Observation Provisions: All equipment and systems shall be arranged to provide clear view and easy access, without use of portable ladders, for maintenance, testing and operation of all devices including, but not limited to: all equipment items, valves, backflow preventers, filters, strainers, transmitters, sensors, meters and control devices. All gages and indicators shall be clearly visible by personnel standing on the floor or on permanent platforms. Maintenance and operating space and access provisions that are shown on the drawings shall not be changed nor reduced.
- D. Structural systems necessary for pipe and equipment support shall be coordinated to permit proper installation.
- E. Location of pipe sleeves, trenches and chases shall be accurately coordinated with equipment and piping locations.
- F. Cutting Holes:
  - 1. Holes through structural steel or concrete shall be by the General Contractor, locations and sizes shall be coordinated by this contractor.
- G. Protection and Cleaning:
  - 1. Equipment and materials shall be carefully handled, properly stored, and adequately protected to prevent damage before and during installation, in accordance with the manufacturer's recommendations. Damaged or defective items in the opinion of the Owner's Representative, shall be replaced at no additional cost or time to the Owner.
  - 2. Protect all finished parts of equipment, such as shafts and bearings where accessible, from rust prior to operation by means of protective grease coating and wrapping. Close pipe openings with caps or plugs during installation. Pipe openings, equipment, and plumbing fixtures shall be tightly covered against dirt or mechanical injury. At completion of all work thoroughly clean fixtures, exposed materials and equipment.

### **3.2 TEMPORARY PIPING AND EQUIPMENT**

- A. Continuity of operation of existing facilities may require temporary installation or relocation of equipment and piping. Temporary equipment or pipe installation or relocation shall be provided to maintain continuity of operation of existing facilities.
- B. Temporary facilities and piping shall be completely removed back to the nearest active distribution branch or main pipe line and any openings in structures sealed. Dead legs are not allowed in potable water systems. Necessary blind flanges and caps shall be provided to seal open piping remaining in service.

### **3.3 PIPE AND EQUIPMENT SUPPORTS**

- A. Where hanger spacing does not correspond with joist or rib spacing, use structural steel channels secured directly to joist and rib structure that will correspond to the required hanger spacing, and then suspend the equipment and piping from the channels. Holes shall be drilled or burned in structural steel **ONLY** with the prior written approval of the structural engineer.
- B. The use of chain pipe supports, wire or strap hangers; wood for blocking, stays and bracing, or hangers suspended from piping above shall not be permitted. Rusty products shall be replaced.
- C. Hanger rods shall be used that are straight and vertical. Turnbuckles for vertical adjustments may be omitted where limited space prevents use. A minimum of 1/2 inch clearance between pipe or piping covering and adjacent work shall be provided.
- D. Overhead Supports:
  - 1. The basic structural system of the building is designed to sustain the loads imposed by equipment and piping to be supported overhead.
  - 2. Provide steel structural members, in addition to those shown, of adequate capability to support the imposed loads, located in accordance with the final approved layout of equipment and piping.
- E. Floor Supports:
  - 1. Provide structural steel systems for support of equipment and piping. Structural systems shall be anchored and doweled to resist forces under operating and seismic conditions (if applicable) without excessive displacement or structural failure.
  - 2. Bases and supports shall not be located and installed until equipment mounted thereon has been approved.
  - 3. All equipment shall be shimmed, leveled, firmly anchored, and grouted with epoxy grout. Anchor bolts shall be placed in sleeves, anchored to the bases. Fill the annular

space between sleeves and bolts with a grout material to permit alignment and realignment.

### **3.4 PLUMBING SYSTEMS DEMOLITION**

- A. Unless specified otherwise, all piping, wiring, conduit, and other devices associated with the equipment not re-used in the new work shall be completely removed. This includes all concrete equipment pads, pipe, valves, fittings, insulation, and all hangers including the top connection and any fastenings to building structural systems. All openings shall be sealed after removal of equipment, pipes, ducts, and other penetrations in roof, walls, floors, in an approved manner and in accordance with plans and specifications where specifically covered. Structural integrity of the building system shall be maintained. Reference shall also be made to the drawings and specifications of the other disciplines in the project for additional facilities to be demolished or handled.
- B. The Contractor shall remove all material and equipment, devices and demolition debris under these plans and specifications. Such material shall be removed from property expeditiously and shall not be allowed to accumulate.

### **3.5 CLEANING AND PAINTING**

- A. Prior to final inspection and acceptance of the facilities for beneficial use by the Owner, the facilities, equipment and systems shall be thoroughly cleaned.
- B. In addition, the following special conditions apply:
  - 1. Cleaning shall be thorough. Solvents, cleaning materials and methods recommended by the manufacturers shall be used for the specific tasks. All rust shall be removed prior to painting and from surfaces to remain unpainted. Scratches, scuffs, and abrasions shall be repaired prior to applying prime and finish coats.
  - 2. Control and instrument panels shall be cleaned and damaged surfaces repaired. Touch-up painting shall be made with matching paint type and color obtained from manufacturer or computer matched.
  - 3. Pumps, motors, steel and cast iron bases, and coupling guards shall be cleaned, and shall be touched-up with the same paint type and color as utilized by the pump manufacturer.
  - 4. The final result shall be a smooth, even-colored, even-textured factory finish on all items. The entire piece of equipment shall be repainted, if necessary, to achieve this. Lead based paints shall not be used.

END OF SECTION

## **SECTION 22 05 17**

### **SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING**

#### **PART 1 GENERAL**

##### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

##### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Sleeves.
  - 2. Sleeve seal systems.

##### **1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated.

#### **PART 2 PRODUCTS**

##### **2.1 SLEEVES**

- A. Galvanized Steel Wall Pipes: ASTM A 53/A 53M, Schedule 40, with plain ends and welded steel collar; zinc coated.
- B. Galvanized Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, with plain ends.

##### **2.2 SLEEVE SEAL SYSTEMS**

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the work include, but are not limited to, the following:
  - 1. Advance Products & Systems, Inc.
  - 2. CALPICO, Inc.
  - 3. Metraflex Company (The).
  - 4. Pipeline Seal and Insulator, Inc.
  - 5. Proco Products, Inc.

- B. Description: Modular sealing-element unit, designed for field assembly, for filling annular space between piping and sleeve.
  - 1. Sealing Elements: EPDM-rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size of pipe.
  - 2. Pressure Plates: Stainless steel.
  - 3. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, of length required to secure pressure plates to sealing elements.

## **PART 3 EXECUTION**

### **3.1 SLEEVE INSTALLATION**

- A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.
- B. For sleeves that will have sleeve seal system installed, select sleeves of size large enough to provide 1 inch annular clear space between piping and concrete slabs and walls.

### **3.2 SLEEVE SEAL SYSTEM INSTALLATION**

- A. Install sleeve seal systems in sleeves in exterior concrete walls and slabs-on-grade at service piping entries into building.
- B. Select type, size, and number of sealing elements required for piping material and size and for sleeve ID or hole size. Position piping in center of sleeve. Center piping in penetration, assemble sleeve seal system components, and install in annular space between piping and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.

### **3.3 SLEEVE AND SLEEVE SEAL SCHEDULE**

- A. Use sleeves and sleeve seals for the following piping-penetration applications:
  - 1. Exterior Concrete Walls above Grade:
    - a. Piping Smaller Than NPS 6: Cast iron wall sleeves.
  - 2. Exterior Concrete Walls below Grade:
    - a. Piping Smaller Than NPS 6: Cast iron wall sleeves with sleeve seal system.
      - 1) Select sleeve size to allow for 1 inch annular clear space between piping and sleeve for installing sleeve seal system.
  - 3. Concrete Slabs above Grade:

- a. Piping Smaller Than NPS 6: Galvanized steel pipe sleeves or Stack sleeve fittings.
  - b. Piping NPS 6 and Larger: Galvanized steel pipe sleeves or Stack sleeve fittings.
4. Interior Partitions:
- a. Piping Smaller Than NPS 6: Galvanized steel pipe sleeves.
  - b. Piping NPS 6 and Larger: Galvanized steel sheet sleeves.

END OF SECTION

## **SECTION 22 05 29**

### **HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT**

#### **PART 1 GENERAL**

##### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

##### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Metal pipe hangers and supports.
  - 2. Trapeze pipe hangers.
  - 3. Fastener systems.
  - 4. Pipe stands.
- B. Related Sections:
  - 1. Division 05 Section "Metal Fabrications" for structural-steel shapes and plates for trapeze hangers for pipe and equipment supports.

##### **1.3 DEFINITIONS**

- A. MSS: Manufacturers Standardization Society of the Valve and Fittings Industry Inc.

##### **1.4 PERFORMANCE REQUIREMENTS**

- A. Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. Structural Performance: Hangers and supports for plumbing piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.
  - 1. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

##### **1.5 SUBMITTALS**

- A. Product Data: For each type of product indicated.

- B. Shop Drawings: Show fabrication and installation details and include calculations for the following; include Product Data for components:
  - 1. Trapeze pipe hangers.
  - 2. Pipe stands.
  - 3. Equipment supports.
- C. Delegated-Design Submittal: For trapeze hangers indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
  - 1. Detail fabrication and assembly of trapeze hangers.
  - 2. Design Calculations: Calculate requirements for designing trapeze hangers.
- D. Welding certificates.

## **1.6 QUALITY ASSURANCE**

- A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

## **PART 2 PRODUCTS**

### **2.1 METAL PIPE HANGERS AND SUPPORTS**

- A. Carbon-Steel Pipe Hangers and Supports:
  - 1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
  - 2. Galvanized Metallic Coatings: Pre-galvanized or hot dipped.
  - 3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
  - 4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.
  - 5. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
- B. Copper Pipe Hangers:
  - 1. Description: MSS SP-58, Types 1 through 58, copper-coated-steel, factory-fabricated components.

## **2.2 FASTENER SYSTEMS**

- A. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
- B. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

## **2.3 PIPE STANDS**

- A. General Requirements for Pipe Stands: Shop or field-fabricated assemblies made of manufactured corrosion-resistant components to support roof-mounted piping.

## **2.4 MISCELLANEOUS MATERIALS**

- A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.

# **PART 3 EXECUTION**

## **3.1 HANGER AND SUPPORT INSTALLATION**

- A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.
- B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.
  - 1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
  - 2. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.
- C. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.
- D. Fastener System Installation:
  - 1. Install powder-actuated fasteners for use in lightweight concrete or concrete slabs less than 4 inches thick in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.

2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
- E. Pipe Stand Installation:
1. Pipe Stand Types except Curb-Mounted Type: Assemble components and mount on smooth roof surface. Do not penetrate roof membrane.
- F. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.
- G. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
- H. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- I. Install lateral bracing with pipe hangers and supports to prevent swaying.
- J. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
- K. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- L. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.
- M. Insulated Piping:
1. Attach clamps and spacers to piping.
    - a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
    - b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
    - c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.
  2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.

3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
4. Shield Dimensions for Pipe: Not less than the following:
  - a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
5. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

### **3.2 METAL FABRICATIONS**

- A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.
- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:
  1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
  2. Obtain fusion without undercut or overlap.
  3. Remove welding flux immediately.
  4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

### **3.3 ADJUSTING**

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

### **3.4 PAINTING**

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
  1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils.

- B. Touchup: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal are specified in Division 09 painting Sections.
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

### **3.5 HANGER AND SUPPORT SCHEDULE**

- A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.
- B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.
- C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.
- D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- E. Use carbon-steel pipe hangers and supports and metal trapeze pipe hangers and attachments for general service applications.
- F. Use copper-plated pipe hangers for uninsulated copper piping and tubing.
- G. Use padded hangers for piping that is subject to scratching.
- H. Use thermal-hanger shield inserts for insulated piping and tubing.
- I. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
  - 1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30.
  - 2. Carbon or Alloy Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes NPS 3/4 to NPS 36, requiring clamp flexibility and up to 4 inches of insulation.
  - 3. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes NPS 1/2 to NPS 24 if little or no insulation is required.
  - 4. Pipe Hangers (MSS Type 5): For suspension of pipes NPS 1/2 to NPS 4, to allow off-center closure for hanger installation before pipe erection.
  - 5. Adjustable, Swivel Split or Solid-Ring Hangers (MSS Type 6): For suspension of noninsulated, stationary pipes NPS 3/4 to NPS 8.

6. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
  7. Adjustable Band Hangers (MSS Type 9): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
  8. Adjustable, Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
  9. Split Pipe Ring with or without Turnbuckle Hangers (MSS Type 11): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 8.
  10. Extension Hinged or Two-Bolt Split Pipe Clamps (MSS Type 12): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 3.
  11. U-Bolts (MSS Type 24): For support of heavy pipes NPS 1/2 to NPS 30.
  12. Clips (MSS Type 26): For support of insulated pipes not subject to expansion or contraction.
  13. Single-Pipe Rolls (MSS Type 41): For suspension of pipes NPS 1 to NPS 30, from two rods if longitudinal movement caused by expansion and contraction might occur.
  14. Adjustable Roller Hangers (MSS Type 43): For suspension of pipes NPS 2-1/2 to NPS 24, from single rod if horizontal movement caused by expansion and contraction might occur.
  15. Complete Pipe Rolls (MSS Type 44): For support of pipes NPS 2 to NPS 42 if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.
  16. Pipe Roll and Plate Units (MSS Type 45): For support of pipes NPS 2 to NPS 24 if small horizontal movement caused by expansion and contraction might occur and vertical adjustment is not necessary.
  17. Adjustable Pipe Roll and Base Units (MSS Type 46): For support of pipes NPS 2 to NPS 30 if vertical and lateral adjustment during installation might be required in addition to expansion and contraction.
- J. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24.

2. Carbon or Alloy Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 if longer ends are required for riser clamps.
- K. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
  2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
  3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
  4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
  5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.
- L. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
  2. Top Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joint construction, to attach to top flange of structural shape.
  3. Side Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
  4. Center Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
  5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
  6. C-Clamps (MSS Type 23): For structural shapes.
  7. Top Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
  8. Side Beam Clamps (MSS Type 27): For bottom of steel I-beams.
  9. Steel Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
  10. Linked Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.

11. Malleable Beam Clamps with Extension Pieces (MSS Type 30): For attaching to structural steel.
  12. Welded Steel Brackets: For support of pipes from below or for suspending from above by using clip and rod. Use one of the following for indicated loads:
    - a. Light (MSS Type 31): 750 lb.
    - b. Medium (MSS Type 32): 1500 lb.
    - c. Heavy (MSS Type 33): 3000 lb.
  13. Side Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
  14. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.
  15. Horizontal Travelers (MSS Type 58): For supporting piping systems subject to linear horizontal movement where headroom is limited.
- M. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
  2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
  3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.
- N. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Restraint-Control Devices (MSS Type 47): Where indicated to control piping movement.
  2. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches.
  3. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41, roll hanger with springs.
  4. Spring Sway Braces (MSS Type 50): To retard sway, shock, vibration, or thermal expansion in piping systems.

5. Variable-Spring Hangers (MSS Type 51): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from hanger.
  6. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from base support.
  7. Variable-Spring Trapeze Hangers (MSS Type 53): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from trapeze support.
  8. Constant Supports: For critical piping stress and if necessary to avoid transfer of stress from one support to another support, critical terminal, or connected equipment. Include auxiliary stops for erection, hydrostatic test, and load-adjustment capability. These supports include the following types:
    - a. Horizontal (MSS Type 54): Mounted horizontally.
    - b. Vertical (MSS Type 55): Mounted vertically.
    - c. Trapeze (MSS Type 56): Two vertical-type supports and one trapeze member.
- O. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.
- P. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system Sections.
- Q. Use powder-actuated fasteners or mechanical-expansion anchors instead of building attachments where required in concrete construction.
- R. Use pipe positioning systems in pipe spaces behind plumbing fixtures to support supply and waste piping for plumbing fixtures.

END OF SECTION

**SECTION 22 07 00**  
**PLUMBING INSULATION**

**PART 1 GENERAL**

**1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

**1.2 SUMMARY**

- A. Section Includes:
  - 1. Insulation Materials:
    - a. Mineral fiber.
  - 2. Insulating cements.
  - 3. Adhesives.
  - 4. Mastics.
  - 5. Lagging adhesives.
  - 6. Sealants.
  - 7. Factory-applied jackets.
  - 8. Field-applied jackets.
  - 9. Tapes.
  - 10. Securements.
  - 11. Corner angles.

**1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated. Include thermal conductivity, thickness, and jackets (both factory and field applied, if any).
- B. Qualification Data: For qualified Installer.
- C. Material Test Reports: From a qualified testing agency acceptable to authorities having jurisdiction indicating, interpreting, and certifying test results for compliance of insulation materials, sealers, attachments, cements, and jackets, with requirements indicated. Include dates of tests and test methods employed.

- D. Field quality control reports.

#### **1.4 QUALITY ASSURANCE**

- A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.
- B. Fire-Test-Response Characteristics: Insulation and related materials shall have fire-test-response characteristics indicated, as determined by testing identical products per ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing and inspecting agency.
  - 1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
  - 2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

#### **1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

#### **1.6 COORDINATION**

- A. Coordinate size and location of supports, hangers, and insulation shields specified in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment."
- B. Coordinate clearance requirements with piping Installer for piping insulation application and equipment Installer for equipment insulation application. Before preparing piping Shop Drawings, establish and maintain clearance requirements for installation of insulation and field-applied jackets and finishes and for space required for maintenance.

#### **1.7 SCHEDULING**

- A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.
- B. Complete installation and concealment of plastic materials as rapidly as possible in each area of construction.

## **PART 2 PRODUCTS**

### **2.1 INSULATION MATERIALS**

- A. Comply with requirements in Part 3 schedule articles for where insulating materials shall be applied.
- B. Products shall not contain asbestos, lead, mercury, or mercury compounds.
- C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.
- D. Mineral Fiber, Preformed Pipe Insulation:
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Fibrex Insulations Inc.; Coreplus 1200.
    - b. Johns Manville; Micro-Lok.
    - c. Knauf Insulation; 1000 Pipe Insulation.
    - d. Manson Insulation Inc.; Alley-K.
    - e. Owens Corning; Fiberglas Pipe Insulation.
  - 2. Type I, 850 deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, with factory-applied ASJ-SSL. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

### **2.2 ADHESIVE**

- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.
- B. Mineral Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Childers Products, Division of ITW; CP-82.
    - b. Foster Products Corporation, H. B. Fuller Company; 85-20.
    - c. ITW TACC, Division of Illinois Tool Works; S-90/80.
    - d. Marathon Industries, Inc.; 225.

- e. Mon-Eco Industries, Inc.; 22-25.
- 2. For indoor applications, use adhesive that has a VOC content of 80 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

## **2.3 MASTICS**

- A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-C-19565C, Type II.
  - 1. For indoor applications, use mastics that have a VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
- B. Vapor-Barrier Mastic: Water based; suitable for indoor and outdoor use on below ambient services.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Childers Products, Division of ITW; CP-35.
    - b. Foster Products Corporation, H. B. Fuller Company; 30-90.
    - c. ITW TACC, Division of Illinois Tool Works; CB-50.
    - d. Marathon Industries, Inc.; 590.
    - e. Mon-Eco Industries, Inc.; 55-40.
    - f. Vimasco Corporation; 749.
  - 2. Water-Vapor Permeance: ASTM E 96, Procedure B, 0.013 perm at 43-mil dry film thickness.
  - 3. Service Temperature Range: Minus 20 to plus 180 deg F.
  - 4. Solids Content: ASTM D 1644, 59 percent by volume and 71 percent by weight.
  - 5. Color: White.
- C. Breather Mastic: Water based; suitable for indoor and outdoor use on above ambient services.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Childers Products, Division of ITW; CP-10.
    - b. Foster Products Corporation, H. B. Fuller Company; 35-00.

- c. ITW TACC, Division of Illinois Tool Works; CB-05/15.
  - d. Marathon Industries, Inc.; 550.
  - e. Mon-Eco Industries, Inc.; 55-50.
  - f. Vimasco Corporation; WC-1/WC-5.
- 2. Water-Vapor Permeance: ASTM F 1249, 3 perms at 0.0625 inch dry film thickness.
  - 3. Service Temperature Range: Minus 20 to plus 200 deg F.
  - 4. Solids Content: 63 percent by volume and 73 percent by weight.
  - 5. Color: White.

## **2.4 FACTORY-APPLIED JACKETS**

- A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:
  - 1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
  - 2. ASJ-SSL: ASJ with self-sealing, pressure-sensitive, acrylic-based adhesive covered by a removable protective strip; complying with ASTM C 1136, Type I.

## **2.5 TAPES**

- A. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.
  - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Avery Dennison Corporation, Specialty Tapes Division; Fasson 0835.
    - b. Compac Corp.; 104 and 105.
    - c. Ideal Tape Co., Inc., an American Biltrite Company; 428 AWF ASJ.
    - d. Venture Tape; 1540 CW Plus, 1542 CW Plus, and 1542 CW Plus/SQ.
  - 2. Width: 3 inches.
  - 3. Thickness: 11.5 mils.
  - 4. Adhesion: 90 ounces force/inch in width.

5. Elongation: 2 percent.
6. Tensile Strength: 40 lbf/inch in width.
7. ASJ Tape Disks and Squares: Precut disks or squares of ASJ tape.

## **2.6 SECUREMENTS**

### **A. Bands:**

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Childers Products; Bands.
  - b. PABCO Metals Corporation; Bands.
  - c. RPR Products, Inc.; Bands.
2. Stainless Steel: ASTM A 167 or ASTM A 240/A 240M, Type 304 or Type 316; 0.015 inch thick, 1/2 inch wide with wing or closed seal.
3. Aluminum: ASTM B 209, Alloy 3003, 3005, 3105, or 5005; Temper H-14, 0.020 inch thick, 1/2 inch wide with wing or closed seal.
4. Springs: Twin spring set constructed of stainless steel with ends flat and slotted to accept metal bands. Spring size determined by manufacturer for application.

## **2.7 CORNER ANGLES**

- A. PVC Corner Angles: 30 mils thick, minimum 1 by 1 inch, PVC according to ASTM D 1784, Class 16354-C. White or color-coded to match adjacent surface.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Examine substrates and conditions for compliance with requirements for installation and other conditions affecting performance of insulation application.
  1. Verify that systems and equipment to be insulated have been tested and are free of defects.
  2. Verify that surfaces to be insulated are clean and dry.
  3. Proceed with installation only after unsatisfactory conditions have been corrected.

### **3.2 PREPARATION**

- A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.
- B. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless steel surfaces, use demineralized water.

### **3.3 GENERAL INSTALLATION REQUIREMENTS**

- A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of equipment and piping including fittings, valves, and specialties.
- B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of equipment and pipe system as specified in insulation system schedules.
- C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.
- D. Install insulation with longitudinal seams at top and bottom of horizontal runs.
- E. Install multiple layers of insulation with longitudinal and end seams staggered.
- F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.
- G. Keep insulation materials dry during application and finishing.
- H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.
- I. Install insulation with least number of joints practical.
- J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.
  - 1. Install insulation continuously through hangers and around anchor attachments.
  - 2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
  - 3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.

4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.
- K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.
- L. Install insulation with factory-applied jackets as follows:
  1. Draw jacket tight and smooth.
  2. Cover circumferential joints with 3-inch wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4 inches o.c.
  3. Overlap jacket longitudinal seams at least 1-1/2 inches. Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge at 4 inches o.c.
    - a. For below ambient services, apply vapor-barrier mastic over staples.
  4. Cover joints and seams with tape as recommended by insulation material manufacturer to maintain vapor seal.
  5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to pipe flanges and fittings.
- M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.
- N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.
- O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

### **3.4 PENETRATIONS**

- A. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.
- B. Insulation Installation at Floor Penetrations:
  1. Pipe: Install insulation continuously through floor penetrations.
  2. Seal penetrations through fire-rated assemblies. Comply with appropriate section requirements in Division 07 – Thermal and Moisture Protection.

### **3.5 GENERAL PIPE INSULATION INSTALLATION**

- A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.
- B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions:
  - 1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity, unless otherwise indicated.
  - 2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
  - 3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
  - 4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.
  - 5. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below ambient services and a breather mastic for above ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.

### **3.6 MINERAL FIBER INSULATION INSTALLATION**

- A. Insulation Installation on Straight Pipes and Tubes:
  - 1. Secure each layer of preformed pipe insulation to pipe with wire or bands and tighten bands without deforming insulation materials.
  - 2. Where vapor barriers are indicated, seal longitudinal seams, end joints, and protrusions with vapor-barrier mastic and joint sealant.
  - 3. For insulation with factory-applied jackets on above ambient surfaces, secure laps with outward clinched staples at 6 inches o.c.

4. For insulation with factory-applied jackets on below ambient surfaces, do not staple longitudinal tabs but secure tabs with additional adhesive as recommended by insulation material manufacturer and seal with vapor-barrier mastic and flashing sealant.

**B. Insulation Installation on Pipe Fittings and Elbows:**

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed insulation elbows and fittings are not available, install mitered sections of pipe insulation, to a thickness equal to adjoining pipe insulation. Secure insulation materials with wire or bands.

**C. Insulation Installation on Valves and Pipe Specialties:**

1. Install preformed sections of same material as straight segments of pipe insulation when available.
2. When preformed sections are not available, install mitered sections of pipe insulation to valve body.
3. Arrange insulation to permit access to packing and to allow valve operation without disturbing insulation.
4. Install insulation to flanges as specified for flange insulation application.

### **3.7 FIELD QUALITY CONTROL**

- A. Perform tests and inspections.
- B. All insulation applications will be considered defective Work if sample inspection reveals noncompliance with requirements.

### **3.8 INDOOR PIPING INSULATION SCHEDULE**

**A. Domestic and Non-Potable Cold Water:**

1. Below 1½": Insulation shall be the following:
  - a. Mineral Fiber, Preformed Pipe Insulation, Type I: 1/2 inch thick.
2. 1½" and Larger: Insulation shall be the following:
  - a. Mineral Fiber, Preformed Pipe Insulation, Type I: 1/2 inch thick.

**END OF SECTION**

## **SECTION 22 11 16**

### **NON-POTABLE WATER PIPING**

#### **PART 1 GENERAL**

##### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

##### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Under-building slab and aboveground non-potable water pipes, tubes, fittings, and specialties inside the building.
  - 2. Specialty valves.
  - 3. Flexible connectors.

##### **1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Field quality-control reports.

##### **1.4 QUALITY ASSURANCE**

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF 61 for non-potable water piping and components.

#### **PART 2 PRODUCTS**

##### **2.1 PIPING MATERIALS**

- A. Comply with requirements listed on drawings for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

##### **2.2 COPPER TUBE AND FITTINGS**

- A. Hard Copper Tube: ASTM B 88, Type L water tube, drawn temper.
  - 1. Cast-Copper Solder-Joint Fittings: ASME B16.18, pressure fittings.

2. Wrought-Copper Solder-Joint Fittings: ASME B16.22, wrought-copper pressure fittings.
3. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces, and solder-joint or threaded ends.

## **2.3 PIPING JOINING MATERIALS**

- A. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
- B. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.

## **2.4 TRANSITION FITTINGS**

- A. General Requirements:
  1. Same size as pipes to be joined.
  2. Pressure rating at least equal to pipes to be joined.
  3. End connections compatible with pipes to be joined.
- B. Fitting-Type Transition Couplings: Manufactured piping coupling or specified piping system fitting.
- C. Sleeve-Type Transition Coupling: AWWA C219.

## **2.5 FLEXIBLE CONNECTORS**

- A. Bronze-Hose Flexible Connectors: Corrugated-bronze tubing with bronze wire-braid covering and ends brazed to inner tubing.
  1. Working-Pressure Rating: Minimum 200 psig .
  2. End Connections NPS 2 and Smaller: Threaded copper pipe or plain-end copper tube.
  3. End Connections NPS 2-1/2 and Larger: Flanged copper alloy.

# **PART 3 EXECUTION**

## **3.1 PIPING INSTALLATION**

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of non-potable water piping. Indicated locations and arrangements are used to size pipe

and calculate friction loss, expansion, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

- B. Install copper tubing under building slab according to CDA's "Copper Tube Handbook."
- C. Install non-potable water piping level and plumb.
- D. Install piping concealed from view and protected from physical contact by building occupants unless otherwise indicated and except in equipment rooms and service areas.
- E. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- F. Install piping adjacent to equipment and specialties to allow service and maintenance.
- G. Install piping to permit valve servicing.
- H. Install nipples, unions, special fittings, and valves with pressure ratings the same as or higher than system pressure rating used in applications below unless otherwise indicated.
- I. Install piping free of sags and bends.
- J. Install fittings for changes in direction and branch connections.
- K. Install unions in copper tubing at final connection to each piece of equipment, machine, and specialty.
- L. Install sleeves for piping penetrations of walls, ceilings, and floors.

### **3.2 JOINT CONSTRUCTION**

- A. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- B. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- C. Brazed Joints: Join copper tube and fittings according to CDA's "Copper Tube Handbook," "Braze Joints" Chapter.
- D. Soldered Joints: Apply ASTM B 813, water-flushable flux to end of tube. Join copper tube and fittings according to ASTM B 828 or CDA's "Copper Tube Handbook."
- E. Flanged Joints: Select appropriate asbestos-free, nonmetallic gasket material in size, type, and thickness suitable for non-potable water service. Join flanges with gasket and bolts according to ASME B31.9.

- F. Dissimilar-Material Piping Joints: Make joints using adapters compatible with materials of both piping systems.

### **3.3 VALVE INSTALLATION**

- A. Install shutoff valve close to water main on each branch and riser serving plumbing fixtures or equipment, on each water supply to equipment, and on each water supply to plumbing fixtures that do not have supply stops. Use ball or gate valves for piping NPS 3 and smaller. Use butterfly or gate valves for piping NPS 4 and larger.
- B. Install drain valves for equipment at base of each water riser, at low points in horizontal piping, and where required to drain water piping. Drain valves are specified in Division 22 Section "Non-potable Water Piping Specialties."
  - 1. Hose-End Drain Valves: At low points in water mains, risers, and branches.
  - 2. Stop-and-Waste Drain Valves: Instead of hose-end drain valves where indicated.

### **3.4 TRANSITION FITTING INSTALLATION**

- A. Install transition couplings at joints of dissimilar piping.
- B. Transition Fittings in Underground Non-potable Water Piping:
  - 1. NPS 1-1/2 and Smaller: Fitting-type coupling.

### **3.5 HANGER AND SUPPORT INSTALLATION**

- A. Comply with requirements in Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment" for pipe hanger and support products and installation.
  - 1. Vertical Piping: MSS Type 8 or 42, clamps.
  - 2. Individual, Straight, Horizontal Piping Runs:
    - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
    - b. Longer Than 100 Feet : MSS Type 43, adjustable roller hangers.
  - 3. Base of Vertical Piping: MSS Type 52, spring hangers.
- B. Support vertical piping and tubing at base and at each floor.
- C. Rod diameter may be reduced one size for double-rod hangers, to a minimum of 3/8 inch.
- D. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 3/4 and Smaller: 60 inches with 3/8-inch rod.
  2. NPS 1 and NPS 1-1/4 : 72 inches with 3/8-inch rod.
  3. NPS 1-1/2 and NPS 2 : 96 inches with 3/8-inch rod.
  4. NPS 2-1/2 : 108 inches with 1/2-inch rod.
  5. NPS 3 to NPS 5 : 10 feet with 1/2-inch rod.
  6. NPS 6 : 10 feet with 5/8-inch rod.
- E. Install supports for vertical copper tubing every 10 feet .
- F. Support piping and tubing not listed in this article according to MSS SP-69 and manufacturer's written instructions.

### **3.6 CONNECTIONS**

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to equipment and machines to allow service and maintenance.
- C. Connect non-potable water piping to exterior water-service piping. Use transition fitting to join dissimilar piping materials.
1. Connect non-potable water piping to water-service piping with shutoff valve.

### **3.7 IDENTIFICATION**

- A. Identify system components. Label pressure piping with system operating pressure.

### **3.8 FIELD QUALITY CONTROL**

- A. Perform tests and inspections.
- B. Piping Inspections:
1. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.
  2. During installation, notify authorities having jurisdiction at least one day before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:
    - a. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.

- b. Final Inspection: Arrange final inspection for authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
  - 3. Reinspection: If authorities having jurisdiction find that piping will not pass tests or inspections, make required corrections and arrange for reinspection.
  - 4. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- C. Piping Tests:
- 1. Fill non-potable water piping. Check components to determine that they are not air bound and that piping is full of water.
  - 2. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit a separate report for each test, complete with diagram of portion of piping tested.
  - 3. Leave new, altered, extended, or replaced non-potable water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
  - 4. Cap and subject piping to static water pressure not less than the working pressure of the system, or by an air test of not less than 50 psig, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for at least one hour. Leaks and loss in test pressure constitute defects that must be repaired. The water used for testing must be obtained from a non-potable source.
  - 5. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.
  - 6. Prepare reports for tests and for corrective action required.
- D. Non-potable water piping will be considered defective if it does not pass tests and inspections.
- E. Prepare test and inspection reports.

### **3.9 CLEANING**

- A. Clean and disinfect non-potable water piping IN ACCORDANCE NYS DEPARTMENT OF HEALTH PROCEDURES or as follows:
  - 1. Purge new piping and parts of existing piping that have been altered, extended, or repaired before using.

2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction; if methods are not prescribed, use procedures described in either AWWA C651 or AWWA C652 or follow procedures described below:
  - a. Flush piping system with clean, water until dirty water does not appear at outlets.
  - b. Fill and isolate system according to either of the following:
    - 1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.
    - 2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.
  - c. Flush system with clean, water until no chlorine is in water coming from system after the standing time.
  - d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedures if biological examination shows contamination.
- B. Prepare and submit reports of purging and disinfecting activities.
- C. Clean interior of non-potable water piping system. Remove dirt and debris as work progresses.

### **3.10 PIPING SCHEDULE**

- A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.
- B. Flanges and unions may be used for aboveground piping joints unless otherwise indicated.
- C. Aboveground non-potable water piping, NPS 4 and smaller, shall be the following:
  1. Hard copper tube, ASTM B 88, Type L; wrought copper solder-joint fittings; and soldered joints.

### **3.11 VALVE SCHEDULE**

- A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
  1. Shutoff Duty: Use ball valves for piping NPS 3 and smaller. Use butterfly, ball, or gate valves with flanged ends for piping NPS 4 and larger.
  2. Drain Duty: Hose-end drain valves.

END OF SECTION

## DIVISION 26 - ELECTRICAL

## **SECTION 26 05 00**

### **COMMON WORK RESULTS FOR ELECTRICAL**

#### **PART 1 GENERAL**

##### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

##### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Electrical equipment coordination and installation.
  - 2. Sleeves for raceways and cables.
  - 3. Sleeve Seals
  - 4. Common electrical installation requirements.

##### **1.3 DEFINITIONS**

- A. EPDM: Ethylene-propylene-diene terpolymer rubber.
- B. NBR: Acrylonitrile-butadiene rubber.

##### **1.4 COORDINATION**

- A. Coordinate arrangement, mounting, and support of electrical equipment:
  - 1. To allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.
  - 2. To provide for ease of disconnecting the equipment with minimum interference to other installations.
  - 3. To allow right of way for piping and conduit installed at required slope.
  - 4. So connecting raceways, cables, wireways, cable trays, and busways will be clear of obstructions and of the working and access space of other equipment.
- B. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete, masonry walls, and other structural components as they are constructed.

## **PART 2 PRODUCTS**

### **2.1 REFER TO SCHEDULES AND EQUIPMENT NOTES ON DRAWINGS FOR BASIS OF DESIGN MATERIALS, MANUFACTURERS AND MODEL NUMBERS.**

### **2.2 SLEEVES FOR RACEWAYS AND CABLES**

- A. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, galvanized steel, plain ends.

### **2.3 SLEEVE SEALS**

- A. Description: Modular sealing device, designed for field assembly, to fill annular space between sleeve and raceway or cable.
  - 1. Sealing Elements: EPDM interlocking links shaped to fit surface of cable or conduit. Include type and number required for material and size of raceway or cable.
  - 2. Pressure Plates: Carbon steel. Include two for each sealing element.
  - 3. Connecting Bolts and Nuts: Carbon steel with corrosion-resistant coating of length required to secure pressure plates to sealing elements. Include one for each sealing element.

### **2.4 GROUT**

- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

## **PART 3 EXECUTION**

### **3.1 COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION**

- A. Comply with NECA 1.
- B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.
- C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
- D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such

a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.

- E. Right of Way: Give to piping systems installed at a required slope.

### **3.2 SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS**

- A. Electrical penetrations occur when raceways, cables, wireways, cable trays, or busways penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.
- B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of slabs and walls.
- C. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.
- D. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system used are fabricated during construction of floor or wall.
- E. Cut sleeves to length for mounting flush with both surfaces of walls.
- F. Extend sleeves installed in floors 2 inches above finished floor level.
- G. Size pipe sleeves to provide 1/4-inch annular clear space between sleeve and raceway or cable, unless indicated otherwise.
- H. Seal space outside of sleeves with grout for penetrations of concrete and masonry
  - 1. Promptly pack grout solidly between sleeve and wall so no voids remain. Tool exposed surfaces smooth; protect grout while curing.
- I. Fire-Rated-Assembly Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at raceway and cable penetrations. Install sleeves and seal raceway and cable penetration sleeves with firestop materials. Comply with requirements in Division 07 Section, "Penetration Firestopping."
- J. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

### **3.3 SLEEVE-SEAL INSTALLATION**

- A. Install to seal exterior wall penetrations.
- B. Use type and number of sealing elements recommended by manufacturer for raceway or cable material and size. Position raceway or cable in center of sleeve. Assemble mechanical sleeve seals and install in annular space between raceway or cable and sleeve.

Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.

### **3.4 FIRESTOPPING**

- A. Apply firestopping to penetrations of fire-rated floor and wall assemblies for electrical installations to restore original fire-resistance rating of assembly. Firestopping materials and installation requirements are specified in Division 07 Section, "Penetration Firestopping."

END OF SECTION

## **SECTION 26 05 19**

### **LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES**

#### **PART 1 GENERAL**

##### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

##### **1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Building wires and cables rated 600 V and less.
  - 2. Connectors, splices, and terminations rated 600 V and less.

##### **1.3 DEFINITIONS**

- A. EPDM: Ethylene-propylene-diene terpolymer rubber.
- B. NBR: Acrylonitrile-butadiene rubber.

##### **1.4 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Qualification Data: For testing agency.
- C. Field quality control test reports.

##### **1.5 QUALITY ASSURANCE**

- A. Testing Agency Qualifications: An independent agency, with the experience and capability to conduct the testing indicated, that is a member company of the InterNational Electrical Testing Association or is a nationally recognized testing laboratory (NRTL) as defined by OSHA in 29 CFR 1910.7, and that is acceptable to authorities having jurisdiction.
  - 1. Testing Agency's Field Supervisor: Person currently certified by the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Part 3.

- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. Comply with NFPA 70.

## **PART 2 PRODUCTS**

### **2.1 CONDUCTORS AND CABLES**

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Aluminum and Copper Conductors: Comply with NEMA WC 70.
- C. Conductor Insulation: Comply with NEMA WC 70 for Types THHN-THWN.

### **2.2 CONNECTORS AND SPLICES**

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

## **PART 3 EXECUTION**

### **3.1 CONDUCTOR MATERIAL APPLICATIONS**

- A. Feeders: Copper unless otherwise indicated on drawings. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
- B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

### **3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS**

- A. Exposed Feeders: Type THHN-THWN, single conductors in raceway.
- B. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN-THWN, single conductors in raceway.
- C. Exposed Branch Circuits, Including in Crawlspace: Type THHN-THWN, single conductors in raceway.

- D. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Metal-clad cable, Type MC, or single conductors in raceway.

### **3.3 INSTALLATION OF CONDUCTORS AND CABLES**

- A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.
- B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- E. Support cables according to Division 26 Section, "Hangers and Supports for Electrical Systems."
- F. Identify and color code conductors and cables according to Division 26 Section, "Identification for Electrical Systems."

### **3.4 CONNECTIONS**

- A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- B. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
  - 1. Use oxide inhibitor in each termination and splice for aluminum conductors.

### **3.5 FIELD QUALITY CONTROL**

- A. Testing Agency: Engage a qualified testing agency to perform tests and inspections and prepare test reports.
- B. Perform tests and inspections and prepare test reports.
- C. Tests and Inspections:
  - 1. After installing conductors and cables and before electrical circuitry has been energized, test feeder conductors for compliance with requirements.
  - 2. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

- D. Test Reports: Prepare a written report to record the following:
1. Test procedures used.
  2. Test results that comply with requirements.
  3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.
- E. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION

## **SECTION 26 05 26**

### **GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS**

#### **PART 1 GENERAL**

##### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

##### **1.2 SUMMARY**

- A. Section Includes: Grounding systems and equipment.

##### **1.3 SUBMITTALS**

- A. Product Data: For each type of product indicated.
- B. Informational Submittals: Plans showing dimensioned as-built locations of grounding features specified in "Field Quality Control" Article, including the following:
  - 1. Grounding conductors.
- C. Qualification Data: For qualified testing agency and testing agency's field supervisor.
- D. Field quality-control reports.

##### **1.4 QUALITY ASSURANCE**

- A. Testing Agency Qualifications: Member company of NETA or an NRTL.
  - 1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.
- B. 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.
- C. Comply with UL 467 for grounding and bonding materials and equipment.

#### **PART 2 PRODUCTS**

##### **2.1 CONDUCTORS**

- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:

1. Solid Conductors: ASTM B 3.
2. Stranded Conductors: ASTM B 8.
3. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.

## **2.2 CONNECTORS**

- A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
- B. Bolted Connectors for Conductors and Pipes: Copper or copper alloy, pressure type with at least two bolts.
  1. Pipe Connectors: Clamp type, sized for pipe.
- C. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.
- D. Bus-bar Connectors: Mechanical type, cast silicon bronze, solderless exothermic-type wire terminals, and long-barrel, two-bolt connection to ground bus bar.

## **PART 3 EXECUTION**

### **3.1 APPLICATIONS**

- A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.
- B. Conductor Terminations and Connections:
  1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
  2. Connections to Structural Steel: Welded connectors.

### **3.2 EQUIPMENT GROUNDING**

- A. Install insulated equipment grounding conductors with all feeders and branch circuits.
- B. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:
  1. Feeders and branch circuits.
  2. Lighting circuits.
  3. Receptacle circuits.

4. Single-phase motor and appliance branch circuits.
5. Three-phase motor and appliance branch circuits.
6. Flexible raceway runs.
7. Armored and metal-clad cable runs.

### **3.4 INSTALLATION**

- A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- B. Grounding and Bonding for Piping:
  1. Metal Water Service Pipe: Install insulated copper grounding conductors, 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; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.
  2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
  3. Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.
- C. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install bonding jumper to bond across flexible duct connections to achieve continuity.
- D. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column.

### **3.5 LABELING**

- A. Comply with requirements in Division 26 Section "Identification for Electrical Systems" Article for instruction signs. The label or its text shall be green.

### **3.6 FIELD QUALITY CONTROL**

- A. Tests and Inspections:
  1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.

2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
  3. Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal. Make tests at ground rods before any conductors are connected.
    - a. Measure ground resistance no fewer than two 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.
    - b. Perform tests by fall-of-potential method according to IEEE 81.
- B. Grounding system will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.
- D. Report measured ground resistances that exceed the following values:
1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
  2. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 ohms.
  3. Power and Lighting Equipment or System with Capacity More Than 1000 kVA: 3 ohms.
- E. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Engineer promptly and include recommendations to reduce ground resistance.

END OF SECTION

## **SECTION 26 05 29**

### **HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS**

#### **PART 1 GENERAL**

##### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

##### **1.2 SUMMARY**

- A. This Section includes the following:
  - 1. Hangers and supports for electrical equipment and systems.

##### **1.3 DEFINITIONS**

- A. EMT: Electrical metallic tubing.
- B. IMC: Intermediate metal conduit.
- C. RMC: Rigid metal conduit.

##### **1.4 PERFORMANCE REQUIREMENTS**

- A. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.
- B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
- C. Rated Strength: Adequate in tension, shear, and pullout force to resist maximum loads calculated or imposed for this Project, with a minimum structural safety factor of five times the applied force.

##### **1.5 SUBMITTALS**

- A. Product Data: For the following:
  - 1. Steel slotted support systems.
- B. Shop Drawings: Show fabrication and installation details and include calculations for the following:
  - 1. Trapeze hangers. Include Product Data for components.
  - 2. Steel slotted channel systems. Include Product Data for components.

3. Equipment supports.

## **1.6 QUALITY ASSURANCE**

- A. Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- B. Comply with NFPA 70.

## **PART 2 PRODUCTS**

### **2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS**

- A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
  1. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
  2. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
  3. Channel Dimensions: Selected for applicable load criteria.
- B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.
- C. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
2. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
3. Toggle Bolts: All-steel springhead type.
4. Hanger Rods: Threaded steel.

### **2.2 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES**

- A. Description: Welded or bolted, structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.
- B. Materials: Comply with requirements in Division 05 Section "Metal Fabrications" for steel shapes and plates.

## **PART 3 EXECUTION**

### **3.1 APPLICATION**

- A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.
- B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as scheduled in NECA 1, where its Table 1 lists maximum spacings less than stated in NFPA 70. Minimum rod size shall be 1/4 inch in diameter.
- C. Multiple Raceways: Install trapeze-type supports fabricated with steel slotted support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.
  - 1. Secure raceways and cables to these supports with two-bolt conduit clamps.
- D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

### **3.2 SUPPORT INSTALLATION**

- A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.
- B. Raceway Support Methods: In addition to methods described in NECA 1, EMT may be supported by openings through structure members, as permitted in NFPA 70.
- C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.
- D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:
  - 1. To New Concrete: Bolt to concrete inserts.
  - 2. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
  - 3. To Existing Concrete: Expansion anchor fasteners.
  - 4. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches

thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.

- 5. To Steel: Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.
- 6. To Light Steel: Sheet metal screws.
- E. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

### **3.3 INSTALLATION OF FABRICATED METAL SUPPORTS**

- A. Comply with installation requirements in Division 05 Section "Metal Fabrications" for site-fabricated metal supports.
- B. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.
- C. Field Welding: Comply with AWS D1.1/D1.1M.

### **3.4 PAINTING**

- A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
  - 1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.
- B. Touchup: Comply with requirements in Division 09 painting Sections for cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal.
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION

## **SECTION 26 05 33**

### **RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS**

#### **PART 1 GENERAL**

##### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

##### **1.2 SUMMARY**

- A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.

##### **1.3 DEFINITIONS**

- A. EMT: Electrical metallic tubing.
- B. ENT: Electrical nonmetallic tubing.
- C. EPDM: Ethylene-propylene-diene terpolymer rubber.
- D. FMC: Flexible metal conduit.
- E. IMC: Intermediate metal conduit.
- F. LFMC: Liquidtight flexible metal conduit.
- G. LFNC: Liquidtight flexible nonmetallic conduit.
- H. NBR: Acrylonitrile-butadiene rubber.
- I. RNC: Rigid nonmetallic conduit.

##### **1.4 SUBMITTALS**

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

##### **1.5 QUALITY ASSURANCE**

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

## **PART 2 PRODUCTS**

### **2.1 METAL CONDUIT AND TUBING**

- A. Rigid Steel Conduit: ANSI C80.1.
- B. IMC: ANSI C80.6.
- C. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.
  - 1. Comply with NEMA RN 1.
  - 2. Coating Thickness: 0.040 inch, minimum.
- D. EMT: ANSI C80.3.
- E. FMC: Zinc-coated steel.
- F. LFMC: Flexible steel conduit with PVC jacket.
- G. Fittings for Conduit (Including all Types and Flexible and Liquidtight), EMT, and Cable: NEMA FB 1; listed for type and size raceway with which used, and for application and environment in which installed.
  - 1. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 886.
  - 2. Fittings for EMT: Steel, set-screw type.
  - 3. Coating for Fittings for PVC-Coated Conduit: Minimum thickness, 0.040 inch, with overlapping sleeves protecting threaded joints.
- H. Joint Compound for Rigid Steel Conduit or IMC: Listed for use in cable connector assemblies, and compounded for use to lubricate and protect threaded raceway joints from corrosion and enhance their conductivity.

### **2.4 BOXES, ENCLOSURES, AND CABINETS**

- A. Sheet Metal Outlet and Device Boxes: NEMA OS 1.
- B. Sheet Metal Pull and Junction Boxes: NEMA OS 1.

## **PART 3 EXECUTION**

### **3.1 RACEWAY APPLICATION**

- A. Outdoors: Apply raceway products as specified below, unless otherwise indicated:
  - 1. Exposed Conduit: Rigid steel conduit.

2. Concealed Conduit, Aboveground: EMT.
  3. Underground Conduit: RNC, Type EPC-80-PVC, direct buried.
  4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
  5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.
- B. Comply with the following indoor applications, unless otherwise indicated:
1. Exposed, Not Subject to Physical Damage: EMT.
  2. Exposed, Not Subject to Severe Physical Damage: EMT.
  3. Exposed and Subject to Severe Physical Damage: Rigid steel conduit.
  4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
  5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
  6. Damp or Wet Locations: Rigid steel conduit.
  7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4, stainless steel in damp or wet locations.
- C. Minimum Raceway Size: 3/4-inch trade size.
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.
  2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with that material. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer.

### **3.2 INSTALLATION**

- A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.
- B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- C. Complete raceway installation before starting conductor installation.

- D. Support raceways as specified in Division 26 Section "Hangers and Supports for Electrical Systems."
- E. Arrange stub-ups so curved portions of bends are not visible above the finished slab.
- F. Install no more than the equivalent of three 90-degree bends in any conduit run except for communications conduits, for which fewer bends are allowed.
- G. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.
- H. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.
- I. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG.
- J. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.
- K. Flexible Conduit Connections: Use maximum of 48 inches of flexible conduit for equipment subject to vibration, noise transmission, or movement; and for transformers and motors.
  - 1. Use LFMC in damp or wet locations subject to severe physical damage.
  - 2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.

### **3.3 PROTECTION**

- A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of 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 touchup coating recommended by manufacturer.

END OF SECTION

## **SECTION 26 05 53**

### **IDENTIFICATION FOR ELECTRICAL SYSTEMS**

#### **PART 1 GENERAL**

##### **1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

##### **1.2 SUMMARY**

- A. Section Includes:
  - 1. Identification for raceways.
  - 2. Identification for conductors.
  - 3. Warning labels and signs.
  - 4. Equipment identification labels.
  - 5. Miscellaneous identification products.

##### **1.3 QUALITY ASSURANCE**

- A. Comply with ANSI A13.1.
- B. Comply with NFPA 70.
- C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.
- D. Comply with ANSI Z535.4 for safety signs and labels.
- E. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

##### **1.4 COORDINATION**

- A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

- B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
- C. Coordinate installation of identifying devices with location of access panels and doors.
- D. Install identifying devices before installing acoustical ceilings and similar concealment.

## **PART 2 PRODUCTS**

### **2.1 POWER RACEWAY IDENTIFICATION MATERIALS**

- A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.
- B. Colors for Raceways Carrying Circuits at 600 V or Less:
  - 1. Black letters on an orange field
  - 2. Legend: Indicate voltage.
- C. Self-Adhesive Vinyl Labels for Raceways Carrying Circuits at 600 V or Less: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

### **2.2 CONDUCTOR IDENTIFICATION MATERIALS**

- A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.
- B. Self-Adhesive Vinyl Labels: Preprinted, flexible label laminated with a clear, weather- and chemical-resistant coating and matching wraparound adhesive tape for securing ends of legend label.

### **2.3 EQUIPMENT IDENTIFICATION LABELS**

- A. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a dark-gray background. Minimum letter height shall be 3/8 inch.

## **PART 3 EXECUTION**

### **3.1 INSTALLATION**

- A. Verify identity of each item before installing identification products.
- B. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment.
- C. Apply identification devices to surfaces that require finish after completing finish work.

- D. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
- E. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
- F. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.
- G. Underground-Line Warning Tape: During backfilling of trenches install continuous underground-line warning tape directly above line at 12 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench exceeds 16 inches overall. Align tape along the width and along the centerline of conduit.
- H. Painted Identification: Comply with requirements in Division 09 painting Sections for surface preparation and paint application.

### **3.2 IDENTIFICATION SCHEDULE**

- A. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits More Than 30 A, and 120V to ground: Identify with self-adhesive vinyl label. Install labels at 30-foot maximum intervals.
- B. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage.
- C. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.
  - 1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded feeder and branch-circuit conductors.
    - a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.
    - b. Colors for 208/120-V Circuits:
      - 1) Phase A: Black.
      - 2) Phase B: Red.
      - 3) Phase C: Blue.

- c. Colors for 480/277-V Circuits:
    - 1) Phase A: Brown.
    - 2) Phase B: Orange.
    - 3) Phase C: Yellow.
  - d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.
- D. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall be as required by NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.
- E. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.
- 1. Labeling Instructions:
    - a. Indoor Equipment: Engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high label; where two lines of text are required, use labels 2 inches high.
    - b. Outdoor Equipment: Engraved, laminated acrylic or melamine label.
    - c. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
    - d. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.
  - 2. Equipment to Be Labeled:
    - a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be engraved, laminated acrylic or melamine label.
    - b. Enclosures and electrical cabinets.

- c. Emergency system boxes and enclosures.
- d. Enclosed switches.

END OF SECTION

**ADDENDUM NO. 1**

**ATTACHMENT NO. 2**

CONSTRUCTION PLANS  
FOR THE  
**ROCK CUT ROAD TRANSFER STATION  
BUILDING 2 OPTIMIZATION**  
PREPARED FOR  
**ONONDAGA COUNTY RESOURCE RECOVERY AGENCY**  
5808 ROCK CUT ROAD, JAMESVILLE, NEW YORK

NOVEMBER 2021

△ ADDENDUM 1 - NOVEMBER 30, 2021

SHEET INDEX

GENERAL CONTRACT DRAWINGS (APPLICABLE TO ALL CONTRACTS)

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CIVIL

C1	GENERAL NOTES
C2	EXISTING SITE CONDITIONS & OPERATIONS PLAN

ARCHITECTURAL

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A-1	CODE SHEET
A-2	BASEMENT LIFE SAFETY PLAN
A-3	FIRST FLOOR LIFE SAFETY PLAN
<del>A-4</del>	<del>ACCESSIBLE TYPICAL DETAILS</del>
A-4	EXISTING BASEMENT PLAN
A-5	EXISTING FIRST FLOOR PLAN
A-6	BASEMENT DEMO PLAN
A-7	FIRST FLOOR DEMO PLAN
A-8	BASEMENT FLOOR PLAN
A-9	FIRST FLOOR PLAN

SHEET INDEX

CONTRACT NO. 1 - GENERAL TRANSFER STATION BUILDING 2 OPTIMIZATION

STRUCTURAL

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S001	TITLE SHEET
S101	PARTIAL DEMOLITION PLAN AT FOUNDATION
S102	PARTIAL DEMOLITION PLAN AT TIPPING FLOOR
S103	PARTIAL FOUNDATION PLAN
S104	PARTIAL FRAMING PLAN AT TIPPING FLOOR
S105	PUSHWALL FRAMING PLAN
S201	SECTIONS
S202	SECTIONS
S203	SECTIONS
S204	SECTIONS
S301	DETAILS
S402	SPECIAL INSPECTIONS

CONTRACT NO. 2 - PLUMBING & FIRE SUPPRESSION BUILDING 2 OPTIMIZATION

FIRE PROTECTION

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FP1	FIRE PROTECTION: BASEMENT FLOOR PLANS
FP2	FIRE PROTECTION: FIRST FLOOR DEMO PLAN
FP3	FIRE PROTECTION: FIRST FLOOR PLAN

PLUMBING

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P1	PLUMBING: BASEMENT FLOOR PLANS
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CONTRACT NO. 3 - ELECTRICAL BUILDING 2 OPTIMIZATION

ELECTRICAL

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E1	ELECTRICAL: FIRST FLOOR DEMO PLAN
E2	ELECTRICAL: FIRST FLOOR PLAN



PREPARED BY: CORNERSTONE ENGINEERING AND GEOLOGY, PLLC

100 CRYSTAL RUN ROAD  
SUITE 101  
MIDDLETOWN, NEW YORK 10941  
Tel: (877) 294-9070  
Fax (845) 692-5894



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OVERALL SCOPE OF WORK:

1. THE PROJECT WILL BE LOCATED ON THE SITE OF THE ONONDAGA COUNTY RESOURCE RECOVERY AGENCY'S ROCK CUT ROAD TRANSFER STATION, WHICH IS SUBJECT TO THE NYSDEC PART 360 SOLID WASTE MANAGEMENT FACILITY PERMIT 7-5142-00036/0003 (SWD 34TP0057), EFFECTIVE 03/03/2014 AND HAVING AN EXPIRATION DATE OF 03/02/2024.
2. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR, EQUIPMENT, AND INCIDENTALS REQUIRED TO PERFORM THE WORK UNDER THE CONTRACT AS DETAILED IN THESE CONTRACT DOCUMENTS.
3. THE WORK TO BE PERFORMED FOR THIS PROJECT SHALL INCLUDE ALL WORK SHOWN ON THE CONSTRUCTION PLANS AND DESCRIBED IN THE TECHNICAL SPECIFICATIONS. ALL WORK SHALL BE IN ACCORDANCE WITH THE CONSTRUCTION PLANS, TECHNICAL SPECIFICATIONS, AND ADDENDUMS (IF ANY). SHOULD A CONFLICT ARISE BETWEEN THE CONSTRUCTION PLANS, TECHNICAL SPECIFICATIONS, AND/OR ADDENDUMS (IF ANY) THEY SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION. THE DIRECTIVE PROVIDED BY THE ENGINEER IN RESPONSE TO THE CONFLICT SHALL GOVERN.
4. CONTRACTOR SHALL PLAN ON VEHICULAR TRAFFIC ASSOCIATED WITH THE EXISTING TRANSFER STATION MOVING IN AND OUT OF THE AREA OF THE PROJECT SITE AS DEPICTED ON SHEET NO. C2 "EXISTING SITE CONDITIONS & OPERATIONS PLAN" THROUGHOUT THE CONTRACT. AREAS OUTSIDE OF THE DEPICTED LIMIT OF WORK AND CONTRACTOR STAGING AREA ARE TO BE ASSUMED TO BE UTILIZED FOR ACTIVE TRANSFER STATION OPERATIONS BY THE OWNER.
5. CONTRACTOR SHALL CONSTRUCT ALL WORK TO ACCOMMODATE THE OWNER'S OCCUPANCY REQUIREMENTS THROUGHOUT THE DURATION OF THE PROJECT AND COORDINATE THE CONSTRUCTION SCHEDULE AND OPERATIONS WITH THE OWNER, ENGINEER, AND SUBCONTRACTORS (IF ANY).
6. CONTRACTOR SHALL COOPERATE WITH THE OWNER TO MINIMIZE CONFLICT AND TO FACILITATE THE OWNER'S OPERATIONS AND SHALL SCHEDULE WORK TO ACCOMMODATE THIS REQUIREMENT.
7. THE ONONDAGA COUNTY RESOURCE RECOVERY AGENCY'S ROCK CUT ROAD TRANSFER STATION IS CURRENTLY OPEN TO THE PUBLIC FROM 5:00 AM TO 3:00 PM MONDAY THROUGH FRIDAY. THE OWNER IS EXPECTED TO BE OPERATIONAL ON SITE FROM 3:00 AM TO 3:00 PM MONDAY THROUGH SATURDAY. HOURS MAY BE EXTENDED IN CONFORMANCE WITH THE SOLID WASTE MANAGEMENT FACILITY PERMIT (SEE TECHNICAL SPECIFICATION SECTION 01 10 00 "SUMMARY OF WORK").
8. WEEKEND WORK MAY BE ALLOWED BY THE OWNER. HOURS OF OPERATION WILL BE ESTABLISHED AT THE PRE-CONSTRUCTION MEETING.

CONSTRUCTION NOTES:

1. CONTRACTOR IS ADVISED THAT EXISTING SITE FACILITIES IN THE VICINITY OF THE PROJECT (SERVICE AREAS, TRANSFER STATION BUILDINGS 1 & 3, TRUCK SCALES, SCALE HOUSE, OFFICES, AND EMPLOYEE FACILITIES) ARE ACTIVE AND WILL REMAIN IN USE BY THE OWNER AND/OR OTHERS AS DEPICTED ON SHEET NO. C2 "EXISTING SITE CONDITIONS & OPERATIONS PLAN". THEREFORE, UNLESS OTHERWISE PERMITTED, THE CONTRACTOR SHALL PERFORM THE PROPOSED WORK AND PROVIDE THE NECESSARY CONTROLS SUCH THAT SAFE PEDESTRIAN AND VEHICULAR ACCESS TO ALL EXISTING SITE FACILITIES ARE MAINTAINED AT ALL TIMES. ALL WORK SHALL BE COORDINATED WITH THE OWNER AND PERFORMED SUCH AS TO NOT IMPEDE OR INTERFERE WITH OPERATIONS SUPPORTING THE FACILITY.
2. ALL ABOVEGROUND STRUCTURES AND SURFACE FEATURES SHOWN HEREON ARE THE RESULT OF A FIELD SURVEY UNLESS NOTED OTHERWISE. THERE MAY BE OTHER UNDERGROUND UTILITIES, THE EXISTENCE OF WHICH IS NOT KNOWN. SIZE, DEPTH, CONDITION AND LOCATION OF ALL UTILITIES AND STRUCTURES IN THE VICINITY OF WORK MUST BE VERIFIED BY CONTRACTOR BY APPROPRIATE MEANS INCLUDING CONTACTING APPROPRIATE AUTHORITIES.
3. THE CONTRACTOR SHALL COORDINATE WITH, AND OBTAIN APPROVAL FROM, THE OWNER BEFORE COMMENCING ANY DEMOLITION OR CONSTRUCTION ACTIVITIES.
4. THE CONTRACTOR SHALL CONTACT THE OWNER AND ENGINEER AT LEAST THREE (3) BUSINESS DAYS PRIOR TO CONDUCTING OUTDOOR CONSTRUCTION OR UNDERGROUND DISTURBANCE OF ANY KIND.
5. CONTRACTOR SHALL VERIFY AND IDENTIFY THE EXACT LOCATIONS OF ALL UTILITIES AND CONSTRUCTIONS IDENTIFIED PRIOR TO COMMENCING WORK IN THE PROJECT AREA.
6. SITE CLEANUP AND HOUSEKEEPING IS THE RESPONSIBILITY OF THE CONTRACTOR.
7. CONTRACTOR SHALL KEEP THE WORK AREA CLEAN, HAZARD FREE, AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
8. CONTRACTOR SHALL CONFINE MATERIALS AND STORAGE, AND CONSTRUCTION OPERATIONS TO THE LIMITS SHOWN AND/OR INDICATED BY LAWS, ORDINANCES, PERMITS, AND THE DIRECTIONS OF THE OWNER AND/OR ENGINEER, SO AS TO NOT UNREASONABLY ENCUMBER THE PREMISES WITH SUCH MATERIALS, BUT SHALL STORE THEM IN ORDERLY FASHION SO THAT THEY WILL NOT INTERFERE WITH THE WORK UNDER CONTRACT OR WITH THE OPERATION OF THE OWNER'S FACILITIES. CONTRACTOR SHALL NOT LOAD NOR PERMIT ANY PART OF THE WORK TO BE LOADED WITH A WEIGHT THAT WILL ENDANGER ITS SAFETY OR UNLIVELY AFFECT THE STRUCTURE OR ANY PART THEREOF. CONTRACTOR SHALL ENFORCE THE INSTRUCTIONS OF THE OWNER REGARDING SIGNS, FIRES, AND SMOKING.
9. CONTRACTOR STAGING AREAS AND STOCKPILES OF MATERIAL SHALL BE IN AREAS APPROVED OR DESIGNATED BY THE OWNER AND ENGINEER DURING THE PRE-CONSTRUCTION MEETING.
10. CONTRACTOR OR ANY OF THEIR EMPLOYEES SHALL ONLY PARK VEHICLES AT LOCATIONS AS SHOWN OR AS SPECIFICALLY APPROVED BY THE OWNER FOR THIS PURPOSE.
11. CONTRACTOR SHALL CONDUCT ACTIVITIES ASSOCIATED WITH THIS WORK IN A MANNER CONSISTENT WITH ANY AND ALL REQUIREMENTS OF THE OWNER INCLUDING, BUT NOT LIMITED TO, SITE USE, PROTECTION OF PERSONS AND PROPERTY, WASTE CONTAINMENT, SITE SECURITY, AND NOTIFICATION.
12. UNLESS OTHERWISE DIRECTED BY THESE CONSTRUCTION PLANS, OR ALLOWED BY THE AUTHORITIES HAVING JURISDICTION, ALL EXISTING FACILITIES SHALL BE PROTECTED AND SHALL REMAIN IN SERVICE AND ACCESSIBLE.
13. THE CONTRACTOR SHALL PROVIDE APPROPRIATE ON-SITE TOILET FACILITIES FOR CONTRACTOR AND ALL SUB-CONTRACTOR'S EMPLOYEES DURING ALL PHASES OF CONSTRUCTION. THE OWNER'S TOILET FACILITIES WILL NOT BE AVAILABLE FOR THE CONTRACTOR'S USE.
14. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF CONTRACT DOCUMENTS (CONSTRUCTION PLANS, TECHNICAL SPECIFICATIONS, AND ADDENDUMS (IF ANY)) ON SITE AT ALL TIMES AND ENSURE THE DISTRIBUTION OF NEW REQUIREMENTS TO SUB-CONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD BID DOCUMENTS SHALL BE MARKED VOID AND REMOVED FROM THE PROJECT AREA.
15. CONTRACTOR SHALL FURNISH COMPLETE SETS OF RECORD DRAWINGS, ONE (1) ELECTRONIC COPY (.PDF OR APPROVED EQUAL) AND FOUR (4) HARD COPIES SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW YORK, TO THE OWNER WITHIN FIVE (5) DAYS OF SUBSTANTIAL COMPLETION OF THE PROJECT. AT A MINIMUM, THE AS-BUILT DRAWINGS SHALL INCLUDE ALL FEATURES, STRUCTURES, UTILITIES, EQUIPMENT, AND APPURTENANCES DEPICTED WITHIN THE CONTRACT DOCUMENTS, AS WELL AS ALL THIRD PARTY VENDOR DRAWINGS AS DESCRIBED WITHIN SECTION 01 70 00 OF THE TECHNICAL SPECIFICATIONS.
16. PRIOR TO SUBMISSION OF BIDS, PROSPECTIVE CONTRACTORS SHALL FIELD-VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, OFFSETS, CLEARANCES, AND EXISTING CONDITIONS AT THE SITE AND CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN. PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE PROJECT AREA, THE CONTRACTOR SHALL COMMUNICATE, IN WRITING, TO THE OWNER AND ENGINEER ANY DISCREPANCIES OR CONFLICTS IDENTIFIED.
17. CONTRACTOR SHALL REVIEW ALL OF THE CONTRACT DOCUMENTS (CONSTRUCTION PLANS, TECHNICAL SPECIFICATIONS, AND ADDENDUMS (IF ANY)) AND COORDINATE ALL WORK SHOWN IN THE CONTRACT DOCUMENTS. CONTRACTOR SHALL PROVIDE A COMPLETE SET OF CONTRACT DOCUMENTS TO ALL SUB-CONTRACTORS AND ALL RELATED PARTIES. THE SUB-CONTRACTORS SHALL EXAMINE ALL THE CONTRACT DOCUMENTS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
18. CONTRACTOR SHALL COORDINATE IN ORDER TO PROVIDE A COMPLETE, FUNCTIONING BUILD-OUT WITH ALL FINISHED SITE, UTILITY, STRUCTURAL, ARCHITECTURAL, FIRE PROTECTION, PLUMBING COMPONENTS, ELECTRICAL COMPONENTS, AND APPURTENANCES TO PROVIDE ALL ITEMS AS SHOWN, INDICATED, OR REQUIRED IN THE CONTRACT DOCUMENTS.
19. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR, AND EQUIPMENT TO COMPLETE THE WORK AS REQUIRED IN THE CONTRACT DOCUMENTS AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
20. CONTRACTOR SHALL RECEIVE, IN WRITING, AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.
21. ANY DISTURBANCE OUTSIDE OF THE LIMITS OF THE BUILDING STRUCTURE SHALL BE COORDINATED WITH AND APPROVED BY THE OWNER AND ENGINEER, IN WRITING, PRIOR TO THE CONTRACTOR ENGAGING IN THESE ACTIVITIES.
22. DISTURBANCE TO EXISTING SITE CONDITIONS OUTSIDE THE DEPICTED LIMIT OF WORK SHALL BE MINIMIZED. THE CONTRACTOR SHALL DOCUMENT CONDITION AND EXTENT OF EXISTING SITE CONDITIONS SUBJECT TO DAMAGE. ALL DISTURBANCE OR DAMAGE SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITIONS BY THE CONTRACTOR PRIOR TO FINAL ACCEPTANCE BY THE OWNER.
23. CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OTHERWISE OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
24. ALL WORK PERFORMED AND MATERIALS/EQUIPMENT INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. STRUCTURES, WATER UTILITIES, AND ELECTRICAL SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND ALL STATE AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
25. CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING BEST SKILLS AND ATTENTION. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES REQUIRED BY THE CONSTRUCTION DOCUMENTS. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACTS INCLUDING CONTACT AND COORDINATION WITH THE OWNER AND THE ENGINEER.

26. WHERE THE WORK OF THIS PROJECT INCLUDES INSTALLATIONS IN THE IMMEDIATE VICINITY OF EXISTING TELECOMMUNICATIONS SYSTEMS, THE CONTRACTOR SHALL PROVIDE AND COORDINATE THE METHODS OF PROTECTION OF EXISTING FACILITIES WITH THE VARIOUS TELECOMMUNICATION CARRIERS, AS APPLICABLE.
27. THE CONSTRUCTION PLANS DO NOT INCLUDE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. AS DESCRIBED WITHIN SECTION 01 50 01 OF THE TECHNICAL SPECIFICATIONS, THE CONTRACTOR SHALL PREPARE A SITE SPECIFIC HEALTH AND SAFETY PLAN (HASP) TO PROVIDE SPECIFIC GUIDELINES AND ESTABLISH PROCEDURES FOR THE PROTECTION OF PERSONNEL PERFORMING THE SCOPE OF ACTIVITIES DESCRIBED IN THE CONTRACT DOCUMENTS. THE HASP SHALL BE PREPARED PRIOR TO THE START OF CONSTRUCTION ACTIVITIES. CONTRACTOR IS RESPONSIBLE FOR ALL ON-SITE SAFETY REQUIREMENTS PERTAINING TO THE PROJECT FROM THE TIME THE CONTRACT IS AWARDED UNTIL ALL WORK IS COMPLETE, INSPECTED AND APPROVED BY THE AUTHORITY HAVING JURISDICTION.
28. WHEN DISTURBED, EXISTING FACILITIES SHALL BE REPAIRED OR REPLACED IN KIND AND IN ACCORDANCE WITH THE REQUIREMENTS OR DIRECTION OF THE OWNER. ASSOCIATED COSTS SHALL BE BORNE BY THE CONTRACTOR THAT CAUSED THE DISTURBANCE.
29. CONTRACTOR SHALL APPROPRIATELY BRACE STRUCTURES UNTIL ALL STRUCTURAL ELEMENTS NEEDED FOR STABILITY ARE INSTALLED.
30. CONTRACTOR SHALL NOT CHANGE SIZE OR SPACING OF STRUCTURAL ELEMENTS. INCORRECTLY FABRICATED, DAMAGED, OR OTHERWISE MISFITTING OR NON-CONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE OWNER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION REQUIRES ACCEPTANCE BY THE OWNER AND ENGINEER.
31. CONTRACTOR SHALL SECURE AND PAY FOR PERMITS, INSPECTIONS, AND TESTING REQUIRED FOR THE CONSTRUCTION ELEMENTS INCLUDED WITHIN THE CONTRACT AS DESCRIBED WITHIN THE CONTRACT DOCUMENTS. CONTRACTOR SHALL PLAN AND COORDINATE ALL INSPECTIONS REQUIRED BY STATE OR LOCAL AUTHORITIES, THE OWNER, OR THE ENGINEER. A MINIMUM FORTY-EIGHT (48) HOUR NOTICE SHALL BE PROVIDED TO THE INSPECTOR, OWNER AND/OR ENGINEER UNLESS OTHERWISE REQUIRED BY THE INSPECTOR.
32. CONSTRUCTION DETAILS IN THESE CONSTRUCTION PLANS ARE TYPICAL AND INTENDED TO DEPICT THE END RESULT OF DESIGN. SIMILAR DETAILS APPLY TO SIMILAR CONDITIONS UNLESS OTHERWISE NOTED. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS SO LONG AS THEY DO NOT CHANGE THE DESIGN INTENT. SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK AND INCLUDED IN THE RECORD DRAWINGS.
33. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY THE CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITIONS PER MANUFACTURER'S RECOMMENDATIONS. THE CONTRACTOR SHALL FURNISH AND INSTALL THESE ITEMS AT NO COST TO THE OWNER OR ENGINEER.
34. IN ACCORDANCE WITH SECTION 01 33 00 OF THE TECHNICAL SPECIFICATIONS, CONTRACTOR SHALL PREPARE AND SUBMIT A LIST OF PROPOSED SUBMITTALS FOR REVIEW AND APPROVAL BY THE ENGINEER PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES. SHOP DRAWINGS FOR ALL MATERIALS, PRODUCTS, AND FABRICATIONS INCLUDED ON THE APPROVED LIST OF SUBMITTALS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL. PRIOR TO THEIR SUBMITTAL, THE CONTRACTOR SHALL REVIEW ALL SHOP DRAWINGS, INCLUDING THOSE REQUIRED FROM SUBCONTRACTORS. SHOP DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTAL TO THE ENGINEER FOR REVIEW. ELECTRONIC COPIES (.PDF OR SUITABLE ALTERNATIVE) ARE ACCEPTABLE AND SHALL BE SUBMITTED TO ENGINEER FOR REVIEW PRIOR TO MATERIAL PURCHASE. SUBSTITUTIONS AND DESIGN CHANGE REQUESTS SHALL BE CLEARLY NOTED OR SUBMITTAL MAY BE REJECTED UPON RECEIPT. ALLOW TEN (10) WORKING DAYS FOR REVIEW FROM THE DATE OF RECEIPT BY THE ENGINEER.
35. WHERE ENCOUNTERED IN THE WORK, ALL EXISTING ACTIVE UTILITIES SHALL BE PROTECTED AT ALL TIMES. WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, EXISTING UTILITIES SHALL BE RELOCATED AS DIRECTED BY THE AUTHORITIES HAVING JURISDICTION, THE OWNER, AND ENGINEER. EXTREME CAUTION SHALL BE USED BY THE CONTRACTOR WHEN PERFORMING WORK AROUND OR NEAR UTILITIES.
36. ALL EXISTING INACTIVE UTILITIES, OR UTILITIES TO BE REMOVED AS PART OF THE PROJECT, WHICH INTERFERE WITH THE EXECUTION OF THE WORK SHALL BE TERMINATED, REMOVED, AND/OR ABANDONED TO LIMITS BEYOND THE PROPOSED WORK, SUBJECT TO THE AUTHORITIES HAVING JURISDICTION, THE OWNER, AND THE ENGINEER.
37. ALL SERVICE SHUTDOWNS, INCLUDING BUT NOT LIMITED TO ELECTRIC, WATER, TELEPHONE, HVAC, AND PLUMBING SYSTEMS IN THE EXISTING BUILDINGS AND/OR STRUCTURES, SHALL BE STRICTLY COORDINATED WITH THE APPROPRIATE UTILITY COMPANIES AND THE OWNER.

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ROBERT A. HOLMES, P.E.  
N.Y.P.E. Lic. 07211  
Date

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1	11/30/21	ADDENDUM 1	BPF	ACS	ACS	RAH
2	11/17/2021		BPF	ACS	ACS	RAH

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ROCK CUT ROAD TRANSFER STATION BUILDING 2 OPTIMIZATION  
5808 ROCK CUT ROAD, JAMESVILLE, NY 13078  
ONONDAGA COUNTY RESOURCE RECOVERY AGENCY

GENERAL NOTES

SHEET NO.  
C1  
PROJECT NO.  
4213700

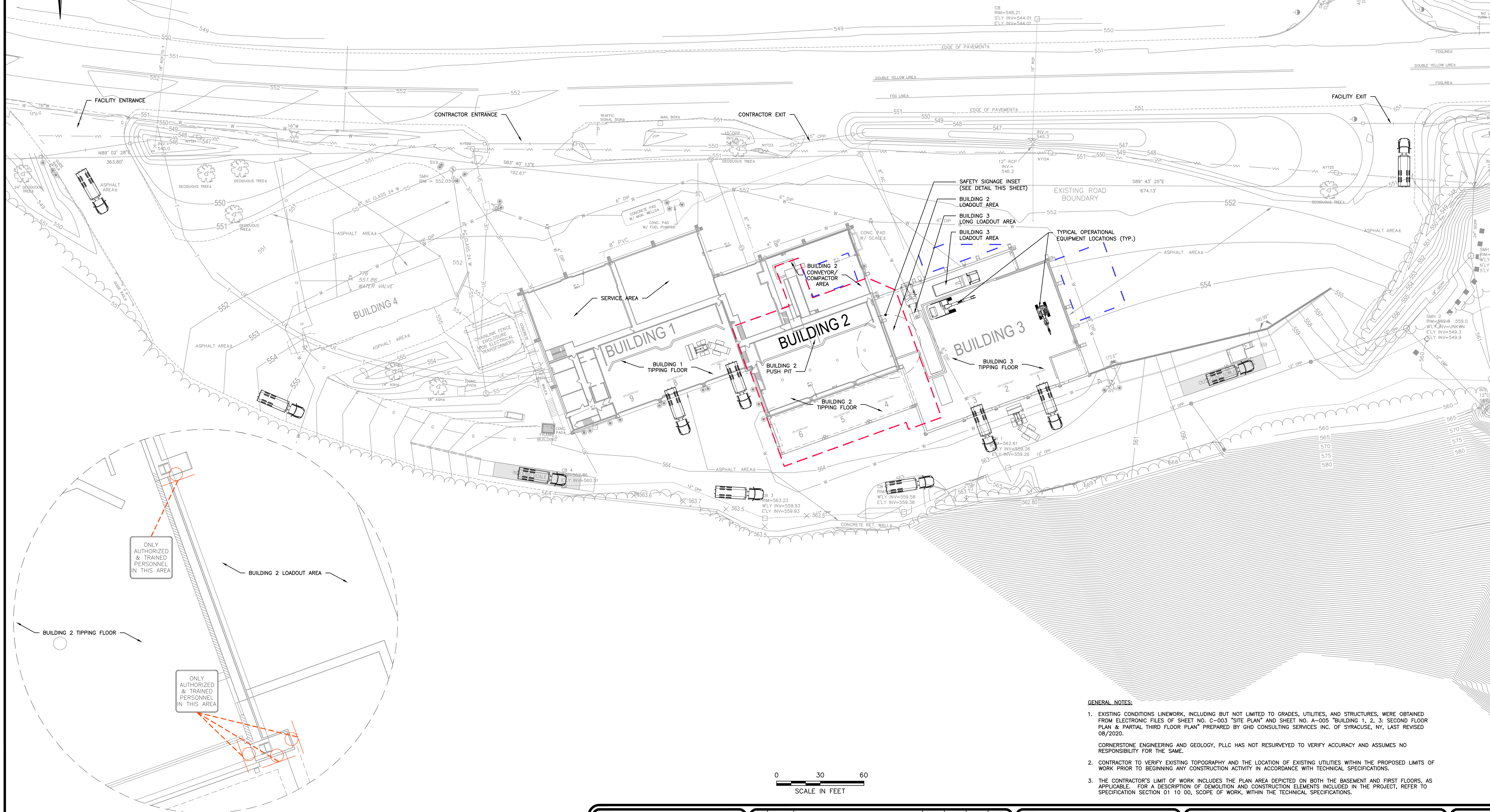
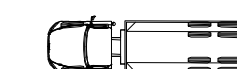


LEGEND:

LIMIT OF WORK (APPROXIMATE)

POTENTIAL CONTRACTOR STORAGE AND STAGING AREA (APPROXIMATE)  
(FINAL LOCATIONS TO BE COORDINATED WITH OWNER)  
(SEE TECHNICAL SPECIFICATIONS FOR ADDITIONAL DETAIL)

TYPICAL ACTIVE OPERATIONAL TRAFFIC PATTERNS



## SAFETY SIGNAGE INSET

SCALE: 1" = 5'

INSET NOTE:

1. DEPICTED LOCATIONS AND CONTENT OF PERMANENT SAFETY SIGNAGE IS APPROXIMATE. FINAL LOCATIONS, COUNT, AND SIGN LANGUAGE TO BE COORDINATED WITH THE OWNER.

Unauthorized alteration or addition to this plan bearing a licensed professional's seal is a violation of Section 7209, Sub-Division 2, of the New York Education Law. Only copies from the original of this plan marked with an original professional's seal shall be considered to be valid true copies.

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ROBERT A. HOLMES, P.E.



N.Y.P.E. Lic. No. 077317 Date

[illegible]

PREPARED BY:  
CORNERSTONE ENGINEERING AND GEOLOGY, PLLC

ROCK CUT ROAD TRANSFER STATION BUILDING 2 OPTIMIZATION  
5808 ROCK CUT ROAD, JAMESVILLE, NY 13078  
ONONDAGA COUNTY RESOURCE RECOVERY AGENCY

## EXISTING SITE CONDITIONS & OPERATIONS PLAN

SHEET NO.

C2

PROJECT NO.  
4213700

File: X:\PROJECTS\CGRA\4213700 - RCR BUILDING 2 IMPROVEMENT BID\\_Project Drawings\213700-S-02-EXISTING CONDITIONS.DWG Layout: SHEET 2 User: b.piedmont@leachma Nov 17, 2021 - 12:02pm

OCCUPANCY DATA				
<ul style="list-style-type: none"><li>Non separated mixed occupancy</li><li>IIB construction</li></ul>				
BUILDING DATA				
Story	Space Name	Occupancy Group	Function of Space	Designed Area (gross)
-1	Sprinkler Rm	U	Other	88 ft.2
	Basement	U	Industrial areas	3,434 ft.2
1	Building 2	F-1	Industrial areas	13,250 ft.2
	Building 1	F-1	Industrial areas	12,905 ft.2
	Building 3	F-1	Industrial areas	11,675 ft.2
Sprinkler Type	Type of Construction			
NFPA 13	IIB			

HEIGHTS AND AREAS			
<b>Building Area</b>			
Single Occupancy			
Occupancy Group	Designed Area	Allowed Area (Aa)	
F-1	37,830 ft.2	62,000 ft.2	
<b>Building Height in Feet</b>			
Non-separated Mixed Occupancy			
Occupancy Group	Highest Elevation Above Grade Plane Occupancy Appears On		Highest Allowable Elevation Above Grade Plane
F-1	37 ft.		75 ft.
Average Roof Surface Height Above Grade Plane		Highest Allowable Elevation Above Grade Plane	
37 ft.		75 ft.	
<b>Building Height in Stories</b>			
Non-separated Mixed Occupancy			
Occupancy Group	Highest Story Above Grade Plane Occupancy Appears On		Highest Allowable Story Above Grade Plane
U	Only appears below grade		3
F-1	1	3	

EGRESS

Occupant Loads

Story	Space Name	Occupancy Group	Function of Space	Designed Area (gross)	Designed Area (net)	OLF	Occupant Load
-1	Sprinkler Rm	U	Other	88 ft.2	-	Custom	
	Basement	U	Industrial areas	3,434 ft.2	-	100	35
1	Building 2	F-1	Industrial areas	13,250 ft.2	-	100	133
	Building 1	F-1	Industrial areas	12,905 ft.2	-	100	130
	Building 3	F-1	Industrial areas	11,675 ft.2	-	100	117

Min. Exits per Space

More than one exit must be provided if the space occupant load or maximum common path of egress travel distance are exceeded. More exits may be required under high occupant load or other special conditions (see notes below).

Maximum exit access travel distance serving each space should be at a maximum the values below for each occupancy group.

Occupancy Group	Max Exit Access Travel Distance
F-1	400 ft. (See note a)
U	400 ft.

a. Groups F-1 and S-1 have an increase allowed from Section 1017.2.2

Max. Dead-End Corridor Length

Dead-end corridors within each occupancy group should be at a maximum the length given below.

Occupancy Group	Max Dead-end Corridor Distance
F-1, and U	50 ft.

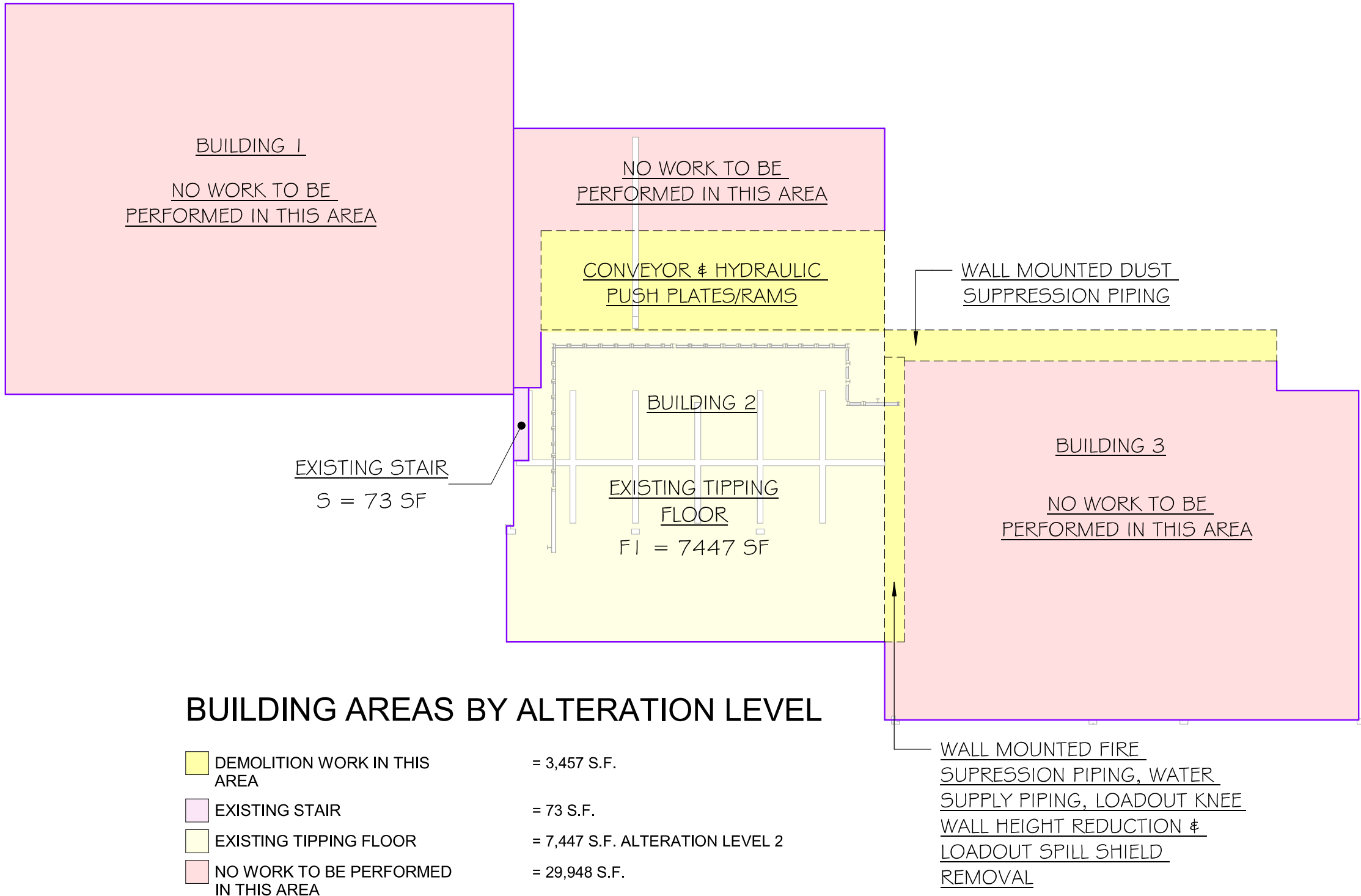
Dead-end corridor length limits only apply where more than one exit or exit access doorway is required

Dead-end corridor length is not limited where the length of the dead-end corridor is less than 2.5 times of its least width

CONSTRUCTION NOTES

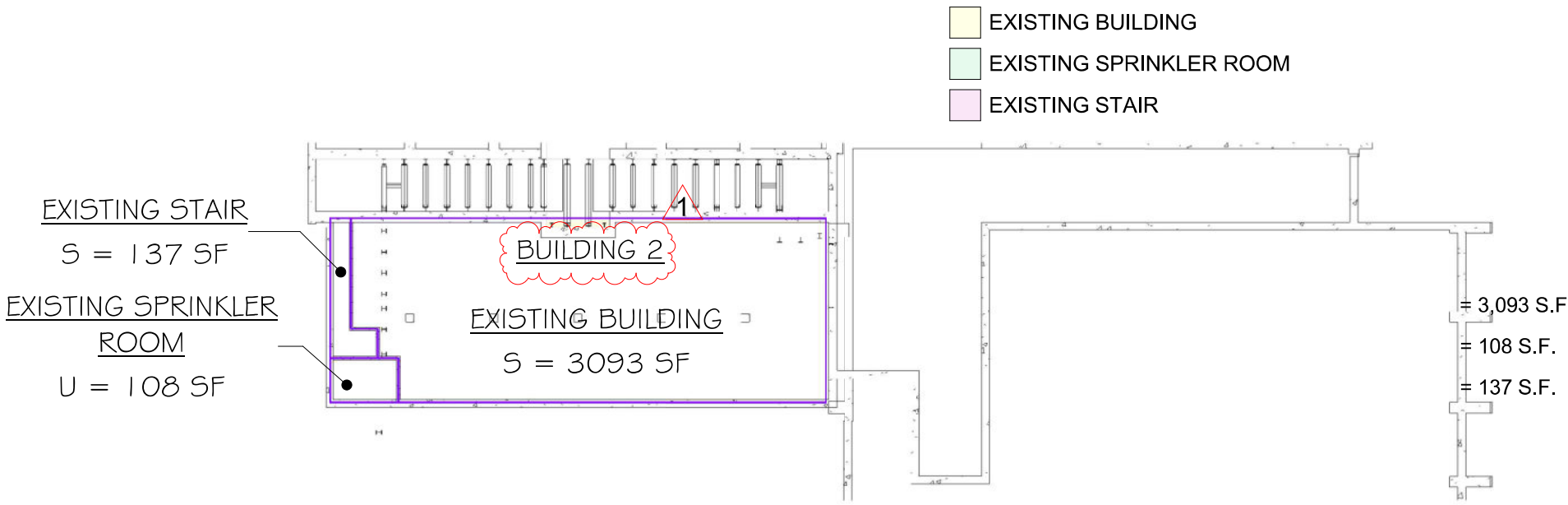
NOTE: NOT ALL NOTES MAY BE USED ON THIS DRAWING

- FIRE ALARM SYSTEM CURRENTLY PROVIDED AND TO BE MAINTAINED AT THE END OF CONSTRUCTION.
- EMERGENCY LIGHTING CURRENTLY PROVIDED AND TO BE MAINTAINED AT THE END OF CONSTRUCTION.
- GENERAL CONTRACTOR MUST SUBMIT AN ACKNOWLEDGMENT STATEMENT TO THE ARCHITECT THAT THEY HAVE READ AND UNDERSTAND THE BUILDING CODE DATA PROVIDED ON THIS SHEET AND CHAPTER 33 OF THE 2020 NYS BUILDING CODE ENTITLED: "SAFEGUARDS DURING CONSTRUCTION" AND SECTION 1704.4 "CONTRACTOR'S RESPONSIBILITY".
- STATE BUILDING CODE CERTIFICATION: I DO HEREBY CERTIFY THAT THESE DRAWINGS, TO THE BEST OF MY KNOWLEDGE AND PROFESSIONAL JUDGMENT, HAVE BEEN DESIGNED IN CONFORMANCE WITH ALL APPLICABLE REQUIREMENTS OF THE LATEST EDITION OF THE NEW YORK STATE BUILDING CODE. I DO HEREBY CERTIFY THAT THESE DRAWINGS, TO THE BEST OF MY KNOWLEDGE AND PROFESSIONAL JUDGMENT, HAVE BEEN DESIGNED IN CONFORMANCE WITH ALL APPLICABLE REQUIREMENTS OF NEW YORK STATE ENERGY CONSERVATION CONSTRUCTION CODE.
- OMITTED.
- OMITTED.
- OMITTED.
- CODE REQUIRED SIGNAGE: PUBLIC RESTROOMS, TRUSS ID, EXITS, STAIRWELLS, OCCUPANCY, AREAS OF ASSEMBLY, AREAS OF REFUGE, FIRE EXTINGUISHERS, LOAD LIMITS, RESTRICTED AREAS.
- SUMMARY OF APPLICABLE CODES/REFERENCE STANDARDS:
  - REGULATORY REQUIREMENTS APPLICABLE TO THIS PROJECT ARE THE FOLLOWING, INCLUDING ALL SUBSEQUENT AMENDMENTS AND UPDATES.
  - 2019 NYS NONDISCRIMINATION ON THE BASIS OF DISABILITY IN STATE AND LOCAL GOVERNMENT SERVICES, FINAL RULE, DEPARTMENT OF JUSTICE, CURRENT EDITION.
  - 2019 NYS NONDISCRIMINATION BY PUBLIC ACCOMMODATIONS AND IN COMMERCIAL FACILITIES, FINAL RULE, DEPARTMENT OF JUSTICE, CURRENT EDITION.
  - 36 CFR 1191-AMERICANS WITH DISABILITIES ACT (ADA) ACCESSIBILITY GUIDELINES FOR BUILDINGS AND FACILITIES, ARCHITECTURAL BARRIERS ACT (ABA) ACCESSIBILITY GUIDELINES, CURRENT EDITION.
  - FED-STD-795-UNIFORM FEDERAL ACCESSIBILITY STANDARDS (UFAS); 1996.
  - 29 CFR 1910-OCCUPATIONAL SAFETY AND HEALTH STANDARDS; (2016 SUPPLEMENT).
  - STATE OF NEW YORK AMENDMENTS TO SOME OR ALL OF THE FOLLOWING (2016, 2017 SUPPLEMENT):
  - NFPA 1-FIRE CODE; 2020.
  - NFPA 101-LIFE SAFETY CODE; 2020.
  - ICC (IBC)-INTERNATIONAL BUILDING CODE; 2020.
  - ICC (IFC)-INTERNATIONAL PLUMBING CODE; 2020.
  - NFPA 70-NATIONAL ELECTRICAL CODE; MOST RECENT EDITION ADOPTED BY AUTHORITY HAVING JURISDICTION, INCLUDING ALL APPLICABLE AMENDMENTS AND SUPPLEMENTS.
  - ICC (IECC)-INTERNATIONAL ENERGY CONSERVATION CODE; 2020.
  - ICC A117.1-ACCESSIBLE AND USAGE BUILDINGS AND FACILITIES; 2009.
  - ICC (IMC)-INTERNATIONAL MECHANICAL CODE; 2020.
  - ICC (IECC)-INTERNATIONAL ENERGY CONSERVATION CODE; 2020.
  - ICC (IPMCC)-INTERNATIONAL PROPERTY MAINTENANCE CODE; 2020.
  - ICC (IFC)-INTERNATIONAL FIRE CODE; 2020.
  - ECC SUPP. NY-SUPPLEMENT TO THE NEW YORK STATE ENERGY CONSERVATION CONSTRUCTION CODE; T. UCS NY-UNIFORM CODE SUPPLEMENT; 2020.
  - ICC (IFSG)-INTERNATIONAL FUEL GAS CODE; IFGC NY 2020.
  - CURRENT LOCAL MUNICIPAL CODES.
  - NYS-EC - EXISTING BUILDING CODE OF NEW YORK 2020.
  - SECTION 2806.B FIRE FIRE EXTINGUISHERS: PORTABLE FIRE EXTINGUISHERS COMPLYING SECTION 906 WITH A MINIMUM RATING A-G-B-C SHALL BE PROVIDED ONLY VEHICLES AND EQUIPMENT OPERATING ON PILES AND ALL PROCESSING EQUIPMENT.



1 EXISTING FIRST FLOOR PLAN  
1" = 30'-0"

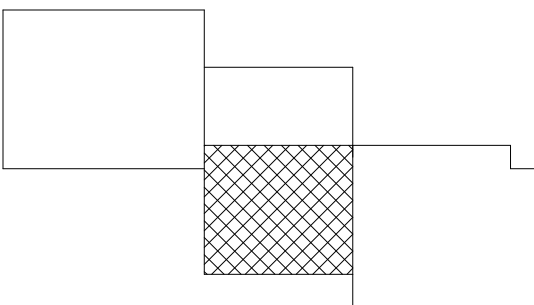
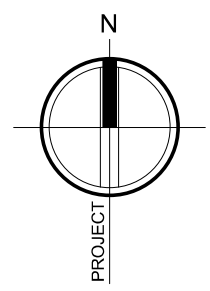
BUILDING AREAS BY ALTERATION LEVEL



2 EXISTING BASEMENT FLOOR PLAN  
1" = 30'-0"

PROJECT

KEY PLAN:



AREA OF CONSTRUCTION

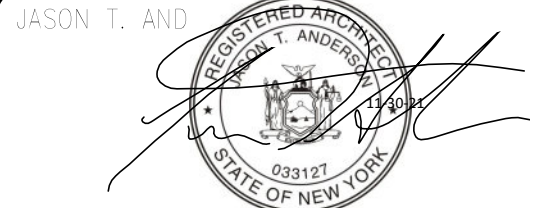
ROCK CUT ROAD TRANSFER STATION BUILDING 2 OPTIMIZATION  
5808 ROCK CUT ROAD, JAMESVILLE, NY 13078  
ONONDAGA COUNTY RESOURCE RECOVERY AGENCY

CODE SHEET

SHEET NO.

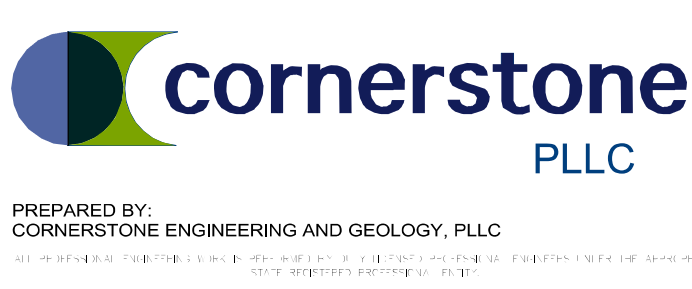
A-1

PROJECT NO.  
21136



N.Y. License No. 033127 Date

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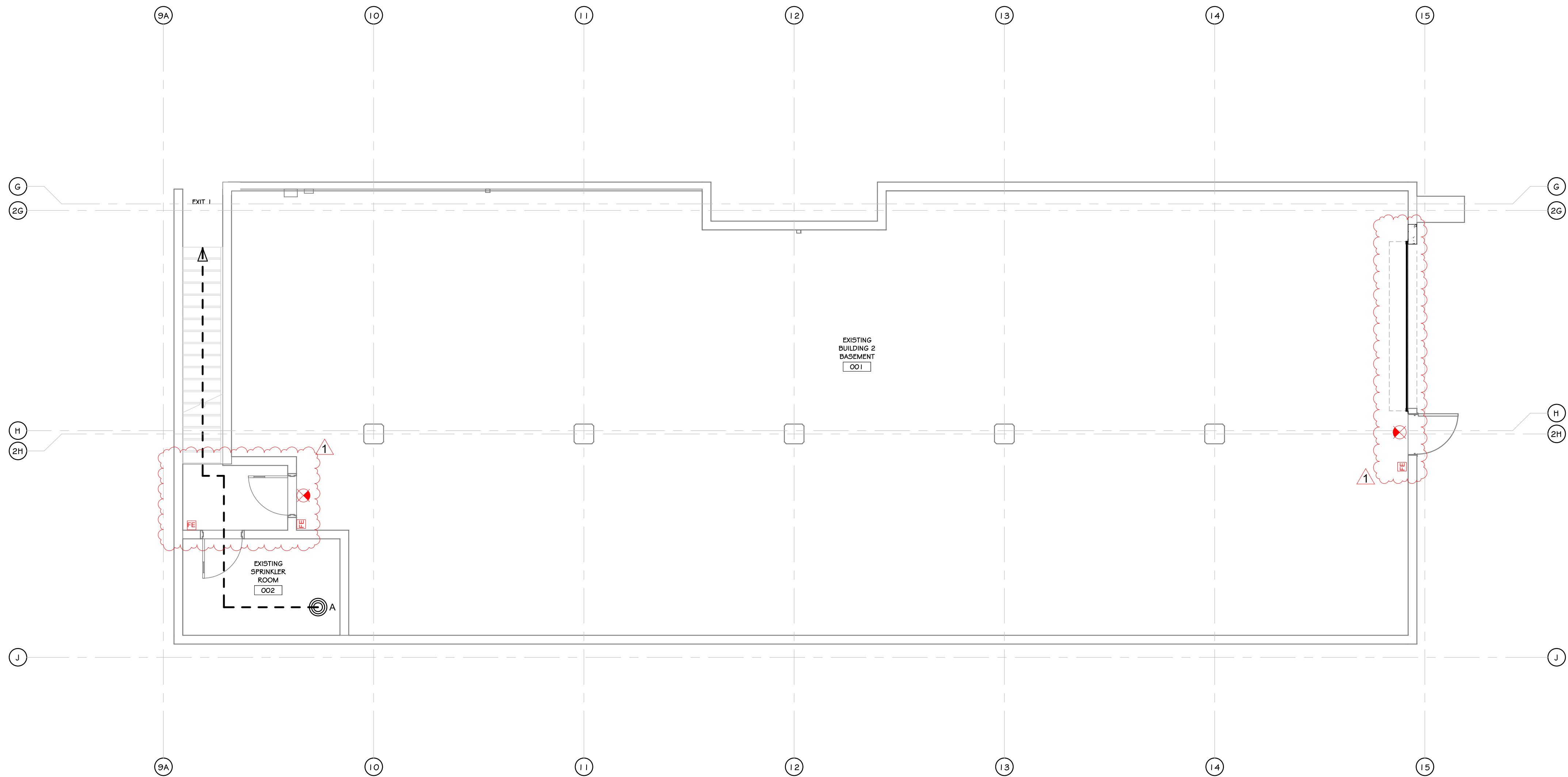


CONSTRUCTION NOTES

NOTE: NOT ALL NOTES MAY BE USED ON THIS DRAWING

1. NOTE: THIS PLAN IS INTENDED TO BE PRINTED AND VIEWED IN COLOR. BLUE AND RED LINES INDICATE VARIOUS FIRE BARRIERS, FIRE WALLS, OR SMOKE BARRIERS. SEE LIFE SAFETY LEGEND.
2. OMITTED.
3. SEE ELECTRICAL/FIRE ALARM DRAWINGS FOR SMOKE & HEAT DETECTORS AND ALL FIRE ALARM DEVICE LOCATIONS.
5. SPECIAL INSPECTIONS REQUIRED - SEE STRUCTURAL DRAWINGS.
6. OMITTED.
7. EXIT PATHS MAY CHANGE BASED ON FINAL DETERMINATION OF STORAGE AREAS/ASLES. ADDITIONAL EXIT ACCESS PATHS WILL BE DETERMINED PRIOR TO A C.O. BEING ISSUED. ADDITIONAL PATHS MAY REQUIRE ADDITIONAL LIFE SAFETY COMPONENTS (EXIST SIGNS, EMERGENCY LIGHTING, FIRE ALARM DEVICES ETC.) OR ADJUSTMENTS TO THE EXISTING/PROPOSED LIFE SAFETY COMPONENTS.

1



2 BASEMENT LIFE SAFETY PLAN  
3/16" = 1'-0"

MAX. TRAVEL DISTANCE SCHEDULE

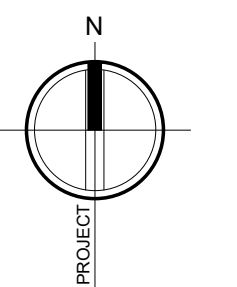
PATH	MAX. TRAVEL DISTANCE
FROM 'A' TO EXIT 1 MAX. TRAVEL DISTANCE	36' - 1"
FROM 'B' TO EXIT 2 MAX. TRAVEL DISTANCE	224' - 2"

LIFE SAFETY LEGEND

NOTE: EXISTING LIFE SAFETY ELEMENTS TO REMAIN UNLESS OTHERWISE NOTED

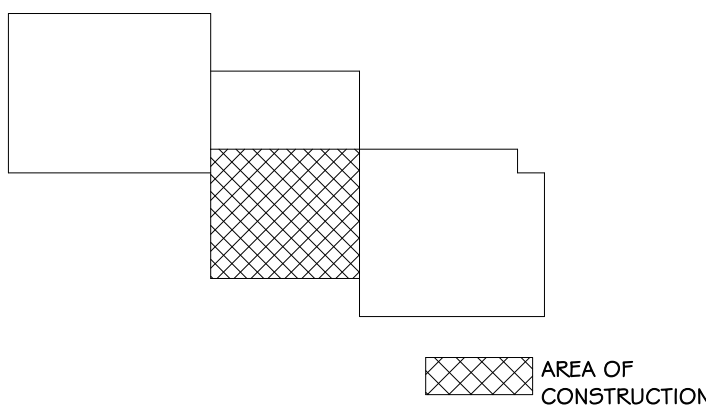
- |                                 |   |     |                       |
|---------------------------------|---|-----|-----------------------|
| EM                              | EMERGENCY LIGHT                               | --- | 2 HOUR FIRE BARRIER   |
| EXIT SIGN WITH EMERGENCY LIGHTS |   | --- | 1 HOUR FIRE BARRIER   |
| FE                              | RECESSED FIRE EXTINGUISHER                    | --- | 1 HOUR SMOKE BARRIER  |
| P                               | ADDRESSABLE MANUAL PULL STATION               | --- | PATH OF EGRESS        |
| FE                              | FIRE EXTINGUISHER                             | --- | STRIPING              |
| ◇                               | TRUSS SIGNAGE                                 | --- | EXIT SIGN             |
| OL                              | OCCUPANCY LOAD SIGN                           | --- | DIRECTIONAL EXIT SIGN |
| KB                              | KNOX BOX LOCATION IF REQUIRED BY MUNICIPALITY |     |                       |

P R O J E C T



N O R T H

KEY PLAN:



AREA OF CONSTRUCTION

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JASON T. ANDI  
N.Y. License No. 033127  
Date

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY
1	11/30/21	ADDENDUM #1	IDEA	AS	AS	
2	11/16/21					

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ROCK CUT ROAD TRANSFER STATION BUILDING 2 OPTIMIZATION  
5808 ROCK CUT ROAD, JAMESVILLE, NY 13078  
ONONDAGA COUNTY RESOURCE RECOVERY AGENCY

BASEMENT LIFE SAFETY PLAN

SHEET NO.

A-2

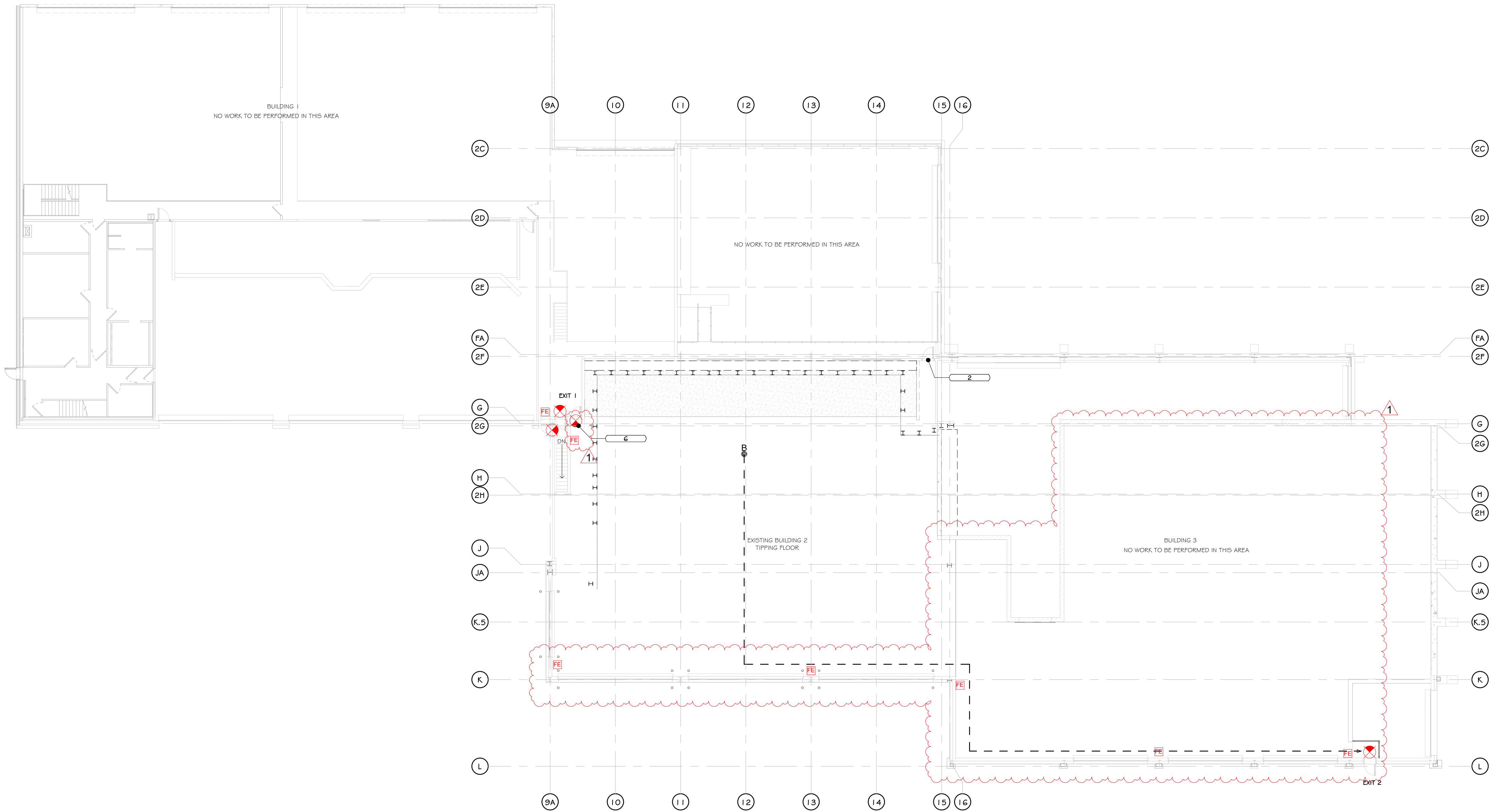
PROJECT NO.  
21136

CONSTRUCTION NOTES

NOTE: NOT ALL NOTES MAY BE USED ON THIS DRAWING

1. NOTE: THIS PLAN IS INTENDED TO BE PRINTED AND VIEWED IN COLOR. BLUE AND RED LINES INDICATE VARIOUS FIRE BARRIERS, FIRE WALLS, OR SMOKE BARRIERS. SEE LIFE SAFETY LEGEND.
2. EXISTING EXIT SIGN TO BE REMOVED AND RELOCATED.
3. SEE ELECTRICAL/FIRE ALARM DRAWINGS FOR SMOKE & HEAT DETECTORS, AND ALL FIRE ALARM DEVICE LOCATIONS.
5. SPECIAL INSPECTIONS REQUIRED - SEE STRUCTURAL DRAWINGS.
6. LOCATION OF RELOCATED EXIT SIGN.
7. EXIT PATHS MAY CHANGE BASED ON FINAL DETERMINATION OF STORAGE AREAS/AISLES. ADDITIONAL EXIT ACCESS PATHS WILL BE DETERMINED PRIOR TO A C.O. BEING ISSUED. ADDITIONAL PATHS MAY REQUIRE ADDITIONAL LIFE SAFETY COMPONENTS (EXIST SIGNS, EMERGENCY LIGHTING, FIRE ALARM DEVICES ETC.) OR ADJUSTMENTS TO THE EXISTING/PROPOSED LIFE SAFETY COMPONENTS.

1



1 FIRST FLOOR LIFE SAFETY PLAN  
1/16" = 1'-0"

MAX. TRAVEL DISTANCE SCHEDULE

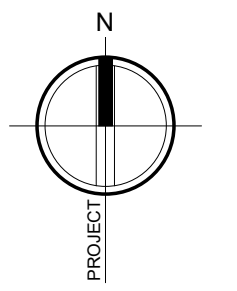
PATH	MAX. TRAVEL DISTANCE
FROM "A" TO EXIT 1 MAX. TRAVEL DISTANCE	36' - 1"
FROM "B" TO EXIT 2 MAX. TRAVEL DISTANCE	224' - 2"

LIFE SAFETY LEGEND

NOTE: EXISTING LIFE SAFETY ELEMENTS TO REMAIN UNLESS OTHERWISE NOTED

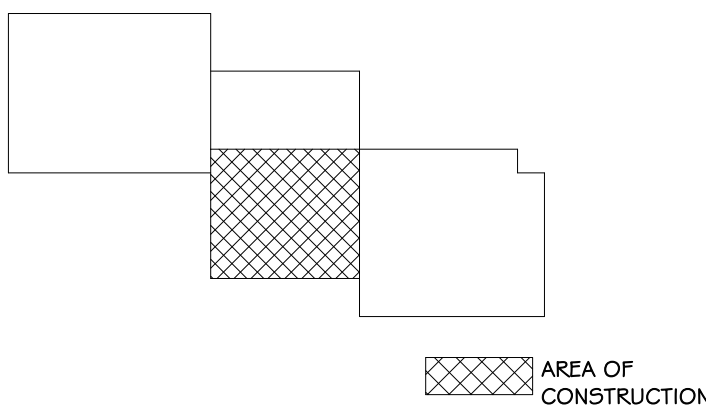
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| EM                              | EMERGENCY LIGHT                               | --- | 2 HOUR FIRE BARRIER   |
| EXIT SIGN WITH EMERGENCY LIGHTS |   | --- | 1 HOUR FIRE BARRIER   |
| FE                              | RECESSED FIRE EXTINGUISHER                    | --- | 1 HOUR SMOKE BARRIER  |
| P                               | ADDRESSABLE MANUAL PULL STATION               | --- | PATH OF EGRESS        |
| FE                              | FIRE EXTINGUISHER                             | --- | STRIPING              |
| T                               | TRUSS SIGNAGE                                 | --- | EXIT SIGN             |
| OC                              | OCCUPANCY LOAD SIGN                           | --- | DIRECTIONAL EXIT SIGN |
| KB                              | KNOX BOX LOCATION IF REQUIRED BY MUNICIPALITY |     |                       |

PROJECT



NORTH

KEY PLAN:



AREA OF CONSTRUCTION

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JASON T. ANDI



N.Y. License No. 033127 Date

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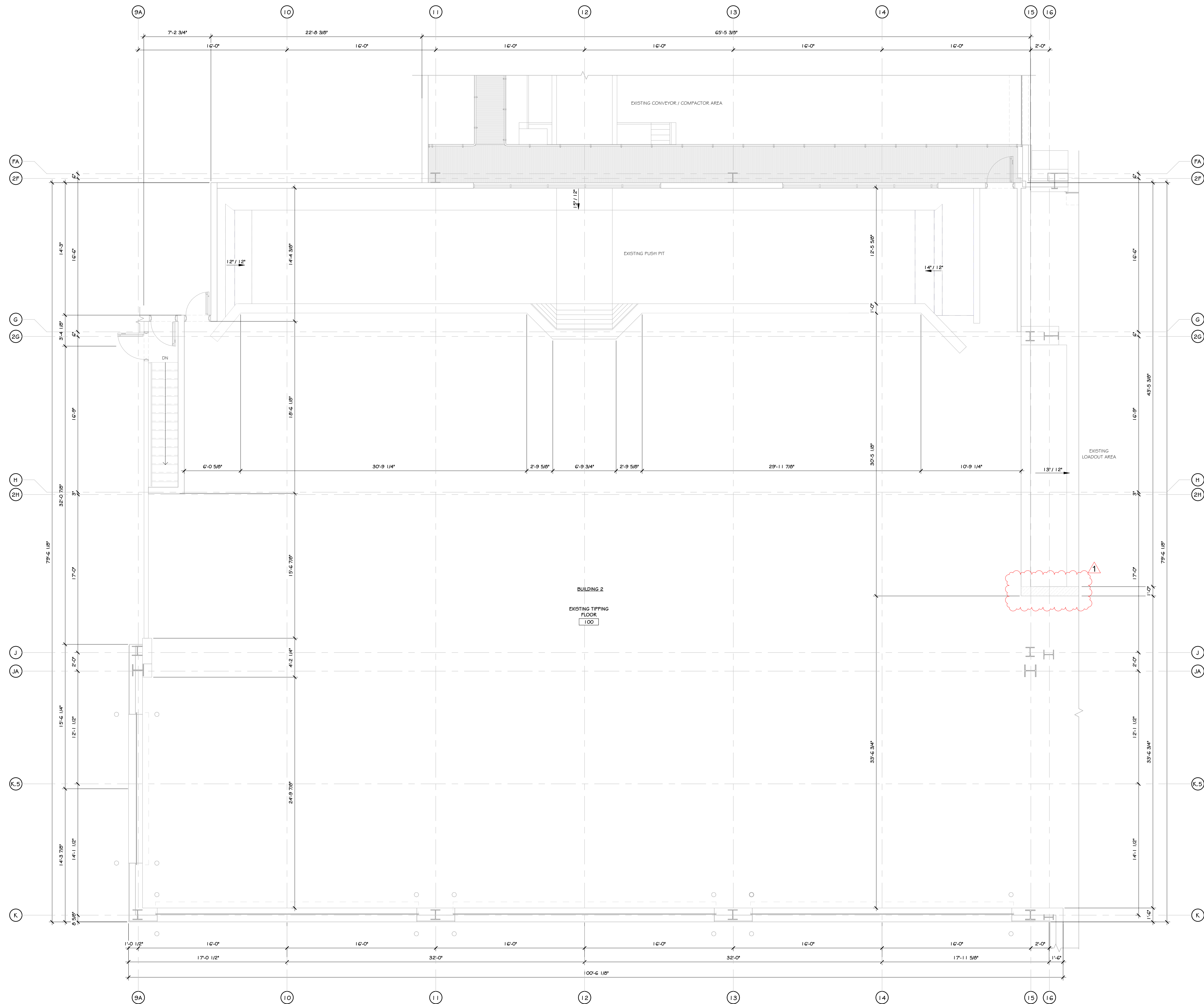


ROCK CUT ROAD TRANSFER STATION BUILDING 2 OPTIMIZATION  
5808 ROCK CUT ROAD, JAMESVILLE, NY 13078  
ONONDAGA COUNTY RESOURCE RECOVERY AGENCY  
**FIRST FLOOR LIFE SAFETY PLAN**

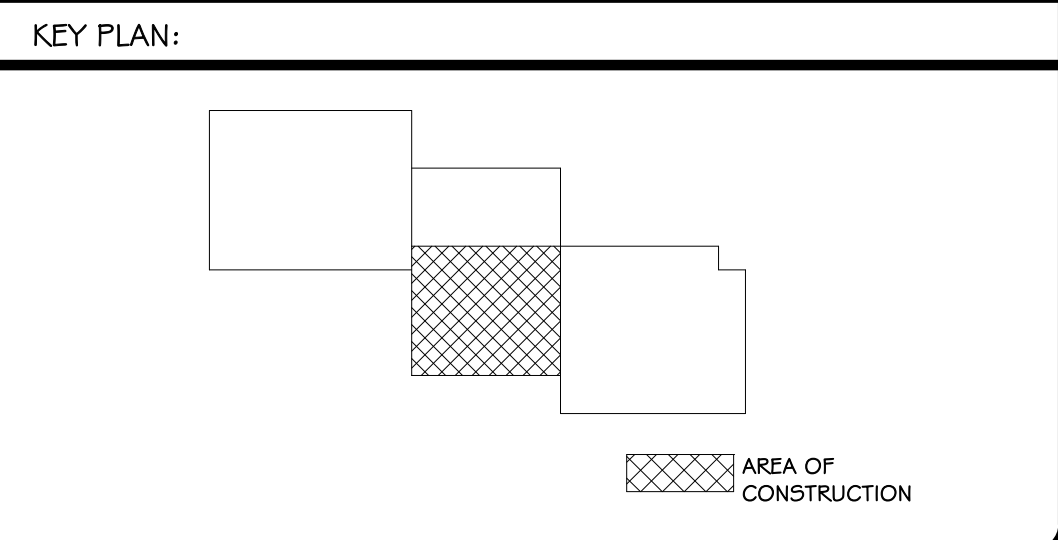
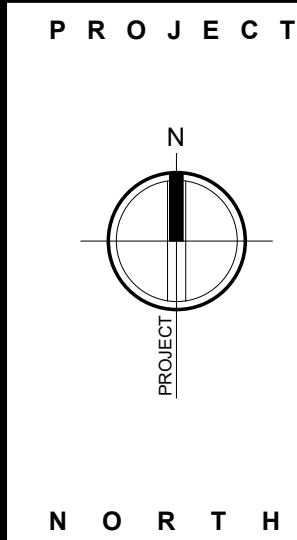
SHEET NO.  
**A-3**  
PROJECT NO.  
21136



SHEET NO.  
**A-4**  
PROJECT NO.  
**21136**



1 EXISTING FIRST FLOOR PLAN  
3/16" = 1'-0"



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JASON T. ANDERSON  
Professional Engineer  
No. 033127  
N.Y. License No. 033127 Date

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY
1	11/30/21	APPENDIX #1		IDEA	AS	AS
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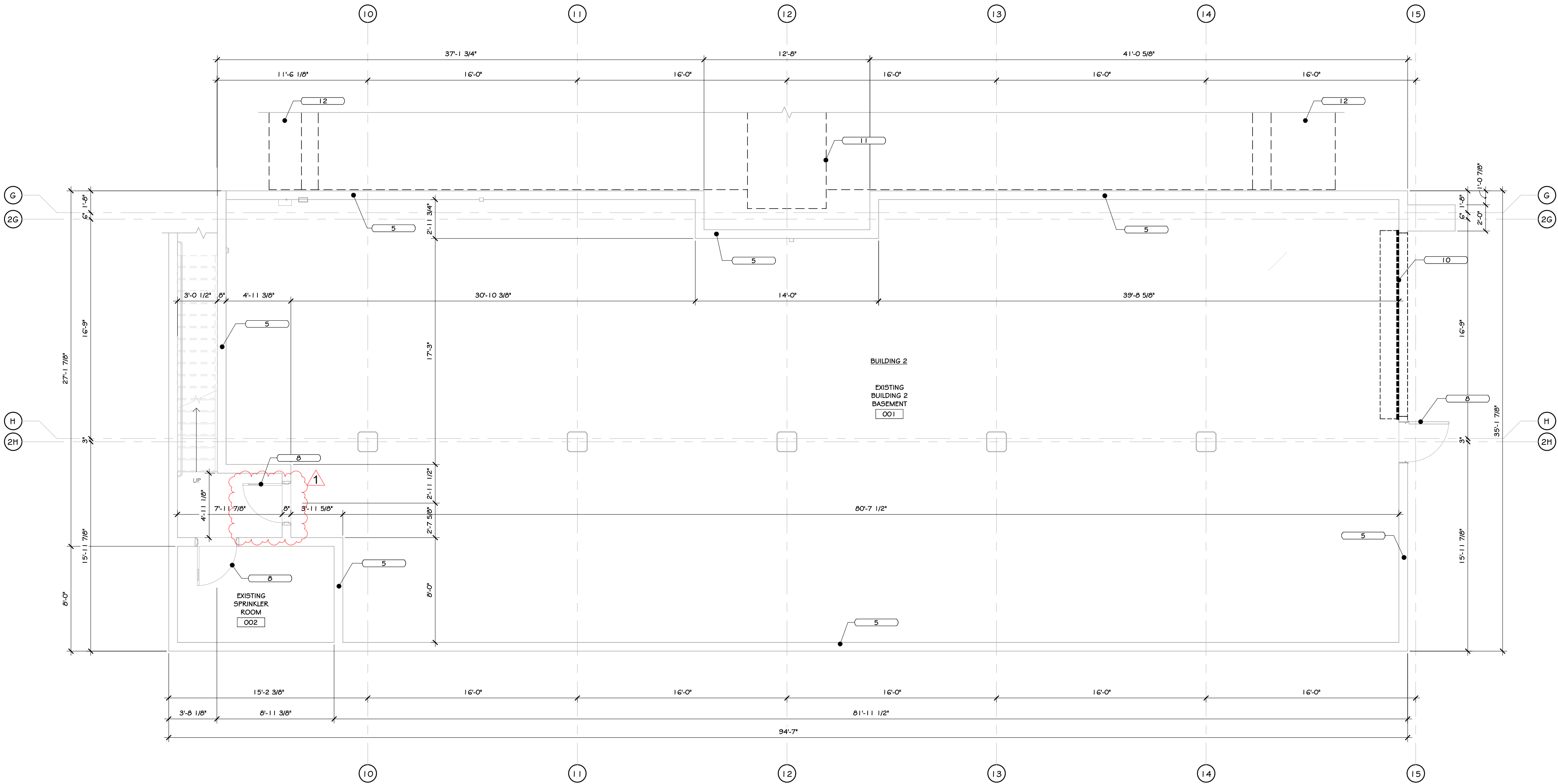
ROCK CUT ROAD TRANSFER STATION BUILDING 2 OPTIMIZATION  
5808 ROCK CUT ROAD, JAMESVILLE, NY 13078  
ONONDAGA COUNTY RESOURCE RECOVERY AGENCY  
**EXISTING FIRST FLOOR PLAN**

SHEET NO.  
**A-5**  
PROJECT NO.  
21136

CONSTRUCTION NOTES

NOTE: NOT ALL NOTES MAY  
BE USED ON THIS DRAWING

- IT IS RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL SHORING (WHERE REQUIRED) IS ADEQUATE TO MAINTAIN STRUCTURAL STABILITY. IF SHORING IS REQUIRED SUBMIT SIGNED AND SEALED SHORING DRAWING FOR REVIEW.
- PROMPTLY REMOVE DEMOLISHED MATERIALS FROM OWNER'S PROPERTY AND LEGALLY DISPOSE OF THEM. DO NOT BURN DEMOLISHED MATERIALS.
- DURING DEMOLITION PROTECT AREAS AND BUILDING COMPONENTS TO REMAIN.
- COMPLY WITH EPA REGULATIONS AND DISPOSAL REGULATIONS OF AUTHORITIES HAVING JURISDICTION.
- EXISTING WALLS TO REMAIN.
- EXISTING WALL TO DEMOLISHED.
- MAINTAIN AND PROTECT EXISTING UTILITIES TO REMAIN IN SERVICE BEFORE PROCEEDING DEMOLITION, PROVIDING BYPASS CONNECTIONS TO OTHER PARTS OF THE BUILDING.
- EXISTING DOORS TO REMAIN.
- EXISTING OVERHEAD DOORS TO REMAIN.
- OVERHEAD DOOR TO BE REMOVED.
- CONVEYOR AND ALL APPURTENANCES TO BE REMOVED.
- EXISTING HYDRAULIC PUSH PLATE AND RAMS TO BE REMOVED.
- OMITTED.



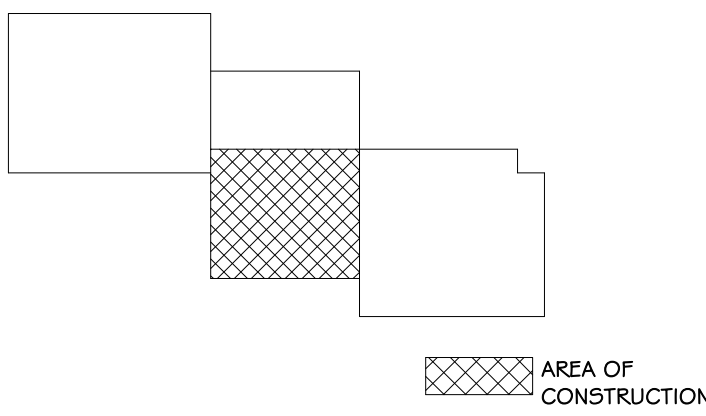
1 BASEMENT FLOOR DEMO PLAN  
3/16" = 1'-0"

WALL LEGEND:

- DEMOWALL
- EXISTING WALL

PROJECT

KEY PLAN:



NORTH

AREA OF CONSTRUCTION

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Professional Engineer  
No. 033127  
State of New York  
N.Y. License No. 033127 Date

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DESIGN  
GROUP  
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ROCK CUT ROAD TRANSFER STATION BUILDING 2 OPTIMIZATION  
5808 ROCK CUT ROAD, JAMESVILLE, NY 13078  
ONONDAGA COUNTY RESOURCE RECOVERY AGENCY  
BASEMENT DEMO PLAN

SHEET NO.  
A-6  
PROJECT NO.  
21136



CONSTRUCTION NOTES

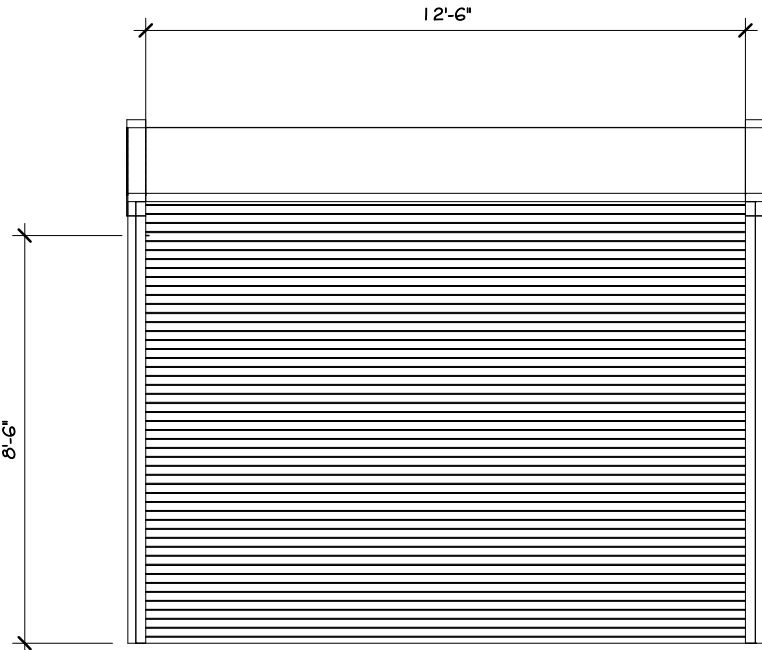
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1. ALL DIMENSIONS ARE TO ROUGH FRAMING.
2. NOTE: ALL CONSTRUCTION NOTES MAY BE SPECIFIC TO THIS DRAWING.
3. NOTE: F.F. ELEVATION 565.0' ON CIVIL DWGS. = F.F. ELEV. 100'-0" ON ARCH., STRUC., & MEP DWGS.
  - F.F. ELEVATIONS:
    - A. TIPPING FLOOR: 100'-0"
    - B. BASEMENT FLOOR: 87'-1.1"
4. OMITTED.
5. SEE LIFE SAFETY PLANS FOR LOCATIONS OF FIRE EXTINGUISHERS. GC TO CONSULT WITH LOCAL AHJ, PRIOR TO CO INSPECTION, TO CONFIRM ACCEPTANCE OF LOCATIONS BY FIRE MARSHAL. WALL HUNG EXPOSED FIRE EXTINGUISHERS TO BE PROVIDED AT ALL INDUSTRIAL AREAS ARE TO BE IDENTIFIED BY PAINTING EACH RESPECTIVE COLUMN RED, FROM F.F. UP TO 5'-0" BELOW THE TOP OF COLUMN.
6. NO UTILITIES (PIPING, FIRE EXTINGUISHERS, CONDUIT, OUTLET, ETC) ARE PERMITTED TO BE MOUNTED TO THE CONCRETE PUSH WALLS WITHIN THE TIPPING FLOOR AND LOADOUT TUNNEL AREAS.
7. STRUCTURAL DETAILS AND SPECIFICATIONS OF ANY FRAMING MEMBERS, BRACING, ETC. SUPERSEDE THE ARCHITECTURAL DRAWINGS.
8. ALL OVERHEAD DOORS ARE SHOWN WITH THEIR OPEN POSITION DASHED IN ABOVE. NO SIGNAGE OR LIGHTING IS TO BE MOUNTED TO AS TO INTERFERE WITH DOOR OPERATION. ALL MEP SYSTEMS, INCLUDING THOSE MOUNTED AT THE CEILING ABOVE, ARE TO BE MOUNTED BETWEEN DOORS.
9. SEE STRUCTURAL, ELECTRICAL, PLUMBING AND FIRE PROTECTION DRAWINGS AND SPECIFICATIONS FOR COORDINATION OF ALL RELATED ITEMS, (INCLUDING UNDERGROUND WORK).
10. SEE CIVIL DRAWINGS AND SPECIFICATIONS FOR ALL SITE IMPROVEMENTS AND INCOMING UTILITIES BEYOND 5'-0" OUTSIDE OF THE BUILDING FOOTPRINT.
11. NEW STEEL COLUMNS - SEE STRUCTURAL DRAWINGS.

1

DOOR SCHEDULE

MARK	LOCATION	HAND	FAMILY	TYPE	WIDTH	HEIGHT
001	EXISTING BUILDING 2 BASEMENT			ROLLING SERVICE DOOR	12'-0"	8'-0"



1\_ROLL UP DOOR

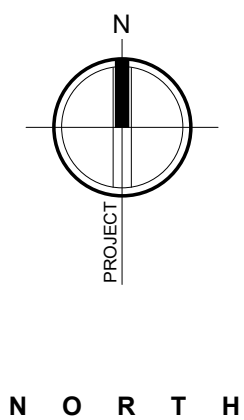
2 TYPICAL DOOR ELEVATION

1/4" = 1'-0"

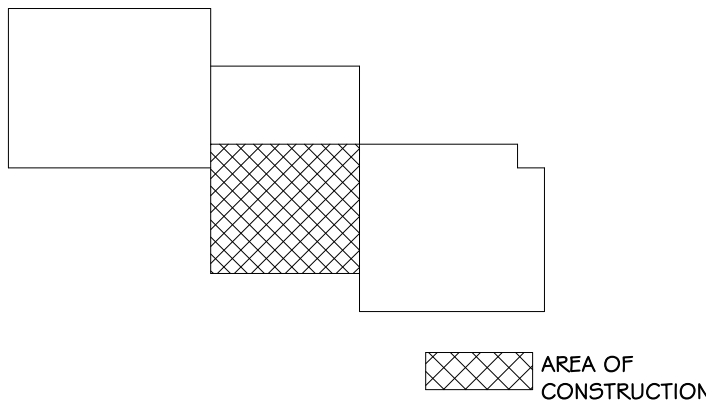
WALL LEGEND:

- NEW STEEL PLATE PUSH WALL
- NEW REINF. CONCRETE WALL
- EXISTING WALL

PROJECT



KEY PLAN:



AREA OF CONSTRUCTION

1 BASEMENT FLOOR PLAN

3/16" = 1'-0"

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Date

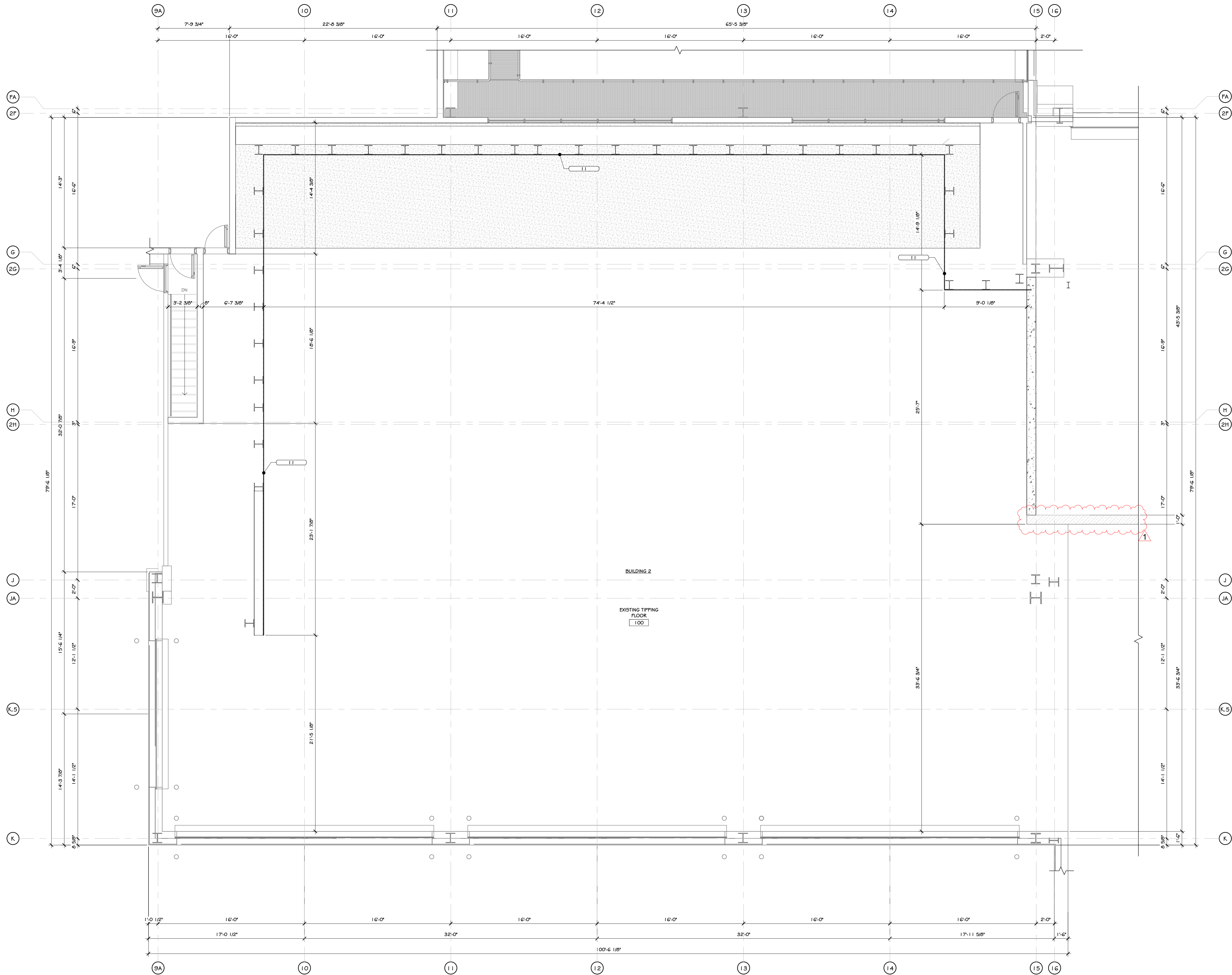
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ROCK CUT ROAD TRANSFER STATION BUILDING 2 OPTIMIZATION  
5808 ROCK CUT ROAD, JAMESVILLE, NY 13078  
ONONDAGA COUNTY RESOURCE RECOVERY AGENCY  
BASEMENT FLOOR PLAN

SHEET NO.  
A-8  
PROJECT NO.  
21136



1 FIRST FLOOR PLAN  
3/16" = 1'-0"

## CONSTRUCTION NOTES

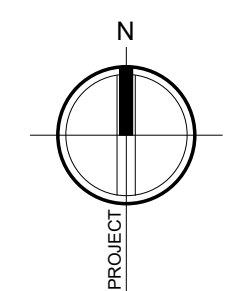
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  - F.F. ELEVATIONS:
    - A. TIPPING FLOOR: 100'-0"
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11. NEW STEEL COLUMNS - SEE STRUCTURAL DRAWINGS.

## WALL LEGEND:

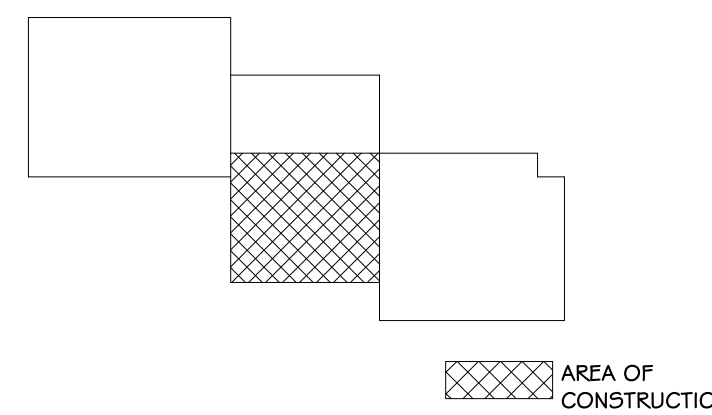
- NEW STEEL PLATE PUSH WALL
- NEW REINF. CONCRETE WALL
- EXISTING WALL

## PROJECT



NORTH

## KEY PLAN:



AREA OF CONSTRUCTION

ROCK CUT ROAD TRANSFER STATION BUILDING 2 OPTIMIZATION  
5808 ROCK CUT ROAD, JAMESVILLE, NY 13078  
ONONDAGA COUNTY RESOURCE RECOVERY AGENCY

## FIRST FLOOR PLAN

SHEET NO.

A-9

PROJECT NO.

21136

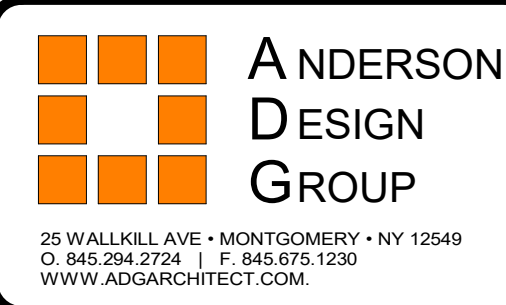
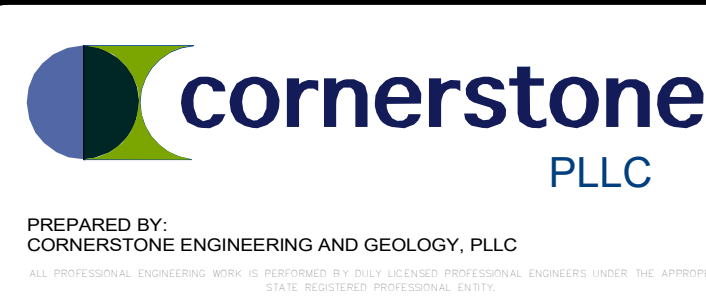
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CONCRETE:

1. CONCRETE SHALL CONFORM WITH THE REQUIREMENTS SET FORTH IN A.C.I. 301 AND SHALL HAVE A 28-DAY COMPRESSIVE STRENGTH AND DENSITY, IN ACCORDANCE WITH THE FOLLOWING:

INTENDED USE	28 DAY STRENGTH $f_c$ (K.S.I.)	CONCRETE DENSITY	MAXIMUM W/C (INCLUDING FLY ASH)	MINIMUM CEMENT MATERIAL (#CY INCLUDING FLY ASH)	MAXIMUM AGGREGATE (IN.)	SLUMP LIMITS (IN.) (+0", -2")	TOTAL AIR LIMITS (%) (B)	REQUIRED ADMIXTURES (C)
FOOTINGS	4	145	0.48	564	1 1/2	4	-	-
INTERIOR SLABS ON GRADE & TIPPING FLOOR	6	145		600	3/4	4	6	AE, WR
ALL CONCRETE NOT OTHERWISE SPECIFIED	4	145	0.40	564	3/4	4	6	-
PRECAST GROUT	7	145	-	-	1/4	6	N	G/K

CONCRETE TABLE NOTES:

- A. FOR MAXIMUM COARSE AGGREGATE SIZE INDICATED, USE THE FOLLOWING AGGREGATE SIZE NUMBERS PER A.S.T.M. C33:
- 3/8" - #8 AGGREGATE  
3/4" - #67 AGGREGATE  
1" - #57 AGGREGATE  
1 1/2" - #467 AGGREGATE
- B. TOTAL AIR CONTENT LIMITS INCLUDE BOTH ENTRAINED AND ENTRAPPED AIR +/- 1 1/2%. "N" IN COLUMN INDICATES ADDITION OF ENTRAINED AIR IS NOT PERMITTED.
- C. ABBREVIATIONS FOR REQUIRED ADMIXTURES AS FOLLOWS: AE - AIR-ENTRAINING ADMIXTURE, WR - WATER REDUCING ADMIXTURE
- D. MAXIMUM SHRINKAGE FOR SLAB ON GRADE SHALL BE LIMITED TO 5/8" PER 100 FOOT.
- E. PRECAST WALL PANEL GROUT SHALL CONTAIN A MINIMUM OF ITS CEMENTITIOUS MATERIAL AS EITHER 15% TYPE "K" CEMENT OR 8% TYPE "G" CEMENT.
2. REINFORCING SHALL CONFORM TO A.S.T.M. A615, GR. 60, INCLUDING TIES AND STIRRUPS. BARS REQUIRING WELDING OR FIELD BENDING SHALL BE A.S.T.M. A706, GRADE 60.
3. WELDED WIRE FABRIC SHALL CONFORM TO A.S.T.M. A185.
4. LAP SPLICES SHALL BE IN ACCORDANCE WITH THE FOLLOWING TABLE, UNLESS NOTED OTHERWISE. WHERE CLASSES ARE NOT CALLED OUT ON DRAWINGS, USE CLASS "B" SPLICES:

SPLICES:  $f_c$  = 4000 P.S.I.,  $f_y$  = 60,000 P.S.I.

STANDARD TENSION LAP SPLICE, GRADE 60													
CLASS A and B LAP SPLICE LENGTH (INCHES)													
BAR SIZE	CLASS	f <sub>c</sub> = 3,000 P.S.I.				f <sub>c</sub> = 4,000 P.S.I.				f <sub>c</sub> = 5,000 P.S.I. & f <sub>c</sub> = 6,000 P.S.I.			
		A		B		A		B		A		B	
		CASE	1	2	1	2	1	2	1	2	1	2	1
#3		16	25	21	32	14	21	18	28	13	19	17	25
#4		22	33	28	43	19	28	25	37	17	25	22	33
#5		27	41	36	53	24	36	31	46	21	32	28	41
#6		33	49	43	64	28	43	37	55	25	38	33	50
#7		48	72	62	93	42	62	54	81	37	56	48	72
#8		55	82	71	107	47	71	62	92	42	64	55	83
#9		62	93	80	120	54	80	70	104	48	72	62	93
#10		70	104	90	136	60	90	78	117	54	81	70	105
#11		77	116	100	151	67	100	87	130	60	90	78	117

"TOP BARS" ARE DEFINED AS ANY BAR WITH MORE THAN 12" OF CONCRETE CAST BELOW THE BAR, SEE NOTE 4 IN TABLE NOTES.

CONCRETE NOTES (CONTINUED):

5. ALL REINFORCING SHALL BE DETAILED, FABRICATED AND PLACED, IN ACCORDANCE WITH THE LATEST EDITION OF THE A.C.I. DETAILING MANUAL.
6. ALL REINFORCING SHALL BE SUPPORTED IN FORMS, SPACED WITH NECESSARY ACCESSORIES AND SHALL BE SECURELY WIRED TOGETHER, IN ACCORDANCE WITH C.R.S.I. "REINFORCING BAR DETAILING", LATEST EDITION.
7. MINIMUM CONCRETE COVER, UNLESS NOTED OTHERWISE:
- A. UNFORMED SURFACE IN CONTACT WITH THE GROUND: 3 IN.
- B. FORMED SURFACES EXPOSED TO EARTH OR WEATHER: 1 1/2 IN. FOR #5 BAR OR SMALLER, 2 IN. FOR #6 BAR OR LARGER
- C. FORMED SURFACES NOT EXPOSED TO EARTH OR WEATHER: WALLS, SLABS: 3/4 IN., BEAMS, GIRDERS AND COLUMNS (TO TIES OR STIRRUPS): 1 1/2 IN
- D. TIPPING FLOOR SLAB TOP BAR COVER SHALL BE 6 IN. MINIMUM.
8. ALL CONSTRUCTION JOINTS SHOWN ON DRAWINGS SHALL BE INCORPORATED INTO THE STRUCTURE, UNLESS THEIR ELIMINATION IS APPROVED BY THE ENGINEER. ADDITIONAL CONSTRUCTION JOINTS, REQUIRED TO FACILITATE CONSTRUCTION, SHALL BE LOCATED AT POINTS OF MINIMUM SHEAR AND SHALL BE DETAILED ON SHOP DRAWINGS WITH LOCATIONS SUBJECT TO APPROVAL BY ENGINEER. REINFORCEMENT SHALL PASS CONTINUOUSLY THROUGH THE JOINT.
9. ALL ABUTTING CONCRETE MEMBERS SHALL BE DOWELED TOGETHER, UNLESS POURED MONOLITHICALLY. DOWELS SHALL BE EQUAL IN SIZE AND SPACING TO THE REINFORCING IN THE ADJACENT MEMBER.
10. UNLESS OTHERWISE SHOWN IN THE ARCHITECTURAL DRAWINGS, PROVIDE 3/4" CHAMFERS AT ALL EDGES THAT ARE EXPOSED TO VIEW IN THE FINISHED STRUCTURE.
11. SEE ARCHITECTURAL DRAWINGS FOR DOOR AND WINDOW OPENINGS, DRIP SLOTS, REGLETS, MASONRY ANCHORS, PRECAST BEARING LEDGES, BRICK LEDGE ELEVATIONS AND FOR MISCELLANEOUS EMBEDDED PLATES, BOLTS, ANCHORS, ANGLES, ETC.
12. REFER TO TECHNICAL SPECIFICATIONS FOR CONCRETE FINISHES. WHERE FINISH IS NOT SPECIFIED, CONFORM TO REQUIREMENTS OF A.C.I. 301.
13. PLUMBING, AND ELECTRICAL DRAWINGS SHALL BE REFERRED TO FOR DRAINS, SLEEVES, OUTLET BOXES, CONDUIT, ANCHORS, ETC. THE VARIOUS TRADES ARE RESPONSIBLE FOR PLACING THEIR ITEMS.
14. BASE PLATES, ANCHOR BOLTS, SUPPORT ANGLES, ETC., BELOW GRADE SHALL BE COVERED WITH A MINIMUM OF 3" CONCRETE.
15. PROVIDE CONTINUOUS WATERSTOP AT HORIZONTAL AND VERTICAL JOINTS BELOW GRADE.
16. SHORING OF COMPOSITE BEAMS AND GIRDERS IS THE RESPONSIBILITY OF THE CONCRETE CONTRACTOR. SEE COMPOSITE BEAM AND DECK NOTES FOR SHORING REQUIREMENTS.
17. WHERE REINFORCING IS NOT INDICATED OR DEFINED, INCLUDE FOR BID PURPOSES ONLY:
- A. WALLS: #5 EACH WAY EACH FACE. SPACING IN INCHES = 140/(WALL THICKNESS IN INCHES) BUT NOT OVER 18" O.C.
- B. BEAMS: 1-#9 CONTINUOUS TOP AND BOTTOM FOR EACH 100 SQUARE INCHES OF BEAM CROSS SECTIONAL AREA AND #4 STIRRUPS SPACED AT 1/4 OF BEAM DEPTH FULL LENGTH OF BEAM.
- C. COLUMNS: 1-#9 VERTICAL PER 50 SQUARE INCHES OF CROSS SECTIONAL AREA AND #3 TIES @ 9" O.C.
- D. SLABS: #5 EACH WAY TOP AND BOTTOM. SPACING IN INCHES = 100/(SLAB THICKNESS IN INCHES) BUT NOT OVER 18" O.C.
- ON SHOP DRAWINGS, INDICATE ABOVE REINFORCING AS "PER GENERAL NOTES". SUCH REINFORCING MAY BE REVISED OR RELOCATED BY STRUCTURAL ENGINEER DURING SHOP DRAWING REVIEW.
18. MASONRY DOWELS: PROVIDE, PLACE, AND SPACE TO MATCH MASONRY REINFORCING.
19. PROVIDE STANDARD HOOKS ON BARS TERMINATING AT A CONCRETE FACE UNLESS NOTED (E.G.: EDGES OF OPENINGS, SLAB EDGES, EXPANSION JOINTS, ENDS OF BEAMS, AND AT: TOP, BOTTOM AND ENDS OF WALLS, ETC...).
20. PROVIDE 2-#5 (MINIMUM) @ EACH SIDE OF OPENING. EXTEND 2'-0" BEYOND OPENINGS.
21. PROVIDE 2-#5 (MINIMUM) @ EACH SIDE OF OPENING. EXTEND 2'-0" BEYOND OPENINGS.

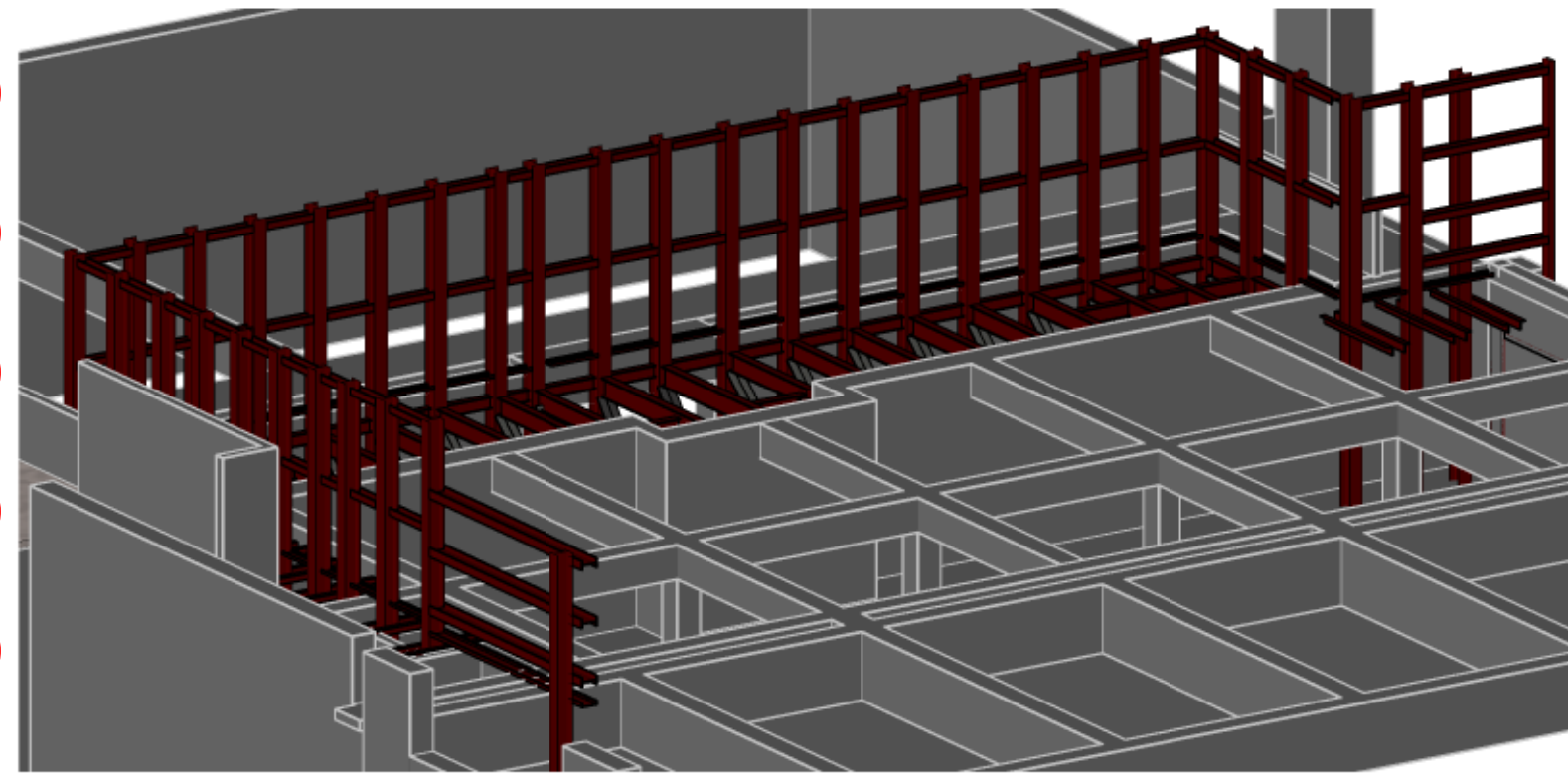
TABLE NOTES:

- A. TABLES ARE BASED A.C.I. 318. WHERE CLEAR SPACING OF BARS BEING DEVELOPED OR SPLICED IS AT LEAST 2 BAR DIAMETERS AND THE CLEAR COVER AT LEAST 1 BAR DIAMETER, USE CASE 1. USE CASE 2 FOR OTHER BAR ARRANGEMENTS.
- B. ALL SPLICES TO BE CLASS "B" TENSION SPlice UNLESS OTHERWISE NOTED.
- C. SPlice PLAIN WELDED WIRE FABRIC BY LAPPING ONE FULL MESH SPACE PLUS 2 INCHES.
- D. FOR TOP BARS, MULTIPLY LENGTHS IN TABLE BY 1.3.
- E. FOR EPOXY COATED REINFORCEMENT, MULTIPLY LENGTHS IN TABLE BY 1.5 FOR COVER LESS THAN 3db OR CLEAR SPACING LESS THAN 6db, MULTIPLY LENGTHS BY 1.2 FOR ALL OTHER EPOXY COATED REINFORCEMENT.
- F. FOR LIGHT WEIGHT CONCRETE, MULTIPLY LENGTHS IN TABLE BY 1.3.
- G. COMPRESSION DOWEL EMBEDMENT: 22 BAR DIAMETERS
- H. COMPRESSION DOWEL EMBEDMENT: 22 BAR DIAMETERS.

COMPRESSION LAP SPlice SCHEDULE	
LAP LENGTH (INCHES)	
$f_c$ = 3,000 P.S.I. OR GREATER	
BAR SIZE	30 BAR DIA.
#3	12
#4	15
#5	19
#6	22
#7	26
#8	29
#9	33
#10	37
#11	41

STRUCTURAL STEEL:

1. STEEL SHALL CONFORM TO THE FOLLOWING GRADES:
- ALL WIDE FLANGE (U.N.O.): A992 GRADE 50 ( $F_y$ =50)  
ALL CHANNEL, ANGLE, BASE PLATES, CONNECTION PLATES (U.N.O.): A36 ( $F_y$ =36)  
STRUCTURAL PIPE: A53 ( $F_y$ =35)  
STRUCTURAL HSS RECTANGULAR TUBE: A500 GRADE B ( $F_y$ =46)  
STRUCTURAL HSS ROUND TUBE: A500 GRADE B ( $F_y$ =42)
2. ALL STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST EDITION OF THE A.I.S.C. CODE OF STANDARD PRACTICE, EXCEPT AS MODIFIED IN THESE NOTES AND THE PROJECT SPECIFICATIONS.
3. CONNECTIONS MAY BE BOLTED OR WELDED. THE FABRICATOR IS RESPONSIBLE FOR THE DESIGN OF CONNECTIONS NOT SHOWN ON THE DRAWINGS. GENERALLY, CONNECTIONS SHOWN ON THE STRUCTURAL DRAWINGS ARE SCHEMATIC AND ARE ONLY INTENDED TO SHOW THE RELATIONSHIP OF MEMBERS CONNECTED. ANY CONNECTION THAT IS NOT SHOWN OR IS NOT COMPLETELY DETAILED ON THE STRUCTURAL DRAWINGS SHALL BE DESIGNED BY A PROFESSIONAL ENGINEER, REGISTERED IN THE STATE OF THE PROJECT, RETAINED BY THE FABRICATOR. COMPLETELY DETAILED MEANS THE FOLLOWING INFORMATION IS SHOWN ON THE DETAIL:
- A. ALL PLATE DIMENSIONS AND GRADES.
- B. ALL WELD SIZES, LENGTHS, PITCHES, AND RETURNS.
- C. ALL HOLE SIZES AND SPACINGS.
- D. NUMBER AND TYPES OF BOLTS: WHERE BOLTS ARE SHOWN BUT NO NUMBER IS GIVEN, THE CONNECTION HAS NOT BEEN COMPLETELY DETAILED.
- E. WHERE PARTIAL INFORMATION IS GIVEN, IT SHALL BE THE MINIMUM REQUIREMENT FOR THE CONNECTION.
- PRIOR TO FABRICATION, PROVIDE (FOR RECORD COPY) DESIGN CALCULATIONS FOR TYPICAL BEAM CONNECTIONS, ALL PRIMARY BRACING AND HANGER CONNECTIONS, SIGNED AND SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF THE PROJECT SHALL BE SUBMITTED TO THE ENGINEER.
4. CONNECTION DESIGN FORCES:
- A. BEAMS, IF REACTION IS NOT SHOWN GREATER OF:
- 55% OF TOTAL ALLOWABLE UNIFORM LOAD CAPACITY FROM A.I.S.C. 14TH EDITION TABLES FOR ALLOWABLE LOADS ON BEAMS, WGL.
- 10 KIPS.
- B. MOMENT CONNECTIONS INDICATED ON THE DRAWINGS THUS:  $\overrightarrow{M}$  DESIGN FOR MOMENT SHOWN OR, IF NOT SHOWN, DEVELOP MOMENT CAPACITY OF MEMBER WITH  $\phi_b = 0.66 F_y$ .
- C. MAINTAIN TENSION CAPACITY OF COLUMNS, DIAGONALS AND MEMBERS SUBJECT TO TENSION AT BOLT HOLES, NOTCHES, OR COPES.
- D. CONNECTION FORCE NOTATION:
- P = AXIAL FORCE IN KIPS: (+) TENSION, (-) COMPRESSION  
V OR  $\{ \}$  = SHEAR IN KIPS  
M = MOMENT IN FOOT KIPS  
T = TORSION IN FOOT KIPS
5. THE MINIMUM PLATE THICKNESS SHALL BE 1/4".
6. BOLTED CONNECTIONS:
- A. MINIMUM BOLT DIAMETER = 3/4"
- B. SLIP CRITICAL CONNECTIONS OF A325SC OR A490SC BOLTS SHALL BE USED FOR ALL BOLTED CONNECTIONS OF BRACING MEMBERS, MOMENT CONNECTIONS, CANTILEVERS, AND AS SHOWN ON THE DRAWINGS. OVERSIZED AND LONG-SLOTTED HOLES ARE ALLOWED FOR SLIP CRITICAL CONNECTIONS.
- C. ALL OTHER BOLTED CONNECTIONS SHALL BE BEARING TYPE USING A325N OR A490N BOLTS. OVERSIZED HOLES AND LONG-SLOTTED HOLES ARE NOT ALLOWED UNLESS SHOWN ON THE DRAWINGS.
- D. A307 BOLTS MAY BE USED WHERE INDICATED ON THE DRAWINGS.
- E. PROTRUDING BOLT HEADS, SHAFTS OR NUTS SHALL NOT EXTEND INTO NOR PROHIBIT THE APPLICATION OF ARCHITECTURAL FINISHES AND THEY SHALL NOT EXTEND INTO NOR PROHIBIT THE PLACEMENT OF STEEL DECKING TO THE CORRECT LINE AND ELEVATION.
- F. THE FABRICATOR IS RESPONSIBLE FOR VERIFYING THE TENSION CAPACITY OF AXIALLY LOADED MEMBERS AFTER A SECTION IS REDUCED FOR BOLT HEADS. MEMBER SIZE MAY BE INCREASED OR CONNECTION PLATES ADDED AS REQUIRED.
- G. SHOP DRAWINGS SHALL INDICATE THE TYPE OF BOLT USED IN EACH CONNECTION AND THE ALLOWABLE VALUES USED FOR THE VARIOUS BOLT TYPES.
7. WELDED CONNECTIONS:
- A. WELDS ARE CONTINUOUS UNLESS NOTED.
- B. ALL FILLET WELDS: A.I.S.C. MINIMUM BUT NOT LESS THAN 1/4" UNLESS NOTED OTHERWISE.
- C. ALL WELDING SHALL BE IN ACCORDANCE WITH THE CURRENT "STRUCTURAL WELDING CODE" (A.W.S. D1.1) PUBLISHED BY THE AMERICAN WELDING SOCIETY. ELECTRODES FOR WELDING SHALL COMPLY WITH THE REQUIREMENTS OF TABLE 4.1.1 OF (A.W.S. D1.1).
- D. ALL GROOVE WELDS SHALL BE COMPLETE PENETRATION UNLESS NOTED OTHERWISE.
8. SPlicing OF STEEL MEMBERS, UNLESS SHOWN ON THE DRAWINGS, IS PROHIBITED WITHOUT WRITTEN APPROVAL OF THE ENGINEER.
9. NO CHANGE IN SIZE OR POSITION OF THE STRUCTURAL ELEMENTS SHALL BE MADE AND HOLES, SLOTS, CUTS, ETC., ARE NOT PERMITTED THROUGH ANY MEMBER UNLESS THEY ARE DETAILED ON THE APPROVED SHOP DRAWINGS.
10. NO FINAL BOLTING OR WELDING SHALL BE MADE UNTIL AS MUCH OF THE STRUCTURE AS WILL BE STIFFENED THEREBY HAS BEEN PROPERLY ALIGNED.
11. UNLESS NOTED OTHERWISE, BEAMS SHALL BEAR 8" MINIMUM ON CONCRETE OR MASONRY. ANCHOR BEAMS TO MASONRY OR CONCRETE WITH 2-3/4" DIA. ANCHOR BOLTS OR WELDED TO EMBED PLATE.
12. FABRICATE ALL BEAMS WITH THE MILL CAMBER UP.
13. SHEAR STUDS: CONFORM TO A.W.S. D1.1-98, SHOP WELD EXCEPT WHERE APPLIED THROUGH METAL DECK.
14. HEADED STUDS SHALL CONFORM TO A.S.T.M. A108, GRADE 1015, WELDABLE ( $F_y$  = 65 K.S.I.).
15. TOP OF ALL TUBES AND PIPES SHALL HAVE A CAP PLATE 1/4", SEAL WELDED ALL AROUND, UNLESS LARGER CAP PLATE AND / OR WELD IS NOTED. THIS DOES NOT APPLY TO DIAGONAL / SLOPING TUBES OR PIPES.
16. WHERE FIREPROOFING IS REQUIRED, ADJUST FIREPROOFING THICKNESS BASED ON MEMBER SIZES. SEE ARCHITECTURAL DRAWINGS FOR FIREPROOFING REQUIREMENTS AND THICKNESS.
17. ALL EXPOSED EXTERIOR STEEL SHALL HAVE A GALVANIZED FINISH, UNLESS NOTED OTHERWISE.



1 S001 ISOMETRIC VIEW AT PUSHWALL

NOTE: ISOMETRIC VIEW IS FOR ILLUSTRATIVE PURPOSES ONLY. ACTUAL FRAMING MAY VARY.

GENERAL NOTES:

DESIGN CRITERIA:

CODES AND STANDARDS:

2020 NEW YORK BUILDING CODE (N.Y.B.C.)

DESIGN LOADS:

ROOF:  
SUPERIMPOSED DEAD LOADS:

ROOFING: 1 P.S.F.  
INSULATION: 1.5 P.S.F.  
METAL DECK: 2 P.S.F.  
M.E.P.: 3 P.S.F.  
SPRINKLER LIVE LOADS: 4.5 P.S.F.  
JOISTS: 3 P.S.F.

LIVE LOADS:

TIPPING FLOOR LIVE LOAD: 250 P.S.F. OR HS20 TRUCK  
WALKWAYS & STAIRS: 100 P.S.F.

SNOW LOADS:

SNOW LOAD IMPORTANCE FACTOR:  $I = 1.0$   
GROUND SNOW LOAD:  $P_g = 50$  P.S.F.  
FLAT ROOF SNOW LOAD:  $P_f = 42$  P.S.F.  
SNOW EXPOSURE FACTOR:  $C_e = 1.0$   
THERMAL FACTOR:  $C_t = 1.2$

WIND DESIGN DATA:

BASIC WIND SPEED: 115 M.P.H. ULTIMATE, 90 M.P.H. SERVICE PER NYBC  
BUILDING OCCUPANCY CATEGORY: II  
WIND EXPOSURE: B  
INTERNAL PRESSURE COEFFICIENT: +/- 0.18

SEISMIC DESIGN DATA:

SEISMIC IMPORTANCE FACTOR:  $I = 1.0$   
MAPPED SPECTRAL RESPONSE ACCELERATIONS:  $S_s = 0.140$  /  $S_1 = 0.061$   
SITE CLASS: D  
SPECTRAL RESPONSE COEFFICIENTS:  $S_{ds} = 0.149$  /  $S_{d1} = 0.097$   
SEISMIC DESIGN CATEGORY: B

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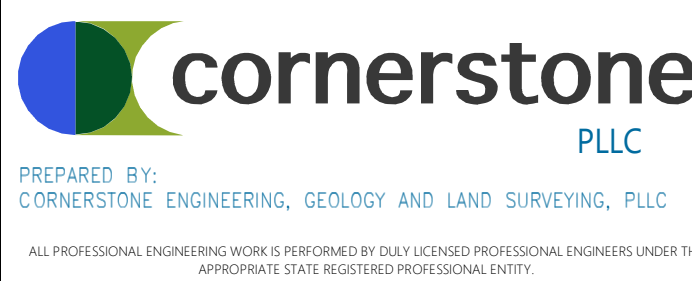
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N.Y.P.E. Lic. No. 096942-1

11-30-21

Date

REV.	DATE	DESCRIPTION	M.E.	M.E.	V.A.G.	V.A.G.
1	11/30/21	ADDENDUM 1				
			DWN BY	DES BY	CHK BY	BYAPP BY
DATE OF ISSUE		DRAWN BY	M.E.	CHECKED BY	V.A.G.	
11-7-21		DESIGNED BY	M.E.	APPROVED BY	V.A.G.	



ROCK CUT ROAD TRANSFER STATION BUILDING 2 OPTIMIZATION

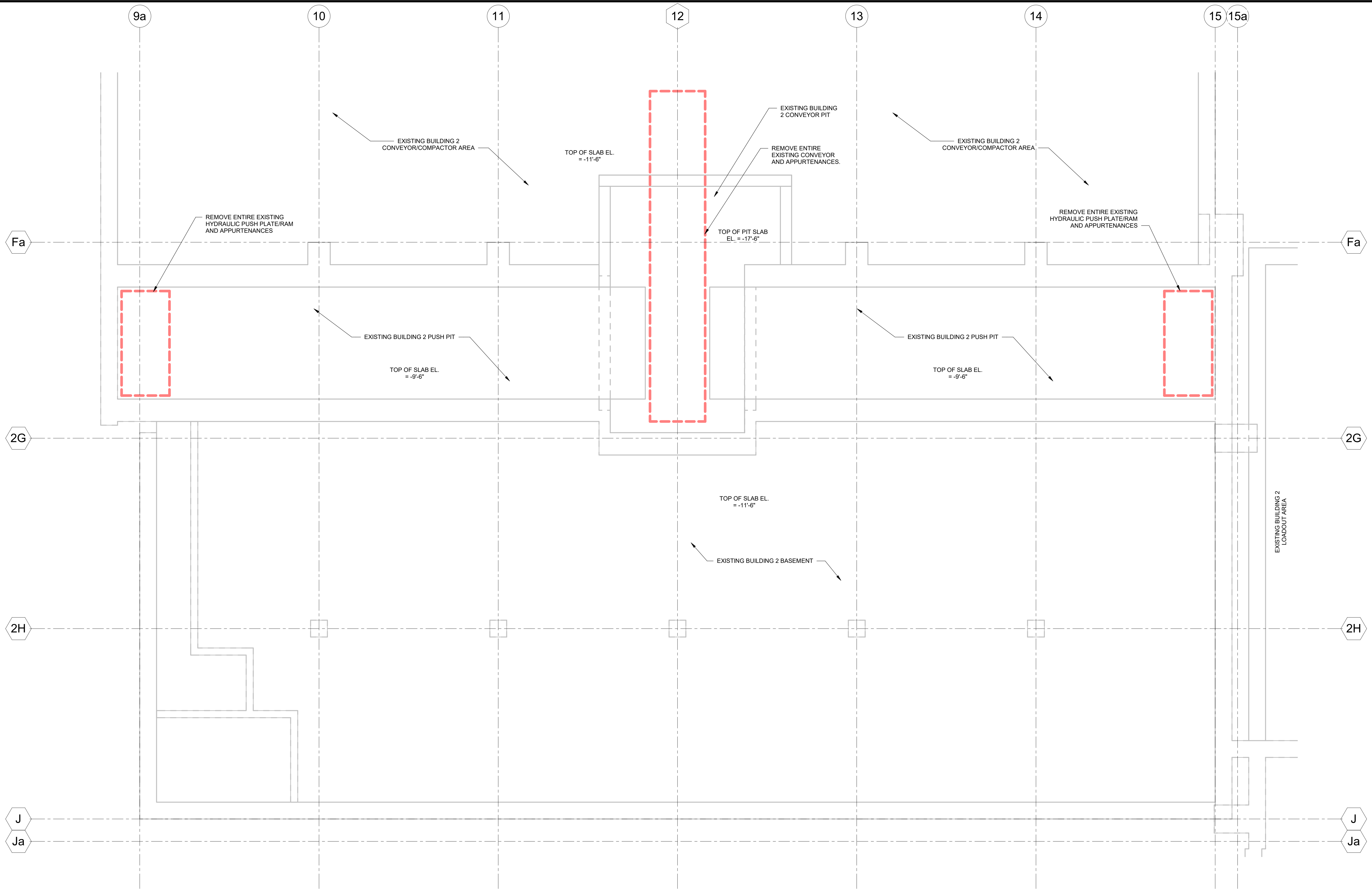
5808 ROCK CUT ROAD, JAMESVILLE, NY 13078  
ONONDAGA COUNTY RESOURCE RECOVERY AGENCY

TITLE SHEET

SHEET NO.

S001

PROJECT NO.  
21136



1 PARTIAL DEMOLITION PLAN AT FOUNDATION  
S101 1/4" = 1'-0"

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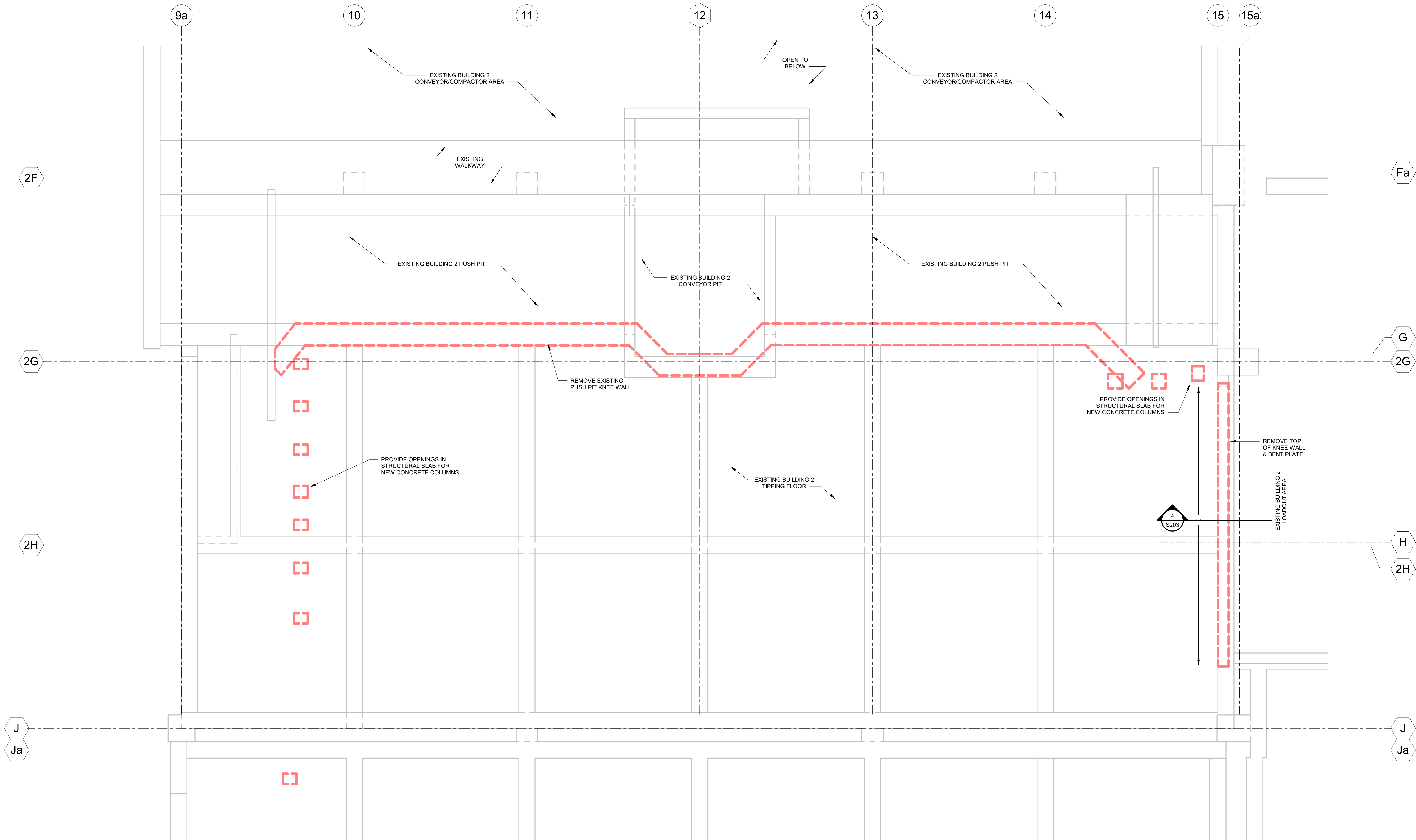


ROCK CUT ROAD TRANSFER STATION BUILDING 2 OPTIMIZATION  
5808 ROCK CUT ROAD, JAMESVILLE, NY 13078  
ONONDAGA COUNTY RESOURCE RECOVERY AGENCY  
PARTIAL DEMOLITION PLAN AT FOUNDATION

SHEET NO.

S101

PROJECT NO.  
21136



1 PARTIAL DEMOLITION PLAN AT TIPPING FLOOR  
S102 1/4" = 1'-0"

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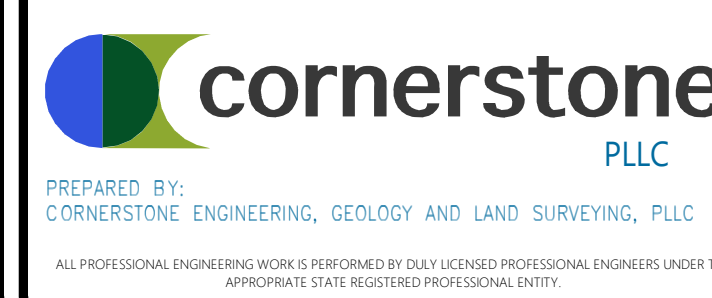
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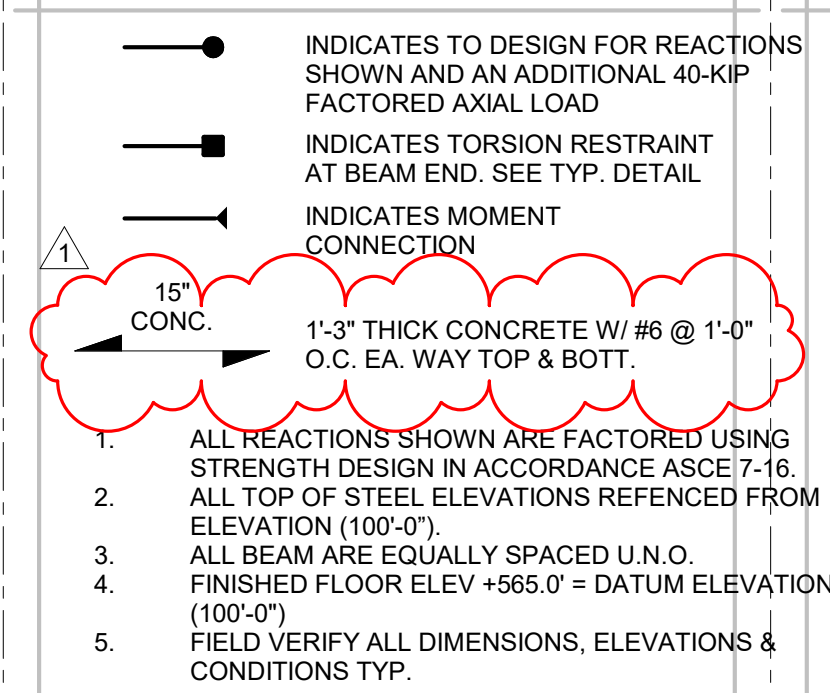
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		DESIGNED BY	M.E.	APPROVED BY	V.A.G.	



ROCK CUT ROAD TRANSFER STATION BUILDING 2 OPTIMIZATION  
5808 ROCK CUT ROAD, JAMESVILLE, NY 13078  
ONONDAGA COUNTY RESOURCE RECOVERY AGENCY  
PARTIAL DEMOLITION PLAN AT TIPPING FLOOR

SHEET NO.  
**S102**  
PROJECT NO.  
21136





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DATE OF ISSUE			DRAWN BY		M.E.	
11-17-21			DESIGNED BY		M.E.	
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			APPROVED BY		V.A.G.	



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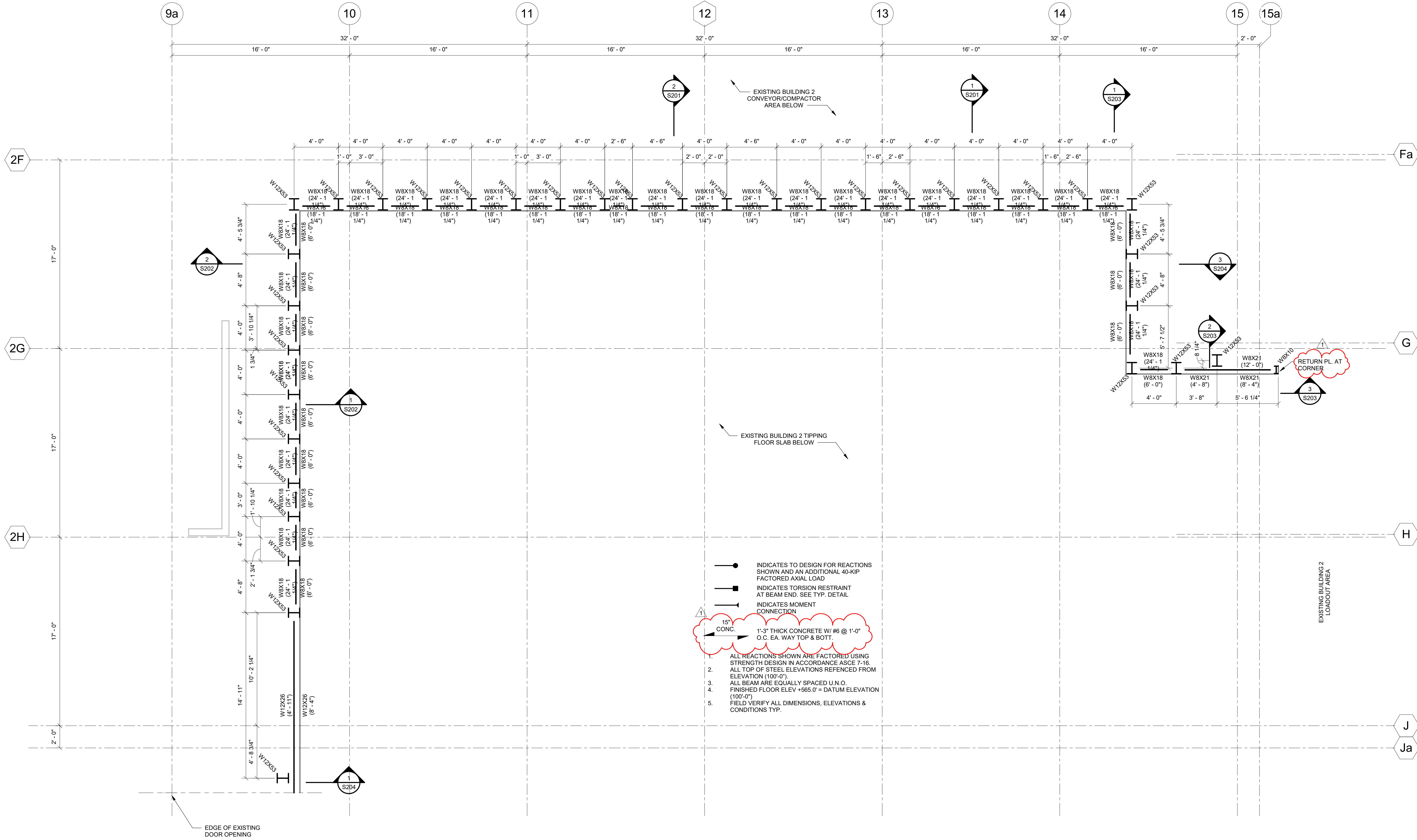
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### PARTIAL FRAMING PLAN AT TIPPING FLOOR

SHEET NO.

104 |

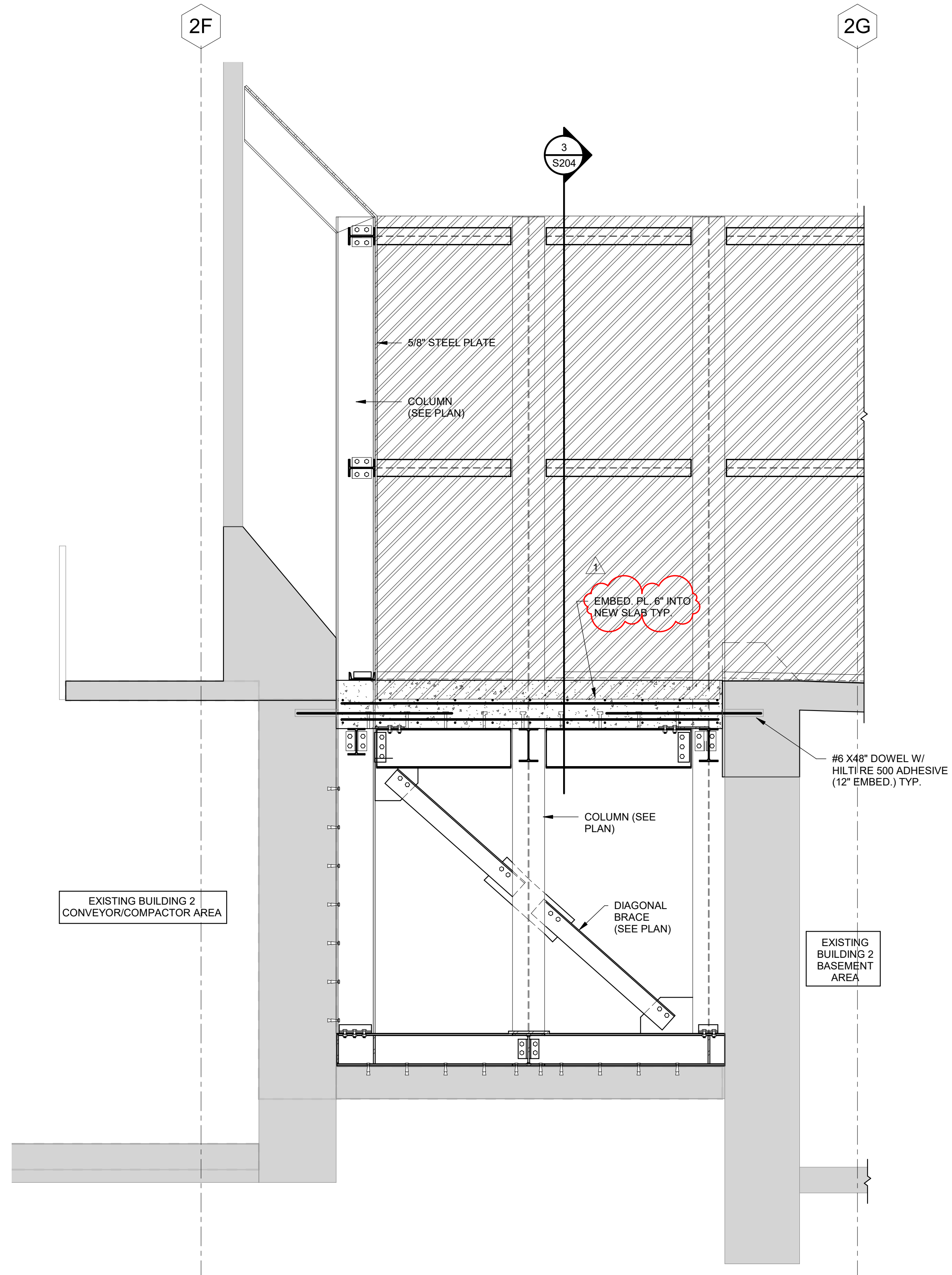
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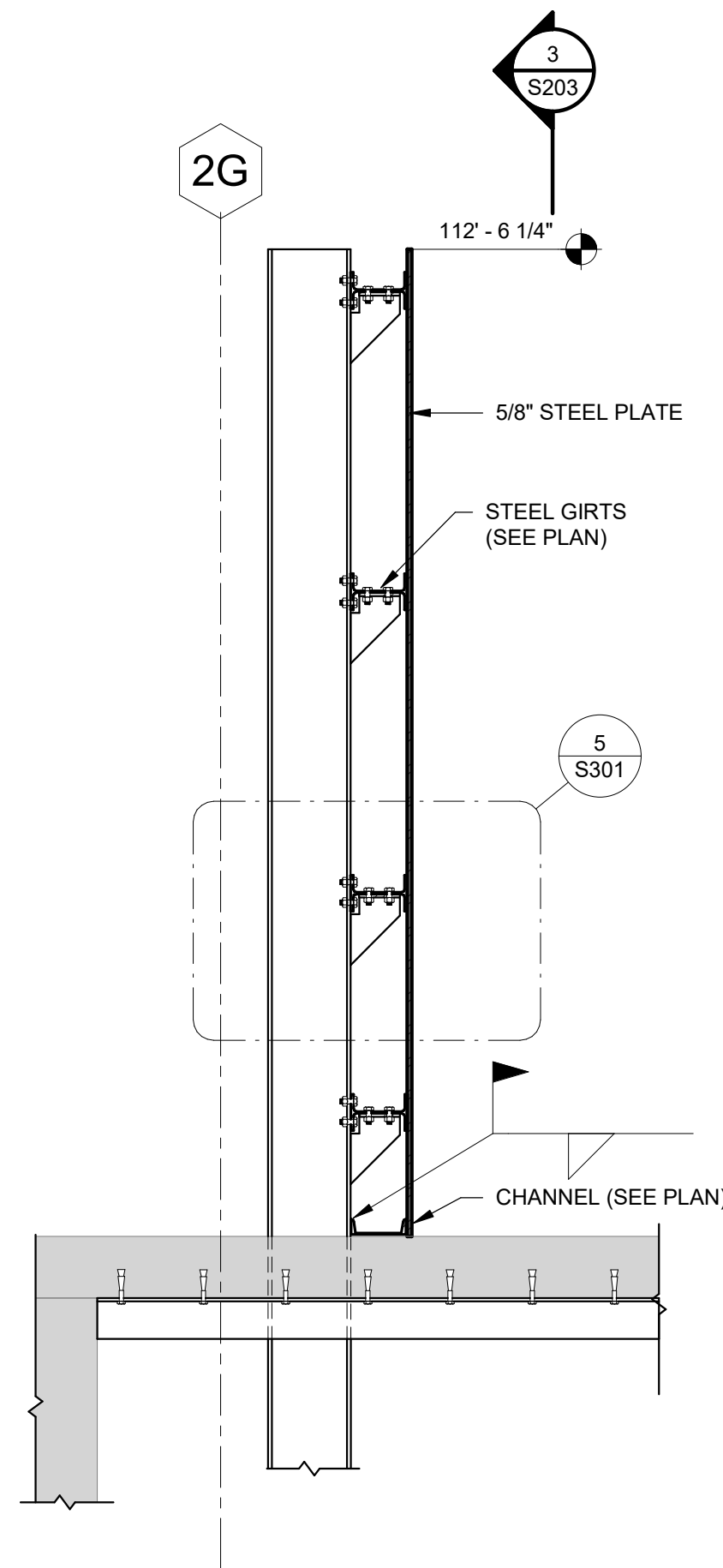




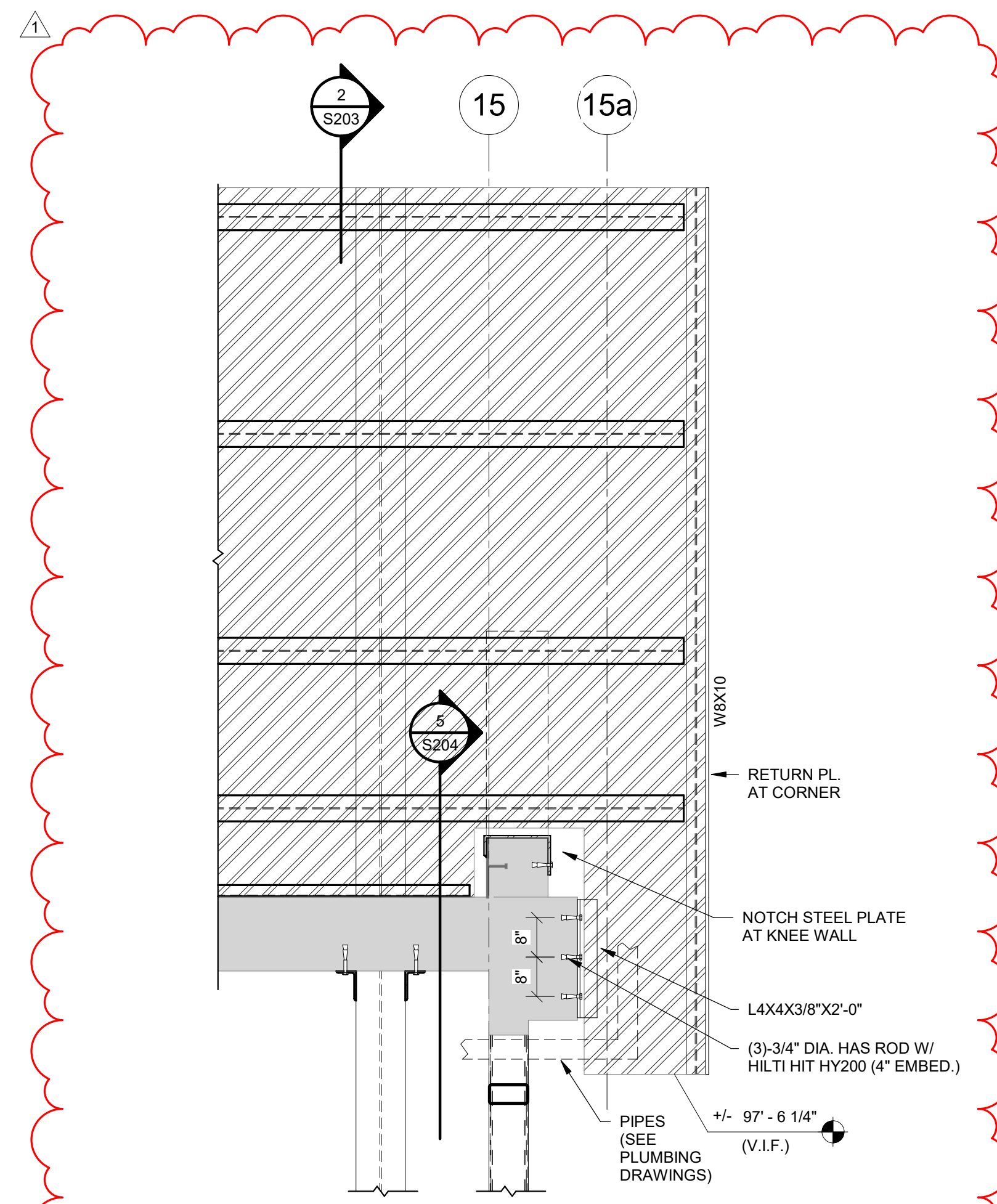
PROJECT NO.  
136



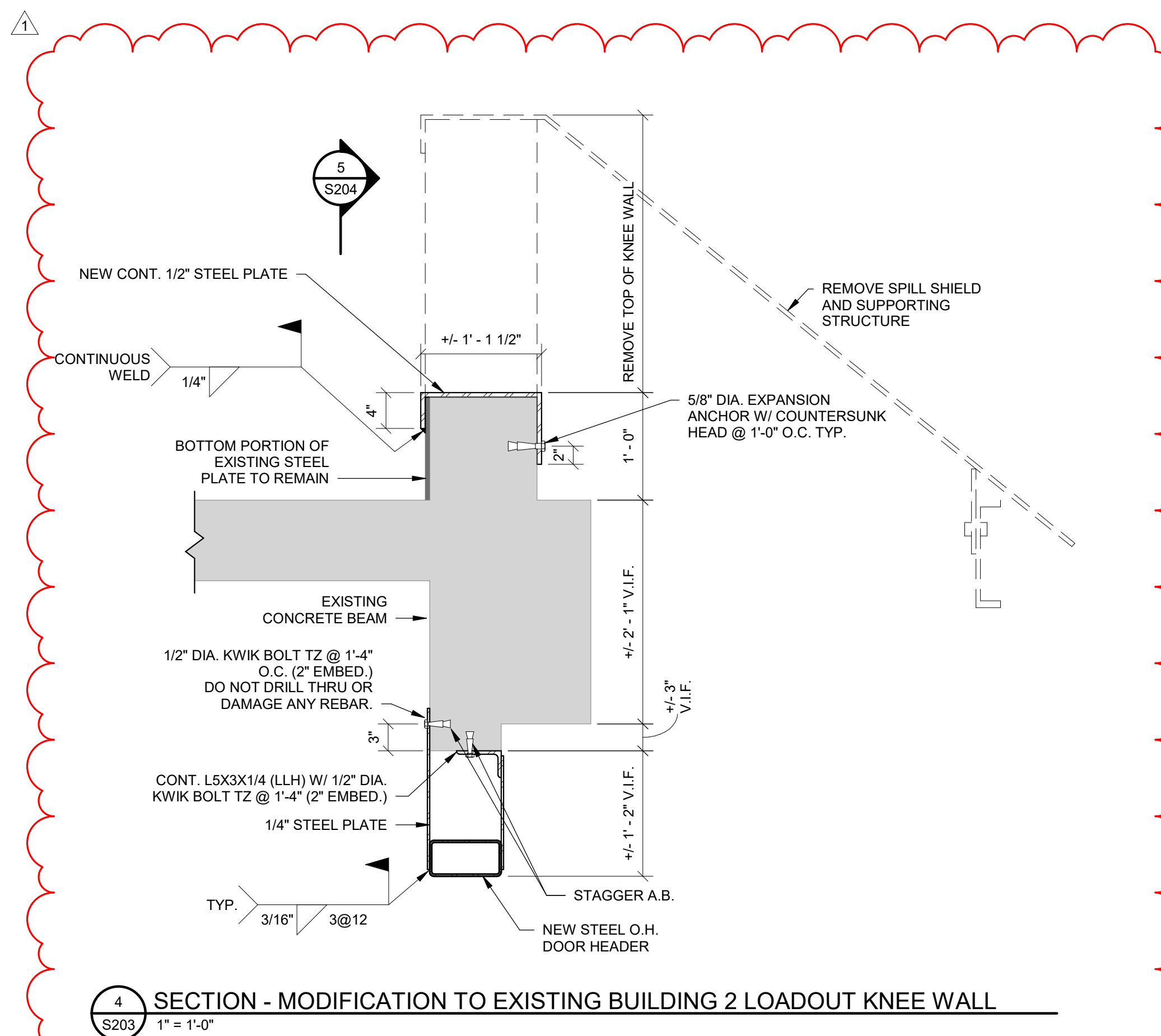
1 SECTION - AT END OF PUSH PIT  
S203 1/2" = 1'-0"



2 SECTION - PUSHWALL COLUMN AT EXISTING COLUMN PROTECTION  
S203 1/2" = 1'-0"



3 SECTION - CANTILEVERED PUSHWALL FRAMING  
S203 1/2" = 1'-0"



4 SECTION - MODIFICATION TO EXISTING BUILDING 2 LOADOUT KNEE WALL  
S203 1" = 1'-0"



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11-30-21  
Date

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1	11/30/21	ADDENDUM 1				
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			DESIGNED BY: M.E.		APPROVED BY: V.A.G.	

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PREPARED BY:  
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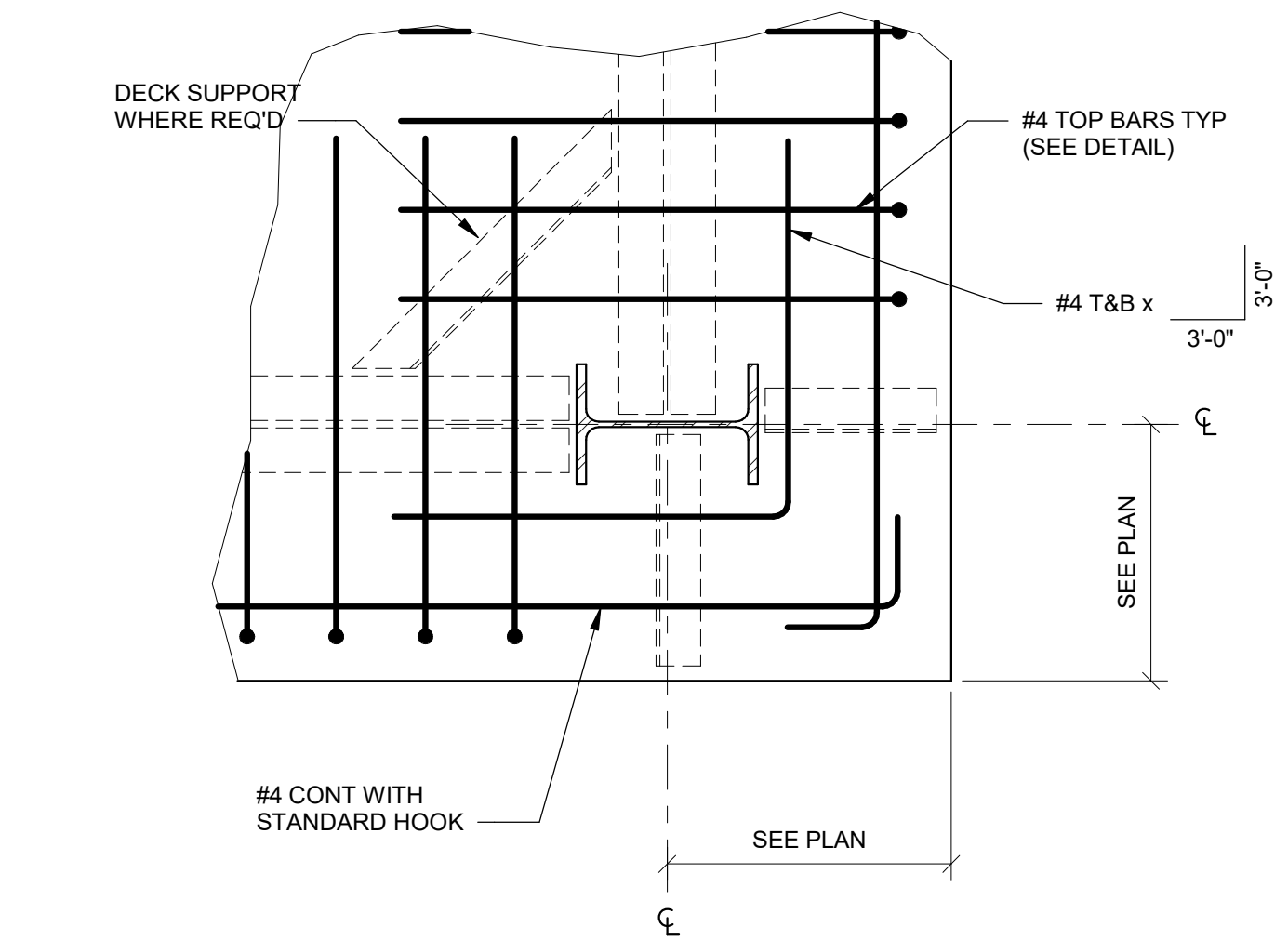
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ASSOCIATES, P.C. | STRUCTURAL ENGINEERS  
70 South Franklin Street, Wilkes-Barre, PA 18701  
570 | 824-6340 info@edpons.com edpons.com

ROCK CUT ROAD TRANSFER STATION BUILDING 2 OPTIMIZATION  
5808 ROCK CUT ROAD, JAMESVILLE, NY 13078  
ONONDAGA COUNTY RESOURCE RECOVERY AGENCY  
SECTIONS

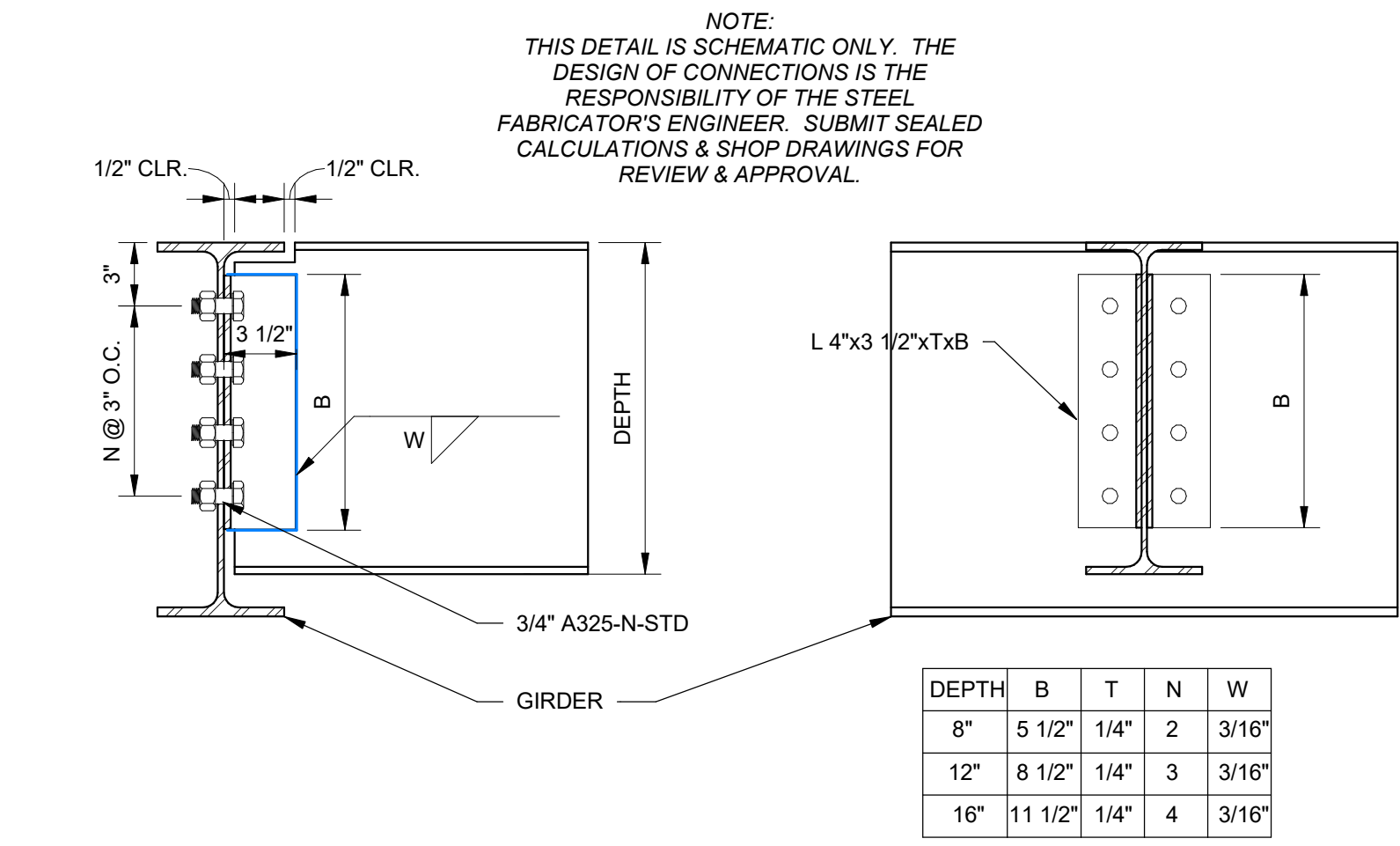
SHEET NO.  
**S203**  
PROJECT NO.  
21136

ISSUED FOR BID

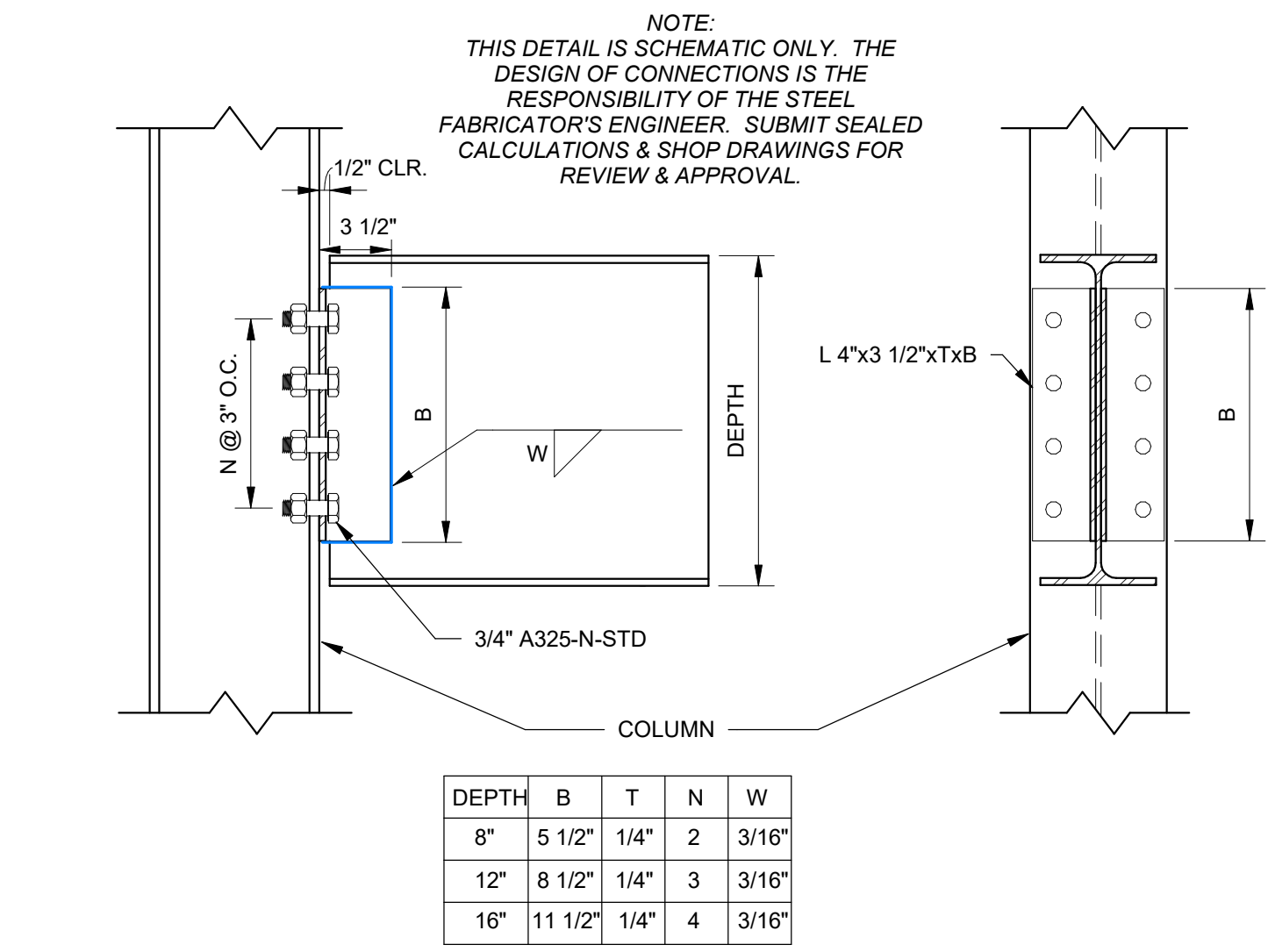
PROJECT NO  
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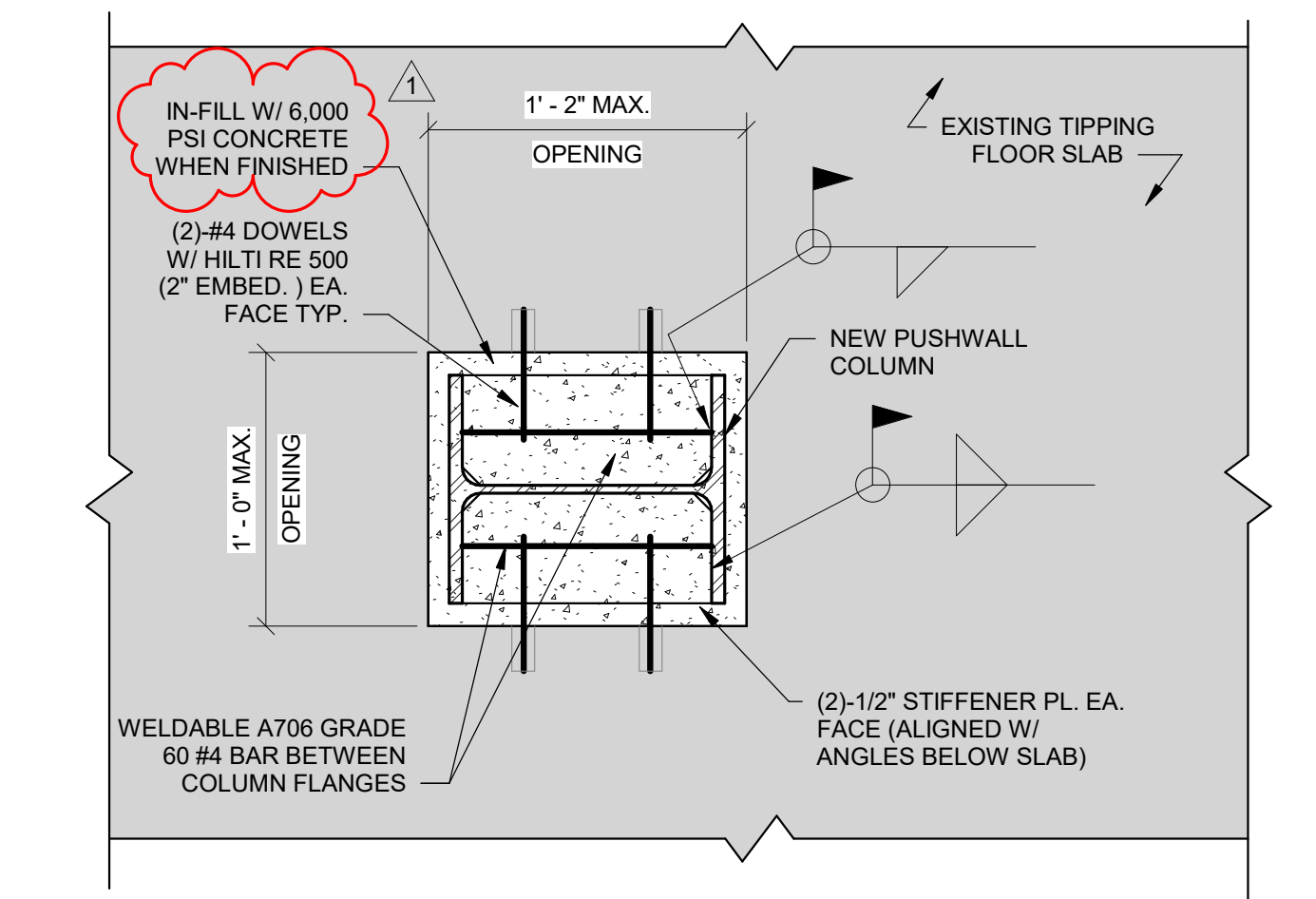
1  
S301 TYP SLAB REINF AT CORNER COLUMN  
1" = 1'-0"



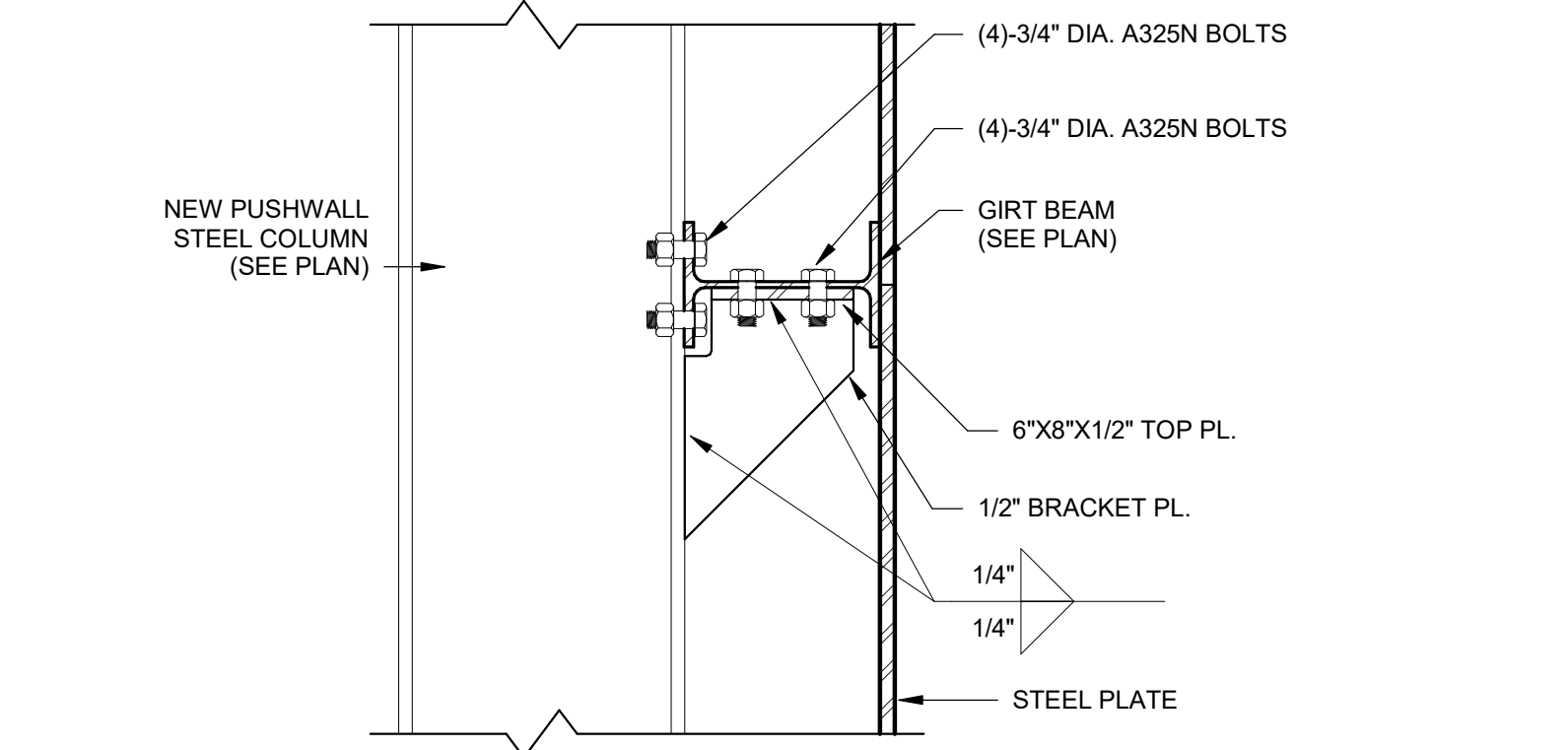
2  
S301 BEAM TO GIRDER CONNECTION  
1 1/2" = 1'-0"



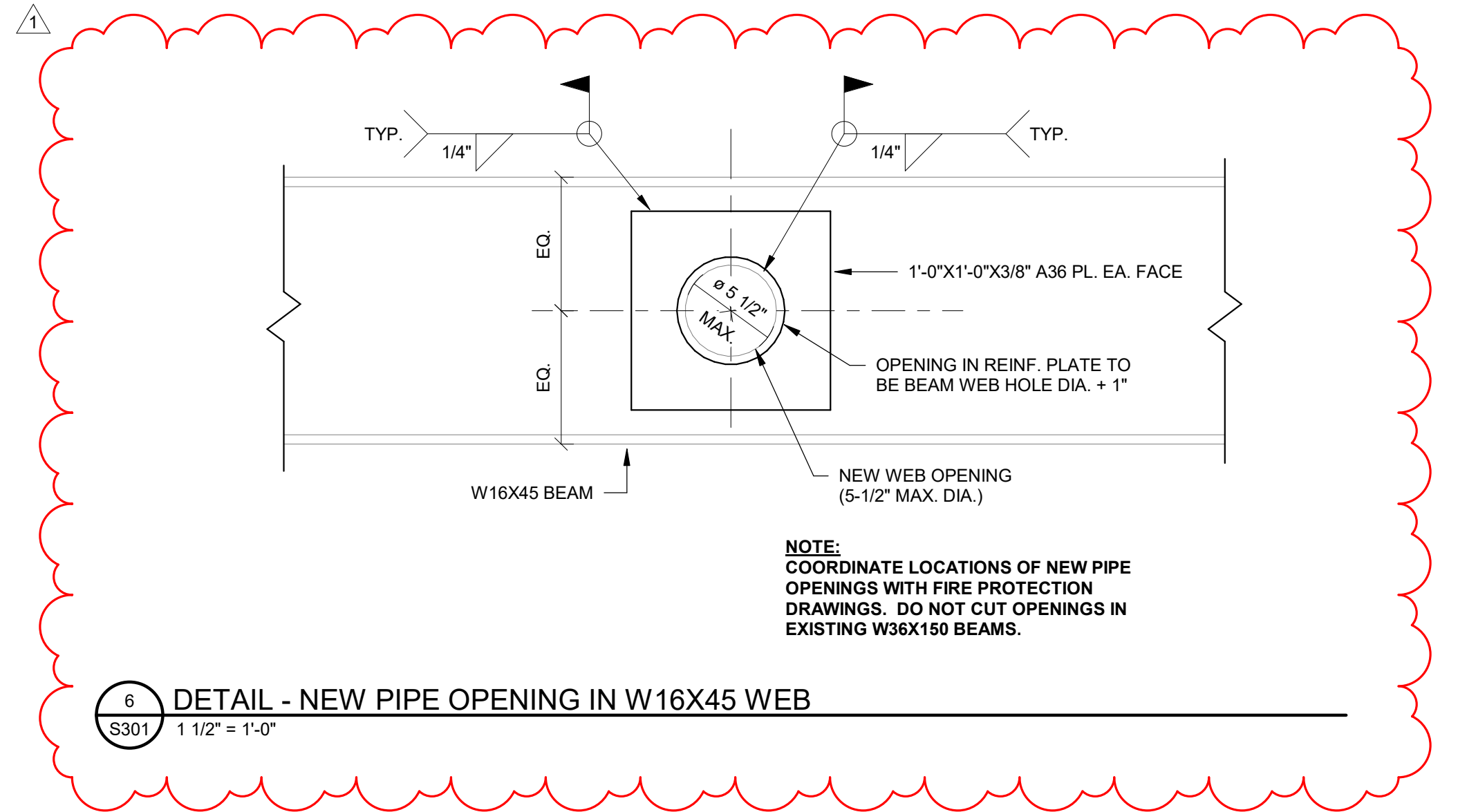
3  
S301 BEAM TO W-SHAPE CONNECTION  
1 1/2" = 1'-0"



4  
S301 DETAIL - COLUMN PENETRATION AT SLAB  
1 1/2" = 1'-0"



5  
S301 DETAIL - BRACKET AT PUSHWALL  
1 1/2" = 1'-0"



6  
S301 DETAIL - NEW PIPE OPENING IN W16X45 WEB  
1 1/2" = 1'-0"

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ROCK CUT ROAD TRANSFER STATION BUILDING 2 OPTIMIZATION

5808 ROCK CUT ROAD, JAMESVILLE, NY 13078  
ONONDAGA COUNTY RESOURCE RECOVERY AGENCY

**DETAILS**

SHEET NO.  
**S301**

PROJECT NO.  
21136

- a. SPECIAL INSPECTION WILL BE IN ACCORDANCE WITH THE 2020 NEW YORK STATE BUILDING CODE (2020 NYSBC).
- b. SPECIAL INSPECTION IS REQUIRED OF MATERIALS, INSTALLATION, FABRICATION, ERECTION OR PLACEMENT OF COMPONENTS AND CONNECTIONS REQUIRING SPECIAL EXPERTISE TO ENSURE COMPLIANCE WITH APPROVED CONSTRUCTION DOCUMENTS.
- c. COORDINATE SCHEDULES WITH THE AGENCY PERFORMING SPECIAL INSPECTIONS TO ENSURE AMPLE TIME IS AVAILABLE TO PERFORM THE REQUIRED TASKS.
- d. THE SPECIAL INSPECTOR SHALL PROVIDE REPORTS TO THE LOCAL BUILDING OFFICIAL, REGISTERED DESIGN PROFESSIONAL IN CHARGE, AND THE OWNER'S DESIGNATED REPRESENTATIVE. THESE REPORTS MUST BE IN COMPLIANCE WITH THE 2020 NYSBC. THE SPECIAL INSPECTOR SHALL IMMEDIATELY NOTIFY THE CONTRACTOR IN WRITING OF NON-CONFORMANCE TO THE APPROVED CONSTRUCTION DOCUMENTS, 2020 NYSBC, OR OTHER VIOLATIONS OF THE APPLICABLE REFERENCED MATERIAL STANDARDS IN THE 2020 NYSBC WITHIN THE SCOPE OF THE SPECIAL INSPECTION REQUIREMENTS.
- e. THE SPECIAL INSPECTION AGENCY SHALL SUBMIT A FINAL REPORT TO THE BUILDING OFFICIAL, REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE, AND OWNER'S REPRESENTATIVE STATING WHETHER THEIR WORK REQUIRING SPECIAL INSPECTION WAS INSPECTED, REPORTED, AND FOUND TO BE IN COMPLIANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS, 2020 NYSBC, AND THE APPLICABLE REFERENCED MATERIAL STANDARDS IN THE 2020 NYSBC. FINAL REPORTS SHALL CATALOG ALL INSPECTION, TESTING, AND RELATED ENGINEER SIGNED REPORTS.

- a. STRUCTURAL OBSERVATION IS THE VISUAL OBSERVATION OF THE STRUCTURAL SYSTEM BY A REGISTERED DESIGN PROFESSIONAL FOR GENERAL CONFORMANCE TO THE APPROVED CONSTRUCTION DOCUMENTS AT SIGNIFICANT CONSTRUCTION STAGES AND AT COMPLETION OF THE STRUCTURAL SYSTEM. THESE OBSERVATIONS DO NOT WAIVE THE RESPONSIBILITY FOR THE INSPECTION AS DEFINED BY SPECIAL INSPECTION.
- b. THE STRUCTURAL OBSERVER IS NOT INSPECTING FOR OSHA COMPLIANCE AND TEMPORARY CONSTRUCTION, SUCH AS BRACING, SHORING, MEANS AND METHODS, ETC.

- a. PERIODIC SPECIAL INSPECTION: THE PART-TIME OR INTERMITTENT OBSERVATION OF WORK REQUIRING SPECIAL INSPECTION BY AN APPROVED SPECIAL INSPECTOR WHO IS PRESENT IN THE AREA WHERE THE WORK HAS BEEN OR IS BEING PERFORMED AND AT THE COMPLETION OF WORK. (2020 NYSBC)
- b. CONTINUOUS SPECIAL INSPECTION: THE FULLTIME OBSERVATION OF WORK REQUIRING SPECIAL INSPECTION BY AN APPROVED SPECIAL INSPECTOR WHO IS PRESENT IN THE AREA WHERE WORK IS BEING PERFORMED. (2020 NYSBC)
- c. ITEMS NOT SHOWN MAY REQUIRE CONTINUOUS OR PERIODIC SPECIAL STRUCTURAL INSPECTION AT THE DISCRETION OF THE PROJECT MANAGER. ITEMS LISTED MAY REQUIRE ALTERNATE FREQUENCIES OF INSPECTION OTHER THAN SHOWN.
- d. WELDING OF REINFORCING STEEL IS NOT ACCEPTABLE UNLESS DIRECTED BY THE ENGINEER OF RECORD.

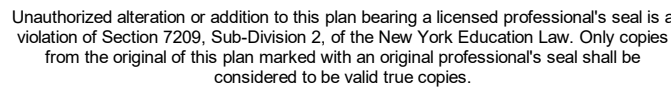
THE FOLLOWING STRUCTURAL ELEMENTS OF CONSTRUCTION SHALL REQUIRE SPECIAL INSPECTION PER 2020 NYSBC SECTION 1704. OWNER TO FURNISH INSPECTION UNLESS INSTRUCTED OTHERWISE BY THE CONSTRUCTION CONTRACT.

1. SPECIAL INSPECTION IS NOT A SUBSTITUTE FOR INSPECTION BY A COUNTY INSPECTOR. SPECIALLY INSPECTED WORK WHICH IS INSTALLED OR COVERED WITHOUT THE APPROVAL OF THE COUNTY INSPECTOR IS SUBJECT TO REMOVAL OR EXPOSURE.
2. THE SPECIAL INSPECTORS MUST BE CERTIFIED BY THE COUNTY TO PERFORM THE TYPES OF INSPECTION SPECIFIED.
3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO INFORM THE SPECIAL INSPECTOR OR INSPECTION AGENCY AT LEAST ONE WORKING DAY PRIOR TO PERFORMING ANY WORK THAT REQUIRES SPECIAL INSPECTION. ANY WORK PERFORMED WITHOUT REQUIRED SPECIAL INSPECTION IS SUBJECT TO REMOVAL.
4. SUBMIT WRITTEN REPORTS WITHIN TWO DAYS OF TESTING TO ARCHITECT, ENGINEER OF RECORD AND BUILDING OFFICIAL.

REINFORCED CONCRETE	<ol style="list-style-type: none"> <li>1. CURRENT ICC REINFORCED CONCRETE SPECIAL INSPECTOR OR ACI CONCRETE CONSTRUCTION INSPECTOR.</li> <li>2. CONCRETE FIELD TESTING CAN BE BY AN ACI CONCRETE FIELD TESTING TECHNICIAN WITH GRADE 1 CERTIFICATION.</li> <li>3. ENGINEER-IN-TRAINING (EIT) WITH RELEVANT EXPERIENCE.</li> <li>4. NEW YORK STATE LICENSED PROFESSIONAL ENGINEER (P.E.) WITH RELEVANT EXPERIENCE.</li> </ol>
WELDING	<ol style="list-style-type: none"> <li>1. CURRENT AWS CERTIFIED WELDING INSPECTOR.</li> <li>2. CURRENT ICC STRUCTURAL STEEL AND WELDING CERTIFICATE PLUS ONE YEAR OF RELEVANT EXPERIENCE.</li> <li>3. CURRENT LEVEL II CERTIFICATION FROM THE AMERICAN SOCIETY FOR NONDESTRUCTIVE TESTING (NDT).</li> <li>4. CURRENT NDT LEVEL III PROVIDED PREVIOUSLY CERTIFIED AS NDT LEVEL II.</li> </ol>
HIGH-STRENGTH BOLTING & STEEL FRAME INSPECTION	<ol style="list-style-type: none"> <li>1. CURRENT ICC STRUCTURAL STEEL AND WELDING CERTIFICATION AND ONE YEAR OF RELEVANT EXPERIENCE.</li> <li>2. EIT WITH RELEVANT EXPERIENCE.</li> <li>3. P.E. WITH RELEVANT EXPERIENCE.</li> </ol>
MASONRY	<ol style="list-style-type: none"> <li>1. CURRENT ICC STRUCTURAL MASONRY CERTIFICATION AND ONE YEAR OF RELEVANT EXPERIENCE.</li> <li>2. EIT WITH RELEVANT EXPERIENCE.</li> <li>3. P.E. WITH RELEVANT EXPERIENCE.</li> </ol>
EXCAVATION AND FILLING; VERIFICATION OF SOILS;	<ol style="list-style-type: none"> <li>1. CURRENT LEVEL II CERTIFICATION IN GEOTECHNICAL ENGINEERING TECHNOLOGY/CONSTRUCTION FROM THE NATIONAL INSTITUTE FOR CERTIFICATION IN ENGINEERING TECHNOLOGIES (NICET).</li> <li>2. EIT WITH RELEVANT EXPERIENCE.</li> <li>3. P.E. WITH RELEVANT EXPERIENCE.</li> </ol>
INSPECTION OF FABRICATORS	<ol style="list-style-type: none"> <li>1. BAR JOIST: SEE WELDING REQUIREMENTS.</li> <li>2. STRUCTURAL STEEL: SEE WELDING REQUIREMENTS</li> </ol>
EXTERIOR AND INTERIOR ARCHITECTURAL WALL PANELS	<ol style="list-style-type: none"> <li>1. P.E. WITH RELEVANT EXPERIENCE.</li> <li>2. EIT WITH RELEVANT EXPERIENCE.</li> <li>3. SEE THE MASONRY REQUIREMENTS FOR THE SI OF MASONRY VENEERS SUBJECT TO BCNYS SECTION 1704.10.</li> </ol>
EXTERIOR INSULATION AND FINISH SYSTEM	<ol style="list-style-type: none"> <li>1. REGISTERED DESIGN PROFESSIONAL (RDP) WITH RELEVANT EXPERIENCE.</li> <li>2. EIT WITH RELEVANT EXPERIENCE</li> </ol>
SMOKE CONTROL	<ol style="list-style-type: none"> <li>1. THE RDP RESPONSIBLE FOR DESIGN.</li> </ol>
SEISMIC RESISTANCE	<ol style="list-style-type: none"> <li>1. SEE THE APPLICABLE CATEGORIES IN THIS TABLE.</li> </ol>

1.	INSPECTION OF REINFORCING STEEL, INCLUDING PRESTRESSING TENDONS, AND PLACEMENT.		X
2.	INSPECTION OF REINFORCING STEEL WELDING IN ACCORDANCE WITH TABLE FOR STRUCTURAL STEEL INSPECTION, ITEM 5B.	X	
3.	INSPECT BOLTS TO BE INSTALLED IN CONCRETE PRIOR TO AND DURING PLACEMENT OF CONCRETE WHERE ALLOWABLE LOADS HAVE BEEN INCREASED.	X	
4.	VERIFYING USE OF REQUIRED DESIGN MIX.		X
5.	AT THE TIME FRESH CONCRETE IS SAMPLED TO FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	X	
6.	INSPECTION OF CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	X	
7.	INSPECTION FOR MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.		X
8.	ERECTION OF PRECAST CONCRETE MEMBERS.		X
9.	VERIFICATION OF IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POST TENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS.		X
10.	INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.		X
	ERECTION OF PRECAST CONCRETE MEMBERS.		
11.	VERIFY SUBMITTAL OF CERTIFIED MILL TEST REPORTS FOR EACH SHIPMENT OF REINFORCING STEEL USED TO RESIST FLEXURAL, SHEAR AND AXIAL FORCES IN REINFORCED CONCRETE INTERMEDIATE FRAMES, SPECIAL MOMENT FRAMES AND BOUNDARY ELEMENTS OF SPECIAL REINFORCED CONCRETE OR REINFORCED MASONRY SHEAR WALLS.		X
12.	TEST ASTM A 615 REINFORCING STEEL IS USED TO RESIST EARTHQUAKE INDUCED FLEXURAL AND AXIAL FORCES IN SPECIAL MOMENT FRAMES AND IN WALL BOUNDARY ELEMENTS OF SHEAR WALLS IN STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY D, E OR F, PER ACI 318.		X
13.	TEST ASTM A 615 REINFORCING STEEL THAT IS TO BE WELDED, CHEMICAL TESTS SHALL BE PERFORMED TO DETERMINE WELDABILITY IN ACCORDANCE WITH SECTION 3.5.2 OF ACI 318		X
14.	INSTALLATION OF (CHEMICAL / EPOXY) ADHESIVE ANCHORS, RODS AND DOWELS	X	
15.	INSTALLATION AND TORQUE TESTING EXPANSION ANCHORS	X	

1.	MATERIAL VERIFICATION OF HIGH-STRENGTH BOLTS, NUTS AND WASHERS:		
	a. IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS.		X
	b. MANUFACTURER'S CERTIFICATE OF COMPLIANCE REQUIRED.		X
2.	INSPECTION OF HIGH-2. STRENGTH BOLTING:		
	a. BEARING-TYPE CONNECTIONS. (SNUG TIGHT JOINTS)		X
	b. PRETENSIONED AND SLIP-CRITICAL JOINTS USING TURN-OF-NUT WITH MATCHMARKING, TWIST-OFF BOLT OR DIRECT TENSION INDICATOR METHODS OF INSTALLATION.		X
	c. PRETENSIONED AND SLIP-CRITICAL JOINTS USING TURN-OF-NUT WITHOUT MATCHMARKING OR CALIBRATED WRENCH METHODS OF INSTALLATION.	X	
3.	MATERIAL VERIFICATION OF STRUCTURAL STEEL AND COLD - FORMED DECK		
	a. IDENTIFICATION MARKINGS TO CONFORM TO ASTM STANDARDS SPECIFIED IN THE APPROVED CONSTRUCTION DOCUMENTS.		X
	b. MANUFACTURERS' CERTIFIED MILL TEST REPORTS.		X
4.	MATERIAL VERIFICATION OF WELD FILLER MATERIALS:		
	a. IDENTIFICATION MARKINGS TO CONFORM TO AWS SPECIFICATION IN THE APPROVED CONSTRUCTION DOCUMENTS.		X
	b. MANUFACTURER'S CERTIFICATE OF COMPLIANCE REQUIRED.		X
5.	INSPECTION OF WELDING:		
	a. STRUCTURAL STEEL AND COLD - FORMED STEEL DECK		
	1.) COMPLETE AND PARTIAL PENETRATION GROOVE WELDS.	X	
	2.) MULTI-PASS FILLET WELDS.	X	
	3.) SINGLE-PASS FILLET WELDS > 5/16"	X	
	4.) SINGLE-PASS FILLET WELDS ≤ 5/16"		X
	5.) FLOOR AND ROOF DECK WELDS.		X
	6.) WELDED STUDS WHEN USED FOR STRUCTURAL DIAPHRAGM.		X
	7.) WELDED SHEET STEEL FOR COLD-FORMED STEEL MEMBERS.		X
	8.) WELDING OF STAIRS AND RAILING SYSTEM.		X
	b. REINFORCING STEEL:		
	1.) VERIFICATION OF WELDABILITY OF REINFORCING STEEL OTHER THAN ASTM A 706.		X
	2.) REINFORCING STEEL-RESISTING FLEXURAL AND AXIAL FORCES IN INTERMEDIATE AND SPECIAL MOMENT FRAMES, AND BOUNDARY ELEMENTS OF SPECIAL REINFORCED CONCRETE SHEAR WALLS AND SHEAR REINFORCEMENT.	X	
	3.) SHEAR REINFORCEMENT.	X	
	4.) OTHER REINFORCING STEEL.		X
6.	INSPECTION OF STEEL FRAME JOINT DETAILS FOR COMPLIANCE WITH APPROVED CONSTRUCTION DOCUMENTS:		
	a. DETAILS SUCH AS BRACING AND STIFFENING.		X
	b. MEMBER LOCATIONS.		X
	c. APPLICATION OF JOINT DETAILS AT EACH CONNECTION.		X
7.	INSPECTION OF FABRICATORS: REVIEW PLANT OPERATIONS AND QUALITY CONTROL PROCEDURES.		
8.	INSPECTION OF FLOOR AND ROOF DECK ATTACHMENT.		X
9.	INSPECTION OF STEEL JOIST AND JOIST GIRDER INSTALLATION AND ATTACHMENT TO SUPPORTS, INCLUDING BRIDGING AND ACCESSORIES.		X
10.	COMPLIANCE WITH CONSTRUCTION DOCUMENTS AND APPROVED SUBMITTALS SHALL BE VERIFIED WITH SETS USED IN THE FIELD.		
	INSPECTION OF FLOOR AND ROOF DECK ATTACHMENT.		
11.	THE TESTING SHALL BE AS REQUIRED BY AISC 341.	-	-
12.	BASE METAL THICKER THAN 1.5 INCHES (38 MM), WHERE SUBJECT TO THROUGH-THICKNESS WELD SHRINKAGE STRAINS, SHALL BE ULTRASONICALLY TESTED FOR DISCONTINUITIES BEHIND AND ADJACENT TO SUCH WELDS AFTER JOINT COMPLETION.	-	-
13.	THE ACCEPTANCE CRITERIA FOR NONDESTRUCTIVE TESTING SHALL BE AS REQUIRED IN AWS D1.1 AS SPECIFIED BY THE REGISTERED DESIGN PROFESSIONAL. ANY MATERIAL DISCONTINUITIES SHALL BE ACCEPTED OR REJECTED ON THE BASIS OF ASTM A 435 OR ASTM A 598 (LEVEL 1 CRITERIA) AND CRITERIA AS ESTABLISHED BY THE REGISTERED DESIGN PROFESSIONAL(S) IN RESPONSIBLE CHARGE AND THE CONSTRUCTION DOCUMENTS.		
14.	CONTINUOUS SPECIAL INSPECTION IS REQUIRED FOR STRUCTURAL WELDING IN ACCORDANCE WITH AISC 341.	X	



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DATE OF ISSUE 11-17-21		DRAWN BY		M.E.		CHECKED BY		V.A.G.	
		DESIGNED BY		M.E.		APPROVED BY		V.A.G.	



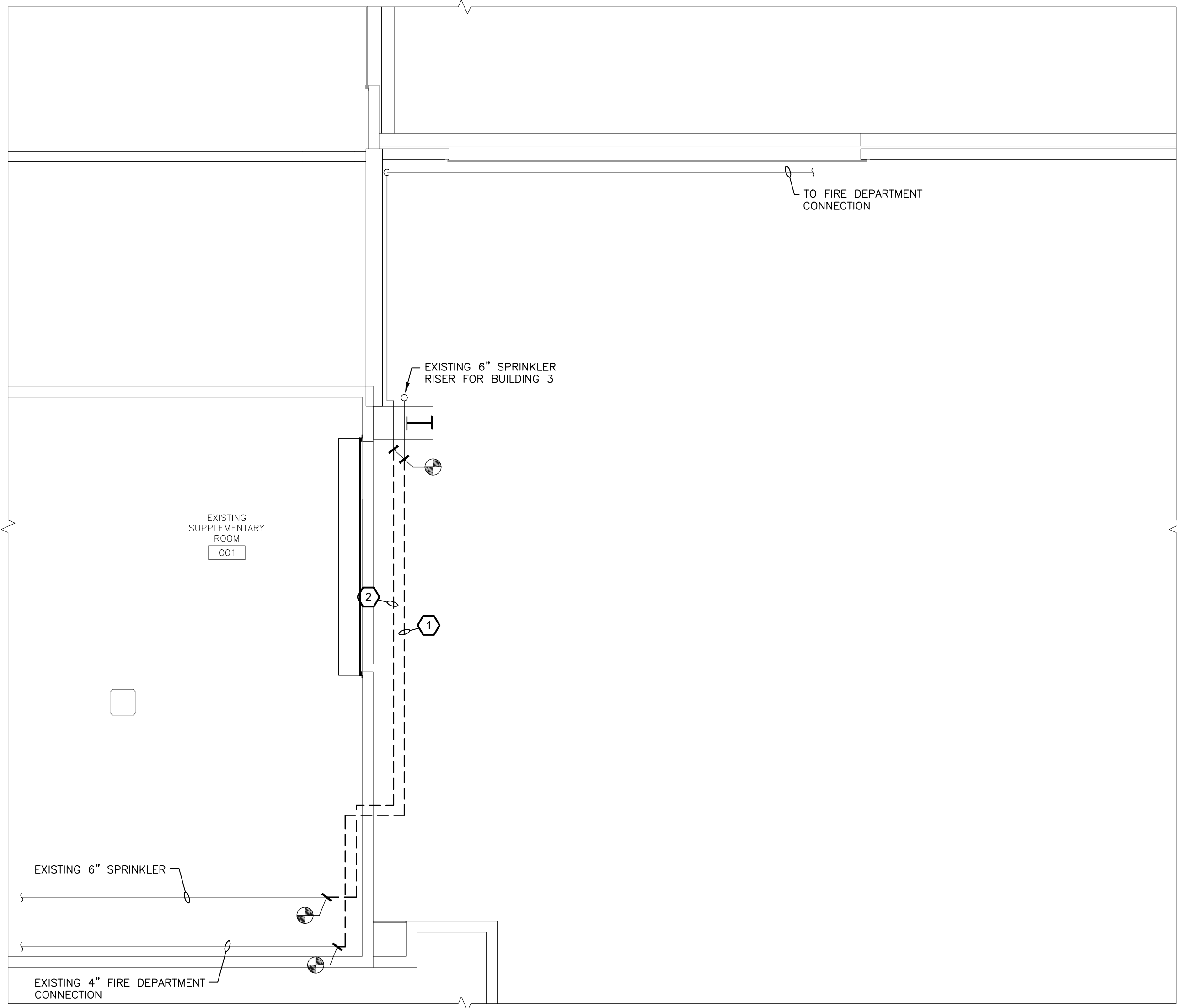
5808 ROCK CUT ROAD, JAMESVILLE, NY 13078  
ONONDAGA COUNTY RESOURCE RECOVERY AGENCY

## SPECIAL INSPECTIONS

SHEET NO.

# S401

PROJECT NO.  
21136



FIRE PROTECTION: BASEMENT DEMOLITION PLAN

SCALE: 3/16" = 1'-0"

0' 2' 10' 20' 40'

1  
FP1

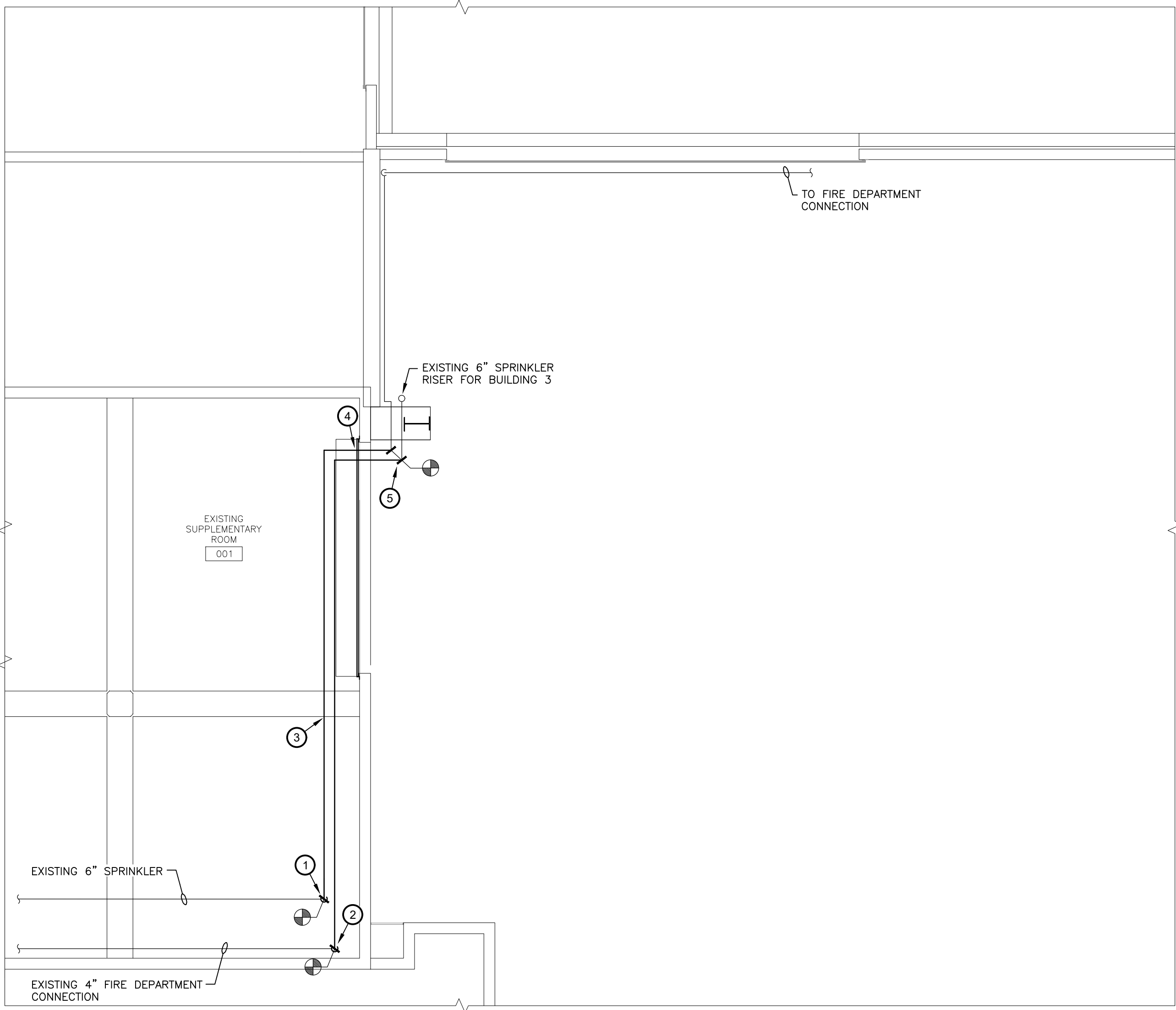
KEYED DEMOLITION NOTES

(APPLIES TO 1/FP1 ONLY)

- ① 6" SPRINKLER MAIN TO BE REMOVED  
② 4" FIRE DEPARTMENT CONNECTION TO BE REMOVED

SYMBOLS

⊕/ CONNECTION/DISCONNECTION POINT



FIRE PROTECTION: BASEMENT FLOOR PLAN

SCALE: 3/16" = 1'-0"

0' 2' 10' 20' 40'

2  
FP1

KEYED NOTES


(APPLIES TO 2/FP1 ONLY)

- ① PROVIDE NEW VERTICAL CONNECTION AT EXISTING 6" SPRINKLER.  
② PROVIDE NEW VERTICAL CONNECTION AT EXISTING 4" FIRE DEPARTMENT CONNECTION.  
③ NEW PIPING TO BE INSTALLED TIGHT TO UNDERSIDE OF CONCRETE BEAM.  
④ NEW PIPING TO BE INSTALLED TIGHT TO UNDERSIDE OF CONCRETE HEADER ABOVE DOOR FRAME. COORDINATE EXACT LOCATION AND CONFIGURATION OF PIPING WITH GENERAL CONTRACTOR PRIOR TO INSTALLATION.  
⑤ RECONNECT TO EXISTING 6" AND 4" PIPES.

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N.Y. P.E. LICENSE NO. 069684  
NOV 17, 2021  
Date

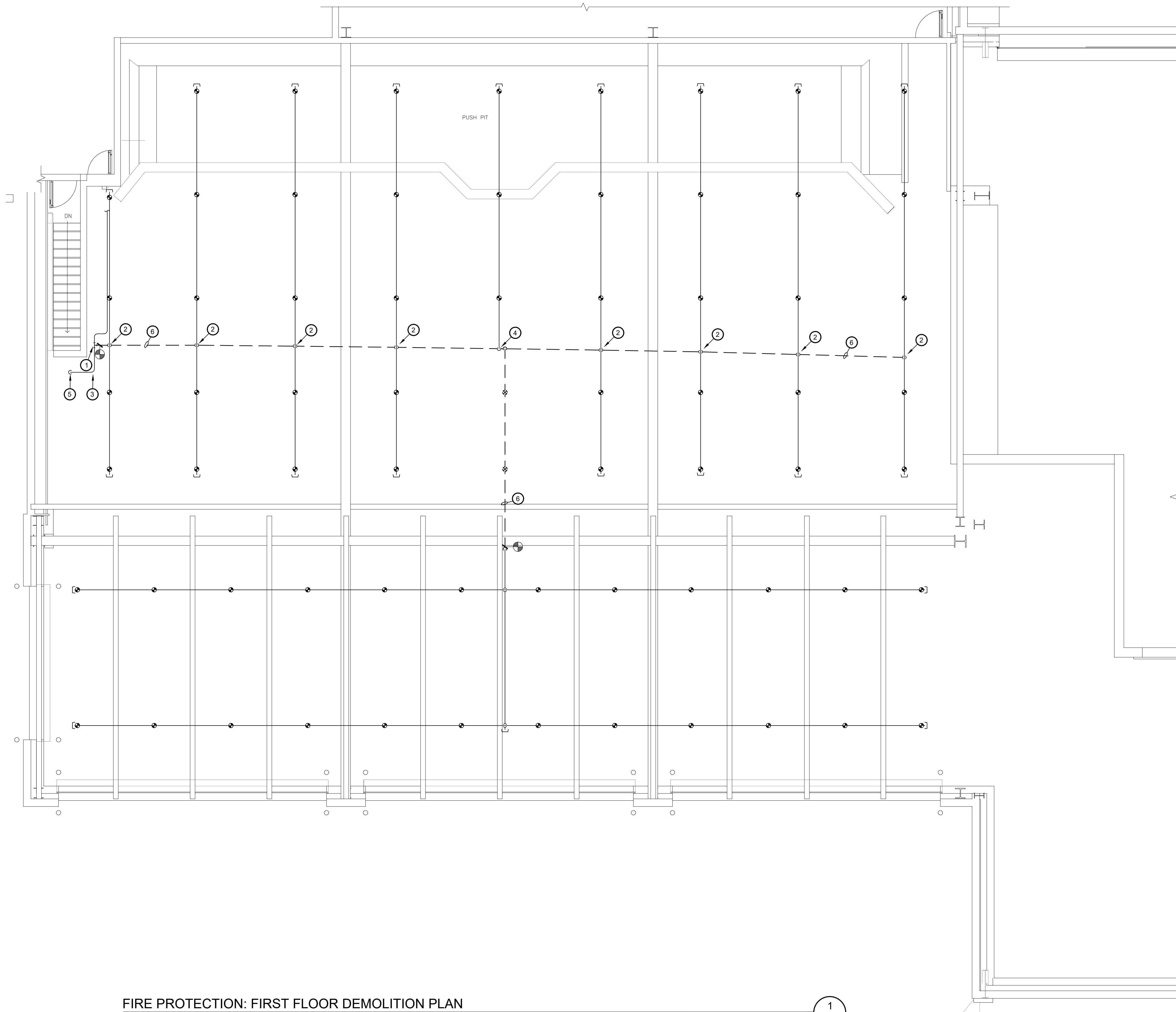
	11/30/21	ADDENDUM 1									
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		DESIGNED BY		APPROVED BY							

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GERARD ASSOCIATES  
CONSULTING ENGINEERS, P.C.  
223 MAIN STREET, GOSHEN NY 10924  
TEL (845) 291 1272  
info@GerardAssociates.com www.GerardAssociates.com  
GA21044

ROCK CUT ROAD TRANSFER STATION BUILDING 2 OPTIMIZATION  
5808 ROCK CUT ROAD, JAMESVILLE, NY 13078  
ONONDAGA COUNTY RESOURCE RECOVERY AGENCY  
FIRE PROTECTION:  
BASEMENT FLOOR PLANS

SHEET NO.  
FP1  
PROJECT NO.  
4213700



#### KEYED DEMOLITION NOTES (APPLIES TO THIS SHEET ONLY)

- 1 DISCONNECT 6" SUPPLY PIPE AND PROVIDE CAP AT EXISTING TEE.
- 2 REMOVE EXISTING 2" TEE AND PROVIDE NEW 2" STRAIGHT STRAIGHT CONNECTOR.
- 3 REMOVE EXISTING 6" ELBOW AND PROVIDE NEW 6" TEE.
- 4 REMOVE EXISTING 2" ELBOW AND PROVIDE NEW 2" STRAIGHT CONNECTOR.
- 5 EXISTING 6" BUILDING 2 SPRINKLER RISER UP FROM BASEMENT.
- 6 REMOVE EXISTING 4" SUPPLY PIPE.

#### SYMBOLS

- CONNECTION/DISCONNECTION POINT
- EXISTING SPRINKLER HEAD TO REMAIN
- EXISTING SPRINKLER HEAD TO BE REMOVED
- EXISTING PIPING TO REMAIN
- EXISTING PIPING TO BE REMOVED

#### SPRINKLER SYSTEM TESTS

1. HYDROSTATIC TEST: ALL PIPING AND APPURTENANCES SHALL BE HYDROSTATICALLY TESTED AT 200 PSI AND SHALL MAINTAIN THAT PRESSURE WITHOUT LOSS FOR 2 HOURS.
2. DRY PIPE AIR TEST: IN ADDITION TO THE STANDARD HYDROSTATIC TEST, AN AIR PRESSURE LEAKAGE TEST AT 40 PSI SHALL BE CONDUCTED FOR 24 HOURS. ANY LEAKAGE THAT RESULTS IN A LOSS OF PRESSURE IN EXCESS OF 1 1/2 PSI FOR THE 24 HOURS SHALL BE CORRECTED.
3. SYSTEM OPERATIONAL TESTS - WATER FLOW DETECTING DEVICES.
4. MAIN DRAIN VALVE - STATIC AND RESIDUAL PRESSURES.
5. CONTRACTOR SHALL PERFORM ALL SPRINKLER SYSTEM TESTS REQUIRED BY LOCAL FIRE INSPECTOR OR AUTHORITY HAVING JURISDICTION.
6. ALL TESTS WITNESSED BY LOCAL FIRE INSPECTOR OR AUTHORITY HAVING JURISDICTION. SUBMIT REPORT ON ALL TESTS TO LOCAL FIRE INSPECTOR AND ENGINEER FOR APPROVAL.

#### FIRE PROTECTION: FIRST FLOOR DEMOLITION PLAN

SCALE: 3/16" = 1'-0"

0' 2' 10' 20' 40' 1 FP2

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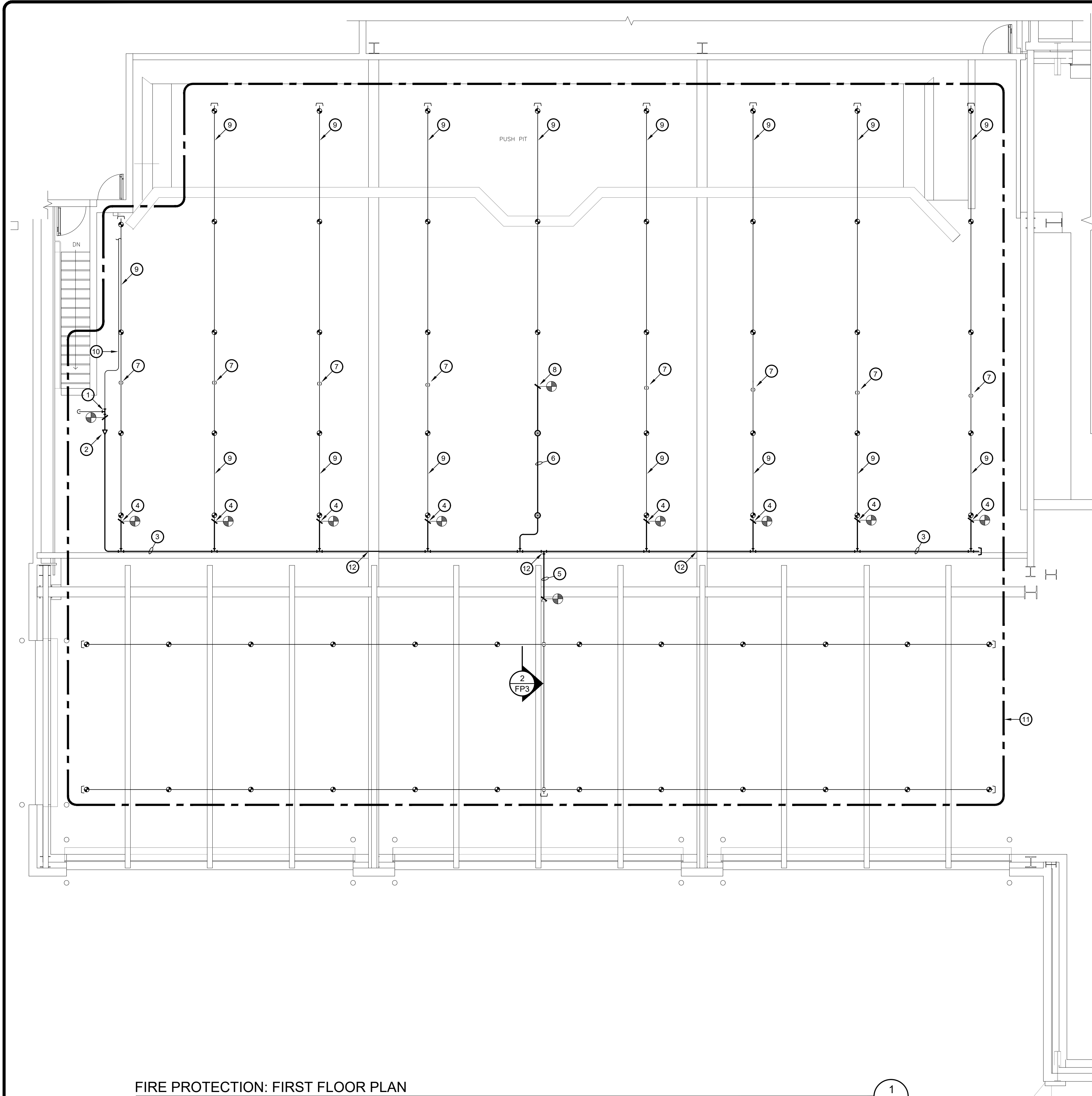
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info@GerardAssociates.com www.GerardAssociates.com  
GA21044

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ONONDAGA COUNTY RESOURCE RECOVERY AGENCY  
**FIRE PROTECTION:  
FIRST FLOOR DEMO PLAN**

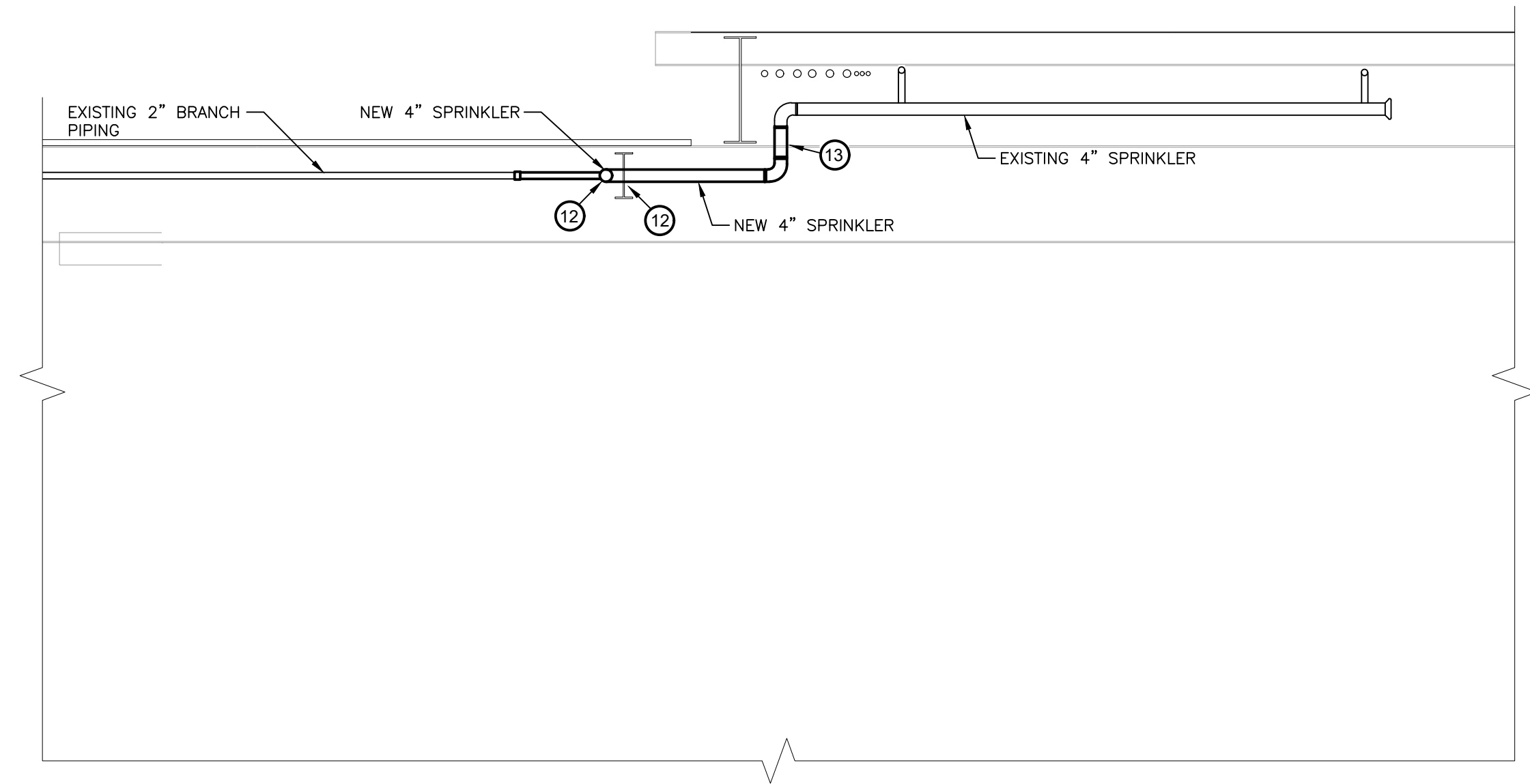
SHEET NO.  
**FP2**  
PROJECT NO.  
4213700



FIRE PROTECTION: FIRST FLOOR PLAN

SCALE: 3/16" = 1'-0"

0' 2' 10' 20' 40' 1 FP3



FIRE PROTECTION: SECTION

SCALE: 1/4" = 1'-0"

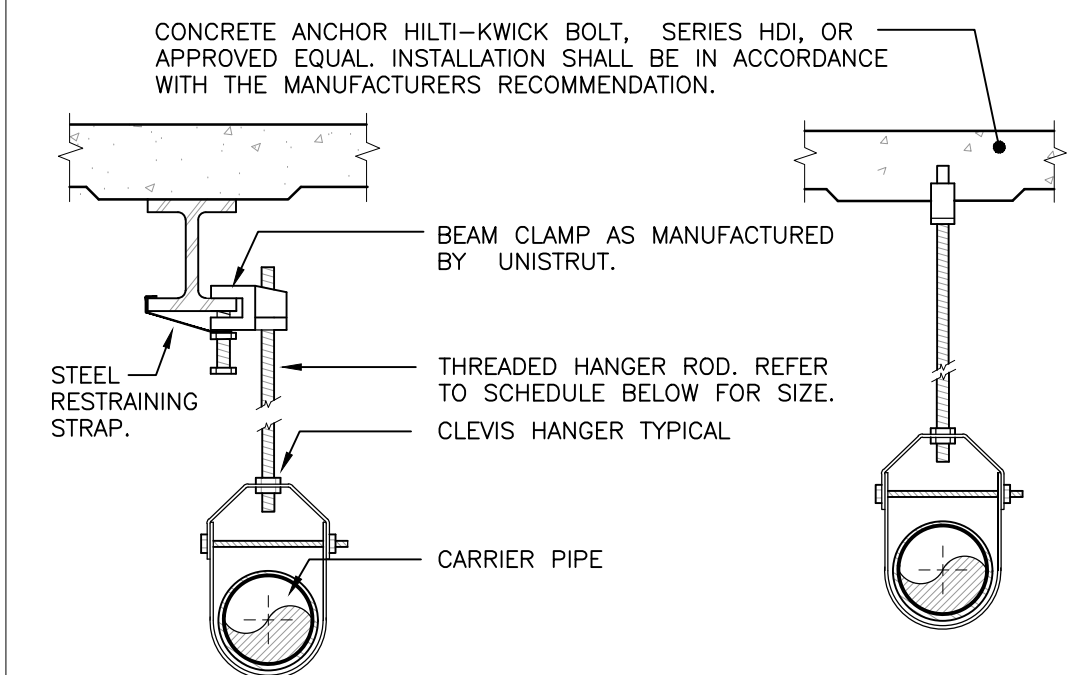
0' 1' 5' 10' 2 FP3

KEYED CONSTRUCTION NOTES (APPLIES TO THIS SHEET ONLY)

- 1 PROVIDE NEW 6" TEE
- 2 PROVIDE NEW 6"x4" REDUCER.
- 3 NEW 4" SUPPLY.
- 4 REMOVE CAP FROM EXISTING 2" BRANCH SUPPLY, EXTEND NEW 2" TO NEW 4" SUPPLY.
- 5 NEW 4" SUPPLY.
- 6 NEW 2" BRANCH SUPPLY WITH (2) NEW SPRINKLER HEADS.
- 7 PROVIDE NEW 2" STRAIGHT CONNECTOR WHERE TEE WAS REMOVED.
- 8 PROVIDE NEW 2" STRAIGHT CONNECTOR WHERE ELBOW WAS REMOVED.
- 9 RAISE EXISTING 2" BRANCH PIPING WITH HEAD UP (APPROXIMATELY 6") TO ENSURE DRAINAGE BACK TO NEW 4" SUPPLY. VERIFY ELEVATION IN FIELD.
- 10 EXISTING 6" SUPPLY TO REMAIN.
- 11 CONTRACTOR SHALL PROVIDE HYDRAULIC CALCULATIONS FOR BUILDING 2, FIRST FLOOR AREA AS OUTLINED, FOR ORDINARY GROUP II CLASSIFICATION.
- 12 HOLES THROUGH EXISTING STRUCTURAL STEEL SHALL BE CUT BY GENERAL CONTRACTOR. SPRINKLER CONTRACTOR SHALL COORDINATE EXACT LOCATIONS AND SIZES OF HOLES WITH G.C. SEE STRUCTURAL PLANS FOR DETAILS.
- 13 MODIFY LENGTH OF EXISTING 4" SPRINKLER TO ACCOMMODATE NEW ELEVATION, AND RECONNECT.

SYMBOLS

- CONNECTION/DISCONNECTION POINT
- EXISTING SPRINKLER HEAD TO REMAIN
- NEW SPRINKLER HEAD
- NEW SPRINKLER PIPING, SCHEDULE 10 GALVANIZED STEEL FOR 6" AND 4"; SCHEDULE 40 GALVANIZED STEEL FOR 2".



PIPE HANGER SCHEDULE					
PIPE DIA.	3/4"-2"	2 1/2"-3"	4"-5"	6"	8"-12"
HANGER DIA.	3/8"	1/2"	5/8"	3/4"	7/8"

NOTES:

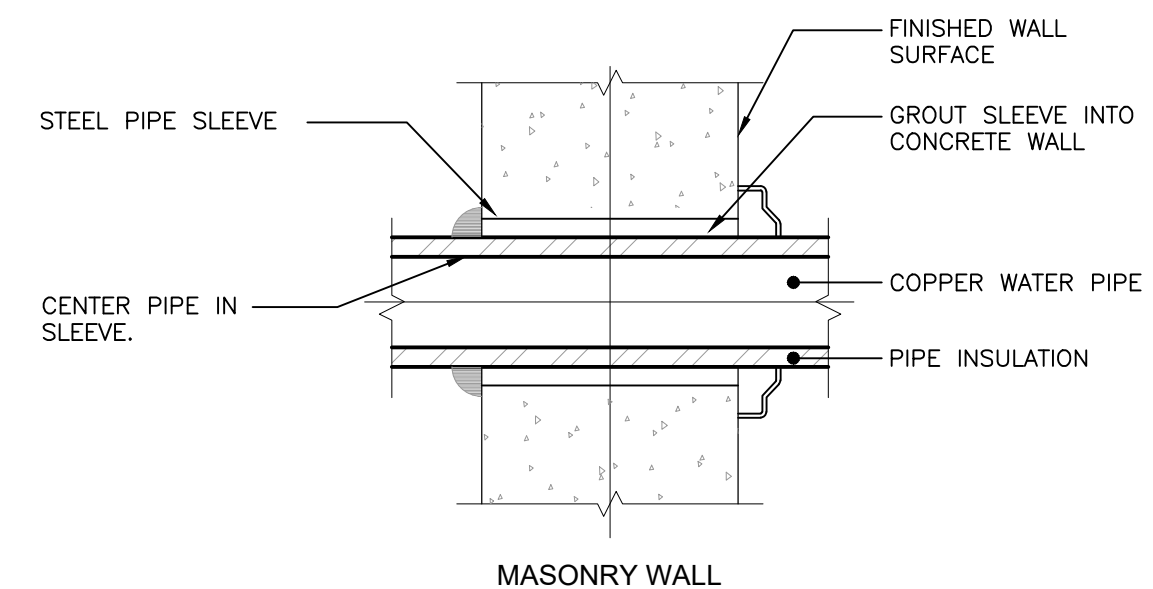
1. CLEVIS HANGERS WITH WELDED INSULATION SHIELDS SIMILAR TO RAUCH FIG. 100SH ON ALL PIPES LARGER THAN 1".
2. ALL PIPE HANGERS SHALL BE GALVANIZED STEEL OR FACTORY PAINTED BLACK WITH ENAMEL.

PIPE HANGER DETAIL

NOT TO SCALE

GENERAL SPRINKLER NOTES

1. ALL SPRINKLER SYSTEM WORK SHALL BE INSTALLED IN ACCORDANCE 2020 MECHANICAL, BUILDING, PLUMBING, FIRE AND ENERGY CONSERVATION CONSTRUCTION CODE OF NYS, NATIONAL FIRE PROTECTION ASSOCIATION STANDARD 13, 20 72, ALL APPLICABLE LOCAL CODES AND GENERALLY ACCEPTED STANDARDS.
2. CONTRACTOR SHALL FURNISH AND INSTALL ALL PIPING, VALVES, SPRINKLER HEADS, TESTS, HANGERS, FITTINGS AND MISCELLANEOUS COMPONENTS NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER THE COMBINED SPRINKLER/STANDPIPE SYSTEM COMPLETE, OPERABLE, AND IN ACCORDANCE WITH APPLICABLE CODES AND GENERALLY ACCEPTED INDUSTRY STANDARDS.
3. CONTRACTOR SHALL COORDINATE LOCATIONS OF ALL PIPING, SPRINKLER HEADS AND EQUIPMENT WITH OTHER CONTRACTORS TO AVOID CONFLICTS.
4. CONTRACTOR SHALL GUARANTEE ALL WORKMANSHIP AND MATERIAL INSTALLED UNDER THIS CONTRACT FREE FROM DEFECTS FOR A PERIOD OF ONE (1) YEAR FROM DATE OF SUBSTANTIAL COMPLETION AND ACCEPTANCE BY THE OWNER, AND AGREES TO REPLACE DEFECTIVE WORK AT NO ADDITIONAL COST TO OWNER DURING THE GUARANTEE PERIOD.
5. CONTRACTOR SHALL PAY FOR ALL PERMITS AND INSPECTIONS FEES REQUIRED BY LOCAL AUTHORITY HAVING JURISDICTION.
6. CONTRACTOR SHALL NOT DRILL OR CUT ANY STRUCTURAL MEMBERS WITHOUT PERMISSION OF ARCHITECT/ENGINEER.
7. CONTRACTOR SHALL INSTALL NEW 4" SUPPLY PIPING TO AS A GREAT AN EXTEND AS POSSIBLE PRIOR TO SHUTTING DOWN EXISTING SYSTEM FOR REMOVALS TO MINIMIZE SYSTEM DOWNTIME.
8. CONTRACTOR SHALL PROVIDE A 24-HOUR/7 DAY FIRE WATCH AT ALL TIMES THAT THE EXISTING SYSTEM IS OUT OF SERVICE IN ACCORDANCE WITH NFPA STANDARD 25.



WALL PIPE PENETRATION DETAIL

NOT TO SCALE

1" 1/2" 0"

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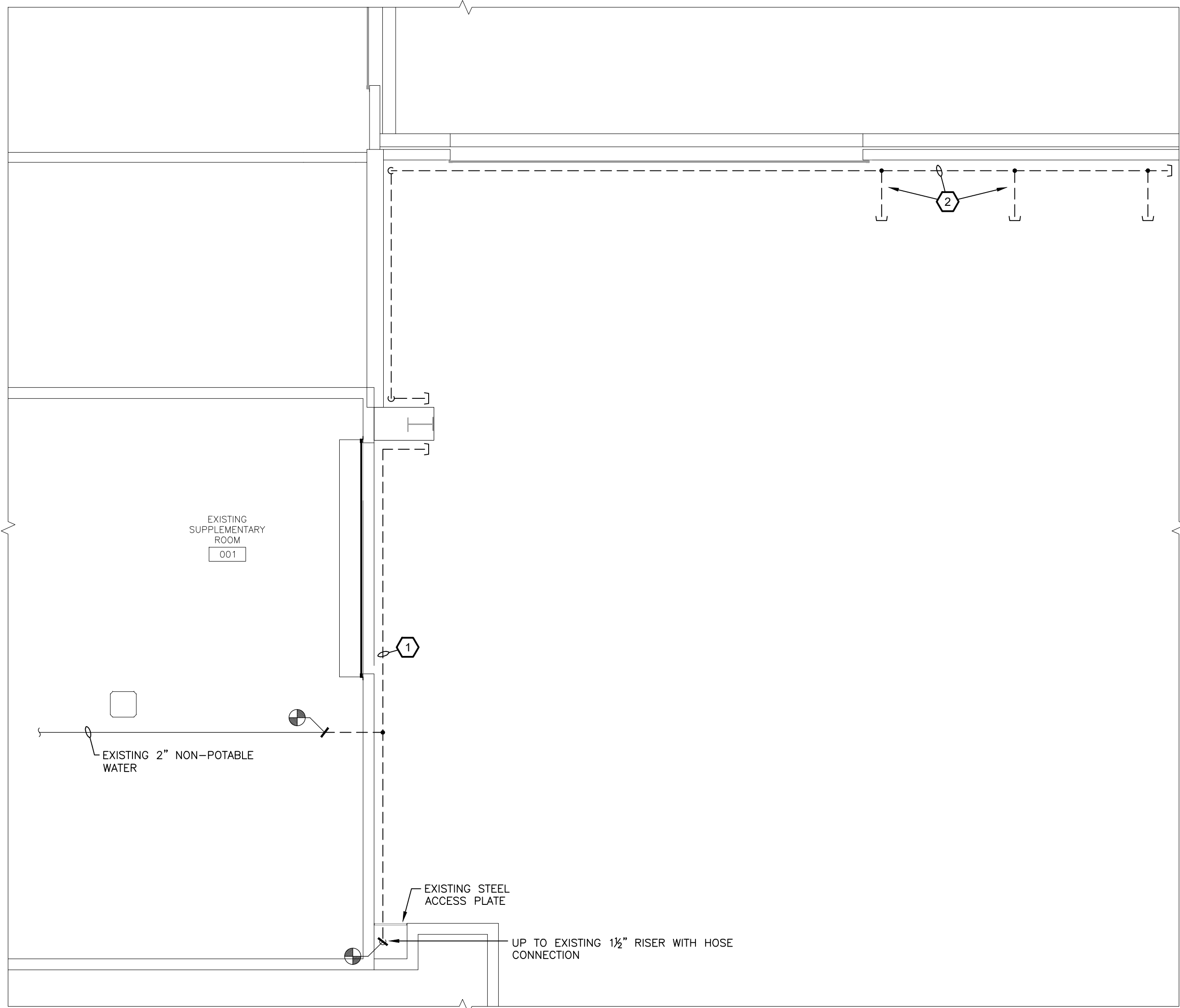
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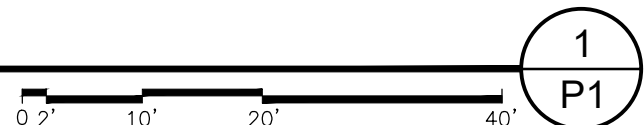
ROCK CUT ROAD TRANSFER STATION BUILDING 2 OPTIMIZATION  
5808 ROCK CUT ROAD, JAMESVILLE, NY 13078  
ONONDAGA COUNTY RESOURCE RECOVERY AGENCY  
FIRE PROTECTION:  
FIRST FLOOR PLAN

SHEET NO.  
FP3  
PROJECT NO.  
4213700



PLUMBING: BASEMENT DEMOLITION PLAN

SCALE: 3/16" = 1'-0"



1  
P1

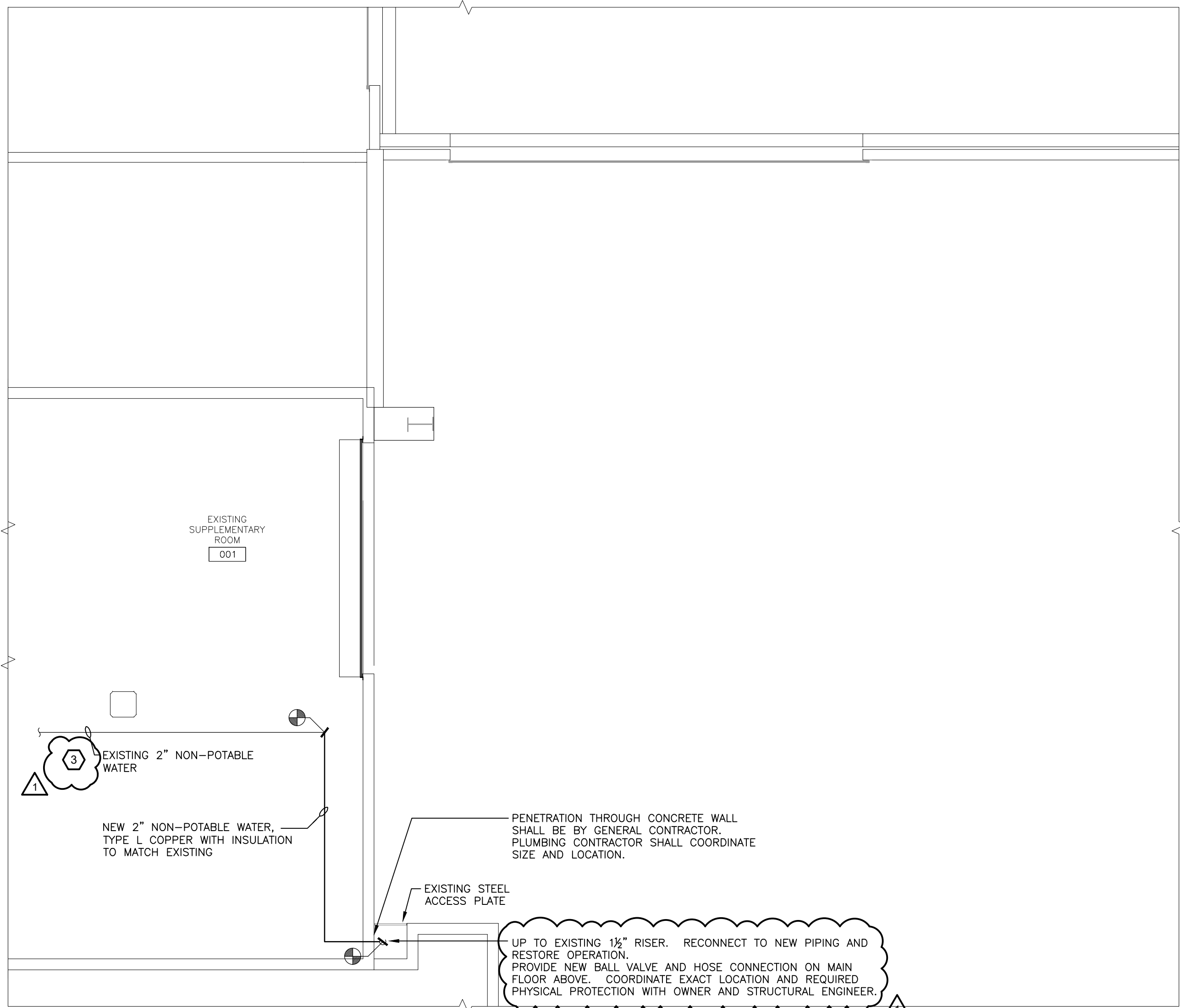
KEYED DEMOLITION NOTES

(APPLIES TO 1/P1 ONLY)

- 2" NON-POTABLE WATER SUPPLY TO BE REMOVED
- 2" NON-POTABLE WATER SUPPLY WITH BRANCH PIPING FOR DUST SUPPRESSION SPRAY TO BE REMOVED (ALL PIPING AND BRANCHES NOT SHOWN HERE)
- PROVIDE 1" TAP WITH BALL VALVE FOR SYSTEM DRAIN ON DOWNSTREAM SIDE OF EXISTING BACKFLOW PREVENTER LOCATED IN BASEMENT SPRINKLER ROOM.

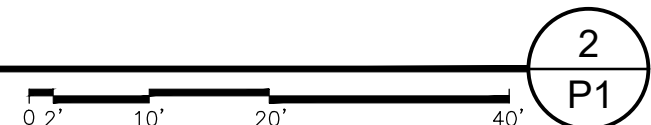
SYMBOLS

CONNECTION/DISCONNECTION POINT

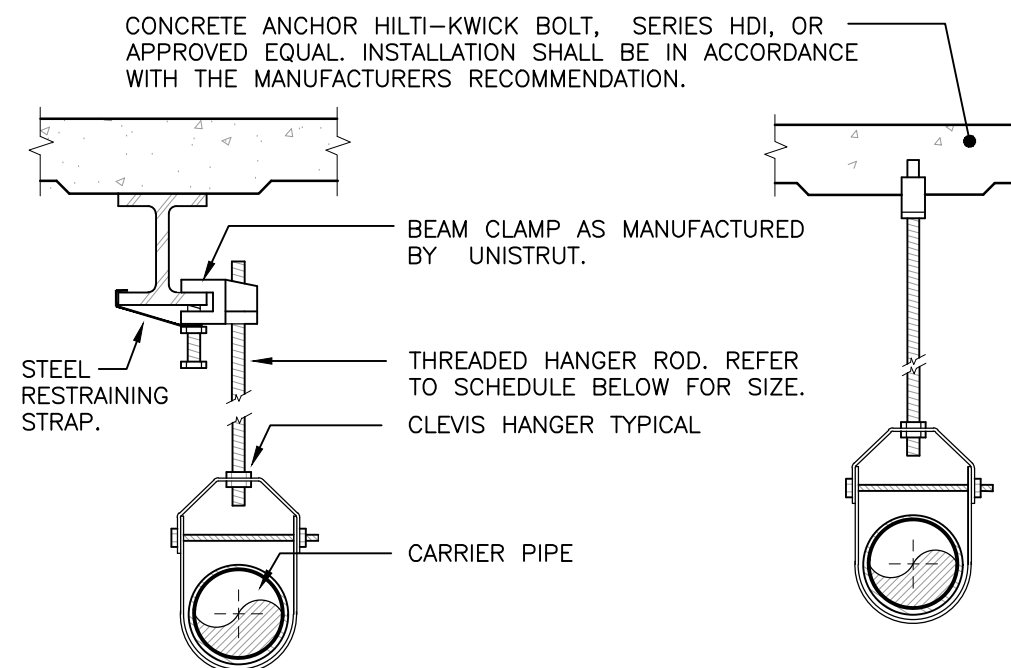


PLUMBING: BASEMENT FLOOR PLAN

SCALE: 3/16" = 1'-0"



2  
P1



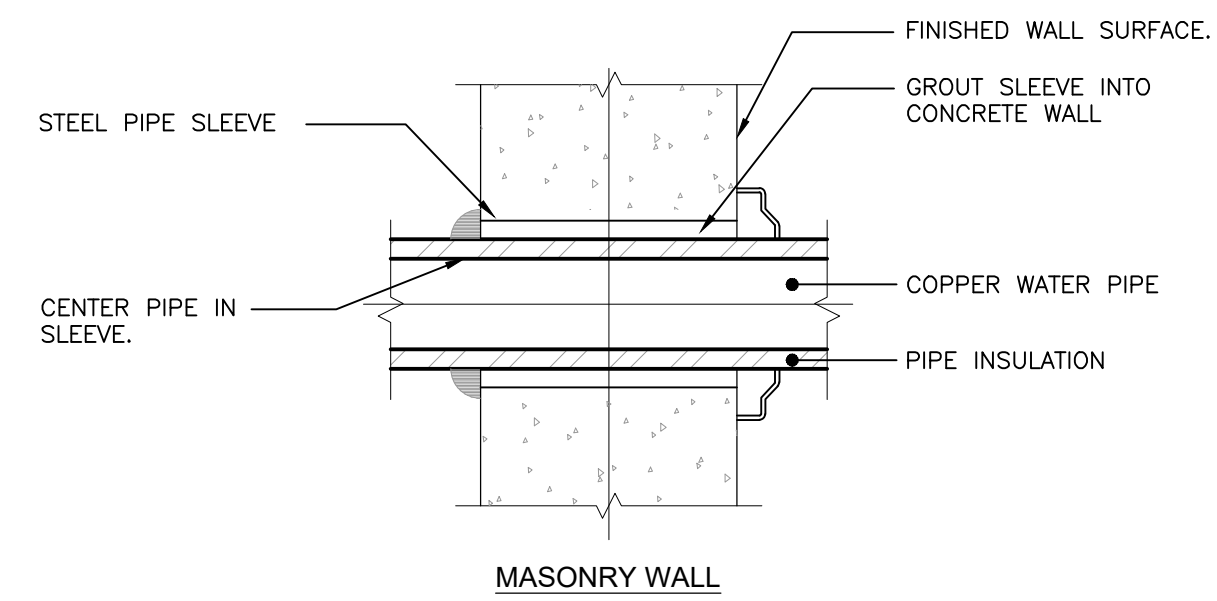
PIPE HANGER SCHEDULE							
PIPE DIA.	3/4"-2"	2 1/2"-3"	4"-5"	6"	8"-12"		
HANGER DIA.	3/8"	1/2"	5/8"	3/4"	7/8"		

- NOTES:
- CLEVIS HANGERS WITH WELDED INSULATION SHIELDS SIMILAR TO RAUCH FIG. 100SH ON ALL PIPES LARGER THAN 1".
  - ALL PIPE HANGERS SHALL BE GALVANIZED STEEL OR FACTORY PAINTED BLACK WITH ENAMEL.

PIPE HANGER DETAIL

NOT TO SCALE

3  
P1



WALL PIPE PENETRATION DETAIL

NOT TO SCALE

4  
P1

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NOV 17, 2021  
Date

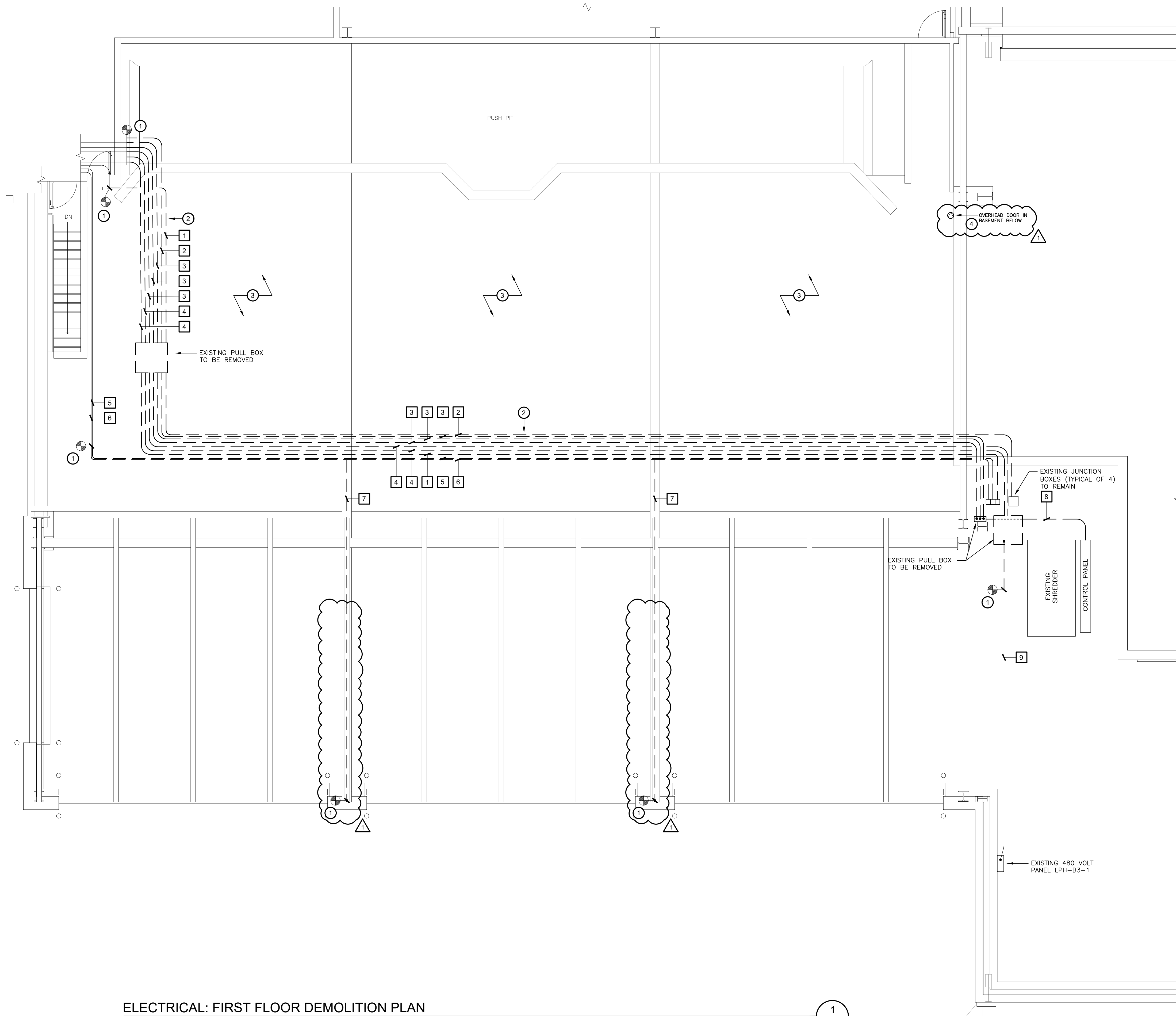
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223 MAIN STREET, GOSHEN NY 10924  
TEL (845) 291 1272  
info@GerardAssociates.com www.GerardAssociates.com  
GA21044

ROCK CUT ROAD TRANSFER STATION BUILDING 2 OPTIMIZATION  
5808 ROCK CUT ROAD, JAMESVILLE, NY 13078  
ONONDAGA COUNTY RESOURCE RECOVERY AGENCY  
PLUMBING:  
BASEMENT FLOOR PLANS

SHEET NO.  
P1  
PROJECT NO.  
4213700



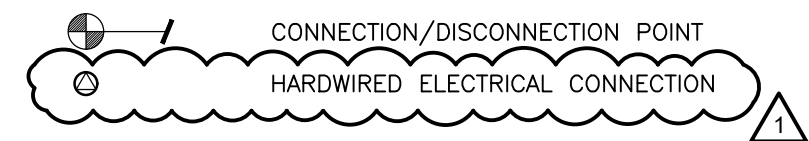
KEYED DEMOLITION NOTES (APPLIES TO THIS SHEET ONLY)

- CUT CONDUIT(S) AT LOCATION INDICATED. ALLOW SUFFICIENT CABLE SLACK FOR SPLICE IN NEW JUNCTION BOX, REFER TO NEW WORK PLANS FOR LOCATION.
- REMOVE ALL CONDUIT, WIRING, HANGERS & SUPPORTS WHERE INDICATED FOR REMOVAL.
- REMOVE ALL OUT OF SERVICE LIGHT FIXTURES, CONDUIT, BOXES, AND SUPPORTS.
- DISCONNECT EXISTING OVERHEAD DOOR OPERATOR. SAFE OFF CONDUCTORS AND PREPARE FOR RECONNECTION TO NEW DOOR OPERATOR.

WIRING/CONDUIT KEY (APPLIES TO THIS SHEET ONLY)

- |   |   |
|---|---|
| 1 | 1½" C W/ (7) SECURITY/DATA CABLES           |
| 2 | 2" C W/ (1) CAT6 & (2) 12-STRAND F.O.       |
| 3 | 3" C W/ (3) 250mcm & (1) #2 GND             |
| 4 | 3" C W/ (4) 250mcm & (1) #1/0 GND           |
| 5 | 1" C W/ (6) #10 THHN                        |
| 6 | 1" C W/ (12) #14THHN & (1) 4C FA CABLE      |
| 7 | 1" C W/ (1) 4C FA CABLE                     |
| 8 | (3) SETS: 3" C W/ (3) 250mcm & (1) #2 GND   |
| 9 | (2) SETS: 3" C W/ (4) 250mcm & (1) #1/0 GND |

SYMBOL



GENERAL ELECTRICAL NOTES

- ELECTRICAL DEVICES MATERIALS AND PACKAGED EQUIPMENT SHALL BE LISTED AND LABELED BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL) SUCH AS UNDERWRITERS LABORATORIES INC. (UL), FOR THE INTENDED USE, AND SHALL BEAR ITS LABEL. NOTE THAT NRTL APPROVAL OF INDIVIDUAL COMPONENTS OF PACKAGED EQUIPMENT DOES NOT CONSTITUTE APPROVAL OF THE ENTIRE PACKAGE.
- ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE 2017 EDITION (NFPA 70), AND THE BUILDING CODE OF NEW YORK STATE.
- ELECTRICAL CONTRACTOR SHALL OBTAIN, PAY FOR AND COMPLY WITH ALL PERMITS REQUIRED FOR ALL WORK PERFORMED UNDER THE ELECTRICAL CONTRACT. THE ELECTRICAL CONTRACTOR SHALL ARRANGE FOR ALL INSPECTIONS REQUIRED FOR ALL WORK PERFORMED UNDER THE ELECTRICAL CONTRACT AND SUBMIT COPIES OF ACCEPTANCE CERTIFICATES TO OWNER PRIOR TO COMPLETION OF PROJECT.
- ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL BOXES, FITTINGS, CONNECTORS, COVER PLATES, AND OTHER MISCELLANEOUS ITEMS, NOT NECESSARILY DETAILED ON THESE DRAWINGS TO RENDER THE ELECTRICAL INSTALLATION COMPLETE AND OPERATIVE, AND IN COMPLIANCE WITH APPLICABLE CODES.
- ALL WIRING SHALL BE COPPER CONDUCTOR, MINIMUM SIZE #12 AWG, UNLESS OTHERWISE NOTED.
- ELECTRICAL CONTRACTOR SHALL FIELD VERIFY LOCATION OF EXISTING EQUIPMENT AND NOTE CONDITIONS AND AREAS WHERE WORK WILL OCCUR IN FIELD.
- ELECTRICAL CONTRACTOR SHALL COORDINATE WITH ALL OTHER TRADES TO AVOID CONFLICTS OF EQUIPMENT INSTALLATION. ELECTRICAL CONTRACTOR SHALL VERIFY EXACT LOCATIONS OF ALL EQUIPMENT CONNECTIONS, CONDUIT AND HANGERS WITH ENGINEER PRIOR TO INSTALLATION.
- ELECTRICAL CONTRACTOR SHALL SUBMIT EQUIPMENT SHOP DRAWINGS FOR APPROVAL BY ARCHITECT-ENGINEER PRIOR TO COMMENCING INSTALLATION.
- ELECTRICAL CONTRACTOR SHALL GUARANTEE ALL WORKMANSHIP AND MATERIAL INSTALLED UNDER THIS CONTRACT TO BE FREE FROM DEFECTS FOR A PERIOD OF ONE (1) YEAR FROM DATE OF COMPLETION AND ACCEPTANCE BY THE OWNER. CONTRACTOR AGREES TO REPLACE ANY DEFECTIVE EQUIPMENT AT NO ADDITIONAL COST TO THE OWNER FOR THE DURATION OF THE GUARANTEE PERIOD.
- THE FACILITY MUST REMAIN IN OPERATION THROUGHOUT THE CONSTRUCTION PERIOD. ONLY CIRCUITS THAT ARE TO BE ALTERED OR RELOCATED SHALL BE DE-ENERGIZED, AND OWNER SHALL BE NOTIFIED AT LEAST 7 DAYS IN ADVANCE PRIOR TO DE-ENERGIZING.
- THE FIRE ALARM SYSTEM MUST REMAIN IN OPERATION AT ALL TIMES. WHERE CIRCUITRY OR DEVICES MUST BE DISCONNECTED, THEY SHALL BE DONE SO IN A MANNER THAT ALLOWS THE REMAINING SYSTEM TO REMAIN ACTIVE. IF FULL ACTIVATION AND NOTIFICATION CANNOT BE RESTORED AT THE END OF A WORK DAY, A FIRE WATCH SHALL BE PROVIDED IN ACCORDANCE WITH NFPA 25.
- AS IDENTIFIED IN THE KEYED NOTES, A TEMPORARY GENERATOR SHALL BE PROVIDED TO ENSURE CONTINUITY OF PANEL LPH-B3-1. A MAXIMUM DOWN TIME OF 7 DAYS SHALL BE PERMITTED FOR ALL OTHER INTERRUPTED CIRCUITS. CONTRACTOR SHALL HAVE A WORK SCHEDULE, INCLUDING INTERRUPTION TIMES, APPROVED BY THE OWNER PRIOR TO COMMENCING WORK. SHUTDOWN AND CUTOVER OF ALL CIRCUITS MUST TAKE PLACE BETWEEN 3:00PM AND 3:00AM MONDAY THROUGH FRIDAY, OR ON SATURDAY OR SUNDAY.
- EXISTING CONDUCTORS AND CONDUIT TO BE RELOCATED, MAY BE REUSED AT THE DISCRETION OF THE CONTRACTOR IF THEY ARE UNDAMAGED UPON REMOVAL. THE CONDITION OF THE CONDUCTORS AND CONDUIT ARE SUBJECT TO THE INSPECTION AND APPROVAL OF THE ENGINEER AND THE OWNER.
- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS DETAILING CONDUIT HANGERS AND SUPPORTS FOR REVIEW BY THE ENGINEER PRIOR TO INSTALLATION.

ELECTRICAL: FIRST FLOOR DEMOLITION PLAN

SCALE: 3/16" = 1'-0"

0' 2' 10' 20' 40'

1  
E1

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GERARD S. HLUCHAN, P.E.



NOV 17, 2021  
N.Y. P.E. LICENSE NO. 069684 Date

REV	DATE	DESCRIPTION	DWN BY	DES BY	CHK BY	APP BY
1	11/30/21	ADDENDUM 1				
	DATE OF ISSUE	DRAWN BY	DESIGNED BY	CHECKED BY	APPROVED BY	
	NOV 17, 2021	KC	BH	GH	GH	

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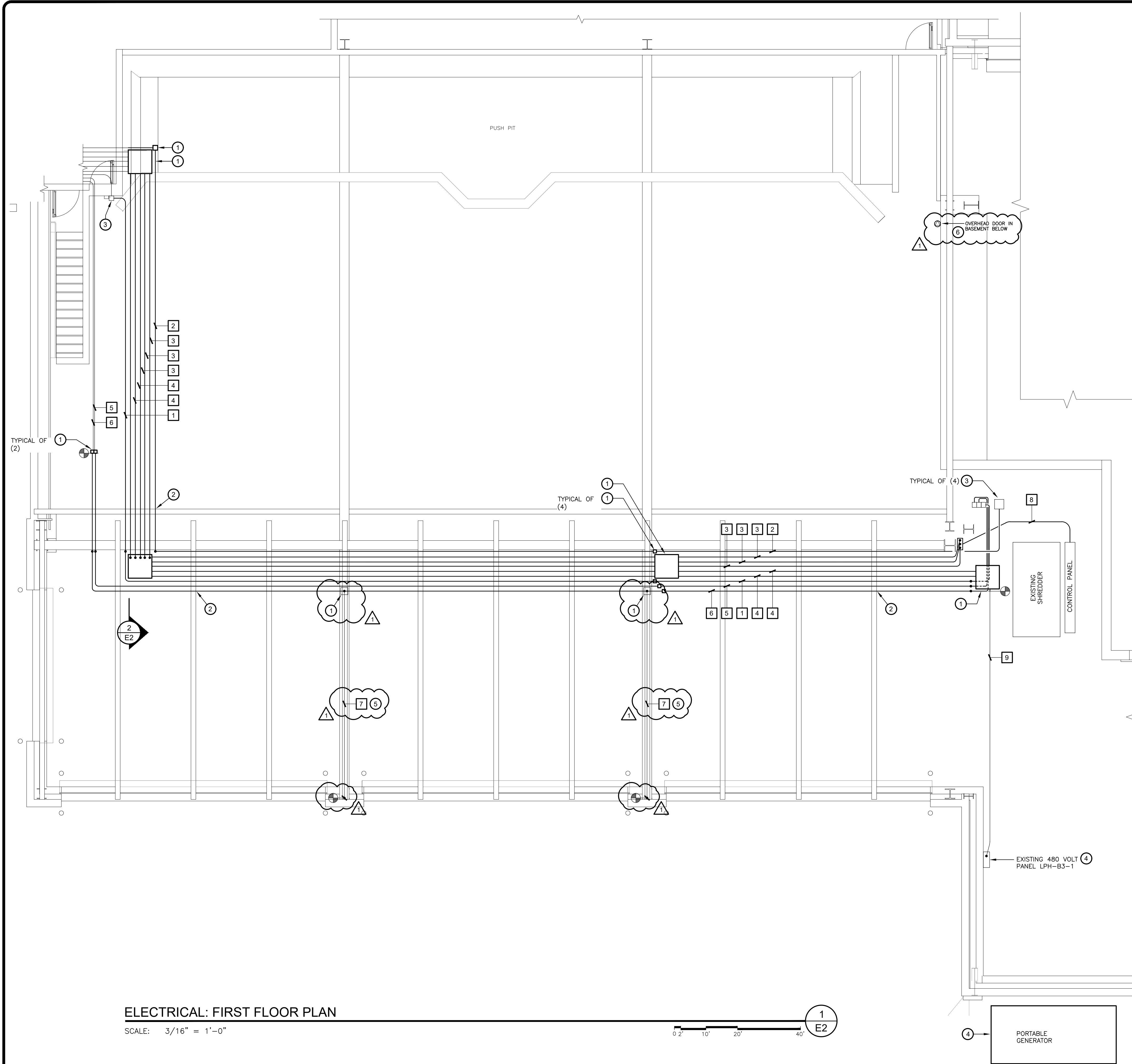
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GA21044

ROCK CUT ROAD TRANSFER STATION BUILDING 2 OPTIMIZATION  
5808 ROCK CUT ROAD, JAMESVILLE, NY 13078  
ONONDAGA COUNTY RESOURCE RECOVERY AGENCY

**ELECTRICAL**  
**FIRST FLOOR DEMO PLAN**

SHEET NO.  
**E1**  
PROJECT NO.  
4213700



ELECTRICAL: FIRST FLOOR PLAN

SCALE: 3/16" = 1'-0"

ELECTRICAL: SECTION

SCALE: 1/4" = 1'-0"

KEYED CONSTRUCTION NOTES

(APPLIES TO THIS SHEET ONLY)

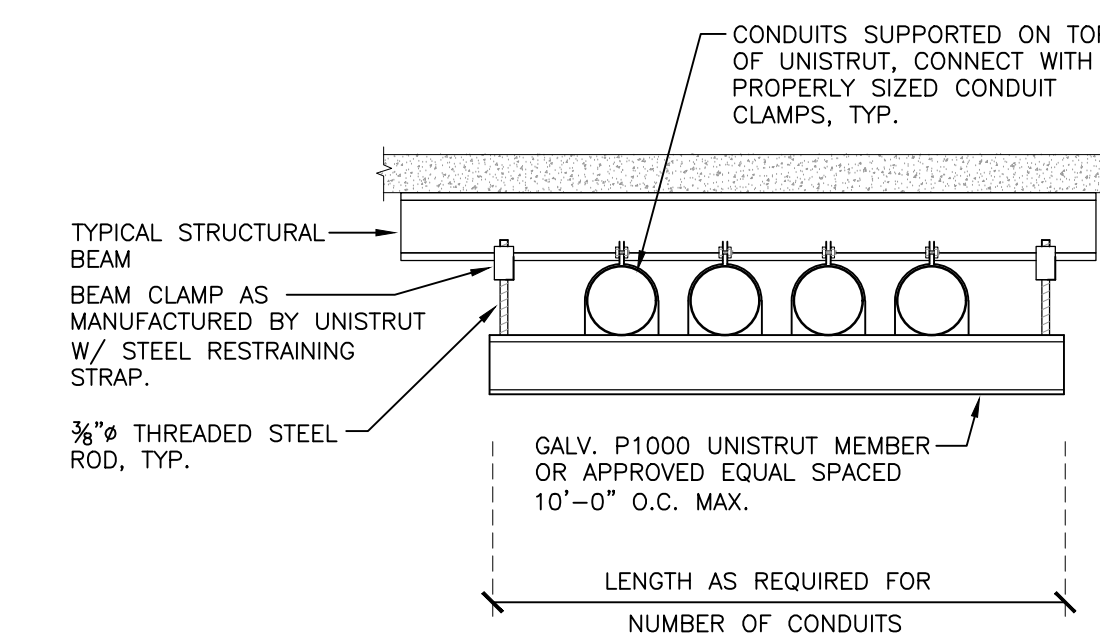
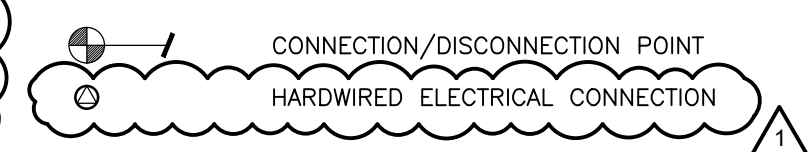
- 1 PROVIDE NEW JUNCTION/PULL BOXES. LOCATIONS MAY BE ALTERED TO FACILITATE RE-USE OF EXISTING CABLE/CONDUCTOR LENGTHS.
- 2 TOP OF ALL CONDUITS SHALL BE TIGHT TO UNDERSIDE OF STEEL BEAM, REFER TO SECTION 2/E2.
- 3 EXISTING JUNCTION/PULL BOX TO REMAIN.
- 4 CONTRACTOR SHALL PROVIDE A 75kW 277/480 VOLT, 3 PHASE, 4 WIRE DIESEL PORTABLE GENERATOR TO THE PROJECT TO POWER PANEL LPH-B3-1 WHILE THE FEEDER CONDUCTORS TO THE PANEL ARE BEING RECONFIGURED. PROVIDE A TEMPORARY 100 AMPERE CABLE FROM THE GENERATOR TO THE PANEL. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING FUEL FOR THE GENERATOR AS NECESSARY TO MAINTAIN CONTINUOUS OPERATION FOR THE DURATION OF THE UTILITY SOURCE OUTAGE DUE TO CONSTRUCTION. THE GENERATOR SHALL BE IN OPERATION CONTINUOUSLY FROM 3:00AM TO 3:00PM FROM EVERY SUNDAY MORNING TO EVERY FRIDAY AFTERNOON FOR THE DURATION OF THE PROJECT, WHEN UTILITY POWER IS NOT AVAILABLE DUE TO ELECTRICAL CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR STARTING AND STOPPING THE GENERATOR EACH DAY. LOCATION OF GENERATOR SHALL BE CONFIRMED WITH OWNER PRIOR TO INSTALLATION.
- 5 RELOCATE CONDUIT FOR FIRE ALARM FROM UNDERSIDE OF EXISTING 36" BEAM TO ON TOP OF BEAM. RECONNECT AT VERTICAL CONDUIT AT EXTERIOR WALL.
- 6 CONNECT NEW DOOR OPERATOR IN BASEMENT TO EXISTING BRANCH CIRCUIT, MADE AVAILABLE DURING DEMOLITION.

WIRING/CONDUIT KEY

(APPLIES TO THIS SHEET ONLY)

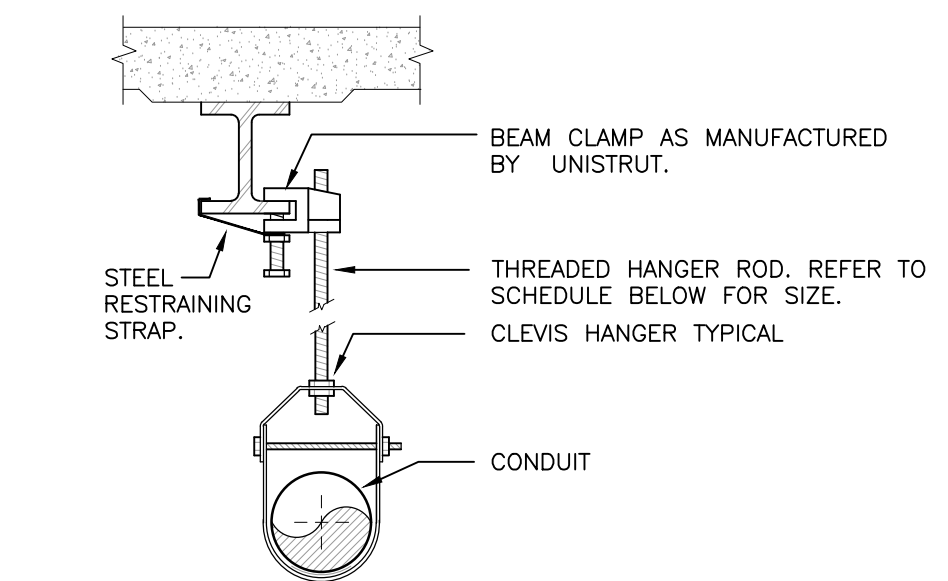
- |   |   |
|---|---|
| 1 | 1 1/2" C W/ (7) SECURITY/DATA CABLES        |
| 2 | 2" C W/ (1) CAT6 & (2) 12-STRAND F.O.       |
| 3 | 3" C W/ (3) 250mcm & (1) #2 GND             |
| 4 | 3" C W/ (4) 250mcm & (1) #1/0 GND           |
| 5 | 1" C W/ (6) #10 THHN                        |
| 6 | 1" C W/ (12) #14THHN & (1) 4C FAS CABLE     |
| 7 | 1" C W/ (1) 4C FAS CABLE                    |
| 8 | (3) SETS: 3" C W/ (3) 250mcm & (1) #2 GND   |
| 9 | (2) SETS: 3" C W/ (4) 250mcm & (1) #1/0 GND |

SYMBOL



TRAPEZE SUPPORT DETAIL

NOT TO SCALE



CONDUIT HANGER SCHEDULE					
CONDUIT DIA.	3/4"-2"	2 1/2"-3"	4"-5"	6"	8"-12"
HANGER DIA.	3/8"	1/2"	3/4"	1"	1 1/4"

CONDUIT SUPPORT DETAIL

NOT TO SCALE

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	NOV 17, 2021	KC		GH		GH
		BH		GH		

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ONONDAGA COUNTY RESOURCE RECOVERY AGENCY  
ELECTRICAL  
FIRST FLOOR PLAN  
SHEET NO.  
E2  
PROJECT NO.  
4213700