HIGHLAND
ASSOCIATES

To: **All Bidding Contractors** **Date:** November 25, 2026

From: Drew Marcinkevich **Project:** Afton CSD

Job No: 2025-005 Phase 2
Add. No.: Pre-Bid Addendum #001

A d d e n d u m

The following items are to be included in Pre Bid Addendum #001

Included:

- Pre Bid Agenda with Sign in Sheet – November 19, 2026
- Multiple Contract Summary
- Logistics Plan
- Milestone Schedule
- General Scope of Work and Requirements
- Revised RFI Sheet (Note: Date Change)
- Questions with Responses

Drawings:

A-100
A-102
A-103
A-400
A-401
A-500
S-100
M-100

HIGHLAND
ASSOCIATES

M-101
M-200
E-001
E-100
E-101
ES-100

Specifications:

Civil: 323002 Playscape Work

Electrical:

DIVISION 26 - ELECTRICAL

26 05 00	COMMON WORK RESULTS - ELECTRICAL	16
26 05 01	SUMMARY OF WORK	2
26 05 02	ELECTRICAL ABBREVIATIONS AND DEFINITIONS	2
26 05 03	CODES, FEES	1
26 05 04	PROJECT RECORD DOCUMENTS	1
26 05 05	REVIEW AND ACCEPTANCES	4
26 05 06	GUARANTEE	1
26 05 10	TESTING, INSPECTION AND CERTIFICATION	4
26 05 14	EQUIPMENT CONNECTIONS AND COORDINATION	4
26 05 21	WIRES AND CABLES (0-1000V)	9
26 05 26	GROUNDING AND BONDING	9
26 05 29	HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS	10
26 05 33	RACEWAYS AND BOXES	15
26 05 53	IDENTIFICATION FOR ELECTRICAL SYSTEMS	4
26 07 00	ELECTRICAL DEMOLITION	3
26 27 26	WIRING DEVICES	6
26 28 23	DISCONNECT SWITCHES - FUSED AND NON-FUSED	4
26 51 00	INTERIOR LIGHTING	7

HIGHLAND
ASSOCIATES

Questions with Responses:

1. Do you happen to have the estimate for the Sitework Contract for Afton CSD?

   Response: GC: 650k, MC: 220k, EC: 100K, SC: 275K

2. Spec 011200 – MCS- Sitework Construction is listed as a prime contract however a scope of work section is not included in the multiple contract summary.

   Response: MCS updated and is included in this addendum.

3. I do not find and specs for electrical work.

   Response: Included and issued with this addendum

4. I'm not clear on why drawings MD-101, MD-102 and MD-103 are shown. I don't see any mechanical work in these areas. What is the reason for the referencing of these areas?

   Response: Drawings MD-101, MD-102 and MD-103 will be eliminated from project documents via addendum #01.

5. Piping to the FCUs indicate they are heating only units. However, the schedule indicates there is cooling but EWT indicates 180F. This is a typo, correct? Also, there is a secondary pan and moisture sensor called for in drawing M401 under "Connections". Is this required?

   Response: Fan coil units are heating only. Secondary drain and moisture sensor not required as unit is heating only and has no condensate connection.

6. Drawing G-001, note 13 says work to be done during normal hours. However, spec 011000 "Summary" 1.12 says "while the building is occupied for the school year, all work shall be 2nd shift except for where access to the construction areas are directly from the outside". Is there any expected 2nd shift working hours in the base bid or alternates?

   Response: Second shift work is not anticipated for this project. All work should be substantially complete by the end of August. Reference milestone schedule for exact dates. Should any prime contractor not meet substantial completion deadline, all overtime and irregular shift work will not be absorbed by the Owner, it is the responsibility of each prime contractor.

7. Is there a project schedule or one to be provided?

   Response: Milestone schedule released via addendum #01.

HIGHLAND
ASSOCIATES

8. In drawing M200, the FCU piping detail says "field installed temperature control valve by control vendor". However in M401, deluxe piping packages with control valves are called for, indicating that the mechanical contractor will furnish and field install and the control vendor will wire. Please clarify who will furnish, install, and wire the FCU control valves. If they are to be furnished by control vendor, please indicate if they are two position or modulating.

   Response: Mechanical contractor shall furnish and install the control vendor will wire.

   Valves shall be two position modulating style don't appear to be feasible due to low flow needed to maintain temp. setpoint through fan coil heating coils.

9. How is each FCU and associated OA supply fan to be controlled in tandem? Is the intention to utilize the manufacturer FCU controller or have a separate field installed BAS controller for control of the OA supply fan? If wired back to a separate field installed controller, we recommend combining control for both the FCU and OA supply fan into one field installed controller instead of two separate controllers. If wired back to the manufacturer controller, please indicate if the manufacturer controller will have spare inputs and outputs to facilitate control of the OA supply fan.

   Response: It is acceptable to control the remote fan via binary output on the Trane controller to a relay to switch the fan on. It is confirmed that the Trane manuf. controller has output connections for the supply fan.

102 Highland Avenue | Clarks Summit, PA 18411 | (570) 586-4334 | fax (570) 587-8164 | www.highlandassociates.com
Gil Ben-Ami, PE Kunpol Buddhani, PE George W. Christiana Jr. David M. Gilmore, NCARB Richard J. Guditus, PE M. Bilal Hasan, PE Glenn D. Leitch, AIA
Anthony J. Lello, PE Antonio Mendoza, PE Thomas W. Millard, PE Teddy Muliawan, PE James G. Scandale, PE Brian W. Schafer Eric R. Scott, AIA Michael Wolf, AIA
Highland Associates, Ltd. Architecture Engineering Interior Design Highland Associates Architecture Engineering Design, P.C.

Pre-Bid Meeting Minutes

Afton Central School District Capital Project Phase II

Prepared By: **Schoolhouse Construction Services, LLC**
Meeting Date: **November 19, 2026**
Meeting: **Pre-Bid Meeting**
Location: **29 Academy Street, Afton, NY 13730**

Attendees:

☐ Annette Hammond	Afton CSD	☒ Jason Maxian	Andrew R Mancini
☐ Kristyn DeGroat	Afton CSD	☒ Owen Tice	B@I Construction Group
☒ Kim Knapp-Moravcik	Afton CSD		
☒ Connor Fitzgerald	Schoolhouse Construction		
☐ Melisa Secord	Schoolhouse Construction		
☒ Drew Marcinkevich	Highland Associates		
☐ Robert Campbell	Highland Associates		
☐ Frank Genell	Highland Associates		
☐ Mariah Tague	Highland Associates		
☐ Patrick Costello	Appel Osborne		
☐ Alexander Belding	Appel Osborne		
☒ Tim Rogers	Louis N Picciano & Son		
☒ Noah Gregory	Byler Excavating		
☒ Brooks Buttice	Daniel J Lynch		

Distribution:

Attendees, Non-Attending Project Representatives, Project File

Item	Meeting Item Description	Responsibility	Status
I.	**Introduction**		
1.1	• The owner, project team and prospective bidders have been introduced and all in attendance filled out the attached sign-in sheet.	N/A	Record
II.	**Project Scope Overview**		
2.1	• Major scope associated with phase II of the Afton CSD capital improvement project includes Bus Loop walkways reconstruction, relocation of existing exterior basketball courts, Elementary playground upgrades, bleacher pad installations, corridor ceiling replacements, exterior masonry restoration at the 1908 wing, and window replacements. Additionally at the Bus Garage a new fuel island canopy with lighting will be provided.	N/A	Record

2.2	• Owner Provided Items Include: o Playground Equipment o Artificial Turf	N/A	Record
2.3	• Review of Prime Contracts: o General Construction o Mechanical Construction o Electrical Construction o Sitework Construction	N/A	Record
III.	**Bidding Instructions**		
3.1	• Bidder Questions: Requests for clarification or interpretation of the bidding documents shall be submitted by the bidder via email and will be considered if received prior to Thursday, December 3rd, at 2:00pm. All requests are required to be submitted using the "Contractor Pre-Bid RFI Form" (section 00 22 14) and addressed to Highland Associates and Schoolhouse Construction Services. Ensure that Drew Marcinkevich (dmarcinkevich@ha-pa.com), Melisa Secord (melisa.secord@schoolhouse.construction), and Connor Fitzgerald (connor.fitzgerald@schoolhouse.construction) are copied.	N/A	Record
3.2	• There was a slight confusion during the pre-bid meeting on the deadline for pre-bid RFI's. The date given above (12/3/26 at 2pm) is the deadline. Official clarification will be given via Addendum #01.	HA-PA, SCS	Open
3.3	• Bid Forms and Attachments: o Attachment #1: Statement of Surety Intent o Attachment #2: Non-Collusive Bidding Certification o Attachment #3: Bid Security o Attachment #4: Corporate Resolution o Attachment #5: Certification of Compliance Iran Divestment Act o Attachment #6: Labor Law Certification of Registration o Attachment #7: Sexual Harassment Form	N/A	Record
3.4	• Bids Due/Opened: December 10, 2026 by 11:00am, local time. o Bid Opening Location: Afton CSD Board of Education Room, 29 Academy Street, Afton, NY 13730 o Attn: Annette Hammond, Superintendent	N/A	Record
IV.	**Overview of Bidding Documents**		
4.1	• Prevailing Wages: Refer to NYS wage rate schedule in project specifications.	N/A	Record
4.2	• Allowances (Section 01 21 00) o General Contractor Allowance - $10,000.00 o Mechanical Contractor Allowance - $5,000.00 o Electrical Contractor Allowance - $5,000.00 o Sitework Contractor Allowance - $25,000.00	N/A	Record

4.3	• Bid Alternates (Section 01 23 00)
	  ○ Alternate #1: Window Replacements on South Side of 1908 Wing (ADD)
	  ○ Alternate #2: Window Replacements on West Side of 1908 Wing (ADD)
	  ○ Alternate #3: Ground Floor Corridor Ceiling Replacements (DEDUCT)
	  ○ Alternate #4: Concrete Bleacher Pads (ADD)
	• Clarification for ADD vs DEDUCT will be identified in Addendum #01.
		HA-PA, SCS	Open

4.4	• Unit Prices (Section 01 22 00)
	  ○ No. L-1: 4" SMT
	  ○ No. L-2: Undercutting (300CY Included w/ Base Bid)
	  ○ No. L-3: Medium Duty Asphalt
	  ○ No. L-4: Heavy Duty Asphalt
	  ○ No. L-5: Heavy Duty Concrete Sidewalk
	  ○ No. L-6: Granite Curb
	  ○ No. L-7: Sodded Lawn
	  ○ No. L-8: Rock Excavation (50CY Included w/ Base Bid)
	  ○ No. L-9: Soil Stabilization Fabric
		N/A	Record

V. Equivalents & Substitutions			
5.1	• The use of manufacturer's brand names, catalog numbers, and similar proprietary identifying data in the contract documents are not intended to eliminate from consideration products that are equivalent in quality, appearance and function to those specified. Where, in the specifications, certain kinds, types, brands, or manufacturers of materials are names, they shall be regarded as the required standard of quality. Where two or more are named, these are presumed to be equal, and the contractor may select one of those items. If the contractor desires to use any kind, type, brand, or manufacturer of material other than those named in the specification, he/she shall indicate in the bid form, or in writing when requested, prior to award of contract, that kind, type, brand or manufacturer is included in the base and/or alternate bid for the specified item(s). Further, the contractor may be requested to submit information describing in specific detail, wherein the bid material differs from the quality and performance required by the base specifications, and such other information as may be required by the architect. The risk of acceptance of bid equivalents is the responsibility of the contractor. • Equivalents are pre-award and substitution are post-award. • Equivalents: Refer to Supplementary Instructions to Bidders 00 22 13. • Substitutions: Refer to Division 01 specification section 01 60 00 "Product Requirements".	N/A	Record
VI. Construction Schedule Summary			
6.1	• Field work for submittals and other preparation activities will be immediately upon required insurances being set in place. • On-Site Activities and Milestone Dates: See attached milestone schedule. • Substantial Completion Date: August 27, 2027	N/A	Record
6.2	• Attached milestone schedule will be formally released via Addendum #01.	HA-PA, SCS	Open
VII. Tour of Project Site			
7.1	• Prospective bidders were brought on tour of all areas of work indicated throughout the bid documents.	N/A	Record

VIII. Questions			
8.1	• Q: What are the budget numbers? • A: Budgets will be release via Addendum #01.	HA-PA, SCS	Open
8.2	• Q: Will there be any details release on playground equipment foundation locations, equipment installation details, etc? • A: Schoolhouse requests that a pre-bid RFI be formally submitted to obtain further detail on playground equipment installations.	HA-PA, SCS	Open
8.3	• Q: The bid documents depict fencing and gate details. Where does the fencing go? • A: Fencing is indicated in bold and should be inclusive with Alternate #4.	HA-PA, SCS	Open
8.4	• Q: Are all of the alternates ADD alts? • A: No, alternates 1, 2, and 4 are ADD alternates. Alternate #3 is a deduct alternate.	HA-PA, SCS	Open

Bid Opening: Thursday, December 10th 2026 @ 11am

THESE MINUTES ARE NOT INTENDED TO BE AN EXACT TRANSCRIPT OF THE MEETING BUT ARE MEANT TO HIGHLIGHT THE MAJOR ITEMS DISCUSSED.

Afton Central School District - CIP Phase II

Project Milestone Schedule 9/24/26

Item	Description	Start Date	Substantial Completion
Afton Central School District - Capital Improvements Project			
Main Building			
	Sitework	**June 28, 2027**	**August 27, 2027**
1	Elementary Playground	June 2027	August 2027
2	Bus Loop Sidewalk Replacement	June 2027	August 2027
3	Athletic Field Walkways and Bleacher Pads	June 2027	August 2027
4	Parking Lot Restriping - Student Parking Lot, Basketball Court	June 2027	August 2027
	Windows	**June 28, 2027**	**August 20, 2027**
1	Removal and Replacement of Windows - 1908 Wing	Late June 2027	Late July 2027
2	Interior Sills, Ceiling Reinstallations, Misc Patching	Early August 2027	Mid-August 2027
	Corridor Ceiling Replacements	**June 28, 2027**	**August 13, 2027**
1	Ceiling and Associated Utility Demo	Late June 2027	Early July 2027
2	Mechanical Installations	July 2027	July 2027
3	Ceiling Installation - Includes Light Fixtures and Ceiling Devices	Late July 2027	Early August 2027
4	Testing and Balancing of New Mechanical Equipment	Mid-August 2027	Mid-August 2027
	Masonry Restoration	**June 28, 2027**	**August 20, 2027**
1	Brick Repointing & Joint Caulking	Late June 2027	Mid-August 2027
Bus Garage			
	Fuel Station Canopy	**June 28, 2027**	**August 27, 2027**
1	Canopy Foundations	Late June 2027	Mid-July 2027
2	Parking Lot Utility Trenching	Late June 2027	Mid-July 2027
3	Erect Canopy Steel	Mid-July 2027	Early August 2027
4	Final Utility Connections and Site Restoration	Early August 2027	Late August 2027

Scheduling Notes:

*Weekend (Saturdays and Sundays), 2nd shift, and overtime work throughout the regular work week(s) in order to complete activities in a timely manner may be required to meet the dates outlined above, at no additional cost to the District.

**Work schedule during the School Year will be coordinated with the Construction Manager, Architect and District. It is understood by All Contractors that work may need to be 2nd Shift if it is determined to affect the operations of the District. This will be at the discretion of the Construction Manager.

***Abatement of Hazardous Materials Shall Occur During School Break Periods. Contractor Shall Set-Up for Abatement As Soon As Possible Before Break and Commence Abatement Activities Immediately After the Building is Vacated for the Designated Break Period. Contractors Shall Work Continous During Weekend Periods (Saturday and Sunday) and Extended Work Hours. Additionally, Contractors Shall Accomodate Clearance Testing to Occur Well in Advance to Students Coming Back to School and Enough Time Should There be a Need for an Additional Round of Cleaning and Testing.

SECTION 01 12 00 – MULTIPLE CONTRACT SUMMARY

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including Division 00, General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes a summary of each contract, including responsibilities for coordination and temporary facilities and controls.

B. Specific requirements for Work of each contract are also indicated in individual Specification Sections and on Drawings.

C. Related Requirements:

1. Section 01 10 00 “Summary” for the Work covered by the Contract Documents, restrictions on use of Project site, coordination with occupants, and work restrictions.
2. Section 01 31 00 “Project Management and Coordination” for general coordination requirements.

1.3 DEFINITIONS

A. Permanent Enclosure: As determined by Architect, the condition at which roofing is insulated and weathertight; exterior walls are insulated and weathertight’ and openings are closed with permanent construction or substantial temporary closures equivalent in weather protection to permanent construction.

1.4 PROJECT COORDINATOR

A. Project coordinator (Lead Contractor) shall be GENERAL CONSTRUCTION CONTRACTOR and shall be responsible for coordination between the General Construction Contact, HVAC Construction Contract, Electrical Construction Contract, and Site Construction Contract.

1.5 COORDINATION

A. Project coordinator shall perform Project coordination activities for the multiple contracts, including, but not limited to, the following:

1. Provide typical overall coordination of the Work with all Prime Contractors.

2. Coordinate shared access to workspaces.
3. Coordinate and schedule interruptions of permanent and temporary utilities, including those necessary to make connections for temporary services with Owner's approval.
4. Coordinate sequencing and scheduling of the Work. Refer to paragraph 1.7 for details.

B. The Construction Manager will coordinate the work between the Prime Contractors and the Owner.

C. Coordination by each Prime Contractor: Coordination activities of all Prime Contractors include, but are not limited to, the following:

1. Schedule and sequence their Work activities and coordinate with the Project Coordinator.
2. Preparation and coordination of Coordination Drawings.
3. Coordinate sharing access to workspaces.
4. Coordinate integration of work into limited spaces.
5. Coordinate protection of contractors' work.
6. Coordinate cutting and patching for their work along with cut and patch for the HVAC / Plumbing Contractor and the Electrical Contractor.
7. Coordinate tests and inspections for their work. Coordinate testing and inspections with the Construction Manager and with the 3rd party inspector.
8. Coordinate staging with the Construction Manager.
9. Coordinate temporary services and facilities.

1.6 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work will be constructed under multiple Prime Contractor Agreements including through public bidding, cooperative purchasing and through state contracts. Cooperative purchasing agreements and state contracts are considered Prime Contracts for this project.

B. One complete set of Contract Documents is issued to cover the multiple Prime Contracts. Prime Contracts are separate Contracts between the District and independent Contractors representing significant construction activities. Each Prime Contract is performed concurrently and closely coordinated with construction activities performed on the Project under other Prime Contracts.

C. Multiple Prime Contractors for this project include:

1. General Trades Construction (GC)
2. HVAC Construction (MC)
3. Electrical Construction (EC)
4. Sitework Construction (SC)

D. Drawings – For all Contracts:

1. Each drawing is included and integral to each Prime Contract. Complete set of drawings is the responsibility of each contractor. Contractor is to review all drawings for that contract's scope on all drawings.
2. List of Drawings – Refer to Construction Document's Cover Sheet.

1.7 GENERAL SCOPE OF WORK AND REQUIREMENTS

A. General scope of work and requirements for Prime Contractors shall include, but is not limited to, the following:

1. All Contractors must review all information in the Contract documents and are responsible for their work shown on other Contract's drawings.
2. All Contractors shall visit the site to verify and review existing conditions before bidding the cost of the project.
3. Prime Contractors shall supply all labor, materials, tools, equipment, supervision, layout and survey of their work, and coordination with other prime, trade contractors, Schoolhouse, the Architect, as necessary; in order to complete all of their work as required and detailed in the drawings, specifications, addenda and all other contract documents.
   a. All workers must meet the requirements of NYS Labor Law 220-I to perform work on the project site.
   b. For identification and security purposes, workers are required to wear photoidentification badges at all times while working at District occupied sites. Each Contractor is responsible for control, maintenance and updating of the badges worn by their personnel and by the subcontractor's personnel.
4. Prime contractors shall provide their own OSHA compliant access to their work through use of staging, scaffolding, personnel lifts, temporary scaffolding, shoring, supports, guys, braces, falsework, cranes and the like to complete the work.
5. Correct any, or all, quality control issues or concerns, which are not deemed acceptable to Schoolhouse, the Architect, and Owner or are not deemed as highquality finished product.
6. Verify that air and surface temperature, moisture, and humidity conditions are suitable for installation of this work, per the requirements of the specifications and product manufacturers. If the conditions prohibit installation, notify Schoolhouse's on-site representative. Documentation of conditions shall be noted within this contractor's daily field reports.
7. The District has the right of first refusal for any equipment and/or materials being removed or disposed. The Contractor will move at their own expense, any equipment and/or materials requested by the District to a designated location.
8. All drawings, specifications, and addenda prepared by the Design Team are applicable to the performance of this contract.
9. This contractor agrees to take all precautionary measures necessary to prevent damage to the Owner's property and the work of other trades and contractors and to repair promptly

any damage caused by this contractor's action or that of its employees, subcontractors or vendors. If damage is caused by this contractor's action or that of its employees, subcontractors or vendors, this contractor must repair the damage within 1 calendar week. If this contractor fails to make acceptable repairs within 1 week of notification, Schoolhouse may direct these repairs to be completed on behalf of this contractor and at this contractor's expense.

a. In the event that the damage presents a safety, security, or environmental risk, or affects the ability of other contractors to perform their work, the repairs must be made immediately.

10. Each Contractor shall provide temporary shoring, bracing, supports, or protection systems needed to complete the Work of their Contract. All Contractors are responsible, individually and collectively, for maintaining safe-working conditions at all times.
11. Provide means for maintaining acceptable indoor air quality and adequate ventilation to eliminate fumes and/or the off gassing of material products, according to OSHA and SED requirements.

B. Prohibited Work:

1. Contractor is notified that the use of gasoline or diesel powered engines or motors is prohibited within the existing building. The use of gas powered equipment in the school building is strictly prohibited.
2. Contractors are notified that the dry-cutting of masonry or gypsum based products with rotary cutting equipment is prohibited on the project site.

C. Extent of Contract: Unless the Agreement contains a more specific description of the Work of each Contract, requirements indicated on Drawings and in Specification Sections determine which contract includes a specific element of Project.

1. Unless otherwise indicated, the work described in this Section for each contract shall be complete systems and assemblies, including products, components, accessories, and installation required by the Contract Documents.
2. If two or more Prime Contracts have the same scope of work, the Owner, Construction Manager and A.E will determine which Contract is responsible to perform the work. A credit change order will be executed for the work not required by the other Contracts.
3. The owner will provide and install all playground equipment and synthetic turf through a separate contract for the elementary school playground.

1.8 SUBSTITUTIONS

A. Substitutions: Each contractor shall cooperate with other contractors involved to coordinate approved substitutions with reminder of the work. Coordinate with the Architect, Construction Manager and the Owner for any substitutions.

1. Each Prime Contractor shall coordinate their own substitutions. All proposed substitutions shall be submitted to the CM and A/E within 10 days of contract for approval.

1.9 TEMPORARY FACILITIES AND CONTROLS

A. Temporary Facilities and Controls: In addition to specific responsibilities for temporary facilities and controls indicated in this Section and in Section 01 50 00 “Temporary Facilities and Controls”, each contractor is responsible for the following:

1. Installation, operation, maintenance, and removal of each temporary facility necessary for its own normal construction activity, and costs and use charges associated with each facility, except as otherwise provided for in this Section.
2. Plug-in electric power cords and extension cords, supplementary plug-in task lighting, and special lighting necessary exclusively for its own activities.
3. Its own field office, complete with necessary furniture, utilities, and telephone service.
4. Its own storage and fabrication sheds.
5. Temporary enclosures for its own construction activities.
6. Staging and scaffolding for its own construction activities.
7. General hoisting facilities for its own construction activities.
8. Prgoress cleaning of work areas affected by its operations on a daily basis.
9. Secure lockup of its own tools, materials, and equipment.
10. Construction aids and miscellaneous services and facilities necessary exclusively for its own construction activities.

B. Temporary Heating, Cooling and Ventilation: Is not required on the interior of the building.

C. Use Charges: Comply with the following:

1. Sewer Service: Owner
2. Water Service: Owner
3. Electric Power Service: Owner

1.10 CUTTING AND PATCHING

A. Cutting/Patching: Each Prime Contractor shall provide cutting and patching as required to perform their contract work. This includes openings in existing floors, walls and ceilings.

B. If structural steel is required for roof and/or floor openings the General Construction Contractor is responsible for the structural steel. Cutting of such opening is the responsibility of the General Construction Contractor. Layout of opening the responsibility of the contractor requiring the opening.

C. Any opening requiring lintels and/or structural steel is the work of the General Construction Contract. Layout of openings to be performed by the contractor requiring the opening, cutting of the opening and installation of structural steel is the responsibility of the General Construction Contract. Reference all drawings for locations or required lintels.

D. All openings, penetrations, or abandoned locations created by the performance of the work of each contractor, either by cutting, demolitions, removals, or for any other reason, including openings that remain after demolition, shall be sealed, filled, repaired, and/or patched to match, to meet or exceed the quality of existing or new adjacent and surrounding finishes, and existing and new material warranties shall be maintained. Patching shall be done by tradesmen qualified in performing the type of work required for the patching.

E. <u>Ceiling Work:</u>

1. Above ceiling work for ceiling scheduled to remain: General Contractor is responsible for removing and reinstalling ceiling in order to accommodate mechanical ductwork demo and installation. All other above ceiling work: Electrical, plumbing, fire protection, controls, etc. will be the responsibility of each trade performing the work which includes removing, storing and reinstalling of ceiling. Any damage to ceiling tile/grid scheduled to remain is to be replaced by the trade responsible.
2. Reinstall of Ceiling Work: General Contractor is responsible for removal, preservation of and reinstallation of existing ceiling system. Electrical Contractor is responsible for removal or suspension of existing electrical ceiling equipment. Existing electrical ceiling equipment to be re-installed by Electrical Contractor. Mechanical Contractor is responsible for removal of all existing grilles and reinstall once new ceiling system is being installed. Coordinate new work before reinstallation with all respective contractors.
3. New Ceiling Work & MEP's to Remain: General Contractor is responsible for demolition and installation of new ceiling systems. Electrical Contractor is responsible for removal or suspension of existing electrical ceiling equipment. Existing electrical ceiling equipment to be re-installed by Electrical Contractor. General Contractor is responsible for cutting around existing lighting fixtures, grilles, etc. for installation of new ceiling. Mechanical Contractor responsible for removing and reinstalling any mechanical grills/equipment in ceiling system. If ceiling elevation lowers and effects electrical equipment on the walls, Electrical Contractor to lower such equipment to accommodate elevation changes. Electrical equipment is; but not limited to, clocks, speakers, lighting, emergency lighting, fire alarm devices, sensors, etc.

4. This shall include all ceiling types, unless shown in the documents as receiving new ceiling, in which case no reinstallation or replacement is required by this contractor.
   Include all other removals and replacement needed for the work of this contract. Contractor shall verify the locations of existing plaster, sheetrock, acoustic lay in and spline ceilings and adjust their bid accordingly.

1.11 PRIME CONTRACTS SCOPE OF WORK

A. GENERAL TRADES CONTRACT (GC)

1. Work of the General Trades Contract includes all building demolitions and General Construction. Provide all material, labor, equipment, supervision, management, and administration required for the total performance of the Work of this Contract including but is not limited to, the following:

   a. All work as shown on all ARCHITECTURAL (A) and Structural (S) series drawings unless specifically noted as by another contract.
   b. Remaining work not identified as work under other contracts.
   c. Preparing temporary building egress in accordance with the requirements of NYSED or the drawings and specifications and to accommodate the construction schedule and District use of the buildings.
   d. Protection of existing flooring to remain.
   e. Dumpsters for hazardous materials and dumpsters for all construction waste for all trades.
   f. Selective demolition including all items required to be demolished to receive new work and demolition of items not required for future use and completion of systems and spaces.
   g. Fuel Island Canopy, shop drawings, and installation of complete system. Includes foundations, steel, gutters, earthwork, etc.
   h. Window replacements as indicated in the contract drawings, including all required ceiling removal and reinstallation, wall/surrounding finishes patching, trim, sills, etc as necessary to perform this work. It is the responsibility of the General Trades Contractor to visit the project site and verify existing conditions at each opening prior to bidding the project.
   i. Ground floor corridor ceiling replacements.
   j. Exterior masonry repairs and associated work.
   k. Exterior closure, including work at parapets.
   l. Exterior closure, including walls, parapets, doors, windows. Louvers are furnished by the contractor requiring the louver, installed by General Trades Contractor. Includes any necessary patching surrounding louver installations (interior & exterior).

m. Interior construction, including partitions, interior glazed openings, insulation and caulking.
n. Interior finishes, finish carpentry, architectural woodwork, built in casework, wall, floor, base and ceiling finishes, designated FF&E, wall mirrors, benches, lockers, grab bars, toilet partitions and toilet and shower accessories. Blocking for all contractor supplied and Owner supplied equipment.
o. Interior caulking of all door frames, windows and sills to adjacent surfaces. Caulk all joints where concrete, masonry and gypsum adjoin. Caulk all casework and countertops to adjacent surfaces after finish painting of all rooms.
p. Shall install all access doors furnished by other contractors, into wall or ceiling assemblies. Coordinate locations with other trades.
q. Review all other drawings for patch required for finishes.
r. Painting of exposed piping, HVAC ductwork, and electrical conduit in all interior locations. Exterior painting of exposed piping, HVAC ductwork, and electrical conduit shall be by the contractor providing the exposed piping, HVAC ductwork and electrical conduit.
s. Responsible to patch all wall surface defects prior to painting any walls indicated to receive new paint finish on the contract documents. This is to include minor dings, scratches, plaster cracks etc. to ensure all walls are free of defects when turned over to the owner.
t. The contractor will provide all weather protection and protection systems for remaining adjacent building elements as caused by demolition.
u. Exterior closure, including walls and louvers and patching and repair of exterior walls.

2. Temporary facilities and controls in the General Construction Contract include, but are not limited to, the following:

a. Security enclosure and lockup. Checking and securing windows, doors and gates for security.
b. Temporary facilities and controls that are not otherwise specifically assigned to other Prime Contractors.
c. Unpiped temporary toilet fixtures, wash facilities, and drinking water facilities, including disposable supplies.
d. Temporary enclosure for building exterior, except as indicated for other primes.
e. Temporary roads and paved areas.
f. Dewatering facilities and drains.
g. Excavation support and protection, unless required solely for the work of another contract.
h. Special or unusual hoisting requirements for construction activities, including hoisting loads.

i. Project identification and temporary signs.
j. General waste disposal facilities.
k. Pest control.
l. Temporary fire-protection facilities.
m. Barricades, warning signs, and lights.
n. Site enclosure fence.
o. Environmental protection.
p. Maintenance and restoration of Owner's existing facilities and/or property used as temporary facilities.

B. HVAC CONSTRUCTION CONTRACT (Mechanical)

1. Work of the HVAC Construction Contract includes all Mechanical demolition and construction. Provide all material, labor, equipment, supervision, management, and administration required for the total performance of the work of this contract including but is not limited to, the following:

a. All work as shown on MECHANCAL series drawings unless specifically noted as by another contract.
b. Exterior painting of exposed piping, HVAC ductwork, and electrical conduit shall be by the contractor providing the exposed piping, HVAC ductwork, and electrical conduit.
c. HVAC systems and equipment.
d. Fire dampers at all locations new ductwork passes through rated walls.
e. Heating system closed loop treatment as it is affected by new unit installations.
f. HVAC instrumentation and controls shall be provided by the Mechanical Contractor. Reference Instrumentation and Controls specification plus the sequence of operation and points list in the contract documents. Coordinate with Electrical as necessary.
g. HVAC testing, adjusting, balancing and commissioning assistance.
h. Building automation system and associated upgrades shall be provided by the HVAC Contractor.
i. Any work specifically called out for the Mechanical Construction Contract in any other drawings and specifications.
j. Mechanical connections to equipment furnished by the General Trades Contract, Plumbing Contract, HVAC Contract, Electrical Contract and Owner.
k. Furnishing of louvers and any roof curbs, installation by the General Trades Contractor.

l. All Mechanical demolition, including mechanical units, ductwork including temporary ductwork, equipment, hangars including special hangers for ductwork, piping, insulation, to facilitate, the Mechanical (HVAC) Contractor scope of work, or to meet code requirements.
m. The Mechanical (HVAC) Contractor is responsible to remove, clean and re-install all mechanical components such as diffusers, louvers and grilles where ceilings are scheduled to be removed and or replaced. Reconnection of existing systems, ductwork, diffusers and equipment that remain is required throughout the building after demolition and where work is required around work that remains.
n. Coordinate all Mechanical (HVAC) equipment electrical requirements with the Electrical Contractor. The Mechanical Contractor will provide all necessary starters, disconnects, and variable frequency drives required by specified mechanical equipment. The Electrical Contractor will install all necessary starters, disconnects and variable frequency drives required by specified mechanical equipment. Reference the MEP equipment connections schedule in the drawings.
o. The Mechanical (HVAC) Contractor shall provide adequate support and protection of the existing Mechanical (HVAC) systems until such time as the new systems are in place and ready for use by the District.
p. The Mechanical (HVAC) Contractor shall provide HVAC equipment filters for all HVAC units around and in the areas of work. These will be changed upon completion of the work.
q. The Mechanical (HVAC) Contractor is notified that final balancing of systems and the submission of final balance reports are required to achieve substantial completion. It is of vital importance that this work is completed in a timely manner.
r. The Mechanical (HVAC) Contractor shall remove and replace existing ceiling as required where existing ceilings are not scheduled for removal and replacement by others. The Mechanical (HVAC) Contractor is responsible to replace any components of existing ceilings that are damaged in the removal or replacement process or as a result of being stored improperly after removal. Replacement materials shall match existing materials.

C. ELECTRICAL CONSTRUCTION CONTRACT

1. Work of the Electrical Contract includes, but is not limited to, the following:

a. Electrical service and distribution.
b. Demolition of existing lighting, devices, wiring, and conduit.
c. The Electrical Contractor is responsible for all sawcutting, trenching, excavation, bedding, underground utilities (conduit, wiring, etc.), backfill, asphalt patching, site restoration, etc. at the Bus Garage.
d. Ductbank associated with the Bus Garage electrical trenching.

e. Electrical connections to equipment furnished by other Prime Contracts.
f. The Electrical Contractor shall provide adequate support and protection of the electrical systems until such time as the new systems are in place and ready for use by the District. Maintain all existing systems including District requirements of power, lighting, safety and communication systems throughout the construction project.
g. The Electrical Contractor is responsible to tie-up all existing loose wiring and cable to ensure components hang at ceiling.
h. The Electrical Contractor is responsible to secure and maintain operational all fire alarm, camera, security, data, controls and other devices in existing ceilings that may be disturbed by removal and replacement of ceilings by the Electrical Contractor and by other contractors. All existing fire alarm, camera, security, data, controls and other devices shall be maintained in operational status for the duration of construction. The Electrical Contractor is responsible to replace existing fire alarm, camera, security, data, controls and other devices in restored and new ceilings following ceiling replacement by the Electrical Contractor and by other
Contractors and confirm operation status of all devices following replacement.
i. The Electrical Contractor is responsible to remove and re-install all electrical components such as light fixtures and ceiling devices (security, fire alarm, lighting controls, etc.). where ceilings are scheduled to be removed or replaced.
Reconnection of existing fixtures and devices that remain is required throughout the building after demolition and where work is required around work that remains.

3. Temporary facilities and controls in the Electrical Contract include, but are not limited to, the following:

a. Electric power service and distribution.
b. Electrical connections to existing systems and temporary facilities and controls furnished by the other Prime Contracts.

D. SITE CONSTRUCTION CONTRACT

1. Work of the Site Contract includes, but is not limited to, the following:

a. All work shown on CIVIL (L) series drawings unless specifically noted as by another contract.
b. Sediment/erosion control.
c. Abide by all SWPPP rules, regulations and requirements throughout the duration of the project.
d. ADA compliance at all new walkways (concrete & medium duty asphalt).
e. Restriping existing parking lot to extent shown on project documents.

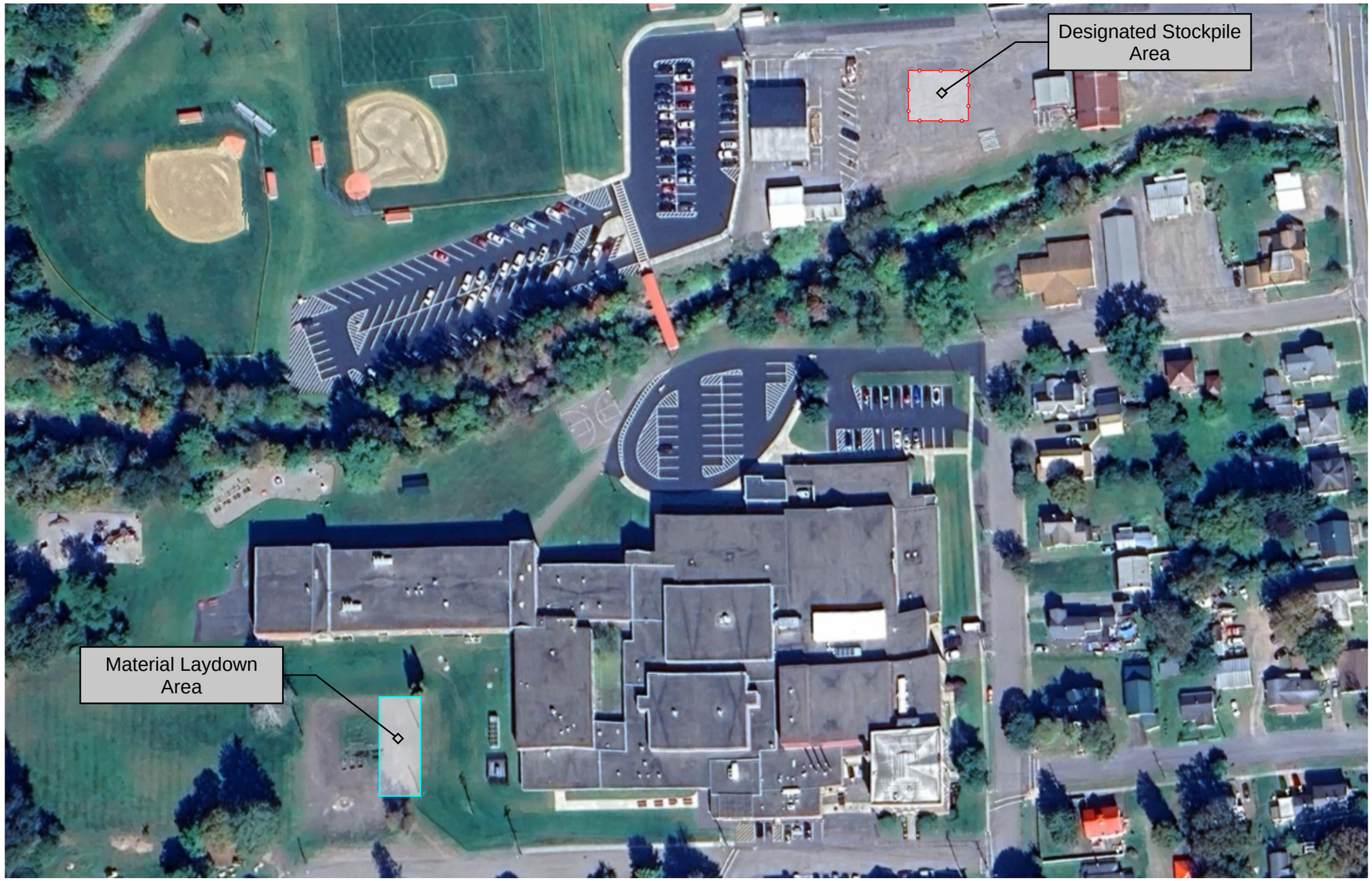
f. Signage.
g. Foundations and installations associated with now basketball hoops.
h. Removal of existing basketball court and hoops. Reconfiguration of bus loop walkways and installation of concrete sidewalk and granite curbing.
i. HDC bleacher pads at athletic fields.
j. Demolition of elementary school playground and associated site prep/grading.
k. Stormwater management trenches.
l. Concrete edge nailer and granular base at elementary school playground.
m. Vinyl chain link fencing and single width gate as shown on project documents.
n. Site restoration at all disturbed areas of landscape.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION 01 12 00

Afton CSD Phase II - Site Logistics Plan



LEGEND

Material Laydown Area

Stockpile Area

General Notes

1) Contractor to Provide Stockpile Area as Required to Perform Their Own Work. Stockpile Area is to be Compliant with all SWPPP Regulations and Requirements.

2) Contractors Shall Use the Designated Material Laydown Area for Any Necessary Storage Connexs, Field Office Trailers, Equipment, Etc.

3) Contractors Are to Provide Traffic Cones and Orange Construction Fencing as Deemed Necessary by the Owner and Owner's Representative Throughout the Duration of the Project.

Logistics Plan

Date: 09/24/2026

HIGHLAND ASSOCIATES
Architecture | Engineering | Interior Design

SCHOOLHOUSE CONSTRUCTION SERVICES LLC

Afton Central School District - CIP Phase II

Project Milestone Schedule 9/24/26

Item	Description	Start Date	Substantial Completion
Afton Central School District - Capital Improvements Project			
Main Building			
	Sitework	**June 28, 2027**	**August 27, 2027**
1	Elementary Playground	June 2027	August 2027
2	Bus Loop Sidewalk Replacement	June 2027	August 2027
3	Athletic Field Walkways and Bleacher Pads	June 2027	August 2027
4	Parking Lot Restriping - Student Parking Lot, Basketball Court	June 2027	August 2027
	Windows	**June 28, 2027**	**August 20, 2027**
1	Removal and Replacement of Windows - 1908 Wing	Late June 2027	Late July 2027
2	Interior Sills, Ceiling Reinstallations, Misc Patching	Early August 2027	Mid-August 2027
	Corridor Ceiling Replacements	**June 28, 2027**	**August 13, 2027**
1	Ceiling and Associated Utility Demo	Late June 2027	Early July 2027
2	Mechanical Installations	July 2027	July 2027
3	Ceiling Installation - Includes Light Fixtures and Ceiling Devices	Late July 2027	Early August 2027
4	Testing and Balancing of New Mechanical Equipment	Mid-August 2027	Mid-August 2027
	Masonry Restoration	**June 28, 2027**	**August 20, 2027**
1	Brick Repointing & Joint Caulking	Late June 2027	Mid-August 2027
Bus Garage			
	Fuel Station Canopy	**June 28, 2027**	**August 27, 2027**
1	Canopy Foundations	Late June 2027	Mid-July 2027
2	Parking Lot Utility Trenching	Late June 2027	Mid-July 2027
3	Erect Canopy Steel	Mid-July 2027	Early August 2027
4	Final Utility Connections and Site Restoration	Early August 2027	Late August 2027

Scheduling Notes:

*Weekend (Saturdays and Sundays), 2nd shift, and overtime work throughout the regular work week(s) in order to complete activities in a timely manner may be required to meet the dates outlined above, at no additional cost to the District.

**Work schedule during the School Year will be coordinated with the Construction Manager, Architect and District. It is understood by All Contractors that work may need to be 2nd Shift if it is determined to affect the operations of the District. This will be at the discretion of the Construction Manager.

***Abatement of Hazardous Materials Shall Occur During School Break Periods. Contractor Shall Set-Up for Abatement As Soon As Possible Before Break and Commence Abatement Activities Immediately After the Building is Vacated for the Designated Break Period. Contractors Shall Work Continous During Weekend Periods (Saturday and Sunday) and Extended Work Hours. Additionally, Contractors Shall Accomodate Clearance Testing to Occur Well in Advance to Students Coming Back to School and Enough Time Should There be a Need for an Additional Round of Cleaning and Testing.

GENERAL SCOPE OF WORK & REQUIREMENTS

All Prime Contractors (9/21/2026)

General

1) All dates, durations, etc. defined herein shall be business days.

2) Except for the NYSED building permit, each Prime Contractor's price shall include all fees and costs required to obtain and maintain, for the duration of the Work, all permits, PE licenses, connection fees, inspections, and similar approvals customarily required for the Work, whether secured by the Prime Contractor or its subcontractors. This includes any utility company applications or permits issued in the name of the Prime Contractor or the Owner, as required. All permits shall be issued in the name of the Prime Contractor when required, with originals provided to the Construction Manager prior to commencement of the Work and copies prominently displayed at a location approved by the Construction Manager.

3) Contractor shall provide videotaped recordings of all existing conditions as a submittal to the project for record. This recording shall provide a record of all-existing buildings, grounds, exterior conditions and interior conditions. The contractor shall schedule a representative of both the Owner and the Construction Manager to be present at this taping. In the absence of this record, the Prime Contractor shall be responsible for paying the costs associated with any and all repairs or replacements of existing materials and/or conditions that were damaged in an area where the Prime Contractor is working or has worked, as may be deemed necessary by the Owner or the Construction Manager.

4) This contractor agrees to take all precautionary measures necessary to prevent damage to the Owner's property and the work of other trades and contractors and to repair promptly any damage caused by this contractor's action or that of its employees, subcontractors or vendors. If damage is caused by this contractor's action or that of its employees, subcontractors or vendors, this contractor must repair the damage within 1 calendar week*. If this contractor fails to make acceptable repairs within 1 week* of notification, Schoolhouse may direct these repairs to be completed on behalf of this contractor and at this contractor's expense.
    - *In the event that the damage presents a safety, security, or environmental risk, or affects the ability of other contractors to perform their work, the repairs must be made immediately.*

5) Each Prime Contractor shall participate in the joint preparation of coordination drawings. Prior to coordination, each Prime Contractor must submit its shop drawings to the Architect for review and approval to address any required revisions.

   Any construction changes made after issuance of the coordination drawings shall be the responsibility of the Prime Contractor initiating the change. If such changes result in additional costs to another Prime Contractor, the initiating Prime Contractor shall be responsible for those costs.

6) Each Prime Contractor shall submit a labor breakdown for each category of labor within their contract.

7) Each Prime Contractor is responsible for providing the required mock-ups defined by the Contract Documents out of sequence as needed by the Architect. A schedule of mock-ups is to be submitted to the Construction Manager and Architect for review with Submittal Schedule.

8) Prime contractors shall supply all labor, materials, tools, equipment, supervision, layout, and coordination with other prime, trade contractors, Schoolhouse, the Architect, as necessary; in order to complete all of their work as required and detailed in the drawings, specifications, addenda, and all other contract documents.

9) All drawings, specifications, and addenda prepared by the Design Team are applicable to the performance of this contract.

10) Each Prime Contractor shall provide, or otherwise see that, the project manager, site managers, and/or responsible workers of each Contractor and major subcontractor are equipped with cellular phones for the purpose of onsite Communications with the Construction Manager.

11) Each Prime Contractor shall include in their base bid the cost of all rigging and equipment required for the performance and installation of their respective Work.

12) Each awarded bidder shall comply, and ensure its subcontractors and retained parties comply, with all applicable safety requirements issued by the CDC, OSHA, NYSED, NYSDOL, NYSDEC, and other governing authorities, including Executive Orders of the Governor of New York and all related federal, state, and local regulations. The contractor is responsible for the safety of its personnel and subcontractors, the means and methods of the Work, and coordination with other contractors while maintaining required protocols.

13) Submit daily field reports indicating number of workers by classification, hours worked, construction progress information, weather conditions, etc., to Schoolhouse's on-site representative on a daily basis.

14) Each Prime contractor is 100% responsible for their own daily and final clean-ups. This includes daily (or more often as needed and deemed by Schoolhouse's on-site representative) removal of waste to appropriate dumpsters. Besides general sweeping of work areas, mopping of work areas and affected corridors is required when the Owner intends to use the facilities before the next working shift. Failure to perform clean-up daily may result in back charges and fines to Prime Contractors. General Trades Contractor responsible for Dumpsters on site for all trades and work, unless noted otherwise.

15) All prime contractors shall assign a dedicated field superintendent to be on-site whenever their company, or their subcontractors, have on-going construction activities. This individual shall be responsible for enforcing safe work practices, ensuring quality control, daily clean-up, and is responsible for locking and securing all doors, windows, etc. at the end of each work shift. The General Contractor's designated field superintendent shall not be a working technician that is tasked with performing field installations, but rather shall remain focused on coordination and planning of construction activities, oversight of operations, and other supervisory tasks.

16) The Prime Contractors shall submit Requests for Information (RFIs), all project submittals/shop drawings, and other key project documentation electronically via the computer-based program implemented by the Design Team and/or Owner. Contractors shall also participate in any training sessions that are requested of them to attend, in order to more effectively use the designated computer-based program.

17) Each copy of each RFI and submittal shall have attached as the cover page the "RFI/Submittal Cover Sheet". All information requested in "Section 01 33 00 Submittal Requirements" shall be provided by the respective Contractor. RFI/Submittals will be returned without review if the cover sheet is not accurately completed.

18) Each Prime Contractor shall generate a complete "Submittal Log" within 10 days of the Notice of Award. This log is to list all required submittals specific to your trade as detailed in the Project Manual/Specs. Please include "ROJ" (Required on Job) date, to assist the judgment of the time gap between submission, Architect review, fabrication/procurement and on-site need for putting the work item into place.

19) Each Prime Contractor shall review all submissions for completeness. Each Prime Contractor is responsible for stamping all shop drawings prior to submission to the Architect. The Architect will not review any shop drawings unless first reviewed by said Contractor. Bundle similar material submissions for proper review. Use the Architects Submittal cover sheet located in the Specifications.

20) Each Prime Contract is responsible for protecting the installation of work at all times, and to not damage adjacent items and/or the work or items of others. All costs incurred to repair, replace or clean insufficiently protected materials/instillations shall be the responsibility of the installing Prime Contract.
    - *This includes a minimum of protective blankets and at least 5/8" plywood being placed over wood or other floor finishes that are susceptible to damages, before major reconstruction and/or manlifts are used on these surfaces*.

21) Temporary Service/ Facilities:

    1) Temporary power and lighting for building and site by the Electrical Contractor. Electric consumption to be paid by Owner. Temporary electrical service to be available 24hours/day, 7days/week at no additional cost to the Owner.
    2) Temporary Heat by the General Trades Contractor – including temporary enclosures at all openings to maintain heat and provide heat for all Trades for temperature sensitive work, activities and material installations and storage, this includes but not limited to cold weather protection for masonry and concrete construction activities. Refer to Temporary Facilities and Controls for additional information.
    3) Temporary sanitary facilities by General Trades Contractor.
    4) Temporary water by Plumbing Contractor.
    5) Snow plowing/shoveling all building areas exposed to weather, inclusive of the Staging Area, temporary parking areas and access to the Owners Trailer/Field Office by General Trades Contractor.
    6) Project identification and safety signs by General Trades Contractor.
    7) Each Contract is responsible for their temporary offices, storage trailers, electric hook-up and phone service.

22) Blocking for the work of each contract, including for all accessories, ADA hardware, wall mounted devices, casework, etc. shall be the work of the General Trades Contractor for all Prime Contractors work. Each prime contractor is responsible for identifying blocking sizes and locations for its own work.

23) Soil erosion control and Site Restoration around disturbed site areas shall be the responsibility of each respective Prime Contractor.

24) All Saw cutting, Concrete/Floor removals, Trenching and Backfill by General Trades Contractor, unless noted otherwise on Drawings. Sand bedding, Duct bank, Handholes and all MEP Equipment by respective Prime Contractor. Trenches and Utilities to be laid out and coordinated by respective Prime Contractor.

25) Cutting/patching, core drilling, and other openings in existing systems
- If under 12" X 12"; shall be the responsibility of each respective prime.
- If over 12"x12"; shall be the responsibility of the General Trades Contractor, each respective prime shall be responsible for layout and sizing.

26) Firestopping shall be the responsibility of each prime contractor.

27) Curbs/Dunnage
- Each respective Prime to furnish and turn over to General Trades Contractor to install/flash.

28) Equipment pads shall be the responsibility of each respective Prime Contractor.

29) Sleeves in existing walls, roofs and floors furnished and installed by the contractor requiring the sleeve. Sleeves in new walls, roofs and floors furnished by the contractor requiring the sleeve and installed by the General Contractor.

30) Furnishing of access panels for the work of each contract shall be the work of each contractor for its own work. Installation of access panels shall be the work of the General Construction Contract. General Contractor to review all construction drawings for access panels requiring installation.

31) Painting for the work of each contract shall be the work of the General Construction Contract unless noted otherwise.

32) Contractor is responsible for dewatering for the work of their contract.

33) The Schedule of Values (SOV) will be reviewed and adjusted if necessary. Once approved, the schedule of values is to be used for the AIA pay application.

The SOV will take into account and include at minimum the following items:

Schedule of Values to be broken down by NYSED Building Project Number

1) Bond/insurance based on actual invoice amount, not to exceed 3%
2) Mobilization – 1%
3) Submittals – 1%
4) Temp Facilities – 1%
5) Meeting Attendance & Meeting Documentation – 2%
6) Supervision + Daily Clean-Up – 4%
7) Final Clean based on actual invoice amount (if applicable)
8) Punch list – 1% of contract sum*
9) Close-out documents/warranties – 2% of the contract sum
10) Material and Labor Breakdowns for each line as applicable
11) Approved Alternates to match bid amounts and list SED Proj. Number

12) Allowances and Change Orders listed at bottom

*Punch list value will be dispersed only when the work has been confirmed to be completed 100%.

ALL PAYMENT APPLICATIONS SHALL INCLUDE A 5% RETAINAGE FACTOR.

Safety/Security

1) Prime contractors shall provide their own OSHA compliant access to their work through use of staging, scaffolding, personnel lifts, temporary scaffolding, shoring, supports, guys, braces, falsework, cranes and the like to complete the work.

2) Outside work areas, excavations, and stored materials shall have perimeter fencing (8'-0" chain-link) provided and maintained by the respective contractor performing the work, as directed by Schoolhouse's on-site representative. The General Trades Contract shall provide fencing at common work areas where multiple prime contractors are working and also surrounding designated material laydown area and zones that accommodate field office trailers and storage units. Other forms of fencing, such as orange snow fencing, is not acceptable.
   - *Chain-Link Fencing: Minimum 2-inch, 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; minimum 8 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch-OD line posts and 2-7/8-inch-OD corner and pull posts, with 1-5/8-inch-OD top rails. Provide privacy screening for all chain-link fencing applications*.

3) Fire Extinguishers: General Trades Contract shall provide and maintain "general use" fire extinguishers for each building construction area; comply with applicable codes for quantities required. Comply with NFPA for recommended classes for exposure; extinguishers shall be inspected and appropriately tagged prior to being brought on site. Provide stands, painted bright orange, sturdy enough to carry the extinguisher, and built as not to create a tipping hazard.

4) Prime contractors are responsible for posting any applicable signage to warn workers and others of potential hazards due to the work, in addition to the standard signs and barricades.

5) Prime contractors are responsible for developing a Site-Specific Safety Plan that is specific to this capital improvement project. Submit this Site-Specific Safety Plan within 10 days of award and no later than the start of construction activities. Prime contractors shall conduct regular toolbox talks, as required by OSHA, which are focused on pertinent aspects of the ongoing project and potential areas of safety hazards. Meeting minutes, with attendance records, for respective toolbox talks and safety related meetings, shall be maintained by each Prime Contractor.

6) In the event of an incident or injury occurring on-site, the Prime contractor and all subcontractors involved are required to furnish Schoolhouse and the owner with all relevant documentation, including but not limited to forms, reports, and any other records related to the incident.

7) Provide means for maintaining acceptable indoor air quality and adequate ventilation to eliminate fumes and/or the off gassing of material products, according to OSHA and SED requirements.

8) Means of temporary lighting and power shall be provided by the Electrical Contractor. This includes task specific lighting as required to perform their specific scope of work, and as required by OSHA.

9) All on-site workers shall wear an identification badge while on-site. Badges shall be displayed via a lanyard or other approved means of displaying proper identification. Additionally, workers shall also have proof of their OSHA 10-Hour certification on display with their badge. Copies of OSHA 10-hour card to be provided to Schoolhouse on site. Each Prime Contractor will provide an ID badge for each of their field personnel prior to coming on school property. All workmen shall display the badge on their person while on site, and at all times. Failure to wear identification badge at all times will result in the immediate removal from the jobsite.

10) Prime contractors shall coordinate with environmental regulatory agencies, as necessary to perform their scope of work. When in doubt as to specific regulatory requirements, contractors shall proceed with caution and contact pertinent agencies to ensure that they are proceeding in compliance with all environmental requirements. Contractors shall notify the Architect, Schoolhouse, and the Owner before they contact regulatory agencies.

11) All crane picks, material delivery, etc. must be coordinated so as not to lift over any occupied area of the building. If absolutely necessary, this work shall be done on off hours to ensure the safety of the building occupants. Crane location must be carefully chosen to ensure the safety of building occupants. Crane picks must also not be conducted during academic hours within 20' of a fully occupied building.

12) All vehicular traffic (personal vehicles, trucks, equipment, deliveries, etc.) are to use the designated entrances as outlined on the Logistics Drawings. Access by other routes is to be on exception basis only.

Schedule

1) All work areas must be coordinated with Schoolhouse's field representative. At no time shall this contractor independently select their schedule and locations of work.

2) Prime Contractors shall provide proposed schedules showing submittals, material procurement (including lead times), and sequence of construction activities. Within (3) weeks of NTP (Notice to Proceed) all Prime Contractors will provide a coordinated Draft master schedule. Each Prime's Project Schedule is to reflect all requirements for submittals, material and equipment procurement, material stockpiling, setting up Contractor's staging area and surveying of existing conditions. These Schedules, reflecting the critical milestone dates established by the attached 'Bid Schedule', are to be coordinated and shall be inclusive of other Prime Contractor's activity. The General Contractor shall integrate draft schedules from the other Prime Contractors into a single master schedule [MS Project] that is reviewed and finalized with Schoolhouse, the Architect, and Owner. The final master schedule shall be accepted by the Project Team and followed in the performance of construction activities. Additionally, contractors will provide schedule updates on a weekly basis, including two-week look-ahead schedules at coordination meetings.

3) All Prime Contractors shall submit a schedule of projected fabrication on long lead items (requiring more than four (4) weeks to fabricate) three weeks after NTP. Progress/Status reports on fabrication to be submitted to the Construction Manager every two weeks.

4) All Prime Contractors shall review the completed "Final" detailed construction schedule and acknowledge their acceptance of this schedule by signing a copy to be kept on record by the Construction Manager. This agreed upon schedule must incorporate all milestone dates and shall be established within five (5) weeks of Notice of Award.

5) All Contractors are to recognize that the Project Schedule is of critical important to the Owner. Prime Contractors shall work overtime, at their own expense, included in their proposal, should they fail to maintain progress in accordance with the project schedule, as determined by Schoolhouse and/or the Architect and Owner.

6) There will be no additional compensation assigned for 2nd shift and/or weekend labor that is necessary to work around the Owner's operations. Coordinate second shift and weekend work requirements in/at school buildings, or at other locations as required, with the Construction Manager as the schedules of the schools/buildings are slightly different so each school/building schedule slightly affects the permitted work times at that school/building. Work will need to be performed in and on both occupied and unoccupied spaces. Each Prime Contract working second shift shall be responsible for all requirements to allow normal functioning of that space the next day. All other work in occupied spaces shall be scheduled for off-hours, vacations and weekends. Weekend, holiday and/or overtime work shall be performed as indicated in the Construction Documents.

7) The Prime Contractor for General Trades Construction shall update the detailed Construction Schedule with the Construction Manager and issue copies to the other Prime Contractors, the Owner, Construction Manager, and Architect monthly with any changes highlighted for review. Each Prime Contractor shall provide the General Trades Contractor all necessary information to provide these updates.

8) Each Prime Contractor shall submit weekly, two-week look-ahead schedules identifying the anticipated activity, and material needs for all of the work scheduled to be formed by the Prime Contractor and their subcontractors for the identified time period.

9) The Prime Contractors understand that during the execution of the work, it is not assumed that construction can be carried out in a continuous, uninterrupted manner. Contractor must include any necessary remobilizations required to successfully complete this work and work around the Owner's operational needs.

10) Weekend and second shift work must be communicated and coordinated with Schoolhouse 48 hours in advance to commencement.

11) Contractors need to be aware that during the duration of this Project there may be work by other projects occurring simultaneously at the same building(s). Each Prime Contractor must coordinate the execution of their work for this project with the work of other Prime Contractors for this project and other potential projects.

12) Any street, roadway, and/or parking lot closures must be coordinated with Schoolhouse's on-site representative and shall be scheduled around other project activities and municipal requirements.

13) All significant material deliveries must be coordinated with Schoolhouse at least 48 hours in advance. Maintenance of traffic and pedestrian protection for deliveries and work performance is the responsibility of this contractor.

14) Storage of materials and equipment at the site shall be permitted only with prior approval received by Schoolhouse's on-site representative. Prime contractors shall only store materials that are to be used in the next 30 days to maintain the ongoing construction activities.

15) Prime Contracts shall reach final completion of their contract obligations and complete all remaining punch list and work items within one month (30 calendar days) of reaching substantial completion. Failure to reach final completion within this timeframe shall be subject to the same penalties associated with not meeting substantial completion.

16) In the event that the Contractor shall fail to complete their work according to the Milestone Schedule or within the time (or times) to which such completion may have been extended, the Contractor shall pay the owner and/or the Owner shall be entitled to deduct from any monies due to the Contractor Seven Hundred Fifty and 00/100 ($750.00) Dollars per day as liquidated damages. If the Contractor does not achieve Substantial Completion according to the Milestone Schedule, the Contractor shall pay the Owner and/or the Owner shall be entitled to deduct from any monies due to the Contractor Seven Hundred Fifty and 00/100 ($750.00) Dollars per day for each person that the Architect and/or the Construction Manager used to furnish project management or related services beyond the date Substantial Completion was to be attained.

Quality Control

1) Correct any, or all, quality control issues or concerns, which are not deemed acceptable to Schoolhouse, the Architect, and Owner, or are not deemed as a high-quality finished product.

2) Verify that air and surface temperature, moisture, and humidity conditions are suitable for installation of this work, per the requirements of the specifications and product manufacturers. If the conditions prohibit installation, notify Schoolhouse's on-site representative. Documentation of conditions shall be noted within this contractor's daily field reports.

3) Provide means of fastening to existing substrates. Any inadequate or poor surface conditions that prevent adequate attachments shall be pointed out to Schoolhouse's on-site representative and the Architect before proceeding with installation.

Testing and Inspections

1) Each Prime Contractor is responsible for notifying the Third-Party Testing agency for coordination of all inspections needed. Notifications shall be given 48 hours in advance of testing required. Coordination to include notification to Construction Manager. In the event the Contractor does not give proper notification and the work is done with no test, the Contractor will bear all costs for replacement of work if necessary and any inspection costs after work is completed.

2) The following is a list of intended (not all) controlled inspections:
   - Soil bearing, Soil bearing, Sieve analysis, sub-grade, sub-base inspection and/or compaction
   - Concrete field and plant testing & rebar placement
   - Asphalt testing
   - Masonry or stone inspection, mortar sampling, reinforcement placement inspection
   - Structural steel field welding, bolting, connections, and metal deck
   - Water and air infiltration for windows
   - Roofing, flashing, waterproofing
   - Under slab plumbing work
   - Firestopping and Fireproofing
   - Asbestos air monitoring
   - Wall Framing

Insurance/Indemnification

1) All Prime Contractors must issue a Certificate of Insurance with liability limits as defined in the Construction Documents naming Schoolhouse Construction LLC, The Architect, The Architect's Consultants and The School District as an "Additional Insured' in addition to all other parties as stipulated in the General Conditions in the Project Manual.
2) All Prime Contractors agree to indemnify and hold harmless Schoolhouse Construction LLC, The Architect, The Architect's Consultants and The School District, its agents and employees in addition to all other parties as stipulated in the General Conditions in the Project Manual.
3) All prime Contractors and Sub-contractor's/Vendors/etc. insurance/indemnity insurance shall comply with Article 11 "Insurance" as specified in General Conditions of the Contract in the Project Manual.

Highland Associates / Schoolhouse Construction Services

CONTRACTOR PRE-BID RFI FORM

(Please Type or Print Neatly)

Question cut -off (No exceptions) – December 3, 2026 12:00 PM

Date: _____

Company: _____ **Name:** _____

Phone #: _____ **E-mail:** _____

Contract(s) bidding on: _____

Drawing Referenced: _____

Spec Section Referenced: _____

Other References: _____

REQUEST:
ANSWER: **Answered By:** _____ **Date:** _____

SECTION 32 30 02 - PLAYSCAPE WORK

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. The extent of playground work is shown on the drawings.

B. The following to be performed by the Owner:
   1. Provide and Install Play Equipment (including wear mats)
   2. Provide and Install Play Area Surfacing Material

C. Contractor to provide all materials, labor, equipment and services required to accomplish all related work in accordance with the drawings and specifications.
   1. Drainage stone and fabric
   2. Drainage as shown on plans
   3. Playscape edge

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 311201 - Site Preparation

B. Section 312201 - Site Earthwork

C. Section 321201 - Asphalt Paving

D. Section 321301 - Site Concrete Work

E. Section 334001 - Storm Drainage

1.3 SUBMITTALS:

A. IPEMA CERTIFICATION: All standard pieces of playground equipment shall be certified by the International Playground Equipment Manufacturers Association (IPEMA) for conformance to the requirements of ASTM F1487.

B. CPSC COMPLIANCE: All pieces of playground equipment shall be certified by the manufacturer to be in compliance with the Handbook for Public Playground Safety.

C. CPSIA of 2008 COMPLIANCE: All playground equipment shall be certified by the manufacturer to be in compliance with all applicable requirements of the Consumer Product Safety Improvement Act of 2008. Lead test data that is shipped with the equipment shall be turned over to the Owner immediately after the equipment arrives.

D. MAINTENANCE AND USE MANUAL: Submit information describing the manufacturer's maintenance manual.

1.4 JOB CONDITIONS

A. Job conditions in Section 312201 apply.

B. Construction Review: Notify the Architect when the playscape is staked out, posts are installed, and upon completion of playscape.

1.5 QUALITY ASSURANCE

A. Installer: At least twenty (20) completed play structures with similar components and complexity. Upon request, provide list of completed structures to the Owner's Representative with playground owner's name, address, telephone number and representative's name.

B. Installer must be a Manufacturer's Factory Certified Installer:
1. Proof of certification by manufacturer shall be produced.
2. Certified Playground Safety Inspector with crew at all times.
3. Proof of NPSI Certification required.

1.6 ADA COMPLIANCE CHART

A. The play area or areas shall meet or exceed the accessibility requirements set for by the ADA as follows:

Total Elevated Play Components:			8
Total Elevated Play Components Accessible by Transfer or Ramp Shown:	8	Required	4
Total Elevated Play Components Accessible by Ramp Shown:	0	Required	0
Total Accessible Ground Level Play Components Shown:	21	Required	3
Types of Ground Level Play Components Shown:	11	Required	3

PART 2 PRODUCTS

2.1 OWNER PROVIDED AND INSTALLED EQUIPMENT AND SURFACING

A. Playground Equipment: Details and specifications representing the minimum acceptable standard of quality have been based on playground equipment by Landscape Structures, Inc. as supplied by Parkitects or Architect approved equal, and will be furnished by the Owner when requested by the Contractor a minimum of eight (8) weeks prior to Contractor schedule.

B. Play Area Surfacing: Details and specifications representing the minimum acceptable standard of quality have been based on Playground Grass Ultra surfacing by ForeverLawn of Ohio, Inc.

844-614-8873, or Architect approved equal, and will be furnished by the Owner when requested by the Installation Contractor a minimum of eight (8) weeks prior to Contractor schedule.

2.2 PLAY AREA - SPECIFIC COMPONENTS AND ATTACHED PLAY EVENTS

Shall be furnished and installed by the owner.

2.3 PLAY AREA - SPECIFIC INDEPENDENT PLAY ITEMS

Shall be furnished and installed by the owner.

2.4 SITE FURNISHINGS INSIDE PLAYSCAPE EDGING

Shall be furnished and installed at playscape only by the Owner.

2.5 SUBSURFACE DRAINAGE FABRIC: 140N non-woven filter fabric as manufactured by Mirafi, Inc., Mirafi, Inc., Charlotte, NC (704) 523-7477 or Architect approved equal.

2.6 PLAY SURFACE DRAINAGE STONE: The playscape surface drainage stone base material shall be crushed stone conforming to ASTM C 33 No. 57, as presented in Table 1.

TABLE 1
GRANULAR BASE
GRADING REQUIREMENTS

ASTM C 33 No 57	
Sieve Size	**Percent Passing**
1 ½ in (37.5 mm)	100
1 in (25 mm)	95 to 100
½ in (12.5 mm)	25 to 60
No. 4 (4.75 mm)	0 to 10
No. 8 (2.36 mm)	0 to 5

PART 3 EXECUTION

3.1 EXAMINATION OF SITE

A. Prior to beginning installation, examine site and existing conditions to verify that site clearing and earthwork operations, including rough and finish grading, have been completed in accordance with play structure manufacturer's requirements for proper installation of the play structure.

B. Identify to Prime Contractor or Owner any conditions that would prevent installation of play structure in accordance with manufacturer's instructions. Do not begin installation of play structure until unsatisfactory conditions have been corrected. Beginning of installation indicates acceptance of existing conditions.

3.2 CONTRACT INSTALLATION

A. Equipment shall be installed by owner in conformance to the manufacturer's specifications and architectural drawings and specifications contained within this document.

3.3 PLAY STRUCTURES

A. Contractor shall coordinate location of drainage with Owner's playscape contractor to avoid conflicts. Notify architect of any discrepancies.

3.4 SUBSURFACE DRAINAGE FABRIC

A. Fasten in continuous strips on top of all playground subgrades, after equipment is installed. Overlap joints by 18" minimum and staple per manufacturer's instructions. Install second layer after drainage stone is placed.

3.5 PLAYGROUND TURF INSTALLATION

A. Contractor shall coordinate with Owner's surfacing installer the final elevation of drainage stone base to accommodate synthetic turf and resilient pad system. Contractor shall also coordinate depth of turf nailer with playscape edge. Notify architect or any discrepancies immediately.

3.6 ADJUSTING, CLEANING AND PROTECTION

A. Adjust and Clean all surfaces after completion of structure installation, and provide means of preventing unauthorized access to structure until surfacing is installed and/or concrete has cured.

3.7 CLEAN UP

During the contract and at intervals as directed by the Architect and as playscape installation is completed, clear the site of extraneous packaging and debris. Leave the site in a clean, safe, well draining, neat condition.

END OF SECTION 32 30 02

AFTON CENTRAL SCHOOL DISTRICT
2024 CAPITAL PROJECT – PHASE 2

CENTRAL SCHOOL SED#: 08-01-01-04-0-001-020
BUS GARAGE SED#: 08-01-01-04-5-015-003

NOVEMBER 24, 2026
HA PN: 2025-005P

TABLE OF CONTENTS

Division	Section Title	Pages
DIVISION 26 - ELECTRICAL		
26 05 00	COMMON WORK RESULTS - ELECTRICAL	16
26 05 01	SUMMARY OF WORK	2
26 05 02	ELECTRICAL ABBREVIATIONS AND DEFINITIONS	2
26 05 03	CODES, FEES	1
26 05 04	PROJECT RECORD DOCUMENTS	1
26 05 05	REVIEW AND ACCEPTANCES	4
26 05 06	GUARANTEE	1
26 05 10	TESTING, INSPECTION AND CERTIFICATION	4
26 05 14	EQUIPMENT CONNECTIONS AND COORDINATION	4
26 05 21	WIRES AND CABLES (0-1000V)	9
26 05 26	GROUNDING AND BONDING	9
26 05 29	HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS	10
26 05 33	RACEWAYS AND BOXES	15
26 05 53	IDENTIFICATION FOR ELECTRICAL SYSTEMS	4
26 07 00	ELECTRICAL DEMOLITION	3
26 27 26	WIRING DEVICES	6
26 28 23	DISCONNECT SWITCHES - FUSED AND NON-FUSED	4
26 51 00	INTERIOR LIGHTING	7

END OF TABLE OF CONTENTS

SECTION 26 05 00 - COMMON WORK RESULTS - ELECTRICAL

PART 1 - GENERAL

1.1 EXECUTION OF THE WORK

A. These specifications call out certain duties of the Electrical Contractor and his Subcontractors. They are not intended as a material list of items required by the Contract. Any reference in these specifications and on the accompanying drawings to the Contractor, Electrical Contractor, Electrical Subcontractor or abbreviation "E.C.", shall be construed to mean the Contractor responsible for all electrical construction (Division 26) work for this project.

B. This division of the specifications covers the electrical systems of the project. It includes work performed by the electrical trades as well as trades not normally considered as electrical trades.

C. Provide all items and work indicated on the Drawings and all items and work called for in this division of the specifications in accordance with the conditions of Contract (Division 01 General Requirements Documents). This includes all incidentals, equipment, appliances services, hoisting, scaffolding, supports, tools supervision, labor consumable items, fees licenses, etc., necessary to provide complete systems. Perform start-up and checkout on each item and system to provide fully operable systems.

D. Comply with all provisions of the Contract Documents including the General Conditions, and Division 01 General Requirements of the specifications.

E. Certain terms such as "shall, provide, install, complete, start-up" are not used in some parts of these specifications. This does not indicate that the items shall be less than completely installed or that systems shall be less than complete.

F. Examine and compare the Electrical Drawings with these specifications, and report any discrepancies between them to the Architect/Engineer and obtain from him written instructions for changes necessary in the work. At time of bid the most stringent requirements must be included in said bid.

G. Examine and compare the Electrical Drawings and Specifications with the Drawings and Specifications of other trades, and report any discrepancies between them to the Architect/Engineer and obtain from him written instructions for changes necessary in the work. At time of bid, the most stringent requirements must be included in said bid.

H. Install and coordinate the electrical work in cooperation with other trades installing interrelated work. Before installation, make proper provisions to avoid interferences in a manner approved by the Architect/Engineer. All changes required in the work of the Contractor, caused by his neglect to do so, shall be made by him at his own expense.

I. It is the intent of the Drawings and Specifications to provide a complete workable system ready for the Owner’s operation. Any item not specifically shown on the Drawings or called for in the

Specifications, but normally required to conform with the intent, are to be considered a part of the Contract.

J. These specifications are basically equipment, installation, and performance Specifications. Some installation details are indicated on the Drawings. Where these differ from the Specifications, apply the more stringent at time of bid. Upon award of bid, contact Architect/Engineer for definite instructions.

K. All materials furnished by the Contractor shall be new and unused (temporary lighting and power products are excluded) and free from defects. All materials used shall bear the Underwriter's Laboratory, Inc. label provided a standard has been established for the material in question.

L. All products and materials shall be new, clean, free of defects and free of damage and corrosion.

M. The exclusion from, or limitation in, the symbolism used on the Drawings, or the language used in the Specifications for electrical work shall not be interpreted as a reason for omitting the accessories necessary to complete any required system or item of equipment.

N. The use of words in the singular shall not be considered as limiting where other indications denote that more than one item is referred to.

O. Except for conduit, conduit fittings, outlet boxes, wire and cable, all items of equipment or material shall be the product of one manufacturer throughout. Multiple manufacturers will not be permitted.

P. Receive, inspect, store, install and wire Owner-furnished equipment where Owner furnished equipment is supplied.

Q. Painting

1. All manufactured electrical equipment such as switchgear, control equipment, lighting fixtures, etc., shall have factory-applied finish as specified in the appropriate article in the Electrical Parts of the Specification.

2. All other uncoated steel items such as boxes supports, hanger, rods, etc., shall be galvanized or have a shop coat of paint applied under this part of the Specification. Normally shop coats shall be an approved primer containing at least 50 percent rust inhibitive pigment, applied before assembling the different parts.

3. Including painting and retouching of:

   a. Pre-finished enclosures of switchgear, panelboards, switches, wireways, where the finish has been slightly damaged in transit before assembling the different parts.

   b. Any woodwork furnished in the electrical work.

   c. Fixture hangers, except those received from manufacturers that are prefinished.

   d. Miscellaneous iron brackets and supports.

e. Steel conduits buried in earth.

4. Woodwork installed under this part of the specification shall be finished with filler sealer plus two (2) coats of PPG "Water Spar" gloss varnish.

1.2 COORDINATION OF THE WORK

A. Certain materials will be provided by other trades. Examine the Contract Documents to ascertain these requirements.

B. Carefully check space requirements with other trades and the physical confines of the area to ensure that all material can be installed in the spaces allotted thereto including finished suspended ceilings and the spaces within the existing building. Make modifications thereto as required and approved.

C. No items foreign to the electrical system shall be run in the dedicated space of the electrical equipment. Dedicated space shall be defined as the width and depth of the equipment from the floor to the bottom of the structural ceiling. Foreign systems include but are not limited to ductwork, piping, sprinklers, drip trays, etc. Contractor shall be responsible to coordinate the locations of the dedicated spaces with all trades as required.

D. Transmit to other trades all information required for work to be provided under their respective Sections in ample time for installation.

E. Wherever work interconnects with work of other trades, coordinate with other trades to ensure that all trades have the information necessary so that they may properly install all the necessary connections and equipment. Identify all items of work that require access so that the ceiling trade will know where to install access doors and panels.

F. Due to the type of installation, a fixed sequence of operation is required to properly install the complete systems. Coordinate, project and schedule work with other trades in accordance with the construction sequence.

G. The locations of lighting fixtures, outlets, panels and other equipment indicated on the Drawings are approximately correct, but they are understood to be subject to such revision as may be found necessary or desirable at the time the work is installed in consequence of increase or reduction of the number of outlets, or in order to meet field conditions or to coordinate with modular requirements of ceilings, or to simplify the work, or for other legitimate causes.

H. Exercise particular caution with reference to the location of panels, outlets, switches, etc., and have precise and definite locations approved by the Architect/Engineer before proceeding with the installation.

I. The Drawings show only the general run of raceways and approximate location of outlets. Any significant changes in location of outlets, cabinets, etc., necessary in order to meet field conditions shall be brought to the immediate attention of the Architect/Engineer and receive his approval before such alterations are made. All such modifications shall be made without additional cost to the Owner.

J. Obtain from the Architect/Engineer in the field, the location of such outlets or equipment not definitively located on the Drawings.

K. Circuit "tags" in the form of arrows are used where shown to indicate the home runs of raceways to electrical distribution points. These tags show the circuits in each home run and the panel designation. Show the actual circuits numbers on the finished record tracing and on panel directory card. Where circuiting is not indicated, Electrical Contractor must provide required circuiting in accordance with the loading indicated on the drawings and/or as directed.

L. The Drawings generally do not indicate the exact number wires in each conduit for the branch circuit wiring of fixtures, and outlets, or the actual circuiting. Provide the correct wire size and quantity as required by the indicated circuiting and/or circuit numbers indicated and control, wiring diagrams, if any, specified voltage drop or maximum distance limitations, and the applicable requirements of the NEC.

M. Adjust location of conduits, panels, equipment, pull boxes, fixtures, etc. to accommodate the work to prevent interferences, both anticipated and encountered. Determine the exact route and location of each raceway prior to fabrication.

1. Right-of-Way:

a. Lines which pitch have the right-of-way over those which do not pitch. For example: steam, condensate, and plumbing drains normally have right-of way. Lines whose elevations cannot be changed to have right-of-way over lines whose elevations can be changed.

b. Make offsets, transitions and changes in direction in raceways as required to maintain proper headroom in pitch of sloping lines whether or not indicated on the Drawings.

N. Wherever the work is of sufficient complexity, prepare additional Detail Drawings to scale similar to that of the bidding Drawings, prepared on tracing medium of the same size as Contract Drawings. With these layouts, coordinate the work with the work of other trades. Such detailed work shall be clearly identified on the Drawings as to the area to which it applies. Submit for review Drawings clearly showing the work and its relation to the work of other trades before commencing shop fabrication or erection in the field.

O. Contractor shall furnish services of an experienced Superintendent, who shall be in constant charge of all work, and who shall coordinate his work with the work of other trades. No work shall be installed before coordinating with other trades.

P. Coordinate with contractors for work under other Divisions of this specification for all work necessary to accomplish this contractor’s work.

Q. Where electrical connections are required, to equipment provided by the Owner or by other trades, this Contractor shall verify the exact requirements for these connections prior to ordering any materials or laying out any work. Where there is a discrepancy between the equipment being furnished and that shown on the Contract Drawings, the Contractor shall notify the Architect/Engineer for direction. Failure to comply with this coordination shall not constitute a

reason for extra monies for equipment ordered or installed. Restocking charges will not be paid.

1.3 EXAMINATION OF SITE

A. Prior to the submitting of bids, the Contractor shall visit the site of the job and shall familiarize himself with all conditions affecting the proposed installation and shall make provisions as to the cost thereof. Failure to comply with the intent of this paragraph will in no way relieve the contractor of performing all necessary work shown on the Drawings.

1.4 PROGRESS OF WORK

A. The Contractor shall order the progress of his work so as to conform to the progress of the work of other trades and shall complete the entire installation as soon as the conditions of the building will permit. Any cost resulting from the defective or ill-timed work performed under this section shall be borne by the Contractor.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Ship and store all products and materials in a manner which will protect them from damage, weather and entry of debris. If items are damaged, do not install, but take immediate steps to obtain replacement or repair. Any such repairs shall be subject to review and acceptance of the Architect/Engineer.

B. Delivery of Materials: Deliver materials in manufacturer's unopened container fully identified with manufacturer’s name, trade name, type, class, grade, size and color.

C. Storage of Materials, Equipment and Fixtures: Store materials suitably sheltered from the elements, but readily accessibly for inspection by the Architect/Engineer until installed. Store all items, susceptible to moisture damage, in dry, heated spaces.

1.6 HOUSEKEEPING PADS AND ANCHOR BOLTS

A. Housekeeping pads for all floor mounted equipment shall be furnished by the General Contractor. Equipment pads shall conform to the shape of the piece of equipment it serves with a minimum 4" clear around the equipment and supports. Pads shall be a minimum of 4" high and made of a minimum 28 day, 2500 psi concrete reinforced with 6" x 6" 6/6 gauge welded wire mesh. Tops and sides of pad shall be troweled to smooth finishes, equal to those of the floors, with all internal corners bullnosed to 3/4" radius.

B. Furnish and install galvanized anchor bolts for all equipment placed on concrete equipment pads or on concrete slabs. Bolts shall be the size and number recommended by the Manufacturer of the equipment and shall be located by means of suitable templates.

C. The Electrical Contractor shall furnish information on pad sizes to the General Contractor in a timely manner for him to proceed with his work. Failure to do so shall constitute a reason for the Electrical Contractor to provide such pads at his own expense.

1.7 EQUIPMENT ACCESSORIES

A. Provide supports, hangers and auxiliary structural members required for support of the work according to Section 26 05 29 "Hangers and Supports for Electrical Systems."

B. Furnish and set all sleeves for passage of raceways through structural, masonry and concrete walls or floors and elsewhere as will be required for the proper protection of each raceway passing through building surfaces.

C. Wall mounted equipment may be directly secured to wall by means of steel bolts. Maintain at least 1" air space between equipment and supporting wall. Groups or arrays of equipment may be mounted on adequately sized steel angles, channels, or bars. Prefabricated steel channels providing a high degree of mounting flexibility, such as those manufactured by Kindorf, Glob-Strutt and Unistrut, may be used for mounting arrays of equipment.

1.8 EXCAVATION, TRENCHING AND BACKFILLING

A. Provide excavation for the Work. Excavate all material encountered, to the depths indicated on the drawings or required. Remove from the site, excavated materials not required or suitable for backfill as determined by the Soils Engineer. Provide grading, as may be necessary, to prevent surface water from flowing into trenches or other excavations. Remove any water accumulating therein. Provide sheeting and shoring as may be necessary for the protection of the Work and for the safety of personnel.

B. Provide trenches of widths necessary for the proper execution of the Work. Grade bottom of the trenches accurately to provide uniform bearing and support the Work on undisturbed soil at every point along its entire length. Except where rock is encountered, do no excavate below the depths indicated. Where rock excavations are required, excavate rock to a minimum overdepth of four (4") inches below the trench depths indicated on the Drawings or required. Backfill overdepths in the rock excavation and unauthorized overdepths with loose granular, moist earth, thoroughly machine tamped, to a compaction level of at least 92 maximum density as per ASTM D-1557 Modified Proctor Method. Whenever unstable soil that is incapable of properly supporting the Work, as determined by Soils Engineer, is encountered in the bottom of the trench, remove soil to a depth required and backfill the trench to the proper grade with coarse sand, fine gravel, or other suitable material acceptable to the Soils Engineer.

C. Excavate trenches for utilities to a depth that will provide 24-inch minimum depths of cover from existing grade or from indicated finished grade, whichever is lower, unless otherwise specifically shown.

D. Trenches should not be placed within ten (10) feet of foundation or soil surfaces which must resist horizontal forces.

E. Do not backfill trenches until all required tests have been performed and the installation observed by the Soils Engineer. Comply with the requirements of other sections of these specifications. Backfill should consist of non-expansive soil with limited porosity. Deposit in eight (8") inch layers and thoroughly and carefully compact to 92% maximum density as per ASTM D-1557 Modified Proctor Method. Uniformly grade the finished surface.

F. The Contractor shall have and pay for the services of a qualified Soils Engineer approved by the Architect. Soils Engineer to submit test reports to the Architect.

1.9 PROTECTING TRENCHES

A. Provide suitable barriers and warning tapes around all trenches to prevent accidental stepping or driving into them. Where left open overnight, provide warning lights in addition to tape barriers.

B. Remove water from trenches on a daily basis, weather permitting.

1.10 CUTTING, PATCHING

A. The work shall be carefully laid out in advance. Where cutting, channeling, chasing or drilling of floors, walls, partitions, ceilings or other surfaces is necessary for the proper installation, support or anchorage of raceway, outlets or other equipment, the work shall be carefully done. Any damage to the building, piping, equipment or defaced finish plaster, woodwork, metalwork, etc. shall be repaired by skilled mechanics or the trades involved at no additional cost to the Owner.

B. The Contractor shall do no cutting, channeling, chasing or drilling of unfinished masonry, tile, etc., unless he first obtains permission from the Architect/Engineer. If permission is granted, the Contractor shall perform this work in a manner approved by the Architect/Engineer

C. Where conduits, mounting channels, outlet, junction, or pull boxes are mounted on a painted surface, or a surface to be painted, they shall be painted to match the surface. Whenever support channels are cut, the bare metal shall be cold galvanized.

D. Slots, chases, openings and recesses through floors, walls, ceilings, and roofs will be provided by the various trades in their respective materials. The trade requiring them to properly locate such openings and be responsible for any cutting and patching caused by the neglect to do so.

E. Structural steel fabricator and installer shall be responsible for the coordination of all framed openings in roof with approved equipment manufacturers. (Openings such as, but not limited to mechanical units, exhaust fans, curb mounted equipment, roof drains, skylights, stair openings, roof hatches, smoke hatches, duct thru roof penetrations, expansion joints, etc.)

Exact sizes and exact locations of all openings are to be verified with the approved shop drawings issued for the installation. The exact sizes shall be coordinated prior to any fabrication and installation by any/all trades. (Sizes and locations indicated on contract drawings are diagrammatic and for information only.)

Any fabrication and/or installation which has not been properly coordinated with approved equipment manufacturer and must be repaired, relocated, altered, replaced, re-installed or modified in any manner will be done to the satisfaction of the Owner with no additional cost to the Owner or design professional.

1.11 FIRESTOPPING

A. Apply firestopping to cable and raceway penetrations of fire-rated floor and wall assemblies to achieve fire resistance of the assembly. Firestopping materials and installation requirements are specified in Division 7 Section "Firestopping".

1.12 NORMAL VOLTAGES (Unless Otherwise Noted)

A. Primary Distribution – above 480 volts or 208 volts.

B. Secondary Distribution – 277/480 Volt, 3 phase, 4 wire or 120/208 volt, 3 phase 4 wire.

1.13 MOUNTING HEIGHTS

A. Unless otherwise noted or required because of special conditions, locate outlets as follows:

1. Heights listed are from finished floor to center of device. Verify exact locations with the Architect/Engineer before installation.

a. Convenience and Signal Outlets, Telephone and Data: 18 inches, unless otherwise noted.

b. Lighting Switches: 3 feet, 6 inches (42 inches).

c. Disconnect Switches and Motor Controller: Five (5) feet.

d. Exit Lights: Two (2) inches above top of door to bottom.

e. Audio/Visual Fire Alarm Devices: Eighty (80) inches to bottom.

f. Fire Alarm Pull Stations: Forty-Two (42) inches.

1.14 DEMOLITION AND CONTINUANCE OF EXISTING SERVICES – REFER TO SECTION 26 07 00

A. All existing electrical services not specifically indicated to be removed or altered shall remain as they presently exist.

B. Should any existing services, etc., interfere with new construction, the Contractor shall (after obtaining written approval from the Architect/Engineer) alter or reroute such existing equipment to facilitate new construction.

C. Under no circumstances shall existing services, etc., be terminated or altered unless deemed necessary by the Architect/Engineer or specified herein; also, prior to altering any existing situation, the Contractor shall notify the Owner in writing giving two (2) weeks advance notice of planned alteration.

D. It shall be solely the Contractor's responsibility to guarantee continuity of present facilities (with respect to damage or alteration due to new construction) and any unauthorized alteration to existing equipment shall be corrected by the Contractor to the Architect/Engineer's satisfaction at the Contractor's expense.

1.15 CLEANING UP

A. Contractor shall take care to avoid accumulation of debris, boxes, crates, etc., resulting from the installation of his work. Contractor shall remove from the premises each day all debris, boxes, etc., and keep the premises clean, subject to the Architect/Engineer’s instructions, which shall be promptly carried out.

B. Contractor shall clean all fixtures and equipment at the completion of the project.

C. All switchboards, panelboards, wireways, trench ducts, cabinets, enclosures, etc. shall be thoroughly vacuumed clean prior to energizing equipment and at the completion of the project. Equipment shall be opened for observation by the Architect/Engineer as required.

1.16 WATERPROOFING

A. Avoid, if possible, the penetration of any waterproof membranes such as roofs, machine room floors, basement walls, and the like. If such penetration is necessary, perform it prior to the waterproofing and furnish all sleeves or pitch-pockets required. Advise the Architect/Engineer and obtain written permission before penetrating any waterproof membrane, even where such penetration is shown on the Drawings.

B. If Contractor penetrates any walls or surfaces after they have been waterproofed, he shall restore the waterproof integrity of that surface as directed by the Architect/Engineer at his own expense, using workmen skilled in that trade.

1.17 PROHIBITED LABELS AND IDENTIFICATIONS

A. Prohibited Markings: In all public areas, tenant areas and similar locations within the project, the inclusion or installation of any item, element or assembly which bears on any exposed surface any name, trademark, or other insignia which is intended to identify the manufacturer, the vendor, or other source(s) from which such object has been obtained, is prohibited. Also prohibited is the inclusion or installation of any article which bears visible evidence that an insignia, name, label, or other device had been removed.

B. Exception: Required Underwriter's Laboratory labels shall not be removed nor shall identification specifically required under the various technical sections of the specifications be removed.

1.18 COORDINATION WITH UTILITY COMPANIES

A. The Electrical Contractor shall be responsible for contacting and meeting with the respective utility company to obtain electric service. He shall make all arrangements for this service and pay all costs associated with the installation including utility company charges.

B. The Electrical Contractor shall provide all conduit, wiring, excavation and backfill necessary to bring electric service into the building.

C. Do not order any materials associated with this service without prior approval from the respective utility. With respect to this, special attention is called to fuses and circuit breakers which must be coordinated with the Power Company.

1.20 CONNECTION TO EXISTING UTILITIES AND SYSTEMS

A. If connecting to an existing system, the Electrical Contractor shall be responsible to verify the integrity of the system being connected to. All applicable testing and acceptance will apply.

PART 2 - PRODUCTS

2.1 MATERIALS

A. If products and materials are specified or indicated on the Drawings for a specific item or system, use those products or materials. If products and materials are not listed in either of the above, use first class products and materials, subject to approval of Shop Drawings where Shop Drawings are required or as approved in writing where Shop Drawings are not required.

B. All equipment capacities, etc. are listed for job site operating conditions. All equipment sensitive to altitudes or ambient temperatures shall be derated and method of derating shown on Shop Drawings. Where operating conditions shown differ from the laboratory test conditions, the equipment shall be derated and the method of derating shown on Shop Drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Follow manufacturer's instructions for installing, connecting, and adjusting all equipment. Provide one copy of such instructions to the Architect/Engineer before installing any equipment. Provide a copy of such instructions at the equipment during any work on the equipment. Provide all special supports, connections, wiring, accessories, etc.

B. Use mechanics skilled in their trade for all work.

C. Keep all items protected before and after installation. Clean up all debris.

D. Perform all tests required by local authorities in addition to tests specified herein, such as life safety systems.

E. Applicable equipment and materials to be listed by Underwriters' Laboratories and Manufactured in accordance with ASME, NEMA, ANSI or IEEE standards, and as approved by local authorities having jurisdiction as mentioned in Division 1.

F. Before commencing Work, examine all adjoining, underlying. Work on which this Work is in any way dependent for perfect workmanship and report any condition which prevents performance of first class work. Become thoroughly familiar with actual existing conditions to which connections must be made or which must be changed or altered.

3.2 PREMIUM TIME WORK

A. The following Work shall be performed at night or weekend other than holiday weekends as directed and coordinated with the Owner.

1. All tie-in, cut-over and modifications to the existing electrical system and other existing system requiring tie-ins or modifications shall be arranged and scheduled with the Owner to be done at a time as to maintain continuity of the service and not interfere with normal building operations.

3.3 PROJECT MANAGEMENT AND COORDINATION

A. Coordination: Coordinate construction operations included in different Sections of the Specification to ensure efficient and orderly installation of each part of the work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the work depends on installation of other components, before or after its own installation.

2. Coordinate installation of different components with other contractors to ensure maximum accessibility for required maintenance, service, and repair.

3. Make adequate provisions to accommodate items scheduled for later installation.

4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their work is required.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's Construction Schedule
2. Preparation of the Schedule of Values
3. Installation and removal of temporary facilities and controls
4. Delivery and processing of submittals
5. Progress meetings
6. Pre-installation conferences
7. Project closeout activities
8. Startup and adjustment of systems
9. Project closeout activities

D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into the work. Refer to other Sections for disposition of salvaged materials that are designated as Owner's property.

3.4 SUBMITTALS

A. Coordination Drawings: Prepare Coordination Drawings if limited space availability necessitates maximum utilization of space for efficient installation of different components or if coordination is required for installation of products and materials fabricated by separate entities.

1. Content: Project-specific information, drawn accurately to scale. Do not base Coordination Drawings on reproductions of the Contract Documents or standard printed data. Include the following information, as applicable:

a. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.

b. Indicate required installation sequence.

c. Indicate dimensions shown on the Contract Drawings and make specific note of dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect for resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

2. Number of Copies: Submit three opaque copies of each submittal. Architect, through Construction Manager, will return one copy.

    a. Submit five copies where Coordination Drawings are required for operation and maintenance manuals. Architect and Construction Manager will retain two copies; remainder will be returned. Markup and retain one returned copy as a Project Record Drawing.

3. Refer to individual Sections for Coordination Drawing requirements for work in those Sections.

B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project Site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home and office telephone numbers. Provide names, addresses, and telephone numbers of individuals assigned as standbys in the absence of individuals assigned to Project.

1. Post copies of list in Project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

3.5 ADMINISTRATIVE AND SUPERVISORY PERSONNEL

A. General: In addition to Project Superintendent, provide other administrative and supervisory personnel as required for proper performance of the work.

3.6 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project Site, unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times.

2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.

3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within three days of the meeting.

B. Preconstruction Conference: Schedule a preconstruction conference before starting construction, at a time convenient to Owner, Construction Manager, and Architect, but no later than 15 days after execution of the Agreement. Hold the conference at Project site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

1. Attendees: Authorized representatives of Owner, Construction Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and

other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the work.

2. Agenda: Discuss items of significance that could affect progress, including the following:

   a. Tentative construction schedule
   b. Phasing
   c. Critical work sequencing and long-lead items
   d. Procedures for processing field decisions and Change Orders
   e. Procedures for requests for interpretations (RFIs)
   f. Procedures for testing and inspecting
   g. Procedures for processing Applications for Payment
   h. Submittal procedures
   i. Preparation of Record Documents
   j. Use of the premises and existing building
   k. Work restrictions
   l. Owner's occupancy requirements
   m. Responsibility for temporary facilities and controls
   n. Construction waste management and recycling
   o. Parking availability
   p. Office, work, and storage areas
   q. Equipment deliveries and priorities
   r. First aid
   s. Security
   t. Progress cleaning
   u. Working hours

3. Minutes: Record and distribute meeting minutes.

C. Pre-installation Conferences: Conduct a pre-installation conference at Project Site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect and Construction Manager of scheduled meeting dates.

2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

   a. The Contract Documents
   b. Deliveries
   c. Review of mockups
   d. Possible conflicts
   e. Time schedules
   f. Manufacturer's written recommendations
   g. Acceptability of substrates
   h. Temporary facilities and controls

i. Coordination with other work
j. Protection of construction and personnel

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.

4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.

5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the work and reconvene the conference at earliest feasible date.

D. Progress Meetings: Conduct progress meetings at biweekly intervals. Coordinate dates of meetings with preparation of payment requests.

1. Attendees: In addition to representatives of Owner, Construction Manager, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to the work.

2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's Construction Schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

1) Review schedule for next period.

b. Review present and future needs of each entity present, including the following:

1) Interface requirements
2) Status of submittals
3) Off-site fabrication
4) Site utilization
5) Hazards and risks
6) Progress cleaning
7) Status of correction of deficient items
8) Requests for interpretations (RFIs)
9) Status of proposal requests
10) Pending changes
11) Status of Change Orders
12) Pending claims and disputes
13) Documentation of information for payment requests

3. Minutes: Record the meeting minutes.

4. Reporting: Distribute minutes of the meeting to each party present and to parties who should have been present.

    a. Schedule Updating: Revise Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

END OF SECTION 26 05 00

SECTION 26 05 01 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY

A. Provide the Work included in accordance with the Contract Documents.

B. Provide all labor, materials, equipment, tools, appliances, auxiliaries, services, hoisting, scaffolding, support, supervision, and Project Record Documents, and perform all operations for the furnishing and installing of the complete electrical system, including but not limited to the work described hereinafter. The work shall meet or exceed the latest codes, regulations and requirements required by the local Building Department (as mentioned in Division 01).

C. The electrical work is shown schematically on the Drawings to indicate the general system arrangement and configuration. The work of this Division shall include coordination with the work of other Divisions of the Specifications and the Contract Documents so as to provide a complete and operational system capable of being readily operated and maintained, including approved re-arrangement of the systems and equipment and re-routing of distribution services to enable the complete system to fit within the confines of the allotted electrical spaces, all to the satisfaction of the Architect/Engineer or as directed by the Architect/Engineer.

D. The work shall include but not limited to the following:

1. Panelboard rework
2. Feeder and branch circuits
3. Wiring devices
4. Lighting fixtures
5. Lighting controls
6. Equipment connections

1.2 SETTING OUT OF WORK

A. Layouts shown for mechanical equipment and elevator machine rooms are for estimating purposes only. Coordinate installation of conduit, outlets, luminaries, and equipment with final room equipment layout as supplied by equipment supplier.

B. Where switches, receptacles, fire alarm pull stations, are in the same general location, outlets shall be aligned vertically unless otherwise called for by the Architect. Comply with ADA mounting heights.

C. All equipment capacities, etc. are listed for job site operating conditions. All equipment sensitive to altitudes or ambient temperatures shall be derated and method of derating shown on the Shop Drawings.

D. Use mechanics skilled in their trade for all work.

E. Keep all items protected before and after installation. Clean up all debris.

F. Perform all tests required by local authorities in addition to tests specified herein, such as life safety systems.

G. Applicable equipment and materials shall be listed by Underwriters' Laboratories and manufactured in accordance with ASME, NEMA, ANSI or IEEE standards and as approved by local authorities having jurisdiction.

H. Before commencing work, examine all adjoining, underlying, etc., work on which this work is in any way dependent for perfect workmanship and report any condition which prevents performance of first class work. Become thoroughly familiar with actual existing conditions to which connections must be made or which must be changed or altered.

1.3 MECHANICAL EQUIPMENT WIRING

A. Provide all labor and materials required to complete electrical (power) wiring for plumbing, heating and ventilating, elevators, and miscellaneous equipment, as called for in these specifications and/or shown on the Drawings.

B. Provide all single phase motor protection switches and combination starters and disconnects as required for mechanical equipment unless otherwise specifically noted in these specifications or on the drawings. Remote starters will be provided by the trade providing the motor.

C. Confirm final connections, loads, and locations of motors prior to ordering of equipment and installation.

END OF SECTION 26 05 01

SECTION 26 05 02 - ELECTRICAL ABBREVIATIONS AND DEFINITIONS

PART 1 - GENERAL

1.1 REFERENCES

A. Utilize the following abbreviations and definitions for discernment within the Drawings and Specifications.

1. Abbreviations

a.	NEC	National Electrical Code
b.	OSHA	Occupational Safety and Health Act
c.	ANSI	American National Standards Institute
d.	NFPA	National Fire Protection Association
e.	ASA	American Standards Association
f.	IEEE	Institute of Electrical and Electronics Engineers
g.	NEMA	National Electrical Manufacturers Association
h.	UL	Underwriters' Laboratories, Inc.
i.	IES	Illuminating Engineering Society
j.	IPCEA	International Power Cable Engineers Association
k.	ASTM	American Society of Testing Materials
l.	ETL	Electrical Testing Laboratories, Inc.
m.	EIA	Electronic Industries Association
n.	BIL	Basic Impulse Level
o.	LED	Light Emitting Diode
p.	O.E.M.	Original Equipment Manufacturer
q.	IBC	International Building Code

1.2 DEFINITIONS

A. "PROVIDE" means to supply, purchase, transport, place, erect, connect, test, and turn over to Owner, complete and ready for regular operation, the particular Work referred to.

B. "INSTALL" means to join, unite, fasten, link, attach, set up, or otherwise connect together before testing and turning over to Owner, complete and ready for regular operation, the particular work referred to.

C. "FURNISH" means to supply all materials, labor, equipment, testing apparatus, controls, tests, accessories, and all other items customarily required for the proper and complete application for the particular Work referred to.

D. "WIRING" means the inclusion of all raceways, fittings, conductors, connectors, tape, junction and outlet boxes, connections, splices, and all other items necessary and/or required in connection with such Work.

E. "CONDUIT" means the inclusion of all fittings, hangers, supports, sleeves, etc.

F. "AS DIRECTED" means as directed by the Architect/Engineer, or his representative.

G. "CONCEALED" means embedded in masonry or other construction, installed behind wall furring or within double partitions, or installed within hung ceilings.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

A. NOT USED

END OF SECTION 26 05 02

SECTION 26 05 03 - CODES, FEES

PART 1 - GENERAL

1.1 DESCRIPTION

A. General: Comply with Codes in accordance with the Contract Documents.

1.2 CODES

A. The electrical installation shall comply with the National Electrical Code and any other agency or authority having jurisdiction in this area.

B. All equipment shall be equal to or exceed the minimum requirements of N.E.M.A., I.E.E.E., and UL.

C. Should any change in Drawings or Specifications be required to comply with governmental regulations, the Contractor shall notify Architect/Engineer prior to execution of the Work. The work shall be carried out according to the requirements of such code in accordance with the instruction of the Architect/Engineer and at no additional cost to the Owner.

D. The provisions of Standards, Codes, Laws, Ordinances, etc., shall be considered minimum requirements. In case of conflict between their published requirements, the Owner's Representative shall determine which is to be followed and his decision shall be binding. Specific requirements of this specification and/or the drawings which exceed the published requirements shall take precedence over them.

1.3 FEES

A. All local fees and permits and services of inspection authorities shall be obtained and paid for by the Contractor. The Contractor shall cooperate fully with local companies with respect to their services. Contractor shall include in his bid; any costs to be incurred relative to power service (primary and/or secondary) and telephone service.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION 26 05 03

SECTION 26 05 04 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work under this section is subject to requirements of the contract documents, including the general conditions and supplementary conditions, and sections under Division 01, General Requirements.

B. During construction, keep an accurate record of all deviations between the work as shown on Drawings and that which is actually installed. Keep this record set of prints at job site for review by the Architect/Engineer.

C. Upon completion of the installation and acceptance by the Owner, obtain from the Architect a complete set of black and white prints of the original contract drawings. Supplemental drawings, clarification drawings, change order drawings, etc., will not be furnished. Enter thereon, in a neat and accurate manner, a complete record of all revisions to the original Drawings as actually installed. This shall include but not be limited to all information relative to change orders, field directive, clarifications (either in written form or drawings), field modifications, etc. Submit this set of black and white prints to the Architect/Engineer for review. After review by the Architect/Engineer, make necessary changes and then deliver them to the Architect for transmittal to the Owner.

D. Provide in each main electrical service room a framed copy, under glass, of the appropriate One Line Riser Diagram as reviewed by the electrical engineer. Media shall be a high quality presentation type paper.

E. Provide location of all underground conduits outside and all feeders (1000 amps or more) on the interior. Show dimensioned location from a wall or column line and the depth.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION 26 05 04

SECTION 26 05 05 - REVIEW AND ACCEPTANCES

PART 1 - GENERAL

1.1 SUBSTITUTION OF MATERIALS OR EQUIPMENT

A. Wherever the words "for approval" or "approved" are used in regard to manufactured specialties, or wherever it is desired to substitute a different make or type of apparatus for that specified, submit all information pertinent to the adequacy and adaptability of the proposed apparatus, and secure Architect/Engineer's acceptance before apparatus is ordered.

B. All requests for substitution of materials or equipment shall be made by the Contractor within thirty (30) days after the execution of the Owner/Contractor Agreement. No requests for substitution will be accepted prior to execution of the Owner/Contractor Agreement or from anyone other than the successful Contractor.

C. Wherever quantities or a definite make and size of apparatus is specified, the make and size of apparatus which is proposed must conform substantially (in regard to the operating results) to that specified or implied. Same shall apply to important dimensions relating to operation of apparatus in coordination with the rest of the system, or to properly fitting it into available space conditions. Any substitution of equipment or apparatus shall include all necessary revisions, as required to complete the installation.

D. Acceptance of substitutions, for equipment specified herein, will not be given merely upon submission of manufacturer's names and will be given only after receipt of complete and satisfactory performance data covering the complete range of operating conditions in tabular and graphical form. Furnish complete and satisfactory information relative to equipment dimensions, weight, etc. Acceptance of all equipment specified or shown on the Drawings, or substitutions submitted for that specified or shown on the Drawings, will be granted if such equipment, in the opinion of the Architect/Engineer, conforms to the performance requirements, space conditions, weight requirements and quality requirements. Any additional construction and design costs incurred, as a result of any accepted substitution, shall be borne by this Contractor. The opinion and judgement of the Architect/Engineer shall be final, conclusive, and binding.

1.2 SUBMITTAL LIST

A. Product Data, Shop Drawings: Bear stamp of approval of authority having jurisdiction and the Owner's insurance underwriter.

B. Within thirty (30) days after date of execution of the Owner/Contractor Agreement, submit for review and acceptance, a list of all material and equipment manufacturers whose products are proposed, as well as names of all subcontractors whom this trade proposes to employ.

C. Any requests for substitutions of equipment or materials must be submitted and returned prior to submitting the Submittal List. Only specified or accepted manufacturers or suppliers shall appear on the Submittal List.

D. The complete Submittal List must be reviewed and accepted by the Architect/Engineer prior to submittal of Shop Drawings. No Shop Drawings will be processed without an accepted Submittal List.

E. The Submittal List shall include all material, systems, and equipment as listed herein.

1.3 SHOP DRAWINGS

A. Within 90 days after date of execution of the Owner/Contractor Agreement, prepare and submit detailed Shop Drawings for materials, systems and equipment as listed herein, in each section of this specification. Should the Contractor fail to submit shop drawings in a timely manner, or fail to order materials in a timely manner, the Contractor shall be required to install temporary materials when deemed necessary to avoid delaying the project. The Contractor shall replace the temporary materials with the specified materials at his/her own cost.

B. The Work described in any Shop Drawing submission shall be carefully checked for all clearances (including those required for maintenance and servicing), field conditions, maintenance of architectural conditions and proper coordination with all trades on the job. Each submitted Shop Drawing shall include a certification that all related job conditions have been checked and that no conflict exists.

C. All drawings shall be submitted sufficiently in advance of field requirements to allow ample time for checking and re-submittal as may be required. All submittals shall be complete and contain all required and detailed information. Re-submittals shall be made within fourteen (14) days of receipt of rejected submittals.

D. Acceptance of any submitted data or Shop Drawings for material, equipment apparatus, devices, arrangements, and layout shall not relieve Contractor from responsibility of furnishing same of proper dimensions and weight, capacities, sizes, quantity, quality and installation details, to efficiently perform the requirements and intent of the Contract. Such acceptance shall not relieve Contractor from responsibility for errors, omissions, or inadequacies of any sort on submitted data or Shop Drawings.

E. Each Shop Drawing shall contain job title and reference to the applicable drawing and specification article.

F. Individual Shop Drawing submittals shall be provided for each specific material, system or equipment as identified herein. Submittals provided in other than this manner will be returned without review.

G. All nameplate data shall be complete at time of equipment submittals – refer to Section 26 05 53 for identification requirements.

PART 2 - EXECUTION

2.1 PRODUCTS

2.2 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

ELECTRICAL SUBMITTAL LIST

DATA:
CONTRACTOR:

EQUIPMENT	MANUFACTURER	REMARKS
Raceways		
Wire and Cable (480 Volts and Below)		
Switches Receptacles		
Wall Plates		
Grounding System		
Disconnecting Switches		
Fuses		
Panelboards		
Contactors		
Luminaires (each type specified)		
Lamps		
Exit Lights		
Poles & Standards		
Battery Operated Emergency Lights		

NOTE: THIS IS A SAMPLE LIST AND DOES NOT NECESSARILY REFLECT THE EQUIPMENT LIST REQUIRED FOR THIS PROJECT.

END OF SECTION 26 05 05

SECTION 26 05 06 - GUARANTEE

PART 1 - GENERAL

1.1 DESCRIPTION

A. General: Provide a Guarantee in accordance with the Contract Documents

B. Submit a single guarantee stating that all portions of the work are in accordance with Contract requirements. Guarantee all work against faulty and improper material and workmanship for a period of one (1) year from date of final acceptance by the Owner; except that where guarantees or warranties for longer terms are specified herein, such longer term shall apply. Within 24 hours after notification, correct any deficiencies which occur during the guarantee period at no additional cost to the Owner, all to the satisfaction of the Owner and Owner/Engineer. Obtain similar guarantees from subcontractors, manufacturers, suppliers and subtrade specialists.

PART 2 - PRODUCTS

2.1 NOT USED

PART 3 - EXECUTION

3.1 NOT USED

END OF SECTION 26 05 06

SECTION 26 05 10 - TESTING, INSPECTION AND CERTIFICATION

PART 1 - GENERAL

1.1 DESCRIPTION

A. General – The Contractor shall completely test and inspect all systems in accordance with the specifications and drawings. The Contractor shall certify that all systems are in complete working order prior to being turned over to the owner.

1.2 STANDARDS

A. Except as modified by governing codes and by the contract documents, comply with the latest applicable provisions and latest recommendations of the following:

1. NFPA
2. NEMA
3. NEC
4. IEEE
5. IPCEA
6. ANSI
7. UL
8. Local Fire Department

1.3 GENERAL TESTING

A. It shall be the responsibility of this Contractor to furnish all testing equipment and labor necessary to perform the following tests:

1. After wires or cables are in place, but before being connected to devices and equipment, the system shall be tested for shorts, opens, intentional and unintentional grounds. Wires or cables that are shorted or unintentionally grounded shall be replaced.

2. A voltage test shall be made on the last outlet of each branch circuit and the potential drop shall not exceed 2%. Voltage drops for panel and large feeders shall not exceed 3% hence the total voltage drop for a feeder and any branch circuit shall not exceed 5% of the service voltage. The test shall be made under design load or its equal.

3. Any wiring device or electrical apparatus in this contract, if grounded or shorted on an integral "line" part, shall be removed and the trouble corrected.

4. When required, complete test and inspection records shall be made and incorporated into a report for each piece of equipment tested. All readings taken shall be recorded. Four (4) copies shall be submitted to the Engineer for approval.

5. All tests must be conducted in the presence of Project Coordinator.

PART 2 - PRODUCTS

2.1 TEST EQUIPMENT AND MATERIALS

A. The Contractor shall provide all testing instruments, equipment and all materials, connections, etc., required to perform tests in accordance with these specifications.

PART 3 - EXECUTION

3.1 WIRING TEST

A. All wiring and cable tests shall be made before any circuits, main switch, motor, transformer or line is energized.

B. Tests shall be made for continuity, identification and absence of shorts and grounds for each conductor. Both ends of a given conductor shall be identified alike. Before circuit terminal connections are made, continuity and identification of wiring shall be checked by means of a DC test device using a bell, light, meter, or buzzer.

C. Insulation test shall be made at the following values:

480Y/277 Volt wiring at 1000 Volts DC
208Y/120 Volt wiring at 500 Volts DC

D. Insulation resistance between phase conductors and ground shall not be less than the minimum requirements of 2000 meg-ohms.

1. Wire terminations are not to be made to equipment (motors, MCCs, bus ducts, etc.), until that piece of equipment has been tested and verified as specified in this section.

2. Test motor feeders with motors disconnected, but with circuit breakers, switches or starters in the circuit opened so as to include only that portion of the feeder it is desired to test.

3. Test lighting feeders with the circuit breakers and panelboards connected but with lighting branch circuit breakers or switches open so as to include only the feeder circuit desired to test.

E. Contractor shall correct or replace any circuit which is defective or grounded and he shall also correct all other troubles encountered by these tests. All defects whether due to faulty workmanship or material furnished by the Contractor shall be corrected under this section at the Contractor's expense in a manner acceptable to the Engineer.

3.2 LIGHTING TEST

A. Check all lighting fixtures for proper operation. All Contractor supplied fixtures shall be 100% operable at no additional cost to the Owner. Repair cost to the Owner supplied fixtures shall not be the responsibility of the Contractor unless otherwise stated.

3.3 MOTOR TEST

A. All 460 volt motors shall be individually "spot tested" for insulation resistance using 1000V DC. All 208/120V motors shall be "spot tested" with 500V DC in a similar manner. The minimum resistance to ground shall be 2000 meg-ohm (corrected to 20 degrees C). The Contractor shall record the ambient temperature of the motor and submit this value along with insulation resistance value.

B. Make the following checks on all motors prior to start-up:

1. Check motor name plates for H.P., speed, phase and voltage. Verify proper wiring.
2. Check shaft for freedom of rotation.
3. Verify that the motor is properly lubricated prior to energizing.

C. Contractor shall furnish a proper sized heater for each overload relay. Notify the Engineer prior to installation of the motor full-load current rating, the number of overload relays, the starter catalog number, and the heater catalog number. The Engineer will aid in the selection of the proper heaters if requested, provided all pertinent information is given.

D. Make the following tests on all motors during or immediately after start-up:

1. Check for proper shaft rotation.
2. Check motor for smooth operation (vibration).
3. Take a current reading using a clamp-on ammeter. (No-load readings and loaded readings).

E. Equipment shall be put into operation after certification by the Contractor that the installation is satisfactory.

3.4 PANELBOARD TESTS

A. "Spot Test" all equipment to be operated on the 480/277 and 208/120V systems at 500V DC prior to connecting feeders. A minimum insulation resistance of 2000 meg-ohms shall be obtained between all phases and between phase and ground.

3.5 SPOT TEST

A. "Spot Test" mentioned in this section shall be interpreted as the specific test method of obtaining insulation resistance by applying indicated test voltage for 60 seconds to the equipment or wiring being tested.

3.6 CONTROL WIRING/OUTLET TEST

A. Control wiring shall perform the function as noted in operation methods and/or included schematics and single line diagrams.

B. All 120 volt outlets shall be tested with a Daniel Woodhead Cat. No. 1750 and 1760 tester under the supervision of the Coordinator. Minimum acceptable tension is 4 oz. for NEMA 1-15R, and 5-20R, 6-15R, 6-20R, 7-15R, 7-20R, 14-15R, 14-20R, 15-15R and 15-20R.

END OF SECTION 26 05 10

SECTION 26 05 14 - EQUIPMENT CONNECTIONS AND COORDINATION

PART 1 - GENERAL

1.1 DESCRIPTION

A. General: Provide final connections to equipment and coordinate same in accordance with the Contract Documents. <Verify connection requirement with schedule on drawings.>

B. Equipment to receive final connections shall include but not be limited to the following:

1. Elevators
2. Motors and Equipment
3. Appliances
4. Owner Furnished Equipment

C. Related work on Division 26

1. Section 26 05 21 – Wire and Cable (0-1000)
2. Section 26 24 19 – Motor Control Center
3. Section 26 29 13 – Enclosed Controllers

D. Related work specified in other Divisions of these specifications.

1. Vertical Transportation
2. Motors
3. Control Wiring
4. Appliances

1.2 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:

1. American National Standard Safety Code for Elevators, Dumbwaiters and Moving Walks (ANSI A17.1).

1.3 QUALITY ASSURANCE

A. Prior to the submitting of bids, the contractor shall familiarize himself with all conditions affecting the proposed installation of equipment requiring electrical connections and shall make provisions as to the cost thereof. Failure to comply with the intent of this paragraph shall in no way relieve the Contractor of performing all necessary work required for final electrical connections and equipment and the coordination thereof.

B. Connections shall be made in accordance with the manufacturers' recommendations and approved shop drawings.

1.4 COORDINATION

A. Prior to ordering breakers, switches, fuses, wire, conduit or any equipment required for connection to equipment supplied by the Owner, this Contractor or other trades, verify the exact current, phase, voltage and frequency of that equipment to assure the proper equipment is provided for said connections. Failure to do so, shall be cause for the Contractor to provide the proper rated equipment at his expense including all labor, material, taxes, freight, restock charges and any other costs associated with providing the proper installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Only those products listed in Division 26 shall be employed.

PART 3 - EXECUTION

3.1 ELEVATORS

A. Connections for and coordination of elevators shall include but not be limited to the following:

1. Dedicated power outlets (one circuit per car) and circuitry for car lights and fans. All such outlets are to be served by the emergency generator.

2. Empty raceway from each controller to nearest telephone backboard for telephone communications.

3. Lighting, switch and duplex outlet within each elevator pit.

4. Fused disconnect switches or circuit breaker with shunt trip with feeders extended to and connected at each elevator controller. Fuse sizes shall be as per elevator vendor's requirements. All fuses shall be time delay type.

5. Warden's fire telephone within each elevator cab and appropriate connections at the elevator machine room and Fire Management System.

6. Smoke and heat detection in the elevator machine room, top of shaft, bottom of shaft, elevator lobby.

7. Coordination and connections with the fire alarm system, fire protection system (sprinkler) security and building management systems.

8. Refer to drawings for elevator sequence of operations.

3.2 EQUIPMENT

A. Connections for a coordination of motors and equipment requiring electrical connections shall include but not be limited to the following:

1. Install motor controllers and disconnect switch for each motor and each piece of equipment.

2. Verify that the motor rotation is correct and reconnect if necessary.

3. Provide separate ground wires in flexible, metal conduit and non-metallic conduit so as to provide an electrically continuous ground path. Ground all equipment.

4. Provide motor branch circuit conductors and connections to each individual motor controller and from each controller to the motor through an approved disconnect switch. Make final connection in minimum 24 inch length of liquid tight, flexible, metal conduit.

5. Provide all necessary wiring and connections for interlocking, remote and automatic controls. Installation of equipment and wiring shall be in compliance with shop drawings and manufacturer's recommendations.

6. Where equipment is fed from branch circuit routed in or under the slab, terminate branch circuit at J-box on 2 foot rigid conduit stub-up and make final connection to equipment in liquid tight, flexible, metal conduit. Provide suitable knee brace on conduit stub-up.

7. Where equipment is fed from overhead support conduit feeder descending from ceiling on flanged floor fitting with conduit type fitting connecting to motor with 24-inch minimum of liquid tight flexible steel conduit.

8. Where nameplate on equipment indicates fuse protection the disconnecting means shall be equipped with time delay fuses.

3.3 APPLIANCES

A. Connections for and coordination of appliances shall include but not be limited to the following:

1. The basic requirements for motors and equipment specified above shall apply where applicable.

2. Where cord and plugs are provided with the appliances this contractor shall coordinate the receptacle installation to match. Information on the Drawing as to receptacle type is for bidding purposes only.

3. Direct connected equipment shall be serviced by disconnecting means.

3.4 OWNER FURNISHED EQUIPMENT

A. The requirements for equipment furnished by the Owner for installation by this contractor shall include but not be limited to the following:

1. The coordination of the proper delivery scheduling of such equipment.

2. The receiving and unloading of such equipment at the property line.

3. The inspection of such equipment for damages, defacement, corrosion, missing components, etc. at the job site. All deficiencies shall be recorded. Deficiencies occurring after inspection shall be corrected by this contractor at his cost.

4. The safe handling and secure storage of such equipment from unloading to the time of permanent installation.

5. The completion of field make up of internal wiring as required.

6. The lamping of equipment.

7. The installation of accessories on such equipment.

8. The installation of such equipment including the transportation of the equipment to the installation area, and the installation of all supports, fasteners, canopies, extension, etc. required to insure safe support and adaptation to the finished structural, electrical and architectural conditions.

9. The final connections and grounding to the building electrical system including all necessary labor and materials including but not limited to junction box extensions, lug change outs, etc.

10. The testing of such equipment in its final location.

3.5 VARIABLE SPEED DRIVES

A. Where variable speed drives are utilized for control, the following shall be included in addition to other requirements in this Section:

1. Wiring: Install incoming and outgoing power circuits. All outgoing circuits shall be run in individual conduits. No two shall be run in the same conduit. Make final connections to motor.

END OF SECTION 26 05 14

SECTION 26 05 21 - WIRES AND CABLES (0-1000V)

PART 1 - GENERAL

1.1 DESCRIPTION

A. General

1. Provide 600-volt wire and cable in accordance with the Contract Documents.

1.2 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:

1. General: Underwriters' Laboratories labeling of all insulations and jackets.

2. Rubber Insulated Wire and Cables

   a. ICEA pub. No. S-19-81 (NEMA Pub. No. WC 3): Rubber-Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.

   b. UL 44: Rubber-Insulated Wires and Cables

3. Thermoplastic Insulated Wire and Cables

   a. ICEA pub. No. 1 S-614-02 (NEMA Pub. No. WC3): Thermoplastic Insulated Wire and Cable for the Transmission and Distribution of Electrical Energy.

   b. UL 83: Wires, Thermoplastic-Insulated

4. Cross Linked Thermosetting Polyethylene Insulated Wire and Cables

   a. ICEA pub. No. S-66-524: (NEMA Pub. No. WC7): Cross Linked Thermosetting Polyethylene Insulated Wire and Cable for Transmission and Distribution of Electrical Energy.

   b. UL 44: Rubber Insulated Wires and Cables

   c. UL 854: Service-Entrance Cables.

5. Annealed Copper Wire for Conductors

   a. ASTM B-3: Soft or Annealed Copper Wire

6. Terminal Blocks

   a. UL 1059

7. Insulation Thicknesses for Individual conductors

   a. N.E.C. Table 310-13: Conductor Application and Insulations.

1.3 SUBMITTALS

A. Provide listing of manufacturers proposed in the submittal list identified in Section 26 05 05 of these specifications.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver wire and cable to job site on reels or coils marked in accordance with N.E.C. Section 310-11.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Wire and Cable:

1. Anaconda
2. General Electric Company
3. Hatfield Wire and Cable
4. The Okonite Company
5. Kerite Company
6. Paranite Wire and Cable Division of Essex
7. International, Inc.
8. Pierelli Cable Corporation
9. Phelps Dodge Copper Products Corporation
10. Reynolds Metal Company
11. Rockbestos Products – Cerro Wire and Cable Company
12. Rome Cable Corporation
13. Cyprus Wire and Cable Company
14. Southwire Company
15. Triangle Conduit and Cable Company.

B. Connectors (UL Approved):

1. Hand-Applied:

   a. T&B "Piggy"
   b. 3M Company "Scotchlok"

c. Ideal Industries "Wing Nut"
d. Buchanan "Squeeze On"

2. Tool-Applied:

a. T&B "Stakon" or Series "54475" through "54490"
b. Ideal Industries "410 Crimp Connector"
c. Burndy "KA-U" or "YA"
d. ILSCO "TA", or "AU" or "D"
e. Buchannan "Wrap Cap"

C. Electrical Tape

1. W.H. Brady "B-500+", "B-500"
2. T&B "E-Z" code Type WBC
3. 3M "Scotch 35" vinyl plastic, electrical
4. Johns-Manville

2.2 WIRE AND CABLE

A. General

1. Provide wire with a minimum insulating rating of 600 volts, except for wire used in 50 volts or below applications for control of signal systems, use 300 volt minimum. Where permitted to be incorporated with other wiring systems, 600 volt wire shall be used for lower voltage wiring systems.

2. Conductor construction and application shall comply with N.E.C. article 310.104. Allowable ampacities shall comply with Table 310.15 (B) (16) or other applicable tables based on temperature and location. In general, wire shall be rated 90° C. Circuits up to and including 100 amperes shall use the 60° C column for ampacities and circuits above 100 amperes shall use the 75° C column for ampacities. For ambient temperatures other than 30° C, use the proper correction factor listed for each table.

B. Conductor

1. Electrical grade, annealed copper, tinned if rubber insulated and fabricated in accordance with ASTM standards. Minimum size number 12 for branch circuits; number 18 for control wiring.

2. The conductors illustrated on the drawings are copper. Except as otherwise noted, aluminum is not permitted.

C. Stranding and Number of Conductors

1. Number 12 and number 10 conductors shall be solid.

2. Cables larger than number 10, stranded in accordance with ASTM Class B stranding designations.

3. Control wires stranded in accordance with ASTM Class B stranding designations.

4. Cables, multi-conductor unless otherwise noted for low-tension systems.

D. Insulated Single Conductors

1. Type THHN – Flame retardant: Heat resistant thermoplastic insulation, nylon jacket rated for 90 C operation. Use for lighting branch circuit wiring installed and passing through the ballast channels of fluorescent fixtures, wiring in metal roof-decks in or near roof insulation in attic or joist spaces, or in raceways exposed to the sun.

2. Type THWN - 75°C: Use in dry or wet locations.

E. Color Coding

1. Provide consistent color coding of all feeders, sub feeders, motor circuits and the likes as follows:

a. 120/208 volts code

1) Phase A – Black
2) Phase B – Red
3) Phase C – Blue
4) Neutral – White
5) Ground – Green

b. 277/480 Volt Code

1) Phase A – Brown
2) Phase B – Orange
3) Phase C – Yellow
4) Neutral – Gray
5) Ground – Green with Yellow Stripe

2. Color-code wiring for control systems installed in conjunction with mechanical and/or miscellaneous equipment in accordance with the wiring diagrams furnished with the equipment. Factory color code wire number 2 and smaller. Wire number 1 and larger may be color coded by color taping of the entire length of the exposed ends.

3. Signal and Communication (100 conductors or fewer per cable): In accordance with Table 5-1, Part 5 of ICEA Pub. S-61-402 (NEMA WC 5).

4. Substitutions for Color-Coded Wire: With approval of Owner's Representative and where color coding cannot be readily provided because of limited quantities involved, either of the following:

a. Plastic tape applied spirally and half-lapped over exposed portions of conductors within manholes, boxes and similar enclosures.

b. Colored tubing cut and inserted over ends of wire prior to installing terminals.

2.3 CONNECTORS

A. Make connections, splices and taps and joints with solderless devices, mechanically and electrically secure. Protect exposed wires and connecting devices with electrical tape or insulation to provide protection not less than that of the conductor.

B. Branch circuit wires (number 10 and smaller):

1. Hand-Applied

a. Coiled, tapered, spring wound devices with a conducting corrosion-resistant coating over the spring steel and a plastic cover and skirt providing full insulation for splice and wired ends. Screw connector on by hand.

b. Hydraulic tool of the same lug manufacturer shall be used and hydraulic tool shall emboss on the connector the proper die number for inspection.

2.4 ELECTRICAL TAPE

A. Specifically designed for use as insulating tape.

2.5 LUBRICANT

A. Use lubricant only where the possibility of damage to conductors exists. Use only a lubricant approved by the cable manufacturer and one, which is compatible with cable and raceways.

PART 3 - EXECUTION

3.1 WIRE AND CABLE

A. Provide a complete system of conductors in raceway system. Mount wiring through a specified raceway regardless of voltage application.

B. Drawings indicate the minimum size wiring for branch circuits. Use No. 12 AWG, minimum. For branch circuits whose length from panel to furthest outlet exceeds 75 feet for 120-volt circuits or 175 feet for 277-volt circuits, use number 10 or larger.

C. Do not install wire in incomplete conduit runs or until after the concrete work and plastering is completed and moisture is swabbed from conduits. Eliminate splices wherever possible. Where necessary, splice in readily accessible pull, junction or outlet box.

D. Provide cable supports for all vertical risers where required by code not to exceed the following:

Minimum Conductor Size	Vertical Supports Aluminum	Copper
No. 18 AWG to No. 8 AWG	100 ft.	100 ft.
No. 6 AWG to No. 8 AWG	200 ft.	100 ft.
No. 00 AWG to No. 0000 AWG	180 ft.	80 ft.
250,000 CM to 350,000 CM	135 ft.	60 ft.
350,001 CM to 500,000 CM	120 ft.	50 ft.
500,001 CM to 750,000 CM	95 ft.	40 ft.

E. Flashover or insulation value of joints shall be equal to that of the conductor. Provide Underwriters' Laboratories listed connectors rated to 600 volts for general use and 1,000 volts for use between ballasts and lamps or gaseous discharge fixtures.

F. Use terminating fittings, connectors, etc., of a type suitable for the specified cable furnished. Make bends in cable at termination prior to installing compression device. Make fittings tight.

G. Apply an anti-oxide inhibitor equivalent to "Penetrox" (Burndy) or "Noalox" (Ideal) to all aluminum terminations.

H. Install wire in raceways and make up terminations in accordance with manufacturer's recommendations using special washers, nuts, etc., as required. Use an accepted wire pulling lubricant equivalent to "Yellow" (Ideal) for all wire number 4 and larger. Strip insulation so as to avoid nicking of wire.

I. Extend wire sizing for the entire length of a circuit, feeder, etc. unless specifically noted otherwise.

J. Where multiwire branch circuits (connected to multiple overcurrent devices) are installed in a single conduit, derating adjustments in accordance with NEC 310.15 shall apply. The neutrals shall be counted as current carrying conductors. Shared neutrals are not allowed.

K. Where a three-phase circuit consisting of (3) three phase wires, (1) one neutral, and (1) one ground wire connected to a single over-current device is installed in a single conduit, derating adjustments outlined in NEC 310.15 shall not apply.

L. Each main and branch circuit shall have its own neutral conductor. Shared neutral conductors shall not be installed.

M. Conductors and Insulation Applications

1. Service Entrance: Type THHN-THWN, single conductors in raceway.

2. Exposed Feeders: Type THHN-THWN, single conductors in raceway.

3. Feeders Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway.

4. Feeders Concealed in Concrete, below Slabs-on-Grade, and in Crawlspaces: Type THHN-THWN, single conductors in raceway.

5. Exposed Branch Circuits in attic or interstitial space: Type THHN-THWN, single conductors in raceway, Armored cable Type AC or Metal-clad cable Type MC where permitted by N.E.C. articles 320 and 330.

6. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway, Armored cable, Type AC Metal-clad cable or Type MC metal clad cable where permitted by N.E.C. articles 320 and 330.

7. Branch Circuits Concealed in Concrete and below Slabs-on-Grade: Type THHN-THWN, single conductors in galvanized rigid steel conduit.

8. Cord Drops and Portable Appliance Connections: Type SO, hard service cord.

9. Fire Alarm Circuits: Type THHN-THWN, in raceway or Power-limited, fire-protective, signaling circuit cable suitable for use in Plenums. Use metal raceways where required in Section 28 31 02 Multiplex Fire Alarm Systems.

10. Class 1 Control Circuits: Type THHN-THWN, in raceway.

11. Class 2 Control Circuits: Type THHN-THWN, in raceway Power-limited cable, concealed in building finishes Power-limited tray cable, in cable tray.

12. Use Type AC/MC cables for fixture whips not to exceed 6 ft. length.

3.2 INSTALLATION

A. General

1. Provide tools, equipment and materials to pull all wire and cable into place and to make required splices and termination.

B. Wire and Cable in Conduit, Duct or Wireway

1. Utilize roller bearing swivel to prevent twisting of cable entering conduit or duct.

2. Take precautions to avoid the entrance of dirt and water into conduit and ducts.

3. Clean existing conduits and ducts to remove any pulling compound prior to pulling new cables.

4. Do not damage conductor insulation, braid jacket or sheath.

5. Do not bend conductors to less than manufacturer's recommended radius.

6. Lubricate cable if required for pulling using powdered soapstone or pulling lubricants; do not use oils or greases.

7. Make splices only in pull boxes, junction boxes and outlet boxes.

8. Utilize cable reels on jacks for pulling through pull boxes, ducts and conduits so bends will not be excessive and conductors will not touch sharp edges; use feeding tube where required.

9. For large diameter cables, utilize properly sized pulling grips (open-ended woven basket, two to four feet long, of ductile steel).

10. Do not exceed maximum recommended pulling tension of wire and cable.

C. Splices, Terminations and Connections

1. General: Except where lugs are furnished with equipment, provide terminals and connectors suitable for quantity, conductor size and direction of entry (top or bottom).

2. Insulated Flanged Terminals: Install for connection of conductors No. 12 AWG and smaller to device terminals; do not exceed three terminals at single connections.

3. Circumferential Compression Type Connectors: Install for splices and connections No. 4 AWG and larger.

   a. Use for incoming and outgoing cable connections at enclosures and for ground connections.

   b. Use manufacturer's approved tool and correct hex head which embosses die number on connector lug.

   c. Make crimped indentations parallel with conductor.

   d. Fill voids and irregularities with insulation putty.

   e. Cover neatly with four (4) layers of vinyl plastic tape except where insulated covers are permitted; half-lap tape in two directions.

   f. Use spring-held bakelite covers over splices or taps only with approval of Owner's representative.

4. Conductor Arcproofing

   a. Cover two or more power feeder cables occurring in the same switchboard section, junction box or pull box (including pull boxes over switchboards) with arcproof and flameproof tape, except if boxes or compartments are barriered.

   b. Provide tape "Scotch" Irvington Tape No. 7700 or Plymouth Rubber Co. Slipknot No. 30 to provide an insulation capable of withstanding a 200-amp arc for not less than 30 seconds.

   c. Apply tape in a single layer, half-lapped, or as recommended by the manufacturer to conform to the above requirements. Apply with a random wrap of 1/2 inch (15mm) wide pressure sensitive, plastic film tape color coded as specified in the "conductor identification" paragraph.

D. Wire Marker Identification Labels

1. Utilize labels for all feeders and for those circuits where individual conductor identification is indicated on Drawings.

2. Apply to wires and cables at terminals and in all pull junction and splice boxes.

3. Do not cut and splice multi-conductor control cable for purpose of labeling.

4. Clean surfaces before applying labels.

5. Tag and tape all spare wiring.

3.3 FIELD QUALITY CONTROL

A. Testing

1. Test system wiring for continuity, grounds and short circuits prior to connection of any equipment.

2. Test final equipment connections for proper torque.

3. Insulation Resistance of Feeders and Subfeeders

a. Test with megger for insulation resistance
b. Locate faults and replace sections found to have faulty insulation
c. Demonstrate installation is free of grounds and short circuits and that insulation resistance complies with ICEA values.

4. Test direct burial cables after completion of backfilling.

END OF SECTION 26 05 21

SECTION 26 05 26 - GROUNDING AND BONDING

PART 1 - GENERAL

1.1 DESCRIPTION

A. General: Provide a low impedance grounding system in accordance with the Contract Documents.

1. Purpose of grounding system:

a. Adequate path for ground fault currents.
b. Safety to personnel from accidental electric shock hazards.
c. Prevention of hazardous discharge of static electricity.

2. Whether or not indicated on Drawings, provide continuous ground path for all electrical circuits from point of utilization back to source through ground wires, bonded metallic conduit runs, grounded cable trays, and related items.

B. Electrical Equipment: Provide complete exterior and interior grounding system, including grounding provisions for high and low voltage switchgear and transformers, motor control centers, cable trays, lightning arrestors, motors, emergency generators and other equipment as indicated on Drawings or required by applicable standards.

C. Miscellaneous Equipment: Provide complete grounding for chimneys, smokestacks, flag poles, metal lighting standards, substation fences, metal antennas, supports for elevated metal floors, steel framework of buildings, elevators, and other equipment as indicated on Drawings or required by applicable standards.

D. Related Work Specified in Division 26

1. Section 26 05 10 – Testing, Acceptances and Certifications
2. Section 26 05 14 – Equipment Connections and Coordination
3. Section 26 05 21 –Wires and Cables
4. Section 26 05 33 – Raceways and Boxes
5. Section 26 24 13 – Switchboards
6. Section 26 27 26 – Wiring Devices

E. Related Work Specified in Other Divisions of these Specifications.

1. Concrete
2. Metallic water piping

1.2 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:

1. Underwriters Laboratory Standard No. U.L. 467.
2. ANSI C-1 1978
3. IEEE Standards No. 142-1982 and No. 80
4. National Electrical Safety Code
5. NFPA
6. Federal Information Processing Standards, Publication #94

1.3 SUBMITTALS

A. Provide a complete set of shop drawings showing service grounding methods as called for on the Contract Documents.

B. Submit test reports certifying resistance values for buried or driven grounds and water pipe grounds.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Ground Connectors and Clamps; Grounding Bushings and Locknuts.

1. All Steel Equipment, Inc.
2. Appleton Electric Company
3. Electrical fitting Corp. (EFCOR)
4. Gedney Electric Company
5. lliscol – Div. Of Bardes Corp.
6. Midwest Elec. Mfg. Company
7. Steel City Div., Midland Ross Corp.
8. Thomas & Betts
9. O-Z/Gedney Co.

B. Welding Type Ground Connectors:

1. Burndy Engineering Company (Thermoweld)
2. Erico Products, Inc. (Cadweld)

C. Compression Type Grid Connectors:

1. Thomas & Betts Company – Series, 53,000
2. Burndy Corp. – Cat No. YGL-C

D. Ground Rods and Clamps

1. Copperweld Steel Company

2. ITT Blackburn Corp.
3. J.A. Weaver Company

E. Bonding Jumpers for Hinged-Joints in Cable Tray: Husky/Burndy Cat. No. AF5-C.

F. Electrical Insulating Tapes:

1. Self-Fusing: 3M Company No. 23
2. Vinyl: 3M Company No. 33+

G. Compound for Compression Connectors:

1. Thomas & Betts Co. – Kopr/Shield
2. Brundy Engineering Company – Penetrox "E"

2.2 MATERIALS

A. Ground Cables: Bare or green color coded, insulated, annealed stranded tinned copper wire as indicated on Drawings; insulated wire to conform with requirements of Section 26 05 21.

B. Mechanical Connectors: Tin-plated aluminum alloy, UL approved and stamped for use with aluminum or copper conductors.

C. Ground Rods:

1. Copper-clad steel fabricated by molten welding process
2. Diameter: 3/4 inch.
3. Length: 10 feet

D. Ground Lugs and Connectors for Cable Tray: Tin-plated aluminum alloy suitable for use with aluminum or copper conductors.

2.3 GENERAL

A. Furnish and install electrical grounding systems as indicated on the construction documents and as specified herein.

B. Grounding systems shall be installed in accordance with the requirements of the local authorities, NEC Section 250, and subject to the approval of the Architect/Engineer.

C. Install equipment grounding conductors in all feeders and branch circuits.

D. Install insulated equipment grounding conductor with circuit conductors for the following items, in addition to those required by NEC:

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.

E. All ground wires and bonding jumpers shall be stranded copper installed in conduit. All ground wires shall be without joints and splices over its entire length.

F. The system neutral shall be grounded at the service entrance only and kept isolated from grounding systems throughout the building.

G. Each system of continuous metallic piping and ductwork shall be grounded in accordance with the requirements of the NEC Section 250.

H. Mechanical equipment shall be bonded to the building equipment grounding system. This shall include but is not limited to, fans, pumps, chillers, etc.

I. Metallic conduits and portions of metallic piping and duct systems which are isolated by flexible connections, insulated couplings, etc., shall be bonded to the equipment ground with a flexible bonding jumper, or separate grounding conductor.

J. Metal raceways, cable trays, cable armor, cable sheath, enclosures, frames, fittings and other metal noncurrent-carrying parts that are to serve as grounding conductors shall be effectively bonded where necessary to assure electrical continuity and the capacity to conduct safely any fault current likely to be imposed on them. Any non-conductive paint, enamel, or similar coating shall be removed at threads, contact points and contact surfaces or be connected by means of fittings so designed as to make such removal unnecessary.

2.4 SERVICE GROUNDING SYSTEM

A. Provide a bare copper bus, wall mounted within the electrical switchboard room. Bus shall be 1/4" thick by 2" wide by 4' long.

B. Extend two (2) service grounding connectors in separate raceways from wall mounted ground bus to ground bus in each switchboard.

C. Extend conductors in raceway from service ground bus to switchboard ground bus as indicated on the drawings.

2.5 SWITCHBOARDS

A. Bond each section of switchboards unit substations and primary switchgear housing and service conduits entering same to ground bus.

2.6 SEPARATELY DERIVED SYSTEMS

A. Equipment grounding conductors shall be provided for separately derived systems and shall be grounded to building steel, cold water pipes, etc., or an alternate grounding means. Equipment grounding shall consist of but not to be limited to the following:

1. Power transformer

2.7 RECEPTACLES

A. Receptacles shall be grounded to the outlet box by means of a bonding jumper between the outlet box and the receptacle-grounding terminal.

2.8 OUTDOOR EQUIPMENT

A. Outdoor enclosures shall be connected with No. 4 bare copper installed not less than 24 inches below grade, connecting to the indicated ground rods or ground grid. Fence and equipment connections shall be bare copper No. 4. Fence shall be grounded at each gate post and corner post. Each gate section shall be bonded to the fence post through a 1/8-inch by one-inch flexible braided copper strap and approved clamps. Transformer neutral connection shall be sized, based on a separately derived system, N.E.C. table 250.66.

2.9 CONCENTRIC KNOCKOUTS

A. Provide grounding type bushings for conduits terminated through multiple concentric knockouts not fully knocked out, on inside of electrical enclosures. Ground bushing with #12 bare copper to ground bus within enclosure or to enclosure proper where a ground bus is not present.

2.10 TRANSFORMER VAULTS

A. Provide bare copper grounding ring around the vault and directly accessible to each transformer that is installed. See details on drawings. The ground ring shall be tied off at two (opposite) ends with bare copper and connected to the building service ground bus. Verify with local utility company prior to installation.

2.11 TOGGLE SWITCHES

A. Provide grounding clip on each toggle switch. Mount over device mounting strap such that contact is made between mounting strap, screw, faceplate and outlet box.

B. Provide devices with ground screw where required by local authorities and bond this with #10 conductor to associated outlet box.

2.12 GROUND METHODS

A. Ground rods shall be copper-clad steel not less than 3/4 inch in diameter, ten (10) feet long, driven full length into the earth. The maximum resistance shall not exceed 5 ohms. If this resistance cannot be obtained with a single rod, additional rods shall be installed not less than six (6) feet on center. If sectional type rods are used, two additional sections may be coupled and driven with the first rod.

B. Ufer grounding system shall consist of a bare copper cable minimum forty (40) feet in length placed in the concrete foundation at not more than three inches or less than one inch from bottom, where concrete is in direct contact with the earth.

C. The metal frame of the building, where effectively grounded.

D. The metal underground water piping system used for grounding shall be in direct contact with the earth for ten feet or more and shall be electrically continuous. Provide bonding jumpers at water meter and at insulating joints.

E. Steel reinforcing bars used for grounding shall be encased by at least two inches of concrete, located within and near the bottom of a concrete foundation or footing that is in direct contact with the earth. Reinforcing bars shall be minimum 1/2 inch diameter and consisting of twenty feet of one or more steel reinforcing bars.

F. All bonding jumpers for the above grounding systems shall be sized in accordance with NEC Section 250-102.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Grounding Grid:

1. Install grounding grids with ground rods and cables as indicated on Drawings. At a minimum grounding grid shall consist of a counterpoise layout. Counterpoise shall include (3) 3/4" x 10' long ground rods space 10' apart in a triangular fashion connected together with bare #4 copper cad welded to each rod.

2. Avoid splices in ground cables.

3. Connectors:

a. Install mechanical connectors in above ground accessible locations only.

b. Install welding type ground connections or connection type grid grounding connectors underground, in manholes, or at inaccessible locations only.

c. Thoroughly clean contact surfaces before making connections.

d. Apply manufacturer's compound for compression connectors to conductors prior to crimping.

e. Make connections using compression type grid grounding connectors with approved manufacturer's hydraulic tool and correct size hex head die which, for inspection, embosses proper die number on connectors.

4. Make connection from ground grid to equipment ground buses as shown on Drawings.

5. Provide for future disconnection for testing where building ground loop or grid connects to exterior or interior steel.

6. Wrap conductors with self-fusing electrical tape and cover with vinyl electrical tape where insulation of grounding system connection is required.

B. Cold Water Pipe Grounding:

1. Make connection with clamp type fitting; do not damage water pipe.
2. Bond ground conductor and its conduit to water pipe.
3. Install No. 4/0 AWG bonding jumper with ground clamps around water meter.

C. Ground Conductors:

1. Size as shown on Drawings or as required by NEC Table 250-66 and 250.122.

2. Where ground cables are required, install insulated copper ground conductors in steel conduit, or as indicated.

3. Where ground cable is protected by metallic conduit, bond cable to conduit at both ends.

4. Connect ground conductors in cables and in conduit to appropriate ground buses (as in switchgear, motor control centers, and distribution panelboards) or directly to metallic enclosure if no ground bus is provided.

D. Conduit Attachment to Electrical Equipment:

1. Ground conduits to metal framework of electrical equipment with double locknuts or grounding bushings and bonding jumpers unless otherwise noted.

2. Install bonding jumpers at all electrical equipment to provide continuous ground return path through conduit.

3. Install NEC approved bonding jumpers across expansion fittings between conduit sections for ground path continuity.

4. Bond conduits to cable tray where conduit enters or exits tray.

5. Where motors or other utilization equipment are connected to electrical system with flexible conduit, ground by one of the following:

a. Flexible metal conduit alone if length is 6 feet or less, conduit is terminated in fitting approved for purpose, and circuit conductors contained therein are protected by overcurrent devices rated 20 at amperes or less.

b. External jumper across flexible conduit.

c. Flexible conduit containing integral ground wire.

d. Do not install external jumpers for flexible conduit connections to kitchen equipment.

E. Receptacles and Switches:

1. Install bonding jumpers between outlet box and receptacle grounding terminal except where contact device or yoke is provided for grounding purposes.

F. Wireways: Install grounding jumpers for bonding between wireway and other panelboards, conduit, switchgear, motor control centers, and at any other point where solid connection would otherwise not be provided in supporting system to insure continuous ground.

G. Panelboards: Install bonding jumpers inside (if possible) all panelboards to bond feeder conduit to panelboards, except ground panelboards containing branch circuits each having less than 150 amperes current carrying capacity, with two standard locknuts and bushings, one inside and one outside, run up wrench tight.

H. Sheet Metal Boxes:

1. Install bonding jumpers inside (if possible) all sheet metal boxes containing one or more feeders with current carrying capacity of 150 amperes or greater, to bond one conduit with another.

2. Ground boxes containing branch circuits only or feeders each less than 150 amperes current carrying capacity, with two standard locknuts and bushings, one inside and one outside, run up wrench tight.

3. Panelboards: Install bonding in sheet metal boxes in systems over 600 volts, regardless of current carrying capacity.

3.2 FIELD QUALITY CONTROL:

A. Resistance Values for System and Equipment Grounds: For each ground rod and ground grid.

1. Acceptable Testing Equipment: Vibroground by Associated Research, Inc.; or Megger Earth Tester by James G. Biddle Co.

2. Method: Three (3) electrode fall of potential as prescribed by instrument manufacturer.

3. Drive additional ten-foot ground rods spaced eight feet apart, if necessary, until total resistance of system is measured at five ohms or less.

END OF SECTION 26 05 26

SECTION 26 05 33 - RACEWAYS AND BOXES

PART 1 - GENERAL

1.1 SUMMARY

A. Provide raceways in accordance with the Contract Documents.

B. Related work in other sections:

1. Section 26 05 00 – Common Work Results for Electrical
2. Section 26 05 10 –Testing, Inspection and Certification
3. Section 26 05 26 – Grounding and Bonding
4. Section 26 05 29 – Hangers and Supports for Electrical Systems
5. Section 26 05 53 – Identifications for Electrical Systems
6. Section 26 27 26 – Wiring Devices

1.2 REFERENCES

A. Except as modified by governing codes and by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:

1. Rigid Steel Conduit

   a. UL Standards UL-6
   b. A.N.S.I. C80-1
   c. Federal Specification WW-C-581E

2. Intermediate Metallic Conduit

   a. UL Standard UL-1242
   b. Federal Specification WW-C-581E

3. Electrical Metallic Tubing

   a. UL Standard UL-797
   b. A.N.S.I. C80-3
   c. Federal Specification WW-C-563

4. Flexible Steel Conduit

   a. UL Standard UL-1

5. Liquid Tight Flexible Conduit

   a. UL Standard UL-360

6. Non-Metallic Conduit

    a. UL Standard UL-651
    b. A.N.S.I. Standard F512
    c. N.E.M.A. Standard TC-2
    d. Federal Specification GSA-FSS and W-C-1094-A
    e. Corps of Engineers Specification CE-303:01

7. Wireways and Auxiliary Gutters

    a. UL Standard UL-870

8. Rigid Aluminum Conduit

    a. A.N.S.I. C80.5

1.3 SUBMITTALS

A. Provide manufacturer's catalog cuts of fittings.

B. Indicate duct banks or multi-trade coordinated shop drawings.

C. Submit shop drawings or catalog descriptive data on boxes exceeding twenty-four (24") inches for any one dimension.

D. Submit shop drawings or catalog descriptive for floor boxes and accessories.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide products by the following:

B. Conduit Bodies:

1. Adalet-PLM
2. American Electric
3. Appleton Electric Co.
4. Carlon
5. Crouse-Hinds Division, Cooper Industries, Inc.
6. Delta-Industrial Products
7. Killark Electric Mfg. Co.
8. Kraloy Products Co.
9. O-Z/Gedney
10. Spring City Electrical Mfg. Co.

C. Fittings:

1. Appleton Electric Co.
2. O-Z/Gedney
3. RACO
4. Steel City
5. Thomas and Betts

D. Wireway:

1. GS Metals Corp.
2. Hoffman Engineering Co.
3. Keystone/Rees, Inc.
4. Square D Co.

E. Surface Metal Raceway:

1. B-Line Systems, Inc.
2. GS Metals Corp.
3. Hoffman Engineering Co.
4. Square D Co.
5. The Wiremold Co.

2.2 RACEWAY TYPES

A. Standard Threaded Rigid Steel Conduit

1. Rigid conduit, heavy wall, galvanized.
2. Threaded type fittings: "Erickson" couplings where threaded cannot be used.

B. Intermediate Metallic Conduit

1. Light weight, rigid steel conduit, galvanized.
2. Threaded type fittings: "Erickson" couplings where threaded cannot be used.

C. Electric Metallic Tubing

1. Continuous, seamless tubing, galvanized or sheradized on the exterior, coated on the interior with a smooth hard finish of lacquer, varnish, or enamel.

2. All couplings, connectors, etc., used in conjunction with this raceway, which are two (2") inches in size and smaller shall be steel compression gland fittings, "Tomic" tap-on or "Tomic" compression type. Conduits 2 1/2 inch size and larger may use set screw type which employ four (4) set screws per fitting.

3. EMT is not allowed in concrete.

D. Flexible Steel Conduit

1. Single strip, continuous, flexible interlocked, double-wrapped steel, galvanized inside and outside, forming smooth internal wiring channel.

2. Maximum length: Six (6) feet.

3. Each section of raceway must contain a bonding wire at each end and sized as required. Provide connectors with insulating bushings.

4. Squeeze-type fittings.

E. Liquid Tight Flexible Electrical Conduit

1. Same as flexible steel conduit except with tough, water-tight plastic outer jacket.

2. Fittings: Cast malleable iron body and gland nut, cadmium plated with one-piece brass grounding bushings which thread to interior of conduit. Spiral molded vinyl sealing ring between gland nut and bushing and nylon insulated throat.

F. Non-Metallic Raceway

1. Composed of polyvinyl chloride suitable for 90 degrees C.

2. Raceway, fittings, and cement must be produced by the same manufacturer who must have had a minimum of ten (10) years experience in manufacturing the products.

3. Materials must have a tensile strength of 7,000-7,200 psi at 73.4 degrees F, flexural strength of 12,000 psi and compressive strength of 9,000 psi.

4. All joints shall be solvent cemented in accordance with the recommendations of the manufacturer.

G. Wireways and Auxiliary Gutters

1. Of sizes and shapes indicated on the drawings and as required.
2. Provide all necessary elbows, tees, connectors, adaptors, etc.
3. Hinged cover secured with captive screws.
4. Wire retainers not less than twelve (12") inches on center.

H. Duct Banks

1. Provide duct banks and concrete encasements for both interior and exterior work as indicated on the drawings for all circuits in excess of 600 volts and for all utility company feeders, and as otherwise indicated.

2. Reinforce duct banks with steel where such duct banks are positioned beneath roads and parking areas.

3. Concrete shall be minimum fc = 3,000 pounds per square inch.

4. At building walls and at manhole walls, provide raceways of rigid steel, one size larger than the specified raceway, for a length of five (5) feet. Pitch conduit away from building at every point where duct bank enters the building or equipment.

5. Support raceways installed in duct banks every five (5) feet to assure correct alignment.

6. Duct joints shall be staggered to provide maximum linear strength.

7. Terminate raceways with flared bells to enable ease of pulling cable and to eliminate stress on the cable. Free bells and raceway terminations of burrs and rough edges.

8. Provide concrete markers at grade where duct banks are stubbed out for future use.

9. Install utility duct banks not less than thirty (30") inches below grade top elevation.

10. Red dye inhibiting agents shall be employed in the concrete mix for power duct banks.

11. Provide rigid steel elbows for vertical risers.

12. Provide yellow vinyl tracer ribbon six (6") inches below grade above each duct bank buried in backfill.

I. Aluminum Conduit

1. Rigid conduit heavy wall.
2. Threaded type fittings: "Erickson" couplings where threaded cannot be used.

2.3 OUTLET, JUNCTION, AND PULL BOXES

A. Cast Type Conduit Boxes, Outlet Bodies and Fittings

1. Provide surface mounted outlet and junction boxes, in indoor locations, where exposed to moisture and all outdoor locations.

2. Requirements

Type Conduit	Box Material	Type Hubs
Rigid Steel & IMC	Ferrous Alloy	Inside Thread
Electrical Metallic Tubing	Ferrous Alloy or Inside Thread with Adapter	Compression

3. Covers: Cast or sheet metal unless otherwise required.
4. Tapered threads for hubs.

B. Galvanized Pressed Steel Outlet Boxes

1. General

a. Pressed steel galvanized or cadmium-plated, minimum of four (4") inches octagonal or square, with galvanized cover or extension ring as required.

2. Concrete Box

a. Four (4") inch octagons with a removable backplate and 3/8" fixture stud, if required. Depth of box shall allow for a minimum of one (1") inch of concrete to be poured above the backplate.

3. Switch and Receptacle Box, Indoors

a. Nominal four (4") inches square, 1-1/2" or 2-1/8" deep as required, with raised cover unless otherwise indicated on drawings.

4. Lighting Fixture Box

a. Four (4") inch octagon with 3/8" fixture stud.

b. For suspended ceiling work, four (4") inch octagon with removable backplate where required, and two (2) parallel bars for securing to the cross-furring channels and extend flexible conduit to each fixture.

5. Plug any open knockouts not utilized.

C. Sheet Steel Boxes Indoors

1. No. 12 USS gauge sheet steel for boxes with maximum side less than forty (40") inches, and maximum area not exceeding 1,000 square inches; riveted or welded 3/4 inch flanges at exterior corners.

2. No. 10 USS gauge sheet steel for boxes with maximum side forty (40") to sixty (60") inches, and maximum area 1,000 to 1,500 square inches; riveted or welded 3/4 inch flanges at exterior corners.

3. No. 10 USS gauge sheet steel riveted or welded to 1-1/2" by 1-1/2" by 1/4" welded angle iron framework for boxes with a maximum side exceeding sixty (60") inches and more than 1,500 square inches in area.

4. Covers

a. Same gauge steel as box.
b. Subdivided single covers so no section of cover exceeds fifty (50) pounds.
c. Machine bolts, machine screws threaded into tapped holes, or sheet metal screws as required; maximum spacing twelve (12") inches.

5. Paint

a. Rust inhibiting primer; ANSI No. 61 light gray finish coat.

6. Where size of box is not indicated, size to permit pulling, racking and splicing of cables.

D. Pull and Splice Boxes, Outdoors

1. Aluminum reinforced, with removable covers secured by brass machine screws.

2. Where size of box is not indicated, size to permit pulling, racking, and splicing of the cables.

3. Braze a ground connector suitable for copper cables to the inside of the box.

E. Junction Box, Sidewalk Type

1. Cast iron, hot-dipped galvanized with threaded conduit entrance hubs, flanged, reinforced checkered cover, gasketed with pry bar slots and countersunk stainless-steel screws.

F. Identification Labels

1. Acceptable Manufacturers

a. W.H. Brady Company (Style A)
b. Thomas & Betts Company (T&B), Style A

2. Plasticized Cloth

a. Non-conductive

b. Waterproof

c. Capable of withstanding continuous temperatures of 235 degrees F and intermittent temperatures to 300 degrees F.

d. Overcoating for protection against oil, solvents, chemicals, moisture, abrasion and dirt.

3. Heavy, thermo-resistant industrial grade adhesive, for adhesion of label to any surface without curling, peeling or falling off.

4. Legends

a. Sharp, bold face, two-inch black letters on "Alert" orange background.

5. Label Designations: Nominal System Voltages Applied to the covers of all medium and low voltage pull, splice and junction boxes.

a. 208 volts
b. 240 volts
c. 480 volts
d. 2,400 volts
e. 4,160 volts
f. 12,400 volts
g. 13,200 volts

h. 13,800 volts
i. Other

PART 3 - EXECUTION

3.1 APPLICATION OF RACEWAYS

A. The following applications must be adhered to except as otherwise required by Code. Raceways not conforming to this listing must be removed by this Contractor and replaced with the specified material at this Contractor's expense.

B. Raceway Types	Application
Rigid Steel	Application: Where installed in concrete within the building, in or under slabs within the building, where exposed to mechanical injury, where specifically required, indoors where exposed to moisture and where required by codes and for all circuits in excess of 600 volts.
I.M.C.	Application: Same as standard threaded rigid steel conduit.
E.M.T.	Application: Use in every instance except where another material is specified. Strictly prohibited in concrete or in contact with earth or fill.
Flexible Steel	Applications: Use in dry areas for connections to lighting fixtures in hung ceilings, connections to equipment installed in removable panels of hung ceilings at bus duct takeoffs, at all transformer or equipment raceway connections where sound and vibration isolation is required. Maximum length: 6'-0".
Liquid-Tight Flexible Conduit	Applications: Use in areas subject to moisture where flexible metal conduit is permitted, at connections to all motors, and all raised floor areas.
Non-Metallic Conduit	Application: a. Schedule 40 – Outside the building, where raceways are in concrete, below grade levels, for raceways in duct banks. b. Schedule 80 – Where specifically called for on the drawings for underground raceways outside of the building which are not encased in concrete. Also for secondary conductors of cold cathode lighting systems.

3.2 RACEWAY SYSTEM IN GENERAL

A. Provide raceways for all wiring systems. All wiring shall be installed in EMT unless otherwise noted or required by Code. 277/480 volt wiring must be kept independent of 120/208 volt wiring. Emergency system wiring must be kept independent of the normal system wiring. Where non-metallic raceways are utilized, provide sizes as required with the grounding conductor considered as an insulated additional conductor. Minimum size, 3/4 inch for branch circuits, and one (1") inch minimum for power distribution. Wiring of each type and system must be installed in separate raceways.

B. Install capped bushings on raceways as soon as installed and remove only when wires are pulled. Securely tie embedded raceway in place prior to embedment. Raceways installed below or in floor slabs must extend a minimum of four (4") inches above the finished slab to the first connector. Lay out the work in advance to avoid excessive concentrations of multiple raceway runs.

C. Locate raceways so that the strength of structural members is unaffected and they do not conflict with the services of other trades. Install one (1") inch or larger raceways, in or through structural members (beams, slabs, etc.) only when and in the manner accepted by the Architect/Engineer. Draw up couplings and fittings full and tight. Protect threads from corrosion with one (1) coat red lead or zinc chromate after installation.

D. Above Grade-Defined as the area above finished grade for a building exterior and above top surface of any slabs (or other concrete work) on grade for a building interior. Above-grade raceways shall comply with the following:

1. Install raceways concealed except at surface cabinets and for motor and equipment connection in electrical and mechanical rooms. Install a minimum of six (6") inches from flues, steam pipes, or other heated lines.

   Provide flashing and counter-flashing for waterproofing of raceways, outlets, fittings, etc., which penetrate the roof. Route exposed raceways parallel or perpendicular to building lines with right-angle turns and symmetrical bends. Run raceways in or under slabs in a direct line and, where possible, with long sweep bends and offsets. Provide sleeves in forms for new concrete walls, floor slabs, and partitions for passage of raceways. Waterproof sleeved raceways where required.

2. Provide raceway expansion joints for exposed and concealed raceways with necessary bonding conductor at building expansion joints and between buildings or structures and where required to compensate for raceway or building thermal expansion and contraction. Provide expansion fittings every 200 feet on outdoor conduit.

3. Provide one (1) empty 3/4 inch raceway for each three (3) spare unused poles or spaces of each flush-mounted panelboard. Terminate empty 3/4 inch conduit in a junction box, which after completion, is accessible to facilitate future branch circuit extension.

4. Provide raceway installation (with appropriate seal-offs, explosion-proof fittings, etc.) in special occupancy area, as required. Provide conduit seal-offs where portions of an interior raceway system pass through walls, ceiling, or floors which separate adjacent rooms having substantially different maintained temperatures, as in refrigeration or cold storage rooms.

5. Protect metal raceways in earth or fill with two (2) coats of asphalt base paint. Touch up abrasions and wrench marks after conduit is in place.

6. In lieu of the above, protect raceways with a minimum of twenty (20) mil tape approved for the purpose and overlapped a minimum of one half tape width.

7. Provide drag wire in spare or empty raceways. Allow five (5) feet of slack at each end and in each pull box. Tag both ends of wire denoting opposite end termination location with black India ink on flameproof linen tag.

8. Install pull-wire in empty raceways. Use polypropelene on monofilament plastic line with not less than 200 lb. tensile strength. Leave at least 12 inches of slack at each end of pull-wire.

E. Below Grade

1. Defined as the area below finished grade for a building exterior and below or within the bottom floor slab for a building interior. Below grade raceways to comply to the following:

a. Project below-grade raceways four (4") inches minimum above floor or equipment foundation. Install exterior underground conduits twenty-four (24") inches minimum below finished grade. Do not penetrate waterproof membranes unless proper seal is provided.

F. No raceway may be installed in a concrete slab except with the permission of the Structural Engineer and with the written consent of the Owner. Conduits embedded in structural concrete slabs shall have the following minimum thickness and shall conform to the following:

Raceway Size	**Minimum Thickness of Concrete Slab**
3/4"	4-1/2"
1"	5"

1. Unless specifically approved in writing, raceways 1-1/4 inch size and larger, shall not be installed in structural concrete slabs.

2. In no case will installation of raceways be permitted to interfere with the proper placement of principal reinforcement.

3. Raceways in structural slabs shall be placed between the upper and the lower layers of reinforcing steel. This will require careful bending of conduits.

4. Raceways embedded in concrete slabs shall be spaced not less than eight (8") inches on centers and as widely spaced as possible where they converge at panels or junction boxes.

5. Raceways running parallel to slab supports, such as beams, columns, and structural walls, shall be installed not less than twelve (12") inches from such supporting elements.

6. To prevent displacement during concrete pour of lift slab, saddle supports for conduit, outlet boxes, junction boxes, inserts, etc., shall be secured with suitable adhesives.

G. Non-metallic raceway installation shall conform to the following:

1. All joints are to be made by the solvent cementing method using the material recommended by the raceway's manufacturer. To insure good joints, components shall be cleaned prior to assembly. Fittings, cement, and conduit shall be supplied by the same manufacturer.

2. Raceway cut-offs shall be square and made by handsaw or other approved means which does not deform the conduit. Raceways shall be reamed prior to solvent cementing to couplings, adaptors, or fittings.

3. Electrical devices which are served by PVC raceways shall be grounded by means of a ground wire pulled in the raceway.

4. Male box adapters shall be used for all box or raceway fittings to terminate plastic raceways.

5. Where separable terminations are required, they shall be made using PVC Threaded Adapters with lock-nuts or bushings. If such terminations must be water-tight, "O" rings shall be installed.

6. Bends shall be made by methods that do not deform or damage the conduit. The radii of field bends shall not be less than those established by the N.E.C.

7. Raceway expansion fittings shall be provided where necessary. The position of the expansion fitting shall be adjusted proportional to the temperature at installation.

8. Raceway supports shall be installed, in such a manner, to allow the PVC Conduit to slide through the supports as the temperature changes.

9. Elbows must be galvanized rigid steel or intermediate metallic conduit.

10. Non-metallic raceway is not permitted to be installed within the building.

H. Raceways in hung ceiling shall be run on and secured to slab or primary structural members of ceiling, not to lathing channels or T-bars, Z-bars, or other elements which are the direct supports of the ceiling panels. Secure conduit firmly to steel by clips and fittings designed for that purpose. Install as high as possible, but not less than 1'-0" above hung ceilings.

I. Conduit above accessible ceilings and exposed raceways shall be run parallel or at right angles with building lines. Secure raceway clamps or supports to masonry materials by toggle bolts, expansion bolts, or steel inserts. Install raceways on steel construction with approved clamps which do not depend on friction or set screw pressure alone.

J. Clear raceway of all obstructions and dirt prior to pulling in wires or cables. This shall be done with a ball mandrel (diameter approximately 85% of conduit inside diameter) followed by a close fitting wire brush and wad of felt, or similar material. This assembly may be pulled in

together with, but ahead of, the cable being installed. All empty raceways shall be similarly cleaned. Clear any raceway which rejects ball mandrel.

K. Support less than two (2") inches trade size, vertically run, raceways at intervals no greater than eight (8) feet. Support such raceways, two (2") inches trade size or larger and made up with threaded couplings, at intervals no greater than the story height, or fifteen (15) feet, whichever is smaller.

L. Support less than (1") inch trade size, horizontally run, raceways at intervals no greater than seven (7) feet. Support such raceways, one (1") inch trade size or larger, at intervals no greater than ten (10) feet.

3.3 WIREWAYS AND AUXILIARY GUTTER

A. Wireways installed in hung ceilings shall be placed such that the cover will hinge upward from the side.

B. Twelve (12") inches clear shall be provided from wireway cover when it is in the open position.

C. Routing of wireways, shown on plans, is diagrammatic. Provide a complete system including corners, elbows, and angle sections to clear the work of other trades and other obstructions.

3.4 OUTLET, JUNCTION, AND PULLBOXES

A. Provide outlet, junction, and pullboxes as indicated on the drawings and as required for the complete installation of the various electrical systems, and to facilitate proper pulling of wires and cables. J-boxes and pullboxes shall be sized per electrical code minimum. Boxes on empty conduit systems shall be sized as if containing conductors of #4 AWG.

B. The exact location of outlets and equipment is governed by structural conditions and obstructions, or other equipment items. When necessary, relocate outlets so that when fixtures or equipment are installed, they will be symmetrically located according to the room layout and will not interfere with other work or equipment. Verify final location of outlets, panels, equipment, etc., with Architect.

C. Back-to-back outlets in the same wall, or "thru-wall" type boxes, are not permitted. Provide twelve (12") inch (minimum) spacing for outlets shown on opposite sides of a common wall to minimize sound transmission.

D. Fit outlet boxes in finished ceiling or walls with appropriate covers, set flush with the finished surface. Where more than one switch or device is located at one point, use gang boxes and covers unless otherwise indicated. Sectional switch boxes or utility boxes will not be permitted. Provide Series "GW" (Steel City) tile box, or as accepted, or a four (4") inch square box with tile ring in masonry walls, which will not be plastered or furred. Where drywall materials are utilized, provide plaster ring. Provide outlet boxes of the type and size suitable for the specific application. Where outlet boxes contain two (2) or more 277 volt devices, or where devices occur of different applied voltages, or where normal and emergency devices occur in same box, provide suitable barrier.

E. Types of Boxes and Fittings for Various Locations

Locations	Types
Outlet	Galvanized pressed steel
Outlet exposed to moisture and outdoors	Cast type conduit fitting
Splice	Galvanized press steel

F. Pull Box Spacing

1. Provide pull boxes so no individual conduit run contains more than the equivalent of four (4) quarter bends (360 degrees total).

2. Conduit Sizes 1-1/4" and larger.

   a. Provide boxes to prevent cable or wire from being excessively twisted, stretched, or flexed during installation.

   b. Provide boxes for medium voltage cables so that maximum pulling tensions do not exceed cable manufacturer's recommendations.

   c. Provide support racks for boxes with multiple sets of conductors so that the conductors do not rest on any metal work inside box.

3. Conduit sizes one (1") inch and smaller, low voltage wire and cable (maximum distances).

   a. 150 feet straight runs.
   b. 100 feet runs with one 90 degree bend or equivalent.
   c. 75 feet runs with two 90 degree bends or equivalent.
   d. 50 feet runs with three or four 90 degree bends or equivalent.

G. Sheet Steel Boxes

1. Size and shape (if not on drawings) to avoid exceeding manufacturer's minimum bending radius recommendations for conductors.

2. Access for removal and replacement of conductors, splices, and equipment.

3. Minimum dimensions of boxes in runs of 1-1/2" or larger conduit.

   a. Straight Pulls

      1) Sizes length eight (8) times nominal diameter of largest conduit.

   b. Angle or U Pulls

      1) Size such that distance between conduit entry and opposite wall of box is six (6) times nominal diameter of largest conduit.

4. Covers

a. Fasten to flange or framework of box with machine bolts, machine screws threaded into tapped holes, or sheet metal screws as required.

H. Identification labels for all low voltage and medium voltage pull, splice and junction boxes in main feeder and subfeeder runs, indicating nominal system voltage.

1. Apply labels after painting of boxes, conduits, and surrounding areas have been completed.

2. Clean surfaces before applying labels; clean aluminum surfaces with solvent wipe.

3. Apply labels on cover and minimum of one (1) fixed side: one (1) label viable from floor where boxes are installed exposed.

3.5 SLEEVES

A. Where sleeves are required for the installation of electrical work, passing through walls or floors, they shall be furnished and installed under this Section of the specification unless indicated otherwise on the drawings. Such sleeves shall be galvanized or black enameled rigid steel conduit or Schedule 40 black steel pipe. Aluminum conduit sleeves shall not be used. Where specific sizes are not indicated on the drawings, sleeves shall be sized to provide 1/2 inch clearance around the outside surface of the item for which they are installed. They shall be cut flush with wall surfaces and shall extend two (2") inches above finished floor level, or as indicated on the drawings.

B. For interior walls and for floors, the space between conduit, ground cable, or similar items and sleeves shall be packed to the full depth of wall or slab thickness with one of the following:

Material	Manufacturer
All-Purpose Insulating Cement	McMasters-Carr Supply Company
Vermiculite (Plaster Mix)	Vermiculite Products, Inc. Houston, TX 77000 Vermiculite-Intermountain, Inc. 333 West – 100 South Salt Lake City, UT
Perlite (Plaster Mix)	Perlite Manufacturing Company Carnegie, PA 15106 Zonolite Construction Products – Division of W.R. Grace & Company 62 Witamore Avenue Cambridge, MA

END OF SECTION 26 05 33

SECTION 26 05 53 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Provide fixed identification of all distribution equipment and conductors in accordance with the Contract Documents.

B. Related work in other sections:

1. Section 26 05 21 – Wires and Cables
2. Section 26 24 13 – Switchboards
3. Section 26 24 16 – Panelboards
4. Section 26 28 23 – Disconnect Switches – Fused and Non-Fused
5. Section 26 51 00 – Interior Lighting

1.2 REFERENCES

A. Except as modified by governing codes and by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:

1. Industry standards shall apply.

1.3 SUBMITTALS

A. Identification procedures shall be noted and scheduled on the applicable shop drawings.

PART 2 - PRODUCTS

2.1 Unless otherwise noted, nameplates shall be black lamacoid plates with white engraved upper case letters enclosed by white border on beveled edge.

2.2 Nameplates for equipment, supplied by the emergency system, shall be red lamacoid with white lettering.

2.3 All nameplates must be engraved and must be secured with rivets, brass or cadmium plate screws. The use of Dymo tape or the like is unacceptable.

2.4 Lettering heights unless otherwise noted must be as follows:

Item	Lettering Height
Switchboards	2"
Panelboards and Load Centers	1/2"
Feeder Switches	1/4"
Remote Smoke Detector Lamps	1/8"
Wall Plates	1/8"

2.5 Cable tags must be flameproof secured with flameproof non-metallic cord.

2.6 Nameplate inscriptions must bear the name and number of equipment to which they are attached as indicated on the Drawings. The engineer reserves the right to make modifications in the inscriptions as necessary.

2.7 The Engineer reserves the right to request additional nameplates at time of review of shop drawings and upon site observations. These shall be furnished at no additional cost to the Owner.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Switchboards

1. Furnish and install a master nameplate for each switchboard engraved with the equipment identification indicated on the Drawing. Mount at top of incoming section.

2. Provide on each main switch an identifying nameplate. Where multiple mains are employed each switch shall be numbered. Inscription shall be "main switch" or "main switch no 1" et al.

B. Panelboards and Load Centers

1. Furnish and install a nameplate for each panelboard and load center engraved with the identification indicated on the Drawings. Mount at top of panel.

2. After installations are complete, provide and mount under sturdy transparent shield in the directory frame of each panel door, a neat, accurate, and carefully typed directory properly identifying the lighting, receptacles, outlets and equipment each overcurrent device controls.

3. Include on directory the panel or load center identification, the cable and raceway size of panel feeder, and the feeder origination point.

C. Disconnect Switches

1. Furnish and install a nameplate for each disconnect switch engraved with the equipment designation which the disconnect serves.

D. Feeder Switches

1. Furnish and install for each feeder switch two (2) nameplates as follows:

a. The first nameplate must be white background with red lettering. Engrave with the words "REPLACE ONLY WITH _____FUSE." Engrave with proper fuse trade name and ampere rating (i.e. Bussman LPS-R 100).

b. The second nameplate shall indicate the load served, the size and type of cable and raceway example:

1) LP-4, LP-5, LP-6
2) 4#500 MCM-THW-CU-3-1/2"C

E. Remote Smoke Detector Lamps and Test Stations

1. Furnish and install a nameplate on each remote smoke detector lamp and/or test station. Engraving must indicate the location of the devise to which the lamp is connected, as approved by the Engineer.

F. Switches

1. Furnish and install an engraved nameplate for each switch, controlling loads which are not local to the switch. Engraving shall be as directed by the Engineer.

G. Pullboxes, Enclosures and Cable Terminations

1. Furnish and install cable tags on each cable, which enters a pullbox, enclosure, switchboard, and at terminations. Mark tags with type written inscription noting the load served, type and size of cable, and the overcurrent device protecting the cable.

H. High Voltage Raceways (over 600 volts)

1. Furnish and install on each high voltage raceway and following as conditions permit:

a. Exposed

1) Self-adhesive labels on each raceway at every floor level and not more than 25'-0" on center. Labels are to be of a conspicuous color and note the operating voltage of the conductors so enclosed.

b. Concealed below grade or concrete

1) Concrete insert type markers above each raceway at every floor level and not less than 25'-0" on center. Inserts are to be four (4") inches in diameter of nonferrous metal fit flush with finished surface. Inscription to state size of raceway and cable operating voltage and date of installation.

I. Luminaires

1. Where connected to other than 120-volt circuit, provide each fluorescent or high intensity discharge fixture with the ballast voltage stenciled on the ballast cover in letters not less than 1/2 inch high.

J. Painting and Finishing

1. All electrical fitting, supports, hanger rods, pullboxes, channel frames, conduit racks, outlet boxes, brackets clamps, etc., shall be galvanized finished or have enamel paint finish over corrosion-resistant primer.

2. All panelboards, distribution centers, etc., shall be factory finished in alkyd high gloss enamel applied over corrosion-resistant primer. Matte or flat type finish paint not acceptable. Factory finished units that are scratched or marked during installation shipping shall be touched up with matching spray-on air dry lacquer or, if required, to provide a satisfactory job, shall be completely refinished.

3. Fire alarm pullboxes and junction boxes to be finished in red.

END OF SECTION 26 05 53

SECTION 26 07 00 - ELECTRICAL DEMOLITION

PART 1 - GENERAL

1.1 GENERAL

A. The work of this section includes furnishing of all labor, tools, materials, and equipment necessary to complete all the demolition required for the project as specified herein and shown on the drawings.

B. Cooperation with contractors under separate contracts is required, and the work described herein and shown on the drawings shall be coordinated as required to fulfill the intent of the contract.

1.2 INTENT

A. It is the intent of this specification and accompanying drawings to describe and indicate the demolition work to be performed. It is not intended that the specifications and drawings describe and indicate every piece of equipment required to be removed for where items are intended to be removed or as required for the satisfactory completion of the project or is considered to be the accepted practice of the trade, they shall be considered to be specified and indicated.

B. The contractor shall disconnect and remove all lighting fixtures, conduit, wire and related electrical items as indicated on the drawings, or as required by the project. This includes all abandoned low voltage signal and communication cables.

C. The contractor shall seal floor, wall and ceiling openings with thermo setting fire resistive compound after removal of conduits.

D. The contractor is cautioned that when performing demolition work circuitry servicing areas of the building outside the work area must remain in operation. The contractor is responsible, at his own expense, to repair any services or damages caused by his demolition work.

E. When disconnecting equipment from existing circuits, if equipment is connected to the circuit which must remain active, the circuit continuity shall be maintained as required. Wiring from circuits becoming completely inactive shall be removed back to the source of supply.

PART 2 - SCOPE OF WORK

2.1 DEMOLITION/ALTERATION

A. Prior to start of demolition, check to determine that power, communication services, etc., such as electricity and telephone, have been disconnected at the source of supply.

B. The Contractor shall furnish and erect barriers, and maintain approved danger, warning, and "Keep Out" signs at locations where the placing of such signs is warranted for safety of all personnel not working in this area.

C. Demolition shall be performed in such a manner as to avoid hazards to persons and property, interference with the use of adjacent properties, and interruption of free passage to and from such property. Work shall be performed in strict accordance with all Municipal, State and Federal Rules, Regulations, Codes, and Laws which may govern and apply to this work.

D. During the demolition work in the effected areas, the building non-work areas must be protected from dust, dirt and possible water damage, to the Owner's satisfaction.

E. All areas shall be cleaned and free of all debris resulting from the demolition work on a daily basis.

F. Remove all equipment shown to be removed; however, all changes cannot be detailed completely on the drawings, some removals and relocations of existing electric work will be necessary for satisfactory performance of this and other trades. Take into consideration in proposal all required changes.

G. Maintain continuous service on feeders, circuits or partial circuits, and outlets affected by this work, except where Architect gives written permission for outage for specified time. All work requiring shut down of existing systems shall be performed on overtime at hours as approved by the Architect and at no additional cost to the Owner. Submit schedule of required outages to the Owner for approval. Perform work in a manner to minimize shutdown time.

H. Provide reconnections and temporary installations as required; remove at job completion.

I. Take possession and remove from the premises all abandoned materials and equipment unless specified as returnable to the Owner; in which case, remove without damage all such equipment and turn over and deliver to Owner at location designated by the Owner.

J. Cut back to floor, wall, or ceiling and plug ends of concealed conduits made obsolete by alterations to permit refinishing surfaces. Remove exposed conduits, wireways, outlet boxes, hangers and devices made obsolete by this work unless designated specifically to remain.

K. Existing concealed conduits not interfering with the work of this or any other trade may remain; however, wiring shall be removed from panelboards or source of power and ends taped. No unused live wiring shall be left in place.

L. Provide blank plates on all unused outlet boxes.

M. Wherever extensions of wires or cables are shown on the drawings, check and verify wire and cable sizes and capacities. Secure Architect's acceptance of this data before new cables are ordered or installation started.

PART 3 - SALVAGE

3.1 SALVAGE

A. The contractor shall be responsible for all damage to existing materials not affected by the demolition work. The contractor shall repair or replace damaged material or equipment as directed at no additional cost to the owner. Repairing and patching of areas shall be done by the respective trade involved with the demolition, utilizing workmen skilled in the trade involved with the repair or replacement of the material in question.

B. All equipment, removed during demolition shall remain on the site, unless otherwise noted. The Owner reserves all rights to claiming material removed during demolition. The contractor is responsible to remove from the site all material not claimed by the Owner. In addition, the contractor is responsible to deliver to the Owner's storage facilities, equipment claimed by the Owner.

END OF SECTION 26 07 00

SECTION 26 27 26 - WIRING DEVICES

PART 1 - GENERAL

1.1 DESCRIPTION

A. General: Provide wiring devices in accordance with the Contract Documents.

B. Related Work Specified in other Divisions of these Specifications.

1. Finish painting.

C. Color: Confirm the color of devices and plates with the Owner/Architect prior to submitting shop drawings or ordering any materials.

1.2 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:

1. Switches

a. Federal Specifications Standard WS-896E.

2. Receptacles

a. N.E.M.A. Standard WD-1, 3.2 through 3.10.
b. U.L. Standard 498 Federal Specification WC596-D.
c. ANSI.

1.3 SUBMITTALS

A. Submit manufacturer's catalog cuts and specifications for all wiring devices and plates.

PART 2 - PRODUCTS

2.1 APPROVED MANUFACTURERS

A. The manufacturers listed below as well as Arrow-Hart, General Electric, Slater & Leviton are acceptable. All devices shall be of the same manufacturer.

B. Switches

1. Hubbell – HBL 1220 Series (color white in finished areas, black in utility rooms, shops maintenance areas, etc.)

C. Duplex Convenience Receptacles

1. Hubbell – HBL5362 (color white – in finished areas, black in utility rooms, shops, maintenance areas, etc.).

2. Arrow-Hart – equal.

3. Pass & Seymour – equal.

D. Faceplates

1. Type 302 Stainless Steel device manufacturer.

E. Ground Fault Circuit Interrupters

1. Provide GFCI receptacle in cast aluminum box with weatherproof, gasketed, spring loaded in-use cover complying with NEC Article 406.8(B) wet locations.

F. Outdoor Receptacles

1. Hubbell – GF5362 (color black – in unfinished areas.)

G. Tamperproof Receptacles

1. Hubbell – HBL8300 GA series (color white)

2.2 SWITCHES

A. Provide heavy duty specification grade, flush mounting, quite-operating AC type, with toggle operator, heat-resistant plastic housing and self grounding metal strap. Silver alloy contact. Rated 20A at 120-277V. Design for side or back wiring with up to Number 10 wire. Verified by UL to meet or exceed Federal specification WS-896E.

B. Use single-pole, double-pole, 3-way, 4-way, pilot or keyed type, as indicated on drawings or required.

2.3 DUPLEX CONVENIENCE RECEPTACLES

A. Provide 2-pole, 3 wire, NEMA and ANSI heavy duty, grounding type, with bronze contacts that accept plug with 2 parallel blades and 1 grounding blade. Heat-resistant thermoplastic

enclosure with nylon face. Two grounding screws. Break-off terminals for 2-circuit wiring. Rated 20 amperes at 125-volt electrical alternating current.

2.4 FACEPLATES

A. Provide cover plates for wall receptacles, outlets, and switches of 302 stainless steel with satin finish, unless otherwise noted. When two or more switches or devices are shown in one location, mount under a common plate.

2.5 OUTDOOR LOCATIONS

A. Each receptacle installed in a damp or wet location shall be corrosion resistant having all metal parts from stainless steel or be nickel plated brass.

B. Protect exterior switches and those in mechanical room which act as plenums by a case aluminum metal plate with a fiber shield and spring loaded cover.

C. Protect exterior receptacles and receptacles in wet locations by a cast aluminum metal plate with a clear plastic, spring loaded cover that is weatherproof whether or not the attachment plug cap is inserted.

D. All switches located outside shall be provided with weatherproof cover.

2.6 GROUND FAULT CIRCUIT INTERRUPTERS

A. Where indicated or required provide ground fault circuit interrupters which will interrupt leakage currents between 4-6 M.A. having a maximum circuit current of 20 amperes. Employ feed through or non-feed through devices as indicted, or required.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including the mounting heights listed in that standard, unless otherwise required by ADA or indicated in Section 260500.

B. Coordination with Other Trades:

1. Take steps to insure that devices and their boxes are protected. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of the boxes.

2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.

3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.

4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:

1. Do not strip insulation from conductors until just before they are spliced or terminated on devices.

2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.

3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.

4. Existing Conductors:

a. Cut back and pigtail, or replace all damaged conductors.
b. Straighten conductors that remain and remove corrosion and foreign matter.
c. Pigtailing existing conductors is permitted provided the outlet box is large enough.

D. Device Installation:

1. Replace all devices that have been in temporary use during construction or that show signs that they were installed before building finishing operations were complete.

2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.

3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.

4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.

5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, 2/3 to 3/4 of the way around terminal screw.

6. Use a torque screwdriver when a torque is recommended or required by the manufacturer.

7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.

8. Tighten unused terminal screws on the device.

9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the right.

2. Install hospital-grade receptacles in patient-care areas with the ground pin or neutral blade at the top.

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

H. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 IDENTIFICATION

A. Comply with Division 16 Section "Electrical Identification."

1. Receptacles: Identify panelboard and circuit number from which served. Use hot, stamped or engraved machine printing with lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.3 FIELD QUALITY CONTROL

A. Perform tests and inspections and prepare test reports.

1. In healthcare facilities, prepare reports that comply with recommendations in NFPA 99.
2. Test Instruments: Use instruments that comply with UL 1436.
3. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated LED indicators of measurement.

B. Tests for Convenience Receptacles:

1. Line Voltage: Acceptable range is 105 to 132 V.
2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is not acceptable.
3. Ground Impedance: Values of up to 2 ohms are acceptable.
4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
5. Using the test plug, verify that the device and its outlet box are securely mounted.
6. The tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

C. Test straight blade hospital-grade convenience outlets for the retention force of the grounding blade according to NFPA 99. Retention force shall be not less than 4 oz.

END OF SECTION 26 27 26

SECTION 26 51 00 - INTERIOR LIGHTING

PART 1 - GENERAL

1.1 DESCRIPTION

A. General: Provide luminaires and accessories in accordance with the Contract Documents.

B. Related Work Specified in Division 26

1. Section 260510 – Testing, Inspection and Certification
2. Section 260514 – Equipment Connections and Coordination
3. Section 260521 – Wires and Cables
4. Section 260529 – Hangers and Supports for Electrical Systems
5. Section 260533 – Raceways and Boxes
6. Section 260553 – Identification for Electrical Systems
7. Section 262726 – Wiring Devices

C. Related Work Specified in Other Divisions of these Specifications.

1. F.F. & E. Package
2. Concrete Bases
3. Duct and Duct Accessories

1.2 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:

1. Luminaires – UL 57, UL 1570, UL 1571, UL 1572, UL 676.

2. Exit and Egress Luminaires – NFPA 70 and 101, UL 924.

3. Lamp Holders and Starters – UL 496, UL 542, UL 879.

4. Hazardous Locations – UL 1225, UL 1203, UL 506, UL 844, UL 886.

5. Cords – UL 62.

6. IES-SPI-NEMA Joint Standards for Class A and Class C acrylic compounds for plastic enclosures.

7. L.E.D. Light Sources – UL 8750-09

8. Local code requirements.

1.3 SUBMITTALS

A. Submit shop drawings and manufacturers' data for the following items in accordance with the conditions of the contract and as specified below.

1. Major luminaires and special luminaires shall show full-size cross sections. Indicate finished dimensions, metal thicknesses, and materials.

2. Show mounting details, including hung ceiling construction.

3. Shop drawings shall include a complete listing of all luminaires on a single sheet. This listing shall contain the luminaire type, manufacturers catalog number, applied voltage and luminaire quantities.

4. The Owner reserves the right to require submittal of a complete sample fixture for any fixture type.

PART 2 - PRODUCTS

2.1 APPROVED MANUFACTURERS

A. Luminaires

1. Manufacturers and catalog numbers used for basis of design are listed in the lighting fixture schedule shown on the Drawings.

2. Fixtures submitted shall be as per specified in the lighting fixture schedule as shown on the Drawings. Substitutions to specified fixtures may be submitted for approval if the substitution meets the minimum lamp performance and design criteria as described in the fixture schedule. All substitutions shall be made to the construction manager or engineer 10 days prior to bid due date for approval.

3. The designations indicated on the lighting fixture schedule are a design series reference (not necessarily a complete catalog number) and do not necessarily represent the number, size, voltage, wattage, type of lamp, finish trim, ceiling type, mounting hardware of special requirements as specified hereinafter on as required by the particular installation(s) and code. Contractor shall verify these requirements and order fixtures as required to give proper installation per the contract documents and per code.

2.2 FIXTURE QUALITY AND DESCRIPTION

A. Manufacture luminaires to the specifications described herein and on the drawings.

2.3 FABRICATION

A. Provide luminaires, completely factory-assembled and wired and equipped with necessary LED drivers, wiring, shielding, reflectors, channels, lenses, etc., and deliver to job ready for installation.

2.4 MATERIALS

A. Plastic Lenses and Diffusers:

1. Virgin methyl methacrylate unless otherwise noted. De-staticize after cleaning. Install and leave with no finger prints or dirt marks on the lens or diffuser. Use white gloves if necessary.

2. Minimum nominal thickness for flat acrylic lens: .156 inch unless otherwise specified in the Fixture Schedule on the drawings.

B. Finish: Porcelain or baked enamel finish, matte white on interiors with minimum tested reflectance of 90 percent. Matte white finish or as specified for visible portions of exterior. Thoroughly clean base metal and bonderize after fabrication.

C. Luminaire Wiring: Minimum individual luminaire wiring – number 18 gauge with insulation at rated operating temperature of 105 degrees Centigrade or higher. Terminate wiring for recessed luminaires, except fluorescent units, in an external splice box.

2.5 LED LIGHT FIXTURES

A. General:

1. LED light fixtures shall be in accordance with IES, NFPA, UL, as shown on the drawings, and as specified.

2. LED light fixtures shall be Reduction of Hazardous Substances (RoHS) – compliant.

3. LED drivers shall include the following features unless otherwise indicated:

   a. Minimum efficiency: 85% at full load.
   b. Minimum Operating Ambient Temperature: -20° C. (-4°F)
   c. Input Voltage: 120-277V (+/-10%) at 60 Hz.
   d. Integral short circuit, open circuit, and overload protection.
   e. Power Factor: ≥ 0.95
   f. Total Harmonic Distortion: $\leq 20\%$
   g. Comply with FCC 47 CFR Part 15

4. LED modules shall include the following features unless otherwise indicated:

   a. Comply with IES LM-79 and LM-80 requirements.

b. Minimum CRI 80 and color temperature 3000° K unless otherwise specified in LIGHTING FIXTURE SCHEDULE.

c. Minimum Rated Life: 50,000 hours per IES L70.

d. Light output lumens as indicated in the LIGHTING FIXTURE SCHEDULE.

B. LED Downlights:

1. Housing, LED driver, and LED module shall be products of the same manufacturer.

C. LED Troffers:

1. LED drivers, modules, and reflector shall be accessible, serviceable, and replaceable from below the ceiling.

2. Housing, LED driver, and LED module shall be products of the same manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Architect's and/or interior designers reflected ceiling plans show actual location of luminaires. Report to the Architect/Engineer any conflict between these plans and the electrical documents. Perform the work in accordance with the Architects/Engineers instructions. At the time of bid, include the most stringent requirement.

B. Spaces for luminaire insertion will be provided by the trade that installs the ceiling. Furnish plaster and other frames for setting and installing under another section of these specifications.

C. Install luminaires in mechanical and unfinished areas after ductwork and piping installation. Locate fixtures 8 feet 6 inches above floor or at suitable locations within space on walls but not lower than 7'-0" AFF. Where mounted lower than 8'-6" luminaires shall be protected by an approved wire guard.

D. The Contractor is required to protect luminaires from damage during installation of same and up to time to acceptance by the Architect/Engineer and any broken luminaires, glassware, plastics, lamps, etc., must be replaced by the contractor with new parts, without any additional expense to the Owner.

E. Where luminaires are surface mounted, they shall be labeled for such and in minimum of one-half (1/2) inch air space shall be maintained between top of luminaire and mounting surface by an approved means.

F. Pendant mounted units shall comply with the following:

1. Where 8' and 4' luminaires are mounted in a continuous row, luminaires, eight feet in length, shall have stems placed within 2'-0" apart. Stems shall be spaced symmetrically

with a minimum of two (2) stems per eight foot fixture and one (1) stem per four foot fixtures so as to provide a uniform appearance throughout.

2. Individual luminaires, four feet or three feet in length, shall have two stems placed approximately 3 inches from each end.

3. Individual luminaires, eight feet in length shall have two stems placed approximately 4'-0" apart.

4. Each stem shall have a brass or steel swivel of other self-aligning device. The entire luminaire mounting (hickey, aligner, swivel, stem, etc.) shall be approved and provided by the fixture manufacturer.

5. A malleable iron bushing shall be placed at luminaire end of stem through which wire passes.

6. A pendant support using an approved sliding clevis bracket which firmly grips an indentation in rigid sides of the wiring channel will be acceptable.

7. Connections between outlet boxes and luminaires shall be by means of approved flexible raceways.

G. Where luminaires are mounted upon surface-mounted outlet boxes in surface mounted conduit runs, this Contractor shall furnish and install a luminaire canopy sufficiently deep to permit exposed conduits to pass through. Canopy shall have proper openings cut by luminaire manufacturer through which conduits may pass. Submit sample of canopy for approval before installation.

H. Where required by the local Building Department, provide approved wire guards over luminaires.

I. Prior to final payment this contractor shall clean all luminaires and replace all expended lamps. He shall also touch up all scratch marks, etc. in an approved manner.

J. Except as otherwise noted as a minimum procedure, support surface or pendant mounted luminaires:

1. Where weight is less than five pounds, from its outlet box by means of an interposed metal strap.

2. Where weight is from five to fifty pounds, from its outlet box by means of a hickey or other direct threaded connection.

3. Whose weight exceeds fifty pounds, directly from structural slab, deck or framing member.

K. Except as otherwise noted as a minimum procedure, support recessed luminaires:

1. Where weight is eighty pounds or less ceiling suspension members, as described above.

2. Where weight is more than eighty pounds directly from structural slabs, decks or framing members.

3. Where luminaires and ceilings are such as to require luminaire support from ceiling opening frames, include in the electric work the members necessary to tie back the ceiling opening frames to ceiling suspension members or slabs so as to provide actual support for the luminaires as noted above.

L. In conjunction with luminaires weighing less than fifty pounds the above restriction against supporting from suspended ceiling splines, runners or bars in the plane of the ceiling will be waived for ceilings which have been specifically approved for the weight and arrangement of luminaires being applied. Any support members, or other appurtenances, however, required to tie in or adapt the luminaires and their ceiling opening frames (if any) to the ceiling in the approved manner shall be included as part of the electric work.

M. In stairwells provide at minimum a luminaire of the type specified at each landing and at each intermediate landing.

N. Install exit lights as indicated on the drawings but not higher than 10'-0" AFF. All exit lights shall be installed with the downlight component fully operational.

O. Track luminaires, adjustable luminaires, floodlights, and accent lights shall be aimed as directed by the Architect/Engineer. Outdoor lighting shall be aimed in periods of darkness.

P. Recessed luminaires to be installed in metal pan or acoustic modular ceilings shall be modified as required to fit into openings in ceiling construction. This contractor shall coordinate and verify this work with the General Construction Contractor. Shop drawings showing details shall be submitted for approval.

Q. Plumb all outdoor lighting standards to true vertical. For bolted poles, provide galvanized anchor bolts and nuts. Plumb using a nut above and below the base plate on the anchor bolts. Pack grout between base plate and concrete footing and provide drain hole below base plate to prevent accumulation of moisture inside pole base. Provide two piece or individual covers for nuts exposed above the baseplate of the same color as the pole. Ground all metal lighting standards.

3.2 COORDINATION WITH MOUNTING CONDITIONS

A. This contractor is responsible for coordinating the mounting accessories and luminaire trims with the ceiling conditions for which each luminaire will be installed. No extra compensation will be permitted for failure to coordinate.

B. All luminaires in hung ceilings are to be installed with earthquake clips.

3.3 COORDINATION WITH AMBIENT CONDITIONS

A. This contractor is responsible for coordinating the characteristics and the U.L. labeling of the luminaires and their components with the ambient conditions which will exist when the

luminaires are installed. No extra compensation will be permitted for failure to coordinate the luminaires with their ambient conditions. These areas of coordination include but are not limited to the following:

1. Wet location labels
2. Damp location labels
3. Plenums and air handling spaces
4. Fire rated ceilings
5. Low density ceilings
6. Insulated ceilings

3.4 FINAL ADJUSTMENTS

A. Adjust reflector/refractor position and aim fixtures as required.

END OF SECTION 26 51 00

SECTION 26 28 23 - DISCONNECT SWITCHES - FUSED AND NON-FUSED

PART 1 - GENERAL

1.1 DESCRIPTION

A. General: Provide fused and unfused disconnect switches in accordance with Contract Documents.

B. Related Work Specified in Division 26

1. Section 26 28 14 – Fuses – Low Voltage
2. Section 26 05 26 – Grounding and Bonding
3. Section 26 05 53 – Identification for Electrical Systems

C. Related Work Specified in other Divisions of these Specifications.

1. Setting of motors and other equipment.

1.2 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the latest applicable provisions and the latest applicable recommendations of the following:

1. U.L. Standards #98 (File #4776) and #508.
2. Federal Specifications W-S-865C.
3. NEMA Standard KS1-1975.
4. U.L. 20 and Federal Specification Test Standards for Toggle Switches.

1.3 SUBMITTALS

A. Submit manufacturer's data for all disconnect switches.

B. Identify motor or equipment served by each switch; indicate nameplate inscription.

PART 2 - PRODUCTS

2.1 APPROVED MANUFACTURERS

A. Safety switches.

1. Shall be of the same manufacturer as the <switchboard> <panelboards> <other>.

B. Toggle type manual control switches.

1. Square D Class 2510, 11, 12.
2. Siemens Class SMF
3. General Electric Type RB with enclosure.

2.2 SAFETY SWITCHES

A. Heavy-duty, horsepower rated, single-throw knife switch with quick-make, quick-break mechanism, capable of full load operations. Meet NEMA and U.S. Government specifications for Class A switches.

B. Provide with contact arc-quenching devices, such as magnetic blowouts or snuffing plates. Provide self-aligning switchblades with silver alloy contact areas and designed so that arcing upon making and breaking does not occur on the final contact surfaces. Provide with high-pressure, spring-loaded contact. Mount switch parts on high-grade insulating base.

C. Enclosure – NEMA 1 with hinged door and defeatable interlock when switch is in "ON" position and can be positively padlocked in "ON" and "OFF" positions. Utilize NEMA 3R (rain-tight) enclosure for exterior installations.

D. Size, fusing and number of poles as shown or as required. Where fused, the devices must be provided with UL listed rejection feature to reject all but Class R fuses. Provide horsepower rated switch to match motor load if no size is shown. Use 3 pole plus solid neutral switches on four wire circuits and 3 pole switches on all other circuits, unless otherwise noted.

E. Lugs must be UL listed for aluminum and/or copper conductors and be front removable.

F. Provide six (6) pole switches for connection to motors with the following starter types:

1. Non-reversing – two-step – part winding – star connected.
2. Non-reversing – full voltage – two speed separate winding.
3. Non-reversing – full voltage – two speed single winding.
4. Where otherwise required.
5. Provide auxiliary contacts for switches where required or where indicated on the drawings.

2.3 TOGGLE TYPE MANUAL CONTROL SWITCHES

A. Provide switches that operate at their full rating with fluorescent, tungsten and resistance loads, and at 80% of their rated capacity with motor loads.

B. Switches to be heavy duty and have:

1. Arc-resisting bodies.
2. Slow make-and-break mechanisms

3. Silver alloy contact buttons
4. Side or back wiring with up to No. 10 AWG solid conductors

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Each motor over 1/2 HP shall be provided with a horsepower-rated safety-type disconnect switch.

B. Each piece of equipment utilizing multi-phase power shall be supplied with a safety-type disconnect switch.

C. Each piece of equipment utilizing single-phase power but protected at over 30 amperes shall be supplied with a safety-type disconnect switch.

D. Equipment other than that mentioned above may utilize a toggle type manual control switch properly sized and rated for the equipment it disconnects.

E. Factory installed disconnect switches may be used to satisfy the above requirements with the Architect/Engineer's prior approval.

3.2 MOUNTING

A. Provide connections and wiring to and from each disconnect switch. Support conduit feeder from ceiling or floor.

B. Disconnect switches shall be mounted at adjacent wall or from the floor with independent supports. Switches shall not be mounted on fan housings.

C. Mount switch enclosure rigidly and with proper alignment on building structure or steel supports with centerline of operating handle not more than 6 feet above finished floor unless otherwise required. Use steel supports fabricated from standard rolled structural steel shapes or framing channel to provide one-inch separation between enclosure and building wall for vertical flow of air.

D. Install fuses as specified in Section 26 28 14.

E. Completed installation shall contain no extraneous openings.

3.3 IDENTIFICATION

A. Provide identification of all disconnect switches in accordance with Section 26 05 53 of these specifications.

END OF SECTION 26 28 23

SECTION 26 05 29 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUBMITTALS

A. Shop Drawings: Show support details if different from methods specified or shown on the drawings.

B. Product Data: Catalog sheets, specifications and installation instructions.

PART 2 - PRODUCTS

2.1 ANCHORING DEVICES

A. Sleeve Anchors (FS FF-S-325 Group II, Type 3, Class 3): Molly/Emhart's Parasleeve Series, Phillips' Red Head AN, HN, FS Series, or Ramset's Dynabolt Series.

B. Wedge Anchors (FS FF-S-325 Group II, Type 4, Class 1): Hilti's Kwik Bolt Series, Molly/Emhart's Parabolt Series, Phillips' Red Head WS, or Ramset's Trubolt Series.

C. Self-Drilling Anchors (FS FF-S-325 Group III, Type 1): Phillips' Red Head Series S or Ramset's Ram Drill Series.

D. Non-Drilling Anchors (FS FF-S-325 Group VIII, Type 1): Hilti's Drop-In Anchor Series, Phillips' Red Head J Series, or Ramset's Dynaset Series.

E. Stud Anchors (FS FF-S-325 Group VIII, Type 2): Phillips' Red Head JS Series.

2.2 CAST-IN-PLACE CONCRETE INSERTS

A. Continuous Slotted Type Concrete Insert, Galvanized:

1. Load Rating 1300 lbs./ft.: Kindorf's D-986.
2. Load Rating 2400 lbs./ft.: Kindorf's D-980.
3. Load Rating 3000 lbs./ft.: Hohmann & Barnard Inc.'s Type CS-H.
4. Load Rating 4500 lbs./ft.: Hohmann & Barnard Inc.'s Type CS-HD.

B. Threaded Type Concrete Insert: Galvanized ferrous castings, internally threaded.

C. Wedge Type Concrete Insert: Galvanized box-type ferrous castings, designed to accept bolts having special wedge-shaped heads.

2.3 MISCELLANEOUS FASTENERS

A. Except where shown otherwise on the Drawings, furnish type, size, and grade required for proper installation of the Work, selected from the following: Furnish galvanized fasteners for exterior use, or for items anchored to exterior walls, except where stainless steel is indicated.

1. Standard Bolts and Nuts: ASTM A 307, Grade A, regular hexagon head.
2. Lag Bolts: FS FF-B-561, square head type.
3. Machine Screws: FS FF-S-92, cadmium plated steel.
4. Machine Bolts: FS FF-B-584 heads; FF-N-836 nuts.
5. Wood Screws: FS FF-S-111 flat head carbon steel.
6. Plain Washers: FS FF-W-92, round, general assembly grade carbon steel.
7. Lock Washers: FS FF-W-84, helical spring type carbon steel.
8. Toggle Bolts: Tumble-wing type; FS FF-B-588, type, class and style as required to sustain load.

B. Stainless Steel Fasteners: Type 302 for interior Work; Type 316 for exterior Work; Phillips head screws and bolts for exposed Work unless otherwise specified.

2.4 TPR (THE PEEL RIVET) FASTENERS

A. 1/4 inch diameter, threadless fasteners distributed by Subcon Products, 315 Fairfield Road, Fairfield, NJ 07004 (800) 634-5979.

2.5 POWDER DRIVEN FASTENER SYSTEMS

A. Olin Corp.'s Ramset Fastening Systems, or Phillips Drill Company Inc.'s Red Head Powder Actuated Systems.

2.6 HANGER RODS

A. Mild low carbon steel, unless otherwise specified; fully threaded or threaded each end, with nuts as required to position and lock rod in place. Unless galvanized or cadmium plated, provide a shop coat of red lead or zinc chromate primer paint.

2.7 "C" BEAM CLAMPS

A. With Conduit Hangers:

1. For 1 Inch Conduit Maximum: B-Line Systems Inc.'s BG-8, BP-8 Series, Caddy/Erico Products Inc.'s BC-8P and BC-8PSM Series, or GB Electrical Inc.'s HIT 110-412 Series.

2. For 3 Inch Conduit Maximum: Appleton Electric Co.'s BH-500 Series beam clamp with H50W/B Series hangers, Kindorf's 500 Series beam clamp with 6HO-B Series hanger, or OZ/Gedney Co.'s IS-500 Series beam clamp with H-OWB Series hanger.

3. For 4 Inch Conduit Maximum: Kindorf's E-231 beam clamp and E-234 anchor clip and C-149 series lay-in hanger; Unistrut Corp.'s P2676 beam clamp and P-1659A Series anchor clip with J1205 Series lay-in hanger.

B. For Hanger Rods:

1. For 1/4 Inch Hanger Rods: B-Line Systems Inc.'s BC, Caddy/Erico Products Inc.'s BC, GB Electrical Inc.'s HIT 110, Kindorf's 500, 510, or Unistrut Corp.'s P1648S, P2398S, P2675, P2676.

2. For 3/8 Inch Hanger Rods: Caddy/Erico Products Inc.'s BC, Kindorf's 231-3/8, 502, or Unistrut Corp.'s P1649AS, P2401S, P2675, P2676.

3. For 1/2 Inch Rods: Appleton Electric Co. BH-500 Series, Kindorf's 500 Series, 231-1/2, OZ/Gedney Co.'s IS-500 Series, or Unistrut Corp.'s P1650AS, P2403S, P2676.

4. For 5/8 Inch Rods: Unistrut Corp.'s P1651AS beam clamp and P1656A Series anchor clip.

5. For 3/4 Inch Rods: Unistrut Corp.'s P1653S beam clamp and P1656A Series anchor clip.

2.8 CHANNEL SUPPORT SYSTEM

A. Channel Material: 12 gage steel.

B. Finishes:

1. Phosphate and baked green enamel/epoxy.
2. Pre-galvanized.
3. Electro-galvanized.
4. Hot dipped galvanized.
5. Polyvinyl chloride (PVC), minimum 15 mils thick.

C. Fittings: Same material and finish as channel.

D. UL Listed Systems:

1. B-Line Systems Inc.'s B-22 (1-5/8 x 1-5/8 inches), B-12 (1-5/8 x 2-7/16 inches), B-11 (1-5/8 x 3-1/4 inches).

2. Grinnell Corp.'s Allied Power-Strut PS 200 (1-5/8 x 1-5/8 inches), PS 150 (1-5/8 x 2-7/16 inches), PS 100 (1-5/8 x 3-1/4 inches).

3. Kindorf's B-900 (1-1/2 x 1-1/2 inches), B-901 (1-1/2 x 1-7/8 inches), B-902 (1-1/2 x 3 inches).

4. Unistrut Corp.'s P-3000 (1-3/8 x 1-5/8 inches), P-5500 (1-5/8 x 2-7/16 inches), P-5000 (1-5/8 x 3-1/4 inches).

5. Versabar Corp.'s VA-1 (1-5/8 x 1-5/8 inches), VA-3 (1-5/8 x 2-1/2 inches).

2.9 MISCELLANEOUS FITTINGS

A. Side Beam Brackets: B-Line Systems Inc.'s B102, B103, B371-2, Kindorf's B-915, or Versabar Corp.'s VF-2305, VF-2507.

B. Pipe Straps:

1. Two Hole Steel Conduit Straps: B-Line Systems Inc.'s B-2100 Series, Kindorf's C-144 Series, or Unistrut Corp.'s P-2558 Series.

2. One Hole Malleable Iron Clamps: Kindorf's HS-400 Series, or OZ/ Gedney Co.'s 14-G Series, 15-G Series (EMT).

C. Deck Clamps: Caddy/Erico Products Inc.'s DH-4-T1 Series.

D. Fixture Stud and Strap: OZ/Gedney Co.'s SL-134, or Steel City's FE-431.

E. Supporting Fittings for Pendent Mounted Industrial Type Fluorescent Fixtures on Exposed Conduit System:

1. Ball Hanger: Appleton Electric Co.'s AL Series, or Crouse-Hinds Co.'s AL Series.

2. Flexible Fixture Hanger: Appleton Electric Co.'s UNJ-50, UNJ-75, or Crouse-Hinds Co.'s UNJ115.

3. Flexible (Hook Type) Fixture Hanger: Appleton Electric Co.'s FHHF, or Crouse-Hinds Co.'s UNH-1.

4. Eyelet: Unistrut Corp.'s M2250.

5. Eyelet with Stud: Kindorf's H262, or Unistrut Corp.'s M2350.

6. Conduit Hook: Appleton Electric Co.'s FHSN, or Crouse-Hinds Co.'s UNH-13.

F. Supporting Fasteners (Metal Stud Construction): Metal stud supports, clips and accessories as produced by Caddy/Erico Products Inc.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Where specific fasteners are not specified or indicated for securing items to in-place construction, provide appropriate type, size, and number of fasteners for a secure, rigid installation.

B. Install anchoring devices and other fasteners in accordance with manufacturer's printed instructions.

C. Make attachments to structural steel wherever possible.

3.2 FASTENER SCHEDULE

A. Material:

1. Use cadmium or zinc coated anchors and fasteners in dry locations.

2. Use hot dipped galvanized or stainless-steel anchors and fasteners in damp and wet locations.

3. For corrosive atmospheres or other extreme environmental conditions, use fasteners made of materials suitable for the conditions.

B. Types and Use: Unless otherwise specified or indicated use:

1. Cast-in-place concrete inserts in fresh concrete construction for direct pull-out loads such as shelf angles or fabricated metal items and supports attached to concrete slab ceilings.

2. Anchoring devices to fasten items to solid masonry and concrete when the anchor is not subjected to pull out loads, or vibration in shear loads.

3. Toggle bolts to fasten items to hollow masonry and stud partitions.

4. TPR fasteners to fasten items to plywood backed gypsum board ceilings.

5. Metallic fasteners installed with electrically operated or powder driven tools for approved applications, except:

a. Do not use powder driven drive pins or expansion nails.

b. Do not attach powder driven or welded studs to structural steel less than 3/16 inch thick.

c. Do not support a load, in excess of 250 lbs. from any single welded or powder driven stud.

d. Do not use powder driven fasteners in precast concrete.

3.3 ATTACHMENT SCHEDULE

A. General: Make attachments to structural steel or steel bar joists wherever possible. Provide intermediate structural steel members where required by support spacing. Select steel members for use as intermediate supports based on a minimum safety factor of 5.

1. Make attachments to steel bar joists at panel points of joists.
2. Do not drill holes in main structural steel members.
3. Use "C" beam clamps for attachment to steel beams.

B. Where it is not possible to make attachments to structural steel or steel bar joists, use the following methods of attachment to suit type of construction unless otherwise specified or indicated on the drawings:

1. Attachment to Steel Roof Decking (No Concrete Fill):

   a. Decking With Hanger Tabs: Use deck clamps.
   b. Decking Without Hanger Tabs:

      1) Before Roofing Has Been Applied: Use 3/8 inch threaded steel rod welded to a 4 x 4 x 1/4 inch steel plate and installed through 1/2 inch hole in roof deck.

      2) After Roofing Has Been Applied: Use welding studs, or self-drilling/tapping fasteners. Exercise extreme care when installing fasteners to avoid damage to roofing.

2. Attachment to Concrete Filled Steel Decks (Total thickness, 2-1/2 inches or more):

   a. Before Fill Has Been Placed:

      1) Use thru-bolts and fish plates.
      2) Use welded studs. Do not support a load in excess of 250 pounds from a single welded stud.

   b. After Fill Has Been Placed: Use welded studs. Do not support a load in excess of 250 lbs from a single welded stud.

3. Attachment to Cast-In-Place Concrete:

   a. Fresh Concrete: Use cast-in-place concrete inserts.
   b. Existing Concrete: Use anchoring devices.

4. Attachment to Cored Precast Concrete Decks:

   a. New Construction: Use thru-bolts and fish plates before Construction Work Contractor has placed concrete fill over decks.

   b. Existing Construction: Toggle bolts may be installed in cells for a maximum load of 50% of that allowed for new construction.

5. Attachment to Hollow Block or Tile Filled Concrete Deck:

   a. New Construction: Use cast-in-place concrete inserts by having Construction Work Contractor omitting blocks and pouring solid blocks with insert where required.

6. Attachment to Waffle Type Concrete Decks:

   a. New Construction:

      1) Use cast-in-place concrete inserts in fresh concrete.
      2) If concrete fill has been applied over deck, thru-bolts and fish plates may be used where additional concrete or roofing is to be placed over the deck.

7. Attachment to Precast Concrete Planks: Use anchoring devices, except do not make attachments to precast concrete planks less than 2-3/4 inches thick.

8. Attachment to Precast Concrete Tee Construction:

   a. New Construction:

      1) Use tee hanger inserts between adjacent flanges.
      2) Use thru-bolts and fish plates, except at roof deck without concrete fill.

   b. Existing Construction:

      1) Use anchoring devices installed in webs of tees. Install anchoring devices as high as possible in the webs.

   c. Do not use power driven fasteners.

   d. Exercise extreme care in drilling holes to avoid damage to reinforcement.

9. Attachment to Wood Construction: Use side beam brackets fastened to the sides of wood members to make attachments for hangers.

   a. Under 15 lbs Load: Attach side beam brackets to wood members with 2 No. 18 x 1-1/2 inch long wood screws, or 2 No. 16 x 1-1/2 inch long drive screws.

   b. Over 15 lbs Load: Attach side beam brackets to wood members with bolts and nuts or lag bolts. Do not use lag bolts in wooden members having a nominal thickness (beam face) under 2 inches in size. Install bolts and nuts or lag bolts in the side of wood members at the mid-point or slightly above. Install plain washers under all nuts.

LOAD	LAG BOLT SIZE	BOLT DIAMETER
15 lbs to 30 lbs	3/8 x 1-3/4 inches	3/8 inch
31 lbs to 50 lbs	1/2 x 2 inches	1/2 inch
Over 50 lbs to load Limit of structure.	Use bolt & nut	5/8 inch

   c. Bottom chord of wood trusses may be utilized as structural support, but method of attachment must be specifically approved.

d. Do not make attachments to the diagonal or vertical members of wood trusses.

e. Do not make attachments to the nailing strips on top of steel beams.

10. Attachment to Metal Stud Construction: Use supporting fasteners manufactured specifically for the attachment of raceways and boxes to metal stud construction.

a. Support and attach outlet boxes so that they cannot torque/twist. Either:

1) Use bar hanger assembly, or:
2) In addition to attachment to the stud, also provide far side box support.

3.4 CONDUIT SUPPORT SCHEDULE

A. Provide number of supports as required by National Electrical Code. Exception: Maximum support spacing allowed is 4'-0" for conduit sizes 3 inches and larger supported from wood trusses.

B. Use pipe straps and specified method of attachment where conduit is installed proximate to surface of wood or masonry construction.

1. Use hangers secured to surface with specified method of attachment where conduit is suspended from the surface.

C. Use "C" beam clamps and hangers where conduit is supported from steel beams.

D. Use deck clamps and hangers where conduit is supported from steel decking having hanger tabs.

1. Where conduit is supported from steel decking which does not have hanger tabs, use clamps and hangers secured to decking, utilizing specified method of attachment.

E. Use channel support system supported from structural steel for multiple parallel conduit runs.

F. Where conduits are installed above ceiling, do not rest conduit directly on runner bars, T-Bars, etc.

1. Conduit Sizes 2-1/2 Inches and Smaller: Support conduit from ceiling supports or from construction above ceiling.

2. Conduit Sizes Over 2-1/2 Inches: Support conduit from beams, joists, or trusses above ceiling.

3.5 LIGHTING FIXTURE SUPPORT SCHEDULE

A. General: Do not support fixtures from ceilings or ceiling supports unless it is specified or indicated on the drawings to do so.

1. Support fixtures with hanger rods attached to beams, joists, or trusses. Hanger rod diameter, largest standard size that will fit in mounting holes of fixture.

    a. Where approved, channel supports may span and be attached to the underside of beams, joists, or trusses and be utilized for the support of lighting fixtures.

2. Use 2 nuts and 2 washers on lower end of each hanger rod to hold and adjust fixture (one nut and washer above top of fixture housing, one nut and washer below top of fixture housing).

    a. Where specified that an adequately supported outlet box is to support a fixture or be utilized as one point of support, support the box so that it may be adjusted to bring the face of the outlet box even with surface of ceiling.

B. Specific Installations Where Fixtures May Be Supported From New Ceilings Being Installed By Construction Work Contractor:

1. Support surface mounted fixtures directly from plywood backed gypsum board ceilings.

2. Support surface mounted fixtures directly from framing or furring members of fire rated suspended ceilings (double gypsum board).

3. Support recessed mounted fixtures directly from furring members of furred gypsum board ceilings.

4. Support recessed mounted fixtures directly from the suspension system of suspended acoustical ceilings. Exception: Support each fixture weighing more than 50 pounds (including lamps) independent of the suspended ceiling grid.

5. Deliver documents which state actual fixture weights and indicate fixture locations to the Construction Work Contractor (thru the Director's Representative).

C. Number of Supports For Ceiling Mounted Lighting Fixtures: Provide at least the following number of supports. Provide additional supports when recommended by fixture manufacturer or shown on the drawings.

1. Commercial and Industrial Fixtures:

    a. Support individual fixtures less than 2 feet wide at 2 points.

    b. Support continuous row fixtures less than 2 feet wide at points equal to the number of fixtures plus one. Uniformly distribute the points of support over the row of fixtures.

    c. Support individual fixtures 2 feet or wider at 4 corners.

    d. Support continuous row fixtures 2 feet or wider at points equal to twice the number of fixtures plus 2. Uniformly distribute the points of support over the row of fixtures.

e. An adequately supported outlet box may be utilized as one point of support for fixtures weighing less than 50 pounds.

D. Number of Supports For Wall Mounted Lighting Fixtures: Provide at least the following number of supports. Provide additional supports when recommended by fixture manufacturer, or shown on the drawings.

1. Commercial and Industrial Fixtures:

a. Support individual fixtures 2 feet long or less at 2 points.

b. Support individual fixtures over 2 feet long at 3 points.

c. Support continuous row fixtures at points equal to twice the number of fixtures. Uniformly distribute the points of support.

d. An adequately supported outlet box may be utilized as one point of support for fixtures weighing less than 50 pounds.

3.6 CHANNEL SUPPORT SYSTEM SCHEDULE

A. Use channel support system where specified or indicated on the drawings.

B. Channel supports may be used, as approved, to accommodate mounting of equipment.

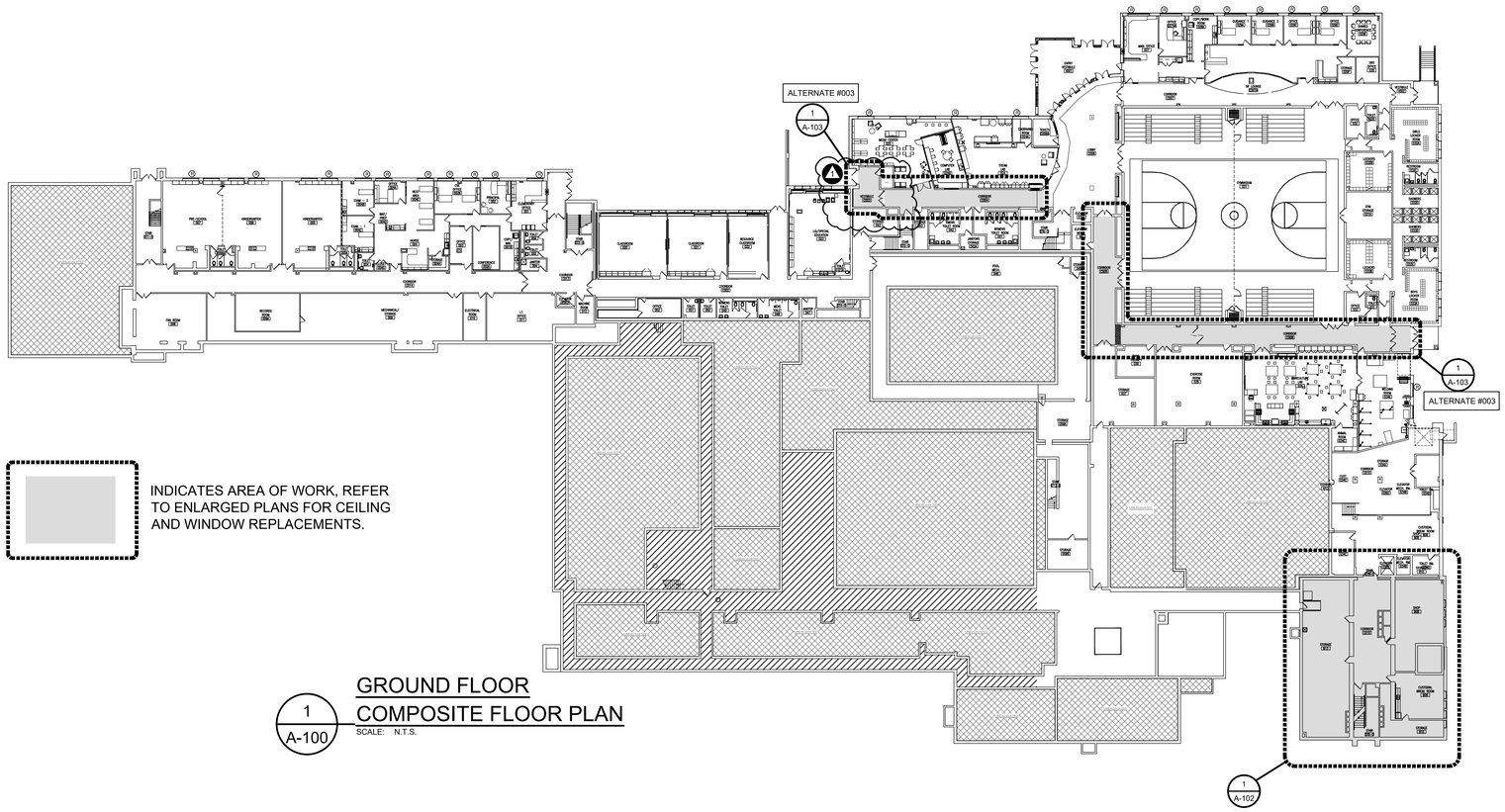
C. Material and Finish:

1. Dry Locations: Use 12 gage steel channel support system having any one of the specified finishes.

2. Damp Locations: Use 12 gage steel channel support system having any one of the specified finishes except green epoxy/enamel.

3. Wet Locations: Use 12 gage steel channel support system having hot dipped galvanized, or PVC finish.

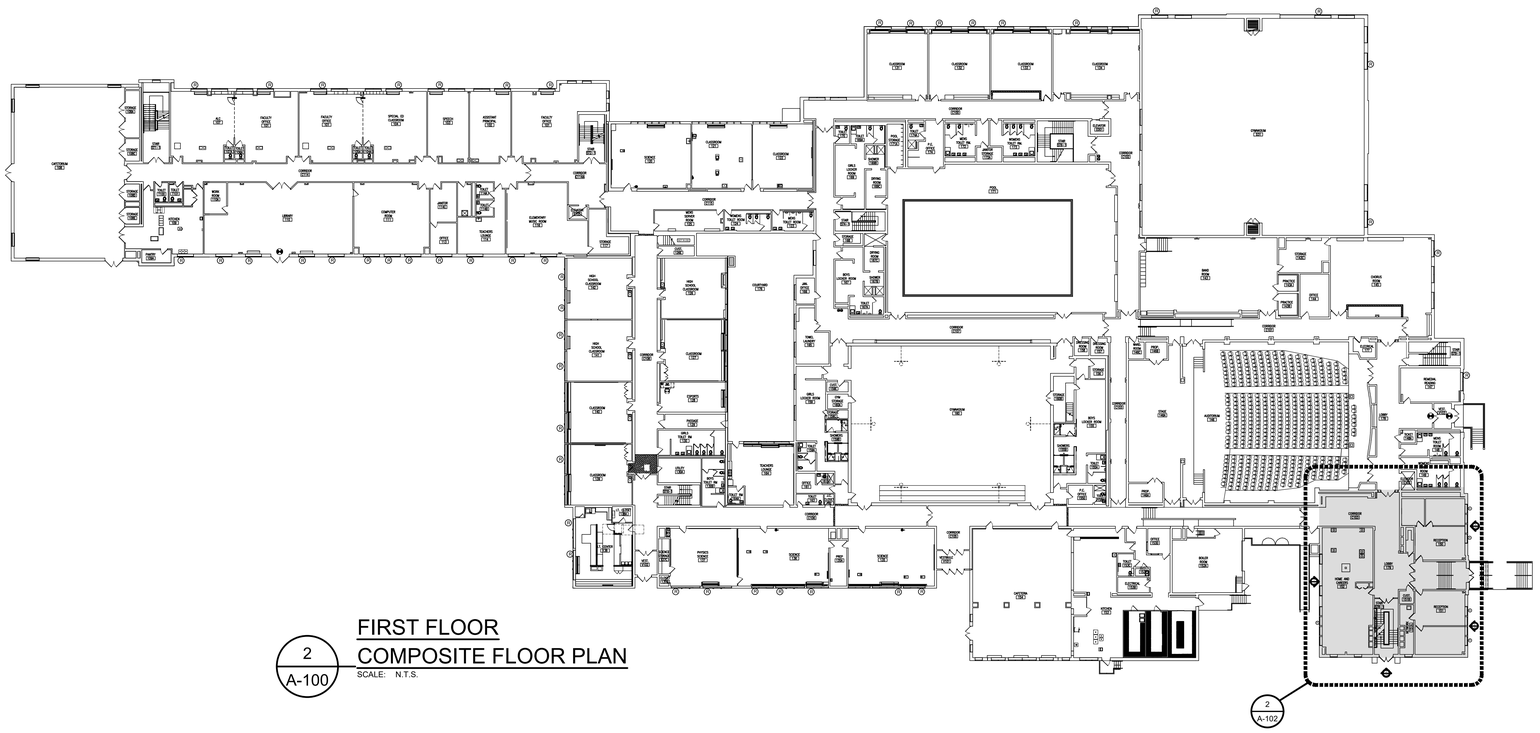
END OF SECTION 26 05 29



INDICATES AREA OF WORK, REFER TO ENLARGED PLANS FOR CEILING AND WINDOW REPLACEMENTS.

1 / A-100 — GROUND FLOOR COMPOSITE FLOOR PLAN

SCALE: N.T.S.



2 / A-100 — FIRST FLOOR COMPOSITE FLOOR PLAN

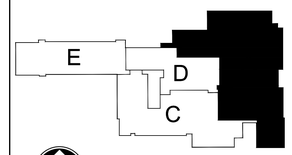
SCALE: N.T.S.

HIGHLAND ASSOCIATES
architecture | engineering | interior design
102 Highland Avenue
Clarks Summit, PA 18411
570-586-4334
www.highlandassociates.com
New York • Pennsylvania

REVISION NO:

1	ADDENDUM #001	11/24/2026

- ADDED CEILING @ VESTIBULE C0003 TO SCOPE OF WORK



KEY PLAN

BID DOCUMENTS

SCHOOL SED # 08-01-01-04-0-001-020
BG SED # 08-01-01-04-5-015-003

COPYRIGHT:
"HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ®" SHALL BE DEEMED THE AUTHOR OF THESE DOCUMENTS AND SHALL RETAIN ALL COMMON LAW STATUTORY AND OTHER RESERVED RIGHTS INCLUDING COPYRIGHT.
UNAUTHORIZED DOCUMENT USE:
THIS DRAWING MAY BE UTILIZED ONLY FOR THE PURPOSE OF CONSTRUCTING OR INSTALLING THE WORK SHOWN THEREON AT THE SITE OF THE WORK SPECIFIED. ANY OTHER USE OF THIS DRAWING, INCLUDING WITHOUT LIMITATION ANY REPRODUCTION OR ALTERATION OF THIS DRAWING, WITHOUT THE PRIOR WRITTEN APPROVAL OF "HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ®" IS A VIOLATION OF THE LAW AND IS PROHIBITED.

PROJECT TITLE:

Afton Central School District
29 Academy St, Afton, NY 13730

2024 Capital Project
Phase 2

SEALS:

DRAWING TITLE:

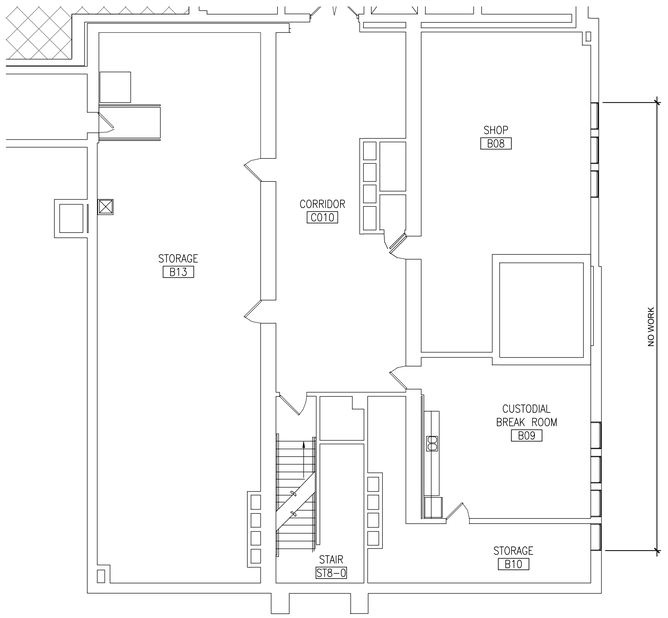
GROUND FLOOR
FIRST FLOOR
COMPOSITE FLOOR PLANS

DRAWN BY:	CHECKED BY:
R.J.C.	DM
DATE:	PROJECT NO:
11/03/2026	2025-005

DRAWING NO:

A-100

CAD FILE: 9005-A-100-PH2.DWG PLOT DATE: 11/23/2026



1 A-102 GROUND FLOOR COMPOSITE PLAN (PART B)
SCALE: 1/8" - 1'-0"

DRAWING LEGEND

- R — INDICATES RESCUE WINDOW
- X — WINDOW TYPE
- INDICATES PHOTOS FOR REFERENCE
- -------- INDICATES PORTIONS OF CEILING TO BE REMOVED AND REPLACE AFTER WINDOW INSTALLATION

DEMOLITION KEY NOTES

1. CONTRACTOR IS TO REMOVE EXISTING WINDOWS, FRAMES, SILL, CAULKING, AND FRAMING. PREPARE EXISTING OPENING FOR NEW WINDOW INSTALLATION.
2. CONTRACTOR IS TO REMOVE AND STORE EXISTING CEILING AND GRID (SHOWN DASHED) AS REQUIRED FOR WINDOW INSTALLATION.

CONSTRUCTION KEY NOTES

1. CONTRACTOR IS TO INSTALL NEW WINDOW SYSTEM, INCLUDING ALL REQUIRED FLASHING, CAULKING, INTERIOR MOLDINGS, AND NEW CORIAN SILLS.
2. CONTRACTOR IS TO REINSTALL CEILING GRID AND TILES AFTER COMPLETION OF WINDOW INSTALLATION.



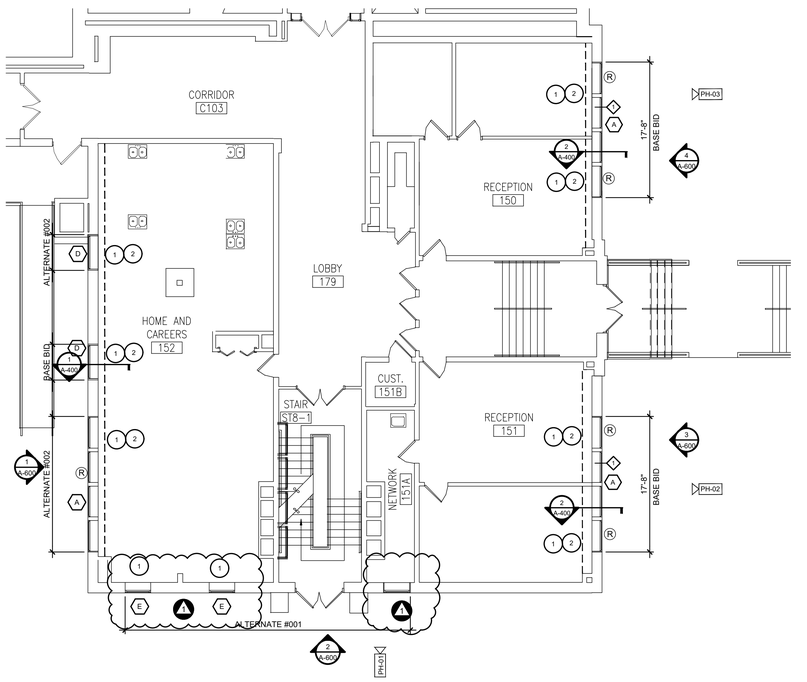
PH-01



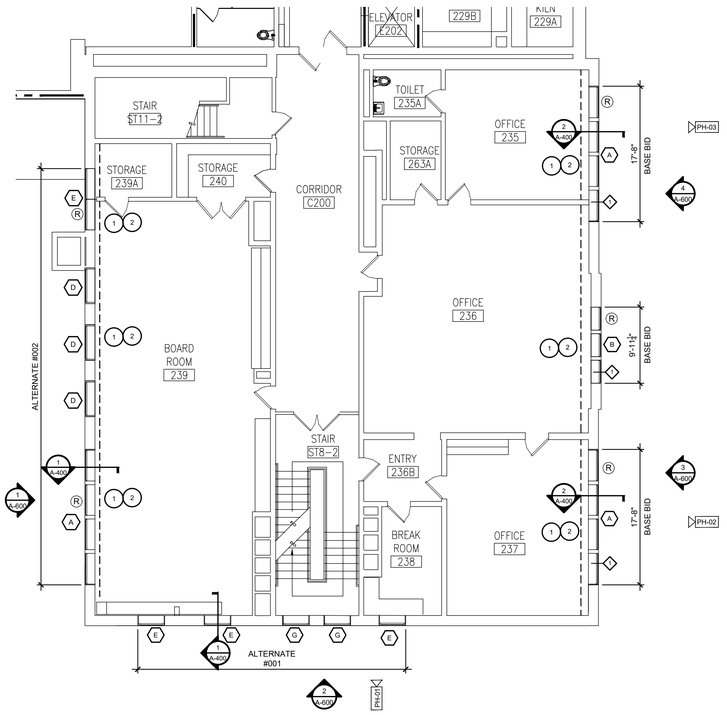
PH-02



PH-03

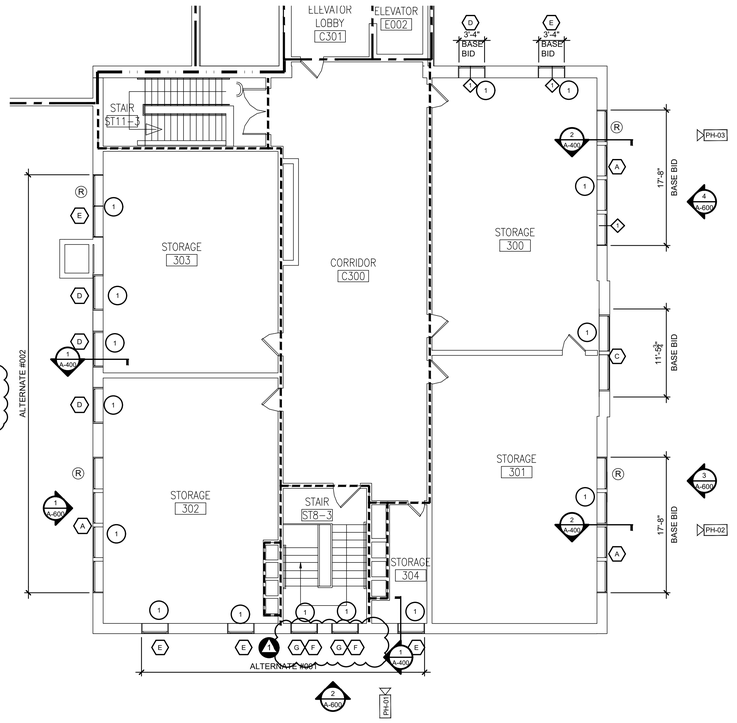


2 A-102 FIRST FLOOR COMPOSITE PLAN (PART B)
SCALE: 1/8" - 1'-0"



3 A-102 SECOND FLOOR COMPOSITE PLAN (PART B)
SCALE: 1/8" - 1'-0"

ADDENDUM #001 - CONTRACTOR TO REMOVE EXISTING WINDOWS PREPARE AREA FOR NEW FIXED WINDOWS TO MATCH WINDOW TYPES IN THE BASE BID. CONTRACTOR IS REASONABLE TO VERIFY WINDOW SIZES IN THE FIELD PRIOR TO SHOP DRAWINGS



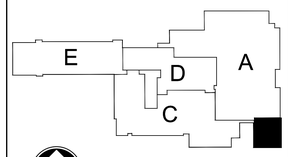
4 A-102 THIRD FLOOR COMPOSITE PLAN (PART B)
SCALE: 1/8" - 1'-0"

HIGHLAND ASSOCIATES
architecture | engineering | interior design
102 Highland Avenue
Clarks Summit, PA 18411
570-586-4334
www.highlandassociates.com
New York • Pennsylvania

REVISION NO:

A	ADDENDUM #001	11/24/2026

- ADDED WINDOWS TO BASE BID
- REMOVED WINDOW TAG (EXISTING LOUVER TO REMAIN)
- ADDED WINDOW TAGS



KEY PLAN

BID DOCUMENTS

SCHOOL SED # 08-01-01-04-0-001-020
BG SED # 08-01-01-04-5-015-003

COPYRIGHT:
"HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ©" SHALL BE DEEMED THE AUTHOR OF THESE DOCUMENTS AND SHALL RETAIN ALL COMMON LAW STATUTORY AND OTHER RESERVED RIGHTS INCLUDING COPYRIGHT.
UNAUTHORIZED DOCUMENT USE:
THIS DRAWING MAY BE UTILIZED ONLY FOR THE PURPOSE OF CONSTRUCTING OR INSTALLING THE WORK SHOWN THEREON AT THE SITE OF THE WORK SPECIFIED. ANY OTHER USE OF THIS DRAWING, INCLUDING WITHOUT LIMITATION ANY REPRODUCTION OR ALTERATION OF THIS DRAWING, WITHOUT THE PRIOR WRITTEN APPROVAL OF "HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ©" IS A VIOLATION OF THE LAW AND IS PROHIBITED.

PROJECT TITLE:

Afton Central School District
29 Academy St, Afton, NY 13730

2024 Capital Project
Phase 2

SEALS:

DRAWING TITLE:

GROUND, FIRST, SECOND, THIRD, FLOOR PLAN WINDOW REPLACEMENT PART - B

DRAWN BY:	CHECKED BY:
R.J.C.	DM
DATE:	PROJECT NO:
11/03/2026	2025-005

DRAWING NO:

A-102

CAD FILE: 5005A-102-PH2.DWG PLOT DATE: 11/24/2026

DRAWING LEGEND

EXISTING WALL CONSTRUCTION TO REMAIN

EXISTING DOOR TO REMAIN

ROOM NAME
NO.
INDICATES ROOM NAME AND NUMBER

CONSTRUCTION KEY NOTES

INDICATES NEW 2X2 CEILING GRID AND CEILING TILES AT EXISTING HEIGHT.

INDICATES NEW 2X2 CEILING LIGHTS REFER TO ELECTRICAL FOR INFORMATION

OC INDICATES NEW OCCUPANCY SENSORS SEE ELECTRICAL DRAWINGS FOR INFORMATION

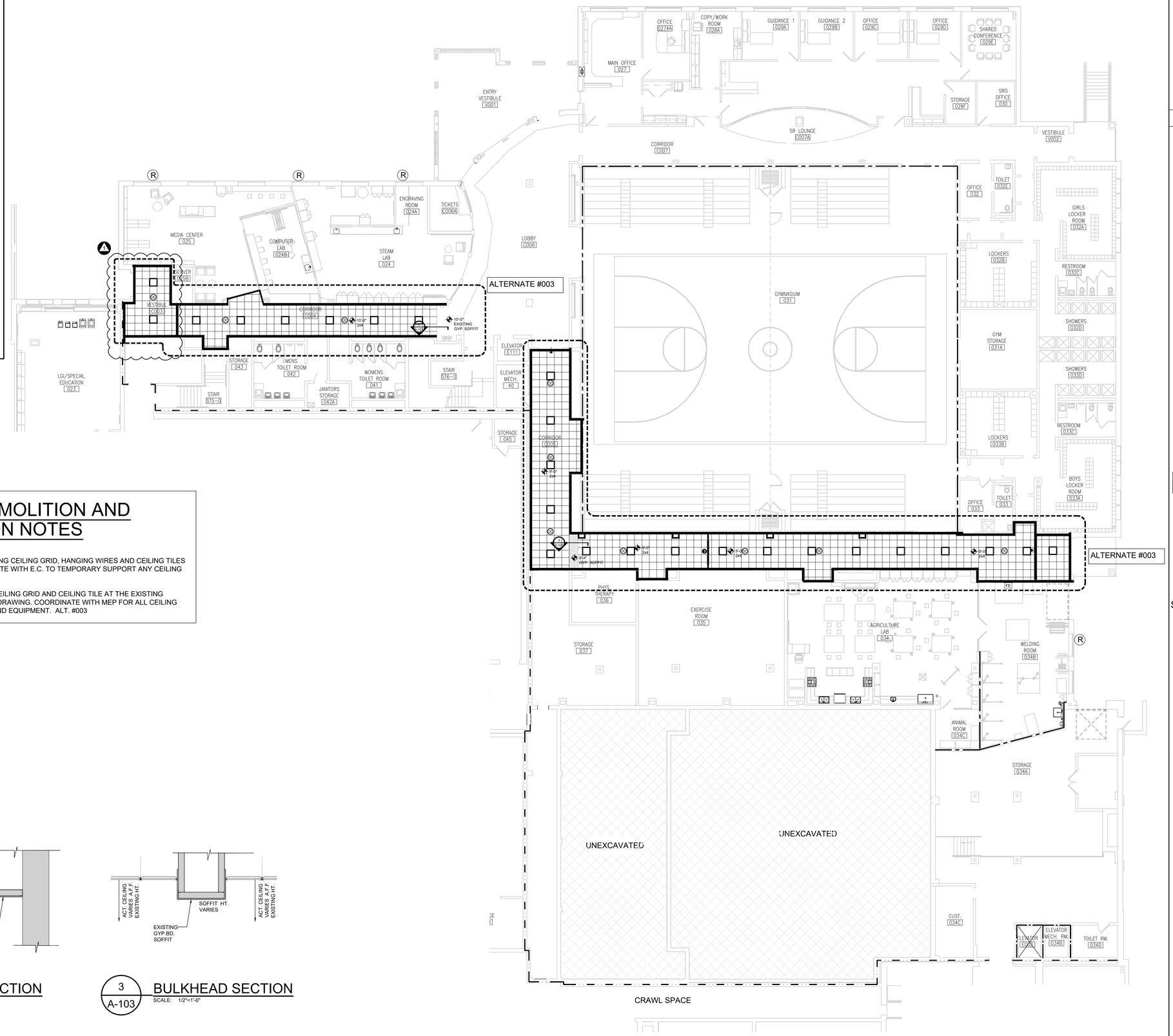
NOTE:

CONTRACTOR TO PATCH & REPAIR ANY WALLS DISTURBED DURING DEMOLITION OF EXISTING CEILINGS TO MATCH EXISTING CONDITIONS

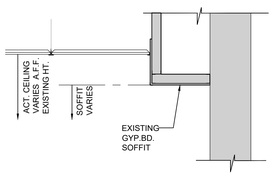
CEILING DEMOLITION AND RENOVATION NOTES

1. G.C. SHALL REMOVE EXISTING CEILING GRID, HANGING WIRES AND CEILING TILES IN THEIR ENTIRETY, COORDINATE WITH E.C. TO TEMPORARY SUPPORT ANY CEILING MOUNTED DEVICES. ALT. #003

2. G.C. SHALL INSTALL NEW CEILING GRID AND CEILING TILE AT THE EXISTING HEIGHTS, INDICATED ON THIS DRAWING. COORDINATE WITH MEP FOR ALL CEILING MOUNTED CEILING DEVICES AND EQUIPMENT. ALT. #003



1 A-103 GROUND FLOOR CEILING PLAN PART - A
SCALE: 3/32" - 1'-0"



2 A-103 SOFFIT SECTION
SCALE: 1/2"=1'-0"

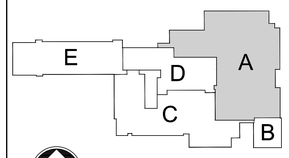
3 A-103 BULKHEAD SECTION
SCALE: 1/2"=1'-0"

HIGHLAND ASSOCIATES
architecture | engineering | interior design
102 Highland Avenue
Clarks Summit, PA 18411
570-586-4334
www.highlandassociates.com
New York • Pennsylvania

REVISION NO:

1	ADDENDUM #001	11/24/2026

- ADDED CEILING @ VESTIBULE C0003 TO SCOPE OF WORK



KEY PLAN

BID DOCUMENTS

SCHOOL SED # 08-01-01-04-0-001-020
BG SED # 08-01-01-04-5-015-003

COPYRIGHT:
HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ® SHALL BE DEEMED THE AUTHOR OF THESE DOCUMENTS AND SHALL RETAIN ALL COMMON LAW STATUTORY AND OTHER RESERVED RIGHTS INCLUDING COPYRIGHT.
UNAUTHORIZED DOCUMENT USE:
THIS DRAWING MAY BE UTILIZED ONLY FOR THE PURPOSE OF CONSTRUCTING OR INSTALLING THE WORK SHOWN THEREON AT THE SITE OF THE WORK SPECIFIED. ANY OTHER USE OF THIS DRAWING, INCLUDING WITHOUT LIMITATION ANY REPRODUCTION OR ALTERATION OF THIS DRAWING, WITHOUT THE PRIOR WRITTEN APPROVAL OF HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ® IS A VIOLATION OF THE LAW AND IS PROHIBITED.

PROJECT TITLE:

Afton Central School District
29 Academy St, Afton, NY 13730

2024 Capital Project
Phase 2

SEALS:

DRAWING TITLE:

GROUND FLOOR CEILING PLAN PART - A

DRAWN BY:	CHECKED BY:
R.J.C. / A.L.	D.G.
DATE:	PROJECT NO:
11/03/2026	2025-005

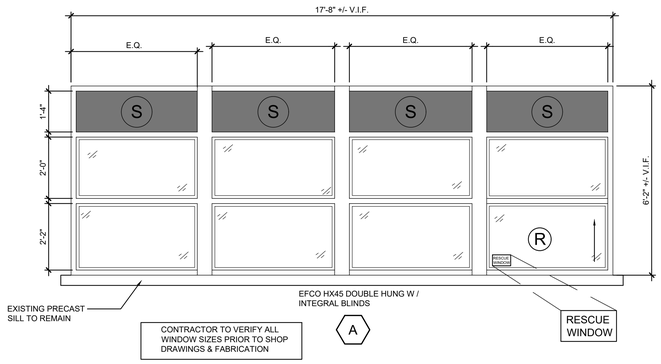
DRAWING NO:

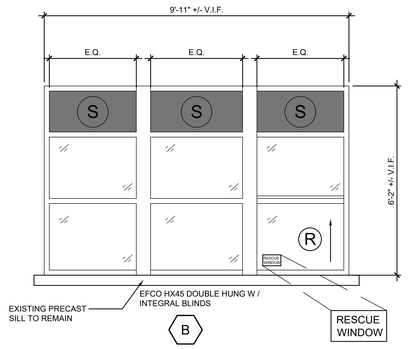
A-103

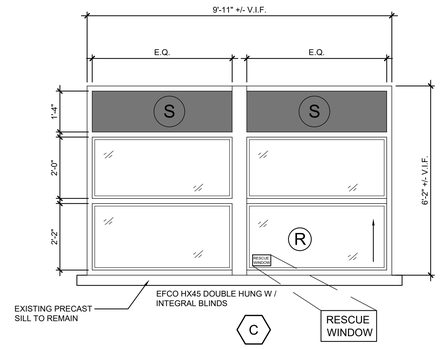
CAD FILE: 5005A-103-PH2.DWG PLOT DATE: 11/24/2026

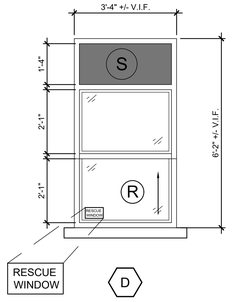
WINDOW ELEVATIONS

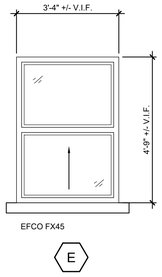
SCALE: 1/2" =1'-0"

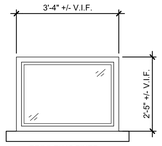




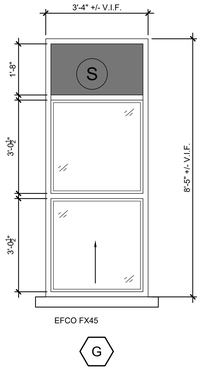




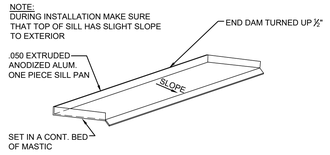




CONTRACTOR TO VERIFY ALL WINDOW SIZES PRIOR TO SHOP DRAWINGS AND FABRICATION



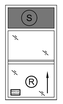
NOTE:
DURING INSTALLATION MAKE SURE THAT TOP OF SILL HAS SLIGHT SLOPE TO EXTERIOR



TYPICAL SILL PAN ISO- METRIC DETAIL @ WINDOWS

SCALE : N.T.S.

WINDOW LEGEND:

S	1" INSULATED METAL PANELS - INSTALLED IN WINDOW GLAZING POCKET BY WINDOW MANUF. • NUDO PANELS-ENDUREX 535 - 1" OVERALL - CUSTOM COLOR FACE SHEETS EXTERIOR/INTERIOR, ISOCYANATE CORE, CEMENT BOARD BACKERS.
R	RESCUE WINDOW TYPICAL
	RESCUE WINDOW TO PROVIDE MIN. CLEAR OPENING OF AT LEAST 6 SQ. FT. AND MIN. DIM. OF 24". COMPLY WITH NYSED REQUIREMENT. 6.5 SQ. FT. CLEAR AREA PROVIDED.
	STICKER TO HAVE BRIGHT YELLOW BACKGROUND W/ BLACK LETTERS TEXT TO BE READABLE FROM BOTH SIDES OF WINDOW. ANY WINDOW COVERINGS ALSO TO HAVE LABELS AND WINDOW OPERATING INSTRUCTIONS IF NOT READILY APPARENT.

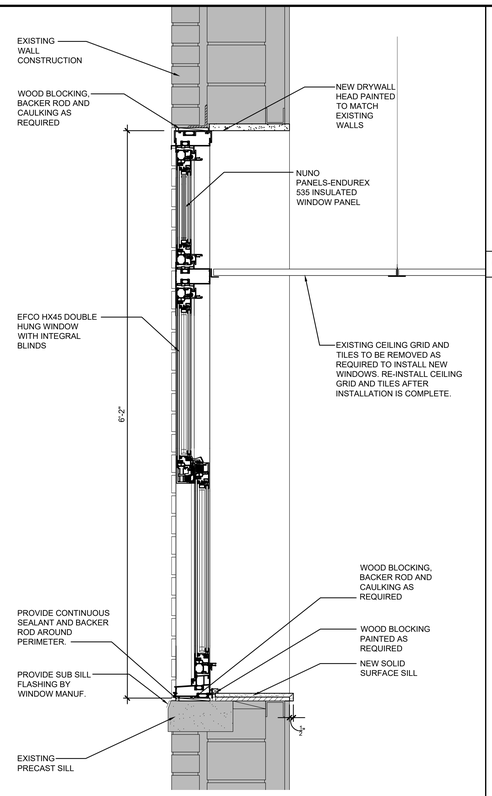
NOTE:
REFER TO DRAWING A-102 FOR RESCUE WINDOW LOCATIONS

NOTES:

1. CONTRACTOR/WINDOW MFG. TO FIELD VERIFY ALL DIMENSIONS PRIOR TO SHOP DRAWINGS AND FABRICATION.
2. ALL EXTERIOR WINDOW GLASS TO BE EFCO 1" OVERALL - ¼" CLEAR TEMPERED SNX62/27 #2, ARGON/TECHNOFORM SPACER, SCHOOL GUARD SG4.
3. WINDOWS TO BE EFCO HX45 DOUBLE HUNG WITH RESCUE WINDOW AND EFCO FX45 FIXED. WITH INTEGRAL BLINDS BOTH OPERABLE AND FIXED WINDOWS REQUIRE A OVERALL U-FACTOR OF .36 OR BELOW.
4. PROVIDE ALUM. SILL FLASHING BY WINDOW MFGR. TO MATCH EXISTING. FIELD VERIFY ALL EXISTING CONDITIONS.
5. ALL EXISTING INTERIOR WINDOW SILLS TO MATCH EXISTING. WINDOW MFGR TO PROVIDE ALUM. EXTENDER TRIM @ HEAD, JAMB, AND SILL TO MATCH WINDOW SYSTEM.
6. PROVIDE CONTINUOUS SEALANT, BACKER ROD AND TRIM AS REQUIRED, AT HEAD, JAMBS AND SILL - EXTERIOR AND INTERIOR.

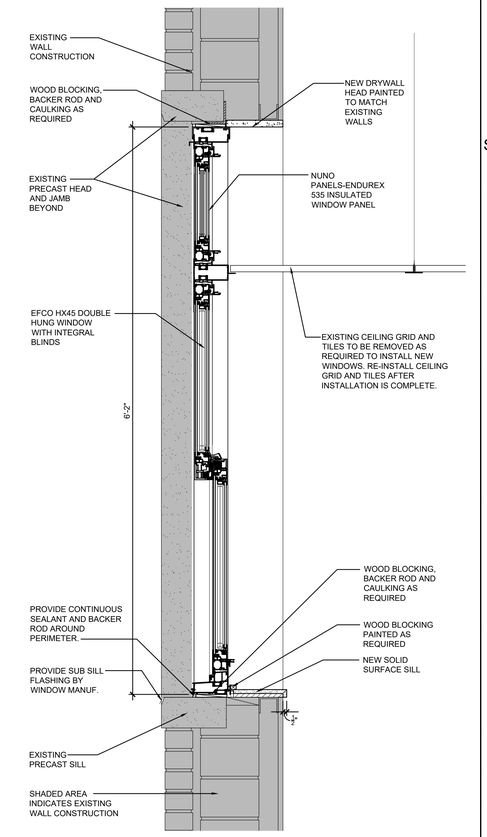


ALL NEW WINDOWS TO HAVE INTEGRAL BLINDS SIMILAR TO EXISTING WINDOWS.



1 / A-400 WINDOW SECTION

SCALE: 1 1/2"=1'-0"



2 / A-400 WINDOW SECTION

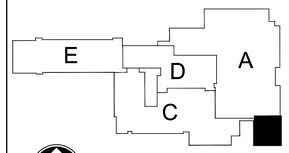
SCALE: 1 1/2"=1'-0"

HIGHLAND ASSOCIATES
architecture | engineering | interior design
102 Highland Avenue
Clarks Summit, PA 18411
570-586-4334
www.highlandassociates.com
New York • Pennsylvania

REVISION NO:

A	ADDENDUM #001	11/24/2026

- REMOVED NOTE #7



NORTH

KEY PLAN

BID DOCUMENTS

SCHOOL SED # 08-01-01-04-0-001-020
BG SED # 08-01-01-04-5-015-003

COPYRIGHT:
"HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ®" SHALL BE DEEMED THE AUTHOR OF THESE DOCUMENTS AND SHALL RETAIN ALL COMMON LAW STATUTORY AND OTHER RESERVED RIGHTS INCLUDING COPYRIGHT.

UNAUTHORIZED DOCUMENT USE:
THIS DRAWING MAY BE UTILIZED ONLY FOR THE PURPOSE OF CONSTRUCTING OR INSTALLING THE WORK SHOWN THEREON AT THE SITE OF THE WORK SPECIFIED. ANY OTHER USE OF THIS DRAWING, INCLUDING WITHOUT LIMITATION ANY REPRODUCTION OR ALTERATION OF THIS DRAWING, WITHOUT THE PRIOR WRITTEN APPROVAL OF "HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ®" IS A VIOLATION OF THE LAW AND IS PROHIBITED.

PROJECT TITLE:

Afton Central School District
29 Academy St, Afton, NY 13730

2024 Capital Project
Phase 2

SEALS:

DRAWING TITLE:

1908 BUILDING WINDOW SECTIONS AND ELEVATIONS

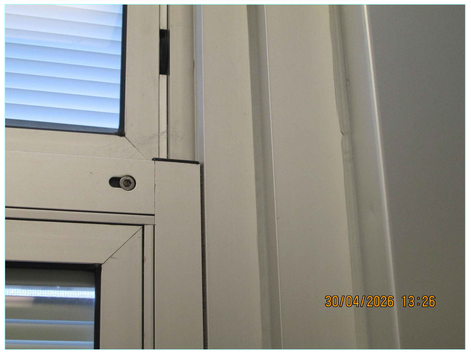
DRAWN BY:	CHECKED BY:
R.J.C.	DM
DATE:	PROJECT NO:
11/03/2026	2025-005

DRAWING NO:

A-400

CAD FILE: 5005-A-400-PH2.DWG PLOT DATE: 11/24/2026

EXISTING WINDOW CONDITIONS





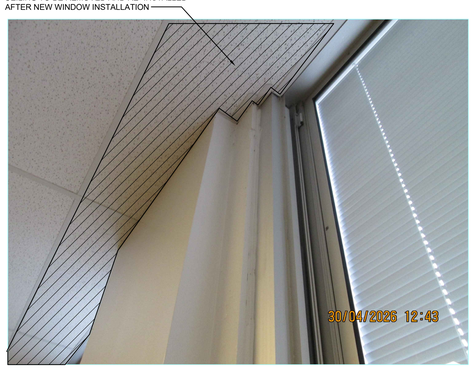
INSTALL NEW CORIAN WINDOW SILL



CEILING TO BE REMOVED AND RE- INSTALLED AFTER NEW WINDOW INSTALLATION



CEILING TO BE REMOVED AND RE- INSTALLED AFTER NEW WINDOW INSTALLATION





INSTALL NEW CORIAN WINDOW SILL





INSTALL NEW CORIAN WINDOW SILL

CEILING TO BE REMOVED AND RE- INSTALLED AFTER NEW WINDOW INSTALLATION





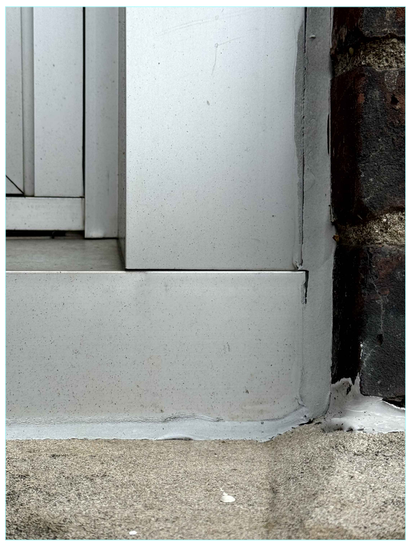




INSTALL NEW CORIAN WINDOW SILL

ADDENDUM #001 - CONTRACTOR TO REMOVE EXISTING WINDOWS PREPARE AREA FOR NEW FIXED WINDOWS TO MATCH WINDOW TYPES IN THE BASE BID. CONTRACTOR IS REASONABLE TO VERIFY WINDOW SIZES IN THE FIELD PRIOR TO SHOP DRAWINGS









HIGHLAND
ASSOCIATES
architecture | engineering | interior design

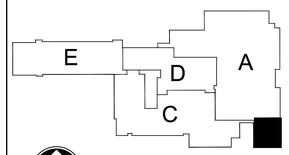
102 Highland Avenue
Clarks Summit, PA 18411
570-586-4334
www.highlandassociates.com

New York • Pennsylvania

REVISION NO:

A	ADDENDUM #001	11/24/2026

- ADDED WINDOWS TO BASE BID



NORTH

KEY PLAN

BID DOCUMENTS

SCHOOL SED # 08-01-01-04-0-001-020
BG SED # 08-01-01-04-5-015-003

COPYRIGHT:
"HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ©" SHALL BE DEEMED THE AUTHOR OF THESE DOCUMENTS AND SHALL RETAIN ALL COMMON LAW STATUTORY AND OTHER RESERVED RIGHTS INCLUDING COPYRIGHT.
UNAUTHORIZED DOCUMENT USE:
THIS DRAWING MAY BE UTILIZED ONLY FOR THE PURPOSE OF CONSTRUCTING OR INSTALLING THE WORK SHOWN THEREON AT THE SITE OF THE WORK SPECIFIED. ANY OTHER USE OF THIS DRAWING, INCLUDING WITHOUT LIMITATION ANY REPRODUCTION OR ALTERATION OF THIS DRAWING, WITHOUT THE PRIOR WRITTEN APPROVAL OF "HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ©" IS A VIOLATION OF THE LAW AND IS PROHIBITED.

PROJECT TITLE:

Afton Central School District
29 Academy St, Afton, NY 13730

2024 Capital Project
Phase 2

SEALS:

DRAWING TITLE:

1908 BUILDING
EXISTING WINDOW
CONDITION PHOTES

DRAWN BY:	CHECKED BY:
R.J.C.	DM
DATE:	PROJECT NO:
11/03/2026	2025-005

DRAWING NO:

A-401

CAD FILE: 5005-A-401-PHO.DWG PLOT DATE: 11/23/2026



WEST ELEVATION



WEST ELEVATION

ADDENDUM #001 - CONTRACTOR TO REMOVE EXISTING WINDOWS PREPARE AREA FOR NEW FIXED WINDOWS TO MATCH WINDOW TYPES IN THE BASE BID. CONTRACTOR IS REASONABLE TO VERIFY WINDOW SIZES IN THE FIELD PRIOR TO SHOP DRAWINGS



WEST ELEVATION



WEST ELEVATION

1 CONTRACTOR TO REMOVE EXISTING CAULKING JOINT AND CLEAN AREA. INSTALL NEW CAULK JOINT AROUND PERIMETER OF BUILDING AT PRECAST AND BRICK JOINT TYP.

HATCHED AREAS INDICATE APPROXIMATE AREAS OF BRICK RE-POINTING. CONTRACTOR TO REMOVE ALL LOOSE MORTAR AND TROWEL IN NEW MORTAR TO MATCH EXISTING.



NORTH ELEVATION



NORTH ELEVATION



EAST ELEVATION



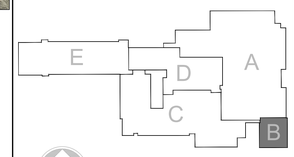
EAST ELEVATION

HIGHLAND
ASSOCIATES
architecture | engineering | interior design
102 Highland Avenue
Clarks Summit, PA 18411
570-586-4334
www.highlandassociates.com
New York • Pennsylvania

REVISION NO:

1	ADDENDUM #001	11/24/2026

- ADDED WINDOWS TO BASE BID



KEY PLAN

BID DOCUMENTS

SCHOOL SED # 08-01-01-04-0-001-020
BG SED # 08-01-01-04-5-015-003

COPYRIGHT:
"HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ©" SHALL BE DEEMED THE AUTHOR OF THESE DOCUMENTS AND SHALL RETAIN ALL COMMON LAW STATUTORY AND OTHER RESERVED RIGHTS INCLUDING COPYRIGHT.
UNAUTHORIZED DOCUMENT USE:
THIS DRAWING MAY BE UTILIZED ONLY FOR THE PURPOSE OF CONSTRUCTING OR INSTALLING THE WORK SHOWN THEREON AT THE SITE OF THE WORK SPECIFIED. ANY OTHER USE OF THIS DRAWING, INCLUDING WITHOUT LIMITATION ANY REPRODUCTION OR ALTERATION OF THIS DRAWING, WITHOUT THE PRIOR WRITTEN APPROVAL OF "HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ©" IS A VIOLATION OF THE LAW AND IS PROHIBITED.

PROJECT TITLE:

Afton Central School District
29 Academy St, Afton, NY 13730

2024 Capital Project
Phase 2

SEALS:

DRAWING TITLE:

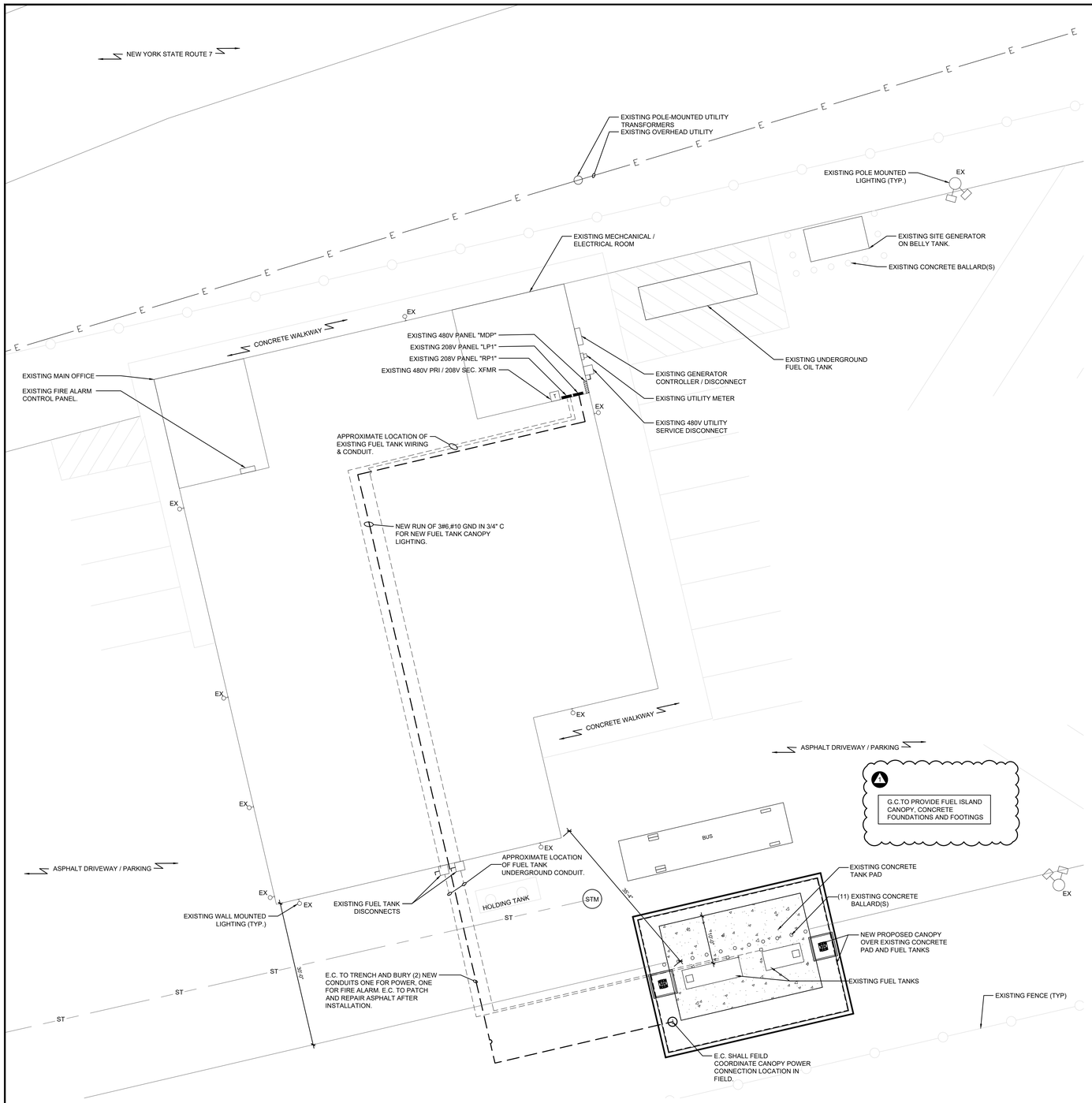
1908 BUILDING
BRICK RE-POINTING
ELEVATIONS

DRAWN BY:	CHECKED BY:
RJC	DM
DATE:	PROJECT NO:
11/03/2026	2025-005

DRAWING NO:

A-500

CAD FILE: 5005-A-500-PH2.DWG PLOT DATE: 11/23/2026



AFTON TRANSPORTATION BUILDING SITE RENOVATION - FUEL TANK CANOPY

SCALE: 1"=10'-0"

HIGHLAND ASSOCIATES
architecture | engineering | interior design
102 Highland Avenue
Clarks Summit, PA 18411
570-586-4334
www.highlandassociates.com
New York • Pennsylvania

REVISION NO:

A	ADDENDUM #001	11/24/2026

- ADDED GENERAL NOTE

BG

BID DOCUMENTS

SCHOOL SED # 08-01-01-04-0-001-020
BG SED # 08-01-01-04-5-015-003

COPYRIGHT:
"HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ®" SHALL BE DEEMED THE AUTHOR OF THESE DOCUMENTS AND SHALL RETAIN ALL COMMON LAW STATUTORY AND OTHER RESERVED RIGHTS INCLUDING COPYRIGHT.
UNAUTHORIZED DOCUMENT USE:
THIS DRAWING MAY BE UTILIZED ONLY FOR THE PURPOSE OF CONSTRUCTING OR INSTALLING THE WORK SHOWN THEREON AT THE SITE OF THE WORK SPECIFIED. ANY OTHER USE OF THIS DRAWING, INCLUDING WITHOUT LIMITATION ANY REPRODUCTION OR ALTERATION OF THIS DRAWING, WITHOUT THE PRIOR WRITTEN APPROVAL OF "HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ®" IS A VIOLATION OF THE LAW AND IS PROHIBITED.

PROJECT TITLE:

Afton Central School District
29 Academy St, Afton, NY 13730

2024 Capital Project
Phase 2

SEALS:

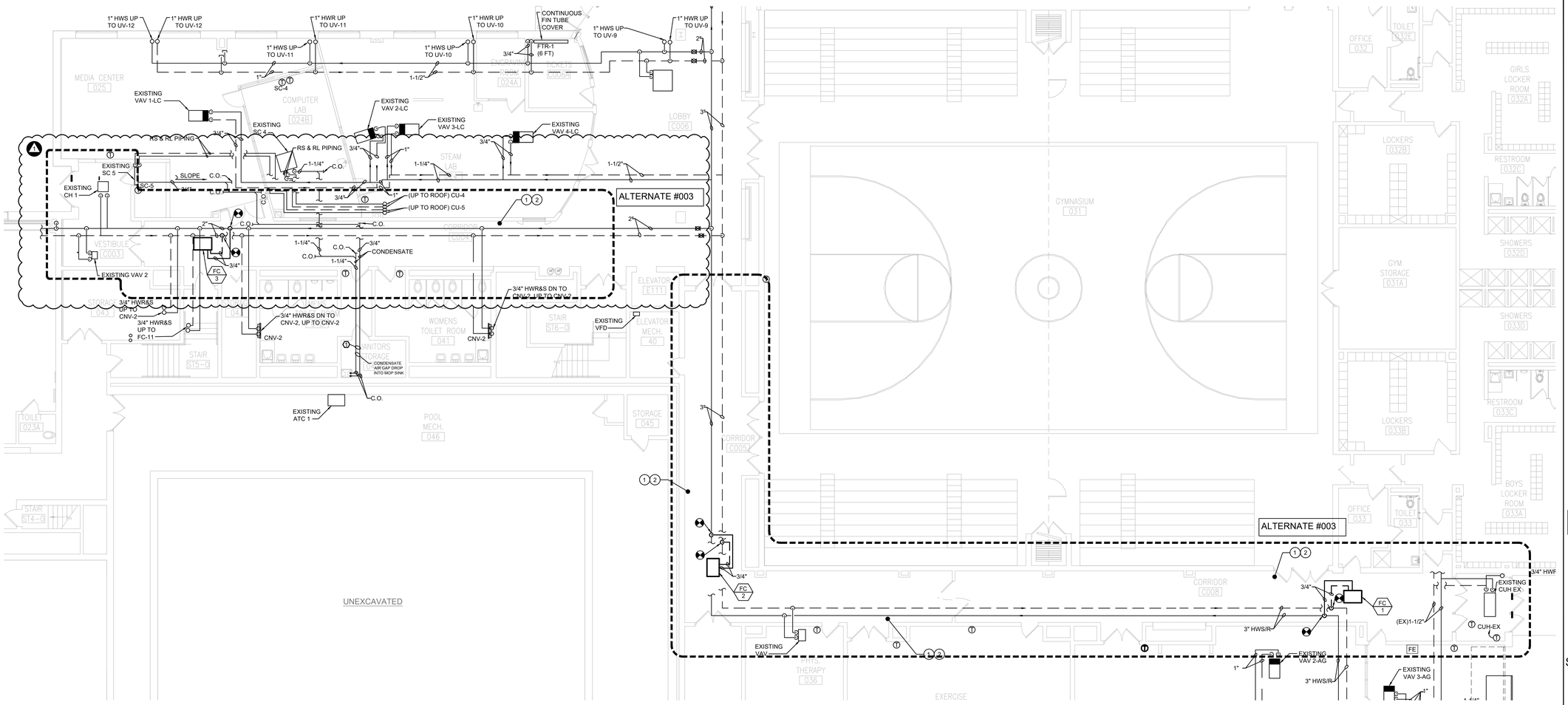
DRAWING TITLE:
CANOPY
AT BUS FUELING
STATION

DRAWN BY:	CHECKED BY:
RJC	DM
DATE:	PROJECT NO:
11/03/2026	2025-005

DRAWING NO:

S-100

CAD FILE: 5005-S-100.DWG PLOT DATE: 11/24/2026



GROUND FLOOR PIPING RENOVATION PLAN - PART D & A

SCALE: 1/8"=1'-0"

KEYED NOTES:

1. THERE IS NO HVAC SYSTEMS SERVING THIS CORRIDOR PROPER.
2. THERE ARE NO DOORS WITH DOOR LOUVERS IN THIS CORRIDOR.

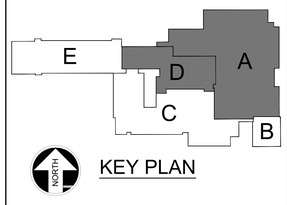
HIGHLAND ASSOCIATES
architecture | engineering | interior design

102 Highland Avenue
Clarks Summit, PA 18411
570-586-4334
www.highlandassociates.com
New York • Pennsylvania

REVISION NO:

1	ADDENDUM #001	11/24/2026

- ADDED CEILING @ VESTIBULE C003 TO SCOPE OF WORK.



KEY PLAN

BID DOCUMENTS

SCHOOL SED # 08-01-01-04-0-001-020
BG SED # 08-01-01-04-5-015-003

COPYRIGHT:
"HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ©" SHALL BE DEEMED THE AUTHOR OF THESE DOCUMENTS AND SHALL RETAIN ALL COMMON LAW STATUTORY AND OTHER RESERVED RIGHTS INCLUDING COPYRIGHT.

UNAUTHORIZED DOCUMENT USE:
THIS DRAWING MAY BE UTILIZED ONLY FOR THE PURPOSE OF CONSTRUCTING OR INSTALLING THE WORK SHOWN THEREON AT THE SITE OF THE WORK SPECIFIED. ANY OTHER USE OF THIS DRAWING, INCLUDING WITHOUT LIMITATION ANY REPRODUCTION OR ALTERATION OF THIS DRAWING, WITHOUT THE PRIOR WRITTEN APPROVAL OF "HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ©" IS A VOLATION OF THE LAW AND IS PROHIBITED.

PROJECT TITLE:

Afton Central School District
29 Academy St, Afton, NY 13730

2024 Capital Project
Phase 2

SEALS:

DRAWING TITLE:

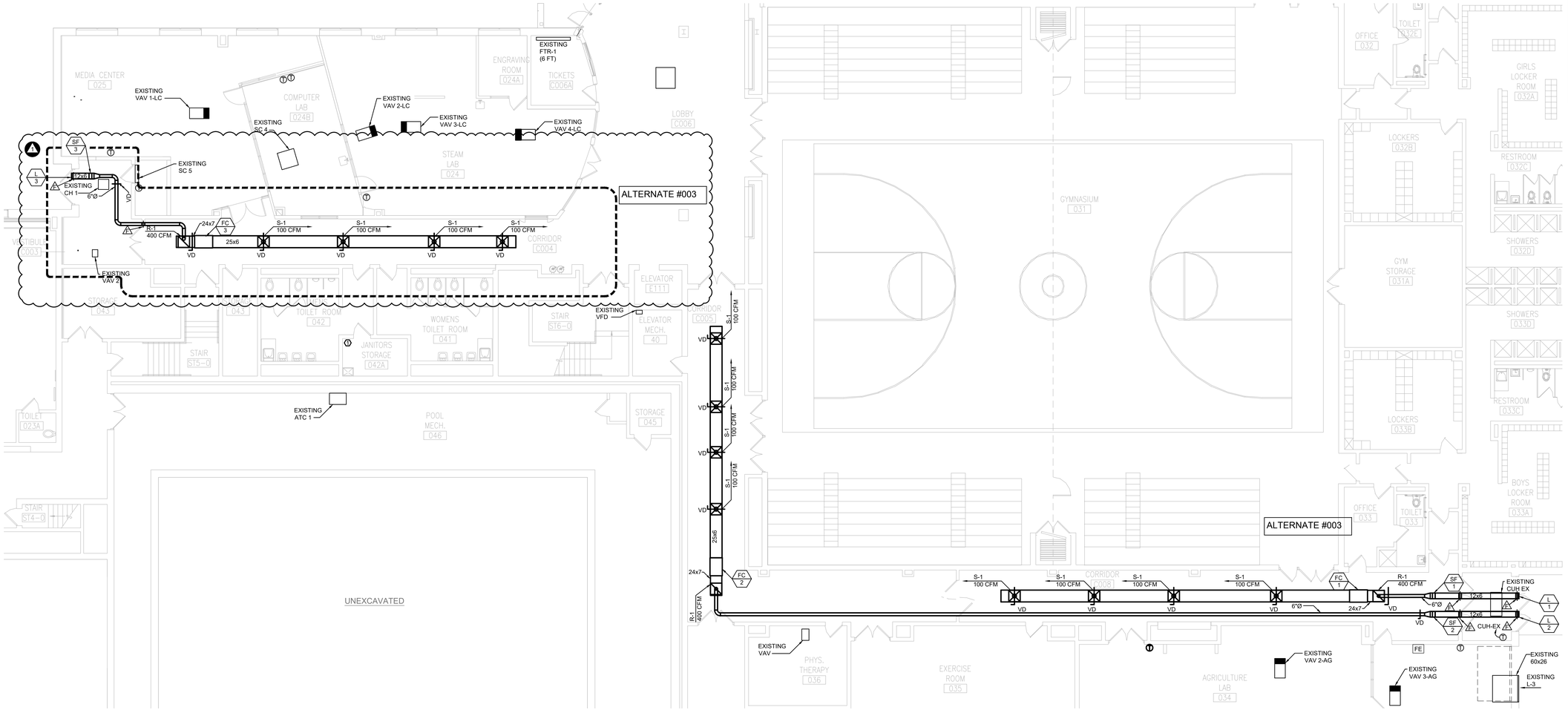
GROUND FLOOR PIPING RENOVATION PLAN

DRAWN BY:	CHECKED BY:
F.R.G.	A.J.L.
DATE:	PROJECT NO:
11/03/2026	2025-005

DRAWING NO:

M-100

CAD FILE: 5005-M-100-PH2.DWG PLOT DATE: 11/24/2026



GROUND FLOOR DUCTWORK RENOVATION PLAN - PART D & A

SCALE: 1/8"=1'-0"

KEYED NOTES:

1. THERE IS NO HVAC SYSTEMS SERVING THIS CORRIDOR PROPER.
2. THERE ARE NO DOORS WITH DOOR LOUVERS IN THIS CORRIDOR.

HIGHLAND ASSOCIATES
architecture | engineering | interior design

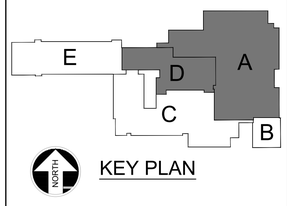
102 Highland Avenue
Clarks Summit, PA 18411
570-586-4334
www.highlandassociates.com

New York • Pennsylvania

REVISION NO:

1	ADDENDUM #001	11/24/2026

- ADDED CEILING @ VESTIBULE C003 TO SCOPE OF WORK.



KEY PLAN

BID DOCUMENTS

SCHOOL SED # 08-01-01-04-0-001-020
BG SED # 08-01-01-04-5-015-003

COPYRIGHT:
"HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ©" SHALL BE DEEMED THE AUTHOR OF THESE DOCUMENTS AND SHALL RETAIN ALL COMMON LAW STATUTORY AND OTHER RESERVED RIGHTS INCLUDING COPYRIGHT.

UNAUTHORIZED DOCUMENT USE:
THIS DRAWING MAY BE UTILIZED ONLY FOR THE PURPOSE OF CONSTRUCTING OR INSTALLING THE WORK SHOWN THEREON AT THE SITE OF THE WORK SPECIFIED. ANY OTHER USE OF THIS DRAWING, INCLUDING WITHOUT LIMITATION ANY REPRODUCTION OR ALTERATION OF THIS DRAWING, WITHOUT THE PRIOR WRITTEN APPROVAL OF "HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ©" IS A VIOLATION OF THE LAW AND IS PROHIBITED.

PROJECT TITLE:

Afton Central School District
29 Academy St, Afton, NY 13730

2024 Capital Project
Phase 2

SEALS:

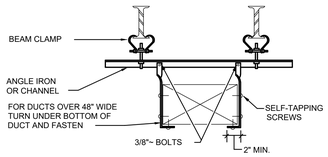
DRAWING TITLE:
GROUND FLOOR DUCTWORK RENOVATION PLAN

DRAWN BY:	CHECKED BY:
F.R.G.	A.J.L.
DATE:	PROJECT NO:
11/03/2026	2025-005

DRAWING NO:

M-101

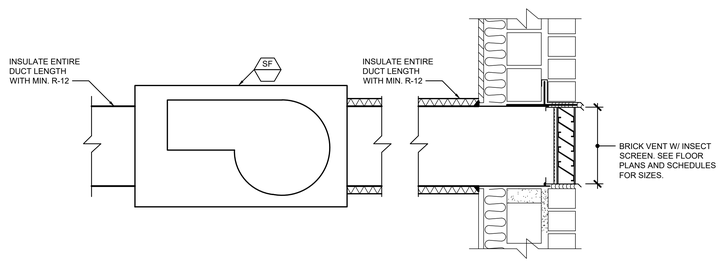
CAD FILE: 5005-M-101-PH2.DWG PLOT DATE: 11/24/2026



DUCT SIZE	HANGER SIZE	MAX. SPACING
UP THRU 2 SQ. FT.	1" X 1/16"	8' - 0"
2 THRU 4 SQ. FT	1" X 1/8"	8' - 0"
4 THRU 10 SQ. FT.	1" X 1/8"	6' - 0"
OVER 10 SQ. FT.	1" X 1/8"	4' - 0"

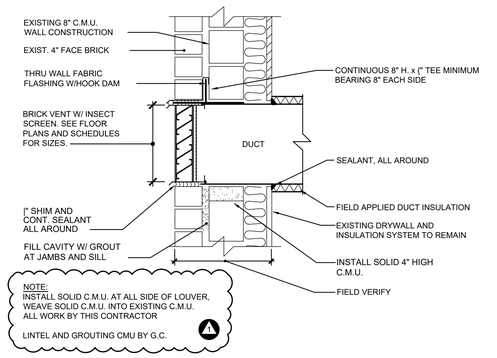
DUCT HANGING DETAIL AND SCHEDULE OF SUPPORTS

NOT TO SCALE



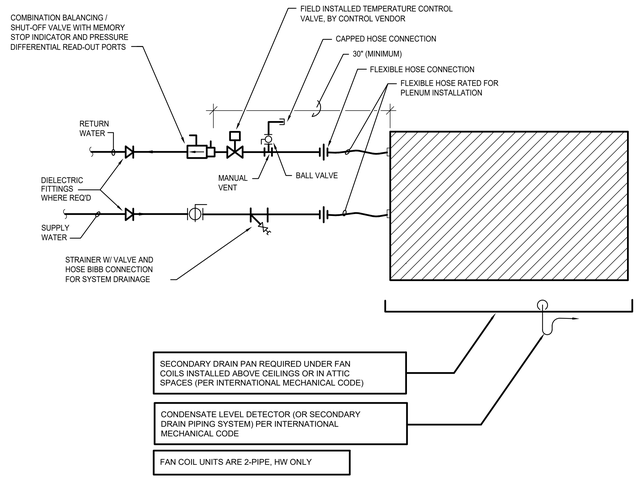
TYPICAL GOOSENECK DETAIL

NOT TO SCALE



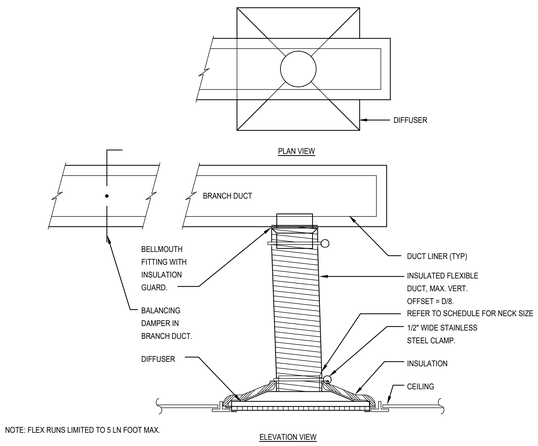
BRICK VENT DETAIL

NOT TO SCALE



FAN COIL UNIT PIPING DETAIL (TYPICAL)

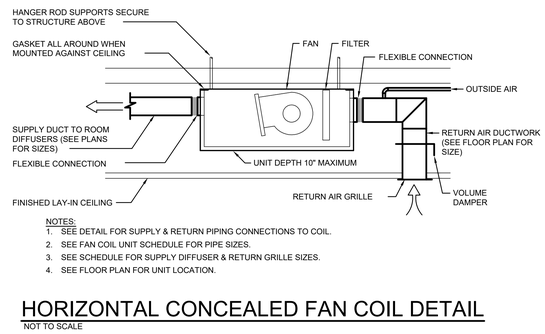
NOT TO SCALE



NOTE: FLEX RUNS LIMITED TO 5 LN FOOT MAX.

SUPPLY AIR DIFFUSER DETAIL (BOTTOM TAP)

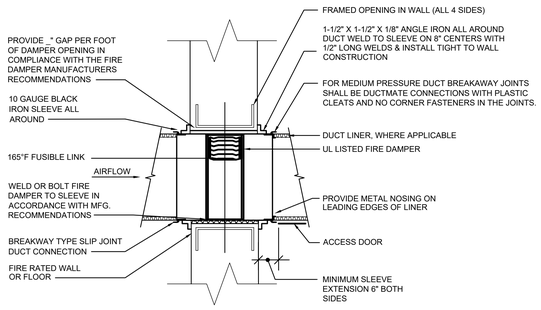
NO SCALE



NOTES:
1. SEE DETAIL FOR SUPPLY & RETURN PIPING CONNECTIONS TO COIL.
2. SEE FAN COIL UNIT SCHEDULE FOR PIPE SIZES.
3. SEE SCHEDULE FOR SUPPLY DIFFUSER & RETURN GRILLE SIZES.
4. SEE FLOOR PLAN FOR UNIT LOCATION.

HORIZONTAL CONCEALED FAN COIL DETAIL

NOT TO SCALE

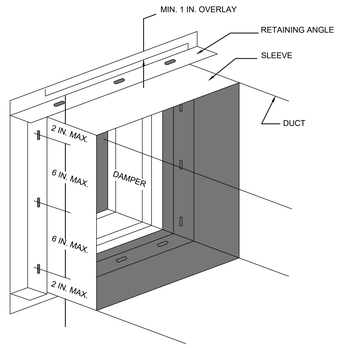


NOTES:
1. HORIZONTAL MOUNTED DAMPERS SHALL HAVE STAINLESS STEEL NEGATOR SPRING

2. PROVIDE FIRE DAMPER WITH ONE - SIDED RETAINING ANGLES WHERE TWO - SIDED RETAINING ANGLES SHALL BE UNACCESSABLE.

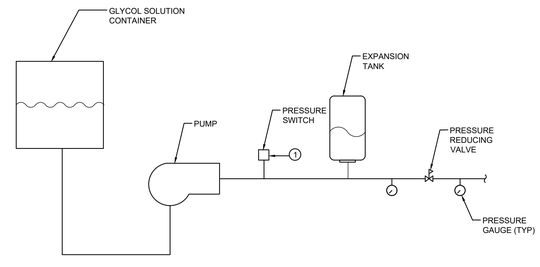
TYPE A FIRE DAMPER DETAIL

NOT TO SCALE



FIRE DAMPER RETAINING ANGLE DETAIL

NOT TO SCALE



① PUMP ON AT 60 PSI
PUMP OFF AT 80 PSI

GLYCOL FILL DETAIL

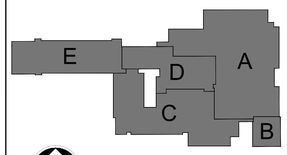
NOT TO SCALE

HIGHLAND ASSOCIATES
architecture | engineering | interior design
102 Highland Avenue
Clarks Summit, PA 18411
570-586-4334
www.highlandassociates.com
New York • Pennsylvania

REVISION NO:

1	ADDENDUM #001	11/24/2026

- ADJUSTED BRICK VENT DETAIL TO SHOW LINTEL AND GROUTING CMU BY G.C..



KEY PLAN

BID DOCUMENTS

SCHOOL SED # 08-01-01-04-0-001-020
BG SED # 08-01-01-04-5-015-003

COPYRIGHT:
"HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ®" SHALL BE DEEMED THE AUTHOR OF THESE DOCUMENTS AND SHALL RETAIN ALL COMMON LAW STATUTORY AND OTHER RESERVED RIGHTS INCLUDING COPYRIGHT.
UNAUTHORIZED DOCUMENT USE:
THIS DRAWING MAY BE UTILIZED ONLY FOR THE PURPOSE OF CONSTRUCTING OR INSTALLING THE WORK SHOWN THEREON AT THE SITE OF THE WORK SPECIFIED. ANY OTHER USE OF THIS DRAWING, INCLUDING WITHOUT LIMITATION ANY REPRODUCTION OR ALTERATION OF THIS DRAWING, WITHOUT THE PRIOR WRITTEN APPROVAL OF "HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ®" IS A VIOLATION OF THE LAW AND IS PROHIBITED.

PROJECT TITLE:

Afton Central School District
29 Academy St, Afton, NY 13730

2024 Capital Project
Phase 2

SEALS:

DRAWING TITLE:

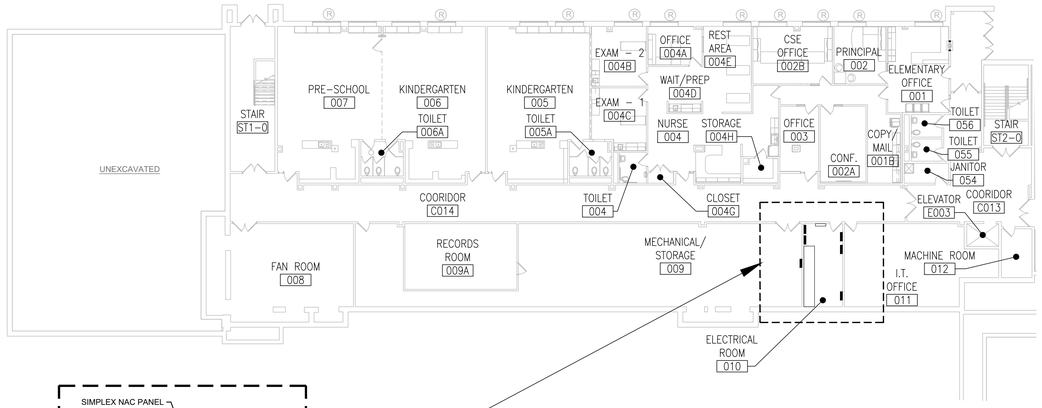
DETAILS

DRAWN BY:	CHECKED BY:
F.R.G.	A.J.L.
DATE:	PROJECT NO:
11/03/2026	2025-005

DRAWING NO:

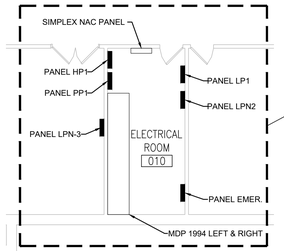
M-200

CAD FILE: 5005-M-200-PH2.DWG PLOT DATE: 11/24/2026



AFTON SCHOOL GROUND FLOOR COMPOSITE PLAN PART E

SCALE 1/16" = 1'-0"



ELECTRICAL ROOM 010

SCALE 1/8" = 1'-0"

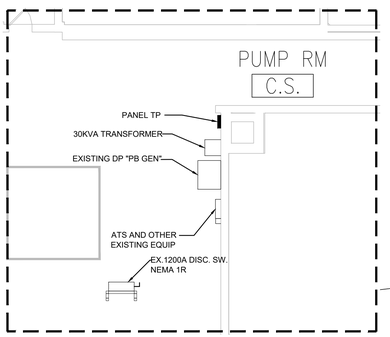
ALL WORK ASSOCIATED WITH C008/C005 & C003/C004 IS PART OF ALTERNATE #003.

ALTERNATE #003: CORRIDOR C004 & VESTIBULE C003 RENOVATION E-101.

ALTERNATE #003: CORRIDOR RENOVATION E-100.

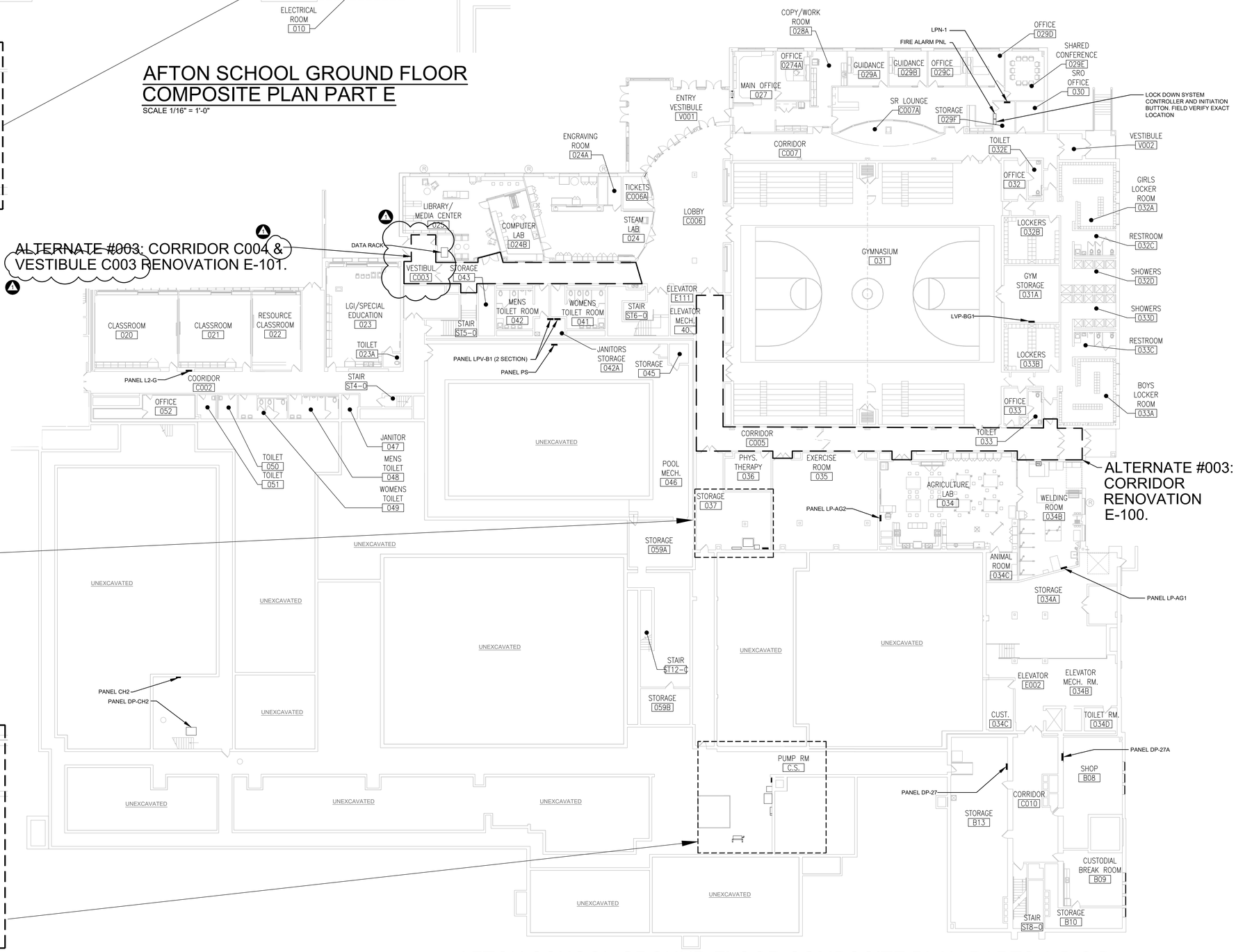
STORAGE ROOM 037

SCALE 1/8" = 1'-0"



CRAWLSPACE PUMP ROOM

SCALE 1/8" = 1'-0"



AFTON SCHOOL GROUND FLOOR COMPOSITE PLAN PARTS A,B,C,D

SCALE 1/16" = 1'-0"

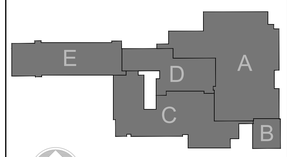
HIGHLAND ASSOCIATES
architecture | engineering | interior design
102 Highland Avenue
Clarks Summit, PA 18411
570-586-4334
www.highlandassociates.com
New York • Pennsylvania

REVISION NO:

1	ADDENDUM #001	11/24/2026

- ADDED CEILING @ VESTIBULE C0003 TO SCOPE OF WORK

BG



KEY PLAN

BID DOCUMENTS

SCHOOL SED # 08-01-01-04-0-001-020
BG SED # 08-01-01-04-5-015-003

COPYRIGHT:
"HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ©" SHALL BE DEEMED THE AUTHOR OF THESE DOCUMENTS AND SHALL RETAIN ALL COMMON LAW STATUTORY AND OTHER RESERVED RIGHTS INCLUDING COPYRIGHT.
UNAUTHORIZED DOCUMENT USE:
THIS DRAWING MAY BE UTILIZED ONLY FOR THE PURPOSE OF CONSTRUCTING OR INSTALLING THE WORK SHOWN THEREON AT THE SITE OF THE WORK SPECIFIED. ANY OTHER USE OF THIS DRAWING, INCLUDING WITHOUT LIMITATION ANY REPRODUCTION OR ALTERATION OF THIS DRAWING, WITHOUT THE PRIOR WRITTEN APPROVAL OF "HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ©" IS A VOLATION OF THE LAW AND IS PROHIBITED.

PROJECT TITLE:

Afton Central School District
29 Academy St, Afton, NY 13730

2024 Capital Project
Phase 2

SEALS:

DRAWING TITLE:

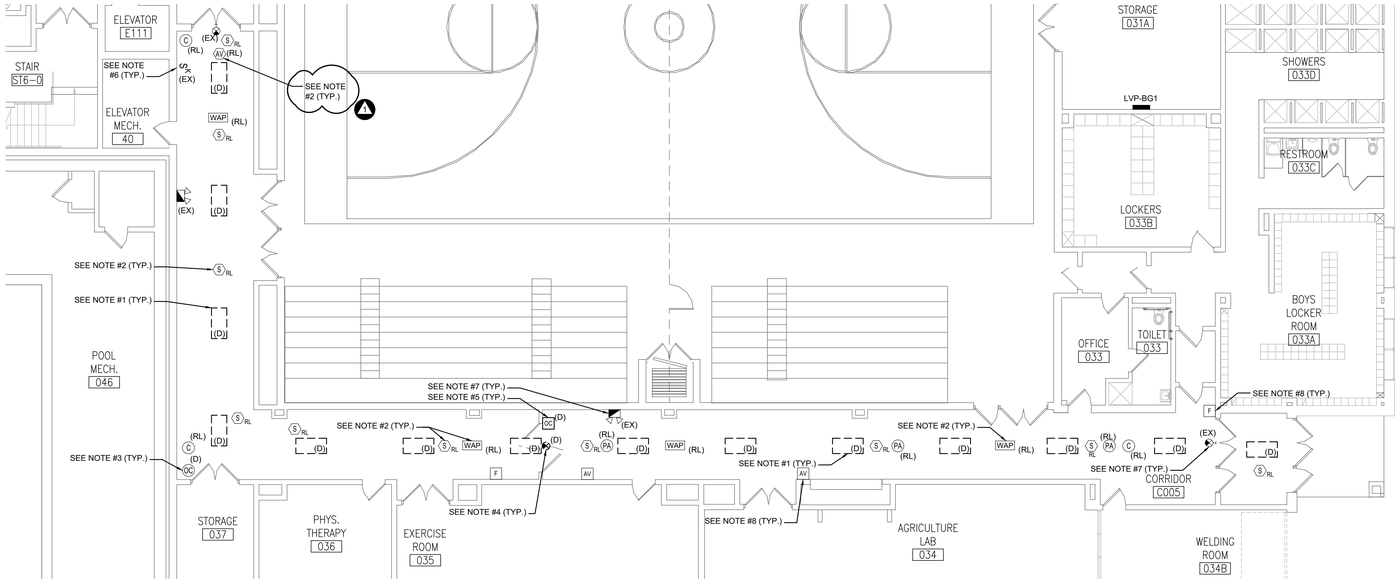
ELECTRICAL COMPOSITE PLAN GROUND FLOOR

DRAWN BY:	CHECKED BY:
MLT / TBH	LKN
DATE:	PROJECT NO:
11/03/2026	2025-005

DRAWING NO:

E-001

CAD FILE: 5005.2-E-001.DWG PLOT DATE: 11/24/2026



CORRIDOR C005/C008 DEMOLITION PLAN

SCALE 1/8" = 1'-0"

1. E.C. SHALL REMOVE EXISTING LIGHTING FIXTURE AND KEEP EXISTING WIRING AND CONDUIT FOR NEW LIGHTING IN RENOVATION.

2. E.C. SHALL TEMPORARILY REMOVE OR SUSPEND/SUPPORT EXISTING WIFI DEVICE, SMOKE/HEAT DETECTOR, AUDIO/VISUAL FIRE ALARM DEVICE, OR CAMERA. AND REINSTALL INTO NEW CEILING TILE IN RENOVATION.

3. E.C. SHALL REMOVE EXISTING CEILING LIGHTING OCCUPANCY SENSOR, KEEPING ALL WIRING AND CONDUIT FOR NEW WORK.

4. E.C. SHALL REMOVE EXISTING EMERGENCY EXIT SIGN, LEAVING ALL WIRING AND CONDUIT FOR NEW SIGN IN RENOVATION.

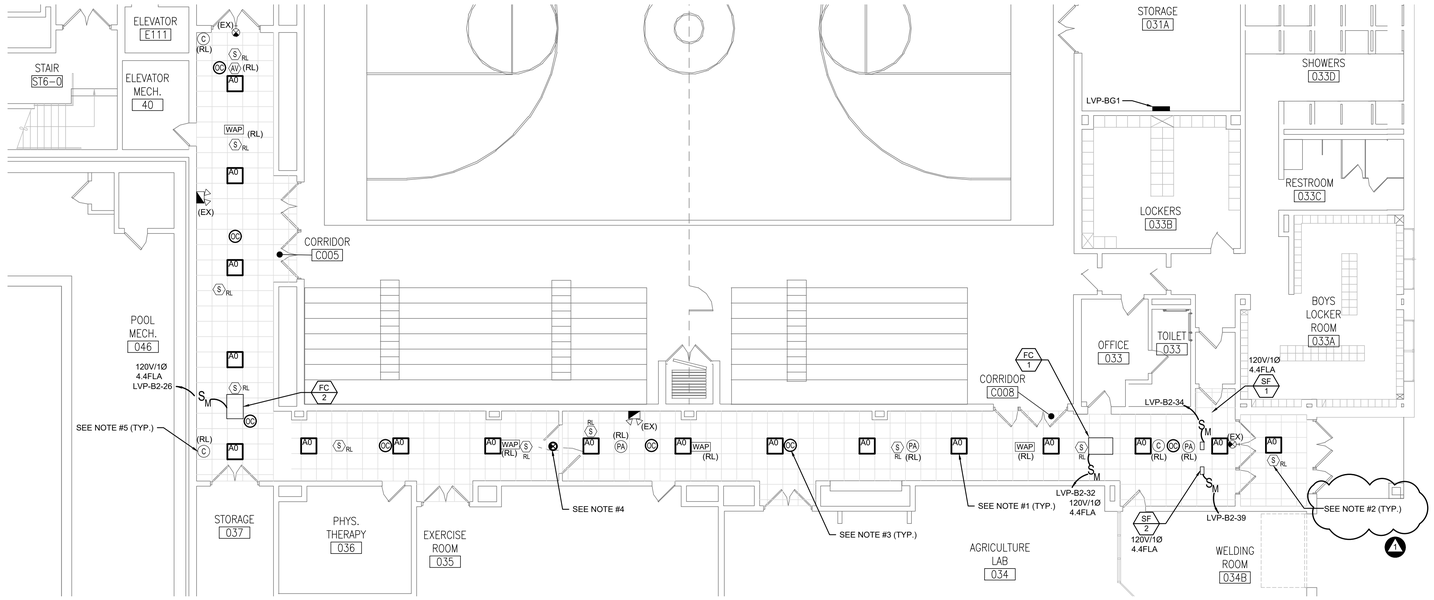
5. EXISTING WALL MOUNTED OCCUPANCY SENSOR SHALL BE REMOVED IN DEMOLITION AND TO BE REPLACED BY CEILING MOUNTED OCCUPANCY SENSOR IN NEW WORK.

6. EXISTING WALL MOUNTED LIGHT SWITCH, SHOWN FOR REFERENCE.

7. EXISTING WALL MOUNTED EMERGENCY EXIT SIGN / EMERGENCY TWIN HEAD FIXTURE TO REMAIN, DEVICES SHOWN FOR REFERENCE.

8. EXISTING FIRE ALARM DEVICE SHOWN FOR REFERENCE.

ALL WORK ASSOCIATED WITH C008/C005 IS PART OF ALTERNATE #003.



CORRIDOR C005/C008 RENOVATION PLAN

SCALE 1/8" = 1'-0"

1. E.C.SHALL RECONNECT NEW LIGHTING FIXTURE TO EXISTING CIRCUIT WHICH SERVES SPACE. E.C. SHALL EXTEND WIRING AND CONDUIT AS NEEDED FOR COMPLETE INSTALLATION.

2. E.C. SHALL REINSTALL ANY WIFI DEVICE, SMOKE/HEAT DETECTOR, AUDIO/VISUAL FIRE ALARM DEVICE, OR PA SYSTEM DEVICE THAT WAS REMOVED OR SUSPENDED/SUPPORTED IN DEMOLITION. DEVICE SHALL BE REINSTALLED IN CENTER OF TILE.

3. E.C. SHALL RECONNECT NEW CEILING OCCUPANCY SENSOR TO EXISTING CIRCUIT WHICH SERVES SPACE. E.C. SHALL EXTEND WIRING AND CONDUIT AS NEEDED FOR COMPLETE INSTALLATION. OCCUPANCY SENSOR SHALL TURN OFF AFTER SET TIME OF NO OCCUPANCY AND TURN LIGHTS ON WHEN PERSON(S) ENTERS CORRIDOR.

4. E.C. SHALL RECONNECT NEW CEILING MOUNTED EMERGENCY EXIT SIGN TO EXISTING CIRCUIT. E.C. SHALL EXTEND WIRING AND CONDUIT AS NEEDED FOR COMPLETE INSTALLATION.

5. E.C. SHALL EXTEND CONDUIT AND WIRE AS REQUIRED FOR INSTALLATION, DEVICE TO BE REINSTALLED IN CENTER OF TILE. E.C. SHALL COORDINATE CAMERA AIM WITH DISTRICT. DEVICE SHALL BE REINSTALLED IN CENTER OF TILE.

HIGHLAND
ASSOCIATES
architecture | engineering | interior design
102 Highland Avenue
Clarks Summit, PA 18411
570-586-4334
www.highlandassociates.com
New York • Pennsylvania

REVISION NO:

1	ADDENDUM #001	11/24/2026

- DESIGN REVIEW COMMENTS



KEY PLAN

BID DOCUMENTS

SCHOOL SED # 08-01-01-04-0-001-020
BG SED # 08-01-01-04-5-015-003

COPYRIGHT:
"HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ©" SHALL BE DEEMED THE AUTHOR OF THESE DOCUMENTS AND SHALL RETAIN ALL COMMON LAW STATUTORY AND OTHER RESERVED RIGHTS INCLUDING COPYRIGHT.
UNAUTHORIZED DOCUMENT USE:
THIS DRAWING MAY BE UTILIZED ONLY FOR THE PURPOSE OF CONSTRUCTING OR INSTALLING THE WORK SHOWN THEREON AT THE SITE OF THE WORK SPECIFIED. ANY OTHER USE OF THIS DRAWING, INCLUDING WITHOUT LIMITATION ANY REPRODUCTION OR ALTERATION OF THIS DRAWING, WITHOUT THE PRIOR WRITTEN APPROVAL OF "HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ©" IS A VIOLATION OF THE LAW AND IS PROHIBITED.

PROJECT TITLE:

Afton Central School District
29 Academy St, Afton, NY 13730

2024 Capital Project
Phase 2

SEALS:

DRAWING TITLE:

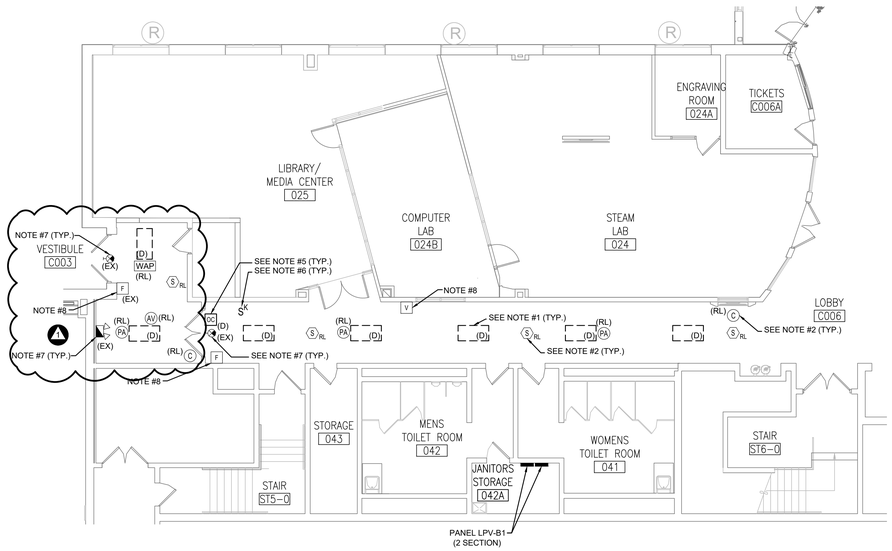
ELECTRICAL PLAN
GROUND FLOOR
CORRIDOR C005/C008

DRAWN BY:	CHECKED BY:
MLT / TBH	LKN
DATE:	PROJECT NO:
11/03/2026	2025-005

DRAWING NO:

E-100

CAD FILE: 5005.2-E-100.DWG PLOT DATE: 11/24/2026



CORRIDOR C004 DEMOLITION PLAN

SCALE 1/8" = 1'-0"

1. E.C. SHALL REMOVE EXISTING LIGHTING FIXTURE AND KEEP EXISTING WIRING AND CONDUIT FOR NEW LIGHTING IN RENOVATION.

2. E.C. SHALL TEMPORARILY REMOVE OR SUSPEND/SUPPORT EXISTING WIFI DEVICE, SMOKE/HEAT DETECTOR, AUDIO/VISUAL FIRE ALARM DEVICE, OR CAMERA. AND REINSTALL INTO NEW CEILING TILE IN RENOVATION.

3. E.C. SHALL REMOVE EXISTING CEILING LIGHTING OCCUPANCY SENSOR, KEEPING ALL WIRING AND CONDUIT FOR NEW WORK.

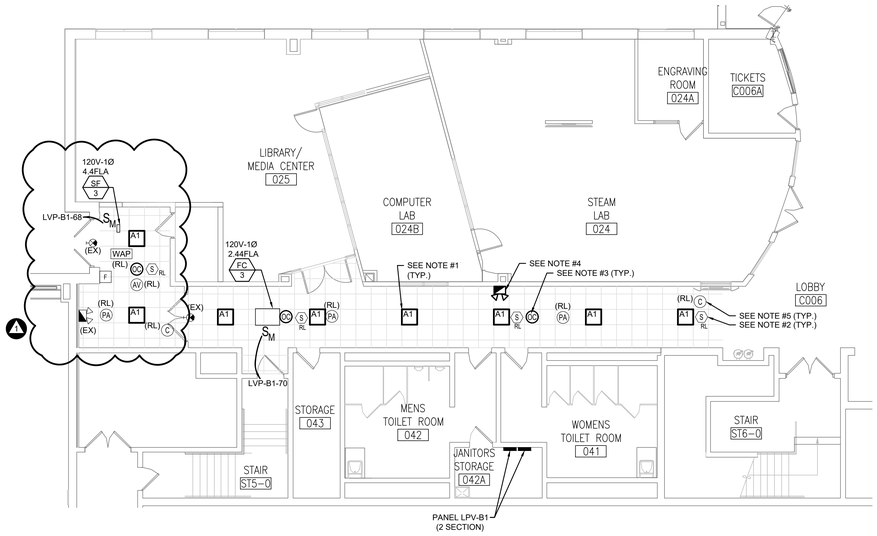
4. E.C. SHALL REMOVE EXISTING EMERGENCY EXIT SIGN, LEAVING ALL WIRING AND CONDUIT FOR NEW SIGN IN RENOVATION.

5. E.C. SHALL REMOVE EXISTING WALL MOUNTED OCCUPANCY SENSOR, SURFACE RACEWAY & DEVICE BOX. SENSOR TO BE REPLACED WITH CEILING MOUNTED SENSOR.

6. EXISTING WALL MOUNTED LIGHT SWITCH, SHOWN FOR REFERENCE.

7. EXISTING WALL MOUNTED EMERGENCY EXIT SIGN / EMERGENCY TWIN HEAD FIXTURE TO REMAIN, DEVICES SHOWN FOR REFERENCE.

8. EXISTING WALL MOUNTED FIRE ALARM DEVICE SHOWN FOR REFERENCE.



CORRIDOR C004 RENOVATION PLAN

SCALE 1/8" = 1'-0"

1. E.C.SHALL RECONNECT NEW LIGHTING FIXTURE TO EXISTING CIRCUIT WHICH SERVES SPACE. E.C. SHALL EXTEND WIRING AND CONDUIT AS NEEDED FOR COMPLETE INSTALLATION.

2. E.C. SHALL REINSTALL ANY WIFI DEVICE, SMOKE/HEAT DETECTOR, OR AUDIO/VISUAL FIRE ALARM DEVICE, THAT WAS REMOVED OR SUSPENDED/SUPPORTED IN DEMOLITION. DEVICE SHALL BE REINSTALLED IN CENTER OF TILE.

3. E.C. SHALL RECONNECT NEW CEILING OCCUPANCY SENSOR TO EXISTING CIRCUIT WHICH SERVES SPACE. E.C. SHALL EXTEND WIRING AND CONDUIT AS NEEDED FOR COMPLETE INSTALLATION. OCCUPANCY SENSOR SHALL TURN OFF AFTER SET TIME OF NO OCCUPANCY AND TURN LIGHTS ON WHEN PERSON(S) ENTERS CORRIDOR. DEVICE SHALL BE CENTERED ON TILE.

4. E.C. SHALL INSTALL NEW TWINHEAD FIXTURE AHEAD OF SWITCHING WITHIN CORRIDOR.

5. E.C. SHALL EXTEND CONDUIT AND WIRE AS REQUIRED FOR INSTALLATION, DEVICE TO BE REINSTALLED IN CENTER OF TILE. E.C. SHALL COORDINATE CAMERA AIM WITH DISTRICT.

ALL WORK ASSOCIATED WITH C004/C003 IS PART OF ALTERNATE #003.

HIGHLAND
ASSOCIATES
architecture | engineering | interior design

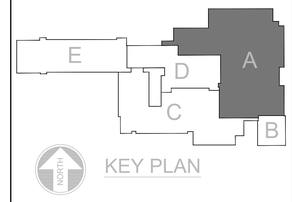
102 Highland Avenue
Clarks Summit, PA 18411
570-586-4334
www.highlandassociates.com

New York • Pennsylvania

REVISION NO:

1	ADDENDUM #001	11/24/2026

- ADDED CEILING @ VESTIBULE C0003 TO SCOPE OF WORK
- DESIGN REVIEW COMMENTS



KEY PLAN

BID DOCUMENTS

SCHOOL SED # 08-01-01-04-0-001-020
BG SED # 08-01-01-04-5-015-003

COPYRIGHT:
©HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ℗ SHALL BE DEEMED THE AUTHOR OF THESE DOCUMENTS AND SHALL RETAIN ALL COMMON LAW STATUTORY AND OTHER RESERVED RIGHTS INCLUDING COPYRIGHT.
UNAUTHORIZED DOCUMENT USE:
THIS DRAWING MAY BE UTILIZED ONLY FOR THE PURPOSE OF CONSTRUCTING OR INSTALLING THE WORK SHOWN THEREON AT THE SITE OF THE WORK SPECIFIED. ANY OTHER USE OF THIS DRAWING, INCLUDING WITHOUT LIMITATION ANY REPRODUCTION OR ALTERATION OF THIS DRAWING, WITHOUT THE PRIOR WRITTEN APPROVAL OF ©HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ℗ IS A VOLATION OF THE LAW AND IS PROHIBITED.

PROJECT TITLE:

Afton Central School District
29 Academy St, Afton, NY 13730

2024 Capital Project
Phase 2

SEALS:

DRAWING TITLE:

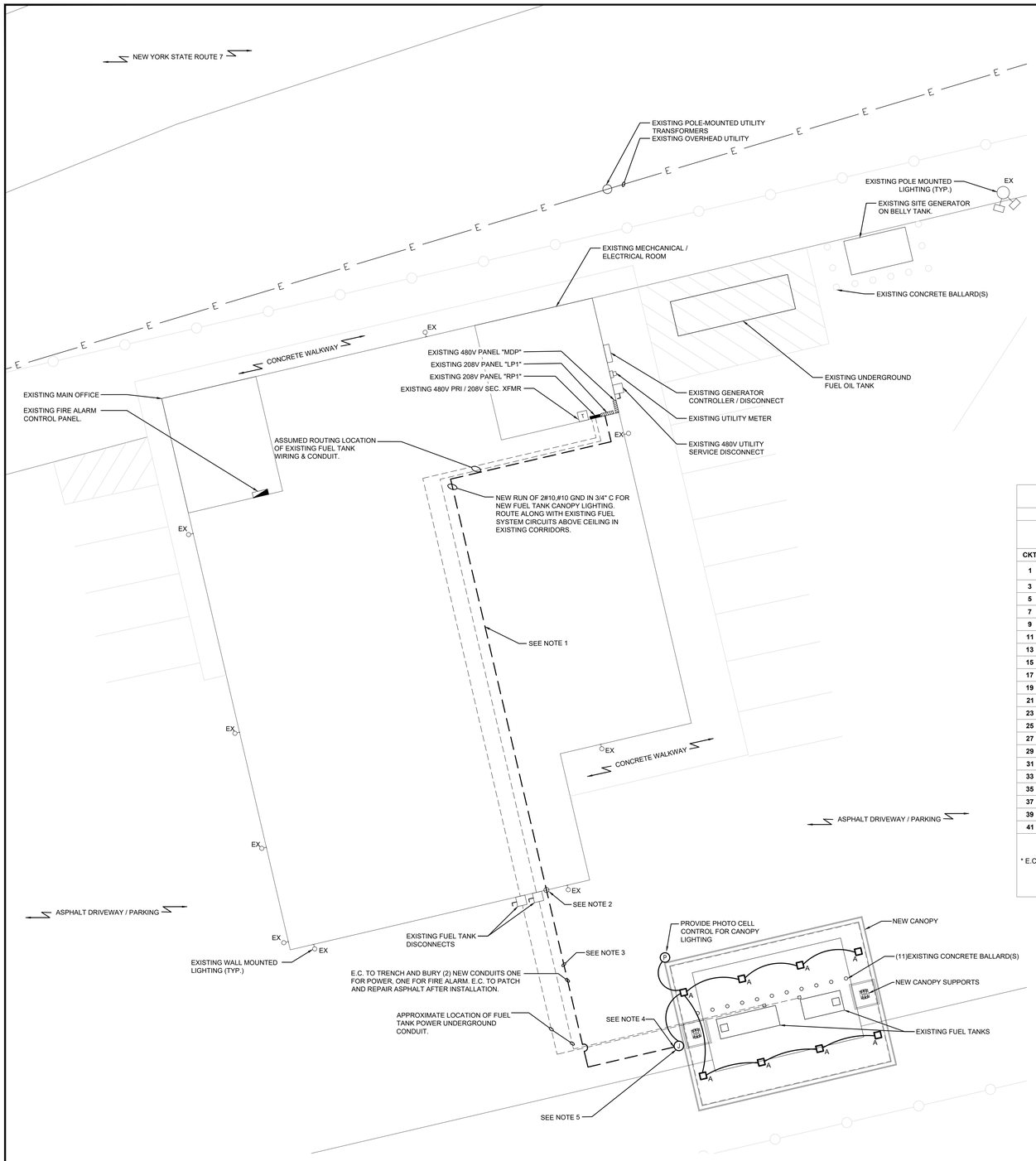
ELECTRICAL PLAN
GROUND FLOOR
CORRIDOR C004

DRAWN BY:	CHECKED BY:
MLT / TBH	LKN
DATE:	PROJECT NO:
11/03/2026	2025-005

DRAWING NO:

E-101

CAD FILE: 5005.2-E-101.DWG PLOT DATE: 11/24/2026

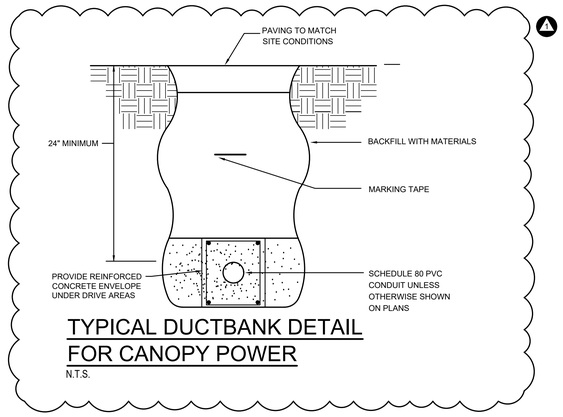


AFTON TRANSPORTATION BUILDING SITE RENOVATION - FUEL TANK CANOPY

SCALE: 1"=10'-0"

NOTES:

1. WIRING SHALL BE RUN IN EMT CONDUIT ABOVE CORRIDOR CEILING.
2. PENETRATE EXTERIOR ALL AND CONVERT TO RGS CONDUIT VIA 90° LB CONDUIT BODY. DROP ON EXTERIOR WALL TO BELOW GRADE.
3. EXTEND NEW CANOPY POWER/SYSTEMS FEEDS IN NEW TRENCH ACROSS EXISTING PAVED AREA. CONDUITS UNDER PAVED TRAFFIC AREA TO BE INSTALLED IN REINFORCED CONCRETE ENVELOPE.
4. EXTEND NEW CANOPY LIGHTING CIRCUIT TO EXISTING PANEL LP1 LOCATED IN THE MAIN ELECTRICAL ROOM.
5. THE E.C SHALL FIELD VERIFY ALL CANOPY CONNECTION LOCATIONS AND WIRING ROUTING WITHIN CANOPY WITH THE MANUFACTURER AND CANOPY INSTALLER.
6. THE E.C SHALL FURNISH AND INSTALL NEW UNDER CANOPY LIGHTING AS SPECIFIED.



TYPICAL DUCTBANK DETAIL FOR CANOPY POWER

N.T.S.

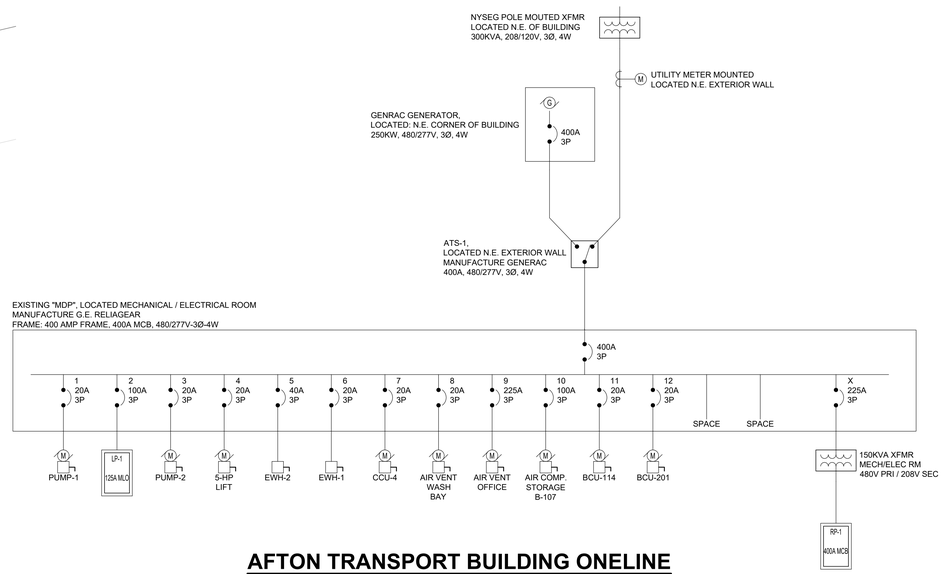
EXISTING PANEL BOARD SCHEDULE

PANEL			SOURCE (A):	100		VOLTAGE:	480	277	3Ø	4W	LOCATION:	MECHANICAL/ELECTRICAL RM				SINGLE	x
LP-1			FRAME (A):	125 MLO		MIN. O.C:	EXISTING				FED BY:	MDP				DOUBLE	
			TYPE:	LIGHTING		A.I.C:	EXISTING				MOUNTING:	SURFACE				COM. COVER	

CKT	POLE	T	W	G	C	LOAD	KVA ØA		KVA ØB		KVA ØC		LOAD	C	G	W	T	P	CKT
1	1	20	-	-	-	RM.B-114,113,111,110	1.3	0.3	***	***	***	***	LIGHT. CORRIDOR B-118,B-120	-	-	-	20	1	2
3	1	20	-	-	-	RM.B-106, B-107, B-103	***	***	0.8	0.6	***	***	RM. B-104, B-105A, B-10...	-	-	-	20	1	4
5	1	20	-	-	-	LIGHT. BUS MAINTEN. B-102	***	***	***	***	1.9	1.6	LIGHT. WASH BAY B-101	-	-	-	20	1	6
7	1	20	-	-	-	LIGHT. MEZZ AREA.	0.6	0.2	***	***	***	***	LIGHTING - CANOPY	3/4"	#10	2#10	20	1	8*
9	1	20	-	-	-	LIGHTING - EXTERIOR	***	***	1.8	1.0	***	***	GENERATOR	-	-	-	20	1	10
11	1	20	-	-	-	EXISTING LOAD	***	***	***	***	0.7	0.7	EXISTING LOAD	-	-	-	20	1	12
13	1	-	-	-	-	SPARE	0.0	0.0	***	***	***	***	SPARE	-	-	-	-	1	14
15	1	-	-	-	-	SPARE	***	***	0.0	0.0	***	***	SPARE	-	-	-	-	1	16
17	1	-	-	-	-	SPARE	***	***	***	***	0.0	0.0	SPARE	-	-	-	-	1	18
19	1	-	-	-	-	SPARE	0.0	0.0	***	***	***	***	SPARE	-	-	-	-	1	20
21	1	-	-	-	-	SPARE	***	***	0.0	0.0	***	***	SPARE	-	-	-	-	1	22
23	1	-	-	-	-	SPARE	***	***	***	***	0.0	0.0	SPARE	-	-	-	-	1	24
25	1	-	-	-	-	SPARE	0.0	0.0	***	***	***	***	SPARE	-	-	-	-	1	26
27	1	-	-	-	-	SPARE	***	***	0.0	0.0	***	***	SPARE	-	-	-	-	1	28
29	1	-	-	-	-	SPARE	***	***	***	***	0.0	0.0	SPARE	-	-	-	-	1	30
31	1	-	-	-	-	SPARE	0.0	0.0	***	***	***	***	SPARE	-	-	-	-	1	32
33	1	-	-	-	-	SPARE	***	***	0.0	0.0	***	***	SPARE	-	-	-	-	1	34
35	1	-	-	-	-	SPARE	***	***	***	***	0.0	0.0	SPARE	-	-	-	-	1	36
37	1	-	-	-	-	SPARE	0.0	0.0	***	***	***	***	SPARE	-	-	-	-	1	38
39	1	-	-	-	-	SPARE	***	***	0.0	0.0	***	***	SPARE	-	-	-	-	1	40
41	1	-	-	-	-	SPARE	***	***	***	***	0.0	0.0	SPARE	-	-	-	-	1	42
							2.5		4.2		4.9								
							Total KVA ØA		Total KVA ØB		Total KVA ØC								
* E.C. TO USE EXISTING 20A-1P SPARE BREAKER FOR NEW LOAD. WIRE UPSIZED FOR VOLTAGE DROP.							TOTAL KVA THIS PANEL:				11.6								
							TOTAL KVA DEMAND:				8.1								
							TOTAL AMPERAGE DEMAND:				9.7								

LIGHTING FIXTURE SCHEDULE

TYPE	MANUFACTURER	CATALOG NO.	LAMPS	VOLTS	DESCRIPTION
A	BEACON GALASY II	XSGY-30-4K7	4757 LUMENS 30 WATTS	120/277V	CANOPY MOUNTED LIGHTING FIXTURE. 4000K, 70CRI.



AFTON TRANSPORT BUILDING ONELINE

SCALE: NTS

HIGHLAND ASSOCIATES
architecture | engineering | interior design
102 Highland Avenue
Clarks Summit, PA 18411
570-586-4334
www.highlandassociates.com
New York • Pennsylvania

REVISION NO:

1	ADDENDUM #001	11/24/2026

- DESIGN REVIEW COMMENTS

BID DOCUMENTS

SCHOOL SED # 08-01-01-04-0-001-020
BG SED # 08-01-01-04-5-015-003

COPYRIGHT:
"HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ©" SHALL BE DEEMED THE AUTHOR OF THESE DOCUMENTS AND SHALL RETAIN ALL COMMON LAW STATUTORY AND OTHER RESERVED RIGHTS INCLUDING COPYRIGHT.

UNAUTHORIZED DOCUMENT USE:
THIS DRAWING MAY BE UTILIZED ONLY FOR THE PURPOSE OF CONSTRUCTING OR INSTALLING THE WORK SHOWN THEREON AT THE SITE OF THE WORK SPECIFIED. ANY OTHER USE OF THIS DRAWING, INCLUDING WITHOUT LIMITATION ANY REPRODUCTION OR ALTERATION OF THIS DRAWING, WITHOUT THE PRIOR WRITTEN APPROVAL OF "HIGHLAND ASSOCIATES, LTD. ARCHITECTURE ENGINEERING INTERIOR DESIGN 2025 ©" IS A VIOLATION OF THE LAW AND IS PROHIBITED.

PROJECT TITLE:

Afton Central School District
29 Academy St, Afton, NY 13730

2024 Capital Project
Phase 2

SEALS:

DRAWING TITLE:
ELECTRICAL SITE PLAN, BUS GARAGE

DRAWN BY:	CHECKED BY:
MLT / TBH	LKN
DATE:	PROJECT NO:
11/03/2026	2025-005

DRAWING NO:

ES-100

CAD FILE: 5005.2-BG-ES-100.DWG PLOT DATE: 11/24/2026