NEW YORK STATE | Office of General Services

DESIGN & CONSTRUCTION GROUP
THE GOVERNOR NELSON A. ROCKEFELLER
EMPIRE STATE PLAZA
ALBANY, NY 12242

ADDENDUM NO. 4 TO PROJECT NO. 47528

CONSTRUCTION WORK
PROVIDE TESTING LABORATORY, BUILDING 14
DOT REGION 1, ALBANY COUNTY
STATE OFFICE BUILDING CAMPUS
ALBANY, NY

April 3, 2026

NOTE: This Addendum forms a part of the Contract Documents. Insert it in the Project Manual. Acknowledge receipt of this Addendum in the space provided on the Bid Form.

GENERAL REQUIREMENTS

1. SECTION 015000.01 CONSTRUCTION FACILITIES & TEMPORARY CONTROLS: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 015000.01 – 1 thru 015000.01 – 9) noted "Addendum 4 04/03/26."

2. SECTION 015213 STATE FIELD OFFICE: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 015213– 1 thru 015213 – 5) noted "Addendum 4 04/03/26."

SPECIFICATIONS

3. SECTION 055119 METAL GRATING STAIRS: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 055119 – 1 thru 055119 – 11) noted "Addendum 4 04/01/26."

4. SECTION 083323 OVERHEAD COILING DOORS: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 083323 – 1 thru 083323 – 9) noted "Addendum 4 04/01/26."

5. SECTION 084413 GLAZED ALUMINUM CURTAIN WALLS: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 084413 – 1 thru 084413 – 13) noted "Addendum 4 04/01/26."

6. SECTION 084418.13 FIRE-RATED GLAZED STEEL CURTAIN WALLS: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 084418.13 – 1 thru 084418.13 – 6) noted "Addendum 4 04/01/26."

7. SECTION 087100 DOOR HARDWARE: Subparagraph 3.9.B.PP: Change Subparagraph to read:
"PP. Hardware Set 42: Not Used."

8. SECTION 102800 TOILET, BATH, AND LAUNDRY ACCESSORIES: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 102800 – 1 thru 102800 – 9) noted "Addendum 4 04/01/26".

9. SECTION 210529 - HANGERS AND SUPPORTS FOR FIRE SUPPRESSION PIPING AND EQUIPMENT: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 210529 – 1 thru 210529 – 10) noted "Addendum 4 04/01/26".

10. SECTION 213900 CONTROLLERS FOR FIRE-PUMP DRIVERS: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 213900 – 1 thru 213900 – 10) noted "Addendum 4 04/01/26".

11. SECTION 230523 GENERAL-DUTY VALVES FOR HVAC PIPING: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 230523 – 1 thru 230523 – 7) noted "Addendum 4 04/01/26".

12. SECTION 233113 METAL DUCTS: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 233113 – 1 thru 233113 – 21) noted "Addendum 4 04/01/26".

13. SECTION 412200 HOISTS AND CRANES: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 412200 – 1 thru 412200 – 9) noted "Addendum 4 04/01/26".

14. SECTION 230923 DIRECT DIGITAL CONTROL (DDC) SYSTEM FOR HVAC: Paragraph 1.9.A: Change Paragraph to read:
"A. Testing Agency Qualifications:
1. Testing Agency's Field Supervisor: Certified by NETA or EQUIVALENT to supervise on-site testing."

15. SECTION 260513 MEDIUM VOLTAGE CABLES: Paragraph 1.5.B: Change Paragraph to read:
"B. Testing Agency Qualifications:
1. Testing Agency's Field Supervisor: Certified by NETA or EQUIVALENT to supervise on-site testing."

16. SECTION 260513 MEDIUM VOLTAGE CABLES: Paragraph 1.5.F: Change Paragraph to read:
"F. Testing Company: Secure the services of an independent accredited testing company for a high voltage after installation test."

17. SECTION 260519 LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES: Paragraph 1.5.A: Change Paragraph to read:
"A. Testing Agency Qualifications:
1. Testing Agency's Field Supervisor: Certified by NETA or EQUIVALENT to supervise on-site testing."

18. SECTION 260523 CONTROL VOLTAGE ELECTRICAL POWER CABLES: Paragraph 1.4.A: Change Paragraph to read:
"A. Testing Agency Qualifications:

1. Testing Agency's Field Supervisor: Currently certified by BICSI as an RCDD to supervise on-site testing."

19. SECTION 260526 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS: Paragraph 1.5.A: Change Paragraph to read:
"A. Testing Agency Qualifications: Certified by NETA or EQUIVALENT."

20. SECTION 260573.15 OVERCURRENT DEVICE COORDINATION SETTINGS: Paragraph 1.2.A: Change Paragraph to read:
"A. Section includes setting, adjusting and testing overcurrent protective device settings and transformer tap connections."

21. SECTION 260573.15 OVERCURRENT DEVICE COORDINATION SETTINGS: Paragraph 1.3.B: Change Paragraph to read:
"B. Field Adjusting Agency: An independent electrical testing agency with full-time employees and the capability to adjust devices and conduct testing indicated."

22. SECTION 260573.15 OVERCURRENT DEVICE COORDINATION SETTINGS: Paragraph 1.6.A: Change Paragraph to read:
"A. Field Adjusting Agency Qualifications:
1. Acceptable to authorities having jurisdiction."

23. SECTION 260573.15 OVERCURRENT DEVICE COORDINATION SETTINGS: Paragraph 3.2.B: Change Paragraph to read:
"B. Gather and tabulate all required input data to support the coordination study. List below is a guide. Comply with recommendations in IEEE551 for the amount of detail required to be acquired in the field. Field data gathering shall be under the direct observation of a NETA (or EQUIVALENT) Level III certified technician. Data include, but are not limited to, the following:"

24. SECTION 260573.15 OVERCURRENT DEVICE COORDINATION SETTINGS: Article 3.3: Delete this Article in its entirety.

25. SECTION 260573.15 OVERCURRENT DEVICE COORDINATION SETTINGS: Article 3.4: Delete this Article in its entirety.

26. SECTION 260573.15 OVERCURRENT DEVICE COORDINATION SETTINGS: Article 3.5: Delete this Article in its entirety.

27. SECTION 260573.15 OVERCURRENT DEVICE COORDINATION SETTINGS: Article 3.7: Delete this Article in its entirety.

28. SECTION 260573.15 OVERCURRENT DEVICE COORDINATION SETTINGS: Change "END OF SECTION" to read: "END OF SECTION 260573.15"

29. SECTION 261116.11 SECONDARY UNIT SUBSTATIONS WITH SWITCHGEAR SECONDARY, Paragraph 1.7.A: Change Paragraph to read:
"A. Testing Agency Qualifications: Member company of an NRTL."

30. SECTION 261116.11 SECONDARY UNIT SUBSTATIONS WITH SWITCHGEAR SECONDARY: Subparagraph 1.7-A-1: Delete this Subparagraph in its entirety.

31. SECTION 262213 LOW VOLTAGE DISTRIBUTION TRANSFORMERS: Paragraph 1.4.A: Change Paragraph to read:
    "A. Testing Agency Qualifications: Accredited by NETA or EQUIVALENT."

32. SECTION 262213 LOW VOLTAGE DISTRIBUTION TRANSFORMERS: Subparagraph 1.4.A.1: Delete this Subparagraph in its entirety.

33. SECTION 262413 LOW VOLTAGE DISTRIBUTION TRANSFORMERS: Paragraph 1.6.B: Change Paragraph to read:
    "B. Testing Agency Qualifications: Accredited by NETA or EQUIVALENT."

34. SECTION 262413 LOW VOLTAGE DISTRIBUTION TRANSFORMERS: Subparagraph 1.6.B.1: Delete this Subparagraph in its entirety.

35. SECTION 262416 LOW VOLTAGE PANEL BOARDS: Subparagraph 2.5.B.1: Change Subparagraph to read:
    "1. Copper phase and neutral buses; 100 percent capacity neutral bus and lugs."

36. SECTION 262419 MOTOR CONTROL CENTERS: Paragraph 1.7.A: Change Paragraph to read:
    "A. Testing Agency Qualifications:
    1. Testing Agency's Field Supervisor: Certified by NETA or EQUIVALENT to supervise on-site testing."

37. SECTION 262816 ENCLOSED SWITCHES AND CIRCUIT BREAKERS: Paragraph 1.6.A: Change Paragraph to read:
    "A. Testing Agency Qualifications: Accredited by NETA or EQUIVALENT.
    1. Testing Agency's Field Supervisor: Currently certified by NETA or EQUIVALENT to supervise on-site testing."

38. SECTION 262913.03 MANUAL AND MAGNETIC MOTOR CONTROLLERS: Paragraph 1.6.A: Change Paragraph to read:
    "A. Testing Agency Qualifications: Accredited by NETA or EQUIVALENT.
    1. Testing Agency's Field Supervisor: Certified by NETA or EQUIVALENT to supervise on-site testing."

39. SECTION 262923 VARIABLE FREQUENCY MOTOR CONTROLLERS: Paragraph 1.7.A: Change Paragraph to read:
    "A. Testing Agency Qualifications: Accredited by NETA or EQUIVALENT.
    1. Testing Agency's Field Supervisor: Currently certified by NETA or EQUIVALENT to supervise on-site testing."

40. SECTION 263213.16 GAS ENGINE DRIVEN GENERATOR SETS: Paragraph 1.7.B: Change Paragraph to read:
    "B. Testing Agency Qualifications: Accredited by NETA or EQUIVALENT.
    1. Testing Agency's Field Supervisor: Certified by NETA or EQUIVALENT to supervise on-site testing."

41. SECTION 263213.16 GAS ENGINE DRIVEN GENERATOR SETS: Subparagraph 2.9.A.2: Delete this Subparagraph in its entirety.

42. SECTION 263213.16 GAS ENGINE DRIVEN GENERATOR SETS: Paragraph 2.9.L: Change Paragraph to read:

"L. Provide a 100 ampere 208/120 V three phase 12 pole (minimum) main circuit breaker panelboard in the generator enclosure for powering convenience outlets, heaters, lights, etc. Provide all branch breakers, conduits, circuitry and connections as required to make a working system. Panel and circuitry to match installation and contract drawings."

43. SECTION 263353 STATIC UNINTERRUPTIBLE POWER SUPPLY: Subparagraph 1.7.A.1: Delete this Subparagraph in its entirety.

44. SECTION 263600 TRANSFER SWITCHES: Subparagraph 1.6.A.1: Change Subparagraph to read:
"1. Member company of NETA or EQUIVALENT."

45. SECTION 263600 TRANSFER SWTICHES: Subparagraph 1.6.A.1.a: Delete this Subparagraph in its entirety.

46. SECTION 274100 AUDIOVISUAL SYSTEMS: Subparagraph 1.3.F.1: Change Subparagraph to read:
"1. Contractor shall include the costs for a one-year service contract, renewable for up to three years, which shall commence with the completion of the two-year warranty period. These contracts shall be fixed-cost and can be accepted at the option of the Director's Representative."

47. SECTION 283101 PROTECTED PREMISES FIRE ALARM SYSTEM: Subparagraph 1.3.G.1.b: Change Subparagraph to read:
"b. Circuits from MFACU and ICU's to Addressable Devices: NFPA 72, Class A, 2, Style 4. A display occurs to identify trouble conditions."

48. SECTION 283101 PROTECTED PREMISES FIRE ALARM SYSTEM: Subparagraph 1.3.G.2.a: Change Subparagraph to read:
"a. Circuits from MFACU and ICU's to Initiating Devices (Fire Alarm, Sprinkler):NFPA 72, Class A, 2, Style C. A display occurs to identify trouble conditions."

49. SECTION 283101 PROTECTED PREMISES FIRE ALARM SYSTEM: Subparagraph 1.3.G.3.a: Change Subparagraph to read:
"a. Circuits from MFACU and ICU's to Notification Appliances: NFPA 72, Class A, Style Y. A display occurs to identify trouble conditions."

50. SECTION 283101 PROTECTED PREMISES FIRE ALARM SYSTEM: Article 2.9: Change this Article to read:
"2.9 PROTECTIVE DEVICES
A. Steel Web Guards.
1. Steel Web Guards for General Application:
a. Construction:
1) All welded 7 gage wire.
2) Nickel plated finish with lacquer coating."

51. SECTION 323113 CHAIN LINK FENCES AND GATES: Paragraph 1.6.E.: Delete this Paragraph in its entirety.

APPENDIX

52. INFORMATION AVAILABLE TO BIDDERS – THERMAL CONDUCTIVITY TEST REPORT: Add the attached Document (pages 1 thru 12) to the Project Manual.

53. INFORMATION AVAILABLE TO BIDDERS – EXISTING SIE-2 SHELVING: Add the attached Document (pages 1 thru 3) to the Project Manual.

54. INFORMATION AVAILABLE TO BIDDERS – EXAMPLE HOT WORKS PERMIT CHECKLIST PROCESS: Add the attached Document (pages 1 thru 4) to the Project Manual.

55. PLA - PROJECT LABOR AGREEMENT UNEXECUTED: Discard the Document bound in the Project Manual and substitute the accompanying Document (pages 1 thru 46) noted "**PLA – Project Labor Agreement**."

DRAWINGS

56. Revised Drawings:
    a. Drawing Nos. C-104, C-105, C-106, S-100A, S-100AR, S-100B, S-100BR, S-101A, S-101B, S-102A, S-102B, S-103A, S-103B, S-104A, S-104B, S-105A, S-105B, S-106B, S-301, S-302, S-414, S-415, S-522, S-540, S-550, F-001, F-102, F-104, F-106, F-108, F-300, F-501, M-211, E-611, E-612, E-613, E-649, FA-101, FA-102, FA-103, FA-104, FA-105, FA-106, FA-107, FA-108, FA-601, FA-602, noted Addendum 4 dated 04/01/26, accompanies this Addendum and supersedes the same numbered previously issued drawings.

END OF ADDENDUM

Brady M. Sherlock, P.E.
Director, Division of Design
Design & Construction

SECTION 015000.01 - CONSTRUCTION FACILITIES & TEMPORARY CONTROLS

PART 1 - GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

A. Construction Waste Management: Section 017419.01.

B. State Field Office: Section 015213.

C. Construction Heat and Temporary Heat: Section 015123.

D. Submittals: Section 013300.0

E. Ground Loop Heat Pump Piping: Section 232113.33

1.2 PROJECT CONDITIONS

A. Provide construction facilities and temporary controls necessary for the Work.

1. Additions to the construction facilities and temporary controls beyond what is specified will fall to the Contractor to provide and maintain.

1.3 SUBMITTALS:

A. The "Waiver of Certain Submittal Requirements" in Section 013300 does not apply to this Section & that submittal for approval must be provided within 15 days after awarded.

B. Shop Drawings: Site Plan: Show location of field office where proposed to be added to Drawing C-105. Indicate temporary field office utility services, portable toilets, connections and accessible stairs and ramps per NYS Building Code.

1.4 TEMPORARY LIGHT, POWER AND INTERNET

A. Electric energy will be made available, metered and charged back to the contractor, for lighting and for power tools. Refer to contract drawings for temporary power connections at location indicated.

1. The current average rate for electricity for the 2026 calendar year is $0.114/kWh. Contractor shall expect a minimum rate yearly increase of 10%.

B. Provide temporary substation and medium voltage feeders as indicated on contract drawings. Substation for temporary light and power need not be new if in satisfactory operating condition. Splices for medium voltage feeders to be coordinated with Directors Representative to minimize operational impact to areas outside of contract site.

C. Contractor to provide portable sources of electricity for temporary light and power of adequate capacity to supply all needs for the performance of Work until the temporary substation can be utilized for temporary light and power.

1. Coordination with Director's Representative as needed.

D. Provide feeder circuits as required for temporary office, storage and/or field trailer structures as required to maintain operations and as indicated on contract drawings. Feeder circuits may be underground or overhead on pole lines. When used, install minimum Class 4 poles of height required to maintain at least 25 feet ground clearance under wires. Space wires on cross arms to suit voltage.

E. Provide feeder circuits as required to building as required to maintain operations, power and lighting indicated below, and as indicated on contract drawings. Feeder circuits may be underground or overhead on pole lines. When used, install minimum Class 4 poles of height required to maintain at least 25 feet ground clearance under wires. Space wires on cross arms to suit voltage.

F. Provide wiring and other equipment within the building for temporary light and power.

1. Wiring for temporary light and single-phase power shall, in general, consist of 2-wire, 120 volt or 4 wire, 120/208-volt feeders, with branch circuits of #12 conductors minimum protected at 20A maximum.

a. Install branch circuits with suitable LED lamp holders or fixtures for temporary lighting as required to maintain a minimum of 10-foot candles in the work areas. Equip fixtures and lamp holders with guards. Fixtures and lamp holders installed in damp or wet locations shall be of the weatherproof type.
b. Install branch circuits with fused grounding type receptacle outlets for single phase power (for power tools, etc.).
c. Install 2 circuits with LED lamp holders or fixtures in corridors and stairs. Space fixtures or lamp holders no more than 30 feet apart in corridors. Install fixture or lamp holder at each stair landing. Also install one fixture or lamp holder in each boiler room and mechanical equipment room (connect to the corridor and stair lighting circuits).

1) Keep the corridor and stair lighting maintained and energized 24 hours per day, 7 days per week.

d. Install wiring for 208/120V 3-phase power for machines and other heavy electrical loads with appropriately sized wiring and fused disconnect switches as required. A maximum motor load of 5 hp at 208/120V volts will be permitted on each feeder.

2. Provide site lighting for security purposes.

a. Keep the site lighting maintained and energized from dusk to dawn, 7 days per week.

3. Provide a fused sealed service entrance switch for corridor and stair lighting circuits and site lighting circuits. Locate switch adjacent to and connect to line side of temporary light and power service entrance switch. Stencil cover "CORRIDOR AND STAIR LIGHTING & SITE LIGHTING".
4. Provide lamps and fuses including replacements required.

G. No load on any branch circuit or feeder shall exceed its rated capacity.

H. Provide temporary wiring and equipment in conformance with the National Electrical Code.

I. Materials for temporary light and power need not be new if they are in satisfactory operating condition.

J. Provide ground-fault protection for personnel (such as portable plug-in type ground-fault circuit-interrupters) on single-phase 15- and 20-ampere receptacle outlets which are in use.

K. Receptacle outlets, portable cord connectors and attachment plugs shall have standard NEMA configurations.

L. As the progress of the Work allows, and as approved, completed portions of the permanent wiring and electrical service may be utilized for temporary light and power.

M. Provide temporary lighting for the entirety of Parking Lot Y as required to maintain a minimum of 5-foot candles in the parking lot until new lighting, as shown on contract drawings, is installed and fully operational. Throughout the entire project duration, keep the Parking Lot Y lighting maintained and energized from dusk to dawn, 7 days per week.

N. Provide ground-fault protection for personnel (such as portable plug-in type ground-fault circuit-interrupters) on single-phase 15- and 20-ampere receptacle outlets which are in use.

O. As the progress of the Work allows, and as approved, completed portions of the permanent wiring and electrical service may be utilized for temporary light and power.

P. Contractor is responsible for providing a high speed, secure, internet connection for construction trailers and for work to be performed.

1.5 TEMPORARY WATER

A. Water will be made available for the Work, metered and charged back to the contractor, at source or sources directed within the limits of the existing supply and usage. Temporary water connection for construction trailers is available as shown on Drawings. Backflow prevention is mandatory and required for the temporary water connections to construction trailers.

1. The current rate for water for the 2026 calendar year is $8.83 per hundred cubic feet. Contractor shall expect a minimum rate yearly increase of 10%.

B. Only with the approval of the Director's Representative will the local to the site fire hydrants be used for potable water supply. Coordinate with the Directors Representative and Campus Utilities department for a temporary meter. Contractor shall Pay for all costs of all such fire hydrant water used for potable water supply purposes.

1. If approval is obtained from the Directors Representative:

    a. The Hydrant in Lot Y cannot be used.

        1) Hoses shall not be run through active parking lots and sidewalks.
        2) Filling of water tanks shall be done at the building 17 service location.
        3) Campus Utilities shall be informed and made aware, thru the Directors Representative, of water operations so they may monitor levels and shall have the right to call for a stoppage at any time due to large drops or other impacts to campus.

C. Prevent waste of water.

D. Protect temporary lines against freezing.

E. Repair damage caused by installation of leaky, defective or broken piping, connections or other fittings.

1.6 TEMPORARY TOILETS

A. Provide temporary toilet facilities for Contractor's and subcontractors employees engaged on the project. Locate toilets where directed and maintain them in a sanitary condition.

NUMBER OF EMPLOYEES	MINIMUM NUMBER OF FACILITIES*
20 or less	1 toilet
20 or more	1 toilet and 1 urinal per 40 employees
200 or more	1 toilet and 1 urinal per 50 employees

*Toilet/Urinal combinations shall count as only one facility.

1. Where water and sewer connections are available, provide water closets, otherwise provide approved chemical or electric toilets.
2. Inside buildings, toilet facilities are no more than 4 stories or 60 feet above or below, nor more than 500 feet travel on the same level from the work location of any person.
3. Locate toilet facilities no more than 1000 feet from any work location.

    a. Exception: Mobile crews who have readily available transportation to nearby toilet facilities.

1.7 TEMPORARY CLOSURES FOR EXTERIOR WALL OPENINGS

A. Whenever necessary, after the building is enclosed, to maintain proper temperatures for the performance of the Work, provide and maintain temporary closures for all openings in exterior walls that are not closed with permanent materials.

B. During the period when plastering is being done and continuing thereafter until the plaster is properly cured, provide exterior window and door openings with temporary closures, regardless of the time of year.

C. Construct temporary closures of 2 x 4 framing sheathed with plywood, waferboard, or 6 mil polyethylene attached to wood frames, as approved and to suit job requirements.

D. Provide closures so that they will afford convenient means of entrance and exit for people having business within the building, afford ample light to permit continued progress of the Work, and exclude inclement weather.

1.8 BARRIERS AND ENCLOSURES

A. Provide barriers during performance of the Work to:

1. Prevent unauthorized entry to work areas.
2. Allow for State's occupancy of areas adjacent to the Site.
3. Protect existing facilities and adjacent properties from damage.
4. Protect vehicular and pedestrian traffic.

B. Scaffolding, Hoist, and Equipment Barriers: Provide temporary fence enclosures as required to prevent unauthorized persons from coming in contact with ground supported scaffolding, hoists, and equipment.

1.9 TEMPORARY FENCE ENCLOSURE

A. Provide temporary fence not less than 8 feet in height above grade.

B. Fabric: 9 gage galvanized steel, or equal gage aluminum, woven together into 2-inch diamond mesh, with both top and bottom edges having a twisted and barbed finish.

C. Posts, Rails, and Connections: Standard galvanized steel products of an approved manufacturer, of the size and types as required and approved. Provide top and bottom rails between all posts secured with bolted connections.

D. Gates: Provide access gates for passage of employees and materials, complete with padlock. Fabricate gates with galvanized steel pipe perimeter covered with same fabric specified for fence. Furnish the Director's Representative with 2 keys per gate. All fence gates will be grounded on each side of gate.

E. Erection: Set posts 4 feet into the ground and not more than 10 feet apart. Install bottom rail not more than 2 inches above existing grade. Pull fabric taut and wire tightly to posts and rails at not more than 2 feet on center.

F. Maintain the temporary fence enclosure throughout the life of the Contract, or until directed to be removed. Replace all items or portions of fence enclosure damaged or destroyed.

1.10 GROUNDS MAINTENANCE

A. Contractor is responsible for mud, snow and ice removal and mowing in all construction areas.

1. Snow and ice staging and relocation must be coordinated with Director's Representative and Facilities.

2. Mowing must be done in all construction areas. There should be no overgrown grass.

    a. Grass should not be taller than 3" before it is mowed.
    b. Clean up clippings.

1.11 PROTECTION OF WORK AND EXISTING PROPERTY

A. Protect installed Work during performance of the Work.

B. Maintain the building in a watertight condition during performance of the Work.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at wall projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, and movement of heavy objects by covering them with durable sheet materials.

F. Protect smoke detectors from airborne dust and debris.

1. At the beginning of each workday, provide protective coverings over smoke detectors in areas where airborne dust and debris will be generated by the Work.
2. At the end of the workday, clean the areas in which the smoke detectors are located by whatever means necessary to assure that airborne dust and debris will not contaminate the smoke detectors, then remove protective coverings.
3. Provide signs, instructions, and alternate methods for reporting a fire during the period that the smoke detectors are covered.
4. Notify the Director's Representative and have procedures approved.

G. Prohibit traffic or storage upon waterproofed and roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturers.

H. Protect existing trees and plants during performance of the Work unless otherwise indicated. Box trees and plants within the grading limit lines. Do not deposit excavated materials or store building materials around trees or plants. Do not attach guy wires to trees.

I. Prohibit traffic from landscaped areas.

J. Cleaning tools of cementitious and other insoluble materials:

1. Do not wash tools in sinks or other sanitary drainage systems. Protect all drainage systems from debris that can clog or damage piping and fixtures.
2. Take all precautions necessary to prevent cementitious and other insoluble materials from flowing into floor drains.

3. Dispose of excess cementitious and other insoluble debris with the other rubbish.

1.12 WATER CONTROLS

A. Provide and maintain pumping equipment necessary to keep the work areas free from water. Discharge water into existing storm drainage systems or otherwise disperse as directed.

1. Refer to Storm Water Pollution Prevention Plan located in Appendices.

1.13 FIRE PREVENTION

A. Take precautions necessary to prevent fires.

B. Fuel for cutting and heating torches shall be gas only and shall be contained in Underwriters Laboratory approved containers.

C. Furnish and maintain a currently inspected 20-pound capacity multi-class ABC fire extinguisher in the immediate vicinity where welding tools or torches are in use.

D. Furnish and maintain a currently inspected fire extinguisher of the appropriate class and size whenever the temporary storage of materials changes that areas classification of fire load or life safety.

E. Do not use flammable liquids, other than those specified, within a building without written approval from the Director's Representative.

F. Tarpaulins shall be flameproof and shall be securely anchored when attached to scaffolding or when used to enclose any portion of a building.

G. If required by the nature of the work and facility regulations, the Contractor shall obtain from the facility and pay all costs associated with "Hot Work Permits" including fire watches to execute the work of its contract. Perform hot work in accordance with the Fire Code of New York State and the Hot Work Program approved for the work. Prior to, during and after performing hot work, inspect the hot work area for compliance with the requirements of the permitted Hot Work Program.

1. Post signage "Caution: Hot Work in Progress - Stay Clear" in conspicuous locations warning others before they enter a hot work area where the area is accessible to persons other than the operator of the hot work equipment.
2. See applicable facility permits and conditions bound in the Appendix.

1.14 ACCESS ROADS

A. Routes of ingress and egress on the premises to the location of the Work shall be as directed.

B. Keep designated access roads clear of dirt and debris resulting from the Work.

C. Provide means of removing mud from vehicle wheels before entering paved roads.

1.15 PARKING

A. There is no parking on the grounds of Harriman State Campus except for vehicles delivering material and equipment while they are being unloaded. This includes all existing and future parking lots on the Harriman State Campus for the duration of construction. The SUNY ETEC facility located at 1220 Washington Ave is also not available for parking for the duration of construction.

1. On-site parking adjacent to field offices for a limited number of select personnel may be available. Coordination and approval will be required with Director's Representative prior to being utilized.

2. Contractor is responsible for determining where staff will park off site and how staff will be shuttled to the site.
3. A copy of the shuttling plan will need to be shared with Director's Representative prior to being utilized for approval.
4. Keep parking areas defined in shuttling plan clear of dirt and debris resulting from the Work.
5. If requested, register vehicles which are to be parked at the Facility with the Facility Safety/Security Department.
6. Remove ignition keys from unattended vehicles and lock doors.

1.16 RUBBISH REMOVAL

A. Clean up and containerize the rubbish (refuse, debris, waste materials, and removed materials and equipment) resulting from the Work at the end of each workday and leave work areas broom clean, except where more stringent cleaning is specified. Locate containerized rubbish where directed.

B. Remove rubbish from State property at least once a week and more often if the rubbish presents a hazard. Properly dispose of rubbish.

C. Burning of rubbish will not be permitted.

D. Also comply with the requirements of Section 017419.01.

1.17 RELOCATION AND REMOVALS

A. Should a change in location of any construction facilities and temporary controls be necessary to progress the Work properly, remove and relocate such items as directed.

B. Remove the construction facilities and temporary controls when they are no longer required. Restore permanent facilities used for or connected to temporary facilities to their original condition or better.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 015000

SECTION 015213 - STATE FIELD OFFICE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Provide and maintain a field office comprised of new custom-built mobile or relocatable office units, new furniture, and new equipment, stair, and ramp for the sole use of the Director's Representative and staff. Include temporary services and accessories necessary for use of the specified items.

1.2 SUBMITTALS

A. Waiver of Submittals: The "Waiver of Certain Submittal Requirements" in Section 013300 does not apply to this Section.

B. Shop Drawings:

1. Site Plan: Show location of field office where directed. Indicate holding tank, utility services, connections and accessible stairs and ramps.

C. Product Data: Catalog sheets, specifications, and installation instructions, for all major items of the field office including furnishings and equipment. Submit within 15 days after award of Contract.

1.3 SCHEDULING

A. Provide units, ready for occupancy by the Director's Representative and staff, within 30 days after shop drawings specified above are approved.

1.4 QUALITY ASSURANCE

A. Accessibility Requirements: Provide fully accessible units including stairs and ramps that comply with ICC/ANSI A117.1 as referenced by the Building Code of New York State.

B. Provide units and all related utility connections in accordance with the NYS Uniform Fire Prevention and Building Code.

C. Provide certification insignia from New York Department of State that certifies trailer unit is code compliant.

PART 2 - PRODUCTS

2.1 MOBILE OR RELOCATABLE OFFICE UNITS

A. Manufacturers/Companies:

1. Williams Scotsman, Corporate Headquarters, 8211 Town Center Dr., Baltimore, MD 21236, (800) 782-1500, www.willscot.com.
2. Anchor Modular Buildings, PO Box 100, Medford, NJ 08055, (866) 396-0227, www.anchormodular.com.

B. Number, Approximate Size and Model:

1. One, 60 x 24 feet, double-wide office unit by approved manufacturers/companies.

C. Office Unit Requirements:

1. Layout: Provide large open meeting area in center with two private offices at each end of the trailer at minimum.
2. Ceiling Height: 8'-0" minimum.
3. Insulation: Exceed code required minimums for insulation. If wood frame construction exceeds the following values, walls > R - 21, floor > R -30 and roof > R - 38. Provide code requirements and provided insulation values.
4. Exterior Doors: Minimum 2, minimum 34 inches wide, with key-in-lever locksets (U-factor to exceed 0.61).
5. Windows: Approximately 7 percent of exterior wall area with insect screens (U-factor to exceed 0.38).
6. Complete ducted heating, ventilating, and air conditioning system with sufficient capacity to maintain a summer office temperature of 75 degrees F and a winter office temperature of 70 degrees F.
7. Water Heater: 6 gal minimum.
8. VCT or sheet vinyl floor finish.
9. Interior partitions to be wood 2 x 4 framing with ½" vinyl covered gypsum board.
10. Fluorescent lights or LED light equivalent needed in all rooms as required to maintain a minimum of 60-foot candles at desktop level.
11. Bulletin board (4 feet x 6 feet).
12. Toilet room with toilet, grab bars, toilet tissue dispenser, lavatory, built-in medicine cabinet, paper towel dispenser and mirror.
13. Insulated skirting from bottom of units to grade, around entire unit. Skirting is to be 2' x 4' wood framing with 2" rigid insulation type SM and white ventilated vinyl siding to match unit.
14. Electric energy and water provided, metered and charged back by the state.
15. Contractor is responsible for providing a high speed, secure, internet connection for construction trailers and as needed for work to be performed.

    a. 50+ Mbps download and 20+ Mbps upload speeds as a minimum.

16. Pre-wire unit for voice and data (5 connections each) as shown on approved shop drawings.

2.2 FURNITURE AND EQUIPMENT

A. Furniture:

1. Eight swivel type chairs with arms suitable for use at office desks.
2. Twelve straight back stackable chairs.
3. Four lockable metal desks, 30 x 60 inches, double pedestal type with keys.
4. One drafting table, 37 x 60 inches.
5. One conference table, 44 x 96 inches.
6. One "Planhold" plan rack, adjustable height, floor supported cantilever type, with plan clamps or plan rack sticks.
7. Two lockable 4-drawer letter size file cabinets.
8. One 4'x 6' wall mounted dry erase board.

B. Office Equipment:

1. One multifunction Printer - HP Laser Jet Enterprise M725dn Printer. Provide three-year service agreement, paid in advance.

    a. Supplies: paper, sizes as directed and toner cartridges for the duration of the project.

        1) Paper of the following sizes should be provided monthly:

            a) 5 reams per month of 8 ½ x 11.
            b) 2 reams per month of 11 x 17.

2. One Panasonic Voicemail system installed, with programming and maintenance for the duration of the project to handle 3 outside lines and 5 compatible instruments. Provide the instruments and all wiring.

    a. System - Panasonic KX-TDA50 Digital Hybrid IP-PBX with wall rack.
    b. Voicemail System - Panasonic KX-TVA50.
    c. Telephones - Main 2 each KX-T7636.
    d. Telephone - Regular 3 ea. KX-T7625.
    e. Provide all wiring between all stations, equipment rack, etc. such that a complete system is installed and operates properly. Maintain the system for the life of the contract.

3. One refrigerated bottled water dispenser, (Hot & Cold Type) with cups, bottled water and necessary supplies. Provide water and cups for duration of contract.

    a. Provide a minimum of 3 (three) 5-gallon water bottles per month, for the duration of the project.

4. One first aid kit.
5. One 15 cubic foot refrigerator, EnergyStar energy efficient model.
6. Fire Extinguisher: Multipurpose Dry-Chemical Type in Steel Container UL-rated 20-A:120-B:C, 20-lb nominal capacity, with monoammonium phosphate-based dry chemical in enameled-steel container.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install units where directed. Remove wheels and hitches from double-wide trailers and store them where directed. If foundations are not provided, ABS pads and tie downs are required to be installed per code requirements.

B. Provide manufacturer's stair with platform at one exterior door and ramp with platform(s) at one exterior entrance.

C. Provide a minimum 20' x 50' parking area of 6" Sub-base Course Type 2 and maintain for the duration of the contract including snow removal.

D. Provide sanitary sewer lines including excavation and backfill from office units to existing sewer (250' max).

E. Provide water service to office units from nearest available source. Retain and pay for a plumber to run the lines underground below frost line. Include excavation and backfill. (250' max).

F. Provide electric service to units from temporary substation per drawing E-051. Temporary generator power may be required prior to new electric service and temporary substation installation. Include 10' above grade 4x4 mast for overhead connections. Retain and pay contractor to do the electrical service and connections.

3.2 MAINTENANCE AND CLEANING

A. Maintain and clean the office units for the duration of this Contract. Include the following:

1. Daily removal of rubbish.
2. Daily cleaning of toilet room, including the plumbing fixtures. Replenish toilet room supplies as needed.
3. Weekly mopping of floors.
4. Weekly dusting of offices and other rooms.

B. Maintain approaches free of mud, snow and ice.

1. Contractor is responsible for snow and ice removal in all construction areas.
2. Snow and ice staging and relocation must be coordinated with Director's Representative and Facilities.

C. Maintain grounds in and around state field office area from overgrown grass.

1. Grass should not be taller than 3" before it is mowed.

a. Clean up clippings.

D. Protect water lines from freezing.

3.3 REMOVALS

A. Remove the units, furniture, and equipment when directed. Restore permanent facilities used for or connected to field office to their original condition or better.

3.4 PARKING

A. There is no parking on the grounds of Harriman State Campus. This includes all existing and future parking lots on the Harriman State Campus for the duration of construction. The SUNY ETEC facility located at 1220 Washington Ave is also not available for parking for the duration of construction.

1. Contractor is responsible for determining where staff will park off site and how staff will be shuttled to the site.

a. Keep parking areas defined in shuttling plan clear of dirt and debris resulting from the Work.

2. A copy of the shuttling plan will need to be shared with Director's Representative prior to being utilized for approval.

END OF SECTION 015213

SECTION 055119 - METAL GRATING STAIRS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Industrial Class stairs with steel-grating treads.
2. Steel railings and guards attached to metal stairs.
3. Steel handrails attached to walls adjacent to metal stairs.
4. Metal grating step at roof cross-over

1.3 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for metal stairs, railings, and guards.

1. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, blocking for attachment of wall-mounted handrails, and items with integral anchors, that are to be embedded in concrete or masonry.
2. Deliver such items to Project site in time for installation.

C. Coordinate locations of hanger rods and struts with other work so they do not encroach on required stair width and are within fire-resistance-rated stair enclosure.

D. Schedule installation of railings and guards so wall attachments are made only to completed walls.

1. Do not support railings and guards temporarily by any means that do not satisfy structural performance requirements.

1.4 SUBMITTALS

A. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.

B. Manufacturer’s installation instructions shall be provided along with product data.

C. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).

D. Product Data: For metal grating stairs and the following:

1. Gratings.
2. Grout.
3. Metal grating cross-over step.

E. Shop Drawings:

1. Include plans, elevations, sections, details, attachment to other work, and welding procedure specifications (WPS).
2. Indicate sizes of metal sections, thickness of metals, profiles, holes, and field joints.
3. Include plan at each level.
4. Indicate locations of anchors, weld plates, and blocking for attachment of wall-mounted handrails.

F. Delegated-Design Submittal: For stairs, railings, and guards, including analysis data signed and sealed by the qualified professional engineer, licensed in the State of New York, responsible for their preparation.

G. Qualification Data: For professional engineer's experience with providing delegated-design engineering services of the kind indicated, including documentation that engineer is licensed and registered in the State of New York.

H. Welding certificates.

I. Source quality-control reports.

1. Documentation to confirm compliance

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code - Steel."

C. If the value of the contract exceeds $100,000 all structural steel, reinforcing steel and other major steel items to be incorporated in the Work of this Contract shall be produced and made in whole or substantial part in the United States, its territories or possessions.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification.

1. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers.
2. Protect steel members and packaged materials from corrosion and deterioration.
3. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures.

a. Repair or replace damaged materials or structures as directed.

B. Store and handle galvanized steel members per the recommendations of the American Galvanized Association.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, licensed and registered to practice in the State of New York, to design stairs, railings, and guards, including attachment to building construction.

B. Structural Performance of Stairs: Metal stairs shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Uniform Load: 100 lbf/sq. ft.
2. Concentrated Load: 300 lbf applied on an area of 4 sq. in.
3. Uniform and concentrated loads need not be assumed to act concurrently.
4. Stair Framing: Capable of withstanding stresses resulting from railing and guard loads in addition to loads specified above.
5. Limit deflection of treads, platforms, and framing members to L/360.

C. Structural Performance of Railings and Guards: Railings and guards, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

a. Uniform load of 50 lbf/ft. applied in any direction.
b. Concentrated load of 200 lbf applied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft.
b. Infill load and other loads need not be assumed to act concurrently.

3. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

a. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 METALS

A. Metal Surfaces: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A36.

C. Steel Bars for Grating Treads: ASTM A36 or steel strip, ASTM A1011 or ASTM A1018.

D. Steel Wire Rod for Grating Crossbars: ASTM A510.

E. Steel Tubing for Stair Supports: ASTM A500 (cold formed) or ASTM A513.

1. Provide galvanized finish for exterior installations and where indicated.

F. Steel Pipe for Railings and Guards: ASTM A53, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.

G. Provide galvanized finish for exterior installations and where indicated.

2.3 FASTENERS

A. General: Provide zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941, Class Fe/Zn 12 for exterior use, and Class Fe/Zn 5 where built into exterior walls.

1. Select fasteners for type, grade, and class required.

B. Fasteners for Anchoring Railings and Guards to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings and guards to other types of construction indicated and capable of withstanding design loads.

C. Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563; and, where indicated, flat washers.

1. Structural Steel Connections: ASTM F3125, Grade A325 Type 1.

D. Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A563; and, where indicated, flat washers.

1. Provide mechanically deposited or hot-dip, zinc-coated anchor bolts for stairs indicated to be galvanized.

E. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E488, conducted by a qualified independent testing agency.

1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn 5, unless otherwise indicated.
2. Material for Interior Locations Where Stainless Steel Is Indicated: Alloy Group 1 stainless-steel bolts, ASTM F593, and nuts, ASTM F594.
3. Material for Exterior Locations: Alloy Group 2 stainless-steel bolts, ASTM F593, and nuts, ASTM F594.

2.4 MISCELLANEOUS MATERIALS

A. Welding Electrodes: Comply with AWS requirements and welding procedure specification.

B. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

C. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107, factory-packaged, nonmetallic aggregate grout; recommended by manufacturer for interior and exterior use; noncorrosive and nonstaining; mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION, GENERAL

A. Provide complete stair assemblies, including metal framing, hangers, railings, guards, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.

1. Join components by welding or bolting unless otherwise indicated.
2. Use connections that maintain structural value of joined pieces.

B. Assemble stairs, railings, and guards in shop to greatest extent possible.

1. Disassemble units only as necessary for shipping and handling limitations.
2. Clearly mark units for reassembly and coordinated installation.

C. Cut, drill, and punch metals cleanly and accurately.

1. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated.
2. Remove sharp or rough areas on exposed surfaces.

D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

E. Form exposed work with accurate angles and surfaces and straight edges.

F. Weld connections to comply with the following:

1. Comply with AWS requirements and approved welding procedure specifications.
2. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
3. Obtain fusion without undercut or overlap.
4. Remove welding flux immediately.
5. Weld exposed corners and seams continuously unless otherwise indicated.
6. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish # 3 - Partially dressed weld with spatter removed.

G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible.

1. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts unless otherwise indicated.
2. Locate joints where least conspicuous.
3. Fabricate joints that are exposed to weather in a manner to exclude water.
4. Provide weep holes where water may accumulate internally.

2.6 FABRICATION OF STEEL-FRAMED STAIRS

A. NAAMM Stair Standard: Comply with NAAMM AMP 510, "Metal Stairs Manual," for Industrial Class, unless more stringent requirements are indicated.

B. Stair Framing:

1. Fabricate stringers of steel channels.

a. Stringer Size: As required to comply with "Performance Requirements" Article.
b. Provide closures for exposed ends of channel stringers.
c. Finish: Bare galvanized, do not paint.

2. Construct platforms and tread supports of steel channel headers and miscellaneous framing members as required to comply with "Performance Requirements" Article.

a. Provide closures for exposed ends of channel framing.
b. Finish: Bare galvanized, do not paint.

3. Weld stringers to headers; weld framing members to stringers and headers.
4. Where stairs are enclosed by gypsum board assemblies, provide hanger rods or struts to support landings from floor construction above or below.

a. Locate hanger rods and struts where they do not encroach on required stair width and are within the fire-resistance-rated stair enclosure.

5. Where masonry walls support metal stairs, provide temporary supporting struts designed for erecting steel stair components before installing masonry.

6. Where metal stairs and platforms are supported on posts at exterior sloping paving substrate, provide adjustable posts or fixed posts as required to produce a level walking surface for stairs and platforms, determined by the engineering process.

7. Fabricate grating treads with anti-slip nosing and with angle or plate carrier at each end for stringer connections. Secure treads to stringers by welding unless otherwise indicated.
8. Fabricate grating platforms with anti-slip nosings. Provide toeplates at open-sided edges of grating platforms. Attach grating to platform framing by welding.
9. Fabricate platforms and treads from press-locked steel grating with 1-1/4-by-3/16-inch (32-by-5-mm) bearing bars at 7/16 inch (13 mm) o.c. and 1/4 inch (7.5 mm) crossbars at 4 inches (100 mm) o.c., NAAMM designation: P-7-4 (1-1/4 x 3/16) STEEL.
10. Gratings spacing shall be ADA compliant.
11. Surface: Smooth
12. Surface Coating: Metal bonded anti-slip coating, either by the plasma stream deposition process of steel on steel (SlipNOT), or metal spray arc bonding abrasive grit particles to surface (Mebac). Level of coating shall be #3 for Mebac, and Grade 2 for SlipNOT.
13. Basis of Design Product: SlipNOT Bar Grating 7-4 manufactured by SlipNOT Metal Safety Flooring, or equal by one of the following:

    a. Harsco Industrial IKG; CMI series, “Mebac” coating.
    b. Brown-Campbell Co.; 7P4 series, “Mebac” coating

2.7 FABRICATION OF STAIR RAILINGS AND GUARDS

A. Fabricate railings and guards to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of member, post spacings, wall bracket spacing, and anchorage, but not less than that needed to withstand indicated loads.

1. Rails and Posts: As indicated on Drawings.
2. Picket Infill: Sizes and shapes as indicated on the Drawings, spaced to prohibit the passage of a 4-inch diameter sphere.

3. For removable railing posts, fabricate slip-fit sockets from stainless steel tube or pipe whose ID is sized for a close fit with posts; limit movement of post without lateral load, measured at top, to not more than one-fortieth of post height.

    a. Provide socket covers designed and fabricated to resist being dislodged.
    b. Provide chain with eye, snap hook, and staple across gaps formed by removable railing sections at locations indicated. Fabricate from same metal as railings.

B. Welded Connections: Fabricate railings and guards with welded connections.

1. Fabricate connections that are exposed to weather in a manner that excludes water.

    a. Provide weep holes where water may accumulate internally.

2. Cope components at connections to provide close fit, or use fittings designed for this purpose.
3. Weld all around at connections, including at fittings.

4. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
5. Obtain fusion without undercut or overlap.
6. Remove flux immediately.
7. Finish welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #3 - Partially dressed weld with spatter removed as shown in NAAMM AMP 521.

C. Form changes in direction of railings and guards as follows:

1. By radius bends of radius indicated

D. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required.

1. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

E. Close exposed ends of railing and guard members with prefabricated end fittings.

F. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated.

1. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.

G. Connect posts to stair framing by direct welding unless otherwise indicated.

H. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work.

1. Furnish inserts and other anchorage devices for connecting to concrete or masonry work.
2. For galvanized railings and guards, provide galvanized fittings, brackets, fasteners, sleeves, and other ferrous-metal components.
3. For nongalvanized railings and guards, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors embedded in exterior masonry and concrete construction.
4. Provide type of bracket with predrilled hole for exposed bolt anchorage and that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface.

I. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, where needed to transfer wall bracket loads through wall finishes to structural supports.

1. Size fillers to suit wall finish thicknesses and to produce adequate bearing area to prevent bracket rotation and overstressing of substrate.

2.8 METAL GRATING CROSS-OVER STEP AT ROOF

A. Provide slip-resistant hot dipped galvanized safety grating walkway material fabricated in steps with walkway support brackets/legs and polycarbonate supports protecting roof surface from metal legs.

1. Sizes and Dimensions: As indicated on Drawings
2. Finish: Mill
3. Base: Polycarbonate 16” x 18”
4. Planking: 12” punched interlocked with anti-slip surface
5. Treads: 12”
6. Risers: 9”
7. Steps: 2
8. Clearance span: 35”
9. Clearance height: 21-1/4”
10. Basis of Design Product: Model C-35x21 by Miro Industries or equal by one of the following:
    a. Eaton

2.9 FINISHES

A. Finish metal stairs after assembly.

B. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153 for steel and iron hardware and with ASTM A123 for other steel and iron products.

1. Do not quench or apply post-galvanizing treatments that might interfere with paint adhesion.
2. Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify elevations of floors, bearing surfaces and locations of bearing plates, and other embedments for compliance with requirements.

1. For wall-mounted railings, verify locations of concealed reinforcement within gypsum board and plaster assemblies.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF METAL STAIRS

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction.

1. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.
2. Provide bolted connection of steel support posts to paving substrate at exterior locations.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.

C. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete unless otherwise indicated.

1. Grouted Baseplates: Clean concrete and masonry bearing surfaces of bond-reducing materials, and roughen to improve bond to surfaces.

a. Clean bottom surface of baseplates.
b. Set steel-stair baseplates on wedges, shims, or leveling nuts.
c. After stairs have been positioned and aligned, tighten anchor bolts.
d. Do not remove wedges or shims, but if protruding, cut off flush with edge of bearing plate before packing with grout.
e. Promptly pack grout solidly between bearing surfaces and plates to ensure that no voids remain.

1) Neatly finish exposed surfaces; protect grout and allow to cure.
2) Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

E. Fit exposed connections accurately together to form hairline joints.

1. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.
2. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
3. Comply with requirements for welding in "Fabrication, General" Article.

3.3 INSTALLATION OF RAILINGS AND GUARDS

A. Adjust railing and guard systems before anchoring to ensure matching alignment at abutting joints with tight, hairline joints.

1. Space posts at spacing indicated or, if not indicated, as required by design loads.
2. Plumb posts in each direction, within a tolerance of 1/16 inch in 3 feet.
3. Align rails and guards so variations from level for horizontal members and variations from parallel with rake of stairs for sloping members do not exceed 1/4 inch in 12 feet.
4. Secure posts, rail ends, and guard ends to building construction as follows:

a. Anchor posts to steel by welding to steel supporting members.
b. Anchor handrail and guard ends to concrete and masonry with steel round flanges welded to rail and guard ends and anchored with post-installed anchors and bolts.

5. Install removable railing sections, where indicated, in slip-fit stainless steel sockets cast in concrete.

B. Attach handrails to wall with wall brackets.

1. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
2. Secure wall brackets to building construction as required to comply with performance requirements.

    a. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
    b. For hollow masonry anchorage, use toggle bolts.
    c. For steel-framed partitions, use hanger or lag bolts set into wood backing between studs. Coordinate with stud installation to locate backing members.
    d. For steel-framed partitions, use self-tapping screws fastened to steel framing or to concealed steel reinforcements.

3.4 REPAIR

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780.

END OF SECTION 055119

SECTION 083323 - OVERHEAD COILING DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Service doors.
2. Insulated service doors.

1.2 SUBMITTALS

A. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.

B. Manufacturer’s installation instructions shall be provided along with product data.

C. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).

D. Product Data: For each type and size of overhead coiling door and accessory.

1. Include manufacturer’s installation instructions, construction details, material descriptions, dimensions of individual components, profiles for slats, and finishes.
2. Include rated capacities, operating characteristics, electrical characteristics, and furnished accessories.

E. Shop Drawings: For each installation and for special components not dimensioned or detailed in manufacturer's product data.

1. Include plans, elevations, sections, and mounting details.
2. Include details of equipment assemblies, and indicate dimensions, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include points of attachment and their corresponding static and dynamic loads imposed on structure.
4. For exterior components, include details of provisions for assembly expansion and contraction and for excluding and draining moisture to the exterior.
5. Show locations of controls, locking devices, and other accessories.
6. Include diagrams for power, signal, and control wiring.

F. Samples for Initial Selection: Manufacturer's finish charts showing full range of colors and textures available for units with factory-applied finishes.

1. Include similar Samples of accessories involving color selection.

G. Samples for Verification: For each type of exposed finish on the following components, in manufacturer's standard sizes:

1. Curtain slats, including full vision window secured to slat.

H. Quality Control Submittals:

1. Qualification Data: For Installer.
2. Sample Warranty: For special warranty.

I. Contract Closeout Submittals

1. Replacement parts list.
2. Special warranty.
3. Maintenance Data: For overhead coiling doors to include in maintenance manuals.

J. Test Reports: Submit for air infiltration rate, as tested per ASTM E283, validated by an independent testing agency.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer for both installation and maintenance of units required for this Project.

1.4 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of doors that fail in materials or workmanship within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design Products: Provide specified products of Cornell Iron Works Inc. or equal from one of the following manufacturers:

1. The Cookson Company.
2. Raynor Garage Doors
3. Overhead Door Corporation.

B. Source Limitations: Obtain overhead coiling doors from single source from single manufacturer.

1. Obtain operators and controls from overhead coiling-door manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design" and ICC A117.1.

B. Structural Performance, Exterior Doors: Capable of withstanding the following design wind loads:

1. Design Wind Load: As indicated on Drawings
2. Deflection Limits: Design overhead coiling doors to withstand design wind load without evidencing permanent deformation or disengagement of door components.

C. Operation-Cycle Requirements: Design overhead coiling door components and operator to operate for not less than 50,000 cycles over lifetime.

D. Air Infiltration Performance for Insulated Door: Provide overhead coiling doors with maximum air infiltration rate of 0.3 CFM/SQ FT when tested in accordance with NFRC 400 or with ASTM E283 at 1.57psf.

2.3 DOOR ASSEMBLY

A. Service and Insulated Service Door: Overhead coiling door formed with curtain of interlocking metal slats.

1. Basis of Design Product, Insulated Door: Thermiser Max Insulated Rolling Door Model ESD30 by Cornell, or equal.
2. Basis of Design Product, Non-Insulated Door: Rolling Service Door Model ESD10 by Cornell, or equal.
3. Sizes: As indicated on Drawings for each location.

B. Insulated Door Curtain Slats: Double skin interlocking roll formed interior and exterior galvanized steel slats with foamed-in-place insulation between slats.

1. Profile: Manufacturer's standard flat-profile slats No. 6F
2. Thickness: Minimum 20 gauge exterior faces, 24 gauge interior faces
3. Total Slat Thickness: 15/16"
4. Insulation: 7/8" thick closed cell pressure foamed in place urethane insulation, Min R value of 8. Foam shall meet the following criteria:

a. Flame Spread Index of 0
b. Smoke Developed Index of 10 as tested per ASTM E84
c. CFC-free process with an Ozone Depletion Potential rating of 0
d. Meets foam plastic insulation requirements of the 2012 IBC®, section 2603.

5. Vision Panels: Approximately 10- by 1-1/2 -inch by ¾” thick oval acrylic panes set with double sided foam glazing tape and fully contained within slat assembly. Provide 6 rows of vision panels beginning at 5’-0” above finish floor. Required on Doors 220.4, 220.3 and 226.2. Refer to exterior elevation drawings for number and placement of vision panels and quantity of doors to receive vision panels.

C. Non-Insulated Door Curtain Slats: Interlocking roll formed galvanized steel slats.

1. Profile: Manufacturer's standard flat-profile slats
2. Thickness: Minimum 20 gauge

D. Insulated Bottom Bar: Reinforced extruded aluminum interior face with full depth insulation and exterior skin slat to match curtain material and gauge. Minimum 4" tall x 1-1/16" thickness and finished to match door.

1. Air Infiltration Certification Label: Must be affixed to bottom bar

E. Endlocks: Fabricate interlocking sections with high strength nylon endlocks on alternate slats each secured with two ¼" (6.35 mm) rivets. Provide windlocks as required to meet specified wind load.

F. Curtain Jamb Guides: Galvanized steel with thermal break and exposed finish matching curtain slats.

G. Hood: Galvanized steel minimum 24 gauge with reinforced top and bottom edges. Provide steel imtermediate support brackets.

1. Shape: Round
2. Mounting: As indicated on Drawings.

H. Electric Door Operator:

1. Usage Classification: Super duty, continuous use, cycle more than 20 times per day.
2. Operator Location: Front of coil.
3. Safety: Listed according to UL 325 by a qualified testing agency for commercial or industrial use; moving parts of operator enclosed or guarded if exposed and mounted at 8 ft. (2.44 m) or lower
4. Motor Exposure: Interior.
5. Motor Electrical Characteristics:

    a. Horsepower: The following hp ratings are based on recommendations from the Basis of Design manufacturer (Cornell) for their Basis of Design products listed. Alternative manufacturers shall provide motors with hp ratings as required to properly operate their products.

        1) 1/2 hp for Doors 220.3, 220.4, 226.2, and 227.3
        2) 3/4 hp for Doors 228.4, 228.5, 228.6, 228.7, 228.8 and 228.9
        3) 2 hp for Doors 222.1, 222.2, and 227.4

    b. Voltage: 460 V ac, three phase, 60 Hz.

6. Emergency Manual Operation: Chain type.
7. Obstruction-Detection Device: Automatic electric sensor edge on bottom bar; self-monitoring type.

    a. Sensor Edge Bulb Color: Black.

8. Control Station(s): Interior mounted.
9. Other Equipment: Provide six (6) remote control operators for the exterior coiling doors in the Driller's Garage that are capable of opening all of the doors located in that space.
10. Basis of Design Product: SGH Operator by Cornell.

I. Curtain Accessories: Equip door with weatherseals

J. Door Finish:

1. Powder-Coated Finish: Zirconium treatment followed by baked-on polyester powder coat, minimum 2.5 mils (0.065 mm) cured film thickness; ASTM D-3363 pencil hardness: H or better

a. Color: Custom color as selected by Architect
b. Basis of Design Product: Spectrashield Coating System by Cornell, or equal.

2. Interior Curtain-Slat Facing: Match finish of exterior curtain-slat face.

2.4 MATERIALS, GENERAL

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.5 DOOR CURTAIN MATERIALS AND CONSTRUCTION

A. Door Curtains: Fabricate overhead coiling-door curtain of interlocking metal slats, designed to withstand wind loading indicated, in a continuous length for width of door without splices. Unless otherwise indicated, provide slats of thickness and mechanical properties recommended by door manufacturer for performance, size, and type of door indicated, and as follows:

1. Steel Door Curtain Slats: Zinc-coated (galvanized), cold-rolled structural-steel sheet; complying with ASTM A653/A653M, with G90 (Z275) zinc coating.

2.6 HOODS

A. General: Form sheet metal hood to entirely enclose coiled curtain and operating mechanism at opening head. Contour to fit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Form closed ends for surface-mounted hoods and fascia for any portion of between-jamb mounting that projects beyond wall face. Equip hood with intermediate support brackets as required to prevent sagging.

2.7 CURTAIN ACCESSORIES

A. Weatherseals for Exterior Doors: Equip each exterior door with weather-stripping gaskets fitted to entire exterior perimeter of door for a weather-resistant installation unless otherwise indicated.

1. At door head, use 1/8-inch- (3-mm-) thick, replaceable, continuous-sheet baffle secured to inside of hood or field-installed on the header.
2. At door jambs, use replaceable, adjustable, continuous, flexible, 1/8-inch- - (3-mm-) thick seals of flexible vinyl, rubber, or neoprene.

2.8 COUNTERBALANCE MECHANISM

A. General: Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed bearings or self-lubricating graphite bearings for rotating members.

B. Counterbalance Barrel: Fabricate spring barrel of manufacturer's standard hot-formed, structural-quality, carbon-steel pipe, of sufficient diameter and wall thickness to support rolled-up curtain without distortion of slats and to limit barrel deflection to not more than 0.03 in./ft. of span under full load.

C. Counterbalance Spring: One or more oil-tempered, heat-treated steel helical torsion springs. Size springs to counterbalance weight of curtain, with uniform adjustment accessible from outside barrel. Secure ends of springs to barrel and shaft with cast-steel barrel plugs.

D. Torsion Rod for Counterbalance Shaft: Fabricate of manufacturer's standard cold-rolled steel, sized to hold fixed spring ends and carry torsional load.

E. Brackets: Manufacturer's standard mounting brackets of either cast iron or cold-rolled steel plate.

2.9 ELECTRIC DOOR OPERATORS

A. General: Electric door operator assembly of size and capacity recommended and provided by door manufacturer for door and operation-cycles requirement specified, with electric motor and factory-prewired motor controls, starter, gear-reduction unit, solenoid-operated brake, clutch, control stations, control devices, integral gearing for locking door, and accessories required for proper operation.

1. Comply with NFPA 70.
2. Control equipment complying with NEMA ICS 1, NEMA ICS 2, and NEMA ICS 6, with NFPA 70 Class 2 control circuit, maximum 24-V ac or dc.

B. Usage Classification: Electric operator and components capable of operating for not less than number of cycles per hour indicated for each door.

C. Door Operator Location(s): Operator location indicated for each door.

1. Front of Coil Mounted: Operator is mounted to the face of the hood on the left or right side. Operator shall fit within the coil height dimensions.

    a. Right Side Mount: Doors 228.4, 227.3, 228.5, 226.2, and 228.6
    b. Left Side Mount: Doors 228.7, 228.8, 228.9, 220.4 and 220.3

D. Motors: Reversible-type motor for motor exposure indicated for each door assembly.

1. Electrical Characteristics: Minimum as indicated for each door assembly. If not indicated, large enough to start, accelerate, and operate door in either direction from any position, at a speed not less than 8 in./sec. (203 mm/s) and not more than 12 in./sec. (305 mm/s), without exceeding nameplate ratings or service factor.
2. Operating Controls, Controllers, Disconnect Switches, Wiring Devices, and Wiring: Manufacturer's standard unless otherwise indicated.
3. Coordinate wiring requirements and electrical characteristics of motors and other electrical devices with building electrical system and each location where installed.

E. Limit Switches: Equip each motorized door with adjustable switches interlocked with motor controls and set to automatically stop door at fully opened and fully closed positions.

F. Obstruction-Detection Devices: External entrapment protection consisting of indicated automatic safety sensor capable of protecting full width of door opening. For non-fire-rated doors, activation of device immediately stops and reverses downward door travel.

1. Electric Sensor Edge: Automatic safety sensor edge, located within astragal or weather stripping mounted to bottom bar. Contact with sensor activates device. Connect to control circuit using manufacturer's standard take-up reel or self-coiling cable, as selected by Architect.

a. Self-Monitoring Type: Four-wire-configured device designed to interface with door operator control circuit to detect damage to or disconnection of sensor edge.

G. Control Station: Three-button control station in fixed location with momentary-contact push-button controls labeled "Open", “Close” and "Stop".

1. Interior-Mounted Units: Full-guarded, surface-mounted, heavy-duty type, with general-purpose NEMA ICS 6, Type 1 enclosure.

H. Emergency Manual Operation: Equip each electrically powered door with capability for emergency manual operation. Design manual mechanism so required force for door operation does not exceed 25 lbf (111 N).

I. Emergency Operation Disconnect Device: Equip operator with hand-operated disconnect mechanism for automatically engaging manual operator and releasing brake for emergency manual operation while disconnecting motor without affecting timing of limit switch. Mount mechanism so it is accessible from floor level. Include interlock device to automatically prevent motor from operating when emergency operator is engaged.

J. Motor Removal: Design operator so motor may be removed without disturbing limit-switch adjustment and without affecting emergency manual operation.

K. Audible and Visual Signals: Audible alarm and visual indicator lights in compliance with the accessibility standard.

2.10 GENERAL FINISH REQUIREMENTS

A. Comply with NAAMM/NOMMA 500 for recommendations for applying and designating finishes.

B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates areas and conditions, with Installer present, for compliance with requirements for substrate construction and other conditions affecting performance of the Work.

B. Examine locations of electrical connections.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Install overhead coiling doors and operating equipment complete with necessary hardware, anchors, inserts, hangers, and equipment supports; according to manufacturer's written instructions and as specified.

B. Install overhead coiling doors, hoods, controls, and operators at the mounting locations indicated for each door.

C. Accessibility: Install overhead coiling doors, switches, and controls along accessible routes in compliance with the accessibility standard.

D. Power-Operated Doors: Install automatic garage doors openers according to UL 325.

3.3 STARTUP SERVICE

A. Engage a factory-authorized service representative to perform startup service.

1. Complete installation and startup checks according to manufacturer's written instructions.
2. After electrical circuitry has been energized, operate doors to confirm proper motor rotation and door performance.
3. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.

3.4 ADJUSTING

A. Adjust hardware and moving parts to function smoothly so that doors operate easily, free of warp, twist, or distortion.

1. Adjust exterior doors and components to be weather resistant.

B. Lubricate bearings and sliding parts as recommended by manufacturer.

C. Adjust seals to provide tight fit around entire perimeter.

3.5 MAINTENANCE SERVICE

A. Initial Maintenance Service: Beginning at Substantial Completion, maintenance service shall include 12 months' full maintenance by skilled employees of coiling-door Installer. Include quarterly preventive maintenance, repair, or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper door operation. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.

1. Perform maintenance, including emergency callback service, during normal working hours.
2. Include 24-hour-per-day, seven-day-per-week, emergency callback service.

3.6 DEMONSTRATION

A. Engage a Company Service Advisor to train Director’s Representative's maintenance personnel to adjust, operate, and maintain overhead coiling doors.

END OF SECTION 083323

SECTION 084413 - GLAZED ALUMINUM CURTAIN WALLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Glazed aluminum curtain wall systems:

a. Conventionally glazed.
b. Two-sided, structural-sealant-glazed.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 SUBMITTALS

A. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.

B. Manufacturer’s installation instructions shall be provided along with product data.

C. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).

D. Provide Qualification Data from Quality Control Submittals prior to submitting the remaining submittals in order specified below.

1. Submit Product Data, Shop Drawings, Samples for Initial Selection, and Delegated Design submittals as one package.
2. Submit remaining Quality Controls Submittals.
3. Submit remaining submittals Sample for Verification, Fabrication Samples.
4. Contract Closeout Submittals.

E. Quality Control Submittals:

1. Qualification Data:

a. For Installer and field testing agency.
b. For professional engineer's experience with providing delegated-design engineering services of the kind indicated, including documentation that engineer is licensed in the state in which Project is located.

2. Energy Performance Certificates: For glazed aluminum curtain walls, accessories, and components from manufacturer.

    a. Basis for Certification: NFRC-certified energy performance values for each glazed aluminum curtain wall.

3. Product Test Reports: For glazed aluminum curtain walls, for tests performed bya qualified testing agency.
4. Quality-Control Program: Developed specifically for Project, including fabrication and installation, in accordance with recommendations in ASTM C1401. Include periodic quality-control reports.
5. Source quality-control reports.
6. Benchmark Testing Submittals:

    a. Testing Program: Developed specifically for Project.
    b. Test Reports: Prepared by a qualified preconstruction testing agency for each benchmark test.
    c. Record Drawings: As-built drawings of preconstruction laboratory benchmarks showing changes made during preconstruction laboratory mockup testing.

7. Field quality-control reports.
8. Sample Warranties: For special warranties.

F. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

2. Include manufacturer’s installation instructions.

G. Shop Drawings: For glazed aluminum curtain walls. Include plans, elevations, sections, full-size details, and attachments to other work.

1. Include details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
2. Include full-size isometric details of each type of vertical-to-horizontal intersection of glazed aluminum curtain walls, showing the following:

    a. Joinery, including concealed welds.
    b. Anchorage.
    c. Expansion provisions.
    d. Glazing.
    e. Flashing and drainage.

3. Show connection to and continuity with adjacent thermal, weather, air, and vapor barriers.

H. Samples for Initial Selection: For units with factory-applied color finishes.

I. Samples for Verification: For each type of exposed finish required, in manufacturer's standard sizes.

J. Fabrication Sample: Of each vertical-to-horizontal intersection of assemblies, made from 12-inch lengths of full-size components and showing details of the following:

1. Joinery, including concealed welds.
2. Anchorage.
3. Expansion provisions.
4. Glazing.
5. Flashing and drainage.

K. Delegated-Design Submittal: For glazed aluminum curtain walls, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

L. Contract Closeout Submittals:

1. Maintenance Data: For glazed aluminum curtain walls to include in maintenance manuals.
2. Maintenance Data for Structural Sealant: For structural-sealant-glazed curtain walls to include in maintenance manuals. Include ASTM C1401 recommendations for post-installation-phase quality-control program.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by manufacturer and that employs a qualified glazing contractor for this Project who is certified under the North American Contractor Certification Program (NACC) for Architectural Glass & Metal (AGM) contractors.

B. Testing Agency Qualifications: Qualified in accordance with ASTM E699 for testing indicated and acceptable to Director's Representative and Architect.

C. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.

1. Do not change intended aesthetic effects, as judged solely by Director's Representative, except with Director's Representative's approval. If changes are proposed, submit comprehensive explanatory data to Director's Representative for review.

D. Structural-Sealant Glazing: Comply with ASTM C1401 for design and installation of structural-sealant-glazed curtain wall assemblies.

1.5 BENCHMARKS

A. Build benchmarks to verify selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation.

1. Build benchmark of typical wall area as shown on Drawing A-910.

2. Testing shall be performed on benchmark in accordance with requirements in "Field Quality Control" Article.
3. Approval of benchmarks does not constitute approval of deviations from the Contract Documents contained in mockups unless Director's Representative specifically approves such deviations in writing.

1.6 WARRANTY

A. Special Assembly Warranty: Manufacturer agrees to repair or replace components of glazed aluminum curtain wall that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including, but not limited to, excessive deflection.
b. Noise or vibration created by wind and thermal and structural movements.
c. Deterioration of metals and other materials beyond normal weathering.
d. Water penetration through fixed glazing and framing areas.
e. Failure of operating components.

2. Warranty Period: Two years from date of Substantial Completion.

B. Special Finish Warranty, Factory-Applied Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of baked enamel, powder coat, or organic finishes within specified warranty period.

1. Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Comply with performance requirements specified, as determined by testing of glazed aluminum curtain walls representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.

1. Glazed aluminum curtain walls shall withstand movements of supporting structure, including, but not limited to, story drift, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.

2. Failure also includes the following:

    a. Thermal stresses transferring to building structure.
    b. Glass breakage.
    c. Noise or vibration created by wind and thermal and structural movements.
    d. Loosening or weakening of fasteners, attachments, and other components.
    e. Failure of operating units.

B. Structural Loads:

1. Wind Loads: As indicated on Drawings.
2. Other Design Loads: As indicated on Drawings

C. Deflection of Framing Members Supporting Glass: At design wind load, as follows:

1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans of up to 13 feet 6 inches (4.1 m) and to 1/240 of clear span plus 1/4 inch (6.35 mm) for spans of greater than 13 feet 6 inches (4.1 m) or an amount that restricts edge deflection of individual glazing lites to 3/4 inch (19.1 mm), whichever is less.or 3/4 inches (19 mm), whichever is smaller, unless otherwise indicated.

D. Structural: Test in accordance with ASTM E330 as follows:

1. When tested at positive and negative wind-load design pressures, assemblies do not evidence deflection exceeding specified limits.
2. When tested at 150 percent of positive and negative wind-load design pressures, assemblies, including anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
3. Duration: As required by design wind velocity, but not less than 10 seconds.

E. Water Penetration under Static Pressure: Test in accordance with ASTM E331 as follows:

1. No evidence of water penetration through fixed glazing and framing areas when tested in accordance with a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 12 lbf/sq. ft.

F. Energy Performance: Certified and labelled by manufacturer for energy performance as follows:

1. Thermal Transmittance (U-factor):

    a. Fixed Glazing and Framing Areas: U-factor for the system of not more than 0.36 Btu/sq. ft. x h x deg F as determined in accordance with NFRC 100.

2. Air Leakage:

    a. Fixed Glazing and Framing Areas: Air leakage for the system of not more than 0.06 cfm/sq. ft at a static-air-pressure differential of 6.24 lbf/sq. ft. when tested in accordance with ASTM E283.

3. Condensation Resistance Factor (CRF):

    a. Fixed Glazing and Framing Areas: CRF for the system of not less than 75 (framing) and 72 (glass).as determined in accordance with AAMA 1503.

G. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes:

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

H. Structural-Sealant Joints:

1. Designed to carry gravity loads of glazing.

I. Structural Sealant: ASTM C1184. Capable of withstanding tensile and shear stresses imposed by structural-sealant-glazed curtain walls without failing adhesively or cohesively. When tested for preconstruction adhesion and compatibility, cohesive failure of sealant shall occur before adhesive failure.

1. Adhesive failure occurs when sealant pulls away from substrate cleanly, leaving no sealant material behind.
2. Cohesive failure occurs when sealant breaks or tears within itself but does not separate from each substrate, because sealant-to-substrate bond strength exceeds sealant's internal strength.

2.2 SOURCE LIMITATIONS

A. Obtain all components of curtain-wall system and storefront system, including framing, entrances, sun control and accessories, from single manufacturer.

2.3 GLAZED ALUMINUM CURTAIN WALL SYSTEMS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. EFCO Corporation.
2. Kawneer Company, Inc., an Arconic Company
3. Oldcastle BuildingEnvelope (OBE); CRH Americas.
4. YKK AP America Inc.

B. Curtain Wall System 2-Sided Structural Silicone Glazed: Manufacturer's standard extruded-aluminum framing members for multi-story curtainwall application of thickness required and reinforced as required to support imposed loads. Provide outside glazed system, with pressure plate, captured vertical mullions and horizontal 2-sided structural silicone glazed joints.

1. Provide mullion configuration with pockets at the inside glazing face to receive fixed resilient elastomeric glazing seal; flexible silicone-compatible elastomer thermal barrier

that provides a minimum of 1/4" separation; EPDM exterior glazing seals secured by extended pressure plates fastened to tongue of back member; provisions to lead moisture accumulation to exterior at all sealed horizontals; and a cover that snaps over pressure plate to show only a sharp, uninterrupted exterior profile.

2. Two-sided structural glazed curtain wall shall include a dense silicone spacer and silicone sealant at the structural joint. Two-sided system shall be captured horizontally by means of an exterior pressure plate and cover, which shall be dry glazed using an interior and exterior dense EPDM preset gasket.
3. Pressure Plate Material: Fiberglass
4. Glazing Plane: Front
5. Aluminum vertical and horizontal main frame extrusions shall have a minimum wall thickness of .070.
6. Frame components shall be mechanically fastened by means of extruded aluminum shear blocks attached to vertical mullions.
7. Dimensions of Framing Members: Provide framing with vertical and horizontal framing members having a nominal face dimension of 2-1/2 inches, and overall depth of 6", 7-1/2 inches or 10-1/2 inches, as indicated on Drawings.
8. Provide custom mullion extrusion caps Profile Type M1, M2 and M3. Refer to Drawings.
9. Provide 90 degree corner SSG mullions. Structurally reinforce as required for loading conditions,
10. Finish: Permadize® Hardcoat finish (50% fluoropolymer resins) with a metallic pearlescence appearance meeting AAMA 2604. Color shall be "Sterling Grey."
11. Basis of Design Product: Provide 2-sided structural glazed silicone system 1600 Wall System 2 by Kawneer Company, Inc., an Arconic Company

C. Entrance Door Systems: Comply with Section 084113 "Aluminum-Framed Entrances and Storefronts".

2.4 SUN CONTROL

A. Sunshades: Assemblies consisting of manufacturer's standard outrigger brackets, louvers, and fascia, designed for attachment to curtain wall with mechanical fasteners.

1. Orientation: Horizontal.
2. Projection from Wall: 36 inches.
3. Outriggers: Straight with square edges .
4. Louvers: Five planar shaped louvers per unit
5. Fasciae: Rectangular.
6. Finish: Match adjacent glazed aluminum curtain wall.
7. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
8. Steel Reinforcement: As required by manufacturer.

2.5 GLAZING

A. Glazing: Comply with Section 088000 "Glazing."

B. Glazing Gaskets: ASTM C509 or ASTM C864. Manufacturer's standard.

1. Color: Black.

C. Glazing Sealants: Comply with Section 088000 "Glazing."

D. Structural Glazing Sealants: ASTM C1184, chemically curing silicone formulation that is compatible with system components with which it comes into contact, specifically formulated and tested for use as structural sealant and approved by structural-sealant manufacturer for use in curtain-wall assembly indicated.

1. Color: Black

E. Weatherseal Sealants: ASTM C920 for Type S; Grade NS; Class 25; Uses NT, G, A, and O; chemically curing silicone formulation that is compatible with structural sealant and other system components with which it comes into contact; recommended by structural-sealant, weatherseal-sealant, and structural-sealant-glazed curtain-wall manufacturers for this use.

1. Color: Match structural sealant.

2.6 MATERIALS

A. Sheet and Plate: ASTM B209.

B. Extruded Bars, Rods, Profiles, and Tubes: ASTM B221.

C. Structural Profiles: ASTM B308.

D. Steel Reinforcement:

1. Structural Shapes, Plates, and Bars: ASTM A36.
2. Cold-Rolled Sheet and Strip: ASTM A1008.
3. Hot-Rolled Sheet and Strip: ASTM A1011.

E. Steel Reinforcement Primer: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods in accordance with recommendations in SSPC-SP COM and prepare surfaces in accordance with applicable SSPC standard.

2.7 ACCESSORIES

A. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
2. Reinforce members as required to receive fastener threads.
3. Use exposed fasteners with countersunk Phillips screw heads, finished to match framing system.

B. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.

1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A123 or ASTM A153 requirements.

C. Concealed Flashing: Dead-soft, 0.018-inch-thick stainless steel, ASTM A240 of type recommended by manufacturer.

D. Bituminous Paint: Cold-applied asphalt-mastic paint containing no asbestos, formulated for 30-mil thickness per coat.

E. Stool Trim: Provide custom aluminum extrusions for stool trim in configurations indicated on the Drawings from curtainwall framing manufacturer. Match finish of curtainwall framing.

2.8 FABRICATION

A. Form or extrude aluminum shapes before finishing.

B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

C. Fabricate components that, when assembled, have the following characteristics:

1. Profiles that are sharp, straight, and free of defects or deformations.
2. Accurately fitted joints with ends coped or mitered.
3. Physical and thermal isolation of glazing from framing members.
4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
5. Provisions for field replacement of glazing from exterior.
6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.
7. Components curved to indicated radii.

D. Fabricate components to resist water penetration as follows:

1. Internal guttering system or other means to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.
2. Pressure-equalized system or double barrier design with primary air and vapor barrier at interior side of glazed aluminum curtain wall and secondary seal weeped and vented to exterior.

E. Curtain-Wall Framing: Fabricate components for assembly using shear-block system

F. Factory-Assembled Frame Units:

1. Rigidly secure nonmovement joints.

2. Prepare surfaces that are in contact with structural sealant in accordance with sealant manufacturer's written instructions, to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.
3. Seal joints watertight unless otherwise indicated.
4. Install glazing to comply with requirements in Section 088000 "Glazing."
5. Install structural glazing.

    a. Set glazing into framing in accordance with sealant manufacturer and framing manufacturer's written instructions and standard practice. Use a spacer or backer as recommended by manufacturer.
    b. Set glazing with proper orientation so that coatings face exterior or interior as specified.
    c. Apply structural silicone sealant to completely fill cavity, in accordance with sealant manufacturers written instructions with the framing and glazing in a fully supported position.
    d. Brace or stiffen framing and glazing in such a manner to prevent undue stresses on the glass edge seal and structural joints or movement of the glazing, until sealant is fully cured in accordance with manufacturer's recommendations.
    e. After structural sealant has completely cured, insert backer rod between lites of glass as recommended by sealant manufacturer.
    f. Install weatherseal sealant to completely fill cavity, in accordance with sealant manufacturer's written instructions, to produce weatherproof joints.
    g. Clean and protect glass as indicated in Section 088000 "Glazing."
    h. Retain bracing or stiffening until erected to prevent racking of units during transportation and erection.

G. After fabrication, clearly mark components to identify their locations in Project in accordance with Shop Drawings.

2.9 ALUMINUM FINISHES

A. Permadize Hardcoat finish (50% fluoropolymer resins) with a metallic pearlescence appearance meeting AAMA 2604. Color shall be “Sterling Grey.”

2.10 SOURCE QUALITY CONTROL

A. Structural Sealant: Perform quality-control procedures complying with ASTM C1401 recommendations, including, but not limited to, assembly material qualification procedures, sealant testing, and assembly fabrication reviews and checks.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Comply with manufacturer's written instructions.

B. Do not install damaged components.

C. Fit joints to produce hairline joints free of burrs and distortion.

D. Rigidly secure nonmovement joints.

E. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.

F. Where welding is required, weld components in concealed locations to minimize distortion or discoloration of finish. Protect glazing surfaces from welding.

G. Seal joints watertight unless otherwise indicated.

H. Metal Protection:

1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with primer, applying sealant or tape, or installing nonconductive spacers as recommended by manufacturer for this purpose.
2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

I. Install components to drain water passing joints, condensation occurring within framing members, and moisture migrating within glazed aluminum curtain wall to exterior.

J. Install components plumb and true in alignment with established lines and grades.

3.3 INSTALLATION OF GLAZING

A. Install glazing as specified in Section 088000 "Glazing."

3.4 INSTALLATION OF STRUCTURAL GLAZING

A. Prepare surfaces that will contact structural sealant in accordance with sealant manufacturer's written instructions, to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.

B. Set glazing into framing in accordance with sealant manufacturer's and framing manufacturer's written instructions and standard practice. Use a spacer or backer as recommended by manufacturer.

C. Set glazing with proper orientation, so that coatings face exterior or interior as specified.

D. Hold glazing in place using temporary retainers of type and spacing recommended by manufacturer, until structural sealant joint has cured.

E. Apply structural sealant to completely fill cavity, in accordance with sealant manufacturer's and framing manufacturer's written instructions and in compliance with local codes.

F. Apply structural sealant at temperatures indicated by sealant manufacturer for type of sealant.

G. Allow structural sealant to cure in accordance with manufacturer's recommendations.

H. Clean and protect glass as indicated in Section 088000 "Glazing."

3.5 INSTALLATION OF WEATHERSEAL SEALANT

A. After structural sealant has completely cured, remove temporary retainers, and insert backer rod between lites of glass, as recommended by sealant manufacturer.

B. Install weatherseal sealant to completely fill cavity, in accordance with sealant manufacturer's written instructions, to produce weatherproof joints.

3.6 ERECTION TOLERANCES

A. Install glazed aluminum curtain walls to comply with the following maximum tolerances:

1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.
3. Alignment:

    a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
    b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
    c. Where surfaces are separated by reveal or protruding element of 1 inch wide or more, limit offset from true alignment to 1/4 inch.

4. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inch over total length.

3.7 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

B. Test Area: Testing agency will perform tests on benchmarks.

1. Testing area will include multiple locations at sunshade outrigger.

C. Field Quality-Control Testing: Testing agency will perform the following test benchmarks .

1. Air Leakage: ASTM E783 at 1.5 times the rate specified for laboratory testing in "Performance Requirements" Article but not more than 0.09 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.
2. Water Penetration: ASTM E1105 at a minimum uniform and cyclic static-air-pressure differential of 0.67 times the static-air-pressure differential specified for laboratory testing in "Performance Requirements" Article, but not less than 6.24 lbf/sq. ft., and shall not evidence water penetration.

D. Structural-Sealant Adhesion: Testing agency will test structural sealant in accordance with recommendations in ASTM C1401, Destructive Test Method A, "Hand Pull Tab (Destructive)," Appendix X2.

1. Repair installation areas damaged by testing.

E. Glazed aluminum curtain walls will be considered defective if they do not pass tests and inspections.

F. Prepare test and inspection reports.

END OF SECTION 084413

SECTION 084418.13 – FIRE-RATED GLAZED STEEL CURTAIN WALLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Fire barrier glazed framing systems for installation as windows and wall sections in exterior fire-rated walls.

B. Related Sections:

1. Division 08 Section “Glazing” for glazing in fire-rated framing.

1.2 SUBMITTALS

A. Product Data: For each product indicated, including laboratory test data.

B. Shop Drawings:

1. Include plans, elevations and details of product showing component dimensions; framed opening requirements, dimensions, tolerances, and attachment to structure
2. Provide templates for the location of embeds and anchor locations required any adjoining work.
3. Include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Technical Information: Submit latest edition of manufacturer’s product data providing product descriptions, technical data and installation instructions. Including blank warranty form.

D. Installer Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

E. Field Quality-Control Reports

F. Closeout Submittals:

1. Maintenance Data: For fire-rated steel framed entrances and storefront to include in maintenance manuals.
2. Warranties: Submit manufacturer’s warranty.

1.5 QUALITY ASSURANCE

A. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of fire rated glazed steel curtain walls that are similar to those indicated for this Project in material, design, and extent.

B. Installer Qualifications: An experienced installer who has completed installations of framing and glazing similar in material, design, and extent to that indicated for Project and whose work has resulted in construction with a record of successful in-service performance.

1. Engineering Responsibility: Preparation of data for fire-rated-framed systems including Shop Drawings based on testing and engineering analysis of manufacturer's standard units in assemblies similar to those indicated for this Project and submission of reports of tests performed on manufacturer's standard assemblies.

C. Source Limitations for Glazing and Framing: Obtain glazing and framing from one single source.

1.6 PRE-INSTALLATION MEETING

A. Conduct a pre-installation conference at the Project site.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle framing and glazing per manufacturer’s directions.

1.8 PROJECT CONDITIONS

A. Field Measurements: Verify dimensions by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.9 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace components of fire rated steel framed storefront, entrances and doors that fail(s) in materials or workmanship within specified warranty period.

1. Warranty Period: Five year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide assembly comprised of “SuperLite II-XL 60” glazing and “GPX Curtainwall” fire-rated steel frame system by SaftiFirst or comparable product by one of the following:

1. Aluflam framing with Vetrotech Division of Saint Gobain glazing.
2. Fireframes Curtainwall Series framing with Pilkington Pyrostop glazing by Technical Glass Products

2.2 PERFORMANCE REQUIREMENTS

A. Structural Performance:

1. Design and size the system to withstand structural forces placed upon it without damage or permanent set when tested in accordance with ASTM E330 using load 1.5 times the design wind loads and of 10 seconds in duration.
2. Positive Wind Load: As indicated on Structural Drawings.
3. Negative Wind Load: As indicated on Structural Drawings
4. Member deflection: Limit deflection of the edge of the glass normal to the plane of the glass to 1/175 of the glass edge length or ¾ inch, whichever is less of any framing member
5. Accommodate movement between storefront and adjoining systems

B. Air Infiltration: Provide systems that allow a maximum air leakage through fixed glazed openings of 0.06 cfm/sq. ft. of area when tested per ASTM E 283 at a static air differential of 6.24 lbf/sq ft.

C. Water Penetration: Under Static pressure, provide systems that do not show uncontrolled water leakage when tested according to ASTM E 331 under static pressure differential of 15 psf as defined in AAMA 501.

2.3 REGULATORY REQUIREMENTS

A. Fire-Rated Window Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by UL, for fire ratings indicated, based on testing according to NFPA 257 and UL9. Assemblies must be factory-welded or come complete with factory-installed mechanical joints and must not require job site fabrication.

B. Fire-Rated Wall Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by UL, for fire ratings indicated, based on testing according to NFPA 257, ASTM E119. Assemblies must be factory-welded or come complete with factory-installed mechanical joints and must not require job site fabrication.

C. Certification: UL tests, signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.

1. Window assemblies shall be tested to the acceptance criteria of ASTM E2010-01, NFPA 257, UL 10-B, UL 10-C Standard methods for Fire Tests of Window Assemblies.
2. Wall assemblies shall be tested to the acceptance criteria of ASTM E119, NFPA 251, UL 263 Standard Test Methods for Fire Tests of Building Construction and Materials.

D. Listings and Labels - Fire Rated Assemblies: Under current follow-up service by an approved independent agency maintaining a current listing or certification. Label assemblies accordance with limits of manufacturer's listing.

2.4 MATERIALS

A. Fire Protection Rated Glazing: Composed of multiple sheets of low iron, high-visible-light transmission glass laminated with an intumescent interlayer.

1. Basis of Design Product: SuperLite II-XL 60 by SaftiFirst. Refer to Section 088000 for specifications.

    a. Exterior Glazing Thickness for 60 Minute Opening: IGU, 2-1/8" thick

2. Glazing Accessories: Manufacturer's standard compression gaskets, spacers, setting blocks and other accessories necessary for a complete installation.

B. GPX Steel Series Framing: System shall be rated for 60 minutes for specific locations indicated on Drawings. Frames shall be steel with steel trim, stainless steel standoffs, and moment and connecting braces. Face dimension of framing shall be 2-3/8" (60mm) and nominal depth shall be as indicated on the Drawings. Provide the following:

1. Setting Blocks: Calcium silicate setting blocks
2. Intumescent tape and caulk, manufacturer's standard.

2.5 FABRICATION

A. Field glaze frame assemblies.

B. Provide KD (knocked-down) frames ready for installation.

C. Fabricate fire rated assembly in compliance with approved Shop Drawings

2.6 ACCESSORY MATERIALS

A. Bituminous Paint: Cold-applied, asphalt-mastic paint complying with SSPC-Paint 12 requirements except containing no asbestos; formulated for 0.762-mm (30-mil) thickness per coat.

B. Stool Trim: Provide custom aluminum extrusions for stool trim in configurations indicated on the Drawings from curtainwall framing manufacturer. Match finish of curtainwall framing.

2.7 FINISHES

A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

B. Finish frames after assembly.

C. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

D. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable. Noticeable variations in the same piece are not acceptable.

E. Superior-Performance Organic Finish, Three-Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat.

1. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
2. Color and Gloss: As indicated on Drawings

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and members to which the work of this section attaches or adjoins prior to frame installation.

B. Provide openings plumb, square and within allowable tolerances.

1. Provide manufacturer recommended shim space at all walls

C. Notify Architect of unsatisfactory conditions

D. Do not proceed until unsatisfactory conditions are corrected.

3.2 INSTALLATION

A. Follow manufacturer’s written instructions for installing assemblies.

B. Install fire-rated framing in strict accordance with the approved shop drawings.

C. Install fire safing / fire stopping at edges of system

D. Install glazing in strict accordance with fire resistant glazing material manufacturer’s specifications. Field cutting of glazing is not permitted.

E. Do not install damaged frames or chipped glazing units.

F. Install plumb and true. Limit out of plumb or true to 3 mm in 3 m (1/8 inch in 10'-0") in any dimension.

3.3 REPAIR AND TOUCH UP

A. Limited to minor repair of small scratches. Use only manufacturer's recommended products.

1. Such repairs shall match original finish for quality or material and view.
2. Repairs and touch-up shall not be visible from a distance of 5 feet.

B. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged.

3.4 PROTECTION AND CLEANING

A. Protect glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface`. Remove nonpermanent labels, and clean surfaces.

1. Do not clean with astringent cleaners. Use a clean "grit free" cloth and a small amount of mild soap and water or mild detergent.
2. Protect surface applied film. Do not use any of the following:

a. Steam jets
b. Abrasives
c. Strong acidic or alkaline detergents, or surface-reactive agents
d. Detergents not recommended in writing by the manufacturer
e. Do not use any detergent above 77 degrees F
f. Organic solvents including but not limited to those containing ester, ketones, alcohols, aromatic compounds, glycol ether, or halogenated hydrocarbons.
g. Metal or hard parts of cleaning equipment must not touch the glass surface

B. Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.

C. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

END OF SECTION 084418.13

SECTION 102800 - TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Public-use washroom accessories.
2. Public-use shower room accessories.
3. Childcare accessories.
4. Custodial accessories.

1.3 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Deliver inserts and anchoring devices set into concrete or masonry as required to prevent delaying the Work.

1.4 SUBMITTALS

A. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.

B. Manufacturer’s installation instructions shall be provided along with product data.

C. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).

D. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
2. Include anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.

E. Samples: For each exposed product and for each finish specified, full size.

1. Approved full-size Samples will be returned and may be used in the Work.

F. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

1. Identify locations using room designations indicated.
2. Identify accessories using designations indicated.

G. Sample Warranty: For manufacturer's special warranties.

1.5 CLOSEOUT SUBMITTALS

A. Maintenance Data: For accessories to include in maintenance manuals.

1.6 WARRANTY

A. Manufacturer's Special Warranty for Mirrors: Manufacturer agrees to repair or replace mirrors that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, visible silver spoilage defects.
2. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Design accessories and fasteners to comply with the following requirements:

1. Grab Bars: Installed units shall be able to resist 250 lbf concentrated load applied in any direction and at any point.
2. Baby Changing Station: Installed units are able to hold 200 lb static load placed in the center of the changing surface.

2.2 PUBLIC-USE WASHROOM ACCESSORIES

A. Source Limitations: Obtain each type of public-use washroom accessory from single source from single manufacturer.

B. Automatic Soap Dispenser, Wall Mount (Designations A and C-SD):

1. Description: Automatic dispenser with infrared sensor to detect presence of hands; battery powered; designed for dispensing soap in lather form.

2. Mounting: Surface mounted on wall.
3. Capacity: 27 fl. oz.
4. Materials: Type 304 stainless steel with satin finish for housing with lockable clear acrylic refill-indicator window and hinged door.
5. Low-Battery Indicator: LED indicator.
6. Basis of Design Product: Bobrick B-2013 or equal.

C. Seat-Cover Dispenser (Designation B):

1. Mounting: Recessed.
2. Minimum Capacity:500 seat covers.
3. Exposed Material and Finish: Stainless steel, ASTM A480 No. 4 finish (satin) with 18 gauge door secured to cabinet with concealed full-length stainless steel piano hinge.
4. Lockset: Tumbler type.
5. Basis of Design Product: Bobrick B-3013 or equal.

D. Sanitary-Napkin and Tampon Vendor (Designation C):

1. Mounting: Fully recessed, designed for minimum 5-9/16" wall recess to finish face of wall.
2. Capacity: 20 sanitary napkins and 30 tampons.
3. Operation: No coin (free).
4. Exposed Material and Finish: Stainless steel, ASTM A480 No. 4 finish (satin) with 18 gauge door secured to cabinet with concealed full-length stainless steel piano hinge.
5. Lockset: Tumbler type, two required.
6. Basis of Design Product: Bobrick B-37063C or equal.

E. Sanitary-Napkin Disposal Unit (Designation D):

1. Mounting: Surface mounted.
2. Door or Cover: Satin finished stainless steel, 20 gauge, secured to cabinet with two rivets and equipped with a magnet catch. .
3. Receptacle: Removable HDPE plastic, with 0.6 gallon capacity.
4. Material and Finish: Stainless steel, ASTM A480 No. 4 finish (satin).
5. Basis of Design Product: Bobrick B-35139 TrimLine Series or equal.

F. Toilet Tissue (Jumbo-Roll) Dispenser (Designation E):

1. Description: One-roll unit.
2. Mounting: Surface mounted.
3. Capacity: 9- or 10-inchdiameter rolls.
4. Material and Finish: Stainless steel, ASTM A480 No. 4 finish (satin
5. Lockset: Tumbler type.
6. Refill Indicator: Pierced slots at front.
7. Basis of Design Product: Bobrick B-9890 Fino Collection, or equal.

G. Toilet Tissue (Roll) Dispenser (Designation F):

1. Description: Double-roll dispenser.
2. Mounting: Surface mounted.
3. Operation: Noncontrol delivery with theft-resistant spindle

4. Capacity: Designed for up to 5-1/8 inch diameter tissue rolls.
5. Material and Finish: Stainless steel, ASTM A480 No. 4 finish (satin
6. Basis of Design Product: Bobrick B-3588 TrimLine Series or equal.

H. Grab Bar (Designations G and H):

1. Mounting: Flanges with concealed fasteners and snap flange cover.
2. Material: Stainless steel, 18 gauge (0.05 inch) thick.

    a. Finish: Smooth, ASTM A480 No. 4 finish (satin) slip-resistant surface .

3. Outside Diameter: 1-1/2 inches.
4. Configuration, Orientation and Length: As scheduled on Drawings for each Designation.
5. Basis of Design Product: Bobrick B-6806 Series, or equal.

I. Mirror Unit (Designation I, R, S, T, and U):

1. Frame: Stainless steel angle, 0.05 inch thick, ¾" x ¾" with vertical direction satin finish. . Back of frame protected by full-size, shock-absorbing, water-resistant, nonabrasive, 3/16" (5mm) thick polyethylene padding.

    a. Corners: Welded and ground smooth.

2. Size:

    a. Designation R: 24" x 36"
    b. Designation S: 36" x 48"
    c. Designation T: ~~56" x 48"~~ 62" x 48"
    d. Designation U: 84" x 48"
    e. Designation I: 24" x 60"

3. Glazing: ¼" thick laminated glass consisting of two pieces of 1/8" (3mm) select float glass: selected for silvering, laminated with 0.015" (0.38mm) thick clear vinyl in the center, and electrolytically copper-plated by the galvanic process.
4. Hangers: Manufacturer's standard rigid, tamper and theft resistant 2S tab design with upper bracket engaging in upper louver and double sided tape below the bottom louver securing mirror to concealed wall hanger.
5. Basis of Design Product: Bobrick B-2909 or equal.

J. Combination Towel (Roll) Dispenser/Waste Receptacle (Designation J and K):

1. Description: Combination unit for dispensing preset length of roll paper towels, with removable waste receptacle.
2. Towel Mechanism: Automatic, battery-operated sensor. Adjustable (2", 3.5", 4") electronic sensor automatically dispenses towel when hands are placed under the towel opening. Intuitive LED light on door directs patrons to dispense area. LED light on the door flashes green when dispenser is ready to dispense, flashes slowly red to indicate it needs paper and red and green (alternating) to indicate low battery. Equip with switches that allow paper length to be set at 10", 12" or 14".
3. Mounting: Recessed designed for minimum 4" opening depth to finish face of wall

4. Minimum Towel-Dispenser Capacity: Dispenses universal, 1-1/2" to 2" diameter core, up to 8" diameter, 8" wide, non-perforated, non-proprietary paper towel rolls, 800 ft long.
5. Minimum Waste Receptacle Capacity:

    a. Designation J: 12 gal.
    b. Designation K: 18 gal.

6. Material and Finish: Stainless steel, ASTM A480 No. 4 finish (satin).
7. Liner: Reusable, vinyl waste-receptacle liner.
8. Lockset: Tumbler type for towel dispenser compartment and waste receptacle.
9. Basis of Design Products:

    a. Designation J: Bobrick B-3974 Classic Series, or equal.
    b. Designation K: Basis of Design Product: Bobrick B-39747 Classic Series, or equal.

K. Paper Towel (Folded) Dispenser (Designations M and C-PA):

1. Description: Constructed from 18 gauge stainless steel, all heliarc welded construction with well defined edges and corners. Cabinet shall be connected to backplate via a hinge at the unit's rear bottom, which prevents paper towels from falling out when opening. Door-limiter shall allow cabinet to open down to a horizontal position, which eases refill of paper towels and prevents cabinet from harming the wall when opening. Backplate shall have recessed key lock mounting holes to prevent mounting screw heads from snapping towels.
2. Mounting: Surface mounted.
3. Minimum Capacity: 400 C-fold or 525 multifold towels.
4. Material and Finish: Stainless steel, ASTM A480 No. 4 finish (satin).
5. Lockset: Tumbler type.
6. Refill Indicator: Pierced slots at sides or front.
7. Basis of Design Product: Bobrick B-9262 Fino Collection, or equal.

L. Automatic Soap Dispenser, Counter Set (Designation N):

1. Description: Dual automatic sensor pump soap dispensers with sponge storage caddy mounted to base for counter set locations. Dispensers shall be designed for dispensing soap in liquid or lotion form and be personalized with (1) dish wash soap icon and (1) hand soap icon.
2. Mounting: Set on counter top.
3. Capacity: 14 fluid oz. liquid, each dispenser.
4. Materials: Brass stainless steel with polished finish.
5. Power Source: Built-in lithium ion battery, rechargeable, with battery life of 8 months on one charge. Provide wireless charger.
6. Extra Materials: One soap refill package.
7. Basis of Design Product: Simplehuman Rechargeable Sensor Pump 14 oz. Dual with Caddy, or equal.

M. Paper Towel (Roll) Dispenser Counter Set (Designation O):

1. Description: Tension arm paper towel holder with weighted base allows the user to cleanly tear one sheet or multiple sheets with one hand. .
2. Mounting: Set on countertop.

3. Minimum Capacity: On standard 8-inch wide, 800-foot long roll.
4. Material and Finish: Brass stainless steel with brushed finish .
5. Basis of Design Product: .Simplehuman Tension Arm Paper Towel Holder, or equal.

N. Folding Shower Seat (Designation P):

1. Configuration: L-shaped seat, designed for wheelchair access.
2. Seat: White vinyl padded seat .
3. Mounting Mechanism: Stainless steel, ASTM A480 No. 4 finish (satin).
4. Basis of Design Product: Bobrick B-517 (right hand seat) and B-518 (left hand seat)

O. Shower Curtain Rod, Hooks and Curtain (Designation Q):

1. Rod:

   a. Description: 1-inch outside diameter, straight rod.
   b. Mounting Flanges: Exposed fasteners; in material and finish matching rod.
   c. Rod Material and Finish: Stainless steel, ASTM A480 No. 4 finish (satin), 20 gauge.
   d. Basis of Design Product: Bobrick B-6107

2. Hooks: Type 304 stainless steel. For use on 1″ and 1-1/4″ (25 and 32mm) dia. shower curtain rods.

   a. Basis of Design Product: Boibrick 204-1¨

3. Curtain:

   a. Size: 42" wide x 72" high
   b. Material: Opaque, matte white vinyl 0.008" (0.2mm) thick, containing antibacterial and flame-retardant agents.
   c. Basis of Design Product: Bobrick 204-2

P. Hook (Designations W and X):

1. Description: Single-prong unit with 3/4" diameter, 2-31/32” long post and integrated 5/8” diameter hook pin.
2. Mounting: Concealed mounting flange shall be 5/32" thick machined solid stainless steel plate, 1-5/16" diameter and equipped with two screw holes for attachment. Machined solid flange cover shall be 1/16" thick stainless steel in satin finish 1-5/16" diameter. Set screw shall fasten the post to the flange and secures the flange cover.
3. Material and Finish: Stainless steel, Type 303 with satin finish .
4. Load Capacity: 150 lbs. when installed per manufacturer’s instructions.
5. Basis of Design Product: Bobrick B-9542 Fino Collection, or equal.

Q. Combination Towel (Folded) Dispenser/Waste Receptacle (Designation Y):

1. Description: Combination unit for dispensing C-fold or multifold towels, with removable waste receptacle. Door shall be 18 gauge; have 9/16" 90° return edges; be secured to cabinet with a concealed, full-length stainless steel piano-hinge; and equipped with a stainless steel cable door-swing limiter and friction catch. Door conceals flange from view.

2. Mounting: Recessed.

    a. Designed for nominal 4-inch wall depth.

3. Minimum Towel-Dispenser Capacity: 300 C-fold or 400 multifold paper towels. Unit shall be equipped with a 90° return towel guide angle inside cabinet to prevent paper towels from falling forward out when door is opened for servicing and a nylon rod across the center of the towel tray to dispense paper towels one at a time.
4. Minimum Waste-Receptacle Capacity: 1.6 gal.
5. Material and Finish: Stainless steel, ASTM A480 No. 4 finish (satin).
6. Liner: Reusable, vinyl waste-receptacle liner.
7. Lockset: Tumbler type for towel-dispenser compartment and waste receptacle.
8. Basis of Design Product: Bobrick B-36903 TrimLine Series, or equal

R. Paper Towel (Roll) Dispenser (Designation BB):

1. Description: Touch-Free pull towel dispensing mechanism dispenses one 12" (300mm) length of towel per pull.
2. Mounting: Surface mounted.
3. Minimum Capacity: On standard 8-inch wide, 8 inch diameter roll.
4. Material and Finish: High-impact, dark translucent grey resin door with high-gloss finish on exposed surfaces and durable, high-impact, light grey resin housing with matte finish.
5. Basis of Design Product: Bobrick B-72860, or equal

S. Sanitary-Napkin and Tampon Vendor (Designation HH):

1. Mounting: Semi recessed, designed for minimum 3-7/8” wall recess to finish face of wall.
2. Capacity: 20 sanitary napkins and 30 tampons.
3. Operation: No coin (free).
4. Exposed Material and Finish: Stainless steel, ASTM A480 No. 4 finish (satin) with 18 gauge door secured to cabinet with concealed full-length stainless steel piano hinge.
5. Lockset: Tumbler type, two required.
6. Basis of Design Product: Bobrick B-370634C or equal

2.3 CHILDCARE ACCESSORIES

A. Source Limitations: Obtain each type of childcare accessory from single source from single manufacturer.

B. Diaper-Changing Station (Designation V):

1. Description: Horizontal unit that opens by folding down from stored position and with child-protection strap. Station shall have two solid handles that allow operation with less than 5 lbs. of force. Handles rest below 27" for cane detection when unit is in the down position. Front panel shall be deep drawn, one-piece, seamless, stainless steel with satin finish and laser etched logo with rounded corners. Deep drawn, one-piece seamless, stainless steel flange with satin finish rounded edges and corners. Concealed 11-gauge chassis frame, compromised of 1" diameter integral steel-tubing that supports the changing bed and interacts with 11-gauge steel wall mounting bracket to provide steel-on-steel hinge

stop. Skirt shall be constructed of Type 304 stainless steel with satin finish and rounded corners. Injection molded polypropylene bed surface shall have Microban® antimicrobial additive, and be ISO 22196 tested for efficacy. Bed surface shall be minimum 535 sq. in. Include dual cavity dispenser with integral spring tab and 50 liner capacity.

a. Engineered to support minimum of 200-lb static load when opened.

2. Mounting: Surface mounted, with unit projecting not more than 4 inches from wall when closed.
3. Operation: By pneumatic shock-absorbing mechanism.
4. Material and Finish Stainless steel, ASTM A480 No. 4 finish (satin), exterior shell with rounded plastic corners; HDPE bed liner in manufacturer's standard grey color.
5. Liner Dispenser: Provide built-in dispenser for disposable sanitary liners.
6. Accessories: Provide solid stainless steel external bag hook.
7. Basis of Design Product: Koala Kare (a division of Bobrick) KB310-SSWM Horizontal Stainless Steel Surface-Mounted Baby Changing Station, or equal.

2.4 CUSTODIAL ACCESSORIES

A. Custodial Mop and Broom Holder (Designation L):

1. Description: Unit with shelf, hooks, and holders.
2. Length: 34 inches.
3. Hooks: Four.
4. Mop/Broom Holders: Three, spring-loaded, rubber hat, cam type.
5. Material and Finish: Stainless steel, ASTM A480 No. 4 finish (satin).

a. Shelf: Not less than nominal 0.05-inch thick stainless steel.

6. Basis of Design Product: Bobrick B-239.

2.5 MATERIALS

A. Stainless Steel: ASTM A240 or ASTM A666, Type 304, 0.031-inch minimum nominal thickness unless otherwise indicated.

B. Brass: ASTM B19, flat products; ASTM B16, rods, shapes, forgings, and flat products with finished edges; or ASTM B30, castings.

C. Steel Sheet: ASTM A1008, Designation CS (cold rolled, commercial steel), 0.036-inch minimum nominal thickness.

D. Galvanized-Steel Sheet: ASTM A653, with G60 hot-dip zinc coating.

E. Galvanized-Steel Mounting Devices: ASTM A153, hot-dip galvanized after fabrication.

F. Fasteners: Screws, bolts, and other devices of same material as accessory unit, unless otherwise recommended by manufacturer or specified in this Section, and tamper and theft resistant where exposed, and of stainless or galvanized steel where concealed.

G. Chrome Plating: ASTM B456, Service Condition Number SC 2 (moderate service).

H. Mirrors: ASTM C1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

2.6 FABRICATION

A. General: Fabricate units with tight seams and joints, and exposed edges rolled. Hang doors and access panels with full-length, continuous hinges. Equip units for concealed anchorage and with corrosion-resistant backing plates.

B. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Director’s Representative.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.

1. Remove temporary labels and protective coatings.

B. Grab Bars: Install to comply with specified structural-performance requirements.

C. Baby Changing Stations: Install to comply with specified structural-performance requirements.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Clean and polish exposed surfaces according to manufacturer's written instructions.

END OF SECTION 102800

SECTION 210529 - HANGERS AND SUPPORTS FOR FIRE SUPPRESSION PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal pipe hangers and supports.
2. Trapeze pipe hangers.
3. Metal framing systems.
4. Fastener systems.
5. Pipe stands.
6. Equipment supports.

1.2 DEFINITIONS

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

1.3 PERFORMANCE REQUIREMENTS

A. NICET Level III Technician: Provide Water-Based Fire Protection Layout with seal and signature of a NYS Registered Professional Fire Protection Engineer using performance requirements, design criteria, FC, and NFPA standards that are indicated in this specification and design documentation.

1. Include factory shop drawings and installation details for hangers and supports on shop drawings.

B. Structural Performance: Hangers and supports for fire-suppression piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7.

1. Design supports for multiple pipes, including pipe hangers & stands, capable of supporting combined weight of supported systems, system contents, and test water.
2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

1.4 SUBMITTALS

A. Product data for each type of product: catalog sheets, specifications, and installation instruction. indicating UL or FM approved for each product.

B. Shop Drawings:

1. Show fabricated piping support structures, pipe racks, trapeze pipe hangers and anchors. Include installation details and include calculations for the following: include Product Data for components.
2. Support Frames, Piping, Tank, and Equipment Supports, and Anchorage: Indicate point loads and support locations, along with calculations and details keyed to the layouts pertaining to supports, support frames, and anchorage from the contract specification and design documentation.
3. Supplementary Steel: Show details of fabrication and installation. Indicate materials, thicknesses, gauges, sizes, dimensions, methods of joining and fastening, welds, finishes, details of reinforcement and embedment, attachments, anchorage, miscellaneous metal items incidental to basic fabrication shown, provisions for work of other trades, and other pertinent information from the contract specification and design documentation.
4. Trapeze pipe hangers.
5. Metal framing systems.
6. Pipe stands.
7. Equipment supports.
8. Include factory shop drawing and installation details for hangers and supports.

C. Welding Qualifications & Welding Certification: Qualify procedures and operators according to 2010 ASME Boiler and Pressure Vessel Code.

1.5 QUALITY ASSURANCE

A. Structural Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

B. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

PART 2 - PRODUCTS

2.1 METAL PIPE HANGERS AND SUPPORTS

A. Acceptable Manufacturers: EATON TOLCO Fire protection solution, ITT Grinnell Pipe Hangers and supports, National Pipe Hanger Corporation, nVent Caddy products, Anvil International pipe hangers-ASC, or equal.

B. Carbon-Steel Pipe Hangers and Supports:

1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
2. Adjustable Clevis Hanger Zinc Plated with cross bolt and nut.
3. Hanger Rods: Continuous-thread rod, nuts, and washer made of low carbon steel/clear zinc plated.

C. Stainless-Steel Pipe Hangers and Supports:

1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
2. Adjustable Clevis Hanger stainless steel with cross bolt and nut.
3. Hanger Rods: Continuous-thread rod, nuts, and washer made of stainless steel.

D. Adjustable Swivel Rings and Supports:

1. Listed UL and FM & complies with Federal Specification A-A-1192A (Type 10), Manufactures' Standardization Society SP-69 (Type 10) and NFPA standards.
2. Adjustable Swivel Ring Carbon Steel Mil. Pre-Galvanized.
3. Hanger Rods: Continuous-threaded rod low carbon steel/clear zinc plated.

E. Hinged Extension Split Ring Hanger:

1. Conforms to Federal Specification WW-H-171E & A-A-1192A, Type and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 12.
2. Malleable Iron/Electro-Galvanized
3. Hanger Rods: Continuous threaded rod low carbon steel/clear zinc plated.

F. Standard Riser Clamp:

1. Listed UL and FM and conforms to Federal Specification WW-H-171 E & A-A-1192A, Type 8, and Manufacturers Standardization Society ANSI/MSS SP-69 & SP-58, Type 8.
2. Steel-Zinc Plated.

2.2 TRAPEZE PIPE HANGERS

A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.3 METAL FRAMING SYSTEMS

A. MFMA Manufacturer Metal Framing Systems:

1. Description: Shop- or field-fabricated pipe-support assembly for supporting multiple parallel pipes.
2. Standard: MFMA-4.
3. Channels: Continuous slotted steel channel with interned lips.
4. Channel Nuts: Formed or stamped steel nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
5. Hanger Rods: Continuous-thread rod, nuts, and washer made of stainless steel.

B. Non-MFMA Manufacturer Metal Framing Systems:

1. Description: Shop- or field-fabricated pipe-support assembly made of steel channels, accessories, fittings, and other components for supporting multiple parallel pipes.
2. Standard: Comply with MFMA-4.

3. Channels: Continuous slotted steel channel within turned lips.
4. Channel Nuts: Formed or stamped steel nuts or other devices designed to fit into channel slot and, when tightened, prevent slipping along channel.
5. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.
6. Coating: Zinc.

2.4 FASTENER SYSTEMS for CONCRETE, STEEL, and WOOD

A. Acceptable Manufactures: Red Head, Powers, Sammys threaded Rod Anchors, Hangermate, EATON TOLCO, Grinnell, Michigan Hanger, Newman, ANVIL, nVent Caddy, or equal.

B. Mechanical-Expansion Anchors: Insert-wedge-type or drop-ins. Male or Female ends zinc-coated steel anchors, for use in hardened Portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

C. Drilling Fasteners Screw Type: For concrete, steel, and wood Type of installation: vertical horizontal-side mounted, swivel.

D. Beam Clamps/ Beam Hangers: Zinc Plated adjustable malleable iron beam clamp, or adjustable forged steel beam clamp, and forged steel beam clamp with weldless eye nut (right hand thread) steel tie rod, nuts and washers.

E. Beam Clamp Retaining Strap.

F. Truss-T Hangers.

G. Rod Couplings: Zinc Plated.

2.5 PIPE STANDS

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

B. Compact Pipe Stand: One-piece steel unit with pipe clamps, or V-shaped cradle to support pipe, for mechanical room installation.

C. Low-Type Pipe Stand: One-piece or two pieces with vertical members with base plate. Cadmium plated steel or stainless steel, continuous threaded rod or pipe with pipe clamps, or V-shaped cradle to support pipe.

D. High-Type Pipe Stand: One-piece or two pieces with vertical members with base plate Cadmium plated steel or stainless steel, continuous threaded rod or pipe with pipe clamps, or V-shaped cradle to support pipe.

2.6 EQUIPMENT SUPPORTS

A. Description: Welded, shop- or field-fabricated equipment support made from structural carbon-steel shapes.

2.7 MISCELLANEOUS MATERIALS

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

B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, no shrink and nonmetallic grout; suitable for interior and exterior applications.

1. Properties: Non-staining, noncorrosive, and nongaseous.
2. Design Mix: 5000 psi, 28-day compressive strength.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT INSTALLATION

A. Metal Pipe-Hanger Installation: Comply with MSS SP-69, MSS SP-89 and NFPA 13 Chapter 9 Hanging, Bracing, and Restraint of System Piping. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.

B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69, MSS SP-89 and NFPA 13 Chapter 9 Hanging, Bracing, and Restraint of System Piping. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.

1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.
2. Field fabricates from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.

C. Metal Framing System Installation: Arrange for grouping of parallel runs of piping, and support together on field-assembled metal framing systems.

D. Fastener System Installation:

1. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
2. Install concrete screws in concrete after concrete is placed and completely cured. Using vertical mount, or horizontal mount. Install fasteners according to the manufacture’s written instructions.

E. Pipe Stand Installation:

1. Pipe Stand Types for pipe supports in mechanical room. Assemble components and mount on concrete floors or steel structure.

F. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.

G. Equipment Support Installation: Fabricate from welded-structural-steel shapes.

H. Install hangers and supports to allow controlled movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

I. Install lateral bracing with pipe hangers and supports to prevent swaying.

J. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, 2/-1/2" inch and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

K. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

L. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.

M. Hanger Spacing for Steel, Cooper, CPVC, and Ductile Iron as per NFPA 13/ Table 9.2.2.1 (a):

3.2 EQUIPMENT SUPPORTS

A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.

B. Grouting: Place grout under supports for equipment and make bearing surface smooth.

C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.3 METAL FABRICATIONS

A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.

B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

3.4 ADJUSTING

A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

B. Where a sprinkler system exceeds 100psi for branch lines above a ceiling supplying sprinkler in a pendent position below a ceiling, the hanger assembly supporting the pipe supplying an end sprinkler in a pendent position shall be of a type that prevents upward movement of the pipe. Use a surge restrainer to prevent movement at each end of the line hanger assembly.

C. Trim excess length of continuous-thread hanger and support rods to 1-1/2.

3.5 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mil.

B. Touchup: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal are specified in Section 099123 "Interior Painting."

C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

3.6 HANGER AND SUPPORT SCHEDULE

A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.

B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.

C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.

D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.

E. Use carbon-steel pipe hangers and supports metal trapeze pipe hangers and metal framing systems and attachments for general service applications.

F. Use corrosion-resistant attachments for hostile environment applications.

G. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Adjustable, Steel Clevis Hangers-Zinc plated (MSS Type 1): For suspension of non-insulated or insulated, stationary pipes NPS ~~½"~~ 2" inch to 30" inch.
2. Riser Clamps/Steel-Zinc Plated (MSS Type 8): For support of stationary steel pipe risers NPS 3/8" inch to 4" inch.
3. Malleable/Electro-Galvanized Split-Ring Hangers (MSS Type 12): For suspension pipes to allow piping to run close to ceilings or walls NPS3/8" inch to 4" inch.
4. Adjustable Swivel Ring/Pre-Galvanized Zinc (MSS Type 10): For suspension of stationary pipes NPS ~~½" inch to 8"~~ 1" inch to 1-1/2" inch.
5. Adjustable Swivel Trapeze Pipe Hanger/Pre-Galvanized (ASTM A653): For suspension of stationary pipes to allow for hanging of piping systems between structural attachments. NPS 1½" inch to 4" inch.
6. Adjustable Swivel Ring/Copper Plated (Type 10) Recommended for suspension of stationary copper tube. ½" inch to 4".
7. U-Bolts (MSS Type 24): For support of heavy pipes NPS ½" inch to 30" inch.
8. Pipe Saddle Supports (MSS Type 36): For support of pipes NPS 4" inch to 36" inch with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate.
9. Pipe Stanchion Saddles (MSS Type 37): For support of pipes NPS 4" inch to 36" inch, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate, and with U-bolt to retain pipe.
10. Adjustable Pipe Saddle Supports (MSS Type 38): For stanchion-type support for pipes NPS 2-1/2" inch to 36" inch if vertical adjustment is required, with steel-pipe base stanchion support and cast-iron floor flange.
11.
12. Surge Restraints if sprinkler system exceeds 100psi.

H. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS ¾" inch to 24" inch.
2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS ¾" inch to 24" inch if longer ends are required for riser clamps.

I. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel Rod Couplings 3/8" through 7/8".
2. Steel Clevises (MSS Type 14): For piping installations.
3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.

J. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
2. Drilling fasteners steel screw for concrete, wood, or steel.
3. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
4. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.

5. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
6. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
7. C-Clamps (MSS Type 23): For structural shapes.
8. Top-Beam Clamps (MSS Type 25): For top of beams if hanger rod is required tangent to flange edge.
9. Steel-Beam Clamps with Eye Nuts (MSS Type 28): For attaching to bottom of steel I-beams for heavy loads.
10. Linked-Steel Clamps with Eye Nuts (MSS Type 29): For attaching to bottom of steel I-beams for heavy loads, with link extensions.
11. Welded-Steel Brackets: For support of pipes from below or for suspending from above by using clip and rod. Use one of the following for indicated loads:

    a. Light (MSS Type 31): 750 lb.
    b. Medium (MSS Type 32): 1500 lb.
    c. Heavy (MSS Type 33): 3000 lb.

12. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
13. Truss T-Hangers.

K. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Restraint-Control Devices (MSS Type 47): Where indicated to control piping movement.
2. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4" inches.
3. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41, roll hanger with springs.
4. Spring Sway Braces (MSS Type 50): To retard sway, shock, vibration, or thermal expansion in piping systems.
5. Variable-Spring Hangers (MSS Type 51): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from hanger.
6. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from base support.
7. Variable-Spring Trapeze Hangers (MSS Type 53): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from trapeze support.
8. Constant Supports: For critical piping stress and if necessary to avoid transfer of stress from one support to another support, critical terminal, or connected equipment. Include auxiliary stops for erection, hydrostatic test, and load-adjustment capability. These supports include the following types:

    a. Horizontal (MSS Type 54): Mounted horizontally.
    b. Vertical (MSS Type 55): Mounted vertically.
    c. Trapeze (MSS Type 56): Two vertical type supports and one trapeze member.

L. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.

M. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system Sections.

N. Use mechanical-expansion anchors or drilled fasteners screw type instead of building attachments where required in concrete construction.

END OF SECTION 210529

SECTION 213900 - CONTROLLERS FOR FIRE-PUMP DRIVERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Full-service, reduced-voltage controllers rated 600 V and less.
2. Controllers for pressure-maintenance pumps.

1.3 DEFINITIONS

A. ATS: Automatic transfer switch(es).

B. ECM: Electronic control module.

C. MCCB: Molded-case circuit breaker.

D. N.O.: Normally open.

1.4 SUBMITTALS

A. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.

B. Manufacturer’s installation instructions shall be provided along with product data.

C. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).

D. Product data for each type of product: catalog sheets, specifications, and installation instruction. indicating UL or FM approved for each product.

E. Shop Drawings: For each type of product indicated. Include dimensioned plans, elevations, sections, details, and attachments to other work, including required clearances and service spaces around controller enclosures.

1. Show tabulations of the following:

a. Each installed unit's type and details.
b. Enclosure types and details for types other than NEMA 250 “Enclosures for Electrical Equipment”, Type 2.
c. Factory-installed devices.
d. Nameplate legends.
e. Short-circuit current (withstand) rating of integrated unit.
f. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices.
g. Specified modifications.

2. Detail equipment assemblies and indicate dimensions, weights, loads, method of field assembly, components, and location and size of each field connection.
3. Schematic and Connection Diagrams: For power, signal, alarm, and control wiring and for pressure-sensing tubing.

F. Qualification Data: For qualified testing agency.

G. Product Certificates: For each type of product indicated, from manufacturer.

H. Manufacturer's factory test reports of fully assembled and tested equipment.

I. Source quality-control reports.

J. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For each type of product indicated to include in emergency, operation, and maintenance manuals. Include the following:

1. Manufacturer's written instructions for setting field-adjustable timers, controls, and status and alarm points.
2. Manufacturer's written instructions for testing, adjusting, and reprogramming microprocessor-based logic controls.

1.6 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Indicating Lights: Two of each type and color of lens installed; two of each type and size of lamp installed.
2. Auxiliary Contacts: One for each size and type of magnetic contactor installed.
3. Power Contacts: Three for each size and type of magnetic contactor installed.
4. Contactor Coils: One for each size and type of magnetic controller installed.
5. Relay Boards: One for each size and type of relay board installed.
6. Operator Interface: One microprocessor board(s), complete with display and membrane keypad.

1.7 QUALITY ASSURANCE

A. Testing Agency Qualifications: Member company of an NRTL.

B. Source Limitations: Obtain fire-pump controllers and all associated equipment from single source or producer.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70 “Standard for Electrical Safety in the Workplace”, by a qualified testing agency, and marked for intended location and application.

D. Comply with standards of authorities having jurisdiction pertaining to materials and installation.

E. Comply with NFPA 20 “Standard for the Installation of Stationary Pumps for Fire Protection” and NFPA 70 “Standard for Electrical Safety in the Workplace”.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store controllers indoors in clean, dry space with uniform temperature to prevent condensation. Protect enclosed controllers from exposure to dirt, fumes, water, corrosive substances, and physical damage.

B. If stored in areas subject to weather, protect controllers from weather, dirt, dust, corrosive substances, and physical damage. Remove loose packing and flammable materials from inside controllers; install temporary electric heating, with at least 250 W per controller or connect factory-installed space heaters to temporary electrical service.

1.9 PROJECT CONDITIONS

A. Environmental Limitations:

1. Ambient Temperature Rating: Not less than 40 deg F and not exceeding 122 deg F unless otherwise indicated.
2. Altitude Rating: Not exceeding 6600 feet unless otherwise indicated.

B. Interruption of Existing Electric Service: Notify Director’s Representative no fewer than seven days in advance of proposed interruption of electric service and comply with NFPA 70E “Standard for Electrical Safety in the Workplace”.

1.10 COORDINATION

A. Coordinate layout and installation of controllers with other construction including conduit, piping, fire-pump equipment, and adjacent surfaces. Maintain required clearances for workspace and equipment access doors and panels. Ensure that controllers are within sight of fire-pump drivers.

B. Coordinate sizes and locations of concrete bases with actual equipment provided.

PART 2 - PRODUCTS

2.1 FULL-SERVICE CONTROLLERS

A. General Requirements for Full-Service Controllers:

1. Comply with NFPA 20 “Standard for the Installation of Stationary Pumps for Fire Protection” and UL 218.
2. Listed by an NRTL for electric-motor driver for fire-pump service.
3. Combined automatic and nonautomatic operation.
4. Factory assembled, wired, and tested; continuous-duty rated.
5. Service Equipment Label: NRTL labeled for use as service equipment.

B. Method of Starting:

1. Pressure-switch actuated.

a. Water-pressure-actuated switch and pressure transducer with independent high- and low-calibrated adjustments responsive to water pressure in fire-suppression piping.
b. System pressure recorder, electric ac driven, with spring backup.
c. Programmable minimum-run-time relay to prevent short cycling.
d. Programmable timer for weekly tests.

~~2. Magnetic Controller: Across-the-line type~~
3. Solid-State Controller: Variable Speed Drive type.
4. Emergency Start: Mechanically operated start handle that closes and retains the motor RUN contactor independent of all electric or pressure actuators.

C. Method of Stopping: Automatic and nonautomatic shutdown after automatic starting

D. Capacity: Rated for fire-pump-driver horsepower and short-circuit-current (withstand) rating equal to or greater than short-circuit current available at controller location.

E. Method of Isolation and Overcurrent Protection: Interlocked isolating switch and nonthermal MCCB; with a common, externally mounted operating handle, and providing locked-rotor protection.

F. Door-Mounted Operator Interface and Controls:

1. Monitor, display, and control the devices, alarms, functions, and operations listed in NFPA 20 “Standard for the Installation of Stationary Pumps for Fire Protection” as required for drivers and controller types used.
2. Method of Control and Indication:

a. Microprocessor-based logic controller, with multiline digital readout.
b. Membrane keypad.
c. LED alarm and status indicating lights.

3. Local Alarm and Status Indications:

    a. Controller power on.
    b. Motor running condition.
    c. Loss-of-line power.
    d. Line-power phase reversal.
    e. Line-power single-phase condition.

4. Audible alarm, with silence push button.
5. Nonautomatic START and STOP push buttons or switches.

G. Optional Features:

1. Extra Output Contacts:

    a. One N.O. contact(s) for motor running condition.
    b. One set(s) of contacts for loss-of-line power.
    c. One each, Form C contacts for high and low reservoir level.

2. Local alarm bell.
3. Door-mounted thermal or impact printer for alarm and status logs.
4. Operator Interface Communications Ports: USB, Ethernet, and RS485.

H. ATS:

1. Complies with NFPA 20 “Standard for the Installation of Stationary Pumps for Fire Protection”, UL 218, and UL 1008.
2. Integral with controller as a listed combination fire-pump controller and power transfer switch.
3. Automatically transfers fire-pump controller from normal power supply to alternate power supply in event of power failure.
4. Allows manual transfer from one source to the other.
5. Alternate-Source Isolating and Disconnecting Means: Integral molded-case switch, with an externally mounted operating handle.
6. Alternate-Source Isolating and Disconnecting Means: Mechanically interlocked isolation switch and circuit breaker rated at a minimum of 115 percent of rated motor full-load current, with an externally mounted operating handle; circuit breaker shall be provided with nonthermal sensing, instantaneous-only short-circuit overcurrent protection to comply with available fault currents.
7. Local Alarm and Status Indications:

    a. Normal source available.
    b. Alternate source available.
    c. In normal position.
    d. In alternate position.
    e. Isolating means open.

8. Audible alarm, with silence push button.
9. Nonautomatic (manual, nonelectric) means of transfer.
10. Engine test push button.

11. Start generator output contacts.
12. Timer for weekly generator tests.
13. Automatic Transfer Switch to be Four Pole style compatible with a Separately Derived Generator System.

2.2 CONTROLLERS FOR PRESSURE-MAINTENANCE PUMPS

A. General Requirements for Pressure-Maintenance-Pump Controllers:

1. Type: UL 508 “Standard for Safety for Industrial Control Equipment” factory assembled, -wired, and tested, across-the-line; for combined automatic and manual operation.
2. Enclosure: UL 508 “Standard for Safety for Industrial Control Equipment” and NEMA 250 “Enclosures for Electrical Equipment”, Type 2 for wall-mounting.
3. Factory assembled, wired, and tested.
4. Finish: Manufacturer's standard color paint.

B. Rate controller for scheduled horsepower and include the following:

1. Fusible disconnect switch.
2. Pressure switch.
3. Hand-off-auto selector switch.
4. Pilot light.
5. Running period timer.

2.3 ENCLOSURES

A. Fire-Pump Controllers, ATS, Remote Alarm Panels, and Low-Suction-Shutdown Panels: NEMA 250 “Enclosures for Electrical Equipment”, to comply with environmental conditions at installed locations and NFPA 20 “Standard for the Installation of Stationary Pumps for Fire Protection”.

1. Indoor, Dry and Clean Locations: Type 1 (IEC IP10).
2. Indoor Locations Subject to Dripping Noncorrosive Liquids: Type 2 (IEC IP11).
3. Other Wet or Damp, Indoor Locations: Type 4 (IEC IP56) .

B. Enclosure Color: Manufacturer's standard "fire-pump-controller red".

C. Nameplates: Comply with NFPA 20 “Standard for the Installation of Stationary Pumps for Fire Protection”; complete with capacity, characteristics, approvals, listings, and other pertinent data.

D. Optional Features:

1. Floor stands, 12 inches high, for floor-mounted controllers.

2.4 SOURCE QUALITY CONTROL

A. Testing: Test and inspect fire-pump controllers according to requirements in NFPA 20 “Standard for the Installation of Stationary Pumps for Fire Protection” and UL 218.

1. Verification of Performance: Rate controllers according to operation of functions and features specified.

B. Fire-pump controllers will be considered defective if they do not pass tests and inspections.

C. Prepare test and inspection reports.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and surfaces to receive equipment, with Installer present, for compliance with requirements and other conditions affecting performance.

B. Examine equipment before installation. Reject equipment that is wet or damaged by moisture or mold.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 CONTROLLER INSTALLATION

A. Install controllers within sight of their respective drivers.

B. Connect controllers to their dedicated pressure-sensing lines.

C. Wall-Mounting Controllers: Install controllers on walls with disconnect operating handles not higher than 79 inches above finished floor, and bottom of enclosure not less than 12 inches above finished floor unless otherwise indicated. Bolt units to wall or mount on lightweight structural-steel channels bolted to wall. For controllers not on walls, provide freestanding racks complying with Section 260529 "Hangers and Supports for Electrical Systems."

D. Floor-Mounting Controllers: Install controllers on 4-inch nominal-thickness concrete bases, using floor stands high enough so that the bottom of enclosure cabinet is not less than 12 inches above finished floor. Comply with requirements for concrete bases specified in Section 033000 "Cast-in-Place Concrete."

1. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inchcenters around the full perimeter of concrete base.
2. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base, and anchor into structural concrete floor.
3. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
4. Install anchor bolts to elevations required for proper attachment to supported equipment.

E. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

F. Comply with NEMA ICS 15.

3.3 POWER WIRING INSTALLATION

A. Install power wiring between controllers and their services or sources, and between controllers and their drivers. Comply with requirements in NFPA 20 “Standard for the Installation of Stationary Pumps for Fire Protection”, NFPA 70 “Standard for Electrical Safety in the Workplace”, and Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

3.4 CONTROL AND ALARM WIRING INSTALLATION

A. Install wiring between controllers and remote devices and facility's central monitoring system. Comply with requirements in NFPA 20 “Standard for the Installation of Stationary Pumps for Fire Protection”, NFPA 70 “Standard for Electrical Safety in the Workplace”, and Section 260523 "Control-Voltage Electrical Power Cables."

B. Install wiring between remote alarm panels and controllers. Comply with requirements in NFPA 20 “Standard for the Installation of Stationary Pumps for Fire Protection”, NFPA 70 “Standard for Electrical Safety in the Workplace”, and Section 260523 "Control-Voltage Electrical Power Cables."

C. Install wiring between controllers and the building's fire-alarm system.

D. Bundle, train, and support wiring in enclosures.

E. Connect remote manual and automatic activation devices where applicable.

3.5 IDENTIFICATION

A. Comply with requirements in NFPA 20 “Standard for the Installation of Stationary Pumps for Fire Protection” for marking fire-pump controllers.

B. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification in NFPA 20 “Standard for the Installation of Stationary Pumps for Fire Protection” and as specified in Section 260553 "Identification for Electrical Systems."

3.6 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a Company Field Advisor per OGS Spec Section 014216 to inspect, test, and adjust components, assemblies, and equipment installations, including connections.

B. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a Company Field Advisor per OGS Spec Section 014216 to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

C. Acceptance Testing Preparation:

1. Inspect and Test Each Component:

    a. Inspect wiring, components, connections, and equipment installations. Test and adjust components and equipment.
    b. Test insulation resistance for each element, component, connecting supply, feeder, and control circuits.
    c. Test continuity of each circuit.

2. Verify and Test Each Electric-Driver Controller:

    a. Verify that voltages at controller locations are within plus 10 or minus 1 percent of motor nameplate rated voltages, with motors off. If outside this range for any motor, notify Directors Representative before starting the motor(s).
    b. Test each motor for proper phase rotation.

3. Operational Test: After electrical circuitry has been energized, start units to confirm proper unit operation.
4. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Field Acceptance Tests:

1. Do not begin field acceptance testing until suction piping has been flushed and hydrostatically tested and the certificate for flushing and testing has been submitted to Directors Representative and authorities having jurisdiction.
2. Prior to starting, notify authorities having jurisdiction of the time and place of the acceptance testing.
3. Engage manufacturer's factory-authorized service representative to be present during the testing.
4. Perform field acceptance tests as outlined in NFPA 20 “Standard for the Installation of Stationary Pumps for Fire Protection”.

E. Controllers will be considered defective if they do not pass tests and inspections.

F. Prepare test and inspection reports.

3.7 STARTUP SERVICE

A. Engage a Company Field Advisor per OGS Spec Section 014216 to perform startup service.

1. Complete installation and startup checks according to manufacturer's written instructions.

3.8 ADJUSTING

A. Adjust controllers and battery charger systems to function smoothly and as recommended by manufacturer.

B. Set field-adjustable switches, auxiliary relays, time-delay relays, and timers.

C. Program microprocessors for required operational sequences, status indications, alarms, event recording, and display features. Clear events memory after final acceptance testing and prior to Substantial Completion.

D. Set field-adjustable pressure switches.

3.9 PROTECTION

A. Temporary Heating: Apply temporary heat to maintain temperature according to manufacturer's written instructions until enclosed controllers are ready to be energized and placed into service.

B. Replace controllers whose interiors have been exposed to water or other liquids prior to Substantial Completion.

3.10 DEMONSTRATION

A. Engage a Company Field Advisor per OGS Spec Section 014216 to train Facility's maintenance personnel to adjust, operate, and maintain controllers, and to use and reprogram microprocessor-based controls within this equipment.

END OF SECTION 213900

SECTION 230523 - GENERAL-DUTY VALVES FOR HVAC PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Gate valves.
2. Globe valves.
3. Ball valves.
4. Butterfly valves.
5. Check valves.

B. Related Sections:

1. Section 230529 - Hangers and Supports for HVAC Piping and Equipment: Product and installation requirements for pipe hangers and supports.
2. Section 230700 - HVAC Insulation: Product and installation requirements for insulation for valves.
3. Section 232113 - Hydronic Piping: Product and installation requirements for piping used in hydronic piping systems.
4. Section 232116 - Hydronic Piping Specialties: Product and installation requirements for piping specialties used in hydronic piping systems.

1.2 REFERENCES

A. ASTM International:

1. ASTM A216/A216M - Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High-Temperature Service.
2. ASTM D4101 - Standard Specification for Propylene Injection and Extrusion Materials.

B. Manufacturers Standardization Society of the Valve and Fittings Industry:

1. MSS SP 67 - Butterfly Valves.
2. MSS SP 70 - Cast Iron Gate Valves, Flanged and Threaded Ends.
3. MSS SP 71 - Cast Iron Swing Check Valves, Flanged and Threaded Ends.
4. MSS SP 80 - Bronze Gate, Globe, Angle and Check Valves.
5. MSS SP 85 - Cast Iron Globe & Angle Valves, Flanged and Threaded.
6. MSS SP 110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.

C. Underwriters Laboratories Inc.:

1. UL 842 - Valves for Flammable Fluids.

1.3 SUBMITTALS

A. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.

B. Manufacturer’s installation instructions shall be provided along with product data.

C. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).

D. Section 013300 - Submittal Procedures: Requirements for submittals.

E. Product Data: Submit manufacturer’s catalog information with valve data and ratings for each service.

F. Manufacturer's Installation Instructions: Submit hanging and support methods, and joining procedures.

G. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 CLOSEOUT SUBMITTALS

A. Section 017000 - Execution and Closeout Requirements: Requirements for submittals.

B. Project Record Documents: Record actual locations of valves.

C. Operation and Maintenance Data: Submit installation instructions, spare parts lists, exploded assembly views.

1.5 QUALITY ASSURANCE

A. Maintain one copy of each document on site.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing work of this section with minimum 3 years documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Section 016500 - Materials and Equipment: Requirements for transporting, handling, storing, and protecting products.

B. Accept valves on site in shipping containers with labeling in place. Inspect for damage.

C. Provide temporary protective coating on cast iron and steel valves.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Do not install valves underground when bedding is wet or frozen.

1.9 WARRANTY

A. Furnish five year manufacturer warranty for valves excluding packing.

1.10 EXTRA MATERIALS

A. Furnish two packing kits for each size valve.

PART 2 - PRODUCTS

2.1 GATE VALVES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. American Valve, Inc.
2. Apollo Valves; a part of Aalberts Integrated Piping Systems.
3. Crane Fluid Systems; Crane Co.
4. Jenkins Valves; a Crane Co. brand.
5. KITZ Corporation.
6. Lance Valves.
7. Milwaukee Valve Company.
8. Powell Valves.
9. Red-White Valve Corp.
10. Stockham; a Crane Co. brand.
11. WATTS; A Watts Water Technologies Company.
12. Approved equivalent.

B. GA-1: 2 inches and Smaller: MSS SP 80 “Bronze Gate, Globe, Angle and Check Valves”, Class 125, bronze body, bronze trim, union bonnet, rising stem, hand-wheel, inside screw, solid wedge disc, solder or threaded ends.

C. GA-2: 2-1/2 inches and Larger: MSS SP 70 “Cast Iron Gate Valves, Flanged and Threaded Ends”, Class 125, cast iron body, bronze trim, bolted bonnet, rising stem, hand-wheel, outside screw and yoke, solid wedge disc with bronze seat rings, flanged ends. Furnish chain-wheel operators for valves 6 inches and larger mounted over 8 feet above floor.

2.2 GLOBE VALVES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

1. American Valve, Inc.
2. Crane Fluid Systems; Crane Co.
3. Hammond Valve.
4. Milwaukee Valve Company.
5. NIBCO INC.
6. WATTS; A Watts Water Technologies Company.
7. Approved equivalent.

B. GL-1: 2 inches and Smaller: MSS SP 80 “Bronze Gate, Globe, Angle and Check Valves”, Class 125, bronze body, bronze trim, threaded bonnet, hand wheel, Buna-N composition disc, solder or threaded ends.

C. GL-2: 2-1/2 inches and Larger: MSS SP 85 “Cast Iron Globe & Angle Valves, Flanged and Threaded”, Class 125, cast iron body, bronze trim, hand wheel, outside screw and yoke, flanged ends. Furnish chain-wheel operators for valves 6 inches and larger mounted over 8 feet above floor.

2.3 BALL VALVES

A. Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. NIBCO INC.
2. WATTS; A Watts Water Technologies Company.
3. Approved equivalent.

B. BA-1: 2 inches and Smaller: MSS SP 110 “Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends”, 400 psi WOG , two piece bronze body, chrome plated brass ball, full port, teflon seats, blow-out proof stem, ~~solder or threaded ends with union~~ and lever handle. Provide standard solder ends, threaded ends, pressure seal ends, press-fit ends, or solder ends with union.

C. BA-2: 2 inches and Smaller: 150 psi at 73 degrees F water temperature, maximum service temperature: 180 degrees F, ASTM D4101 “Standard Specification for Propylene Injection and Extrusion Materials” black polypropylene body and ball, 2 inch square polypropylene operating nut, EPDM or fluorocarbon seals, teflon seats, full port, double union type with socket or threaded ends.

2.4 BUTTERFLY VALVES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Milwaukee.

2. Nibco.
3. Watts.
4. Approved equivalent.

B. BF-1: 2-1/2 inches and Larger: MSS SP 67 “Butterfly Valves”, Class 200.

1. Body: Cast or ductile iron, lug ends, stainless steel stem, extended neck.
2. Disc: Nickel-plated ductile iron.
3. Seat: Resilient replaceable EPDM.
4. Handle and Operator: Infinite position lever handle with memory stop for valve sizes 2-1/2 through 6 inches. Furnish gear operators for valves 8 inches and larger, and chain-wheel operators for valves mounted over 8 feet above floor.

2.5 CHECK VALVES

A. Horizontal Swing Check Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Milwaukee.
b. Nibco.
c. Watts.
d. Approved equivalent.

2. CK-1: 2 inches and Smaller: MSS SP 80 “Bronze Gate, Globe, Angle and Check Valves”, Class 125, bronze body and cap, bronze seat, Buna-N disc, solder or threaded ends.
3. CK-2: 2-1/2 inches and Larger: MSS SP 71 “Cast Iron Swing Check Valves, Flanged and Threaded Ends”, Class 125, cast iron body, bolted cap, bronze or cast iron disc, renewable disc seal and seat, flanged ends.

B. Spring Loaded Check Valves:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Milwaukee.
b. Nibco.
c. Stockham.
d. Approved equivalent.

2. CK-3: 2 inches and Smaller: MSS SP 80 “Bronze Gate, Globe, Angle and Check Valves”, Class 125, bronze body, in-line spring lift check, silent closing, Buna-N disc, integral seat, solder or threaded ends.

3. CK-4: 2-1/2 inches and Larger: MSS SP 71 “Cast Iron Swing Check Valves, Flanged and Threaded Ends”, Class 125, globe style, cast iron body, bronze seat, center guided bronze disc, stainless steel spring and screws, flanged ends.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify piping system is ready for valve installation.

3.2 INSTALLATION

A. Install valves with stems upright or horizontal, not inverted.

B. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.

C. Extended Stems: Where insulation is indicated or specified, provide extended stems arranged to receive insulation.

D. Install 3/4 inch ball valves with cap for drains at main shut-off valves, low points of piping, bases of vertical risers, and at equipment.

E. Install valves with clearance for installation of insulation and allowing access.

F. Provide access where valves and fittings are not accessible. Coordinate size and location of access doors with Section 083113.

G. Refer to Section 230529 for pipe hangers.

H. Refer to Section 230700 for insulation requirements for valves.

I. For installation of valves in ground source water piping systems in geothermal vaults refer to Section 232114.

J. Install Work in accordance with State of New York standards.

3.3 VALVE APPLICATIONS

A. Install shutoff and drain valves at locations indicated on Drawings in accordance with this Section.

B. Install ball, butterfly or gate valves for shut-off and to isolate equipment, part of systems, or vertical risers.

C. Install ball, butterfly or globe valves for throttling, bypass, or manual flow control services.

D. Install spring loaded check valves on discharge of water pumps where triple-duty valves are not indicated.

E. Install lug end butterfly valves adjacent to equipment when functioning to isolate equipment.

F. Install ball, butterfly and gate valves in aboveground ground source water and water source systems for shut-off service.

G. Install butterfly valves in aboveground ground source water and water source systems interchangeably with gate and globe valves.

H. Install calibrated ball and globe valves in aboveground ground source water and water source systems for throttling service.

3.4 SCHEDULES

A. Valve Service:

1. Ground Source Water, aboveground, 125 psig and less:

   a. 2 inches and smaller: ~~Solder or threaded ends,~~ Solder ends, threaded ends, pressure seal ends, press-fit ends, or solder ends with union, GA-1 gates or BA-1 balls, GL-1 globes, and CK-1 or CK-3 check valves.
   b. 2-1/2 inches and larger: Flanged ends, GA-2 gates or BF-1 butterflies, GL-2 globes, and CK-2 or CK-4 check valves.

2. Water Source, aboveground, 125 psig and less:

   a. 2 inches and smaller: ~~Solder or threaded ends,~~ Solder ends, threaded ends, pressure seal ends, press-fit ends, or solder ends with union, GA-1 gates or BA-1 balls, GL-1 globes, and CK-1 or CK-3 check valves.
   b. 2-1/2 inches and larger: Flanged ends, GA-2 gates or BF-1 butterflies, GL-2 globes, and CK-2 or CK-4 check valves.

3. Ground Source Water, belowground, 125 psig and less:

   a. 2 inches and smaller: Solder or threaded ends, BA-2 ball valves.

END OF SECTION 230523

SECTION 233113 - METAL DUCTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Single-wall rectangular ducts and fittings.
2. Single-wall round ducts and fittings.
3. Sheet metal materials.
4. Duct liner.
5. Sealants and gaskets.
6. Hangers and supports.

1.3 SUBMITTALS

A. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.

B. Manufacturer's installation instructions shall be provided along with product data.

C. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).

D. Product Data: For each type of the following products:

1. Liners and adhesives.
2. Sealants and gaskets.

A. Submit an Environmental Product Declaration (EPD) from the manufacturer for steel sheets within this specification section, if available. A statement of the contractor's good faith effort to obtain the EPD shall be provided if not available.

1. Manufacturer-provided EPDs must be Product Specific Type III (Third-Party Reviewed), in adherence with ISO 14025 *Environmental labels and declarations*, ISO 14044 *Environmental management – Life cycle assessment*, and ISO 21930 *Core rules for environmental product declarations of construction products and services.*

B. Product Data: For adhesives, indicating VOC content.

C. Product Data: For sealants, indicating VOC content.

D. Laboratory Test Reports: For antimicrobial coatings, indicating compliance with requirements for low-emitting materials.

E. Shop Drawings:

1. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work.
2. Factory- and shop-fabricated ducts and fittings.
3. Duct layout indicating sizes, configuration, liner material, and static-pressure classes.
4. Elevation of bottom of ducts.
5. Dimensions of all duct runs from building grid lines.
6. Fittings.
7. Reinforcement and spacing.
8. Seam and joint construction.
9. Penetrations through fire-rated and other partitions.
10. Equipment installation based on equipment being used on Project.
11. Locations for duct accessories, including dampers, turning vanes, and access doors and panels.
12. Hangers and supports, including methods for duct and building attachment, and vibration isolation.
13. Shop drawings shall be provided for All mechanical plans.

F. Welding certificates.

G. Field quality-control reports.

H. As-built drawings.

1.4 QUALITY ASSURANCE

A. SMACNA: Gages of materials, fabrication, reinforcement, sealing requirements, installation, and method of supporting ductwork shall be in accordance with the following SMACNA manuals, unless otherwise shown or specified:

1. HVAC Duct Construction Standards.
2. Round Industrial Duct Construction Standard
3. Rectangular Industrial Duct Construction Standard

B. Comply with NFPA 90A, “Installation of Air Conditioning and Ventilating Systems,” unless otherwise indicated.

C. Comply with NFPA 90B, “Installation of Warm Air Heating and Air Conditioning Systems,” unless otherwise indicated.

D. Welding Qualifications: Qualify procedures and personnel in accordance with the following:

1. AWS D1.1, "Structural Welding Code - Steel," for hangers and supports.
2. AWS D1.2, "Structural Welding Code - Aluminum," for aluminum supports.

3. AWS D9.1, "Sheet Metal Welding Code," for duct joint and seam welding.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Structural Performance: Duct hangers and supports shall withstand the effects of gravity loads and stresses within limits and under conditions described in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible".

B. Airstream Surfaces: Surfaces in contact with airstream shall comply with requirements in ASHRAE 62.1.

C. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment," and Section 7 - "Construction and System Startup."

D. ASHRAE/IES Compliance: Applicable requirements in ASHRAE/IES 90.1, Section 6.4.4 - "HVAC System Construction and Insulation."

E. Duct Dimensions: Unless otherwise indicated, all duct dimensions indicated on Drawings are inside clear dimensions and do not include insulation or duct wall thickness.

2.2 SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" based on indicated static-pressure class unless otherwise indicated.

1. Construct ducts of galvanized sheet steel unless otherwise indicated.

B. Transverse Joints: Fabricate joints in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-1, "Rectangular Duct/Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

1. For ducts with longest side less than 36 inches, select joint types in accordance with Figure 2-1.
2. For ducts with longest side 36 inches or greater, use flange joint connector Type T-22, T-24, T-24A, T-25a, or T-25b. Factory-fabricated flanged duct connection system may be used if submitted and approved by Director’s Representative.
3. Where specified for specific applications, all joints shall be welded.

C. Longitudinal Seams: Select seam types and fabricate in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 2-2, "Rectangular Duct/Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards -

Metal and Flexible. "All longitudinal seams shall be Pittsburgh lock seams unless otherwise specified for specific application**.**

1. Where specified for specific applications, all joints shall be welded.

D. Elbows, Transitions, Offsets, Branch Connections, and Other Duct Construction: Select types and fabricate in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Ch. 4, "Fittings and Other Construction," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.3 SINGLE-WALL ROUND DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Ch. 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class unless otherwise indicated.

1. Construct ducts of galvanized sheet steel unless otherwise indicated.
2. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

    a. Elgen Manufacturing.
    b. Linx Industries (formerly Lindab).
    c. McGill AirFlow LLC.
    d. MKT Metal Manufacturing.
    e. Nordfab Ducting.
    f. SEMCO, LLC; part of FlaktGroup.
    g. Set Duct Manufacturing.
    h. Sheet Metal Connectors, Inc.
    i. Spiral Manufacturing Co., Inc.
    j. Stamped Fittings Inc.
    k. Approved equivalent.

B. Transverse Joints: Select joint types and fabricate in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-1, "Round Duct Transverse Joints," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

1. Transverse Joints in Ducts Larger Than 60 Inches in Diameter: Flanged.

C. Longitudinal Seams: Select seam types and fabricate in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-2, "Round Duct Longitudinal Seams," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

1. Fabricate round ducts larger than 90 inches in diameter with butt-welded longitudinal seams.

D. Tees and Laterals: Select types and fabricate in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees," for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

2.4 SHEET METAL MATERIALS

A. General Material Requirements: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

B. Galvanized Sheet Steel: Comply with ASTM A653.

1. Galvanized Coating Designation: G90.
2. Finishes for Surfaces Exposed to View: Mill phosphatized.

C. PVC-Coated, Galvanized Sheet Steel: Comply with ASTM A653.

1. Galvanized Coating Designation: G90.
2. Minimum Thickness for Factory-Applied PVC Coating: 4 mils thick on sheet metal surface of ducts and fittings exposed to corrosive conditions, and minimum 1 mil thick on opposite surface.
3. Coating Materials: Acceptable to authorities having jurisdiction for use on ducts listed and labeled by an NRTL for compliance with UL 181, Class 1.

D. Fluoropolymer-coated Stainless Steel:

1. Core Material Composition: 316 stainless steel.
2. Interior Coating: Factory-applied fluoropolymer barrier, PTFE or similar, providing high chemical resistance.

E. Stainless-Steel Sheets: Comply with ASTM A480, Type 304 or 316, as indicated in "Duct Schedule" Article; cold rolled, annealed, sheet. Exposed surface finish shall be No. 2B, No. 2D, No. 3, or No. 4 as indicated in "Duct Schedule" Article.

F. Factory- or Shop-Applied Antimicrobial Coating:

1. Apply to the surface of sheet metal that will form the interior surface of the duct. An untreated clear coating shall be applied to the exterior surface.
2. Antimicrobial compound shall be tested for efficacy by an NRTL and registered by the EPA for use in HVAC systems.
3. Coating containing the antimicrobial compound shall have a hardness of 2H, minimum, when tested in accordance with ASTM D3363.
4. Surface-Burning Characteristics: Maximum flame-spread index of 25 and maximum smoke-developed index of 50 when tested in accordance with UL 723; certified by an NRTL.
5. Shop-Applied Coating Color: White.

6. Antimicrobial coating on sheet metal is not required for duct containing liner treated with antimicrobial coating.

G. Reinforcement Shapes and Plates: ASTM A36, steel plates, shapes, and bars; black and galvanized.

1. Where black- and galvanized-steel shapes and plates are used to reinforce aluminum ducts, isolate the different metals with butyl rubber, neoprene, or EPDM gasket materials.

H. Tie Rods: Galvanized steel, 1/4-inch-minimum diameter for lengths 36 inches or less; 3/8-inch-minimum diameter for lengths longer than 36 inches

2.5 DUCT LINER

A. Fibrous-Glass Duct Liner: Comply with ASTM C1071, NFPA 90A, or NFPA 90B; and with NAIMA AH124, "Fibrous Glass Duct Liner Standard."

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. CertainTeed Corporation; Saint-Gobain North America.
b. Johns Manville; a Berkshire Hathaway company.
c. Knauf Insulation.
d. Owens Corning.
e. Voltek; a division of Sekisui America Corp.
f. Approved equivalent.

2. Maximum Thermal Conductivity:

a. Type I, Flexible: 0.27 Btu x in./h x sq. ft. x deg F at 75 deg F mean temperature.
b. Type II, Rigid: 0.23 Btu x in./h x sq. ft. x deg F at 75 deg F mean temperature.

3. Antimicrobial Erosion-Resistant Coating: Apply to the surface of the liner that will form the interior surface of the duct to act as a moisture repellent and erosion-resistant coating. Antimicrobial compound shall be tested for efficacy by an NRTL and registered by the EPA for use in HVAC systems.
4. Solvent Based Liner Adhesive: Comply with NFPA 90A or NFPA 90B and with ASTM C916.

a. Adhesive shall have a VOC content of 80 g/L or less.

B. Flexible Elastomeric Duct Liner: Preformed, cellular, closed-cell, sheet materials complying with ASTM C534, Type II, Grade 1; and with NFPA 90A or NFPA 90B.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Aeroflex USA.

b. Armacell LLC.
c. Ductmate Industries, Inc.
d. K-Flex USA.
e. Voltek; a division of Sekisui America Corp.
f. Approved equivalent.

2. Surface-Burning Characteristics: Maximum flame-spread index of 25 and maximum smoke-developed index of 50 when tested in accordance with UL 723; certified by an NRTL.
3. Liner Adhesive: As recommended by insulation manufacturer and complying with NFPA 90A or NFPA 90B.

a. Adhesive shall have a VOC content of 80 g/L or less.

C. Fiberglass-Free Duct Liner: Made from partially recycled cotton or polyester products and containing no fiberglass. Airstream surface overlaid with fire-resistant facing to prevent surface erosion by airstream, complying with NFPA 90A or NFPA 90B. Treat natural-fiber products with antimicrobial coating.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Acoustical Surfaces, Inc.
b. Ductmate Industries, Inc.
c. Approved equivalent.

2. Maximum Thermal Conductivity: 0.24 Btu x in./h x sq. ft. x deg F at 75 deg F mean temperature when tested in accordance with ASTM C518.
3. Surface-Burning Characteristics: Maximum flame-spread index of 25 and maximum smoke-developed index of 50 when tested in accordance with ASTM E84; certified by an NRTL.
4. Liner Adhesive: As recommended by insulation manufacturer and complying with NFPA 90A or NFPA 90B.

a. Adhesive shall have a VOC content of 80 g/L or less.

D. Insulation Pins and Washers:

1. Cupped-Head, Capacitor-Discharge-Weld Pins: Copper- or zinc-coated steel pin, fully annealed for capacitor-discharge welding, 0.106-inch diameter shank, length to suit depth of insulation indicated with integral 1-1/2-inch galvanized carbon-steel washer.
2. Insulation-Retaining Washers: Self-locking washers formed from 0.016-inch- thick galvanized steel; with beveled edge sized as required to hold insulation securely in place, but not less than 1-1/2 inches in diameter.

E. Shop Application of Duct Liner: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 7-11, "Flexible Duct Liner Installation."

1. Adhere a single layer of indicated thickness of duct liner with at least 90 percent adhesive coverage at liner contact surface area. Attaining indicated thickness with multiple layers of duct liner is prohibited.
2. Apply adhesive to transverse edges of liner facing upstream that do not receive metal nosing.
3. Butt transverse joints without gaps, and coat joint with adhesive.
4. Fold and compress liner in corners of rectangular ducts or cut and fit to ensure butted-edge overlapping.
5. Do not apply liner in rectangular ducts with longitudinal joints, except at corners of ducts, unless duct size and dimensions of standard liner make longitudinal joints necessary.
6. Apply adhesive coating on longitudinal seams in ducts with air velocity of 2500 fpm or greater.
7. Secure liner with mechanical fasteners 4 inches from corners and at intervals not exceeding 12 inches transversely; at 3 inches from transverse joints and at intervals not exceeding 18 inches longitudinally.
8. Secure transversely oriented liner edges facing the airstream with metal nosings that have either channel or "Z" profiles or are integrally formed from duct wall. Fabricate edge facings at the following locations:

    a. Fan discharges.
    b. Intervals of lined duct preceding unlined duct.
    c. Upstream edges of transverse joints in ducts where air velocities are higher than 2500 fpm or where indicated.

9. Secure insulation between perforated sheet metal inner duct of same thickness as specified for outer shell. Use mechanical fasteners that maintain inner duct at uniform distance from outer shell without compressing insulation.

    a. Sheet Metal Inner Duct Perforations: 3/32-inch diameter, with an overall open area of 23 percent.

10. Terminate inner ducts with buildouts attached to fire-damper sleeves, dampers, turning vane assemblies, or other devices. Fabricated buildouts (metal hat sections) or other buildout means are optional; when used, secure buildouts to duct walls with bolts, screws, rivets, or welds.

2.6 SEALANT AND GASKETS

A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a maximum flame-spread index of 25 and a maximum smoke-developed index of 50 when tested in accordance with UL 723; certified by an NRTL.

B. Two-Part Tape Sealing System:

1. Tape: Woven cotton fiber impregnated with mineral gypsum and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.

2. Tape Width: 4 inches.
3. Sealant: Modified styrene acrylic.
4. Water resistant.
5. Mold and mildew resistant.
6. Maximum Static-Pressure Class: 10 inch wg, positive and negative.
7. Service: Indoor and outdoor.
8. Service Temperature: Minus 40 to plus 200 deg F.
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum.
10. Sealant shall have a VOC content of 420 g/L or less.

C. Water-Based Joint and Seam Sealant:

1. Application Method: Brush on.
2. Solids Content: Minimum 65 percent.
3. Shore A Hardness: Minimum 20.
4. Water resistant.
5. Mold and mildew resistant.
6. VOC: Maximum 75 g/L (less water).
7. Maximum Static-Pressure Class: 10 inch wg, positive and negative.
8. Service: Indoor or outdoor.
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

D. Solvent-Based Joint and Seam Sealant:

1. Application Method: Brush on.
2. Base: Synthetic rubber resin.
3. Solvent: Toluene and heptane.
4. Solids Content: Minimum 60 percent.
5. Shore A Hardness: Minimum 60.
6. Water resistant.
7. Mold and mildew resistant.
8. Sealant shall have a VOC content of 420 g/L or less.
9. Maximum Static-Pressure Class: 10-inch wg, positive or negative.
10. Service: Indoor or outdoor.
11. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

E. Flanged Joint Sealant: Comply with ASTM C920.

1. General: Single-component, acid-curing, silicone, elastomeric.
2. Type: S.
3. Grade: NS.
4. Class: 25.
5. Use: O.
6. Sealant shall have a VOC content of 420 g/L or less.

F. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.

G. Round Duct Joint O-Ring Seals:

1. Seal shall provide maximum leakage class of 3 cfm/100 sq. ft. at 1-inch wg and shall be rated for10-inch wg static-pressure class, positive or negative.
2. EPDM O-ring to seal in concave bead in coupling or fitting spigot.
3. Double-lipped, EPDM O-ring seal, mechanically fastened to factory-fabricated couplings and fitting spigots.

2.7 HANGERS AND SUPPORTS

A. Hanger Rods for Noncorrosive Environments: Galvanized-steel rods and nuts.

B. Hanger Rods for Corrosive Environments: Electrogalvanized, all-thread rods or galvanized rods with threads painted with zinc-chromate primer after installation.

C. Strap and Rod Sizes: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct."

D. Steel Cables for Galvanized-Steel Ducts: Galvanized steel complying with ASTM A603.

E. Steel Cables for Stainless-Steel Ducts: Stainless steel complying with ASTM A492.

F. Steel Cable End Connections: Galvanized-steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.

G. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

H. Trapeze and Riser Supports:

1. Supports for Galvanized-Steel Ducts: Galvanized-steel shapes and plates.
2. Supports for Stainless-Steel Ducts: Stainless-steel shapes and plates.
3. Supports for Aluminum Ducts: Aluminum or galvanized steel coated with zinc chromate.

I. Rooftop Supports:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

    a. MIRO Industries.
    b. PHP Systems/Design.
    c. Rooftop Support Systems, a division of Eberl Iron Works, Inc.
    d. Approved equivalent.

2. Description: Assembly of bases, vertical and horizontal members, and duct supports, for roof installation without membrane penetration.
3. Bases: Two or more; Polycarbonate.

4. Vertical Members: Two or more channels, minimum 12 gauge.
5. Horizontal Members: One or more, adjustable height, deflection in the horizontal header bar is not to exceed the span length by 360 or 1/8”.
6. Material: All metal parts shall be hot dip galvanized, base material shall be polycarbonate.
7. Accessories: Protection support pads.
8. Height: Adjustable height above roof, provide additional braces as required by manufacturer for taller frames.

PART 3 - EXECUTION

3.1 DUCT INSTALLATION

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction loss for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings and coordination drawings.

B. Install ducts in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" unless otherwise indicated.

C. Install ducts in maximum practical lengths with fewest possible joints.

D. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections.

E. Unless otherwise indicated, install ducts vertically and horizontally, and parallel and perpendicular to building lines.

F. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.

G. Install ducts with a clearance of 1 inch, plus allowance for insulation thickness.

H. Route ducts to avoid passing through transformer vaults and electrical equipment rooms and enclosures.

I. Where ducts pass through non-fire-rated interior partitions and exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal thickness as the duct. Overlap openings on four sides by at least 1-1/2 inches.

J. Install fire**,** combination fire/smoke**,** and smoke dampers where indicated on Drawings and as required by code, and by local authorities having jurisdiction. Comply with requirements in Section 233300 "Air Duct Accessories" for fire and smoke dampers and specific installation requirements of the damper UL listing.

K. Install heating coils, cooling coils, air filters, dampers, and all other duct-mounted accessories in air ducts where indicated on Drawings.

L. Protect duct interiors from moisture, construction debris and dust, and other foreign materials both before and after installation. Comply with SMACNA's "IAQ Guidelines for Occupied Buildings Under Construction," Appendix G, "Duct Cleanliness for New Construction Guidelines."

M. Elbows: Use long-radius elbows wherever they fit.

1. Fabricate 90-degree rectangular mitered elbows to include turning vanes.
2. Fabricate 90-degree round elbows with a minimum of three segments for 12 inches and smaller and a minimum of five segments for 14 inches and larger.

N. Branch Connections: Use lateral or conical branch connections.

3.2 INSTALLATION OF EXPOSED DUCTWORK

A. Protect ducts exposed in finished spaces from being dented, scratched, or damaged.

B. Trim duct sealants flush with metal. Create a smooth and uniform exposed bead. Do not use two-part tape sealing system.

C. Grind welds to provide smooth surface free of burrs, sharp edges, and weld splatter. When welding stainless steel with a No. 3 or 4 finish, grind the welds flush, polish the exposed welds, and treat the welds to remove discoloration caused by welding.

D. Maintain consistency, symmetry, and uniformity in arrangement and fabrication of fittings, hangers and supports, duct accessories, and air outlets.

E. Repair or replace damaged sections and finished work that does not comply with these requirements.

3.3 ADDITIONAL INSTALLATION REQUIREMENTS FOR SUPPLY, RETURN AND EXHAUST DUCTS SERVING HIGH-HUMIDITY LOCATIONS

A. Install exhaust ducts from wet, high-humidity locations without dips and traps that may hold water. Slope ducts a minimum of 2 percent back to inlet or toward drain.

B. Provide a drain pocket at each low point and at the base of each riser with a 1-inch trapped copper drain from each drain pocket to open site floor drain.

C. Minimize number of transverse seams.

D. Do not locate longitudinal seams on bottom of duct.

3.4 ADDITIONAL INSTALLATION REQUIREMENTS FOR LABORATORY EXHAUST AND FUME HOOD EXHAUST DUCTS

A. Install ducts in accordance with NFPA 45, "Fire Protection for Laboratories Using Chemicals."

B. Install exhaust ducts without dips and traps that may hold water. Slope ducts a minimum of 2 percent back to hood or inlet. Where indicated on Drawings, install trapped drain piping.

C. Connect duct to fan, fume hood, and other equipment indicated on Drawings.

3.5 DUCTWORK EXPOSED TO WEATHER

A. All external joints are to have secure watertight mechanical connections. Seal all openings to provide weatherproof construction.

B. Construct ductwork to resist external loads of wind, snow, ice, and other effects of weather. Provide necessary supporting structures.

C. Single Wall:

1. Ductwork shall be galvanized steel.

    a. If duct outer surface is uninsulated, protect outer surface with suitable paint. Paint materials and application requirements are specified in Section 099113 "Exterior Painting."

2. Where ducts have external insulation, provide weatherproof aluminum jacket. See Section 230700 "HVAC Insulation."

3.6 DUCT SEALING

A. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."

B. Seal ducts at a minimum to the following seal classes in accordance with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible":

1. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible."
2. Outdoor, Supply-Air Ducts: Seal Class A.
3. Outdoor, Exhaust Ducts: Seal Class A.
4. Outdoor, Return-Air Ducts: Seal Class C.
5. Unconditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class B.
6. Unconditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: Seal Class A.
7. Unconditioned Space, Exhaust Ducts: Seal Class A.
8. Unconditioned Space, Return-Air Ducts: Seal Class B.
9. Conditioned Space, Supply-Air Ducts in Pressure Classes 2-Inch wg and Lower: Seal Class C.
10. Conditioned Space, Supply-Air Ducts in Pressure Classes Higher Than 2-Inch wg: Seal Class B.
11. Conditioned Space, Exhaust Ducts: Seal Class A.
12. Conditioned Space, Return-Air Ducts: Seal Class C.

13. Room 311D, Supply, Return, Exhaust Ducts: Seal Class A.

3.7 HANGER AND SUPPORT INSTALLATION

A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Chapter 5, "Hangers and Supports."

B. Building Attachments: Concrete inserts, powder-actuated fasteners, or structural-steel fasteners appropriate for construction materials to which hangers are being attached.

1. Where practical, install concrete inserts before placing concrete.
2. Install powder-actuated concrete fasteners after concrete is placed and completely cured.
3. Use powder-actuated concrete fasteners for standard-weight aggregate concretes or for slabs more than 4 inches thick.
4. Do not use powder-actuated concrete fasteners for lightweight-aggregate concretes or for slabs less than 4 inches thick.

C. Hanger Spacing: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.

D. Hangers Exposed to View: Threaded rod and angle or channel supports.

E. Support vertical ducts with steel angles or channel secured to the sides of the duct with welds, bolts, sheet metal screws, or blind rivets; support at each floor and at a maximum intervals of 16 feet.

F. Install upper attachments to structures. Select and size upper attachments with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.

3.8 CONNECTIONS

A. Make connections to equipment with flexible connectors complying with Section 233300 "Air Duct Accessories."

B. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for branch, outlet and inlet, and terminal unit connections.

3.9 PAINTING

A. Paint interior of metal ducts that are visible through registers and grilles and that do not have duct liner. Apply one coat of flat, black, latex paint over a compatible galvanized-steel primer. Paint materials and application requirements are specified in Section 099113 "Exterior Painting" and Section 099123 "Interior Painting."

3.10 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Leakage Tests:

1. Comply with SMACNA's "HVAC Air Duct Leakage Test Manual." Submit a test report for each test.
2. Test the following systems:

a. Ducts with a Pressure Class Higher Than 2-Inch wg: Test representative duct sections, selected by Director's Representative from sections installed, totaling no less than 50 percent of total installed duct area for each designated pressure class.
b. Return Ducts with a Pressure Class of 2- Inch wg or Higher: Test representative duct sections, selected by Director's Representative from sections installed, totaling no less than 50 percent of total installed duct area for each designated pressure class.
c. Exhaust Ducts with a Pressure Class of 2- Inch wg or Higher: Test representative duct sections, selected by Director's Representative from sections installed, totaling no less than 50 percent of total installed duct area for each designated pressure class.
d. Chemical and acid Exhaust Ducts with a Pressure Class of 1- Inch wg or Higher: Test representative duct sections, selected by Director's Representative from sections installed, totaling no less than 100 percent of total installed duct area for each designated pressure class
e. Outdoor-Air Ducts with a Pressure Class of 2-Inch wg or Higher: Test representative duct sections, selected by Director's Representative from sections installed, totaling no less than 50 percent of total installed duct area for each designated pressure class.
f. Room 311D, Supply, Return, Exhaust Ducts: Test entire system serving room for the designated pressure class.

3. Disassemble, reassemble, and seal segments of systems to accommodate leakage testing and for compliance with test requirements.
4. Testing of each duct section is to be performed with access doors, coils, filters, dampers, and other duct-mounted devices in place as designed. No devices are to be removed or blanked off so as to reduce or prevent additional leakage.
5. Test for leaks before applying external insulation.
6. Conduct tests at static pressures equal to maximum design pressure of system or section being tested. If static-pressure classes are not indicated, test system at maximum system design pressure. Do not pressurize systems above maximum design operating pressure.
7. Give seven days' advance notice for testing.

C. Duct System Cleanliness Tests:

1. Visually inspect duct system to ensure that no visible contaminants are present.
2. Test sections of metal duct system, chosen randomly by Director's Representative, for cleanliness in accordance with "Description of Method 3 - NADCA Vacuum Test" in NADCA ACR, "Assessment, Cleaning and Restoration of HVAC Systems."

a. Acceptable Cleanliness Level: Net weight of debris collected on the filter media shall not exceed 0.75 mg/100 sq. cm.

D. Duct system will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

3.11 DUCT CLEANING

A. Clean new duct system(s) before testing, adjusting, and balancing.

B. Use duct cleaning methodology as indicated in NADCA ACR.

C. Use service openings for entry and inspection.

1. Provide openings with access panels appropriate for duct static-pressure and leakage class at dampers, coils, and any other locations where required for inspection and cleaning access. Provide insulated panels for insulated or lined duct. Patch insulation and liner as recommended by duct liner manufacturer. Comply with Section 233300 "Air Duct Accessories" for access panels and doors.
2. Disconnect and reconnect flexible ducts as needed for cleaning and inspection.
3. Remove and reinstall ceiling to gain access during the cleaning process.

D. Particulate Collection and Odor Control:

1. When venting vacuuming system inside the building, use HEPA filtration with 99.97 percent collection efficiency for 0.3-micron-size (or larger) particles.
2. When venting vacuuming system to outdoors, use filter to collect debris removed from HVAC system, and locate exhaust downwind and away from air intakes and other points of entry into building.

E. Clean the following components by removing surface contaminants and deposits:

1. Air outlets and inlets (registers, grilles, and diffusers).
2. Supply, return, and exhaust fans including fan housings, plenums (except ceiling supply and return plenums), scrolls, blades or vanes, shafts, baffles, dampers, and drive assemblies.
3. Air-handling unit internal surfaces and components including mixing box, coil section, air wash systems, spray eliminators, condensate drain pans, humidifiers and dehumidifiers, filters and filter sections, and condensate collectors and drains.
4. Coils and related components.
5. Return-air ducts, dampers, actuators, and turning vanes except in ceiling plenums and mechanical equipment rooms.
6. Supply-air ducts, dampers, actuators, and turning vanes.
7. Dedicated exhaust and ventilation components and makeup air systems.

F. Mechanical Cleaning Methodology:

1. Clean metal duct systems using mechanical cleaning methods that extract contaminants from within duct systems and remove contaminants from building.
2. Use vacuum-collection devices that are operated continuously during cleaning. Connect vacuum device to downstream end of duct sections so areas being cleaned are under negative pressure.

3. Use mechanical agitation to dislodge debris adhered to interior duct surfaces without damaging integrity of metal ducts, duct liner, or duct accessories.
4. Clean fibrous-glass duct liner with HEPA vacuuming equipment; do not permit duct liner to get wet. Replace fibrous-glass duct liner that is damaged, deteriorated, or delaminated or that has friable material, mold, or fungus growth.
5. Clean coils and coil drain pans in accordance with NADCA ACR. Keep drain pan operational. Rinse coils with clean water to remove latent residues and cleaning materials; comb and straighten fins.
6. Provide drainage and cleanup for wash-down procedures.
7. Antimicrobial Agents and Coatings: Apply EPA-registered antimicrobial agents if fungus is present. Apply antimicrobial agents in accordance with manufacturer's written instructions after removal of surface deposits and debris.

3.12 STARTUP

A. Air Balance: Comply with requirements in Section 230593 "Testing, Adjusting, and Balancing for HVAC."

3.13 DUCT SCHEDULE

A. Fabricate ducts with galvanized sheet steel except as otherwise indicated and as follows:

1. Fabricate all ducts to achieve SMACNA pressure class, seal class, and leakage class as indicated below.

B. Supply Ducts:

1. Ducts Connected to Ground Source Heat Pump Units

    a. Pressure Class: Positive 2-inch wg.
    b. Minimum SMACNA Seal Class: B.
    c. SMACNA Leakage Class for Rectangular: 24.
    d. SMACNA Leakage Class for Round: 12.

2. Ducts Connected Roof top Units

    a. Pressure Class: Positive 2-inch wg.
    b. Minimum SMACNA Seal Class: B.
    c. SMACNA Leakage Class for Rectangular: 24.
    d. SMACNA Leakage Class for Round: 12

3. Ducts Connected to dedicated outdoor Units:

    a. Pressure Class: Positive 4-inch wg.
    b. Minimum SMACNA Seal Class: A.
    c. SMACNA Leakage Class for Rectangular: 4 .
    d. SMACNA Leakage Class for Round: 2.

4. Ducts Connected to Equipment Not Listed Above:

    a. Pressure Class: Positive 2-inch wg.
    b. Minimum SMACNA Seal Class: B.
    c. SMACNA Leakage Class for Rectangular: 16.
    d. SMACNA Leakage Class for Round8.

C. Return Ducts:

1. Ducts Connected to Ground Source Heat Pump Units :

    a. Pressure Class: Positive or negative 2-inch wg.
    b. Minimum SMACNA Seal Class: B.
    c. SMACNA Leakage Class for Rectangular: 24.
    d. SMACNA Leakage Class for Round: 12.

2. Ducts Connected Rooftop Units

    a. Pressure Class: Positive 2-inch wg.
    b. Minimum SMACNA Seal Class: B.
    c. SMACNA Leakage Class for Rectangular: 24.
    d. SMACNA Leakage Class for Round: 12

3. Ducts Connected to Equipment Not Listed above:

    a. Pressure Class: Positive or negative 1 inch wg.
    b. Minimum SMACNA Seal Class: B.
    c. SMACNA Leakage Class for Rectangular: 24.
    d. SMACNA Leakage Class for Round: 12.

D. Exhaust Ducts:

1. Ducts Connected to Fans Exhausting (ASHRAE 62.1, Class 1 and 2) Air (General Exhaust):

    a. Duct Material: Galvanized, Sheet Steel. Lock-forming quality; ASTM A653/A653M, G90 (Z275) coating designation; mill-phosphatized finish for surface of ducts exposed to view.
    b. Pressure Class: Negative 3inch wg.
    c. Minimum SMACNA Seal Class: C if negative pressure.
    d. SMACNA Leakage Class for Rectangular: 24
    e. SMACNA Leakage Class for Round: 12.

2. Ducts Connected to Fans Exhausting Canopy Hoods (Heat Exhaust).

    a. Duct Material: Galvanized, Sheet Steel. Lock-forming quality; ASTM A653/A653M, G90 (Z275) coating designation; mill-phosphatized finish for surface of ducts exposed to view.
    b. Pressure Class: Negative 3inch wg.
    c. Minimum SMACNA Seal Class: C if negative pressure.
    d. SMACNA Leakage Class for Rectangular: 24

e. SMACNA Leakage Class for Round: 12.

3. Ducts Connected to Fans Exhausting Fume Hoods (Acid/Chemical Exhaust), Canopy Hoods (Acid/Chemical Exhaust), & Laboratory (ASHRAE 62.1, Class 3 and Class 4) Air:

a. Core Material Composition: 316 stainless steel.
b. Interior Coating: Factory-applied fluoropolymer barrier, PTFE or similar, providing high chemical resistance.
c. Pressure Class: Positive or negative 6--inch wg.
d. Minimum SMACNA Seal Class A
e. SMACNA Leakage Class 2.
f. Airtight/watertight.

4. Ducts Connected to Equipment Not Listed above:

a. Pressure Class: Positive or negative 2-inch wg.
b. Minimum SMACNA Seal Class: B if negative pressure; A if positive pressure.
c. SMACNA Leakage Class for Rectangular: 24.
d. SMACNA Leakage Class for Round: 12.

E. Intermediate Reinforcement:

1. Galvanized-Steel Ducts: Galvanized steel
2. PVC-Coated Ducts:

a. Exposed to Airstream: Match duct material.
b. Not Exposed to Airstream: Match duct material.

F. Liner:

1. Supply-Air Ducts for Ground Source Heat Pump Units: Flexible elastomeric, 1 inch(es) thick from unit to 10 feet long or to the first duct fitting.
2. Supply-Air Ducts for DOAS Units: Flexible elastomeric, 1 inch(es) thick from unit to roof line.
~~3. Return-Air Ducts: Flexible elastomeric, 1 inch(es) thick.~~
~~4. Supply Fan Plenums: Flexible elastomeric, 1 inch(es) thick.~~
~~5. Return- and Exhaust-Fan Plenums: Flexible elastomeric, 1 inches thick.~~

G. Elbow Configuration:

1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-2, "Rectangular Elbows."

a. Velocity 1000 fpm or Lower:

1) Radius Type RE 1 with minimum 0.5 radius-to-diameter ratio.
2) Mitered Type RE 4 without vanes.

b. Velocity 1000 to 1500 fpm:

1) Radius Type RE 1 with minimum 1.0 radius-to-diameter ratio.

2) Radius Type RE 3 with minimum 0.5 radius-to-diameter ratio and two vanes.
3) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."

c. Velocity 1500 fpm or Higher:

1) Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.
2) Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.
3) Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."

2. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-2, "Rectangular Elbows."

a. Radius Type RE 1 with minimum 1.5 radius-to-diameter ratio.
b. Radius Type RE 3 with minimum 1.0 radius-to-diameter ratio and two vanes.
c. Mitered Type RE 2 with vanes complying with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-3, "Vanes and Vane Runners," and Figure 4-4, "Vane Support in Elbows."

3. Round Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-4, "Round Duct Elbows."

a. Minimum Radius-to-Diameter Ratio and Elbow Segments: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Table 3-1, "Mitered Elbows." Elbows with less than 90-degree change of direction have proportionately fewer segments.

1) Velocity 1000 fpm or Lower: 0.5 radius-to-diameter ratio and three segments for 90-degree elbow.
2) Velocity 1000 to 1500 fpm: 1.0 radius-to-diameter ratio and four segments for 90-degree elbow.
3) Velocity 1500 fpm or Higher: 1.5 radius-to-diameter ratio and five segments for 90-degree elbow.
4) Radius-to Diameter Ratio: 1.5.

b. Round Elbows, 12 Inches and Smaller in Diameter: Stamped or pleated.
c. Round Elbows, 14 Inches and Larger in Diameter: Standing seam

H. Branch Configuration:

1. Rectangular Duct: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 4-6, "Branch Connection."

a. Rectangular Main to Rectangular Branch: 45-degree entry.
b. Rectangular Main to Round Branch: Conical spin in.

2. Round: Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible," Figure 3-5, "90 Degree Tees and Laterals," and Figure 3-6, "Conical Tees." Saddle taps are permitted in existing duct.

    a. Velocity 1000 fpm or Lower: 90-degree tap.
    b. Velocity 1000 to 1500 fpm: Conical tap.
    c. Velocity 1500 fpm or Higher: 45-degree lateral.

END OF SECTION 233113

SECTION 412200 - HOISTS AND CRANES

PART 1 - GENERAL

1.1 REFERENCES

A. AISC Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.

B. ANSI MH 27.1, Specifications for Underhung Cranes and Monorail Systems.

C. ANSI B30.16 Safety Standard for Overhead Hoists (Underhung).

D. ANSI B30.11 Safety Standards for Monorails and Underhung Cranes.

E. ASME HST-4M, Performance Standard for Overhead Electric Wire Rope Hoists.

F. ASME NOG-1, Rules for Construction of Overhead and Gantry Cranes.

G. AWS D1.1, Code for Welding in Building Construction.

H. Hoist Manufacturer's Institute Standard Specification for Electric Wire Rope Hoists.

I. ANSI/NFPA 70 National Electric Code, Article 610, Cranes and Hoists.

J. OSHA 29 CFR 1910.179, Overhead and Gantry Cranes.

1.2 SYSTEM DESCRIPTION

A. Hoist and Crane System for Driller's Garage (DOE-50): The system specified consists of an overhead crane, with trolley mounted wire rope hoist, supported by a runway framework and the building structure, and meeting the requirements of the referenced specifications, standards, rules and codes.

B. Hoist and Crane System for Labs: The system specified consists of two overhead hoist and crane systems, supported by runway framework and the building structure:

1. Electric Chain Hoist with Motorized Trolley (SIIE-1(c)): Underhung trolley mounted chain hoist, to fit flat or tapered beam flange, UL listed, supported by a runway framework and the building structure, and meeting the requirements of the referenced specifications, standards, rules and codes.

2. Bridge Crane (GSE-14): Underhung, single girder bridge crane assembly.

a. Electric Chain Hoist with Motorized Trolley: Underhung trolley mounted chain hoist, to fit flat or tapered beam flange, UL listed, supported by Hoist and Crane manufacturer's single bridging girder and meeting the requirements of the referenced specifications, standards, rules and codes.

b. Bridging Girder: By Hoist and Crane manufacturer, sized to meet loading and design requirements of electric chain hoist.
c. End Trucks: Manufacturer's underhung end trucks, with electric motorized drive system and controls, sized to meet travel, loading and design requirements of the bridge crane assembly.

3. The static support structure, consisting of structural steel runway beams for the Hoist and Crane systems is designed by the structural engineer as part of the building and shall be provided by the General Contractor prior to the H&C subcontractor installing its system.

a. Electric Hoist (SIIE-1(c)): Single runway beam nominal 28'-0" above finished floor.
b. Bridge Crane (GSE-14): Pair parallel runway beams nominal 8'-0" on center and 10'-0" above finish floor.
c. Contractor shall field verify exact height and configuration of runway beams and include on shop drawings.

4. Each Hoist and Crane system shall consist of design, fabrication and installation of all moving components, including, but not limited to; travel beam, rollers, hoist trolley, hoist, cable and hook(s) and all electrical and control components required for a complete and fully operational installation. Electrical power sufficient for the system shall be delivered to the area in exposed junction boxes, as required for the Hoist and Crane electrical components. If the Hoist and Crane system requires special fixed rails or similar items, to be installed on the static structural system, they shall also be provided.

1.3 DESIGN REQUIREMENTS FOR DRILLER'S GARAGE BRIDGE CRANE (DOE-50)

A. System Capacity: Will lift and move 5 tons of containers, materials, equipment and pallets within warehouse or maintenance areas.

B. Crane, carrier, and hoist equipment shall be designed for CMAA Class C service.

C. Crane shall be motor propelled, single girder with a minimum span of 17'-6".

D. Bridge travel shall be dual speed, a minimum of 65 feet per minute.

E. Hoist shall be suspended from a motor driven trolley and have a dual lifting speed of 20.0/3.2 feet per minute and a lifting height of 20'-10-1/4"

F. Hoist, trolley, and crane shall be controlled by a remote control with a backup of a pushbutton control pendant suspended 3'-3" above floor.

G. Distance between runway supports shall be as indicated on Structural Drawings..

H. Overall length of runway shall be 74'-0".

I. Distance from floor to top of runway shall be 24'-5".

1.4 DESIGN REQUIREMENTS FOR LABS

A. System Capacity:

1. Electric Hoist (SIIE-1(c)): Will lift and move 5 tons of containers, materials, equipment and pallets within warehouse or maintenance areas.
2. Bridge Crane (GSE-14): Will lift and move 1 ton of containers, materials, equipment and pallets within warehouse or maintenance areas.

B. Crane, carrier, and hoist equipment shall be designed for Class C service.

C. Hoists shall be suspended from a motor driven trolley and have a minimum lifting speed of 14 feet per minute.

D. Hoist, trolley, and crane shall be controlled by a pushbutton control pendant suspended 4'-0" above floor.

E. Electric Hoist (SIIE-1(c)):

1. Crane shall be motor propelled, single girder with span as indicated on the Structural Drawings.
2. Distance from floor to bottom of runway shall be as indicated on the Structural Drawings.

F. Bridge Crane (GSE-14):

1. Bridge girder travel shall be single speed, a minimum of 75 feet per minute.
2. Distance between runway supports nominal 8'-0" on center.
3. Distance from floor to bottom of parallel runway beams shall be as indicated on the Structural Drawings.
4. Overall length of runway shall be as indicated on the Structural Drawings.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.6 SUBMITTALS

A. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.

B. Manufacturer's installation instructions shall be provided along with product data.

C. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).

D. Waiver of Submittals: The "Waiver of Certain Submittal Requirements" in Section 013300 does not apply to this Section.

E. Submittals Package: Submit the shop drawings, product data, and quality control submittals specified below at the same time as a package.

F. Quality Control Submittals:

1. Qualification Data: For professional engineer's experience with providing delegated-design engineering services of the kind indicated, including documentation that engineer is licensed in the state in which Project is located.

G. Shop Drawings:

1. Show the construction details of the hoist and crane system and the crane support structure.
2. Show the electric wiring and control system.
3. Show installation details.
4. Indicate coordination dimensions related to structural support system elements provided by others.
5. Include wiring diagrams
6. Delegated Design: Structural and electrical design of each Hoist and Crane system shall be by vendor and include signed and sealed construction and shop drawings for each system. Involved professionals shall be licensed in their disciplines by the State of New York.

H. Product Data:

1. Catalog sheets, specifications, and installation instructions.
2. Bill of materials.
3. Name, address, and telephone number of nearest fully equipped service organization.

I. Quality Control Submittals:

1. Design data, including safety factor of materials.
2. Test report of hoist and crane system.
3. Certificate required under Quality Assurance.
4. Delegated-Design Submittal: For hoists and cranes, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

J. Contract Closeout Submittals:

1. Operation and maintenance data.
2. Warranty.
3. Test reports of the completed hoist and crane system.

1.7 QUALITY ASSURANCE

A. Company Field Advisor: Secure the services of a Company Field Advisor for a minimum of 10 hours for the following:

1. Render advice regarding installation of the hoist and crane system.
2. Witness final system test and then certify with an affidavit that the hoist and crane system is installed in accordance with the contract requirements and is operating properly.

B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in the jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for design of hoists and cranes including electrical and structural components that are similar to those indicated for this Project in material, design, and extent.

PART 2 - PRODUCTS

2.1 HOIST AND CRANE SYSTEMS FOR DRILLER'S GARAGE BRIDGE CRANE (DOE-50)

A. Basis of Design System: Custom designed ~~under~~ top running, single girder, low headroom, wire rope crane package designed to work as a complete system, including hoist, bridge drive, girders, bridge beam, inverter controllers, load monitoring system and other components.

1. Provide QX wire rope crane package Design QXSka5-TON x 17.5ft Hol:20.86ft (5ton SG TR low-O) by R&M Materials Handling Inc. or equal.

B. Hoist: Electric wire rope hoist, low headroom type with all parts and accessories necessary to install on bridge crane and meeting the following requirements:

1. Maximum lifting capacity of 5 tons.
2. Dual lifting speed 20.0/3.2 ft/min.
3. Trolleys: Trolley assemblies shall be articulating type. Attach load bars to yokes in such manner as to assume that all wheels are in contact with the operating flange at all times.

   a. Yokes shall be ductile castings and fixture machined.

4. Motor driven trolley with travel speed of 100 feet per minute, stepless.
5. Festoon system for control cable.
6. The hoist shall be equipped with an electro-mechanical load-limiting device that shall prevent lifting more than 110% of the rated load.
7. Dual braking system, DC disc type with adequate torque to stop and hold over 125% of the hoist rated load.
8. Upper and lower limit switches.
9. Hook with safety latch. Hook shall be mounted to swivel on thrust bearing.
10. Basis of Design Product: Spacemaster SX by R&M Materials Handling or equal.

C. Crane: ~~Underhung~~ Top running, motor driven, single girder crane as manufactured by R&M Materials Handling with track, suspension system and all parts necessary to meet the following requirements:

1. Rating of Service "Class C" as specified in ANSI MH 27.1.
2. Track and Fittings: Refer to Structural Drawings for structural steel runway track beam for bridge crane.

   ~~a. Track size based on the load positioned on the track system to produce the most severe conditions of stress and deflection.~~
   ~~b. The total track deflection shall not exceed 1/450 of the span or 1-1/4 inch, whichever is the least.~~

c. Track sections shall be installed with bolted type splice plates to provide flush and level connections at the operating tread of the track. The maximum gap between the adjacent ends of the load carrying flange not to exceed 1/16 inch.

d. Rigid track support shall be accomplished by bolting the runway track to the supporting structure.

e. Track Suspension: All necessary clamps, hanger rods, bolts, and other fittings from which the track system is suspended shall be provided as a part of the overhead track system. Track hanger supports shall be spaced as shown on the Drawings.

3. Power Supply:

a. Power supply for the hoist shall be 460 volt, 3 ph., 60 Hz. All power required for the operation of the hoist, trolley, and end trucks shall be developed from this source.

1) Contril Voltage: 115V, 60Hz
2) HP: 16.7

b. Runway electrification shall be 4-bar safety type rigid conductors as manufactured by Insul-8, Duct-O-Wire Company or Wampfler. Wall mounted disconnect switch and power to runway conductors provided under Division 26.

c. Cross bridge electrification shall be flat cable style festoon system with terminal box, multi-conductor cord, plug connectors and accessories. Cables are to be hardwired when plug connectors are not available.

4. Controls:

a. Radio control with six-way operation, plug-in pushbutton pendant suspended from independent festoon track as a back up.

b. Pendant shall include Start (momentary) button and Emergency Stop (push to maintain, turn to release) that controls a mainline contactor in the bridge control panel.

c. Pushbutton shall be clearly marked with hoist, trolley and bridge travel directions.

d. Hoist shall be 2 speed magnetic reversing type (standard) or variable frequency inverter control (optional) and the trolley and bridge controls shall be variable frequency inverter control

e. Electrical control enclosures shall be IP55 or NEMA 4 type. Pushbutton enclosure shall have a rating of IP65, NEMA 4X, 4 or 5.

f. Provide a warning light.

5. Single Girder Cranes: Single girder motor driven cranes with single spans of 40 feet or more, must have rigid outrigger beam mounted parallel to the crane girder running the entire span of the crane.

6. End Trucks: End trucks consisting of structural steel weldments bolted directly to the crane bridge member forming a rigid and square connection.

a. Safety lugs shall limit drop of end truck to not more than one inch in event of wheel yoke, axle or load bar failures. Place safety lugs on both sides of the rail so that if failure occurs the rail is centrally loaded about the vertical axis.

7. Brakes:

   a. Hoisting Brakes: In accordance with Hoist Manufacturers Institute specifications and ANSI B30.16 Safety Standards for Overhead Hoists (Underhung).
   b. Brakes supplied for carrier and crane travel shall conform with ANSI B30.11 Safety Standards.

8. Paint: Crane manufacturer's standard paint system. Color shall be Safety Yellow.

   a. Hoist and trolley shall be factory painted (2-part epoxy) per manufacturer's standards.
   b. Bridge shall be shop cleaned, primed, and painted per manufacturer's standards.
   c. The following items shall not be painted:

      1) Rail surfaces in contact with wheels
      2) Wheel running surfaces
      3) Hoist wire rope
      4) Conductor bar, festoon cables and supports

9. Labeling:

   a. Hoist and bridge beam shall be labeled with load rating.
   b. A corrosion-resistant nameplate shall be fixed to the bridge with the following information:

      1) Name of manufacturer
      2) Mfg.'s model number and serial number
      3) Capacity
      4) Date of manufacture (month and year).

10. Electrical Equipment: Comply with the provisions of ANSI/NFPA 70 National Electrical Code, Article 610, for wiring and equipment.

2.2 HOIST AND CRANE SYSTEMS FOR LABS

A. Hoists: Electric chain hoist as manufactured by L.K. Goodwin Co., American Monorail, Spanmaster, or Robbins & Myers with all parts and accessories necessary to install on bridge crane and meeting the following requirements:

   1. Maximum lifting capacity:

      a. Electric Hoist (SIIE-1(c)): 5 tons.
      b. Bridge Crane (GSE-14): 1 ton

   2. Minimum lifting speed 14 feet per minute.
   3. Trolleys: Trolley assemblies shall be articulating type. Attach load bars to yokes in such manner as to assume that all wheels are in contact with the operating flange at all times.

a. Yokes shall be ductile castings and fixture machined.

4. Motor driven trolley with travel speed of 35 feet per minute.
5. Festoon system for control cable.
6. Friction clutch assembly on hoist to prevent overloading.
7. Dual braking system.
8. Upper and lower limit switches.

B. Hook with safety latch. Hook shall be mounted to swivel on thrust bearing Crane: Underhung, motor driven, single girder crane as manufactured by L.K. Goodwin Co., American Monorail, Robbins & Myers, or Spanmaster with track, suspension system and all parts necessary to meet the following requirements:

1. Rating of Service "Class C" as specified in ANSI MH 27.1.
2. Vertical impact load shall be 1/2 percent of the rated load for each fpm hoisting speed of the carrier.
3. Track and Fittings:

   a. See Structural Drawings for hoist and bridge crane for structural steel runway track beams.

4. Electrification:

   a. Track electrification shall be accomplished by UL approved conductor bar rated 100A continuous. Insulation cover shall be rigid orange PVC, self-extinguishing, with a heat distortion point of 160 degrees F at 260 psi.
   b. Conductors shall be complete with mounting clips, end caps, splices with covers, and power feeds.
   c. Current collectors shall be sliding shoe type, spring loaded, and designed so that sparking and loss of contact shall be minimized.
   d. Separate conductors shall be provided for each phase. More than one conductor in a single enclosure will not be permitted.
   e. All controls shall be housed in a single NEMA 12 panel.
   f. A fused, manual disconnect switch with a lockable handle mounted through the panel door shall be provided and wired into the incoming power circuit.
   g. All motors equipped with magnetic contactors operated with ON-OFF push button station pendant suspended 4'-0" above the floor, from the hoist trolley unit.
   h. All electrical equipment shall meet NEMA 1 requirements.
   i. Crane operation: 480 volt, 3 phase, 60 hertz.
   j. Control circuits: Maximum 120 volts.

5. Single Girder for Bridge Cranes:

   a. Single girder by Hoist and Crane vendor, sized to meet design and loading requirements.
   b. Minimum 12" left and right overhang of runway beams.
   c. Bridge traversing speed 4-40 fpm.
   d. Electric motorized girder and end trucks assembly.

6. End Trucks: End trucks consisting of structural steel weldments bolted directly to the crane bridge member forming a rigid and square connection.

    a. Safety lugs shall limit drop of end truck to not more than one inch in event of wheel yoke, axle or load bar failures. Place safety lugs on both sides of the rail so that if failure occurs the rail is centrally loaded about the vertical axis.

7. Brakes:

    a. Hoisting Brakes: In accordance with Hoist Manufacturers Institute specifications and ANSI B30.16 Safety Standards for Overhead Hoists (Underhung).
    b. Brakes supplied for carrier and crane travel shall conform with ANSI B30.11 Safety Standards.

8. Miscellaneous:

    a. Paint: Crane manufacturer's standard paint system. Color shall be selected by the Director from the manufacturer's standard color selection.
    b. Letter the crane rated capacity on the bridge rail and on the control box.

9. Electrical Equipment: Comply with the provisions of ANSI/NFPA 70 National Electrical Code, Article 610, for wiring and equipment

PART 3 - EXECUTION

3.1 PREPARATION

A. Inspect structure and crane rail erection for conformance with reviewed shop drawings and contract documents prior to installation of equipment. Bring nonconforming work to the attention of the Architect prior to proceeding with crane installation. Non-conforming runway structure or installation must be corrected prior to load testing of crane system.

3.2 INSTALLATION

A. Install the Work in this Section in accordance with the manufacturer's printed instructions, shop drawings, and directions of the Company Field Advisor.

3.3 TESTING

A. Bridge crane shall be inspected and tested for proper operations by a manufacturer's representative. Provide all necessary adjustments as required accessories to make bridge crane complete, usable, and capable of meeting the operating requirements specified. Clean equipment

END OF SECTION 412200

NEW YORK STATE | Office of General Services
Division of Real Estate | Real Property and Facilities Management

HOT WORK PERMITS

POLICY

It is the policy of the Office of General Services to fully comply with all local, state, and federal laws and regulations in order to protect the health and safety of OGS employees, tenants, and the general public. A copy of this procedure is available electronically on the OGS Searchlight/Program Directory/Real Property/Safety & Health/Safety Procedures/Hot Works. http://ogsnow/ProgramDirectory/SaH.asp.

Code/OGS Defined Hot Work

There are two separate types of defined hot work:

Code Defined Hot Work: includes welding, cutting, brazing, flame soldering, grinding, thawing pipes with torches, and any other work where there is the potential for fire. "Work Permit"

OGS Defined Hot Work: includes any type of activity that might disturb the Fire Alarm/Detection system and cause it to go into alarm (i.e. dust generating activities, ex. drilling). "Work Notice"

Hot work as referenced in this procedure shall include both Code defined hot work and OGS defined hot work.

All groups involved in this work shall ensure that all necessary precautions are taken to prevent a fire. There shall also be protective equipment available (fire extinguishers) in the event that a small fire occurs.

Permits

The Office of General Services requires a Hot Work Permit/Work Notice in advance of any work requiring heat or open flame within a facility owned by OGS or any work affecting or potentially affecting any building system(s) including but not limited to Heating, Ventilation, and Air Conditioning (HVAC) and/or fire alarm systems.

The Office of General Services requires that each Facility/Building Manager be responsible for the approval, coordination, and enforcement of rules, regulations, and codes regarding issues involving building-related hot work.

The hot work permit/notice will have a description of the work being performed as well as:

The names and contact information of the requestor, Permit Authorizing Individual, and Building Management.

If fire detection systems have been turned off.

If any other Building or alarm systems have been affected.

If any work is being performed in a confined space.

The building, floor, and area description.

Start date and time.

Finish date and time.

Attached is the OGS approved Hot Work Permit/Work Notice and Checklist.

NEW YORK STATE

Office of General Service
Division of Real Estate | Real Propert
and Facilities Management

Contacts:
NYSP Capitol: 518-474-5330
Albany Utilities: 518-474-6825
Note: A copy of the Hot Work Procedure is available in the Facility Managers' Manual or on the Searchlight.

Hot Work Permit/Work Notice

To be filled in advance of any work being performed, posted on job site and returned with completed work order.
Minimum 24 hours advance required for non-emergency.

Max Time Limits:

- Work notification - open
- System disable - daily
- Code Defined Hot Work 24 hrs - need site checklist

REQUEST INFORMATION

☐ **In-House Emergency Work**

Requester (check one)	**Purpose/Request Type**	**Request Date**
☐ OGS Employee ☐ Contractor/Vendor	☐ Work Notification ☐ Systems Disabled ☐ Code Defined Hot Work Request with Site Checklist (24hr max / 1 instance)	

Requester Name	**Office/Work Phone**	**Cell Phone**	**Email**

Company Name	**Company Address**

Specific Description of the Work

Fire detection system disabled? ☐ Yes ☐ No
Re-enable when work complete.

Any other building/alarm system affected? ☐ Yes ☐ No
If yes, specify →

Is any planned work in a confined space?* ☐ Yes ☐ No
*Note: Confined space work involves different protocols to follow - refer to OSHA 29 CRF 1910.146

PERMIT LOCATION AND SCHEDULE

Building Name	**Floor**	**Room/Area Description**

Start Date	**Start Time**	**End Date**	**End Time**
	→		

Comments/Notes

APPROVALS

☐ **Verbal Approval for Emergency Work Received**

Preliminary Utility Supervisory Approval (required for in-house utilities-related work only) →
Signature Maint. / Utilities Supervisor PUE3 + | Print Name | Date

PAI	**Contact Number**	

Building Manager Approval (required for code defined hot work & any work affecting building systems) →
Permit Approved ☐ Yes ☐ No | Reason | Building Manager | Date | WO/Ref. Number

DISTRIBUTION TRACKING - INTERNAL USE ONLY

☐ Fire/Alarm Co. ☐ Utilities Ofc. - ESP/Campus ☐ Building Manager ☐ Office File
☐ Security ☐ State Police - ESP ☐ OFPC ☐ Vendor
☐ Other →

Building Name/Location:

_____

NEW YORK STATE | Office of General Services
Division of Real Estate | Real Property and Facilities Management

Code Defined Hot Work/Work Notice Checklist

Prior to work – boxes # 1-9 shall be 'Yes' before Code Defined Hot Work is permitted to start. Checklist shall be posted at the job site and maintained for a minimum of 48 hours after completion of work.

1. Equipment is in good repair ☐ Y ☐ N

2. Site is clear of combustibles (35' radius) ☐ Y ☐ N

3. Non-removable combustibles are protected ☐ Y ☐ N

4. Openings are protected ☐ Y ☐ N

Opposite sides of walls _____ Floor _____ Ceiling _____

5. Floors are clean of dust and debris ☐ Y ☐ N

6. Hazards posed by conductive heat transfer have been evaluated and made safe – opposite sides of floors/ceilings/walls ☐ Y ☐ N

7. Fire watches, where required, are assigned ☐ Y ☐ N

(PRINT Name(s)):_____

8. Building Management <u>Approved</u> actions taken to prevent accidental activation of suppression and detection equipment ☐ Y (Go to 8a) ☐ N

8a. Action(s) taken:

_____

Who notified: ☐ **NYSP Capitol** ☐ **Building Management** ☐ **Utilities**

☐ **Other** (Specify) _____

9. Appropriate fire extinguishers are operable and available ☐ Y ☐ N

Minimum 2A-20B-C required for Hot Work Fire Watch

Type: Water _____ ABC _____ Other (Specify):_____

Above items completed

Signature/Print_____**Date**_____

Review of area done; Date:_____ Time:_____ Initials:_____

Use back of sheet for additional notes/comments or reviews of area

10. At the completion of the work day - **all appropriate notifications made (see 8a) and alarm systems returned to normal operating service** ☐ Y

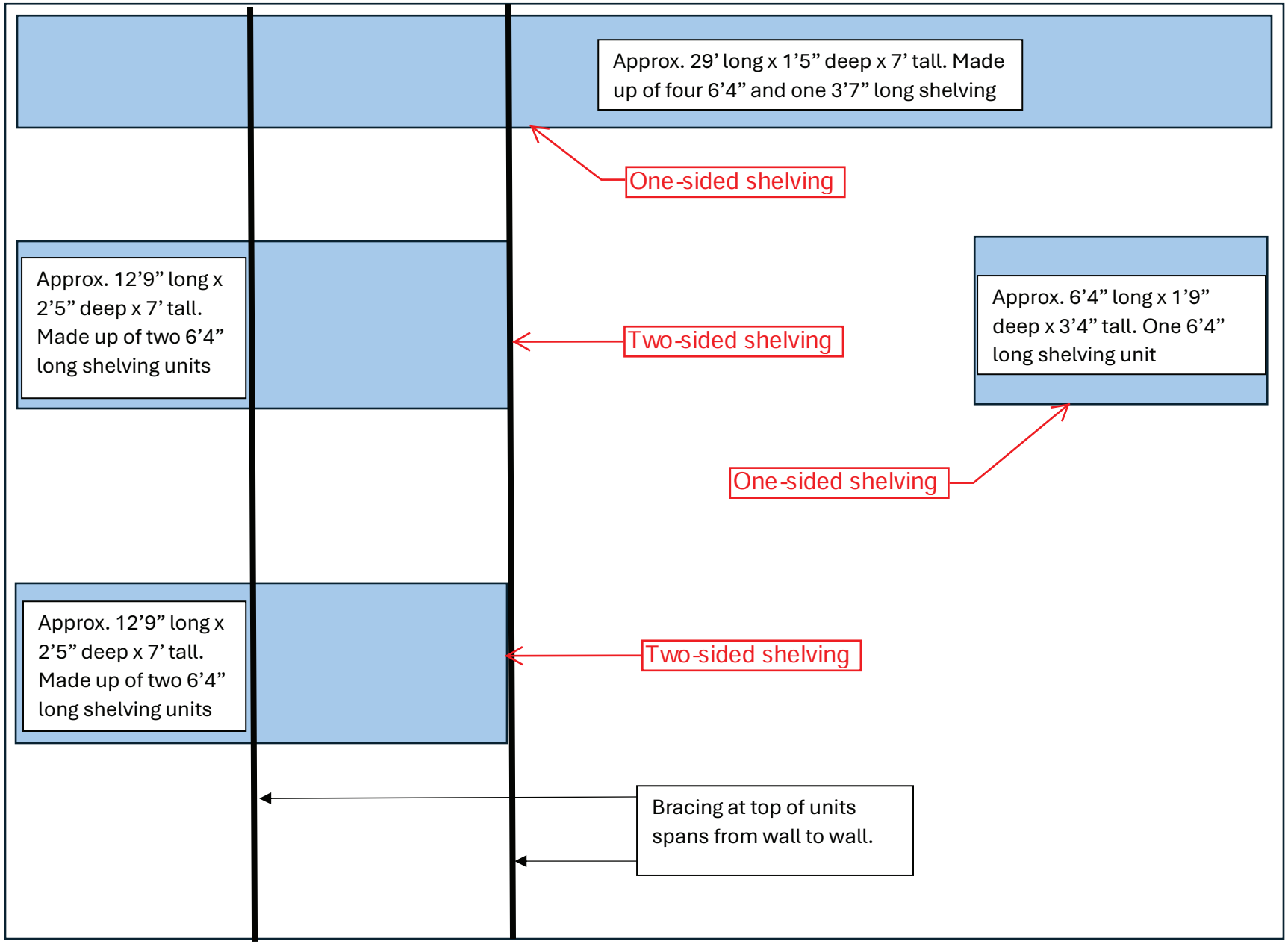
Signature/Print (Person completing #10) _____ **Date**_____

NYSP Capitol – 518-474-5330
Albany Utilities – 518-474-6825

Information Available to Bidders

Existing SIE-2 Shelving

Current Fog Room Shelving Plan from Dave Miles
Envision comments in red.



New York State
Department of Transportation
Proposed Lab Program

DATE: 2/20/15

Equipment Data

Description		Manufacturer/Model No.		Equipment No.
Sample Racks				SIE-2
Physical Attributes	**Environmental**	**Utilities**		
Dimensions	Rel. Hum.	Power	Gases	Water
2' D x 12' L x 5' H				
Weight	Temp.			Waste

Special Features and Considerations

- Rust proof.
- 6 shelves.

Diagram



Information Available to Bidders

Thermal Conductivity Test Report

Thermal Conductivity Test Report

05/06/2024

New York State Department of Transportation Harriman Campus

Engineer of Record:
CHA Consulting

Drilling Contractor:
Rototec, LLC

Thermal Conductivity Test & Report:
Aztech Geothermal, LLC



Figure 1: TC Testing location. Extended Range GeoCube with 47 kVa Generator was used at the Department of Transportation Harriman Campus site.

Ground Loop Design
Thermal Conductivity Report - 5/3/2024

Project: DOT Harriman Campus Test Bore
Address: State Access Rd, Albany, NY 12203

Test Bore Drill Date: 04/24/2024
TC Test Date(s): 05/01/2024 - 05/03/2024

Driller: Rototec LLC
Kim Ojanne
845-396-3090

Note: See pages 3 & 4 of this report for explanations of the key properties listed below.

Prepared By: **Aztech Geothermal, LLC**
Aeowyn Kendall, IGSHPA-AI, CGD Jr.
akendall@aztechgeo.com 772-538-6499

Calculation Results

Thermal Conductivity (Btu/(h*ft*°F)) :	**1.37**
Thermal Diffusivity (est.) (ft^2/day) :	**0.97**
Average Heat Flux (W/ft) :	**22.0**
BH Thermal Resist (BTR) (h*ft*°F/Btu) :	**0.19**
Average Flow Rate (gpm) :	**11.82**
Test Duration (hr) :	**48**
Calculation Interval :	**12.0 - 40.0 Hours**

Borehole Input Parameters

Undisturbed Ground Temperature (°F) :	**56.0**	(average of 50' incremental measurements with temp. probe, see Fig. 2 on pg. 3)
Depth (ft) :	**800.0**	
Borehole Diameter (in) :	**5.50**	
Pipe Size:	**1 1/2 in. (40 mm)**	
Grout Thermal Conductivity (Btu/(h*ft*°F)) :	**1.20**	
Drilling Method :	**Air Rotary/DDH**	
Drilling Time (hr) :	**11**	

Diffusivity Input Parameters

Soil/Rock Specific Heat - Dry (Btu/(°F*lbm)) :	**0.210**
Soil/Rock Density - Dry (lb/ft^3) :	**130.0**
Moisture (0-100) (%) :	**8.0**

Flow Rate Input Parameters

TC Unit Model Name	**GeoCube Extended**

Test Procedure Recommendations

The American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) offers a set of procedural recommendations for in-situ thermal conductivity/thermal response tests. These can be found in the ASHRAE 2007 HVAC Applications Handbook. Several of the key recommended procedures are as follows:

A) Time between test bore installation and start of TC test: A 5 day minimum wait time is recommended.
B) Undisturbed ground temperature measurement: The undisturbed ground temperature should be recorded prior to test start up.
C) Test Duration: Test duration typically should be for 48 hours or longer.
D) Power Quality: The power standard deviation should be equal to or less than 1.5% of the average power and the maximum power variation should be less than 10% of the average power. The average heat flux should fall within the 15 W/ft to 25 W/ft range to best simulate the expected peak loads in the borehole.

Undisturbed Ground Temperature Determination

The undisturbed ground temperature is the constant temperature of the formation. Typically, this temperature is measured before starting the active thermal conductivity test. The TC module automatically estimates this value from the first few temperature measurements collected via the TC test unit data logger. **Aztech Geothermal takes direct temperature measurements using a thermocouple (Figure 2) throughout the borehole depth to gain the most accurate direct measurement prior to starting the test. This allows construction of a temperature profile (Figure 3) of the borehole prior to any thermal interference**. If the TC test is initiated too soon after the installation of the test bore, the undisturbed ground temperature may be inaccurate. In general, it is recommended that the testing company waits a minimum of 3-5 days after installing the borehole before initiating the test so as to ensure that the ground has returned to its native and undisturbed temperature state.



Figure 2: Temperature probe used for measurements

Test Bore Drilling Log Summary

(refer to Test Bore Dilling Log on p. 7 for more detail)

Depth (ft)	Comments
0 - 30'	*dry sand*
30 - 200'	*clay, sometimes with silt. Some groundwater perched above bedrock. clay with gravel*
200 - 205'	*dry shale*
205 - 805'	*No significant water yield encountered Casing set at 210 ft*

Undisturbed Temperature Profile

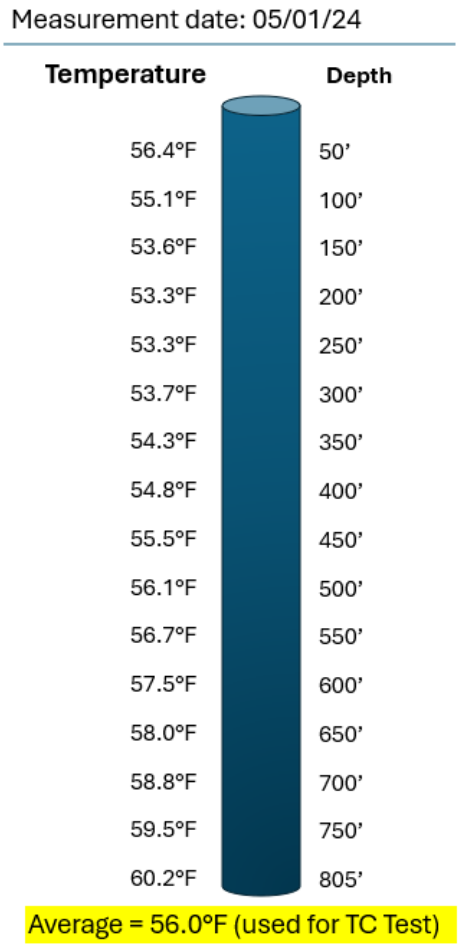


Figure 3: temperature profile of borehole prior to TC test

Thermal Conductivity Test Overview

The thermal conductivity, or thermal response, test is a way to determine ground thermal properties that are critical for ground source heat pump system design. The test is performed by injecting a known and constant heat power into a borehole heat exchanger and then measuring the temperature response. A competent test can provide the undisturbed formation ground temperature, the calculated thermal conductivity, the calculated borehole thermal resistance and an estimate of the thermal diffusivity. These values, critical for the optimal design of a geothermal system, can be used in a geothermal design program to design an optimized, cost effective system.

Thermal Conductivity Calculation

Because thermal conductivity cannot be measured directly, The Ground Loop Design Thermal Conductivity Module uses the line source heat transfer model to calculate the required results. The line source model, which assumes an infinitely thin heat source in a homogeneous medium, is very broadly-referenced in the published literature and is considered to be the standard analysis methodology. To analyze test data, the average temperature of the water entering and exiting the heat exchanger is plotted versus the natural log of time. Using regression analysis, a best-fit line is plotted to match the empirical data and the slope of the line is used to calculate the thermal conductivity of the formation. Typically, the data analysis procedure may be repeated several times for several different time intervals to ensure the closest fit between the empirical data and the derived best-fit line. In addition, approximately the first 10 hours of temperature data are not included in the analysis so as to ensure that the conductivity value is determined from steady state rather than transient heat conduction processes.

Borehole Thermal Resistance Calculation

The borehole thermal resistance cannot be measured directly but can be calculated from the recorded in-situ measurements. After determining the thermal conductivity, the resultant value can be used in the line-source equation to calculate the borehole thermal resistance. Note that the calculated borehole thermal resistance is representative of the entire test bore configuration including the pipe type, pipe spacing, grout resistance and borehole diameter, etc. The empirically derived borehole thermal resistance may be entered into a design program such as Ground Loop Design for final loopfield design assuming the parameters for the boreholes in the final installation are equivalent to those in the test bore. Details pertaining to the general equation used for the calculation can be found in the research literature (Mattison, et al., 2007 for example).

Thermal Diffusivity Estimation

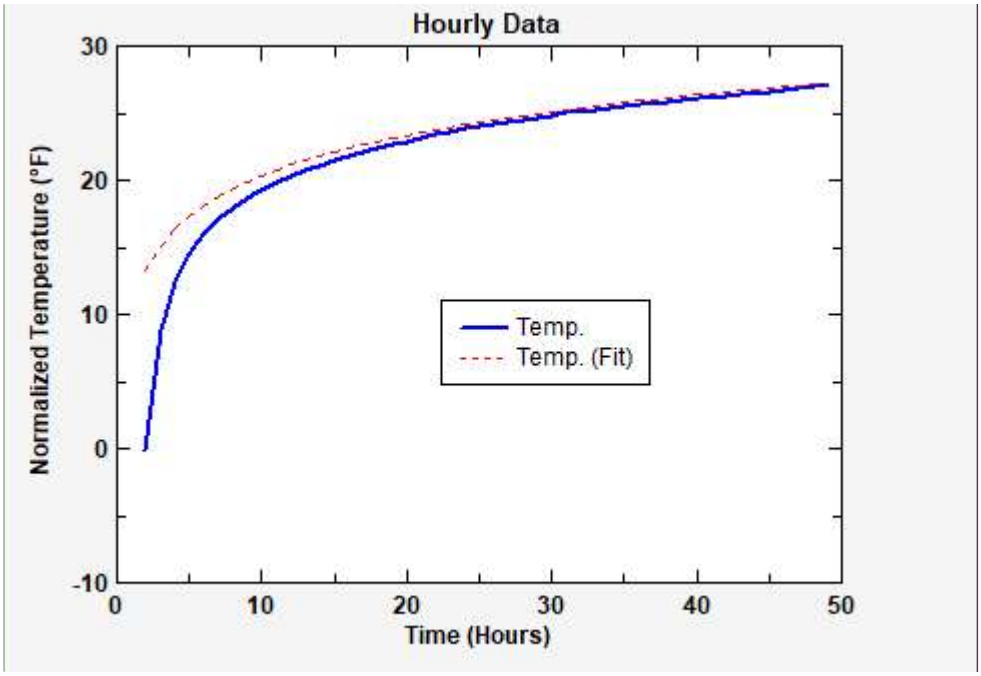
Thermal Diffusivity may be estimated from a combination of the calculated thermal conductivity value (which is directly related to the diffusivity) in conjunction with estimates of the specific heat, density and moisture content of the test bore. The thermal diffusivity reflects the rate of conductive heat transfer in the soil and helps determine the impact of neighboring borehole interactions on the final geothermal loopfield design.

Data Quality

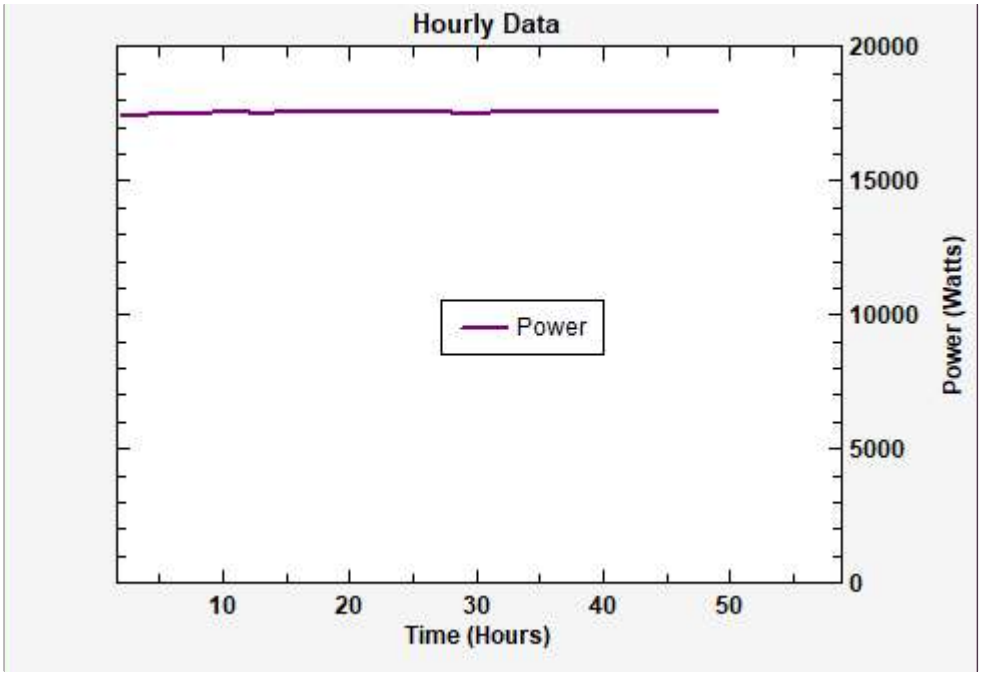
		Threshold			Threshold
Power Standard Deviation :	**Pass**	**1.50 %**	Flow Rate :	**Pass**	**5.00 %**
Power Variation :	**Pass**	**10.00 %**	Slope Stability :	**Pass**	**25.00 %**
Temperature :	**Pass**	**5.00 %**	Water Flow Test :	**Pass**	**20.00 %**

Gaia Geothermal

Temperature vs Time

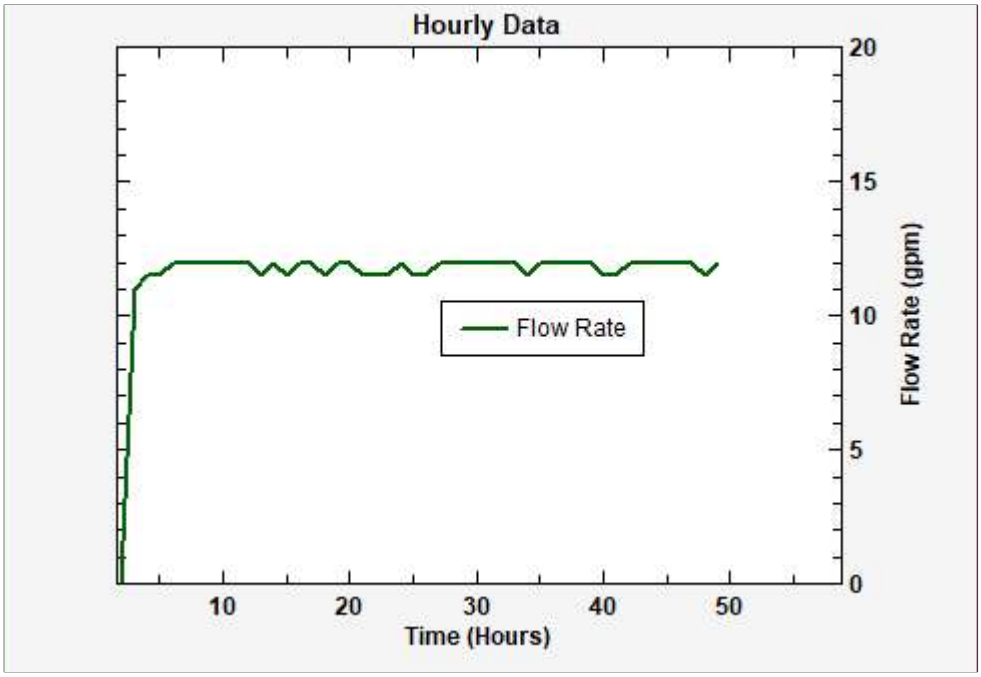


Power vs Time



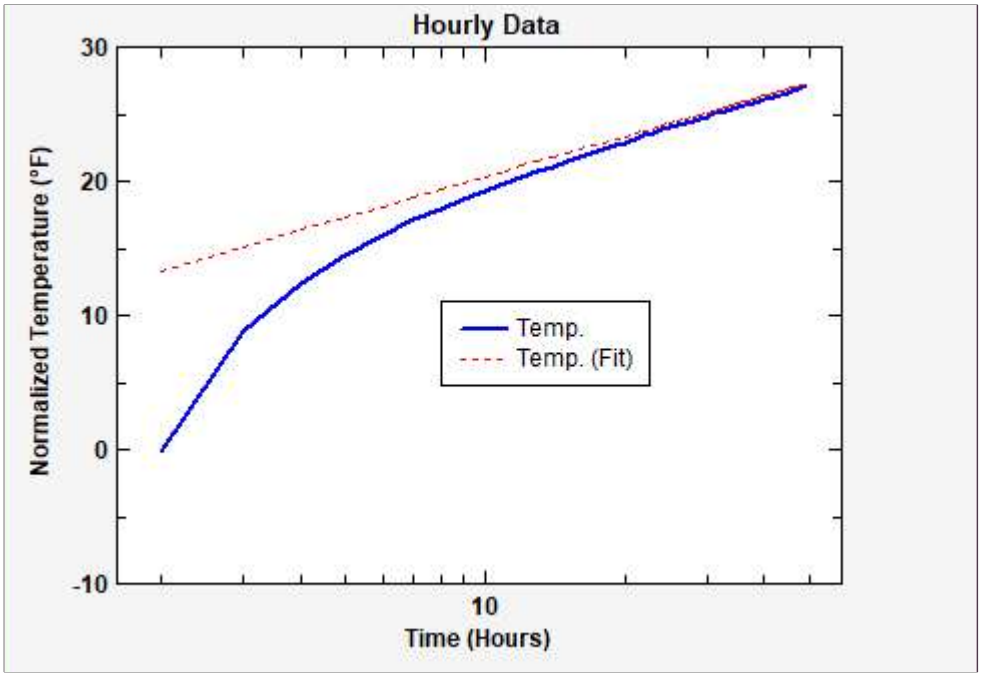
Average Power 17561.1 Watts

Flow Rate vs Time



Average Flow Rate **11.82**

Temperature vs ln(Time)



Slope :	**4.34**
Calculation Interval :	**12.0 - 40.0 Hours**

Gaia Geothermal

ROTOTEC
CLEVER GEOENERGY PIONEER

Aztech Geothermal

Test Bore Drilling Log

Start Date:	4/23/2024	Driller:	Rafael Gonzales, Rototec LLC
Completion Date:	4/25/2024	Logger:	Aeowyn Kendall, Aztech

Project Information		Site Conditions	
Project Name:	DOT Harriman Campus Test Bore	Weather (Temperature/Precip):	30-55 F (weather that day)
Site Address:	State Access Rd Albany, NY 12203	Elevation Above Sea Level:	249 feet
		GPS Location:	42°40'56"N 73°48'48"W (~10 ft off parking lot)

Drilling Equipment		Materials	
Drill rig used:	Comacchio Geo 600	Loop Pipe Manufacturer:	Oil Creek (Morris Industries, Inc.)
Type of Drilling:	Air Hammer/DDH	Loop SD & Resin:	SDR-11, Resin 4710
Type of Bit(s):	Hammer	Loop Pipe Diameter:	1.5 inch
Drill String Dia.:	2 3/8 inch	Tremie Pipe Size & Type:	1.25 inch HDPE
Drill Bit Dia.:	5.5 inch, Casing 6.6 in	Grout Type(s):	GeoPro TG Lite/PowerTEC 2:1 ratio
		Quantity of Grout Used (bags):	42 bags of TGLite, 21 of PowerTEC
		Quantity of Drill Mud Used:	None
		Source of Drilling Water:	Hydrant on site

Well Summary

Static Water Depth: 7 ft (measured by CHA GeoTech)	Depth to Bedrock:	205 feet
	Length of Casing:	210 feet
	Total Depth of Borehole	805 feet

Drilling Log*

Date	Start Time	End Time	Depth Range	Notes: Formation Type & Changes, Estimated Water Flow Rates, General Notes
4/23/2024	8:33am	3:30pm	0-30	dry sand
			30-200	clay, with silt. Some groundwater perched above bedrock.
			200-205	clay, with gravel.
	3:30pm	7:30pm	205-805	dry shale

All changes in formation, rate of production or water flow need to be noted specifically.

Ground Loop Installation

Date	Start Time	End Time	Depth Range	Notes: General Notes
4/24/2024	~9:00am	~9:10am	0-500+ ft	Runaway loop occurred. Work stopped, loop was pulled up.
4/25/2024	10am	12:30pm	0-800ft	Looping completed

Grouting Procedure

Date	Start Time	End Time	Depth Range	Notes: General Notes - Formation Loss?
4/25/2024	1pm	3:30pm	750-0 ft	Less grout was used than expected. Tremie was ~50 ft from bottom.

General Notes / Observations

1. ~860 gallons of grout were anticipated to be used. Just under 800 gallons were actually used.
2. The ratio was 1 bag of PowerTec to 2 bags of TGLite.
3. Tremie pipe was ~50 ft from bottom of bore, accounting for less grout being used than calculated. Not much formation loss anticipated. None would be expected in the cased section, and tight shale with little water yield during drilling would not contribute much either.

TG Lite | PowerTEC | 1.20 Btu/hr-ft-°F

PRODUCT SUBMITTAL INFORMATION

PRODUCT MANUFACTURER & DESCRIPTION

TG Lite and PowerTEC are manufactured, distributed and supported by GeoPro, Inc.

When supplied by GeoPro and mixed according to our specifications, this TG Lite and PowerTEC recipe will yield a bentonite-based thermal grout that provides an environmental seal in the bore annulus with the engineering properties described.

PRODUCT PERFORMANCE & TECHNICAL DATA

This product complies with IGSHPA's Closed-Loop Design and Installation Standards which require:

- Permeability less than $1.0x10^{-7}$ cm/s per ASTM D-5084.
- Thermal conductivity tested per ASTM D-5334.
- Compliance with NSF/ANSI Standard 60 requirements for purity and suitability for contact with drinking water.

Properties and associated certifications are independently verified by a third party laboratory. Copies of independent test reports are available upon request.

FIELD QUALITY CONTROL

When using TG Lite with PowerTEC, GeoPro strongly recommends a field quality control process consisting of:

- Thermal conductivity testing of grout samples
- Submission of material usage reports

Grout samples should be collected in the field and tested in a lab (per ASTM D-5334) to verify that the product meets minimum thermal performance requirements. Thermal conductivity testing is a free service that GeoPro provides. Sample containers are available upon request.

Material usage reports are available for download on our website. Contact us for more information.

BATCH RECIPE

TG Lite	**2**	bag(s)
PowerTEC	**1**	bag(s)
Fresh Water*	**30.0**	gal (US)
Yield	**35.7**	gal (US)

*Mix water must be suitable for human consumption

GROUT PROPERTIES

Target Thermal Conductivity	**1.20**	Btu/hr-ft-°F
Permeability	**$<1x10^{-7}$**	cm/s
Density	**10.7**	lb/gal (US)
Percent Solids	**34.5**	by weight
Percent Active Solids	**28.6**	by weight

MIXING INSTRUCTIONS

1. Fill conventional paddle mixer with 30.0 gal (US) of fresh water (according to mix table). *Accurate mix water volume measurements are critical.*
2. Start mixer and add 1 bag(s) of PowerTEC.
3. Add 2 bag(s) of TG Lite and mix until uniform (approx. 2-3 minutes).
4. Pump with a positive displacement pump (piston pump recommended) through a 1-¼ in tremie pipe.

PACKAGING INFORMATION

TG Lite is packaged in 50 lb bags with 54 bags per heat shrunk pallet.

PowerTEC is packaged in 32 lb bags with 75 bags per heat shrunk pallet.

created: 2021-05-02

302 East Warehouse
Elkton, SD 57026

AQUA JET I.D. / AQUA JET O.D. / AQUA BLUE / GEOTHERMAL

PROPERTIES	TEST METHOD	UNIT	AQUA-JET & GEOTHERMAL (VALUE)	AQUA BLUE (VALUE)
DENSITY	*ASTM D-1505*	*GMS/CM³*	*0.954*	*0.944*
MELT INDEX	*ASTM D-1238 (190 / 2.16)*	*GMS/10 MIN*	*0.10*	*0.11*
TENSILE STRENGTH AT BREAK	*ASTM D-638*	*PSI*	*4500*	*4500*
TENSILE STRENGTH AT YEILD	*ASTM D-638*	*PSI*	*3200*	*3300*
ULTIMATE ELONGATION	*ASTM D-638*	*%*	*850*	*>800*
FLEXURAL MODULAS	*ASTM D-790*	*PSI*	*120,000*	*120,000*
LINEAR THERMAL EXPANSION	*ASTM D-696*	*INCH/INCH/F*	*$9X10_5$*	*$9X10_5$*
HARDENESS	*ASTM D-2240*	*SHORE D*	*58*	*68*
BRITTLENESS TEMPERATURE	*ASTM 746*	***°F***	*<-148*	*<-180*
PENT	*ASTM-F-1473*	*HOURS*	*>100*	*>100*
MATERIAL DESIGNATION	*PPI-TR4*	*-*	*PE-3608*	*PE-3608*
CELL CLASSIFICATION	*ASTM D-3350*	*-*	*345464C*	*345464C*
HDB AT 73.4°F (23°C)	*ASTM D-2837*	*PSI*	*1600*	*1600*
HBD AT 140°F (60°C)	*ASTM D-2837*	*PSI*	*800*	*800*

OIL CREEK PLASTICS TYPICAL MATERIAL PROPERTIES

PE-4710 SERIES / AQUA JET I.D. / AQUA JET O.D. / AQUA BLUE / GEOTHERMAL

SIZE	O.D.	MINIMAL WALL	AQUA-JET & GEOTHERMAL (VALUE)	AQUA BLUE (VALUE)
DENSITY (BLACK)	*ASTM D-791*	*GMS/CM3*	*0.959*	
DENSITY (AQUA BLUE)	*ASTM D-791*	*GMS/CM2*	*0.949*	
MELT INDEX	*ASTM D-1238 (190/2.16)*	*GMS/10 MIN*	*0.080*	
TENSILE STRENGTH AT YIELD	*ASTM D-638*	*PSI*	*>3500*	
ULTIMATE ELONGATION AT BREAK	*ASTM D-638*	*%*	*>500%*	
FLEXURAL MODULAS	*ASTM D-790*	*PSI*	*150,000*	
HYDROSTIC STRENGTH 1798 PSI AT 68°F 725 PSI AT 176°F	*ASTM D-1598*		 *>8 DAY* *>42 DAY*	
BRITTLENESS TEMPERATURE	*ASTM D746A*	***°F***	*>-103°F*	
SLOW CRACK GROWTH PENT	*ASTM D-1437*	*HOURS*	*>1 YEAR*	
MATERIAL DESIGNATION	*PPI-TR4*	*-*	*PE-4710*	
CELL CLASSIFICATION	*ASTM D-3350*	*BLACK*	*PE-445574C*	
HDB AT 73.4°F (23°C)	*ASTM D2837*	*PSI*	*1600*	
HBD AT 140°F (60°C)	*ASTM D2837*	*PSI*	*1600*	

OIL CREEK PLASTICS TYPICAL MATERIAL PROPERTIES

Geothermal loop

GEOTHERMAL - DR-11

SIZE	O.D.	MINIMUM WALL	WEIGHT PER 100”	PSI RATING
3/4”	1.050	0.095	11.6	200
1”	1.315	0.120	18.3	200
1-1/4”	1.660	0.161	27.9	200
1-1/2”	1.900	0.173	38.3	200
2”	2.375	0.216	59.7	200
3”	3.500	0.318	129.0	200
4”	4.500	0.409	208.0	200
6”	6.625	0.602	496.8	200

PROJECT LABOR AGREEMENT
COVERING
NEW YORK STATE OFFICE OF GENERAL SERVICES
W. AVERELL HARRIMAN STATE OFFICE BUILDING CAMPUS PROJECT

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PROJECT LABOR AGREEMENT
COVERING
NEW YORK STATE OFFICE OF GENERAL SERVICES
W. AVERELL HARRIMAN STATE OFFICE BUILDING CAMPUS PROJECT

ARTICLE 1- PREAMBLE

WHEREAS, New York State Office of General Services, ("OGS"), desires the efficient, safe, quality, and timely completion of a construction project relating to the New York State Office of General Services W. Averell Harriman State Office Building Campus Project in a manner designed to afford the lowest reasonable costs to OGS, and the Public it serves, and the advancement of permissible statutory objectives;

WHEREAS, OGS has engaged Seeler Engineering, P.C. ("Seeler") to undertake an analysis of whether the use of a Project Labor Agreement will best serve the OGS's interest in obtaining the best work at the lowest possible price, preventing favoritism, fraud and corruption, and other considerations such as the impact of delay, the possibility of cost saving advantages, and any local history of labor unrest; and

WHEREAS, Seeler's *Report Project Labor Agreement Benefits Analysis*, dated January 5, 2026 ("*Report*") concluded that use of a Project Labor Agreement would provide OGS with measurable economic benefits and would promote OGS's interest in obtaining the best work at the lowest prices as well as preventing favoritism, fraud and corruption; and

WHEREAS, OGS has carefully reviewed and considered Seeler's *Report* and finds, among other things, that OGS's interest in obtaining the best work at the lowest possible price, preventing favoritism, fraud and corruption, preventing the impact of delay, avoiding labor unrest, and gaining measurable management flexibility and benefits are best met by requiring a Project Labor Agreement and, therefore, directs that a Project Labor Agreement be made part of the Project; and

WHEREAS, this Project Labor Agreement will foster the achievement of these goals, inter alia, by:

(1) providing a mechanism for achieving the most cost-efficient means of construction, including direct labor cost savings;

(2) avoiding the costly delays of potential strikes, slowdowns, walkouts, picketing and other disruptions arising from work disputes and promoting labor harmony and peace for the duration of the Project;

(3) standardizing the terms and conditions governing the employment of labor on the Project;

(4) permitting wide flexibility in work scheduling and shift hours and times;

(5) providing comprehensive and standardized mechanisms for the settlement of work disputes, including those relating to jurisdiction;

(6) furthering public policy objectives as to improved employment opportunities for minorities, women and the economically disadvantaged in the construction industry; and

(7) ensuring a reliable source of skilled and experienced labor and,

WHEREAS, the signatory Unions desire the stability, security and work opportunities afforded by a Project Labor Agreement; and

WHEREAS, the Parties desire to maximize Project safety conditions relating to the Project;

NOW, THEREFORE, the Parties enter into this Agreement:

SECTION 1.1 PARTIES TO THE AGREEMENT

This is a Project Labor Agreement ("Agreement") entered into for certain construction work to be performed as part of the "New York State Office of General Services W. Averell Harriman State Office Building Campus Project" (as defined below) by and among: (i) New York State Office of General Service's Construction Manager ("the CM "); (ii) the Greater Capital Region Building & Construction Trades Council, AFL-CIO, on behalf of itself and its affiliated local union members; and (iii) the signatory Local Unions on behalf of themselves and their members.

ARTICLE 2 - PRIME CONDITIONS

SECTION 2.1 DEFINITIONS

Throughout this Agreement:

(A) "Union Parties" and "Unions" means the Greater Capital Region Building & Construction Trades Council, AFL-CIO and the Local Unions individually and collectively;

(B) "Local Union(s)" means the Local Unions that sign this Agreement, individually and collectively;

(C) "The Project" means construction work related to the New York State Office of General Services W. Averell Harriman State Campus Building Campus Project, as more fully set forth in Article 3, Section 1;

(D) "CM" means Jacobs Project Management Company, the Construction Manager, as Agent for the New York State Office of General Services;

(E) "Contractor(s)" means the Prime Contractor(s)("PC(s)") and each Subcontractor to the Prime Contractor(s), of whatever tier engaged in on-site construction work on the Project within the scope of this Agreement as defined in Article 3; and

(F) "Capital Region Council" means the Greater Capital Region Building & Construction Trades Council, AFL-CIO.

SECTION 2.2 CONDITIONS FOR AGREEMENT TO BECOME EFFECTIVE

This Agreement shall not become effective unless each of the following conditions are met: (1) the Agreement is signed by the Capital Region Council and the Local Unions having jurisdiction over the Project work and is approved by the National Building and Construction Trades Department, AFL-CIO; (2) the Agreement is signed by the CM; (3)

the Agreement is approved by the NYS Building & Construction Trades Council; and (4) the Agreement is authorized by OGS.

SECTION 2.3 ENTITIES BOUND & ADMINISTRATION OF AGREEMENT

This Agreement shall be binding on all signatory Unions, and their affiliates and all Contractors performing on-site Project work as defined in Article 3. Contractors shall include in any subcontract that they let for performance during the term of this Agreement a requirement that their Subcontractors, of whatever tier, become bound by this Agreement with respect to subcontracted work performed within the scope of Article 3 and require that each Subcontractor, of whatever tier, sign a letter of assent (Schedule B). The Contractors shall use their best care, skill and diligence in supervising and directing all work on the Project. This Agreement shall be administered by the Construction Manager, for the benefit of OGS, which is an intended third-party beneficiary of this Agreement.

SECTION 2.4 SUPREMACY CLAUSE

This Agreement, together with the local Collective Bargaining Agreements appended hereto and referred to herein as "Schedule A" represents the complete understanding with respect to the Project and supersedes any national agreement, local agreement, or other collective bargaining agreement of any type which would otherwise apply to Project Work, in whole or in part, with the exception that the NTL Articles of Agreement, the National Stack/Chimney Agreement, the National Cooling Tower Agreement, the UA/IBEW Joint National Agreement for Instrument and Control Systems Technicians, and the National Agreement of the International Union of Elevator Constructors ("National Agreements") shall apply. Notwithstanding this exception, Articles 7, 9, and 10 of this Agreement shall also apply. Where a subject covered by the provisions of this Agreement is also covered by a Schedule A, the provisions of this Agreement shall prevail. If this Agreement is silent on any matter addressed in the applicable Schedule A agreement, the Schedule A agreement shall govern. It is understood that by virtue of having become bound by this Project Labor Agreement, the Contractors will not be obligated to sign any other local, area, or national agreement.

Nothing in this Agreement requires employees to join a union or pay dues or fees to a union as a condition of working on the covered project. This Agreement is not, however, intended to supersede independent requirements in applicable local union agreements as to contractors that are otherwise signatory to those agreements and as to employees of such employers performing covered work.

SECTION 2.5 LIABILITY

The liability of any Contractor and the liability of any Union under this Agreement shall be several and not joint. The Prime Contractor and any other Contractor shall not be liable for any violations of this Agreement by any other Contractor; and the Greater Capital Region Council and each Local Union shall not be liable for any violations of this Agreement by any other Local Union. No grievance shall be brought directly against OGS or the CM under this Agreement. Further, no arbitration decision or award may provide retroactivity of more than twenty (20) days prior to the date of service of a written grievance as described herein.

SECTION 2.6 OGS

Each Contractor shall require its Subcontractors, of whatever tier for work within the scope of Article 3, Section 1, to execute the Letter of Assent in Schedule B and to become bound by this Agreement. OGS is not a party to this Agreement and shall not be liable in any manner under this Agreement; but OGS is an intended third-party beneficiary of this Agreement. It is understood that nothing in this Agreement shall be construed as limiting the sole discretion of OGS in determining which Prime Contractor shall be awarded the contract for Project work. It is further understood that OGS has sole discretion at any time to terminate, delay or suspend the work, in whole or part, on the Project, or, in the case of OGS, to undertake any of the work itself without regard to this Agreement.

SECTION 2.7 AVAILABILITY AND APPLICABILITY TO ALL SUCCESSFUL BIDDERS

The Unions agree that this Agreement shall be made available to, and shall fully apply to any Contractor who executes the Letter of Assent (and to its Subcontractors of any tier who execute the Letter of Assent), without regard to whether that Contractor (or its Subcontractors) performs work at other sites on either a union or non-union basis and without regard to whether employees of such Contractor (or its Subcontractors) are, or are not, members of any unions. The Prime Contractor shall provide the CM and the Capital Region Council with a copy of the signed Letter of Assent for each Contractor and Subcontractor prior to the Contractor or Subcontractor performing any work on the Project. This Agreement shall not apply to the work of any Contractor which is performed at any location other than the Project site.

ARTICLE 3 - SCOPE OF THE AGREEMENT

The Project as to which this Agreement applies shall be as defined and limited by the following sections of this Article.

SECTION 3.1 THE WORK

This Agreement shall only apply to Project Work as defined in this Article.

Subject to any exclusions set forth in this Article or elsewhere in this Agreement, the Project as to which this Agreement applies shall be that construction work within the Construction Manager's contract with OGS and delineated by the construction contract documents related to the following New York State Office of General Services W. Averell Harriman State Office Building Campus projects:

- the construction of a new testing laboratory building for NYS DOT,
- the renovation of the bathrooms of Building 22,
- the replacement of the air handlers in Building 21,
- the renovation of Dorms A and B of Building 24,
- the modernization of the elevator system in Building 7A,
- the rehabilitation of the building envelope of Building 24, and
- the rehabilitation of the 4th, 5th, 6th and 7th floors of Building 8, and
- the construction of a new Emergency Management Headquarters building.

Specifically excluded from coverage under this Agreement is all work bid and/or awarded prior to the execution of this Agreement and approved by OGS; work that is part of an OGS Emergency Contract; maintenance and repair work performed in the normal course of OGS operations or any work involving Department of Real Estate (DRE) maintenance contracts; any work to be completed by the OGS; work performed under annual term contracts (whether related to the Project or not); work related to this project as follows.

a. The purchase of telephones, camera/surveillance and door security devices, and data devices. The mounting/installation of the devices as well as all conduit and wiring shall be covered work.
b. The buildout of restaurant concessionaire spaces procured under separate RFP. Water, sewer, natural gas, electrical, ventilation/ductwork services shall be constructed up to a safe and convenient termination point at the limits of the space designated as concessionaire space as covered work.

Further items specifically excluded from the scope of this Agreement, includes, maintenance, repair, replacement, service and/or operation required of equipment, tools and/or infrastructure that has been installed and placed into service, grounds maintenance such as, snow removal (except areas within the project site) lawn care, etc., food services and work self-performed by the owner. Any labor associated with the delivery, unpacking, and placement of Furniture, Fixtures and Equipment (FFE) furnished by or to the Contractor for installation shall be covered work. Any work associated with the installation of separately procured FFE under separate contract and not provided to the Contractor for installation shall be excluded work.

SECTION 3.2 CLEANING

It is the responsibility of each contractor & respective trade on a daily basis, to clean debris generated by their work process in their immediate work area. Such shall be removed to a collection site at the edge of their immediate work area for removal. Each Prime Contractor in its sole discretion will employ laborers in a sufficient quantity to remove such debris or waste materials.

SECTION 3.3 MOVING OF MATERIALS

On-site moving of materials using a Lull or similar equipment shall be operated by the Operating Engineers. The Prime Contractor(s) in its sole discretion will employ a sufficient number of on-site Operating Engineers to operate such equipment.

SECTION 3.4 NO INTERFERENCE

Nothing contained herein shall be construed to prohibit, restrict or interfere with the performance of any other operation, work or function which may occur at the project sites or be associated with the development of the project sites.

SECTION 3.5 TIME LIMITATIONS

This Agreement shall be limited to Project Work performed under OGS's construction contract(s) (subject to exclusions noted herein) provided that this Agreement is approved by the OGS and by the Council and each Local Union and shall terminate when

New York State Office of General Services determines that the Prime Contractor(s) has completed all work of his contract and declares the work covered by this agreement is complete. This Agreement may be extended by mutual written agreement of the parties.

SECTION 3.6 EXCLUDED EMPLOYEES

The following persons are not subject to the provisions of this Agreement, even though performing work on the Project:

a. Superintendents, Supervisors (excluding Forepersons specifically covered by a craft's Schedule A), engineers, inspectors and testers, quality control/assurance personnel, timekeepers, mail carriers, clerks, office workers, messengers, guards, technicians, non-manual employees and all professional, engineering, administrative and management persons.
b. Employees of equipment manufacturers or factory technicians involved in on-site installation or warranty work who participate in a supervisory capacity.
c. Employees of equipment suppliers performing or assisting in on-site equipment installation or warranty work will work with the respective craft having jurisdiction over such work. The craft must have a certified or qualified (trained) person to assist in the work. Certifications shall be obtained at the expense of the unions.
d. Persons engaged in laboratory, geophysical or other specialty testing, inspections or surveying firm not ordinarily done by a member of a Trade Union.
e. Individuals engaged in surveying as direct hires of a Contractor, rather than pursuant to a professional services contract with the Owner, the Construction Manager or any other professional consultants, are covered by this Agreement.
f. Project Site property surveying and benchmarks or survey required to document pay applications or compliance with other provisions of the construction contract(s) shall be provided by the civil engineer or others hired by the Owner or Architect / Engineer ("A/E"). All surveys and layout from the benchmarks provided by others shall be performed by the respective trade in accordance with their collective bargaining agreements.
g. Persons engaged in ancillary Project Site work performed by third parties such as electrical utilities, gas utilities, telephone companies and railroads.
h. Employees of subcontractors and/or suppliers and/or independent haulers engaged in use of vehicles for delivery of and pick up of materials or supplies at the Project Site including concrete and/or ready mix and asphaltic materials (dedicated off-site work to which §220 of New York's Labor Law ("Section 220") applies or delivery of aggregates as defined by §220 of New York's Labor Law are not excluded from coverage).
i. Employees of New York State Office of General Services.
j. Employees and entities engaged in off-site manufacture, modifications, repair, maintenance, handling or fabrication of project components, materials, equipment or machinery to and from the Project (dedicated off-site work to which Section 220 of New York's Labor Law applies is not excluded from coverage).

SECTION 3.7 NON-APPLICATION TO CERTAIN ENTITIES

This Agreement shall not apply to the parents, affiliates, subsidiaries, or other joint or sole ventures of any Contractor which do not perform work at the Project. It is agreed,

for the purposes of this Agreement only, that this Agreement does not have the effect of creating any joint employment, single employer or alter ego status among OGS, the CM, the Prime Contractor and/or any other Contractor. The Agreement shall not apply to the OGS, the CM or any state agency, authority, or other municipal or public entity and nothing contained herein shall be construed to prohibit or restrict the OGS or its employees or any OGS or state authority, agency or entity and its employees from performing on or off-site work related to the Project. As the contracts which comprise the Project Work are completed and accepted, the Agreement shall not have further force or effect on such items or areas except where inspections, additions, repairs, modifications, check-out and/or warranty work are designated in writing (copy to Local Union involved) by the Prime Contractor as work to be performed under the terms of this Agreement.

ARTICLE 4 - UNION RECOGNITION AND EMPLOYMENT

SECTION 4.1 PRE-HIRE RECOGNITION

The Contractors recognize the signatory Unions as the sole and exclusive bargaining representatives of all craft employees who are performing on-site Project Work within the scope of this Agreement as defined in Article 3.

SECTION 4.2 UNION REFERRAL

A. The Contractors agree to hire Project craft employees covered by this Agreement through the job referral systems and hiring halls (where the referrals meet the qualifications set forth in items 1, 2 and 4 of subparagraph B) established in the Local Unions' area collective bargaining agreements (attached as Schedule A to this Agreement), and the Unions agree to provide such craft employees (including apprentices) to all Contractors on a non-discriminatory basis. Notwithstanding this, the Contractors shall have sole right to determine the competency of all referrals; the number of employees required; the selection of employees to be laid-off (except as provided in Article 5, Section 3); and the sole right to reject any applicant referred by a Local Union. In the event that a Local Union is unable to fill any request for qualified employees within a 48-hour period, excluding Sundays and holidays, after such requisition is made by the Contractor, the Contractor may employ qualified applicants from any other available source and notwithstanding the 12.5% limitation set forth in subparagraph B below. In the event that the Local Union does not have a job referral system, the Contractor shall give the Local Union first preference to refer applicants, subject to the other provisions of this Article. The Contractor shall notify the Local Union of Project craft employees hired within its jurisdiction from any source other than referral by the Union. The Local Unions will cooperate with Contractor requests for minority, women or economically disadvantaged referrals to meet the provisions of Article 4, Section 4. These workers may be delivered under a "Direct Entry" designation or by use of a Department of Labor Waiver.

B. A Contractor may request by name, and the Local must honor, referral of persons who have applied to the Local for Project work and who meet the following qualifications:

(1) possess any license required by NYS law for the Project work to be performed;

(2) have worked a total of at least 1000 hours in the Construction craft during the prior 3 years;

(3). were on the Contractor's active payroll for at least 60 out of the 240 calendar days prior to the contract award;
(4) have the ability to safely perform the basic functions of the applicable trade.

No more than 12.5 percent of the employees covered by this Agreement, per Contractor by craft, shall be hired through the special provisions above (any fraction shall be rounded to the next highest whole number). Craft forepersons and/or Prime forepersons shall be included in this 12.5 percent. The Contractor may hire per craft, seven (7) employees referred by the applicable trade or craft, then one (1) employee who is employed by the Contractor, and shall repeat the process, seven and one, until the crew requirements for that craft are met. If requested by the appropriate Union, a Contractor utilizing this provision for by-name referrals shall furnish the Union with a written certification that the individuals requested for referral meet the requirements of (1) - (4) above.

SECTION 4.3 NON-DISCRIMINATION IN REFERRALS

The Local Unions represent that their hiring halls and referral systems shall be operated in a non-discriminatory manner and in full compliance with all applicable federal, state and local laws and regulations which require equal employment opportunities. Referrals shall not be affected in any way by the rules, regulations, bylaws, constitutional provisions or any other aspects or obligations of union membership, policies or requirements and shall be subject to such other conditions as are established in this Article. No employment applicant shall be discriminated against by any referral system or hiring hall because of the applicant's union membership, or lack thereof.

SECTION 4.4 WORKFORCE DIVERSITY UTILIZATION

The Project Specific Prime Contractor and Unions recognize the need to promote opportunities for minority workers as well as local Minority-owned Business Enterprises ("MBE"), Woman-owned Business Enterprises ("WBE"), or Service-Disabled Veteran-Owned Business Enterprises (SDVOBE) (collectively "M/W/SDVOBE") contractors and subcontractors, consistent with the goals of OGS as set forth in Article 8, Section 3. The Parties agree that good faith efforts shall be made for M/W/SDVOBE participation consistent with the goals of OGS. The Parties agree to work to identify emerging M/W/SDVOBE local contractors to perform the work and will encourage open shop contractors to participate.

The Unions and OGS recognize and acknowledge that workforce diversity of minorities and women are employment goals consistent with our values of fair play. Each of the Local Unions agree and will strive to achieve that three and two tenths (3.2%) percent of all referrals will consist of minorities and six and nine tenths (6.9%) percent of all referrals will consist of women. In the event a Local Union either fails, or is unable, to refer qualified minority or female applicants in percentages equaling the diverse workforce goals, the Contractor shall make a good faith effort to employ qualified minority or female applicants from any other available source.

For the purpose of tracking, the PCs shall produce, and each Contractor and Subcontractor shall submit a monthly report with submission of certified payroll documents to the PCs of total hours by craft worked and of minority/women hours worked by craft.

Copies of the reports will be provided to the CM and OGS.

SECTION 4.5 CROSS AND QUALIFIED REFERRALS

The Local Unions shall not knowingly refer to a Contractor an employee then employed by another Contractor working under this Agreement. The Local Unions shall exert their utmost efforts to recruit sufficient numbers of skilled and qualified crafts employees to fulfill the requirements of the Contractor.

SECTION 4.6 UNION DUES

Nothing in this Agreement requires employees to join a union or pay dues or fees to a union as a condition of working on the covered project. This Agreement is not, however, intended to supersede independent requirements in applicable local union agreements as to contractors that are otherwise signatory to those agreements and as to employees of such employers performing covered work. No employee shall be discriminated against because of the employee's union membership or lack thereof. Each Contractor shall be responsible for and guarantee the payment of all remittance to the appropriate Local Union of the applicable union dues payable by its employees working on the Project.

The Prime Contractor(s), in order to ensure the full and timely remittance of all union dues and fringe benefit funds, including but not limited to Health and Welfare, Pension, Annuity, Legal Service, Education and Training, SUB, Apprenticeship (hereinafter "Funds" or "Fund") due the affiliated Local Unions as provided for in all applicable Collective Bargaining Agreements between the Local Unions and Contractors which have contracted to perform Project Work, agrees that it will, upon written notification to the PC of not more than fifteen (15) days from the date of a default from any affiliated Local Union that a Contractor has become delinquent in the payment of Fund contributions due in connection with Project Work, shall immediately stop payment on all monies due or which may become due to the delinquent Contractor up to the amount alleged to be owed for the Project Work and shall take all appropriate actions to resolve the matter to the satisfaction of all Parties involved including payment of all such funds paid to the complaining Local Union in the form of a dual party check which would then be applied against the amount owed by the defaulting Contractor.

The Prime Contractor(s) shall allow the Contractor a period of ten (10) working days from the date of notification to produce a written letter signed by the Business Manager of the complaining Local Union that the amount in default has been paid in full and the Contractor is current in the remittance of Funds or a bona-fide explanation acceptable to the complaining Local Union of why in the Contractor's opinion the amounts are not due as alleged. In the event of such a bon-fide dispute, The Prime Contractor will use its best efforts to act as initial arbiter and take action it then deems appropriate.

No monies shall be paid to the delinquent Contractor, who may request arbitration of the dispute in accordance with Article 7. In the event such a letter is not delivered to the PC within ten (10) working days from the date of notification to the defaulting Contractor, the PC shall issue a two party check to the Fund Administrator of the complaining Local Union in the form of a dual party check which would then be applied against the amount owed by the defaulting Contractor.

SECTION 4.7 CRAFT FOREPERSONS AND PRIME FOREPERSONS

The selection of craft forepersons and/or Prime forepersons and the number of forepersons required shall be solely the responsibility of the Contractor. All forepersons shall take orders exclusively from the designated Contractor representatives. All forepersons shall be designated as working forepersons at the request of the Contractor.

ARTICLE 5 - UNION REPRESENTATION

SECTION 5.1 LOCAL UNION REPRESENTATIVE

Each Local Union signatory to this Agreement shall be entitled to designate a representative, and/or the Business Manager, who shall be afforded reasonable access to the Project. Any Local Union representative requesting access to the work areas shall be required to notify the Construction Manager prior to accessing the work areas and will be required to utilize proper PPE standard for the project. The Construction Manager reserves the right to accompany the Local Union representative while on site.

SECTION 5.2 STEWARDS

(a) Each Local Union shall have the right to designate from among those referred to the Project one working journeyperson as a Steward and one alternate for each Contractor per shift and shall notify the Contractor and the CM of the identity of the designated Steward (and alternate) prior to the assumption of such duties. Stewards shall not exercise supervisory functions and will receive the regular rate of pay for their craft classifications. There will be no non-working Stewards on the Project and there is no requirement that a particular Steward be assigned to work a shift if it will result in overtime.

(b) In addition to their work as an employee, the Steward shall have the right to receive complaints or grievances and to discuss and assist in their adjustment with the Contractor's appropriate supervisor; such activities, however, are not to interfere with the Steward's work unless an emergency exists. Each Steward shall be concerned with the employees of the Steward's Contractor and, if applicable, Subcontractors of that Contractor, but not with the employees of any other Contractor. The Contractor shall not discriminate against the Steward in the proper performance of Union duties.

(c) The Stewards shall not have the right to determine when overtime shall be worked or who shall work overtime.

SECTION 5.3 LAYOFF OF A STEWARD

Contractors agree to notify the appropriate Union 24 hours prior to the layoff of a Steward, except in cases of discipline or discharge for just cause. If a Steward is protected against layoff by a Schedule A, such provisions shall be recognized to the extent the Steward possesses the necessary qualifications to perform the work required. In any case in which a Steward is discharged or disciplined for just cause, the Local Union involved shall be notified immediately by the Contractor.

SECTION 5.4 UNION STANDARDS

The Council and its affiliates have a legitimate interest in preventing the undermining of the work opportunities and standards gained through collective bargaining and desire to preserve and protect work opportunities for its members for work excluded in Article 3.

Contractors, while recognizing this interest, must maintain its ability to utilize the services of off-site fabricators to reduce costs and improve efficiencies in order to be competitive. Contractors should, whenever economically feasible, make reasonable efforts to use union signatory vendors which includes UA Yellow Label and SMW Blue Label products for off-site assemblies or fabrications. The PC agrees to support efforts to retain as much work as possible.

This article does not refer to construction material normally purchased pre-assembled or manufactured, it references work normally and historically done on-site or in local union fabrication shops.

If any dispute should arise with respect to this Article the Trades agree to install any off-site assemblies or fabricated items regardless of the source. The parties shall endeavor to settle such dispute in the Labor Management forum or appropriate sub-committee before a grievance is filed under Article 10.

ARTICLE 6 - MANAGEMENT'S RIGHTS

SECTION 6.1 RESERVATION OF RIGHTS

Except as expressly limited by a specific provision of this Agreement, Contractors retain full and exclusive authority for the management of their operations including, but not limited to: the right to direct the work force, including determination as to the number to be hired and the qualifications therefore; the promotion, transfer, layoff of its employees; or the discipline or discharge for just cause of its employees; the assignment and schedule of work; the promulgation of reasonable Project work rules; and the requirement, timing and number of employees to be utilized for overtime work. Nothing contained herein shall be construed so as to allow direction of an Employee to perform work outside the jurisdiction of that Employee's Labor Union affiliation, if any. No rules, customs, or practices which limit or restrict productivity or efficiency of the individual (as determined by the Contractor) and/or joint working efforts with other employees shall be permitted or observed.

SECTION 6.2 MATERIALS, METHODS & EQUIPMENT

There shall be no limitation or restriction upon the Contractors' choice of materials, techniques, methods, technology or design, or, regardless of source or location, upon the use and installation of equipment, machinery, package units, pre-cast, pre-fabricated, pre-finished, or pre-assembled materials, tools, or other labor-saving devices. Contractors may, without restriction, install or use materials, supplies or equipment regardless of their source. The on-site installation or application of such items shall be performed by the craft having jurisdiction over such work pursuant to an applicable Collective Bargaining Agreement; provided, however, it is recognized that other personnel having special qualifications may participate, in a supervisory capacity, in the installation, check-off or testing of specialized or unusual equipment or facilities as designated by the Contractor.

ARTICLE 7 - WORK STOPPAGES AND LOCKOUTS

SECTION 7.1 NO STRIKES-NO LOCK OUT

There shall be no strikes, sympathy strikes, picketing, work stoppages, slowdowns, hand billing, bannering, demonstrations or other disruptive activity at or in proximity to any Project Work site for any reason by any Union or employee against any Contractor or employer while performing work at the Project. There shall be no other Union, or concerted or employee activity which disrupts or interferes with traffic (vehicular or pedestrian) in or around the W. Averell Harriman State Office Building Campus facilities or any access roads to or from either, or with the operation of OGS, the CM, the Prime Contractor or any Contractor or Subcontractor in or around the W. Averell Harriman State Office Building Campus facilities. Failure of any Union or employee to cross any picket line or banner line established by any union, signatory or non-signatory to this Agreement, or the picket, banner or demonstration line of any other organization, at or in proximity to the Project Site or any other site where Project Work is performed or could be adversely affected is a violation of this Article. There shall be no lockout on Project Work by any signatory Contractor. Contractors and Unions shall take all steps necessary to ensure compliance with this Section 1 and to ensure uninterrupted construction, the free flow of traffic in, out and around Project sites, and unimpeded operation of OGS facilities for the duration of this Agreement.

SECTION 7.2 DISCHARGE FOR VIOLATION

A Contractor may discharge any employee violating Section 1, above, and any such employee will not be eligible thereafter for referral under this Agreement for a period of 100 working days.

SECTION 7.3 NOTIFICATION

If a Contractor contends that any Union has violated this Article, it shall notify the Greater Capital Region Council of the Local Union involved, with copies of the notification to the Local Union. The Greater Capital Region Council shall instruct, order and otherwise use its best efforts to cause the employees, and/or the Local Unions to immediately cease and desist from any violation of this Article. If the Greater Capital Region Council complies with these obligations, it shall not be liable for the unauthorized acts of a Local Union or its members.

SECTION 7.4 EXPEDITED ARBITRATION

Any Contractor or Union alleging a violation of Section 1 of this Article may utilize the expedited procedure set forth below (in lieu of, or in addition to, any actions at law or equity) that may be brought.

A. A party invoking this procedure shall notify Jeffrey Selchick or Tom Hines (individuals recognized by both Local Unions and by the OGS as experienced and impartial arbitrators) who shall alternate as Arbitrator under this expedited arbitration procedure. If the Arbitrator next on the list is not available to hear the matter within 48 hours of notice, the next Arbitrator on the list shall be called. If for any reason none of the foregoing are available, the PC and Council shall attempt mutually to select an arbitrator, but if they are unable to do so, they shall request the American Arbitration Association to provide them with a list of

arbitrators from which the Arbitrator shall be selected. Copies of such notification shall be simultaneously sent to the alleged violator and, if a Local Union is alleged to be in violation, the Greater Capital Region Council, and the PC and the Contractor.

B. The Arbitrator shall thereupon, after notice as to time and place to the Contractor, the Local Union involved, the Council, the Contractor, the PC, the CM and OGS, hold a hearing within 48 hours of receipt (excluding Sundays and holidays) of the notice invoking the procedure if it is contended that the violation still exists. The hearing shall not, however, be scheduled for less than 24 hours (excluding Sundays and holidays) after the notice required by Section 3, above.

C. All notices pursuant to this Article may be by telephone, telegraph, hand delivery, or fax, confirmed by overnight delivery, to the Arbitrator, Contractor and Union involved. The hearing may be held on any day including Saturdays or Sundays. The hearing shall be completed in one session, which shall not exceed 8 hours in duration (no more than 4 hours being allowed to either side to present their case and conduct their cross examination) unless otherwise agreed. The failure of any Union or Contractor to attend the hearing shall not delay the hearing of evidence by those present or the issuance of an award by the Arbitrator.

D. The sole issue at the hearing shall be whether a violation of Section 1, above, occurred. If a violation is found to have occurred, the Arbitrator shall issue a Cease-and-Desist Award restraining such violation and serve copies on the Contractor and Union involved. The Arbitrator shall have no authority to consider any matter in justification, explanation or mitigation of such violation or to award damages, which issue is reserved solely for court proceedings, if any. The Award shall be issued in writing within 3 hours after the close of the hearing and may be issued without an Opinion. If any involved party desires an Opinion, one shall be issued within 15 calendar days, but its issuance shall not delay compliance with, or enforcement of, the Award.

E. An Award issued under this procedure may be enforced by any court of competent jurisdiction upon the filing of this Agreement together with the Award. Notice of the filing of such enforcement proceedings shall be given to the Union and Contractor involved. In any court proceeding to obtain a temporary or preliminary order enforcing the arbitrator's Award as issued under this expedited procedure, the involved Union and Contractor waive their right to a hearing and agree that such proceedings may be ex parte, provided notice is given to opposing counsel. Such an agreement does not waive any party's right to participate in a hearing for a final court order of enforcement or in any contempt proceeding.

F. Any rights created by statute or law governing arbitration proceedings which are inconsistent with the procedure set forth in this Article, or which interfere with compliance thereto, are hereby waived by the Contractors and Unions to whom they accrue.

G. The fees and expenses of the Arbitrator shall be equally divided between the involved Contractor and Union.

SECTION 7.5 ARBITRATION OF DISCHARGES FOR VIOLATION

Procedures contained in Article 9 shall not be applicable to any alleged violation of this Article, with the single exception that an employee discharged for violation of Section 1, above, may have recourse to the procedures of Article 9 to determine only if the employee did, in fact, violate the provisions of Section 1 of this Article; but not for the purpose of modifying the discipline imposed where a violation is found to have occurred.

ARTICLE 8 – LABOR MANAGEMENT COMMITTEE

SECTION 8.1 SUBJECTS

The Project Labor Management Committee shall meet on a regular basis to: 1) promote harmonious relations among the Contractors and Unions; 2) enhance safety awareness, cost effectiveness and productivity of construction operations; 3) protect the public interest; 4) discuss matters relating to staffing and scheduling with safety and productivity as considerations; and 5) review Affirmative Action and equal employment opportunity matters pertaining to the Project.

SECTION 8.2 COMPOSITION

The Committee shall be comprised of three designees of the Greater Capital Region Council (all designees shall be local representatives) a representative of the CM and two other representatives appointed by OGS. Representatives of the Local Unions and Contractors involved in the issues being discussed may participate. The Committee may elect its own chair. The Committee may conduct business through mutually agreed sub-committees.

SECTION 8.3 MINORITY, WOMEN'S, SERVICE-DISABLED VETERAN OR DISADVANTAGED BUSINESS RECRUITMENT

The Local Unions shall actively participate in community outreach and recruitment programs established to achieve the goals thirty percent (30%) Minority Business and Women's Business participation and six and one-half (6.5%) Service-Disabled Veteran Owned Business participation. This effort shall include, at a minimum, two informational recruitment seminars and other such activities as scheduled by OGS and the CM as well as active individual Contractor outreach to encourage participation. Contractors or sub-contractors utilizing this section shall be subject to all provisions of this Agreement, excepting the provisions set forth in Schedule D.

ARTICLE 9 – GRIEVANCE & ARBITRATION PROCEDURE

SECTION 9.1 CLOSE COOPERATION

This Agreement is intended to provide close cooperation between management and labor. Each of the Unions shall assign a local representative to this Project for the purpose of completing the construction of the Project economically, efficiently, continuously, and without interruptions, delays, or work stoppages.

SECTION 9.2 IMPORTANCE TO ALL PARTIES

The Contractors, Unions, and the employees, collectively and individually, realize the importance to all parties to maintain continuous and uninterrupted performance of the work of the Project, and agree to resolve disputes in accordance with the grievance-arbitration provisions set forth in this Article.

SECTION 9.3 PROCEDURE

Any question involving an interpretation expressly related to this Agreement or dispute arising out of and during the term of this Agreement (other than trade jurisdictional disputes) shall be considered a grievance and subject to resolution under the following

procedures:

Step 1:

(a) When any employee subject to the provisions of this Agreement feels he or she is aggrieved by a violation of this Agreement, he or she shall, through the Local Union business representative or job steward, within five (5) working days after the occurrence of the violation, give notice to the work site representative of the involved Contractor stating the provision(s) alleged to have been aggrieved. The business representative of the Local Union or the job steward and the work site representative of the involved Contractor and the Prime Contractor, if the involved Contractor is a Sub-Contractor, shall meet and endeavor to adjust the matter within three (3) working days after timely notice has been given. The representative of the involved Contractor shall keep the meeting minutes and shall respond to the Union representative in writing (copying the Prime Contractor) at the conclusion of the meeting but no later than twenty-four (24) hours thereafter. If they fail to resolve the matter within the prescribed period, the grieving party, may, within forty-eight (48) hours thereafter, pursue Step 2 of the grievance procedure, provided the grievance is reduced to writing, setting forth the relevant information concerning the alleged grievance, including a short description thereof, the date on which the grievance occurred, and the provision(s) of the Agreement alleged to have been violated.

(b) Should the Local Union(s) or the Prime Contractor or any Contractor have a dispute with the other party (excepting jurisdictional disputes) and, after conferring, a settlement is not reached within three (3) working days, the dispute may be reduced to writing and proceed to Step 2 in the same manner as outlined herein for the adjustment of an employee complaint.

Step 2:

The International Union Representative and the involved Contractor shall meet within seven (7) working days of referral of a dispute to this second step to arrive at a satisfactory settlement thereof. Meeting minutes shall be kept by the Contractor. If the parties fail to reach an agreement, the dispute may be appealed in writing in accordance with the provision of Step 3 within seven (7) calendar days thereafter.

Step 3:

(a) If the grievance has been submitted but not resolved under Step 2, either party may request in writing within seven (7) calendar days thereafter, that the grievance be submitted to Jeffrey Selchick or Tom Hines (individuals recognized by both Local Unions and by the Prime Contractor as experienced and impartial arbitrators) who shall act, alternately, as the Arbitrator under this procedure. If for any reason none of the foregoing are available, the PC and Council shall attempt mutually to select an arbitrator, but if they are unable to do so, they shall request the American Arbitration Association to provide them with a list of arbitrators from which the Arbitrator shall be selected. The Labor Arbitration Rules of the American Arbitration Association shall govern the conduct of the arbitration hearing, at which all Step 2 participants shall be parties. The decision of the Arbitrator shall be final and binding on the involved Contractor, Local Union and employees and the fees and expenses of such arbitrations shall be borne equally by the involved Contractor and Local Union(s).

(b) Failure of the grieving party to adhere to the time limits herein shall render the grievance null and void. These time limits may be extended only by written consent of the involved Contractor and involved Local Union at the particular step where the extension is agreed upon. The Arbitrator shall have authority to make decisions only on the

issues presented to him and shall not have the authority to change, add to, delete or modify any provision of this Agreement.

SECTION 9.4 PARTICIPATION BY OGS AND THE CM

OGS and the CM shall be notified by the involved Contractor of all actions at Steps 2 and 3 and, at its election, may participate in full in all proceedings at these Steps, including Step 3 arbitration.

ARTICLE 10– JURISDICTIONAL DISPUTES

SECTION 10.1 ASSIGNMENT

The assignment of the work shall be solely the responsibility of the Contractor performing the work involved, subject to the pre-job conference, and such work assignments shall be in accordance with the Plan for the Settlement of Jurisdictional Disputes in the Construction Industry ("the Plan") or any successor Plan.

SECTION 10.2 PROCEDURE FOR SETTLEMENT OF DISPUTES

All jurisdictional disputes on this Project, between or among Building and Construction Trades Unions and employers, bound by this Agreement, shall be settled and adjusted according to the present Plan established by the North America's Building Trades Unions or any other plan or method of procedure that may be adopted in the future by the North America's Building Trades Unions. Decisions rendered shall be final, binding and conclusive on the Contractors and Unions parties to this Agreement.

SECTION 10.3 NO INTERFERENCE WITH WORK

There will be no strikes, sympathy strikes, work stoppages, slowdowns, picketing or other interference or disruption activity of any kind arising out of any jurisdictional dispute, including while any jurisdictional dispute is being resolved or in protest of any award rendered by the Plan or any successor. The work shall proceed as assigned by the Contractor until finally resolved under the applicable procedure of this Article. No jurisdictional dispute shall excuse a violation of Article 7. Individuals violating this section shall be subject to immediate discharge.

SECTION 10.4 PRE-JOB CONFERENCE

Each Contractor or subcontractor of any tier will conduct a pre-job conference with the Council prior to commencing work. The Prime Contractor, the CM and the OGS will be advised in advance of all such conferences and may participate if they wish.

In conjunction with the pre-job conference, each Contractor and/or subcontractor of any tier shall fill out the attached Proposed Trade Assignments form (Schedule C) identifying all Subcontractors and indicating what trades will be used to perform the Project work. This form shall be submitted to the Capital Region Council at least fourteen (14) days in advance of the commencement of work. If any Local Union(s) objects or disagrees to the Proposed Trade Assignment of either the Contractor or Subcontractor, the Local Union will state its objection and there shall be a good faith discussion among the Contractor or Subcontractor and the objecting Local Union and other affected Unions to resolve objections to the trade assignment. If no resolution is reached,

any involved Local Union may submit their position in writing together with support documentation within seven (7) calendar days to the Contractor or Subcontractor with a copy to all affected Local Unions. The Contractor or Subcontractor will review all submitted supporting documentation regarding the Proposed Trade Assignments and will submit to the Contractor, the Capital Region Council, and all affected Local Unions a "Final Trade Assignment" letter within fourteen (14) days calendar days of the pre-job meeting at which the Proposed Trade Assignments were made. Any unresolved disputes concerning trade assignments shall be handled in accordance with Sections 1, 2, and 3 of this Article in accordance with the present Plan established by the Building and Construction Trades Department.

ARTICLE 11- WAGES AND BENEFITS

SECTION 11.1 CLASSIFICATION AND BASE HOURLY RATE

All employees covered by this Agreement shall be classified in accordance with the work performed and paid the base, straight time hourly wage rates applicable for the respective job classifications specified in the attached Schedule A. The term "straight time" in this Agreement shall mean the hourly wage rate applicable for each job classification, without any premium, "add-on", addition or shift differential. For purposes of wage and benefits, all projects shall be classified as Building Rate. Hours of work, premium payments, shifts and holidays shall be governed under Article 12.

SECTION 11.2 EMPLOYEE BENEFITS/SUPPLEMENTS

A. Unless expressly provided differently in this Agreement, Contractors agree to pay employee benefits/supplements on behalf of all of their employees covered by this Agreement in the amounts required by the applicable Schedule A so long as they are consistent with the Section 220 schedule in effect.

Except as provided below and in Article 11, Section 2B, the Contractors agree that such payments shall be made to those established jointly trusteed employee benefit funds designated in Schedule A, and in the amounts so designated, to the extent such payments are required by and satisfy the Section 220 obligation. Bona fide jointly trusteed fringe benefit plans established or negotiated through collective bargaining during the life of this Agreement may be added if they similarly fall within Section 220. Under no circumstances is a Contractor required to pay benefits except as required under Section 220 or otherwise explicitly required by this Agreement.

B. Notwithstanding Article 11, Section 2A, Contractors who designate employees pursuant to the 48 hour rule set forth in Article 4, Section 2A, or pursuant to Article 4, Section 2B, may satisfy the above benefit obligation with respect to those employees by: (i) providing those employees with coverage under their own bona fide private benefit plans, provided such plans satisfy the requirements of the Internal Revenue Code, (ii) by electing to pay into the applicable jointly held trustee funds designated on Schedule A on their behalf, or (iii) by paying the full amount of such benefit to the employee in cash. When the benefit payments are paid into private plans, the payments to be made on behalf of those employees must equal the total supplement amount set forth at the Wage and Benefit sheet referred in Section 1 of this Article and must be consistent with the requirements of Section 220, and any shortfall must be paid to the employee in cash.

The option for a private plan equivalent supplement shall not apply to

contributions into Joint Apprentice Training Committee (JATC) or similar apprentice funds designated on Schedule A if the Contractor does not have an apprentice training program that is indistinguishable from that of the Local Union fulfilling the referrals and utilizes the same Work Process Outline, satisfying both Appendix A and B, and approved by the Department of Labor. Upon request by the Council, any contractor providing coverage to Article 4, Section 2B employees under private benefit plans will provide the Council with documentation of benefit payments made to individual employees during the term of their employment on the Project.

C. Contractors who exercise the option under Section 2B of this Article to pay into their own private benefit plans rather than the applicable jointly trusteed funds designated in Schedule A shall be responsible for and guarantee employee benefit/supplement payments and shall indemnify and hold harmless the jointly trusteed funds designated in Schedule A against any and all benefit/supplement claims by its employees. Employees who exercise this option shall sign a waiver included as Schedule E. Contractors shall not be allowed to exercise the above-referenced option under Article 11, Section 2B, unless and until a Schedule E waiver is executed by each employee exercising the option and such waiver is delivered to the PC and the Council.

D. Contractors who contribute to jointly trusteed funds under this Section agree to be bound by the written terms of the legally-established jointly trusteed Trust Agreements specifying the detailed basis on which payments are to be paid into, and benefits paid out of, such Trust Funds but only with regard to work done on this Project and only for those employees for whom this Agreement requires such benefit Payments. Notwithstanding the foregoing, a Contractor's liability shall be at all times limited to the amount of contributions required to be made to the Trust Funds.

E. Contractors who choose to satisfy their benefit obligation using option (i) or (iii) of Article 11, Section 2B, rather than paying into one or more of the applicable jointly trusteed funds designated on Schedule A, must have the affected employee execute the attached schedule "E", Waiver of Employee Benefit Contributions.

F. Each Contractor shall be responsible for and guarantee the payment of all required fringe benefits on the Project Site. Prior to the Prime Contractor issuing payment to a Contractor on behalf of the Contractor (or its subcontractor) for Project Site work, the Prime Contractor will notify the applicable Union and any fund to which that Contractor or subcontractor is contributing pursuant to Article 11, Section 2A that a payment will be issued for that Contractor or subcontractor. Notification, which may be by fax and email at the numbers and addresses provided by each Union 's designated representative, which may be revised from time to time by giving notice to the other Party, will provide that the fund has 48 hours from the time the fax or email is sent in which to advise the Prime Contractor of any current contribution delinquencies for that Contractor or subcontractor. If written notice of such a delinquency is received by the Prime Contractor within that 48-hour period, the Prime Contractor shall withhold from any payment due that Contractor the amount of that delinquency, up to the total amount due the Contractor and/or subcontractor, until any dispute regarding the delinquency has been resolved. If notice of a delinquency is not received by the Prime Contractor within the required time periods, the Prime Contractor shall have no basis upon which to withhold, with respect to that delinquency, any part of a payment which is otherwise due.

G. Any payment otherwise required under any CBA with the exception of those expressly required under Section 220 separate and apart from wages and fringe

benefits shall not be required.

ARTICLE 12 — HOURS OF WORK, PREMIUM PAYMENTS, SHIFTS AND HOLIDAYS

SECTION 12.1 WORK WEEK AND WORKDAY

A. The standard work week shall be a Five-Day Work Week: Monday– - Friday; 5 days, 8 hours plus 1/2-hour unpaid lunch period each day consisting of 40 hours of work at straight time rates. The CM, at its sole discretion, or another Contractor with the CM's permission, may modify the work week per one of the following schedules:

(1) Four-Day Work Week: Monday - Thursday; 4 days, 10 hours plus 1/2-hour unpaid lunch period each day.

(2) Such other schedule as may be set by the CM and may change with notice in accordance with Article 12 Section 1D below.

B. The Day Shift shall commence between the hours of 6:00 a.m. and 9:00 a.m. and shall end between the hours of 2:30 p.m. and 7:30 p.m. Starting and quitting times shall occur at the Project site as designated by the CM or another Contractor with the CM's approval.

C. Scheduling –The CM, or another Contractor with the CM's approval, shall have the option of scheduling either a five-day or four-day work week and workday hours consistent with Project requirements, the Project schedule, and minimization of public inconvenience and New York State operations. When conditions beyond the control of the Contractor, including but not limited to weather, power failure, fire or natural disaster, prevent the performance of Project work on a regularly scheduled work day, or when a holiday falls during a regularly scheduled work day and is not worked, the Contractor, with approval of the CM, may schedule Friday, Saturday and/or Sunday (where on '/10's) or Saturday and/or Sunday (where on'5/8's) during that calendar week in which a workday was lost, at straight time pay (except that Sundays shall be two times the base rate); provided the employees involved have not otherwise worked more than 40 hours during that work week. In the event the employees involved have actually worked more than 40 hours during that work week they shall receive time and one-half pay for the hours worked in excess of 40. Provided the Union is able to refer sufficient workers to meet a Contractor's make-up needs, an individual employee shall not be penalized for an occasional inability to work a Saturday or Sunday make-up day.

D. Notice – Not less than 24 hours prior notice shall be provided to the Local Union involved as to the work week and work hour schedules (including any changes in the work schedule) to be worked or such lesser notice as may be mutually agreed upon.

SECTION 12.2 OVERTIME/PREMIUM PAY

Subject to Article 12, Section 1, overtime and/or premium pay for hours worked outside of the standard work week and workday, described in Section 1A above, shall be paid in accordance with the applicable Schedule A, except that overtime/premium pay shall not exceed 1 ½ times the regular rate except Sundays, which shall be paid at 2 times the base rate. There shall be no restriction upon the Contractor's scheduling of overtime or the non-discriminatory designation of employees who shall be worked. There shall be no pyramiding of overtime/premium pay under any circumstances. The Contractor shall have the right to schedule work so as to minimize overtime. Holiday pay, if any, will be paid in

accordance with Article 12, Section 4 below.

SECTION 12.3 SHIFTS

A. Flexible Schedules - Scheduling of shift work shall remain flexible in order to meet Project schedules and existing Project conditions including the minimization of interference with New York State operations and public inconvenience. It is not necessary to work a day shift to schedule a second or third shift. Shifts must have prior approval of the CM and must be scheduled with not less than five workdays' notice to the Local Union.

B. Second/or Third Shifts - The second shift will normally start between 4:30 p.m. and 7:30 p.m. and the third shift will normally start after 7:30 p.m. and in each case shall be paid the lesser of a shift differential of 5% for second shift and 10% for third shift, or the differential required by the applicable Schedule A. There shall be no reduction in hours worked on a second and/or third shift, except that when 3 shifts are working together, the length of one or more shifts can be reduced to accommodate a 24-hour day and only actual hours worked will be paid.

C. Flexible Starting Times - Shift starting times shall be adjusted by the Contractor, with approval of the Prime Contractor, as necessary to fulfill Project requirements subject to the notice requirements of paragraph A. Special shifts can be created outside normal shift hours, if necessary, to facilitate construction and to minimize traffic congestion problems.

D. Four Tens - When working a four-day work week, the standard workday shall consist of 10 hours work for 10 hours of pay at the straight time rate exclusive of an unpaid 1/2 hour meal period and regardless of the starting time.

SECTION 12.4 HOLIDAYS

A. Schedule - There shall be 7 recognized unpaid holidays on the Project:

New Years Day	Labor Day
Memorial Day	Thanksgiving Day
	The Day After Thanksgiving
Fourth of July	Christmas Day

All said holidays shall be observed on the dates designated by New York State Law. In the absence of such designation, they shall be observed on the calendar date except those holidays which occur on Sunday shall be observed on the following Monday.

B. Payment - Premium pay for work performed on such a recognized holiday shall be in accordance with the applicable Schedule A.

C. Exclusivity - No holidays other than those listed in Section 4A above shall be recognized or observed.

SECTION 12.5 REPORTING PAY

A. Employees who report to the work location pursuant to a regular schedule and who are not provided with work or whose work is terminated early by a Contractor, for whatever reason, shall receive the greater of an allowance for travel costs equal to one hours pay or pay for any hours actually worked, but not both. (Such payment is in lieu of any reporting or similar pay provided for in an applicable Schedule A.) The allowance for travel costs is not to be considered as wages nor is it to be included in the

calculation of any benefits.

B. When an employee who has completed their scheduled shift and left the Project site is "called out" to perform special work of a casual, incidental, or irregular nature, the employee shall receive pay for actual hours worked at applicable straight time or overtime rates in accordance with this agreement but no less than a minimum guarantee of 1 hour, at the employee's straight time rate.

C. When an employee leaves the job or work location of their own volition or is discharged for cause or is not working as a result of the Contractor's invocation of Section 7 below, they shall be paid only for the actual time worked.

D. Except as specifically set forth in this Article there shall be no premiums, bonuses, hazardous duty (unless required under Section 220), high time or other special payments of any kind.

E. There shall be no pay for time not actually worked except as specifically set forth in this Article 12.

SECTION 12.6 PAYMENT OF WAGES

A. Payday - Payment shall be made by check, or direct deposit drawn on a New York State bank with branches located within commuting distance of the job site. Paychecks shall be issued by the Contractor at the job site no later than three (3) days after the end of the work week, if mailed the check must arrive no later than three (3) days after the end of the work week. In the event that the scheduled payday is a legal holiday checks must be issued one day earlier, if the holiday/payday falls on Monday checks must be issued the Friday before. Paycheck stubs shall contain the name and business address of the Contractor, together with an itemization of deductions for gross wages.

B. Termination – Employees who are laid off shall be paid in full for that which is due them at the time of termination unless they have direct deposit, in which case the full amount due will be made according to the direct deposit schedule. The Contractor shall also provide the employee with a written notice, setting forth the date and reason of lay off or discharge.

C. Checks that are not paid in accordance with sub-sections A and B will be assessed two (2) hours wages for each day late or the provision in the applicable Schedule A, whichever is less.

SECTION 12.7 EMERGENCY WORK SUSPENSION

A Contractor or Construction Manager may, if considered necessary for the protection of life, property, and/or safety of employees or others, suspend all or a portion of Project work. In such instances, employees shall be paid for actual time worked; provided, however, that when a Contractor requests that employees remain at the job site available for work, employees shall be paid “or "standby" time at their hourly rate of pay.

SECTION 12.8 INJURY/DISABILITY

An employee who, after commencing work, suffers a work-related injury or disability while performing work duties, shall receive no less than 8 hours wages for that day. Further, the employee shall be rehired at such time as the employee is able to return to duties provided there is still work available on the Project for which the employee is qualified and able to perform.

SECTION 12.9 TIME KEEPING

A Contractor may utilize brassing or other systems to check employees in and out.

SECTION 12.10 MEAL PERIOD

A Contractor shall schedule an unpaid meal period of not more than 1/2 hour duration between the 3rd and 5th hour of the scheduled shift. A Contractor may, for efficiency of operation, establish a schedule which coordinates the meal periods of two or more crafts. If an employee is required to work through the meal period, the employee shall be compensated in a manner established in the applicable Schedule A.

SECTION 12.11 BREAK PERIODS

There will be no rest periods, organized coffee breaks or other non-working time established during working hours. Individual coffee containers will be permitted at the employee's work location.

ARTICLE–13 - APPRENTICES

SECTION 13.1 RATIOS

Recognizing the need to maintain continuing supportive programs designed to develop adequate numbers of competent workers in the construction industry and to provide craft entry opportunities for minorities, women and economically disadvantaged non-minority males, Contractors may employ apprentices in their respective crafts to perform such work as is within their capabilities and which is customarily performed by the craft in which they are indentured. Contractors may utilize apprentices and such other appropriate classifications as are contained in the applicable Schedule A in a ratio of not less than 33% of the work force by craft (without regard to whether a lesser ratio is set forth in Schedule A), unless the applicable Schedule A provides for a higher percentage. Apprentices and such other classifications as are appropriate shall be employed in a manner consistent with the provisions of the appropriate Schedule A.

SECTION 13.2 DEPARTMENT OF LABOR

To assist the Contractors in attaining a maximum effort on this Project, the Unions agree to work in close cooperation with, and accept monitoring by, the New York State Department of Labor to ensure that minorities and women are afforded every opportunity to participate in apprenticeship programs which result in the placement of apprentices on this Project. To further ensure that-this Contractor effort is attained, up to 50% of the apprentices placed on this Project may be first year, minority, women or economically disadvantaged apprentices. The Local Unions shall cooperate with Contractor requests for minority, women or economically disadvantaged referrals to meet this Contractor effort.

SECTION 13.3 HELMETS TO HARDHATS

The Contractors and the Unions recognize a desire to facilitate the entry into the building and construction trades of veterans who are interested in careers in the building and construction industry. The Contractors and Unions agree to utilize the services of the Center for Military Recruitment, Assessment and Veterans Employment (hereinafter

"Center) and the Center's "Helmets to Hardhats" program to serve as a resource for preliminary orientation, assessment of construction aptitude, referral to apprenticeship programs or hiring halls, counseling and mentoring, support networks, employment opportunities and other needs as identified by the parties.

The Unions and Contractors agree to coordinate with the Center to create and maintain an integrated database of veterans interested in working on the Project and of apprenticeship and employment opportunities for this Project. To the extent permitted by law, the Unions shall give credit to such veterans for bona fide, provable past experience.

ARTICLE–14 - SAFETY PROTECTION OF PERSON AND PROPERTY

SECTION 14.1 SAFETY REQUIREMENTS

Each Contractor will ensure that applicable OSHA mandated safety requirements are maintained at all times on the Project Site. The employees and Unions agree to cooperate fully with these efforts. Employees must perform their work at all times in a safe manner and protect themselves and the property of New York State and the CM from injury or harm. Failure to do so will be grounds for discipline, including termination. Prevention of accidents at the Project Site is the responsibility of the Contractors, its employees, subcontractors, suppliers, persons, and any other entity at the site. The Contractors will establish their own programs implementing safety measures, policies, and standards conforming to those required by OSHA and any project specific safety plan, whichever is more strict. OGS and the CM are not responsible for identifying unsafe practices and the CM's failure to stop the Contractors' unsafe practices will not relieve the Contractor of the responsibility, therefore.

SECTION 14.2 CONTRACTOR RULES

Employees covered by this Agreement shall at all times be bound by the reasonable safety, security, and visitor rules as established by the Contractors, the CM or the OGS for this Project. Such rules will be published and posted in conspicuous places throughout the Project. Specialized safety related training may be required to conduct work in or around the Project work zones. Such specialized training shall be at the expense of the contractor if so required to complete the work.

SECTION 14.3 INSPECTIONS

Contractors retain the right to inspect incoming shipments of equipment, apparatus, machinery and construction materials of every kind.

ARTICLE–15 - NO DISCRIMINATION

SECTION 15.1 COOPERATIVE EFFORTS

The Contractors and Unions agree that they shall not discriminate against any employee or applicant for employment because of race, color, religion, sex, national origin, marital status, age, union or non-union status, real or perceived sexual orientation or any other status protected by law, in any manner prohibited by law or regulation. It is recognized that special procedures may be established by Contractors and Local Unions and the New York State Department of Labor for the training and employment of persons who have not previously qualified to be employed on construction projects of the type covered by this

Agreement. The parties to this Agreement shall assist in such programs and agree to use their best efforts to ensure that the goals for female and minority employment are met on this Project. Nothing in this section shall be grieveable.

SECTION 15.2 LANGUAGE OF AGREEMENT

The use of the masculine or feminine gender in this Agreement shall be construed as including both genders.

ARTICLE–16 - GENERAL TERMS

SECTION 16.1 PROJECT RULES

The CM, the Prime Contractor and/or other Contractors may establish from time to time such reasonable Project rules as are necessary for the good order of the Project. It is agreed that such rules may include pre-hire, post-hire, and random alcohol and/or drug testing rules, including but not limited to post-accident testing, applicable to all covered employees, provided those rules utilize testing procedures and standards as contained in U.S. Department of Labor C.D.L. Regulations. These rules shall be explained at the pre-job conference (if then existing) and posted at the Project site and may be amended thereafter as necessary. Failure of an employee to observe these rules and regulations shall be grounds for discipline, including discharge. The fact that no order was posted prohibiting a certain type of misconduct shall not be a defense to an employee disciplined or discharged for such misconduct when the action taken is for cause.

SECTION 16.2 TOOLS OF THE TRADE

The welding/cutting torch and chain fall are tools of the trade having jurisdiction over the work performed. Employees using these tools shall perform any of the work of the trade. There shall be no restrictions on the emergency use of any tools or equipment by any qualified employee or on the use of any tools or equipment for the performance of work within the employee's jurisdiction.

SECTION 16.3 SUPERVISION

Employees shall work under the supervision of the craft foreperson or Prime foreperson.

SECTION 16.4 TRAVEL ALLOWANCES

There shall be no payments for travel expenses, travel time, parking, subsistence allowance or other such reimbursements or special pay except as expressly set forth in this Agreement.

SECTION 16.5 FULL WORKDAY

Employees shall be at their work area at the starting time established by the Contractor. The signatories reaffirm their policy of a fair day's work for a fair day's wage.

ARTICLE 17 – COOPERATION

To the fullest extent permitted by law, the parties intend for the provisions of this Agreement to control in the event of a conflict between this Agreement and any provision

of New York State Labor Law. Towards that end, the Prime Contractor, Contractors and the Unions shall cooperate in seeking any NYS Department of Labor approvals that may be required for implementation of any terms of this Agreement.

ARTICLE–18 - SAVINGS AND SEPARABILITY

SECTION 18.1 THIS AGREEMENT

In the event that the application of any provision of this Agreement is enjoined, on either an interlocutory or permanent basis, or otherwise found in violation of law, the provision involved shall be rendered, temporarily or permanently, null and void. In such event, the remainder of the Agreement shall remain in full force and effect, to the extent allowed by law, for contracts already bid and/or awarded and still in construction provided the Contractor voluntarily accepts the Agreement. The parties to this Agreement shall enter into negotiations for a substitute provision in conformity with the law and the intent of the parties for contracts to be let in the future.

SECTION 18.2 THE BID SPECIFICATIONS

In the event that any action (including but not limited to the issuance of any bid specifications) taken by any Contractor requiring that a Contractor become bound to this Agreement is enjoined, on either an interlocutory or permanent basis, or otherwise found in violation of law, then such action, and with it Article 2, Section 6, shall be rendered, temporarily or permanently, null and void. In such event, this Agreement shall remain in full force and effect to the extent allowed by law for contracts already bid and/or awarded and still in construction provided the Contractor then voluntarily accepts the Agreement. The parties shall enter into negotiations as to modifications to the Agreement to reflect the court action taken and the intent of the parties for contracts to be let in the future.

SECTION 18.3 NON-LIABILITY

In the event of an occurrence referenced in Section 1 or Section 2 of this Article, neither OGS, the CM, the Prime Contractor, any Contractor, nor any signatory Union shall be liable under this Agreement or otherwise, directly or indirectly, for any action taken, or not taken, in order to comply with any court order, injunction or determination. All action taken shall be in conformance with court orders then in effect and no retroactive payments or other retroactive action shall be required if the original court determination is reversed. Contracts shall be awarded on the basis of the specification or other requirements issued unless that specification/requirements have been enjoined or otherwise ruled unlawful, in which case the award, if any, shall be in accordance with any applicable court order.

SECTION 18.4 NON-WAIVER

Nothing in this Article shall be construed as waiving the prohibitions of Article 7 as to signatory Contractors and signatory Unions.

ARTICLE–19 - FUTURE CHANGES IN SCHEDULE A AREA CONTRACTS

SECTION 19.1 CHANGES TO AREA CONTRACTS

A. To the extent applicable to the Project, Schedule A to this Agreement shall continue in effect until the Contractor and/or Union parties to the Area

Collective Bargaining Agreements which are the basis for Schedule A notify the CM in writing of the mutually agreed upon changes in provisions of such agreements which are applicable to the Project, and their effective dates. Such changes, including changes in wage and benefit/supplement rates, shall only be effective to the extent consistent with this Agreement.

B. It is agreed that any provisions negotiated into Schedule A shall not apply to work on the Project if such provisions are less favorable to this Project than those uniformly required of contractors for construction work, other than the Project, normally covered by those agreements; nor shall any provision be recognized or applied on the Project if it may be construed to apply exclusively, or predominantly, to work covered by this Agreement.

C. Any disagreement between signatories to this Agreement over the incorporation into Schedule A of provisions agreed upon in the renegotiation of Area Collective Bargaining Agreements shall be resolved in accordance with the procedure set forth in Article 9 of this Agreement.

SECTION 19.2 LABOR DISPUTES DURING AREA CONTRACT NEGOTIATIONS

The Unions agree that there shall be no strikes, work stoppages, sympathy actions, picketing, hand billing, bannering, demonstrations, slowdowns or other disruptive activity or other violations of Article 7 affecting the Project by any Local Union involved in the renegotiation of Area Local Collective Bargaining Agreements nor shall there be any lock-out on this Project affecting a Local Union during the course of such renegotiations.

ARTICLE 20 - WORKERS' COMPENSATION ADR

The parties agree that the Prime Contractor may implement a Workers' Compensation Alternative Dispute Resolution program which is consistent with Section 25 (2-C) of the New York Workers' Compensation Law. The final terms of the program shall be determined by the Prime Contractor, after consultation with the Union. If the GC is not satisfied with the cost savings to be generated by such a program, it may, in its discretion, decline to implement, or at any time after implementation decline to continue, that program.

IN WITNESS WHEREOF the parties have caused this Agreement to be executed and effective as of the **31st** day of **March**, ~~2025~~ **2026**

For: Jacobs Project Management Company, The Construction Manager as Agent for the Office of General Services

BY: Robert Bauco Robert Bauco, Vice President

Title: Vice President

FOR THE BUILDING & CONSTRUCTION TRADES

GREATER CAPITAL REGION BUILDING & CONSTRUCTION TRADES COUNCIL

BY: pat tirino president
(Name/Title)

FOR THE LOCAL UNIONS

BOILERMAKERS' UNION LOCAL NO. 5

BY: William Bailey Assistant Business Manager
(Name/Title)

BRICKLAYERS AND ALLIED CRAFT LOCAL NO. 2

BY: president
(Name/Title)

NORTH ATLANTIC STATES REGIONAL COUNCIL OF CARPENTERS, LOCAL 291

BY Christopher Dugan Business Manager
(Name/Title)

INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS UNION LOCAL NO. 236

BY: Business Manager
(Name/Title)

INTERNATIONAL UNION OF ELEVATOR CONSTRUCTORS, LOCAL NO. 35

BY: N/A
(Name/Title)

DISTRICT COUNCIL NO. 9 GLAZIERS

BY:
(Name/Title)

INTERNATIONAL ASSOCIATION OF HEAT AND FROST INSULATORS AND ALLIED WORKERS, LOCAL NO. 40

BY: Mark Stuto Manager
(Name/Title)

INTERNATIONAL ASSOCIATION OF BRIDGE, STRUCTURAL, ORNAMENTAL AND REINFORCING IRON WORKERS LOCAL NO. 12

BY: Eric Brugeman Business Manager
(Name/Title)

LABORERS INTERNATIONAL UNION OF NORTH AMERICA, AFL-CIO, LOCAL NO. 190

BY: Anthony Frosina Business Manager
(Name/Title)

MILLWRIGHTS LOCAL UNION 1163

BY: [signature] Regional Manager
(Name/Title)

INTERNATIONAL UNION OF OPERATING ENGINEERS LOCAL NO. 158

BY: [signature] District manager
(Name/Title)

DISTRICT COUNCIL NO. 9 PAINTERS

BY: Signed Under District Council No. 9 Glaziers
(Name/Title)

UNITED ASSOCIATION OF JOURNEYMEN AND APPRENTICES OF TIIE PLUMBING AND PIPEFITTING INDUSTRY LOCAL 7

BY: [signature]

UNITED UNION OF ROOFERS, WATERPROOFERS AND ALLIED WORKERS LOCAL NO. 241

BY: Michael L Rossi Business Manager
(Name/Title)

SHEET METAL WORKERS' INTERNATIONAL ASSOCIATION LOCAL NO. 83

BY: Robert Monahan Regional Manager
(Name/Title)

ROAD SPRINKLER FITTERS LOCAL NO. 669

BY: Steve Bauer On behalf of Business Manager Business Agent
(Name/Title)

INTERNATIONAL BROTHERHOOD OF TEAMSTERS, CHAUFFEURS, WAREHOUSEMEN AND HELPERS LOCAL NO. 294

BY: stanley koniszewski iii business agent
(Name/Title)

SCHEDULE A – LOCAL COLLECTIVE BARGAINING AGREEMENTS

NORTHEASTERN STATES ARTICLES OF AGREEMENT between the INTERNATIONAL BROTHERHOOD OF BOILERMAKERS, IRON SHIP BUILDERS, BLACKSMITHS, FORGERS & HELPERS, AFL-CIO and THE FIRMS WHOSE SIGNATURES ARE AFFIXED HERETO January 1, 2022 – December 31, 2024

BRICKLAYERS & ALLIED CRAFTWORKERS BUILDING AGREEMENT between EASTERN CONTRACTORS ASSOCIATION, INC. CONSTRUCTION EMPLOYERS ASSOCIATION OF CNY, INC. and BRICKLAYERS AND ALLIED CRAFTWORKERS LOCAL UNION NO. 2, NY June 1, 2021 – May 31, 2026

BRICKLAYERS & ALLIED CRAFTWORKERS HEAVY & HIGHWAY AGREEMENT between EASTERN CONTRACTORS ASSOCIATION, INC. & CONSTRUCTION EMPLOYERS ASSOCIATION OF CENTRAL NEW YORK, INC. and BRICKLAYERS AND ALLIED CRAFTWORKERS LOCAL UNION NO. 2, NY/VT June 1, 2021 – May 31, 2026

NORTHWEST REGIONAL AGREEMENT between THE ASSOCIATIONS and the NORTHEAST REGIONAL COUNCIL OF CARPENTERS of the UNITED BROTHERHOOD OF CARPENTERS AND JOINERS OF AMERICA June 1, 2021 – May 31, 2026

MEMORANDUM OF AGREEMENT between LABOR RELATIONS DIVISION WESTERN NEW YORK REGION ASSOCIATED GENERAL CONTRACTORS OF NEW YORK STATE LLC and NORTH ATLANTIC STATES REGIONAL COUNCIL OF CARPENTERS OF THE UNITED BROTHERHOOD OF CARPENTERS AND JOINERS OF AMERICA May 1, 2022 – April 30, 2025

AGREEMENT between LABOR RELATIONS DIVISION WESTERN NEW YORK REGION ASSOCIATED GENERAL CONTRACTORS OF NEW YORK STATE LLC and NORTH ATLANTIC STATES REGIONAL COUNCIL OF CARPENTERS UNITED BROTHERHOOD OF CARPENTERS AND JOINERS OF AMERICA May 1, 2022 – April 30, 2025

AGREEMENT between IBEW LOCAL NO. 236 and THE ALBANY ELECTRICAL CONTRACTORS ASSOCIATION NECA ALBANY CHAPTER June 1, 2022 – May 31, 2025

AGREEMENT by and between the NATIONAL ELEVATOR BARGAINING ASSOCIATION and the INTERNATIONAL UNION OF ELEVATOR CONSTRUCTORS July 9, 2022 – July 8, 2027

GLAZIERS TRADE AGREEMENT between EASTERN CONTRACTORS ASSOCIATION, INC. and DISTRICT COUNCIL 9 INTERNATIONAL UNION OF PAINTERS AND ALLIED TRADES, AFL-CIO May 1, 2019 – April 30, 2024

AGREEMENT between INSULATION CONTRACTORS and the INTERNATIONAL ASSOCIATION OF HEAT AND FROST INSULATORS AND ALLIED WORKERS LOCAL #40 May 1, 2022 – April 30, 2025

WORKING AGREEMENT between THE IRON WORKERS UPSTATE LOCALS OF NEW YORK AND VICINITY, CONSISTING OF INTERNATIONAL ASSOCIATION OF BRIDGE, STRUCTURAL, ORNAMENTAL, AND REINFORCING IRON WORKERS LOCAL UNIONS NOS. 6, 9, 12, 33, 60 AND 440 and UPSTATE IRON WORKER EMPLOYERS ASSOCIATION, INC. July 1, 2021 – April 30, 2024

LABORERS BUILDING AGREEMENT between EASTERN CONTRACTORS ASSOCIATION, INC. and the EASTERN NEW YORK LABORERS' DISTRICT COUNCIL for CONSTRUCTION AND GENERAL LABORER' LOCAL UNION NO. 157 May 1, 2022 – April 30, 2025

AGREEMENT between LABOR RELATIONS DIVISION ALBANY REGION ASSOCIATED GENERAL CONTRACTORS OF NEW YORK STATE, LLC and LOCALS 157 & 190 LABORERS INTERNATIONAL UNION OF NORTH AMERICA AFFILIATED WITH THE AFL-CIO April 21, 2022 – March 31, 2025

MILLWRIGHT AGREEMENT between THE EASTERN MILLWRIGHT REGIONAL COUNCIL representing MILLWRIGHTS LOCAL UNION 1163 and the MILLWRIGHT CONTRACTORS, ASSOCIATION, INC. June 1, 2022 – May 31, 2023

OPERATING ENGINEERS BUILDING AGREEMENT between THE ASSOCIATIONS and LOCAL NO. 158 OF THE INTERNATIONAL UNION OF OPERATING ENGINEERS March 1, 2023 – February 28, 2027

AGREEMENT between LABOR RELATIONS DIVISION OF CENTRAL NEW YORK REGION ASSOCIATED GENERAL CONTRACTORS OF NEW YORK STATE, LLC and INTERNATIONAL UNION OF OPERATING ENGINEERS LOCAL UNION NO. 158 April 1, 2023 – March 31, 2027

UP-STATE NEW YORK TECHNICAL ENGINEERS AGREEMENT 2016-2021 between INDEPENDENT EMPLOYERS and INTERNATIONAL UNION OF OPERATING ENGINEERS LOCALS 17, 463, & 158 April 1, 2021 – March 31, 2026

PAINTERS TRADE AGREEMENT between EASTERN CONTRACTORS ASSOCIATION, INC and DISTRICT COUNCIL 9 INTERNATIONAL UNION OF PAINTERS AND ALLIED TRADES, AFL-CIO May 1, 2021 – April 30, 2025

UNITED ASSOCIATION OF JOURNEYMEN AND APPRENTICES OF THE PLUMBING AND PIPEFITTING INDUSTRY OF THE UNITED STATES AND CANADA ARTICLES OF AGREEMENT LOCAL UNION NO. 773 May 1, 2023 – April 30, 2026

AGREEMENT between ROOFER LOCAL UNION NO. 241 ALBANY, NEW YORK UNITED UNION ROOFER, WATERPROOFERS AND ALLIED WORKERS and EASTERN CONTRACTORS ASSOCIATION, INC. ALBANY, NEW YORK June 1, 2022 – May 31, 2024

AGREEMENT between INTERNATIONAL ASSOCIATION OF SHEET METAL, AIR, RAIL AND TRANSPORTATION WORKERS' (SMART) LOCAL UNION NO. 83 and CAPITOL DISTRICT SHEET METAL AND AIR CONDITIONING CONTRACTORS, INC. June 1, 2022 – May 31, 2025

AGREEMENT between NATIONAL FIRE SPRINKLER ASSOCIATION, INC. and ROAD SPRINKLER FITTERS LOCAL UNION NO. 669 April 1, 2021 – March 31, 2025

MEMORANDUM OF AGREEMENT between EASTERN CONTRACTORS ASSOCIATION, INC and TEAMSTERS LOCAL UNION 294 May 1, 2023 – April 30, 2026

AGREEMENT between LABOR RELATIONS DIVISION ALBANY REGION ASSOCIATED GENERAL CONTRACTORS OF NEW YORK STATE, LLC and LOCAL 294 INTERNATIONAL BROTHERHOOD OF TEAMSTERS April 1, 2022 – March 31, 2025

SCHEDULE B - LETTER OF ASSENT

This is to certify that the undersigned Contractor/Subcontractor has examined a copy of the subject Project Labor Agreement negotiated by and between Jacobs Project Management Company, Construction Manager and the Greater Capital Region Building and Construction Trades Council and the signatory Unions to be utilized on the W. Averell Harriman State Office Building Campus Project ("Project").

The undersigned Contractor or Subcontractor agrees to comply with all terms and conditions of the aforementioned Project Labor Agreement. It is understood that the signing of the Letter of Assent shall be binding on the undersigned Contractor to the same degree as though it signed the Project Labor Agreement.

The Letter of Assent shall become effective and binding upon the undersigned Contractor or Subcontractor (Contractor) and said Unions this ___ day of _____, 2026, and shall remain in full force and effect through the completion of the Project.

_____

COMPANY NAME

_____

Address

_____

City, State, Zip

Phone: _____ Fax:_____

Contact Email: _____

Signature:_____ Title: _____

Print Name:_____

Employer EIN _____Employer NYS IU _____ WC#_____

If Sub-Contractor name GC_____

Signed This _____ Day of _____, 20___

SCHEDULE C – PRE-JOB QUESTIONAIRE

THE
W. AVERELL HARRIMAN STATE OFFICE BUILDING CAMPUS PROJECT

PROPOSED TRADE ASSIGNMENTS
PRE-JOB CONFERENCE

TO: Greater Capital Region Building & Construction Trades Council

CLIENT: NEW YORK STATE OFFICE OF GENERAL SERVICES

ADMINISTRATOR: Jacobs Project Management Company
The Construction Manager as Agent
Fax: (XXX) XXX-XXXX

CONTRACTOR: _____

CONTRACT#: _____

NAME OF PROJECT: _____

PURPOSE: To make proposed jurisdictional trade assignments, broken down by craft and classification, as well as to discuss details and answer questions relating to the project scope of work, safety and job requirements.

MEETING PLACE: Greater Capital Region Building and Construction Trades Council,
Albany, New York
(518) 339-0423 Office
(518) 453-3588 Fax

MEETING DATE: _____

RESPONSE DATE: _____

MEETING DATE: _____

** **PLEASE TYPE IN ALL INFORMATION** **

1. **SCOPE OF WORK:**

2. **ESTIMATED WORK SCHEDULE:**

Approximate Commencement Date: _____

Approximate Completion Date: _____

3. **ADDRESSES:**

Job Location: _____

_____

_____

Company's Local Mailing Address: _____

_____

_____

Trust Fund Billing Address: _____

_____

_____

4. **CONTRACTOR PERSONNEL:**

Project Manager:
Office Telephone # _____
Mobile Telephone # _____
Fax Telephone # _____

Superintendent:
Office Telephone # _____
Mobile Telephone # _____
Fax Telephone # _____

Safety Representative:
Office Telephone # _____
Mobile Telephone # _____
Fax Telephone # _____

Drug Test Result Coordinator: (List in order of contact priority)
Name of First Contact: _____
Office Telephone # _____
Mobile Telephone # _____

Name of Second Contact: _____
Office Telephone # _____
Mobile Telephone # _____

Name of Third Contact: _____
Office Telephone # _____
Mobile Telephone # _____

Dispatch Contact Personnel: The following Contractor personnel are the only ones authorized to call the hiring halls to have craft workers dispatched out to this project:

1. _____
2. _____
3. _____

Referral procedures will be in accordance with the provisions contained within the Project Labor Agreement. The referral procedures are to be posted in the hiring halls in order to be in full compliance with the law.

5. WORKFORCE PROJECTIONS:

Workforce Objectives:

CRAFT	PEAK No.	AVG No.	TOTAL HOURS	MINORITY HOURS	MINORITY %	FEMALE HOURS	FEMALE %
Asbestos Workers							
Boilermakers							
Bricklayers/Cement Masons/Plasterers							
Carpenters							
• Carpenters							
• Millwrights							
Electrical Workers (Inside Wiremen)							
Elevator Constructors							
Glaziers							
Insulators							
Ironworkers							
Laborers							

Operating Engineers							
Painters							
Pipefitters/Plumber							
Roofers							
Sheetmetal Workers							
Sprinkler Fitters							
Teamsters							

6. **OPERATIONAL INFORMATION**

Shift Schedule: AM _____ to PM _____

Number of Shifts: _____

Pay Day: Thursday

End of Pay Period: _____

First Aid Facilities: Kits _____

Sanitary Facilities: Portable _____

Job Site Telephone Number: _____

Job Site Fax Number: _____

PROPOSED TRADE ASSIGNMENTS

NAME OF CONTRACTOR: _____

CONTRACT # _____

The following jurisdictional trade assignments are proposed and any Union in disagreement with any of these assignments shall state such disagreement at the pre-job conference and follow the procedure set forth at Article 10, Section 4.

Asbestos Workers: _____

_____

_____

_____

Boilermakers: _____

_____

_____

_____

Bricklayers/Cement Masons/Plasterers: _____

Carpenters: _____

Electrical Workers (Inside Wiremen): _____

Glaziers: _____

Insulators: _____

Ironworkers (Structural): _____

Ironworkers (Rebar): _____

Laborers: _____

Millwrights: _____

Operating Engineers: _____

Painters:

Pile Drivers:

Asbestos Workers:

Pipefitters/Plumbers:

Roofers:

Sheetmetal Workers:

Sprinkler Fitters:

Teamsters:

UTILIZATION OF EQUIPMENT

NAME OF CONTRACTOR: _____

CONTRACT #: _____

List of equipment and the proposed assignment of craft for full time use of operation of each piece:

EQUIPMENT:	**CRAFT:**
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____
6. _____	_____
7. _____	_____
8. _____	_____
9. _____	_____
10. _____	_____
11. _____	_____
12. _____	_____
13. _____	_____
14. _____	_____
15. _____	_____

TOOLS-OF-THE-TRADE: (Part-time use -- lo listing of craft is necessary)

EQUIPMENT:	**EQUIPMENT:**
1. _____	4. _____
2. _____	5. _____
3. _____	6. _____

SUBCONTRACTORS

The following is a list of Subcontractors that are under contract with The Prime Contractor at the time of this meeting. Each Subcontractor is to submit a completed "Proposed Trade Assignment" letter at the time of this meeting. Any Subcontractor not in attendance at the pre-job meeting shall submit a completed Proposed Trade Assignment form as set forth at Article 10, Section 4.

A copy of a signed Letter of Assent ("Schedule B") specific to this contract from each Subcontractor identified below is to be attached to the end of this document. (Also include a copy of the LOA of The Prime Contractor). If additional space is needed, copy this page and attach it to the documents.

Name of Subcontractor:	**Summary of Scope of Work:**
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____
6. _____	_____
7. _____	_____
8. _____	_____
9. _____	_____
10. _____	_____
11. _____	_____
12. _____	_____
13. _____	_____
14. _____	_____
15. _____	_____

SCHEDULE D - SIDE LETTER OF AGREEMENT

This Side Letter of Agreement shall be binding on all entities (Unions, Contractors and/or others) covered by the Project Labor Agreement ("PLA") covering the New York State Office of General Services W. Averell Harriman State Office Campus Project (the "Project"), entered into on the ____ day of _____, 2025, to the same extent as if incorporated therein.

This provision shall not be used if the resulting participation totally excludes or completely prevents a building trades craft discipline from participating in Project Work.

Notwithstanding Article 4, Section 2 of the PLA, or any provision of the PLA, and to the full extent permitted by law, subcontractors who have been identified in the Contractor's approved M/W/SDVOBE Utilization Plan in the amounts set forth in Article 8, Section 3 Minority, Women's, or Service Disabled Veteran Business Recruitment may, with respect to the first 6 hires, request up to 50% of the employees covered by this agreement through the special procedures of Article 4, Section 2B beginning with one (1) named referral, followed by one (1) hiring hall referral, then one (1) named referral, then one (1) hiring hall referral and then one (1) named referral followed by one (1) hiring hall referral. If more than 6 employees are required, manpower will be supplied at a ratio of 20%, meaning the 7th hire may be a named referral, and the 8th, 9th, 10th, and 11th, hires shall be hiring hall referrals, and so forth until the requirements for that trade are met. Identified subcontractors may utilize the procedures set forth in this Schedule D until the Project's stated M/W/SDVOB utilization goals have been achieved.

For purposes of applying this exemption to individual Subcontractors, the work of each building trade craft discipline shall be considered separately in striving for compliance with the Contractor's approved M/W/SDVOBE Plan.

Any disputes arising under this Side Letter of Agreement are subject to Article 9 (Grievance and Arbitration Procedure) of the PLA, or procedures of Article 7 where applicable.

Signed this ___ Day of _____, 2025.

For Jacobs Project Management Company, the Construction Manager as Agent:

BY:_____ Title:_____

For the Greater Capital Region Building & Construction Trades Council:

BY: _____ Pat Tirino, President
By resolution ___ ____, 2025 of the GCRB&CTC authorizing President to sign this Side Letter of Agreement - Schedule D, attached hereto, on behalf of the local unions' signatory to the PLA.

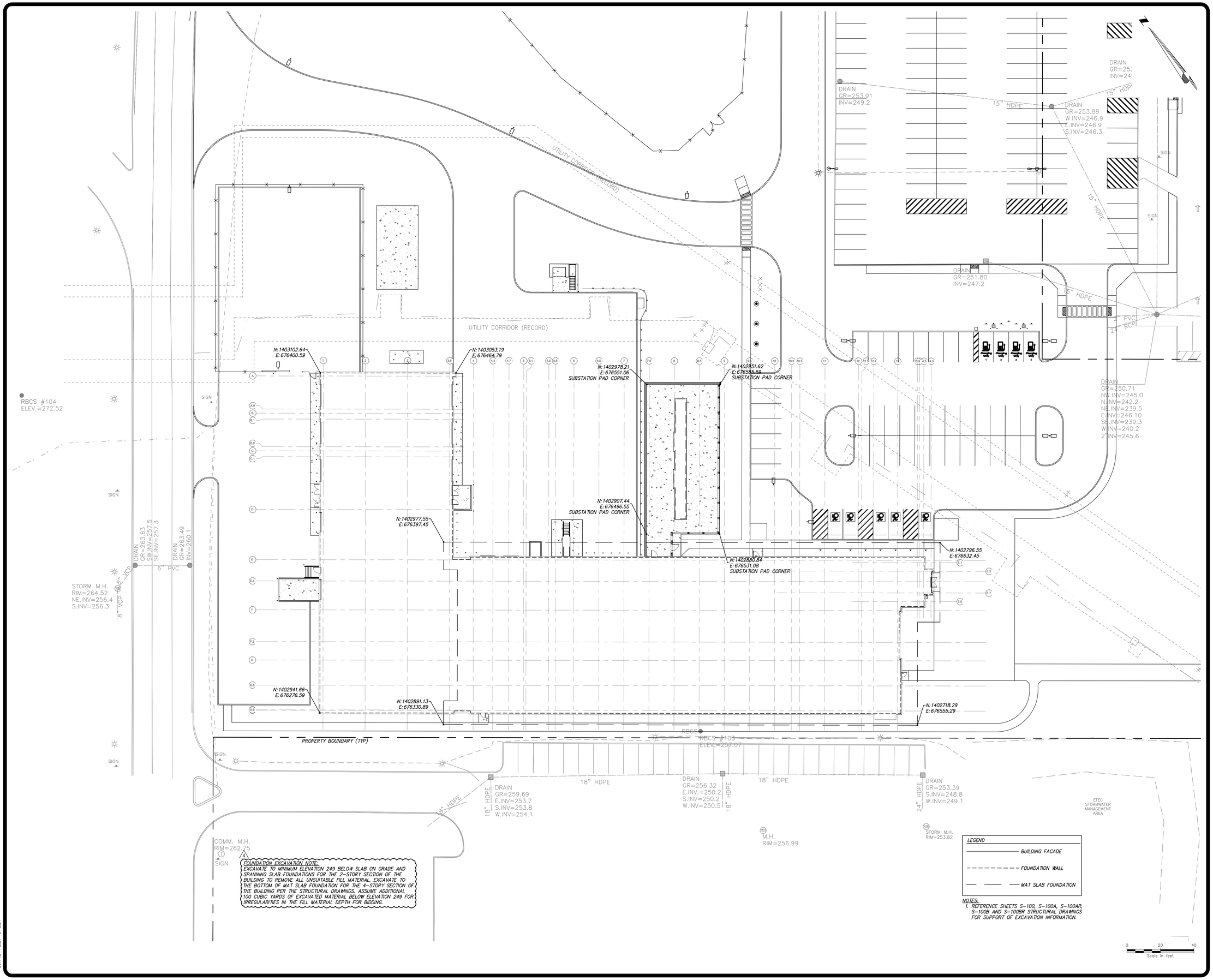
SCHEDULE E - WAIVER OF EMPLOYEE BENEFIT CONTRIBUTIONS

Concerning the Project Labor Agreement Covering the
W. AVERELL HARRIMAN STATE OFFICE BUILDING CAMPUS PROJECT

In accordance with the provisions of Article 11, Section 2 of the Project Labor Agreement covering the W. Averell Harriman State Office Building Campus Project, I am hereby waiving the right to payment on my behalf of contributions into one or more of the applicable jointly trusteed funds designated on Schedule A and, in lieu of such payments and benefit coverage, am requesting and directing that I receive an equivalent amount of such benefit payments either (i) with coverage under my employer's bona fide private benefit plans, provided such plans satisfy the requirements of the Internal Revenue Code, or (ii) by electing to have my employer include the full amount of such benefit in a supplemental check to me. I acknowledge that when the benefit payments are paid into private plans, the payments to be made on my behalf must equal the total supplement amount set forth at the Wage and Benefit sheet referred in Section 1 of this Article and must be consistent with the requirements of Section 220, and that any shortfall will be included in a supplemental check issued to me by my employer.

Date:_____ Signed: _____

Print Name of Employer: _____



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20-42 PLOT SHEET

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 0021745

CHA

UNIFORM CODE STATEMENT:
TO THE BEST OF REGISTERED DESIGN PROFESSIONAL'S KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THESE PLANS AND/OR SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 UNIFORM CODE.

ENERGY CODE WRITTEN STATEMENT:
TO THE BEST OF MY KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THE DRAWINGS BEARING MY PROFESSIONAL SEAL AND SIGNATURE MEET OR EXCEED THE 2020 NEW YORK STATE ENERGY CODE CONSISTING OF THE 2018 INTERNATIONAL ENERGY CONSERVATION CODE, 2016 ASHRAE 90.1.

WARNING:
THE ALTERATION OF THIS MATERIAL IN ANY WAY, UNLESS DONE UNDER THE DIRECTION OF A COMPARABLE PROFESSIONAL I.E. ARCHITECT FOR AN ARCHITECT, ENGINEER FOR AN ENGINEER OR LANDSCAPE ARCHITECT FOR A LANDSCAPE ARCHITECT, IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW AND/OR REGULATIONS AND IS A CLASS 'A' MISDEMEANOR.

STATE OF NEW YORK
JOSEPH P. ROMANO
081995
LICENSED PROFESSIONAL ENGINEER

REGISTRATION EXPIRES:
08/31/2027

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

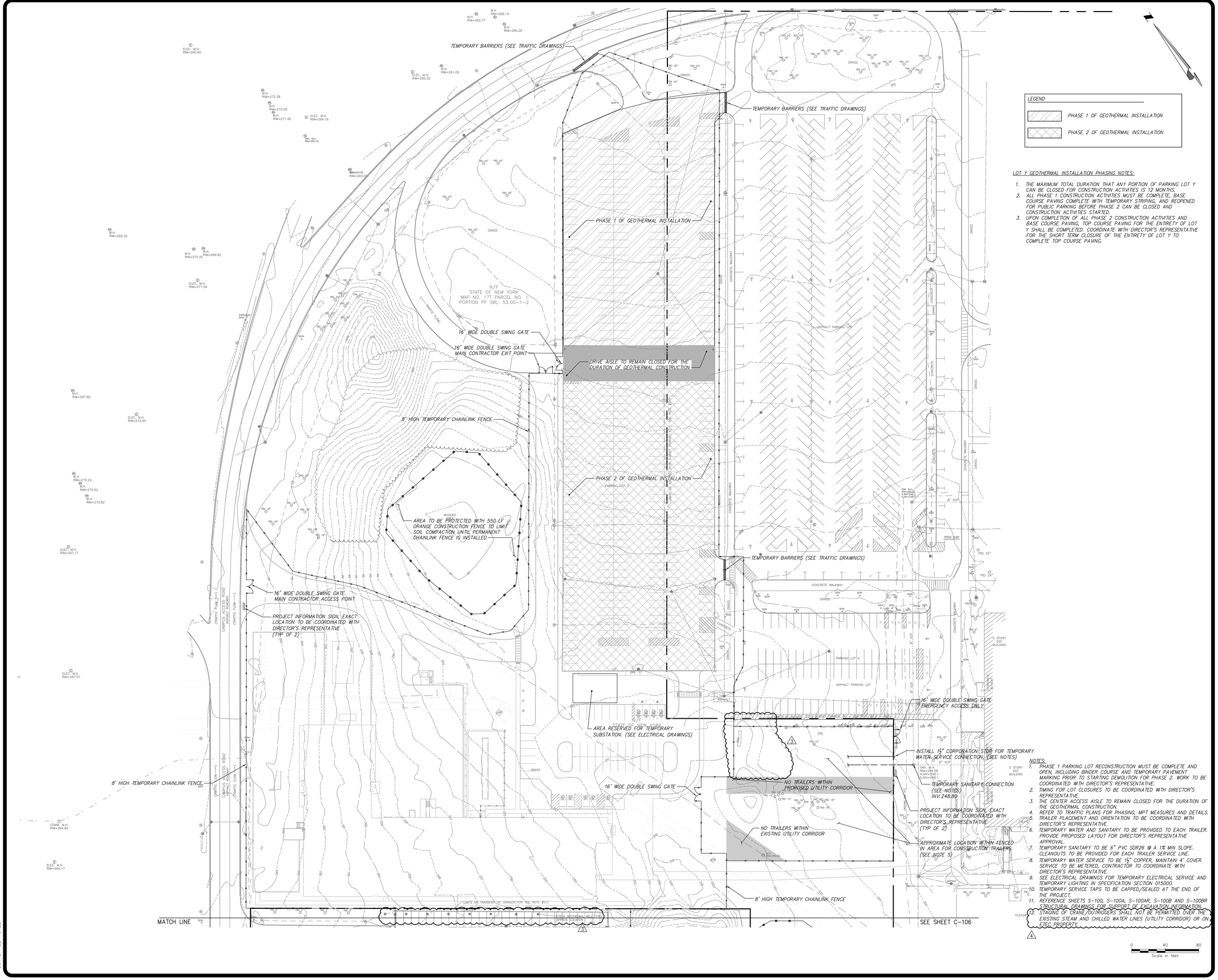
PROJECT NUMBER: 47528-C

DESIGNED BY: JEC
DRAWN BY: JEC
FIELD CHECK:
APPROVED:

SHEET TITLE:
FOUNDATION COORDINATE PLAN

DRAWING NUMBER:
C-104

SHEET: OF



NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 0021745

CHA

UNIFORM CODE STATEMENT:
TO THE BEST OF REGISTERED DESIGN PROFESSIONAL'S KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THESE PLANS AND/OR SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 UNIFORM CODE.

ENERGY CODE WRITTEN STATEMENT:
TO THE BEST OF MY KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THE DRAWINGS BEARING MY PROFESSIONAL SEAL AND SIGNATURE MEET OR EXCEED THE 2020 NEW YORK STATE ENERGY CODE CONSISTING OF THE 2018 INTERNATIONAL ENERGY CONSERVATION CODE, 2016 ASHRAE 90.1.

WARNING:
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STATE OF NEW YORK
JOSEPH P. ROMANO
081993
LICENSED PROFESSIONAL ENGINEER

REGISTRATION EXPIRES:
08/31/2027

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
3	03/25/26	ADDENDUM 3
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

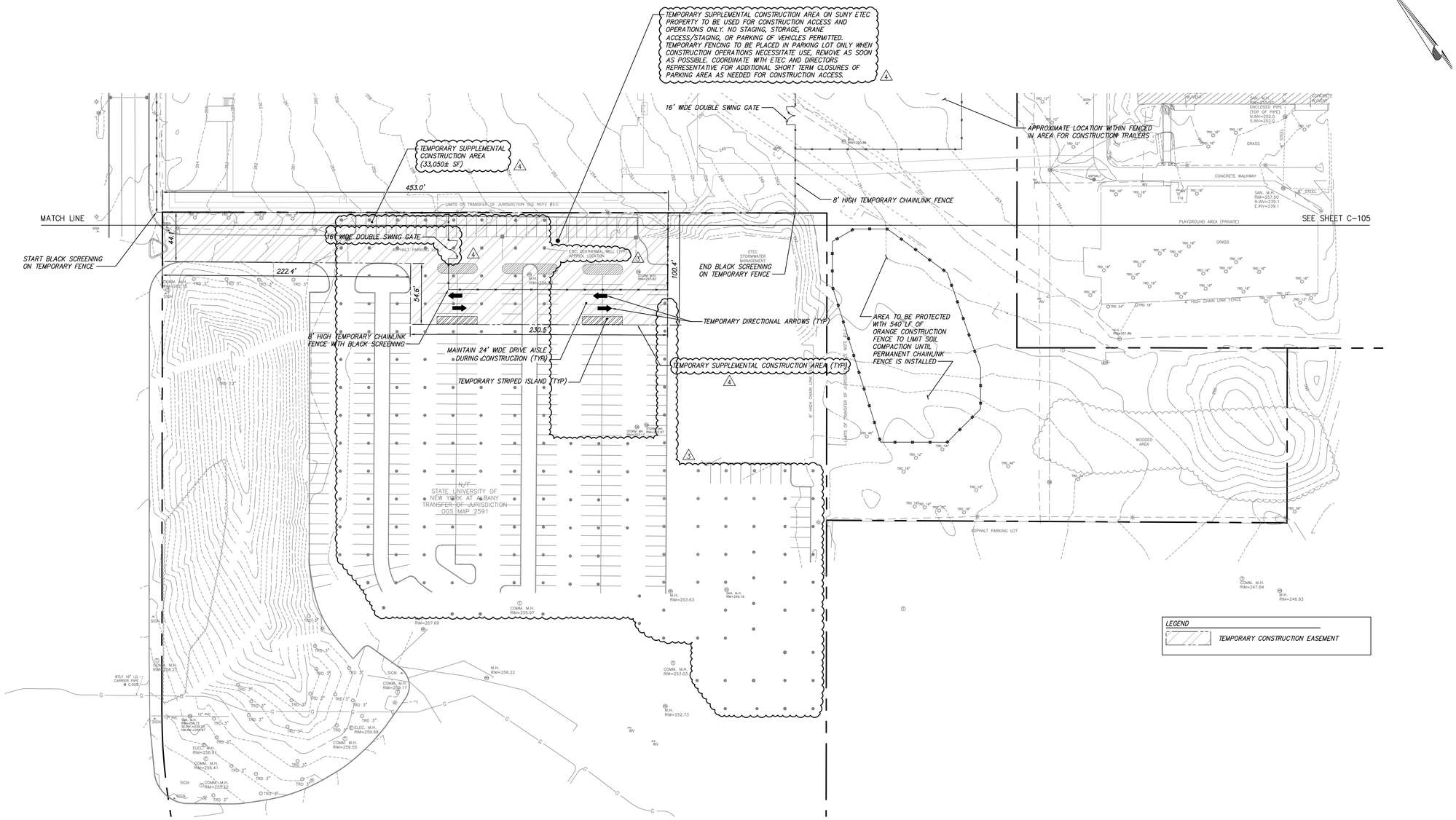
DESIGNED BY: JEC
DRAWN BY: JEC
FIELD CHECK:
APPROVED:

SHEET TITLE:
PHASING, SITE LOGISTICS AND STAGING AREA PLAN

DRAWING NUMBER:
C-105

SHEET: OF

Apr 01,2026 - 8:07am
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30x42 PLOT SHEET



NOTES:
1. TEMPORARY PAVEMENT MARKINGS TO BE INSTALLED AS SHOWN IN THE ETEC PARKING LOT.
2. TEMPORARY PAVEMENT MARKINGS WITHIN ETEC LOT TO BE REMOVED ONCE TEMPORARY FENCING IS REMOVED.
3. PERMANENT PAVEMENT MARKINGS TO BE INSTALLED TO MATCH EXISTING ONCE TEMPORARY MARKINGS HAVE BEEN REMOVED.
4. REFERENCE SHEETS S-100, S-100A, S-100AR, S-100B AND S-100BR STRUCTURAL DRAWINGS FOR SUPPORT OF EXCAVATION INFORMATION.
5. STAGING OF CRANE/OUTRIGGERS SHALL NOT BE PERMITTED OVER THE EXISTING STEAM AND CHILLED WATER LINES (UTILITY CORRIDOR) OR ON ETEC PROPERTY.

4

0 40 80
Scale in feet

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 0021745

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STATE OF NEW YORK · SAMUEL K. REYNOLDS · 084465 · LICENSED PROFESSIONAL ENGINEER

REGISTRATION EXPIRES: 04/30/2027

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
3	03/25/26	ADDENDUM 3
	01/13/26	BID DOCUMENT

PROJECT NUMBER:	47528-C
DESIGNED BY:	JEC
DRAWN BY:	JEC
FIELD CHECK:	
APPROVED:	

SHEET TITLE:
SITE LOGISTICS AND STAGING AREA PLAN

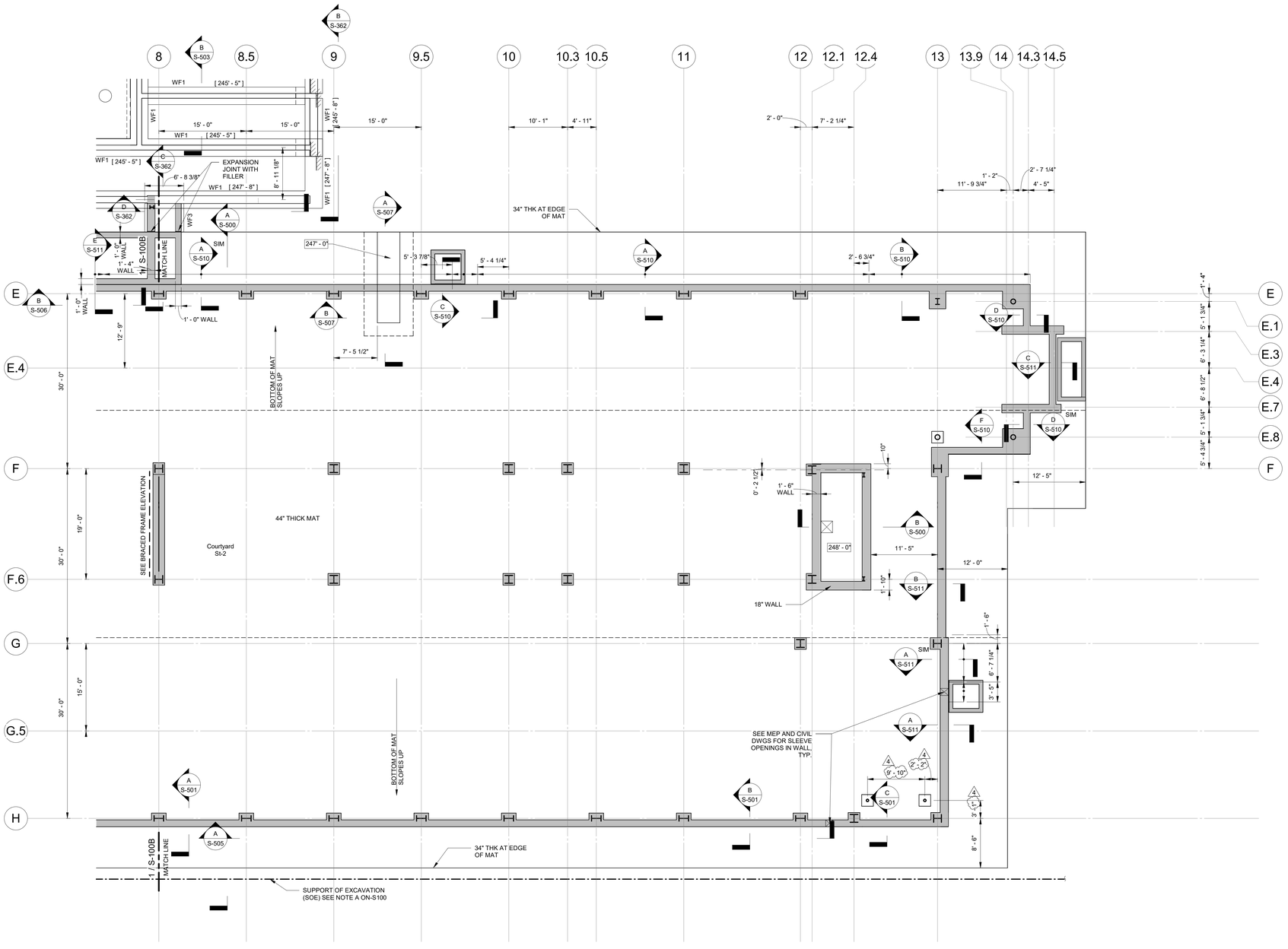
DRAWING NUMBER:
C-106

SHEET: OF

Apr 02,2026 - 3:29pm
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30x42 PLOT SHEET

NOTES:

1. SEE DRAWING S-100 FOR NOTES.



1 FOUNDATION PLAN AREA A

1/8" = 1'-0" 0 4' 8' 16'

KEY PLAN N.T.S.



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42x30 PLOT SHEET

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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LERA
Consulting Structural Engineers
CERTIFICATE OF AUTHORIZATION #: 0021131

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STATE OF NEW YORK · ELIAS SULEIMAN MITRI · 072337 · LICENSED PROFESSIONAL ENGINEER

REGISTRATION EXPIRES: 08/31/2027

PROJECT NORTH

CONTRACT: CONSTRUCTION

TITLE: Provide Testing Laboratory, Building 14

LOCATION: DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT: New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: ESM
DRAWN BY: YT
FIELD CHECK: Checker
APPROVED: Approver

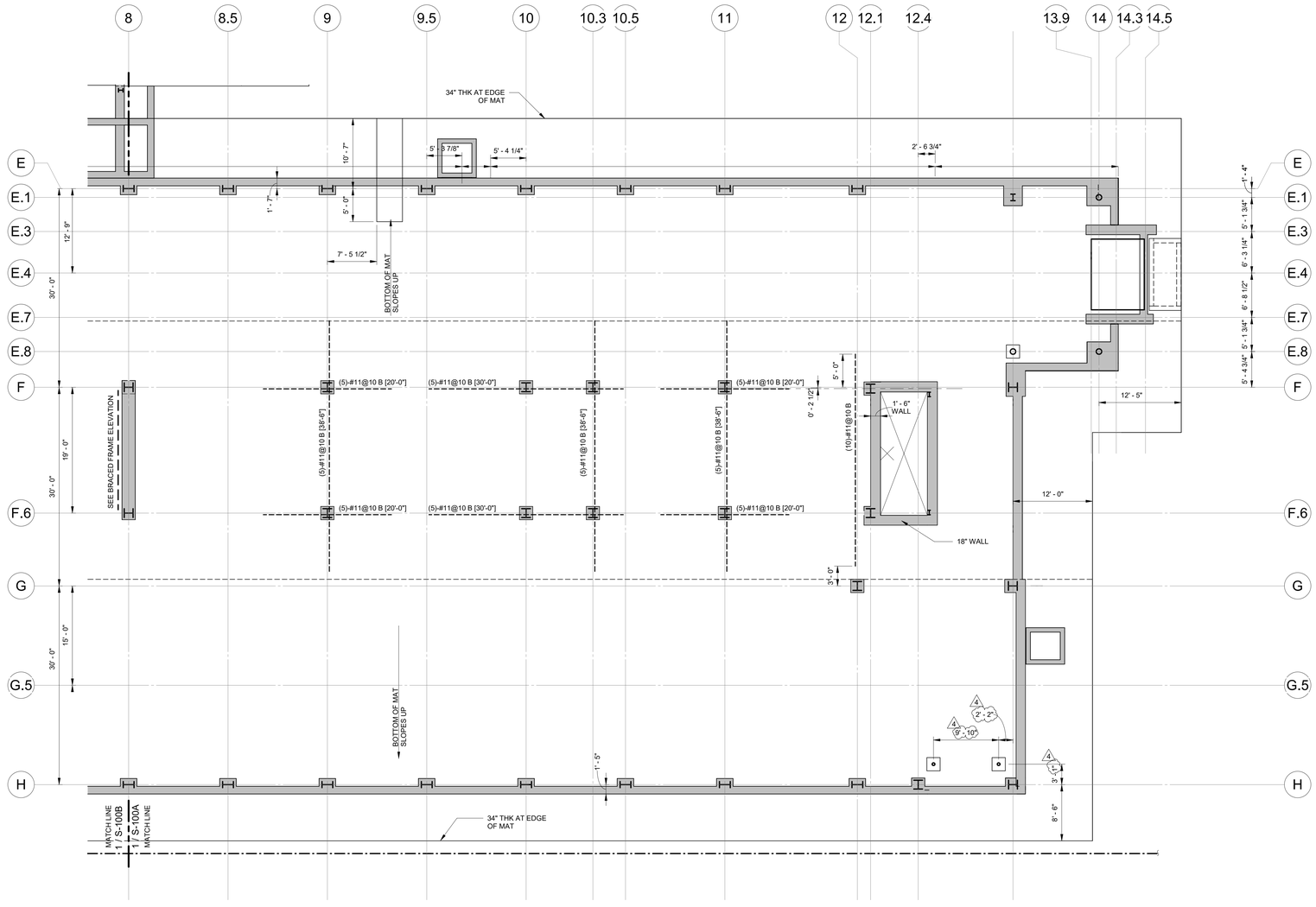
SHEET TITLE: FOUNDATION PLAN AREA A

DRAWING NUMBER: S-100A

SHEET: OF

NOTES:

1. SEE DRAWING S-100 FOR NOTES.



1 FOUNDATION AREA A REINFORCEMENT PLAN
1/8" = 1'-0"



KEY PLAN N.T.S.

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CONSULTANT:

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CLIENT: New York State Department of Transportation

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	01/13/26	BID DOCUMENT

PROJECT NUMBER:	47528-C
DESIGNED BY:	ESM
DRAWN BY:	YT
FIELD CHECK:	Checker
APPROVED:	Approver

SHEET TITLE:
FOUNDATION PLAN AREA A REINFORCEMENT

DRAWING NUMBER:
S-100AR

SHEET: OF

NOTES:

1. SEE DRAWING S-100 FOR NOTES.
2. * INDICATES FOOTING STEPS. REFER TO TYPICAL DETAILS.
3. SEE S-503 FOR ADDITIONAL SUBSTATION GENERAL NOTES.
4. FINAL LOCATIONS AND SIZES OF MANHOLE TO BE LOCATED PRIOR TO CONSTRUCTION OF FOOTINGS FOUNDATION WALLS, TYP. UON

   SEE CIVIL AND ELECTRICAL DRAWINGS FOR INFORMATION NOT SHOWN.

1 FOUNDATION PLAN AREA B
1/8" = 1'-0"

KEY PLAN N.T.S.

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CONSULTANT:

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ELIAS SULEIMAN MINTA — STATE OF NEW YORK — 072337 — LICENSED PROFESSIONAL ENGINEER

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CLIENT:
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	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C
DESIGNED BY: ESM
DRAWN BY: YT
FIELD CHECK: Checker
APPROVED: Approver

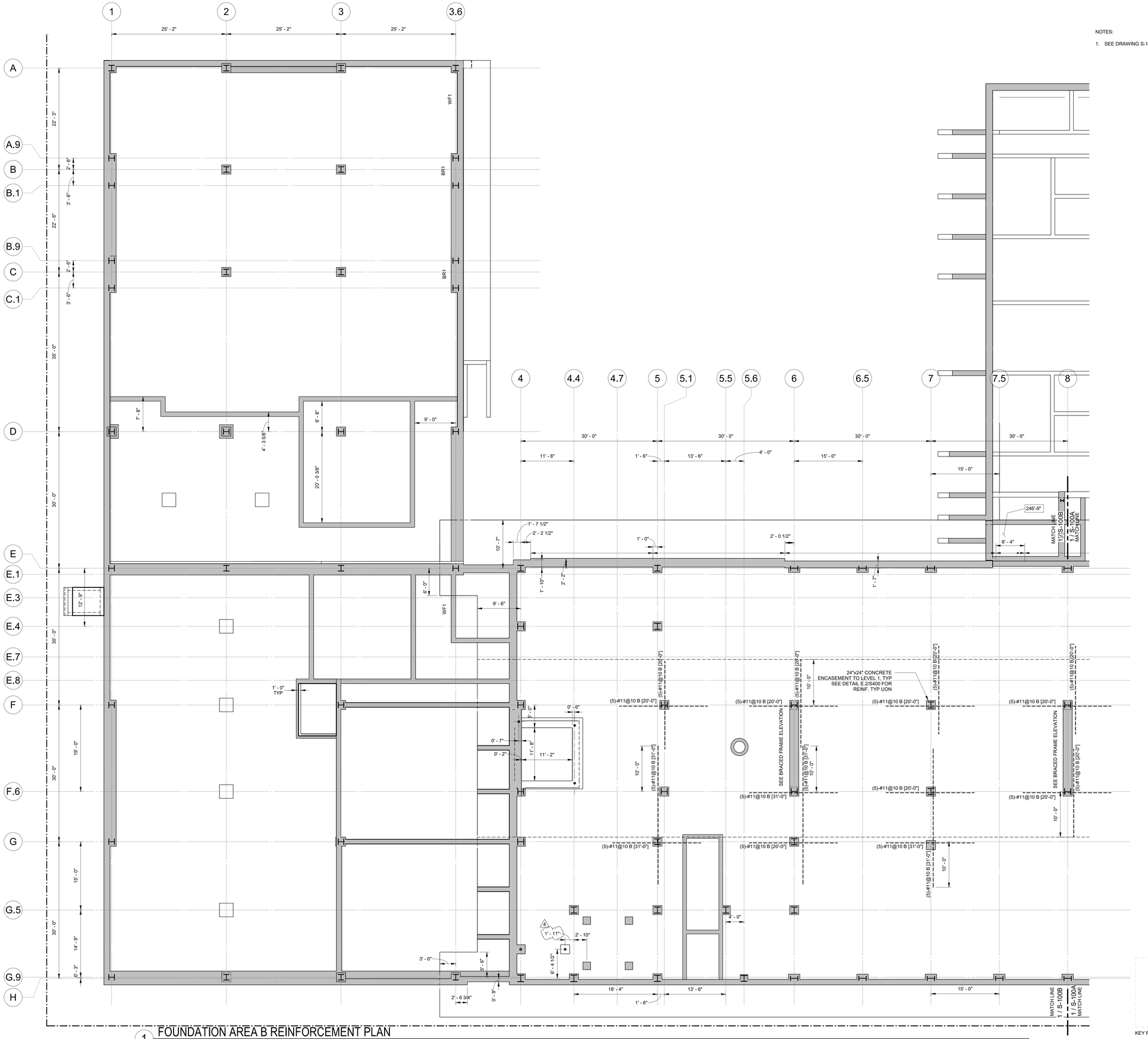
SHEET TITLE:
FOUNDATION PLAN AREA B

DRAWING NUMBER:
S-100B

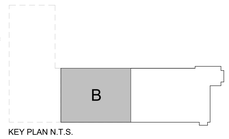
SHEET: OF

NOTES:

1. SEE DRAWING S-100 FOR NOTES.



1 FOUNDATION AREA B REINFORCEMENT PLAN
1/8" = 1'-0" 0 4' 8' 16'



KEY PLAN N.T.S.

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STATE OF NEW YORK
ELIAS SULEIMAN MINTAR
072337
LICENSED PROFESSIONAL ENGINEER

REGISTRATION EXPIRES:
08/31/2027

PROJECT NORTH

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

PROJECT NUMBER:	47528-C
DESIGNED BY:	ESM
DRAWN BY:	YT
FIELD CHECK:	Checker
APPROVED:	Approver

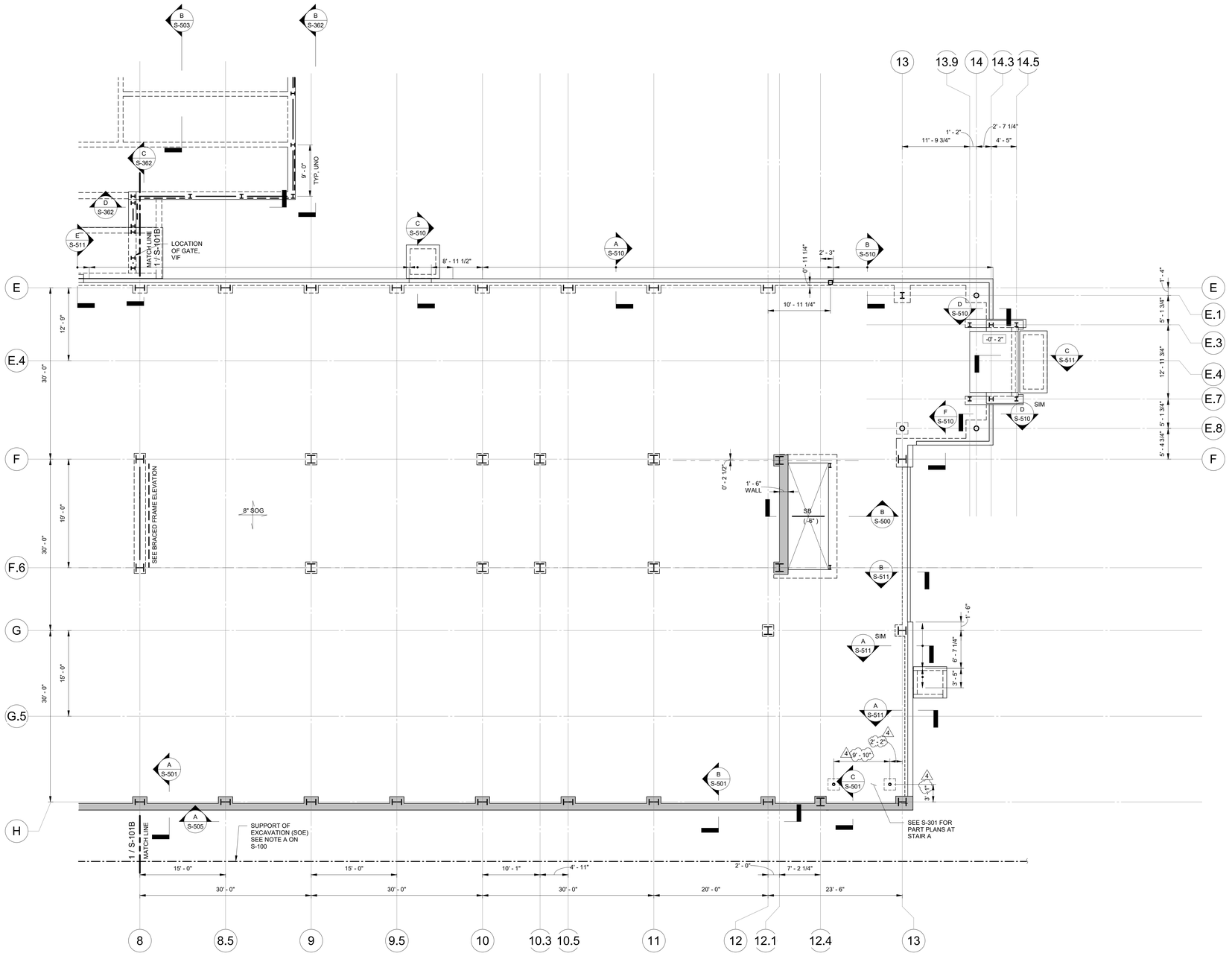
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FOUNDATION PLAN AREA B REINFORCEMENT

DRAWING NUMBER:
S-100BR

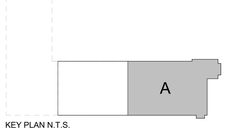
SHEET: OF

NOTES:

1. SEE DRAWING S-101 FOR NOTES.



1 LEVEL 1 AREA A
1/8" = 1'-0"



KEY PLAN N.T.S.

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42x30 PLOT SHEET

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STATE OF NEW YORK · ELIAS SULEIMAN MINTAR · 072337 · LICENSED PROFESSIONAL ENGINEER

REGISTRATION EXPIRES: 08/31/2027

PROJECT NORTH

CONTRACT: CONSTRUCTION

TITLE: Provide Testing Laboratory, Building 14

LOCATION: DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT: New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

PROJECT NUMBER:	47528-C
DESIGNED BY:	ESM
DRAWN BY:	YT
FIELD CHECK:	Checker
APPROVED:	Approver

SHEET TITLE: LEVEL 1 FLOOR PLAN AREA A

DRAWING NUMBER: S-101A

SHEET: OF

NOTES:

1. SEE DRAWING S-101 FOR NOTES.
2. SEE S-503 FOR ADDITIONAL SUBSTATION GENERAL NOTES.

SEE NOTE 5 ON DWG S-101 (TYP) FOR RETAINING WALL

HIGH POINT TOP OF SLAB = 254'-3" SEE CIVIL DWGS FOR SLOPE AND HIGH POINT LOCATION

STEEL POST WITH CIP ANCHORS FOR SCREEN WALL TYP. SEE SECTIONS FOR ANCHOR AND EDGE DISTANCE REQUIREMENTS.

15" THK SUBSTATION SLAB, UON.

EXPANSION JOINT WITH FILLER

LOCATION OF GATE, VIF

T/WALL FTG EL.= 258'-11 1/2"

T/WALL FTG EL.= 257'-6 3/8"

SUPPORT OF EXCAVATION (SOE) SEE NOTE A ON S-100

SEE S-302 FOR PART PLANS AT STAIR B

8" SOG

24"x24" CONCRETE ENCASEMENT BELOW FLOOR 1, TYP SEE DETAIL E.2/S400 FOR REINF. TYP UON

SUMP PIT. SEE SECTIONS

SEE BRACED FRAME ELEVATION

SEE BRACED FRAME ELEVATION

SIM

PC-1 BM 20"X18" PC-2

BM 20"X18"

BM 20"X18"

BM 20"X18"

PC-3 PC-4

1 / S-101A MATCH LINE

1 / S-101A MATCH LINE

KEY PLAN N.T.S.

1 LEVEL 1 AREA B
1/8" = 1'-0"

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Consulting Structural Engineers
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ELIAS SULEIMAN MINTA
072337
LICENSED PROFESSIONAL ENGINEER

REGISTRATION EXPIRES: 08/31/2027

PROJECT NORTH

CONTRACT: CONSTRUCTION

TITLE: Provide Testing Laboratory, Building 14

LOCATION: DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT: New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: ESM

DRAWN BY: YT

FIELD CHECK: Checker

APPROVED: Approver

SHEET TITLE:

LEVEL 1 FLOOR PLAN
AREA B

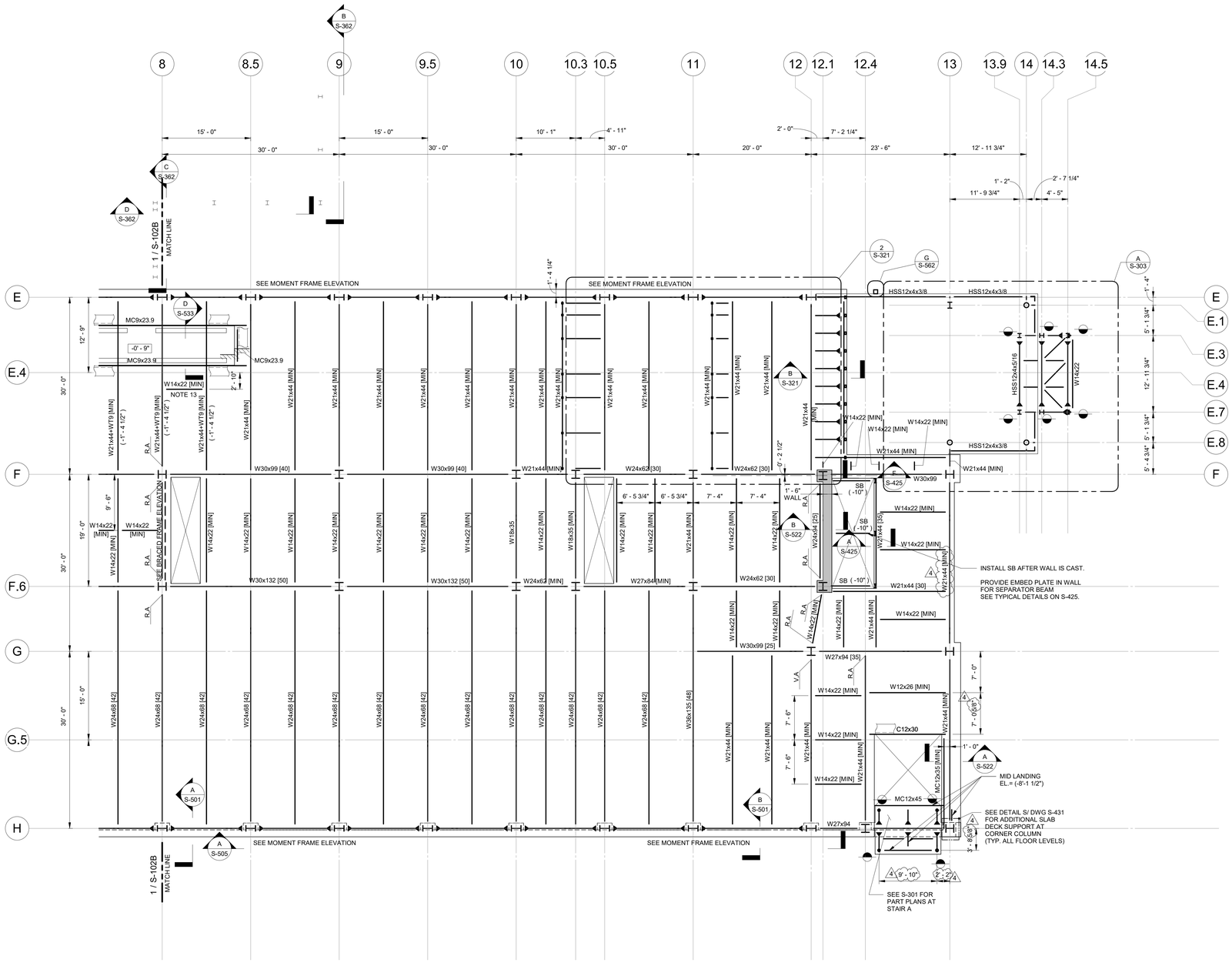
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S-101B

SHEET: OF

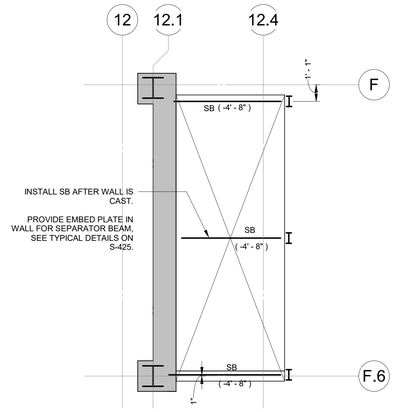
NOTES:

1. SEE DRAWING S-102 FOR NOTES.



1 LEVEL 2 AREA A

1/8" = 1'-0"



2 PART PLAN

1/4" = 1'-0"



KEY PLAN N.T.S.

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4/2/2026 10:5:49 AM
42x30 PLOT SHEET

Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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LERA
Consulting Structural Engineers

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STATE OF NEW YORK · ELIA SULEIMAN ANTAR · 072337 · LICENSED PROFESSIONAL ENGINEER

REGISTRATION EXPIRES: 08/31/2027

PROJECT NORTH

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
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Albany, NY

CLIENT:
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4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT
MARK	DATE	DESCRIPTION

PROJECT NUMBER:	47528-C
DESIGNED BY:	ESM
DRAWN BY:	YT
FIELD CHECK:	Checker
APPROVED:	Approver

SHEET TITLE:

LEVEL 2 - FLOOR PLAN AREA A

DRAWING NUMBER:

S-102A

SHEET: OF

NOTES:

1. SEE DRAWING S-102 FOR NOTES.
2. #BM-CW INDICATES HSS16x8x5/8 SUPPORTING IMPACT CURTAIN WALL AND END CONNECTIONS AND DESIGN AND DETAILED TO BE REMOVABLE. COORDINATE WITH ARCH DWGS FOR BEAM ELEVATIONS. NO FACADE CONNECTIONS PERMITTED TO BE ATTACHED TO THIS BEAM.

1 LEVEL 2 AREA B
1/8" = 1'-0"

KEY PLAN N.T.S.

NEW YORK STATE Office of General Services

CONSULTANT:

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DESIGNED BY:	ESM
DRAWN BY:	YT
FIELD CHECK:	Checker
APPROVED:	Approver

SHEET TITLE:
LEVEL 2 FLOOR PLAN AREA B

DRAWING NUMBER:
S-102B

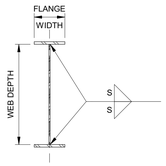
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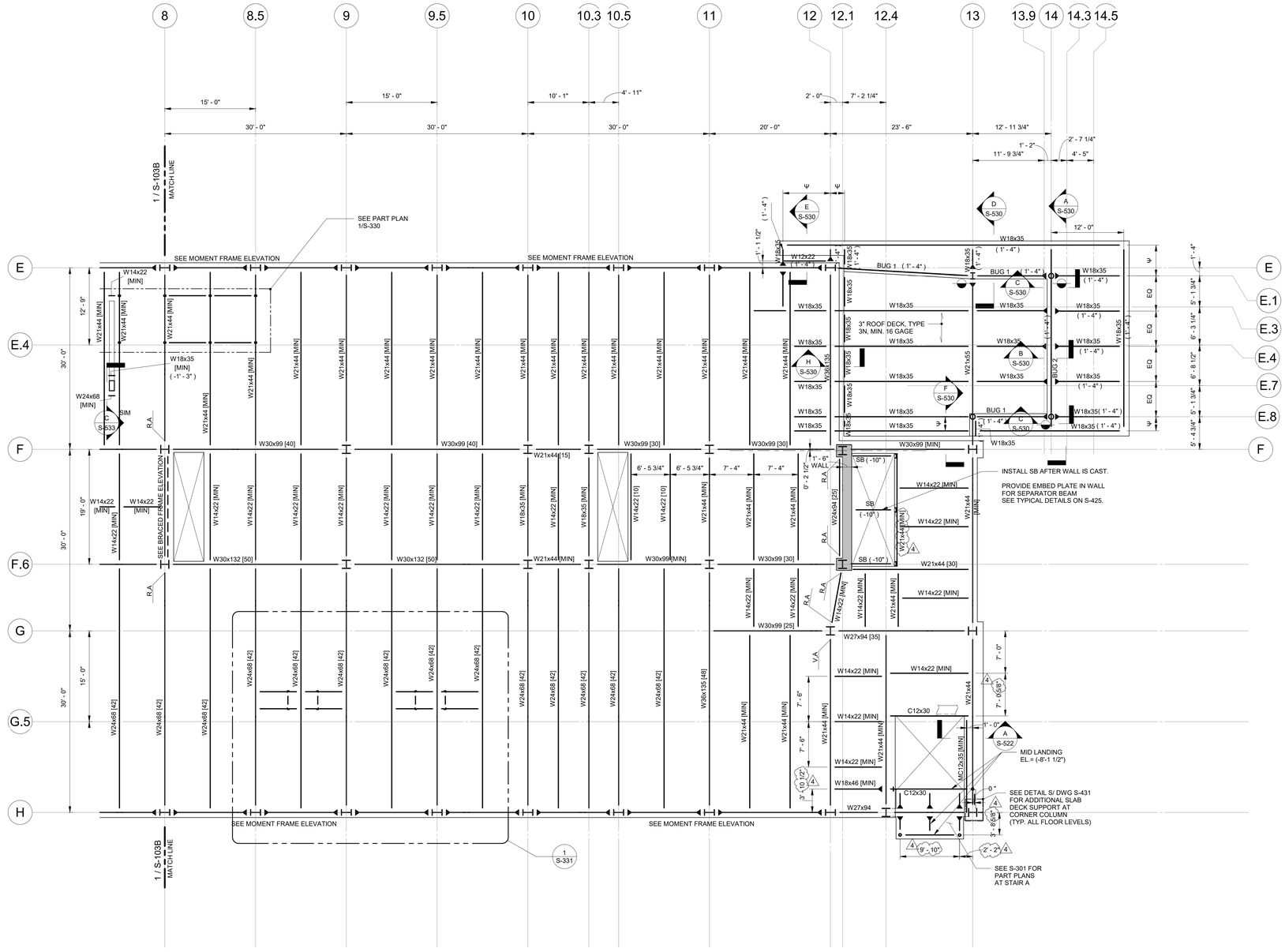
Autodesk Docs://47528 DOT Lab Building/082990_OGS-DOT-Lab_LERA_STRUC_R23.rvt
4/2/2026 10:55:53 AM
42x30 PLOT SHEET

NOTES:

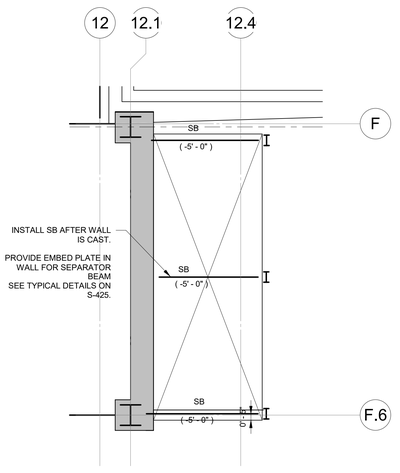
1. SEE DRAWING S-103 FOR NOTES.

BUILT-UP GIRDER SCHEDULE					
NAME	FLANGE		WEB		WELD
	THICK (IN)	WIDTH (IN)	THICK (IN)	DEPTH (IN)	S
BUG 1	1	12	1/2	39 1/4	5/16
BUG 2	1	16	1/2	39 1/4	5/16

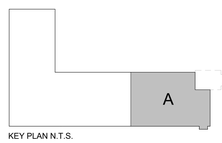




1 LEVEL 3 AREA A
1/8" = 1'-0"



2 PART PLAN
1/4" = 1'-0"



KEY PLAN N.T.S.

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NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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LERA
Consulting Structural Engineers

CERTIFICATE OF AUTHORIZATION #: 0021131

UNIFORM CODE STATEMENT:
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STATE OF NEW YORK · ELIA SULEIMAN ANTAR · 072337 · LICENSED PROFESSIONAL ENGINEER

REGISTRATION EXPIRES: 08/31/2027

PROJECT NORTH

CONTRACT: CONSTRUCTION

TITLE: Provide Testing Laboratory, Building 14

LOCATION: DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT: New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

PROJECT NUMBER:	47528-C
DESIGNED BY:	ESM
DRAWN BY:	YT
FIELD CHECK:	Checker
APPROVED:	Approver

SHEET TITLE:

LEVEL 3 FLOOR PLAN
AREA A

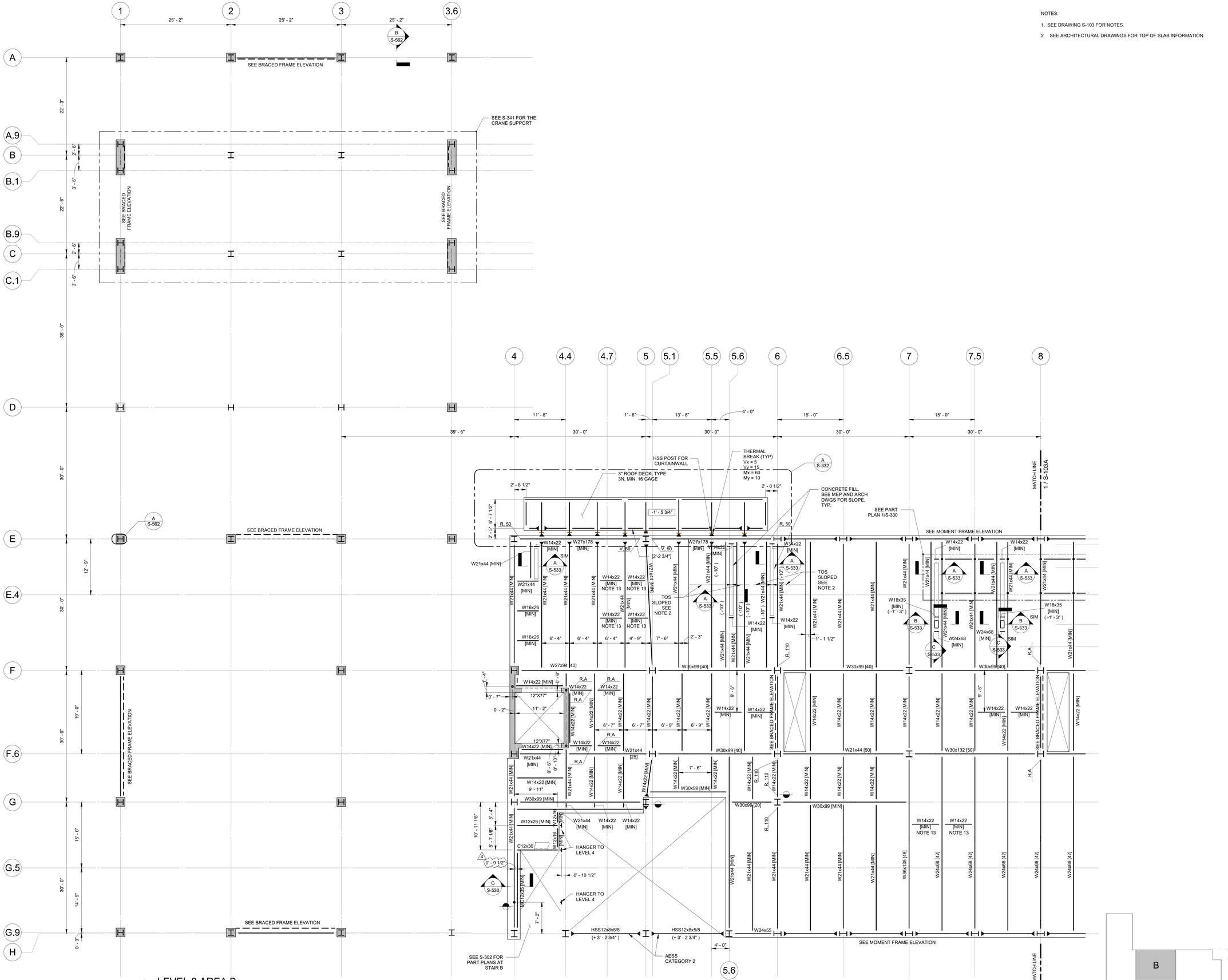
DRAWING NUMBER:

S-103A

SHEET: OF

NOTES:

1. SEE DRAWING S-103 FOR NOTES.
2. SEE ARCHITECTURAL DRAWINGS FOR TOP OF SLAB INFORMATION.



1 LEVEL 3 AREA B

1/8" = 1'-0"

KEY PLAN N.T.S.

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

CHA

LERA
Consulting Structural Engineers

CERTIFICATE OF AUTHORIZATION #: 0021131

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ELIAS SULEIMAN MATAR
072337
LICENSED PROFESSIONAL ENGINEER

REGISTRATION EXPIRES: 08/31/2027

PROJECT NORTH

CONTRACT: CONSTRUCTION

TITLE: Provide Testing Laboratory, Building 14

LOCATION: DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT: New York State Department of Transportation

4	04/01/26	ADDENDUM 4
3	03/25/26	ADDENDUM 3
	01/13/26	BID DOCUMENT

MARK	DATE	DESCRIPTION
PROJECT NUMBER:		47528-C
DESIGNED BY:		ESM
DRAWN BY:		YT
FIELD CHECK:		Checker
APPROVED:		Approver

SHEET TITLE: LEVEL 3 FLOOR PLAN AREA B

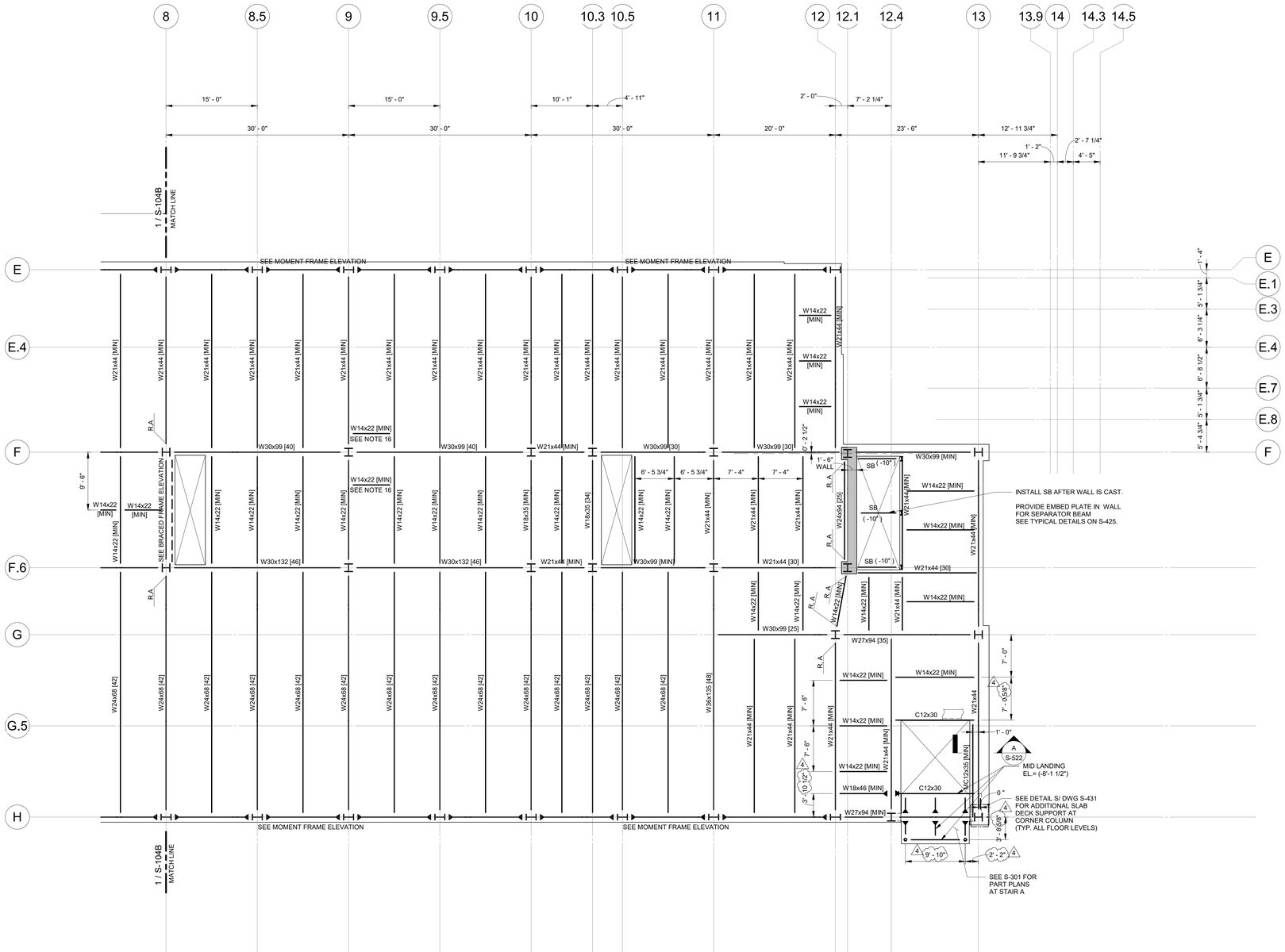
DRAWING NUMBER: S-103B

SHEET: OF

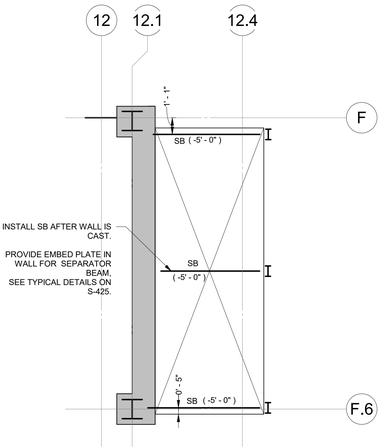
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42x30 PLOT SHEET

NOTES:

1. SEE DRAWING S-104 FOR NOTES.



1 LEVEL 4 AREA A
1/8" = 1'-0"



2 PART PLAN
1/4" = 1'-0"



KEY PLAN N.T.S.

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4/2/2026 9:56:01 AM
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CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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Consulting Structural Engineers

CERTIFICATE OF AUTHORIZATION #: 0021131

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ELIAS SULEIMAN MINTAR
072337
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW YORK

REGISTRATION EXPIRES:
08/31/2027

PROJECT NORTH

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

PROJECT NUMBER:	47528-C
DESIGNED BY:	ESM
DRAWN BY:	YT
FIELD CHECK:	Checker
APPROVED:	Approver

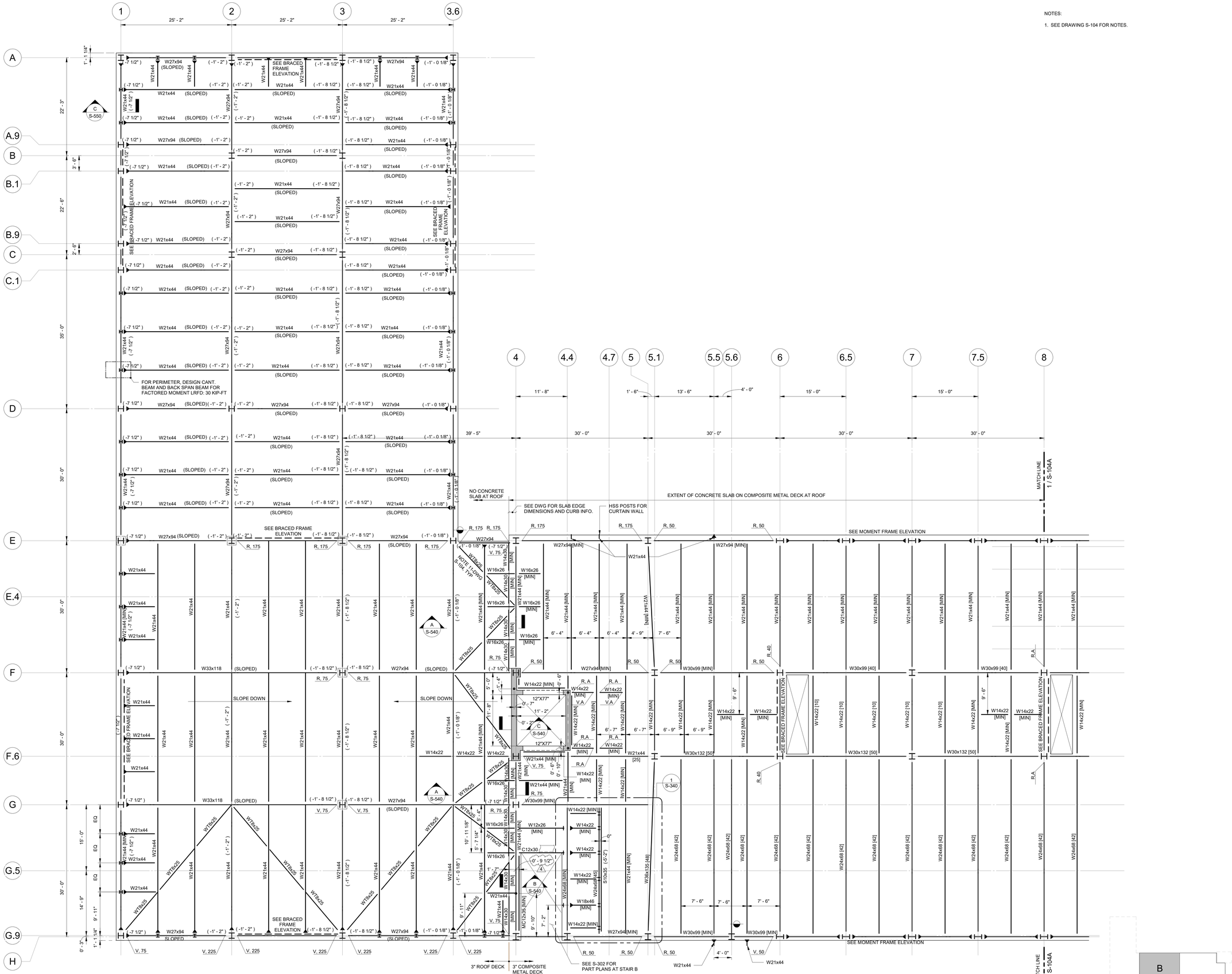
SHEET TITLE:
LEVEL 4 FLOOR PLAN
AREA A

DRAWING NUMBER:
S-104A

SHEET: OF

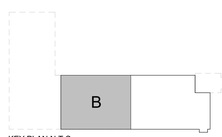
NOTES:

1. SEE DRAWING S-104 FOR NOTES.



1 LEVEL 4 AREA B

1/8" = 1'-0"



KEY PLAN N.T.S.

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Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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Consulting Structural Engineers
CERTIFICATE OF AUTHORIZATION #: 0021131

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STATE OF NEW YORK · ELIAS SULEIMAN MINTAR · 072337 · LICENSED PROFESSIONAL ENGINEER

REGISTRATION EXPIRES: 08/31/2027

PROJECT NORTH

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

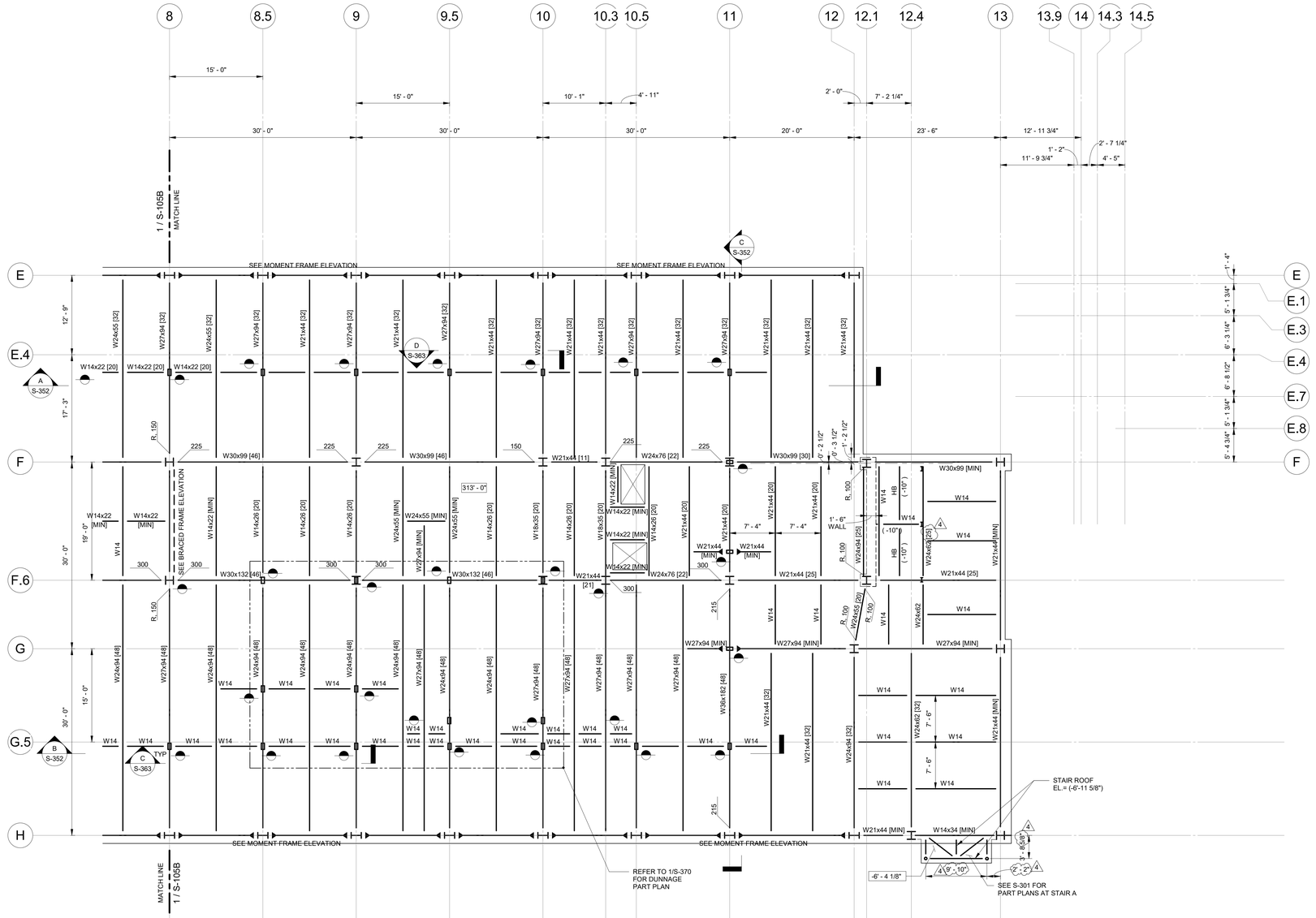
PROJECT NUMBER: 47528-C

DESIGNED BY: ESM
DRAWN BY: YT
FIELD CHECK: Checker
APPROVED: Approver

SHEET TITLE:
LEVEL 4 FLOOR PLAN AREA B

DRAWING NUMBER:
S-104B

SHEET: OF



1 ROOF AREA A
1/8" = 1'-0"

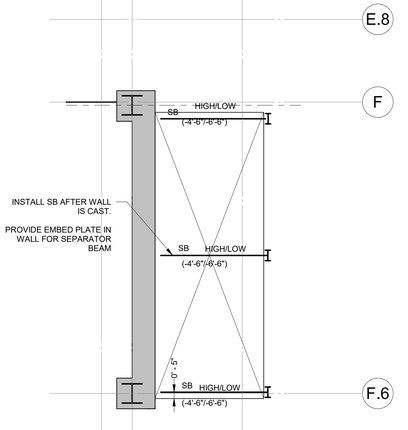
DUNNAGE NOTES:

1. REFER TO:
   S0XX SERIES DRAWINGS FOR DESIGN CRITERIA, GENERAL NOTES AND ABBREVIATIONS
   S1XX SERIES DRAWINGS FOR PLANS
   S2XX SERIES DRAWINGS FOR ELEVATIONS
   S4XX SERIES DRAWINGS FOR TYPICAL DETAILS AND SCHEDULE
   S5XX SERIES FOR REFERENCE DETAILS AND SECTIONS
2. TOP OF STRUCTURAL STEEL IS AT REFERENCE ELEVATION +315' -0" UNLESS OTHERWISE NOTE (XXX). XXX INDICATES TOP OF STRUCTURAL STEEL WITH RESPECT TO REFERENCE ELEVATION.
3. STRUCTURAL STEEL SHAPES SHALL BE FY50 UNLESS OTHERWISE NOTED. CONNECTION PLATES SHALL BE FY50 UON.
4. ▶——◀ INDICATES MOMENT CONNECTION.
5. INDICATES COLUMN ABOVE
   INDICATES COLUMN BELOW.
6. ALL DUNNAGE STEEL, INCLUDING CONNECTION PLATES, SHALL BE HOT-DIPPED GALVANIZED AND PAINTED. HIGH STRENGTH BOLTS AND FASTENERS SHALL BE MECHANICALLY GALVANIZED. SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR PAINT REQUIREMENTS.
7. REFER TO ARCHITECTURAL AND MECHANICAL DRAWINGS FOR DIMENSIONAL INFORMATION NOT SHOWN. CONTRACTOR TO COORDINATE ALL STEEL LOCATIONS, CONNECTION STEEL, FASTENERS, BRACING AND PIPING WITH MECHANICAL, DRAWINGS AND MANUFACTURERS WRITTEN RECOMMENDATIONS FOR SUPPORT DUNNAGE.
8. — — — INDICATES BRACING BELOW.
9. STEEL GRATING ON DUNNAGE SHALL BE 2" DEEP AND SHALL BE CAPABLE OF SUPPORTING A UNIFORM LIVE LOAD OF 100 PSF WITH MAXIMUM 1/4" DEFLECTION. GRATING SPANS IN DIRECTION NOTED ←——→. FASTEN GRATING TO SUPPORT STEEL. GRATING SHALL HOT DIPPED GALVANIZED. SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR MORE INFORMATION.
10. 2L = SEE DUNNAGE ELEVATION, S360 AND S-450.
    MB = W14x22
    W14 = W14x26 [MIN]
    W18 = W18x50
    L6 = L6x6x1/2
    HB = W8x40
11. BEAMS LOCATED BETWEEN GRIDS ARE TO BE EQUALLY SPACED, UNLESS OTHERWISE NOTED.
12. SEE DWG S-370 FOR DUNNAGE PART PLANS.

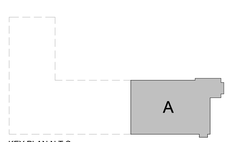
MECHANICAL EQUIPMENT	
UNITS	WEIGHT (LBS)
EF-2	7500
EF-3	15500
EF-4	20000
EF-12	2000

NOTE:

1. ANY CHANGES BY THE GENERAL CONTRACTOR TO REQUIRING STRUCTURAL SUPPLEMENTAL SUPPORT STRUCTURE, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR MODIFICATION, REDESIGN THE MECHANICAL EQUIPMENT WEIGHT OR LOCATION, OR TO DESIGN AND PAY FOR NECESSARY STRUCTURE.
2. CONTRACTOR TO VERIFY THE MECHANICAL EQUIPMENT WEIGHT WITH MEP CONSULTANT



2 PART PLAN
1/4" = 1'-0"



KEY PLAN N.T.S.

Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

LERA Consulting Structural Engineers

CERTIFICATE OF AUTHORIZATION #: 0021131

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ELIAS SULEIMAN MITRI 072337 LICENSED PROFESSIONAL ENGINEER

REGISTRATION EXPIRES: 08/31/2027

PROJECT NORTH

CONTRACT: CONSTRUCTION

TITLE: Provide Testing Laboratory, Building 14

LOCATION: DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT: New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

PROJECT NUMBER:	47528-C
DESIGNED BY:	ESM
DRAWN BY:	YT
FIELD CHECK:	Checker
APPROVED:	Approver

SHEET TITLE:

PENTHOUSE AND ROOF PLAN AREA A

DRAWING NUMBER: S-105A

SHEET: OF

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4/2/2026 9:56:07 AM
42x30 PLOT SHEET

NOTES:

1. SEE DRAWING S-105 FOR NOTES.



1 ROOF AREA B
1/8" = 1'-0"

B
KEY PLAN N.T.S.

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Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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STATE OF NEW YORK
ELIAS SULEIMAN MINTAR
072337
LICENSED PROFESSIONAL ENGINEER

REGISTRATION EXPIRES:
08/31/2027

PROJECT NORTH

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

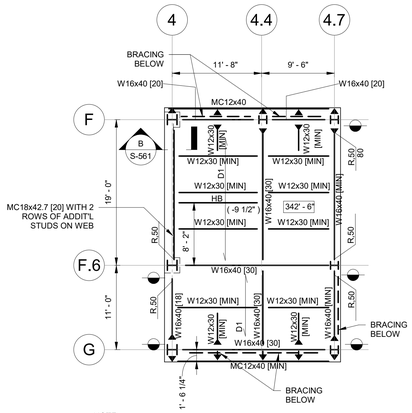
MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C
DESIGNED BY: ESM
DRAWN BY: YT
FIELD CHECK: Checker
APPROVED: Approver

SHEET TITLE:
PENTHOUSE AND ROOF PLAN AREA B

DRAWING NUMBER:
S-105B

SHEET: OF

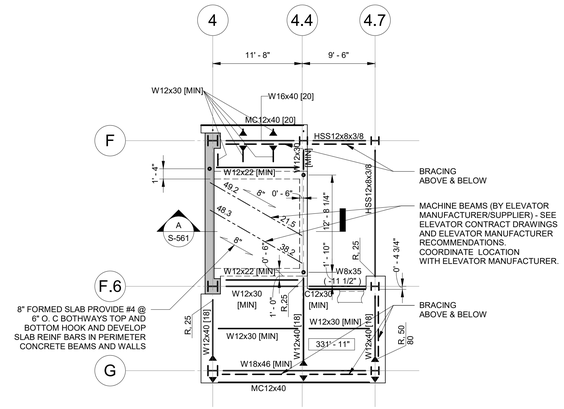


NOTE:

TOP OF STRUCTURAL STEEL AT ELEV. MACHINE RM ROOF IS 7.5" BELOW REFERENCE ELEVATION EL + 342'-6" , UNLESS OTHERWISE NOTED (XXX), WHERE XXX TOP OF STEEL WITH RESPECT TO REFERENCE ELEVATION.

3 ELEV. MACHINE ROOM ROOF PART PLAN

1/8" = 1'-0"



NOTE:

TOP OF STRUCTURAL STEEL EXCLUDING MACHINE BEAMS IS 7.5" BELOW REFERENCE ELEVATION EL + 331'-11" , UNLESS OTHERWISE NOTED (XXX), WHERE XXX TOP OF STEEL WITH RESPECT TO REFERENCE ELEVATION.

2 ELEV. MACHINE ROOM

1/8" = 1'-0"

NOTES:

1. SEE DRAWING S-106 FOR NOTES

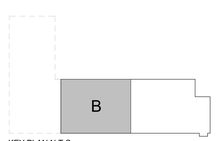


NOTE:

TOP OF STRUCTURAL STEEL AT PENTHOUSE ROOF IS 7.5" BELOW REFERENCE ELEVATION EL + 325'-10", UNLESS OTHERWISE NOTED (XXX), WHERE XXX TOP OF STEEL WITH RESPECT TO REFERENCE ELEVATION.

1 PENTHOUSE ROOF

1/8" = 1'-0"



KEY PLAN N.T.S.

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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LERA
Consulting Structural Engineers

CERTIFICATE OF AUTHORIZATION #: 0021131

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STATE OF NEW YORK · ELIAS SULEIMAN MINTAR · 072337 · LICENSED PROFESSIONAL ENGINEER

REGISTRATION EXPIRES: 08/31/2027

PROJECT NORTH

CONTRACT: CONSTRUCTION

TITLE: Provide Testing Laboratory, Building 14

LOCATION: DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT: New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

PROJECT NUMBER:	47528-C
DESIGNED BY:	ESM
DRAWN BY:	YT
FIELD CHECK:	Checker
APPROVED:	Approver

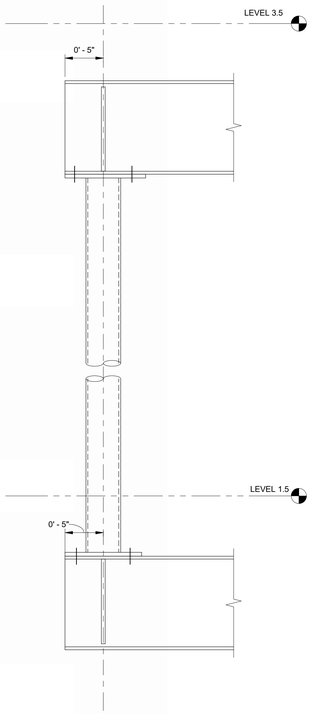
SHEET TITLE:

MEZZANINE AND PENTHOUSE ROOF - AREA B

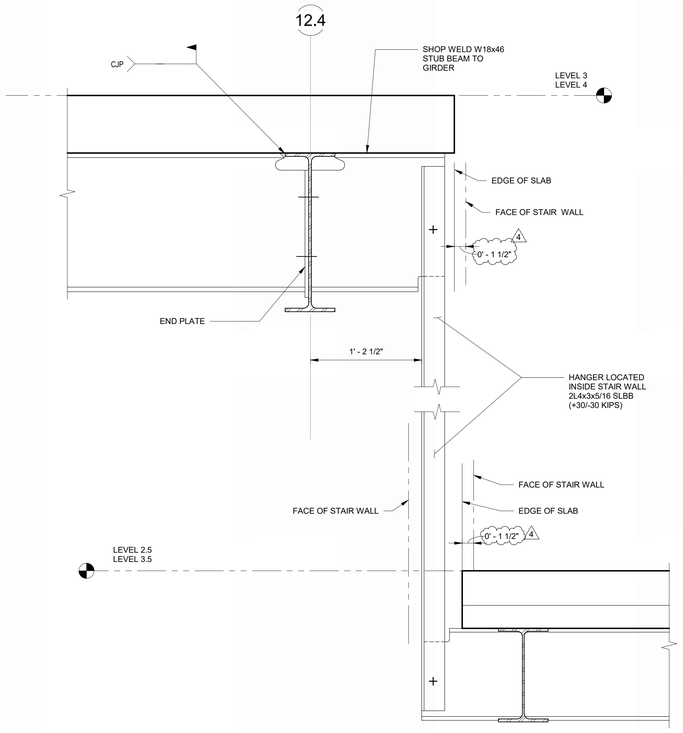
DRAWING NUMBER: S-106B

SHEET: OF

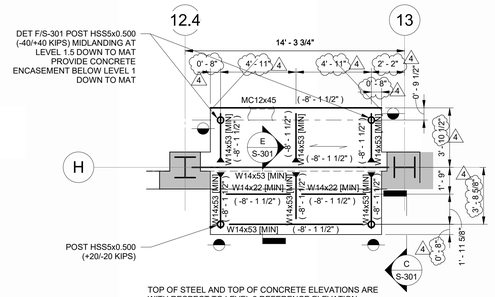
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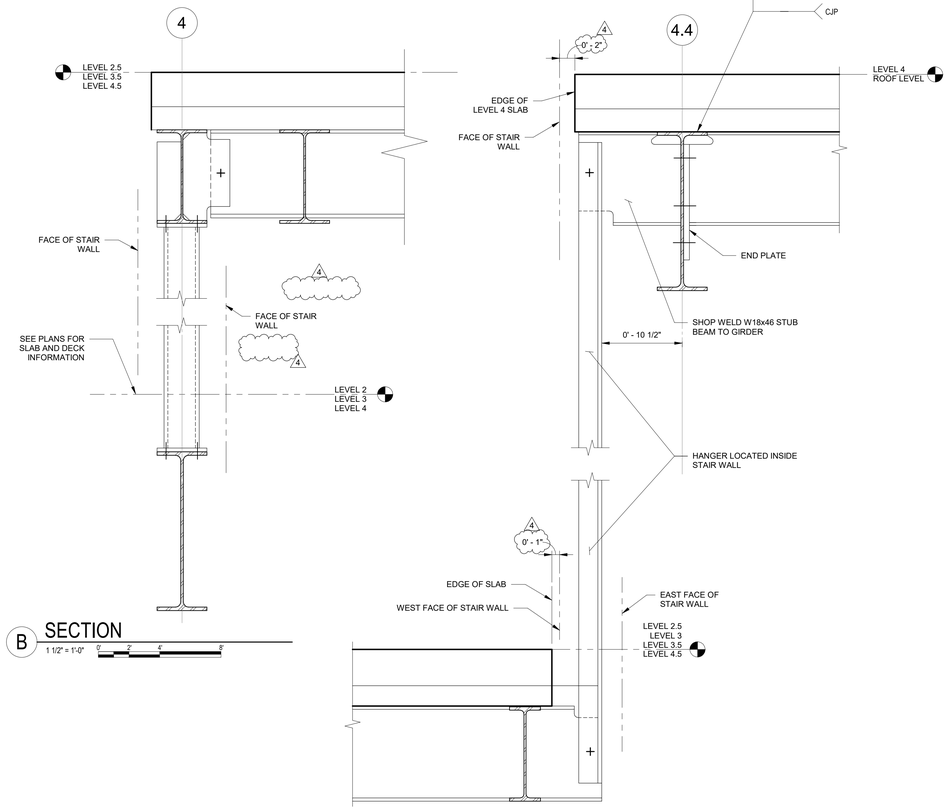


C S-301 DETAIL C
1 1/2" = 1'-0"



A S-301 DETAIL A
1 1/2" = 1'-0"

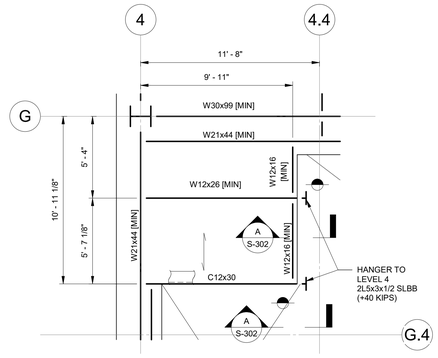

DET F/S-301 POST HSS5x0.500 (-40/+40 KIPS) MIDLANDING AT LEVEL 1.5 DOWN TO MAT PROVIDE CONCRETE ENCASEMENT BELOW LEVEL 1 DOWN TO MAT
12.4
13
14' - 3 3/4"
4' - 11"
4' - 11"
2' - 2"
0' - 8"
6' - 9 1/2"
MC12x45
(-8' - 1 1/2")
W14x53 [MIN]
W14x53 [MIN]
W14x53 [MIN]



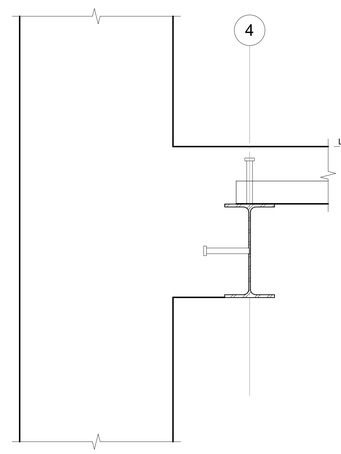
B SECTION
1 1/2" = 1'-0"

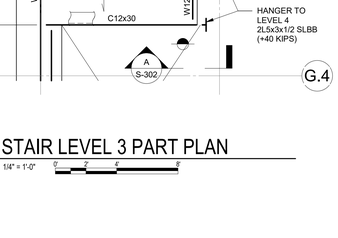


A SECTION
1 1/2" = 1'-0"

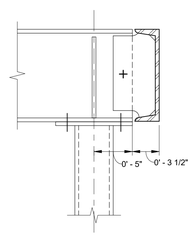


5 STAIR LEVEL 3 PART PLAN
1/4" = 1'-0"

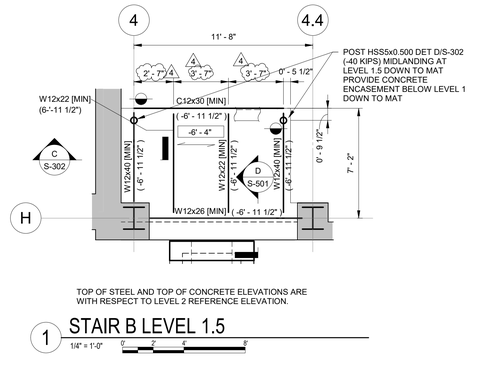




C SECTION
1 1/2" = 1'-0"

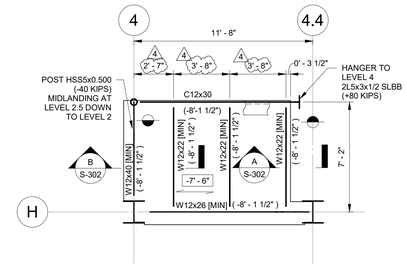


D DETAIL
1 1/2" = 1'-0"



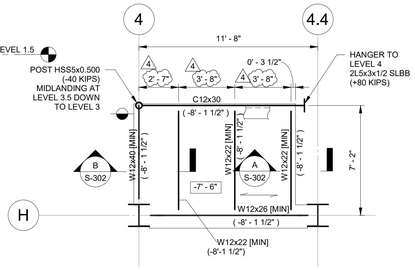
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1 STAIR B LEVEL 1.5
1/4" = 1'-0"



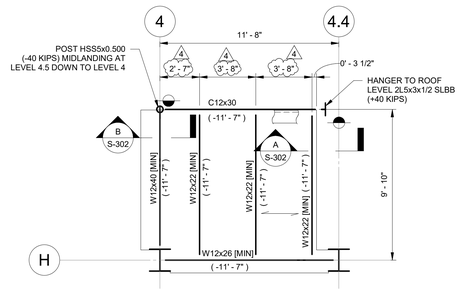
TOP OF STEEL AND TOP OF CONCRETE ELEVATIONS ARE WITH RESPECT TO LEVEL 3 REFERENCE ELEVATION.

2 STAIR B LEVEL 2.5
1/4" = 1'-0"



TOP OF STEEL AND TOP OF CONCRETE ELEVATIONS ARE WITH RESPECT TO LEVEL 4 REFERENCE ELEVATION.

3 STAIR B LEVEL 3.5
1/4" = 1'-0"



TOP OF STEEL AND TOP OF CONCRETE ELEVATIONS ARE WITH RESPECT TO ROOF LEVEL REFERENCE ELEVATION.

4 STAIR B LEVEL 4.5
1/4" = 1'-0"

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

CHA

LERA
Consulting Structural Engineers
CERTIFICATE OF AUTHORIZATION #: 0021131

UNIFORM CODE STATEMENT:
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STATE OF NEW YORK
ELIA SULEIMAN MITRI
072337
LICENSED PROFESSIONAL ENGINEER

REGISTRATION EXPIRES:
08/31/2027

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: ESM
DRAWN BY: YT
FIELD CHECK: Checker
APPROVED: Approver

SHEET TITLE:

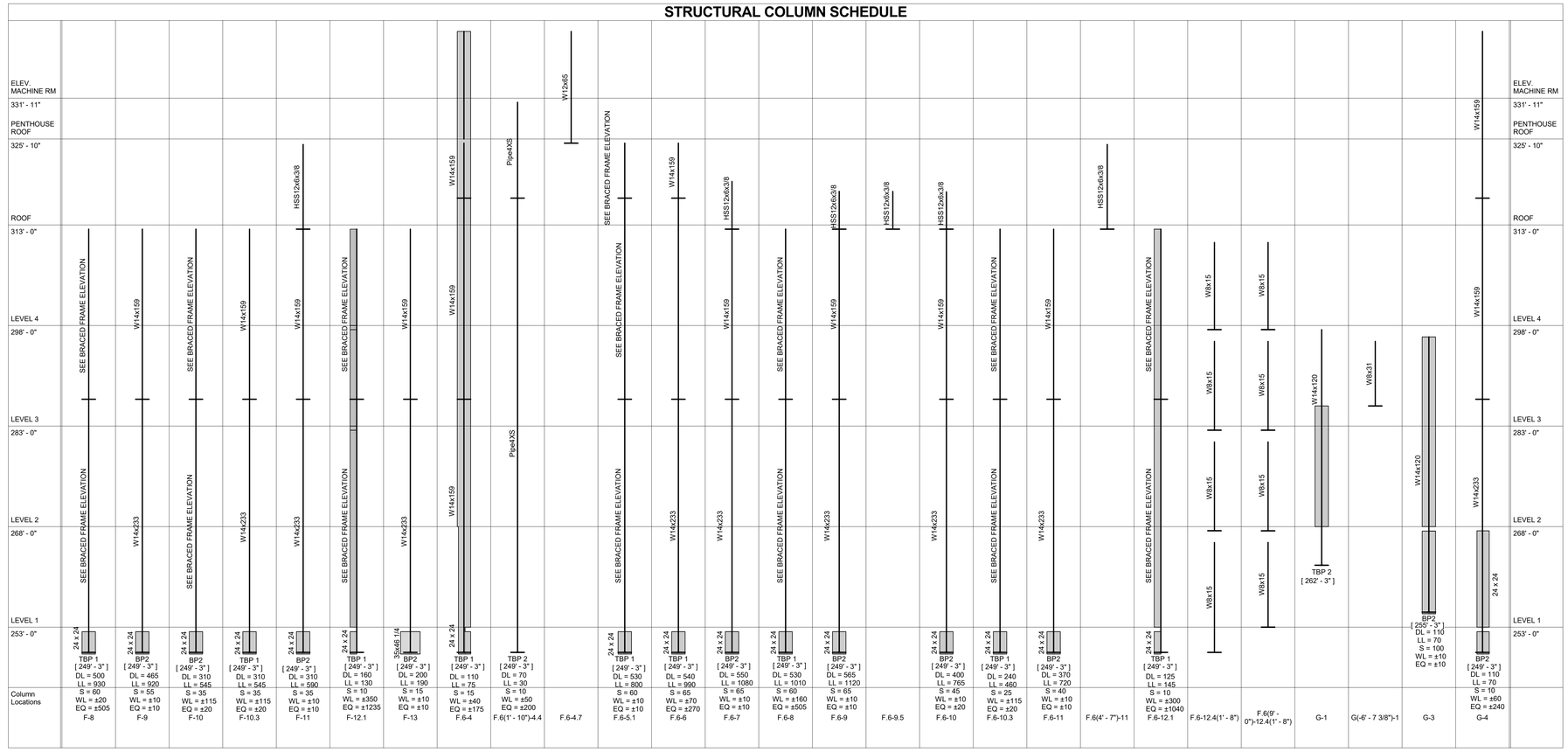
PART PLANS AND DETAILS
STAIR B

DRAWING NUMBER:
S-302

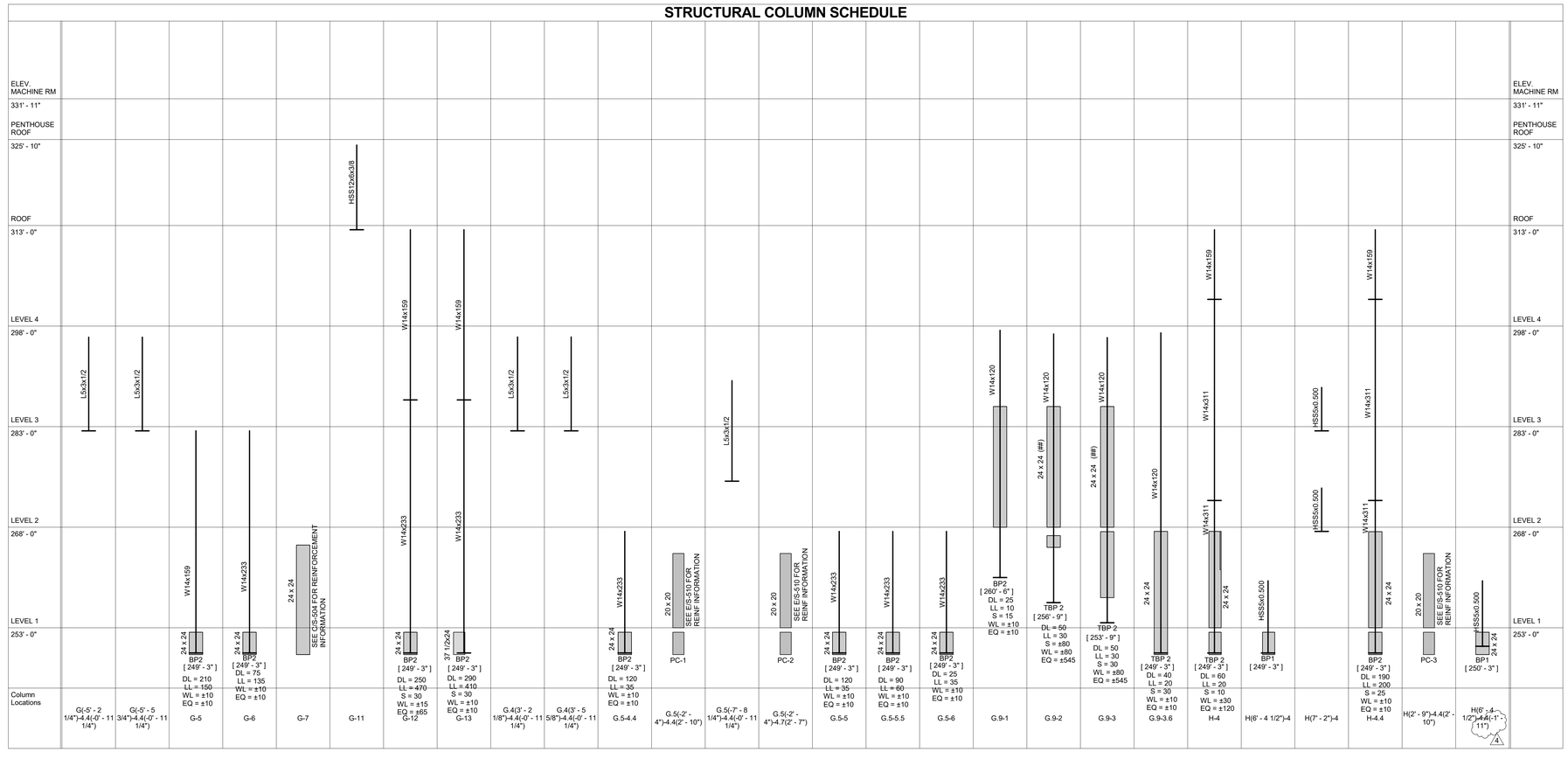
SHEET: OF

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42x30 PLOT SHEET

STRUCTURAL COLUMN SCHEDULE



STRUCTURAL COLUMN SCHEDULE



SCHEDULE EXPORTED FROM MODEL

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

CHA

LERA
Consulting Structural Engineers
CERTIFICATE OF AUTHORIZATION #: 0021131

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STATE OF NEW YORK · ELIA SULEIMAN KHOURI · 072337 · LICENSED PROFESSIONAL ENGINEER

REGISTRATION EXPIRES: 08/31/2027

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C
DESIGNED BY: ESM
DRAWN BY: YT
FIELD CHECK:
APPROVED:

SHEET TITLE:
COLUMN SCHEDULE

DRAWING NUMBER:
S-414

SHEET: OF

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42x30 PLOT SHEET

STRUCTURAL COLUMN SCHEDULE

ELEV. MACHINE RM	331' - 11" PENTHOUSE ROOF	325' - 10" ROOF	313' - 0" LEVEL 4	298' - 0" LEVEL 3	283' - 0" LEVEL 2	268' - 0" LEVEL 1	253' - 0"	Column Locations
			W14x159				BP2 [249' - 3"] DL = 310 LL = 335 S = 35 WL = ±10 EQ = ±10	H-5
			W14x233	W14x233	W14x233	24 x 24		
				W14x176		20 x 20	BP2 [249' - 3"] DL = 105 LL = 85 S = 0 WL = ±10 EQ = ±10	H-5.6
			SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	30x22	BP4 [249' - 3"] DL = 260 LL = 420 S = 30 WL = ±10 EQ = ±105	H-6
			SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	30x22	BP4 [249' - 3"] DL = 250 LL = 400 S = 30 WL = ±10 EQ = ±10	H-6.5
			SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	30x22	BP4 [249' - 3"] DL = 250 LL = 400 S = 30 WL = ±10 EQ = ±10	H-7
			SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	30x22	BP4 [249' - 3"] DL = 250 LL = 400 S = 30 WL = ±10 EQ = ±10	H-7.5
			SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	30x22	BP4 [249' - 3"] DL = 250 LL = 400 S = 30 WL = ±10 EQ = ±10	H-8
			SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	30x22	BP4 [249' - 3"] DL = 250 LL = 400 S = 30 WL = ±10 EQ = ±10	H-8.5
			SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	30x22	BP4 [249' - 3"] DL = 250 LL = 400 S = 30 WL = ±10 EQ = ±10	H-9
			SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	30x22	BP4 [249' - 3"] DL = 250 LL = 400 S = 30 WL = ±10 EQ = ±10	H-9.5
			SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	30x22	BP4 [249' - 3"] DL = 250 LL = 400 S = 30 WL = ±10 EQ = ±10	H-10
			SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	30x22	BP4 [249' - 3"] DL = 250 LL = 450 S = 30 WL = ±10 EQ = ±25	H-10.5
			SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	30x22	BP4 [249' - 3"] DL = 250 LL = 450 S = 20 WL = ±10 EQ = ±25	H-11
			SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	SEE MOMENT FRAME ELEVATION	30x22	BP4 [249' - 3"] DL = 200 LL = 210 S = 20 WL = ±10 EQ = ±75	H-12
			W14x159	W14x159	W14x233	24 x 24	BP2 [249' - 3"] DL = 130 LL = 165 S = 20 WL = ±10 EQ = ±10	H-12.4
				L3x4x5/16 SLBB	L3x4x5/16 SLBB	HSS6x0.500	BP1 [249' - 3"]	
				HSS6x0.500				
			W14x159			W14x233	BP2 [249' - 3"] DL = 110 LL = 60 S = 10 WL = ±10 EQ = ±10	H-13
						36 1/4x29		
						HSS6x0.500	BP1 [249' - 3"]	
					Pipe4XS	Pipe4XS		
			HSS5x0.500					

H(7' - 0 1/4")-4.4(-0' - 11 1/4")

H(2' - 9")-4.7(2' - 7")

H(3' - 1")-12.4(2' - 3 3/4")

H(3' - 11 1/4")-12.4(1' - 3 3/4")

H(-3' - 8 1/2")-12.4(2' - 3 3/4")

H(3' - 1")-13(-2' - 2")

H(3' - 10 1/2")-13

H(-3' - 8 5/8")-13(-2' - 2")

PC-4

SEE FIG-510 FOR REINF INFORMATION

24X24 COLUMN ENCASEMENT (TYP), UON.

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

CHA

LERA Consulting Structural Engineers

CERTIFICATE OF AUTHORIZATION #: 0021131

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REGISTRATION EXPIRES: 08/31/2027

CONTRACT: CONSTRUCTION

TITLE: Provide Testing Laboratory, Building 14

LOCATION: DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT: New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: ESM

DRAWN BY: YT

FIELD CHECK:

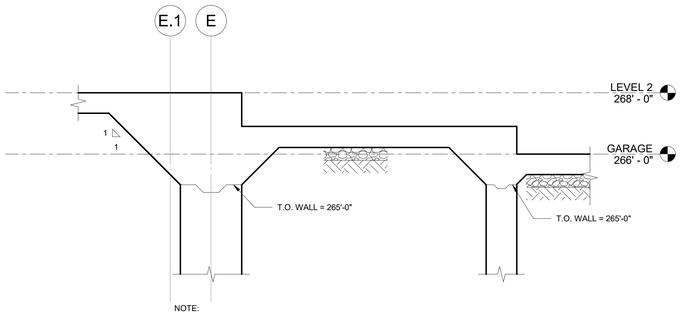
APPROVED:

SHEET TITLE: COLUMN SCHEDULE

DRAWING NUMBER: S-415

SHEET: OF

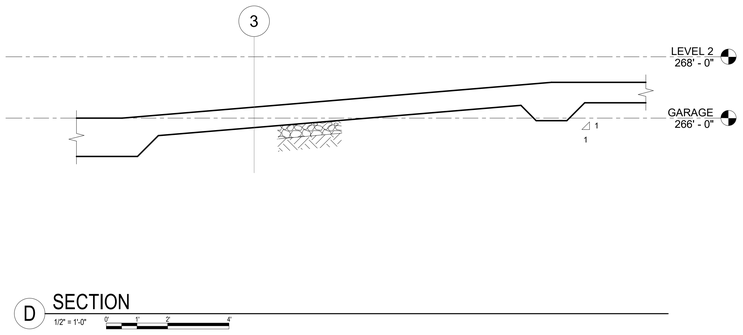
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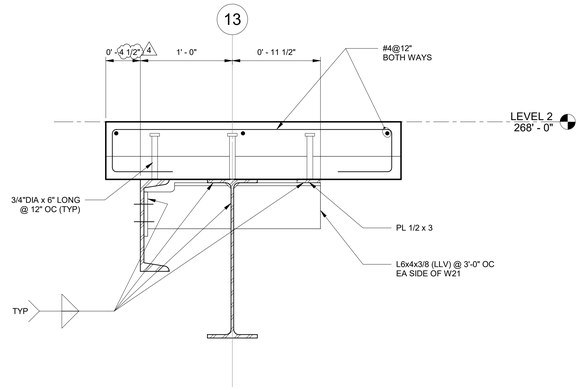
NOTE:

S-471 FOR WALL REINFORCEMENT.

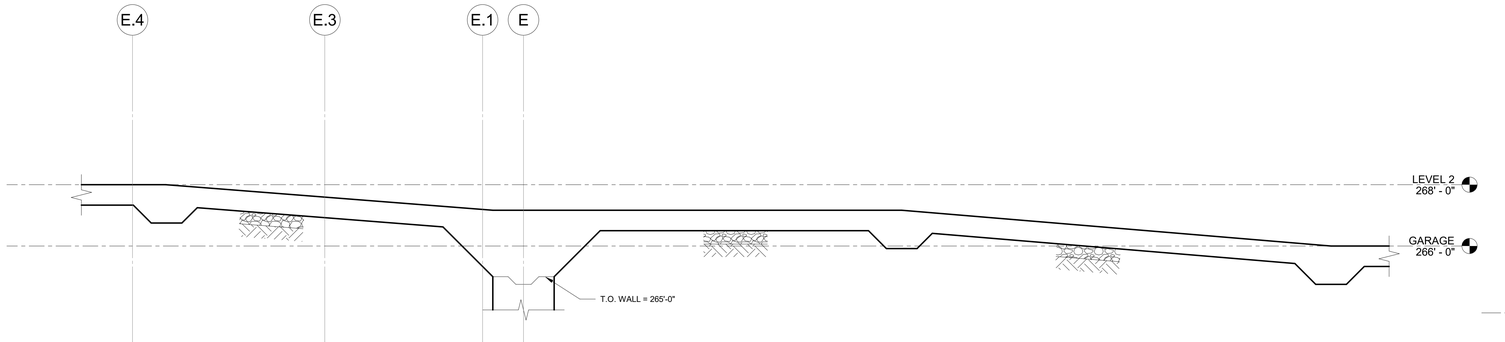
E SECTION
1/2" = 1'-0"



D SECTION
1/2" = 1'-0"



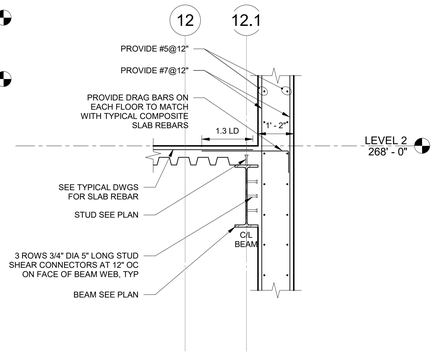
A SECTION
1 1/2" = 1'-0"



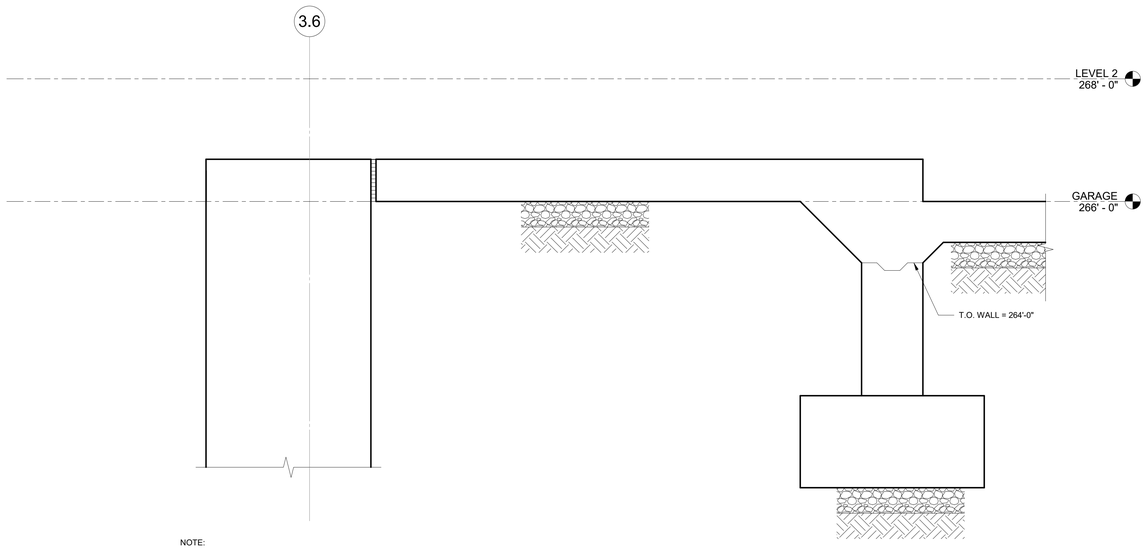
NOTE:

SEE S-471 FOR WALL REINFORCEMENT.

F SECTION
1/2" = 1'-0"



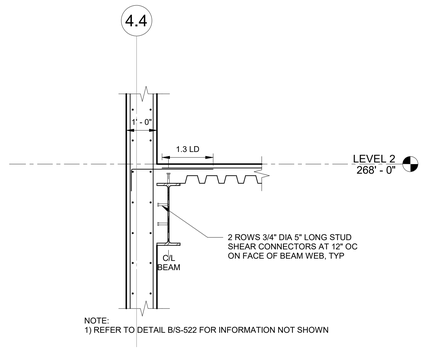
B TYPICAL SLAB TO SHEAR WALL CONNECTION ALONG GRID LINE 12.1
1/2" = 1'-0"



NOTE:

S-471 FOR WALL REINFORCEMENT.

G SECTION
1" = 1'-0"



NOTE:
1) REFER TO DETAIL B/S-522 FOR INFORMATION NOT SHOWN

C TYPICAL SLAB TO SHEAR WALL CONNECTION ALONG GRID LINE 4.4
1/2" = 1'-0"

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

CHA

LERA
Consulting Structural Engineers

CERTIFICATE OF AUTHORIZATION #: 0021131

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STATE OF NEW YORK
ELIAS SULEIMAN MATAR
072337
LICENSED PROFESSIONAL ENGINEER

REGISTRATION EXPIRES:
08/31/2027

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

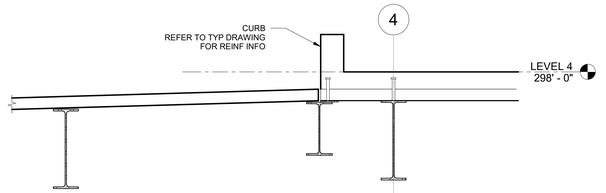
PROJECT NUMBER: 47528-C
DESIGNED BY: ESM
DRAWN BY: YT
FIELD CHECK: Checker
APPROVED: Approver

SHEET TITLE:
LEVEL 2 SECTIONS AND DETAILS

DRAWING NUMBER:
S-522

SHEET: OF

Autodesk Docs://47528 DOT Lab Building/082990_OGS-DOT-Lab_LERA_STRUC_R23.rvt
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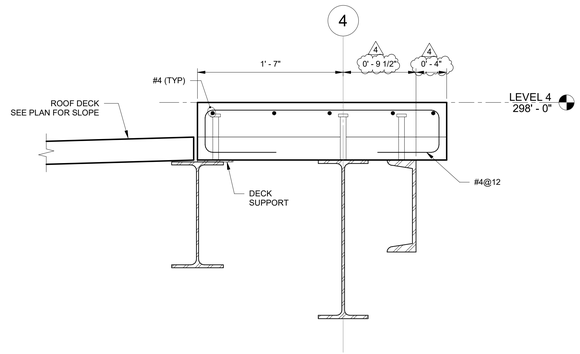


NOTE:

1. SEE ARCH DWGS FOR SLAB EDGE EXTENT AND CURB DIMENSION INFORMATION.

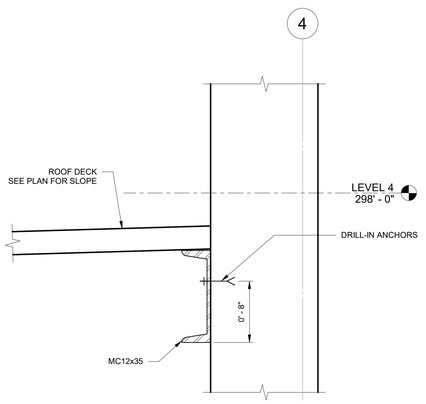
A SECTION

3/4" = 1'-0"



B S-540 DETAIL B

1 1/2" = 1'-0"



C SECTION

1 1/2" = 1'-0"

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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STATE OF NEW YORK · ELIAS SULEIMAN KHATAR · LICENSED PROFESSIONAL ENGINEER · 072337

REGISTRATION EXPIRES:
08/31/2027

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: ESM
DRAWN BY: YT
FIELD CHECK: Checker
APPROVED: Approver

SHEET TITLE:

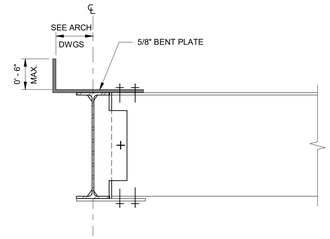
LEVEL 4 SECTIONS AND DETAILS

DRAWING NUMBER:

S-540

SHEET: OF

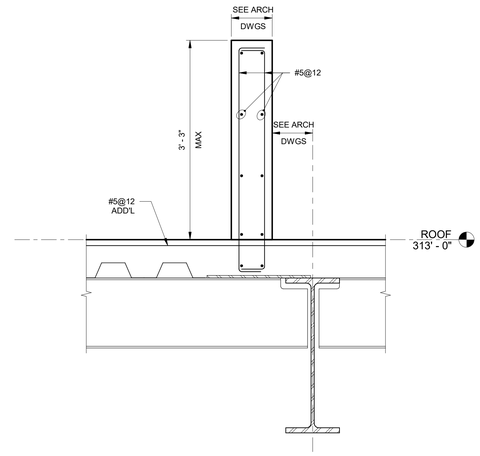
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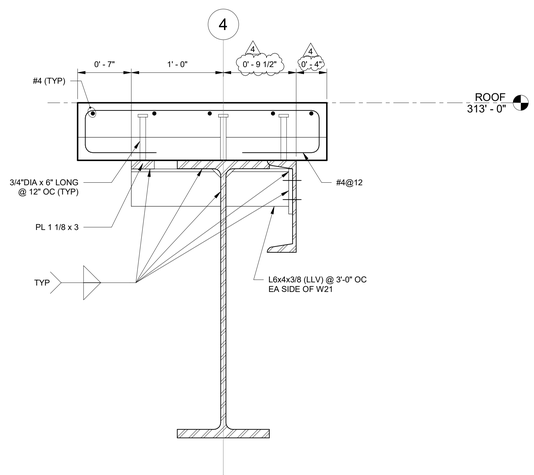
NOTES:

1. EXTENDED SHEAR TAB, WELDS, BOLTS AND OTHER CXN INFORMATION NOT SHOWN SHALL BE DESIGNED FOR PRESCRIBED FORCES SHOWN IN PLAN.
2. SLABS ON METAL DECK/ROOF DECK AND OTER INFORMATION NOT SHOWN FOR CLARITY.
3. DESIGN CONNECTION FOR 10 KIP*FT OF COLUMN MAJOR AXIS MOMENT.
4. DESIGN CONNECTION FOR LRFD 20 KIPS HORZONTAL SHEAR.

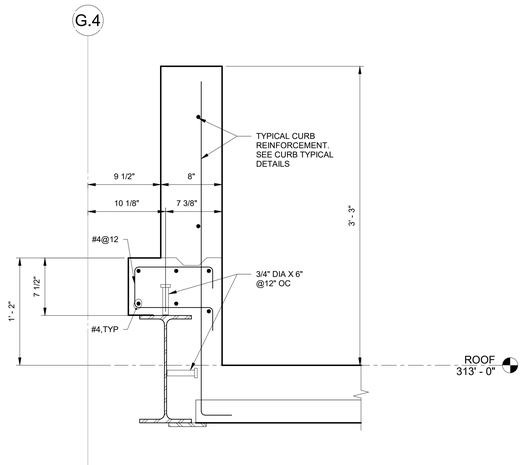
C TYPICAL GARAGE ROOF HIGH PERIMETER DETAIL
1" = 1'-0"



A SECTION
1" = 1'-0"



F SECTION
1 1/2" = 1'-0"



E SECTION
1 1/2" = 1'-0"

Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

CHA

LERA
Consulting Structural Engineers
CERTIFICATE OF AUTHORIZATION #: 0021131

UNIFORM CODE STATEMENT:
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ENERGY CODE WRITTEN STATEMENT:
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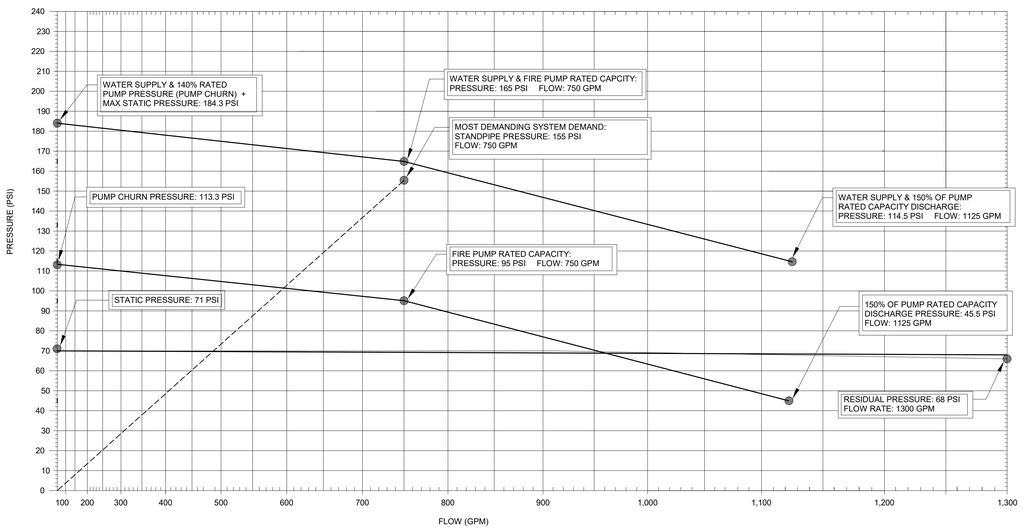
DESIGNED BY: ESM
DRAWN BY: YT
FIELD CHECK: Checker
APPROVED: Approver

SHEET TITLE:
ROOF SECTIONS AND DETAILS

DRAWING NUMBER:
S-550

SHEET: OF

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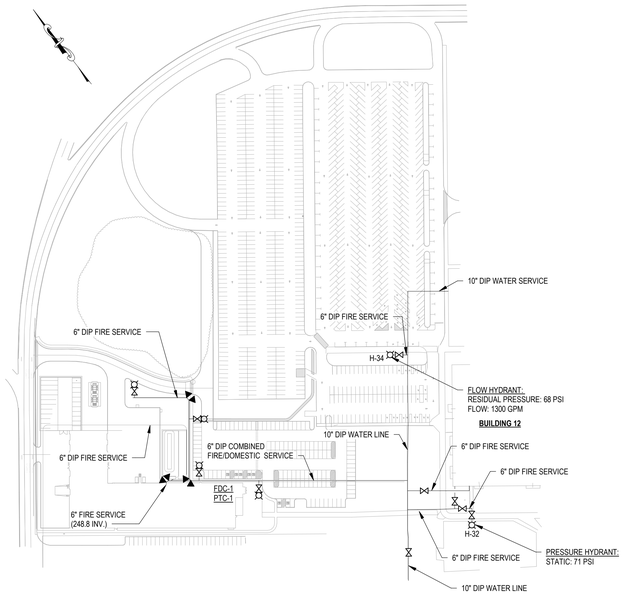


2 FIRE PROTECTION WATER SUPPLY DATA

12" = 1'-0"

WATER SUPPLY DATA GENERAL NOTES:

1. HYDRANT FLOW TEST PERFORMED ON FEBRUARY 16, 2023 AND MARCH 25, 2023. FLOW HYDRANT #34 RESULTED IN 71 PSI STATIC PRESSURE READING. PRESSURE HYDRANT #32 RESULTED IN 68 PSI RESIDUAL PRESSURE AT 1300 GPM. CONTRACTOR SHALL PERFORM A CURRENT FIRE-HYDRANT FLOW TEST IF THE RECORD FLOW TEST DATA ON THE CONTRACT DOCUMENTS IS NOT WITHIN THE 12 MONTH PERIOD TO START PREPARING THE SHOP DRAWINGS AS PER NFPA 13. PRESENT FIRE-HYDRANT FLOW TESTS SHALL BE PERFORMED AS PER NFPA 291. REFER TO NYSOGS SE341 WATER DISTRIBUTION MASTER PLAN APRIL 2024.
2. HYDRANTS USED IN PERFORMING FLOW TEST ARE INDICATED ON HYDRAULIC PLOT PLAN ON THIS DRAWING.
3. OBTAIN ALL CURRENT HYDRAULIC DATA AND PERFORM HYDRAULIC CALCULATIONS TO SIZE SPRINKLER SYSTEM AND FIRE PUMP. FIRE PUMP DISCHARGE CURVE INDICATED ON THIS DRAWING IS SHOWN FOR BIDDING PURPOSES ONLY. CONFIRM AVAILABLE PRESSURE AND FLOW IN THE FIELD AND SUBMIT RESULTS TO DIRECTOR'S REPRESENTATIVE. IF AVAILABLE PRESSURE DEVIATES FROM ANTICIPATED WATER SUPPLY DATA, SUBMIT UPDATED HYDRAULIC CALCULATIONS AND PROVIDE ANY SYSTEM MODIFICATIONS AS NECESSARY TO MAINTAIN PRESSURE SAFETY MARGIN OF 10 PERCENT.
4. FIRE PUMP SHALL BE SELECTED BY SPRINKLER SYSTEM AND STANDPIPE SYSTEM DEMAND DOWNSTREAM OF FIRE PUMP DISCHARGE FLANGE. HOSE STREAM ALLOWANCE SHALL NOT BE INCLUDED IN SYSTEM DEMAND DURING FIRE PUMP SELECTION. HYDRANTS ARE NOT FED FROM FIRE PUMP. HOSE STREAM ALLOWANCE IS REQUIRED TO BE ACCOUNTED FOR IN AVAILABLE PUMP SUCTION PRESSURE.



1 HYDRAULIC PLOT PLAN

12" = 1'-0"

GENERAL FIRE PROTECTION NOTES:

1. THE DESIGN DOCUMENTS (DRAWINGS AND SPECIFICATIONS) FOR THE SPRINKLER SYSTEM TO BE INSTALLED IN THIS PROJECT IDENTIFY PERFORMANCE REQUIREMENTS AND DESIGN INTENT ONLY. SPRINKLER HEAD LOCATIONS ARE INDICATED FOR BIDDING AND COORDINATION PURPOSES. PROVIDE ANY AND ALL ADDITIONAL PIPING, SPRINKLER HEADS, ECT., AS REQUIRED FOR A COMPLETE AND CODE COMPLIANT SYSTEM. PIPE SIZES INDICATED ON THE DRAWINGS ARE FOR REFERENCE ONLY. ACTUAL PIPE SIZES SHALL BE DETERMINED BY CONTRACTOR'S HYDRAULIC CALCULATIONS AND DESIGN. PROVIDE HYDRAULICALLY DESIGNED AND CODE COMPLIANT SYSTEM PREPARED, SIGNED AND STAMPED BY MINIMUM NICET III CERTIFICATION AND SIGNED AND STAMPED BY LICENSED FIRE PROTECTION ENGINEER IN NEW YORK STATE OR HYDRAULICALLY DESIGNED AND CODE COMPLIANT SYSTEM PREPARED, SIGNED AND STAMPED BY LICENSED FIRE PROTECTION ENGINEER IN NEW YORK STATE.
2. THE FIRE SPRINKLER SYSTEMS INCLUDED IN THIS PROJECT SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH NYS UNIFORM FIRE PREVENTION AND BUILDING CODE TO INCLUDE: 2020 BUILDING CODE OF NEW YORK STATE, 2020 FIRE CODE OF NEW YORK STATE, NFPA 20 (2016) "STANDARD FOR THE INSTALLATION OF STATIONARY PUMPS FOR FIRE PROTECTION," NFPA 14 (2016) "STANDARD FOR THE INSTALLATION OF STANDPIPE AND HOSE SYSTEMS," AND NFPA 13 (2016) "STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS."
3. COORDINATE WITH, BUT NOT LIMITED TO, THE FOLLOWING: BUILDING STRUCTURE, CEILINGS, WALLS, FLOORS, POWER, TELEPHONE, DATA, SECURITY, PLUMBING, AND HVAC SYSTEMS AND APPURTENANCES. MAKE ALL NECESSARY MODIFICATIONS INCLUDING ALL MATERIAL AND LABOR NECESSARY TO COORDINATE WITH THE CONSTRUCTION AT NO ADDITIONAL COST.
4. OBTAIN APPROVAL OF THE SYSTEM FROM THE DIRECTOR'S REPRESENTATIVE, THE LOCAL FIRE DEPARTMENT AND THE AUTHORITY HAVING JURISDICTION. ANY WORK DEEMED NECESSARY TO OBTAIN APPROVAL FROM THE DIRECTOR'S REPRESENTATIVE, THE FIRE DEPARTMENT AND THE AUTHORITY HAVING JURISDICITON SHALL BE COMPLETED AT NO ADDITIONAL COST TO THE STATE.
5. DEVELOP SPRINKLER SHOP DRAWINGS PRIOR TO THE INSTALLATION OF WORK. ANY WORK INSTALLED PRIOR TO THE DIRECTOR'S REPRESENTATIVE REVIEW AND APPROVAL OF SHOP DRAWINGS AND HYDRAULIC CALCULATIONS IS TO BE DONE AT THE CONTRACTOR'S RISK. PROVIDE ANY CHANGES REQUIRED FOR DIRECTOR'S REPRESENTATIVE APPROVAL AT NO ADDITIONAL COST TO THE STATE.
6. DRAWINGS ARE DIAGRAMMATIC IN NATURE AND DO NOT SHOW EVERY SPRINKLER HEAD, PIPE, FITTING, VALVE ETC., NECESSARY FOR A COMPLETE SYSTEM. FIELD VERIFY EXISTING CONDITIONS AND REVIEW DESIGN DRAWINGS OF ALL TRADES FOR COORDINATION PURPOSES. INCORPORATE ALL NECESSARY MODIFICATIONS NEEDED FOR COORDINATION IN FINAL DESIGN AT NO ADDITIONAL COST.
7. FIELD VERIFY PIPE ROUTING THROUGH EXISTING CONSTRUCTION AND MAKING ALL NECESSARY ADJUSTMENTS AT NO ADDITIONAL COST.
8. CONCRETE FLOORS MUST BE PROTECTED DURING PIPE CUTTING/REAMING FOR CONNECTION TO PREVENT OIL STAINS. ALL LIFTS SHALL UTILIZE DIAPERS. TIRES SHALL BE WHITE NON-SKID.
9. PROVIDE CUTTING AND PATCHING OF WALLS AND FLOORS 8" AND UNDER. CUTTING AND PATCHING OF WALLS AND FLOORS ABOVE 10" PROVIDED BY CONTRACTOR.
10. OBTAIN ALL CERTIFICATION SUBMITTED AS SUBMITTALS. (1) WELDING CERTIFICATES. (2) CERTIFICATION THAT CONTRACTOR IS APPROVED FOR INSTALLATION BY THE FIRE STOPPING AND SMOKE SEAL MANUFACTURER. (3) CERTIFICATION OF NICET LEVEL III DESIGNER FOR "WATER-BASED FIRE PROTECTION LAYOUT".
11. PROVIDE UL LISTED AND/OR FACTORY MUTUAL APPROVED FIRE PROTECTION MATERIALS AND EQUIPMENT.
12. ALL PIPING 2" AND SMALLER TO BE SCHEDULE 40 PIPE WITH THREADED ENDS AND CAST-IRON FITTINGS. ALL PIPING 2-1/2" AND LARGER TO BE SCHEDULE 40 PIPE WITH ROLL-GROOVED FITTINGS AND COUPLINGS. WET SPRINKLER SYSTEM PIPING TO BE BLACK STEEL.
13. SPRINKLER PIPING SHALL BE LOCATED ABOVE SUSPENDED CEILINGS UNLESS INDICATED OTHERWISE.
14. PITCH ALL PIPING BACK TO SUPPLY MAIN WHERE POSSIBLE. ALL BRANCHLINE PIPING TO BE PITCHED 1/2" PER 10 FT. ALL MAIN PIPING TO BE PITCHED 1/4" PER 10FT. PROVIDE AUXILIARY DRAINS ON TRAPPED SECTIONS OF PIPE PER NFPA 13. COORDINATE DRAIN LOCATIONS WITH DIRECTOR'S REPRESENTATIVE.
15. SPRINKLER HEADS SHALL BE FIELD COORDINATED WITH CEILING FINISH. DRAWINGS INDICATE TYPE OF HEAD REQUIRED. WHERE ACTUAL CONDITIONS VARY, INSTALL THE APPROPRIATE HEAD (IE; CONCEALED PENDENT HEADS IN SUSPENDED CEILINGS) AT NO ADDITIONAL COST TO STATE.
16. SPRINKLER HEADS LOCATED IN ACOUSTIC CEILING TILES SHALL BE LOCATED IN THE CENTER OF THE TILE FOR 24"x24" AND 48"x48" TILES AND AT THE 1/3 OR 1/2 POSITION OF 24"x48" TILES.
17. PITCH ALL PIPING BACK TO SUPPLY MAIN WHERE POSSIBLE. PROVIDE AUXILIARY DRAINS ON TRAPPED SECTIONS OF PIPE PER NFPA 13. COORDINATE DRAIN LOCATIONS WITH THE STATE.
18. PROVIDE ARMOVERS FOR ALL PENDENT HEADS.
19. COORDINATE STAGING AND WORK AREAS WITH DIRECTOR'S REPRESENTATIVE.
20. COORDINATE FIRE DEPARTMENT CONNECTION THREAD TYPE AND SIZE WITH LOCAL FIRE DEPARTMENT.
21. PIPING SHALL NOT BE ROUTED OVER ELECTRICAL EQUIPMENT INCLUDING PANEL BOARDS.
22. SYSTEM MAIN DRAINS SHALL BE ROUTED AND PIPED TO EXTERIOR OF BUILDING. DRAINS SHALL TERMINATE AS INDICATED. PROVIDE SPLASH BLOCK.
23. PROVIDE ALL TAMPER SWITCHES REQUIRED FOR A COMPLETE AND FULLY FUNCTIONAL SYSTEM. REFER TO E-DWGS FOR WIRING OF DEVICES.
24. INSTALLATION OF ALL ELECTRICAL COMPONENTS OF THE FIRE SPRINKLER SYSTEM INCLUDING BUT NOT LIMITED TO: TAMPER SWITCHES, PRESSURE SWITCHES, FIRE PUMP CONTROL PANELS, JOCKEY PUMP CONTROL PANELS, WIRING, CONDUIT, AND ALL CONNECTIONS SHALL BE INSTALLED IN ACCORDANCE WITH NFPA 70 THE NATIONAL ELECTRICAL CODE (2017) AND NFPA 72 THE NATIONAL FIRE ALARM CODE (2016).
25. PROVIDE A TEST AND MATERIALS CERTIFICATE FOR ABOVE GROUND PIPING UPON COMPLETION OF WORK. PROVIDE A CONTRACTOR'S TEST AND MATERIALS CERTIFICATE FOR BELOW GROUND PIPING UPON COMPLETION OF WORK. PROVIDE CONTRACTOR'S MATERIAL AND TEST CERTIFICATE FOR FIRE PUMP SYSTEMS AND CENTRIFUGAL FIRE PUMP ACCEPTANCE TEST FORM. ALSO CONTRACTOR'S MATERIAL AND TEST CERTIFICATE FOR ABOVEGROUND PIPING FOR STANDPIPE SYSTEMS IN ACCORDANCE WITH NFPA 14.
26. SHALL PROVIDE ALL SIGNS AND TAGS REQUIRED BY NFPA 13 (2016). SIGNS, TAGS, WIRES, CHAINS OR OTHER APPROVED MEANS SHALL BE STEEL WITH VITREOUS ENAMEL FINISH, LETTERING ON CONTRASTING BACKGROUND. PROVIDE SIGNS AND TAGS INCLUDING BUT NOT LIMITED TO THE FOLLOWING: HYDRAULIC DESIGN INFORMATION SIGN, GENERAL INFORMATION SIGN, SIGNS INDICATING THE FUNCTION OF TEST, CONTROL VALVES IDENTIFYING THE PORTION OF THE BUILDING SERVED AND DRAIN VALVES.

TESTING PROCEDURE:

1. WET PIPE SPRINKLER SYSTEM SHALL BE HYDROSTATICALLY TESTED AT 200 PSI AND SHALL MAINTAIN THAT PRESSURE WITHOUT LOSS FOR 2 HOURS.
2. DRY PIPE SPRINKLER SYSTEM SHALL BE HYDROSTATICALLY TESTED AT 200 PSI AND SHALL MAINTAIN THAT PRESSURE WITHOUT LOSS FOR 2 HOURS. IN ADDITION TO THE STANDARD HYDROSTATIC TEST, THE SYSTEM MUST BE TESTED WITH AN AIR PRESSURE LEAKAGE TEST AT 40 PSI THAT SHALL BE CONDUCTED FOR 24 HOURS AND WATER DELIVERY TESTING PER NFPA 13 (2016) SECTIONS 25.2.1, 25.2.2., AND 25.2.3.2. ANY LEAKAGE THAT RESULTS IN A LOSS OF PRESSURE IN EXCESS OF 1-1/2 PSI FOR THE 24 HOURS TEST PERIOD SHALL BE CORRECTED.
3. ALL WATER DISCHARGED DURING TESTING, FLUSHING, AND OTHER PROCEDURES SHALL NOT IMPACT SITE FEATURES INCLUDING STAINING OF HARDSCAPING OR LANDSCAPING.
4. STATEMENT OF COMPLIANCE: BEFORE REQUESTING FINAL APPROVAL OF THE INSTALLATION, THE CONTRACTOR SHALL FURNISH A WRITTEN STATEMENT TO THE DIRECTOR'S REPRESENTATIVE STATING THAT THE SPRINKLER SYSTEM WORK INCLUDED IN THIS PROJECT HAS BEEN INSTALLED IN ACCORDANCE WITH THE APPROVED PLANS AND HAS BEEN TESTED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND THE APPROPRIATE INSTALLATION STANDARD. ANY DEVIATIONS FROM THE DESIGN STANDARDS SHALL BE NOTED AND COPIES OF APPROVALS FOR SUCH DEVIATIONS SHALL BE ATTACHED TO THE WRITTEN STATEMENT.

HYDRAULIC CALCULATIONS NOTES:

1. UTILIZE HYDRAULIC CALCULATION METHOD TO DETERMINE SYSTEM DEMAND AND PIPE SIZING REQUIREMENTS PER NFPA 13. MAINTAIN A 10 PERCENT PSI SAFETY MARGIN BETWEEN SYSTEM DEMAND AND AVAILABLE PRESSURE.
2. ANTICIPATED FIRE PUMP SUCTION WATER SUPPLY ON THIS DRAWING SHALL BE USED FOR BIDDING PURPOSES ONLY. OBTAIN CURRENT WATER SUPPLY DATA (I.E. PERFORM FLOW TEST) AT NO ADDITIONAL COST. IF WORKING PLAN SUBMITTAL IS NOT WITHIN 1 YEAR OF WATER SUPPLY DATA, OBTAINING CURRENT WATER SUPPLY DATA (I.E. PERFORM FLOW TEST) IS REQUIRED AT NO ADDITIONAL COST TO THE STATE.
3. PIPE SIZES: SIZE THE FIRE PROTECTION SERVICE (UNDERGROUND MAIN AND SERVICE HEADER) AS INDICATED ON THE DRAWINGS. SIZE SPRINKLER SYSTEM LOCATED DOWNSTREAM OF FIRE PUMP DISCHARGE FLANGE (SYSTEM RISERS AND ALL PIPING DOWNSTREAM OF RISERS) BASED ON CONTRACTOR'S HYDRAULIC CALCULATIONS AND DESIGN.
4. SUBMIT HYDRAULIC CALCULATIONS CONTAINING ALL INFORMATION REQUIRED BY NFPA 13 (2016) SECTION 23.3.5.6 "DETAILED WORKSHEETS" AND RELATED APPENDICES. HYDRAULIC REMOTE AREAS SHALL BE BOLDLY OUTLINED AND LABELED ON DRAWINGS.
5. PROVIDE HYDRAULIC CALCULATIONS IN "NFPA" FORMAT SIMILAR TO FIGURES(S) 23.3.5.1.2 OF NFPA 13 (2016), NO EXCEPTIONS.
6. PROVIDE HYDRAULIC PLOT PLAN WHICH SHOWS PIPING TO WATER SUPPLY DATA SOURCE. PROVIDE PIPE SIZE AND LENGTH DIMENSIONS ON PLOT PLAN. CALCULATIONS SHALL INCLUDE PRESSURE LOSS THROUGH ALL PIPING BEGINNING AT THE POINT OF WATER SUPPLY DATA.

STANDPIPE SYSTEM DESIGN CRITERIA

SYSTEM CLASS	TYPE	SERVICE	SIZE (IN)	HOSE CONNECTION SIZE (IN)	REMARKS
I	AUTOMATIC-WET	STANDPIPE	6	2-1/2	SEE NOTES BELOW

NOTE:

1. STANDPIPE SYSTEM TO BE HYDRAULICALLY CALCULATED PER NFPA 14 (2016) STANDPIPE SYSTEMS. STANDPIPE SYSTEMS SHALL BE CALCULATED TO PROVIDE 500 GPM MOST REMOTE STANDPIPE AND 250 GPM AT EACH ADDITIONAL STANDPIPE RISER. STANDPIPE SYSTEM SHALL FLOW 250 GPM AT THE MOST REMOTE 2-1/2" HOSE CONNECTION (THREE(3) TOTAL HOSE VALVES SHALL FLOW 250 GPM AT EACH HOSE VALVE). FDC-1 REQUIRES THREE(3) 2-1/2" INCH INLETS.

FIRE PROTECTION LINE-TYPES (TWO-LINE)

2" CSSP	COMBINED SPRINKLER/STANDPIPE SYSTEM PIPING (SIZE AS INDICATED)
2" DFP	DRY SPRINKLER SYSTEM PIPING (SIZE AS INDICATED)
2" DR	DRAIN PIPING (SIZE AS INDICATED)
2" (E)FP	EXISTING WET PIPE SPRINKLER SYSTEM PIPING (SIZE AS INDICATED)
2" FDC	FIRE DEPARTMENT CONNECTION PIPING (SIZE AS INDICATED)
2" FP	WET PIPE SPRINKLER SYSTEM PIPING (SIZE AS INDICATED)
2" PRE-A	PRE-ACTION SYSTEM (SIZE AS INDICATED)
2" PTC	FIRE PUMP TEST CONNECTION PIPING (SIZE AS INDICATED)
2" SP	STANDPIPE SYSTEM PIPING (SIZE AS INDICATED)
2" (R)FP	REMOVAL WET PIPE SPRINKLER SYSTEM PIPING (SIZE AS INDICATED)

FIRE PROTECTION ABBREVIATIONS

ACFM	AVERAGE CUBIC FEET PER MINUTE
AFF	ABOVE FINISH FLOOR
CL	CENTER-LINE
DIP	DUCTILE-IRON PIPE
DFP	DRY SPRINKLER SYSTEM
DN	DOWN
FCP	FIRE PROTECTION SYSTEM CONTROL PANEL
FCS	FLOOR CONTROL STATION
FDC	FIRE DEPARTMENT CONNECTION
FM	FACTORY MUTUAL
FP	FIRE PROTECTION
FS	FLOW SWITCH
FT	FEET
GA	GAUGE
GAL	GALLONS
GPM	GALLONS PER MINUTE
HP	HORSEPOWER
HV	HOSE VALVE
HYD	HYDRAULIC
HZ	HERTZ
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NPT	NATIONAL PIPE THREAD
OS&Y	OUTSIDE STEM & YOKE
PH	PHASE
PRV	PRESSURE RELIEF VALVE
PS	PRESSURE SWITCH
PSI	POUNDS PER SQUARE INCH
PTC	PUMP TEST CONNECTION
SF	SQUARE FOOT
SQ	SQUARE
TEMP	TEMPERATURE
TS	TAMPER SWITCH
TYP	TYPICAL
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE
VOLT	VOLTAGE
WFP	WET SPRINKLER SYSTEM
#	NUMBER

SPRINKLER HEAD SYMBOLS

●	UPRIGHT SPRINKLER
◉	CONCEALED PENDENT SPRINKLER
○D	DRY-BARREL RECESSED PENDENT
✕5.6	RECESSED PENDENT
●11.2	CONTROL MODEL SPECIFIC APPLICATION SPRINKLER (CMSA)
◀	HORIZONTAL SIDEWALL SPRINKLER
◀DB	DRY-BARREL HORIZONTAL SIDEWALL SPRINKLER
◀WS	PENDENT WINDOW SPRINKLER

SYMBOLS

⋈	GATE VALVE
⌑	HYDRANT
◀	THRUST BLOCK
TS	TAMPER SWITCH
PS	PRESSURE SWITCH
FS	FLOW SWITCH

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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STATE OF NEW YORK · PETER T. CLARK · 089429 · LICENSED PROFESSIONAL ENGINEER

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3	03/25/26	ADDENDUM 3
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: MJB

DRAWN BY: KMH

FIELD CHECK:

APPROVED:

SHEET TITLE: LEGEND, ABBREVIATIONS AND SYMBOLS

DRAWING NUMBER: F-001

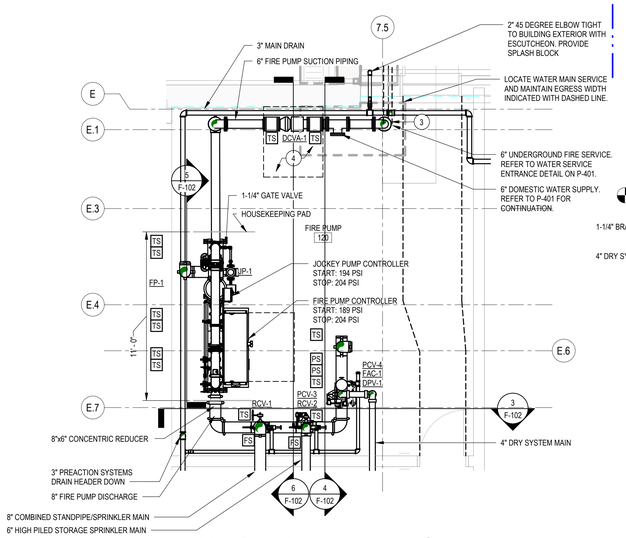
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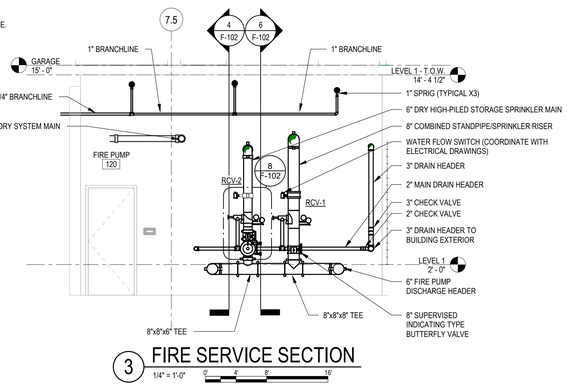
SPRINKLER SYSTEM DESIGN CRITERIA

HATCHING	SYSTEM TYPE	HAZARD CLASSIFICATION	DENSITY (GPM/SQ. FT.)	REMOTE AREA (SQ. FT.)	MAX COVERAGE AREA PER SPRINKLER (SQ. FT.)	HOSE DEMAND (GPM)	REFERENCE
	WET	LIGHT HAZARD	0.10	1500	225	100	NFPA 13 (2016)
	WET	ORDINARY HAZARD GROUP 1	0.15	1500	130	250	NFPA 13 (2016)
	WET	ORDINARY HAZARD GROUP 2	0.20	1500	130	250	NFPA 13 (2016)
	WET	EXTRA HAZARD GROUP 1	0.30	2500	100	500	NFPA 13 (2016)
	WET	EXTRA HAZARD GROUP 2	0.40	2500	100	500	NFPA 13 (2016)
	WET	TABLE 12.8.6 CLASS I-IV COMMODITIES, GROUP A PLASTICS, WOOD AND MISCELLANEOUS STORAGE UP TO 12 FT	0.20	UP TO 12 SPRINKLERS	130	250	NFPA 13 (2016) SECTION 12.8.6
	PRE-ACTION	ORDINARY HAZARD GROUP 1	0.15	1950	130	250	NFPA 13 (2016)

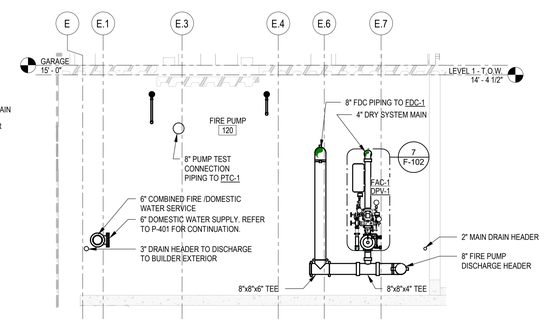
NOTES:
OWNER'S CERTIFICATE PROVIDED IN THE APPENDIX SECTION OF THE PROJECT MANUAL.



2 LEVEL 1 - FIRE PUMP ENLARGED PLAN
1/4" = 1'-0"



3 FIRE SERVICE SECTION
1/4" = 1'-0"



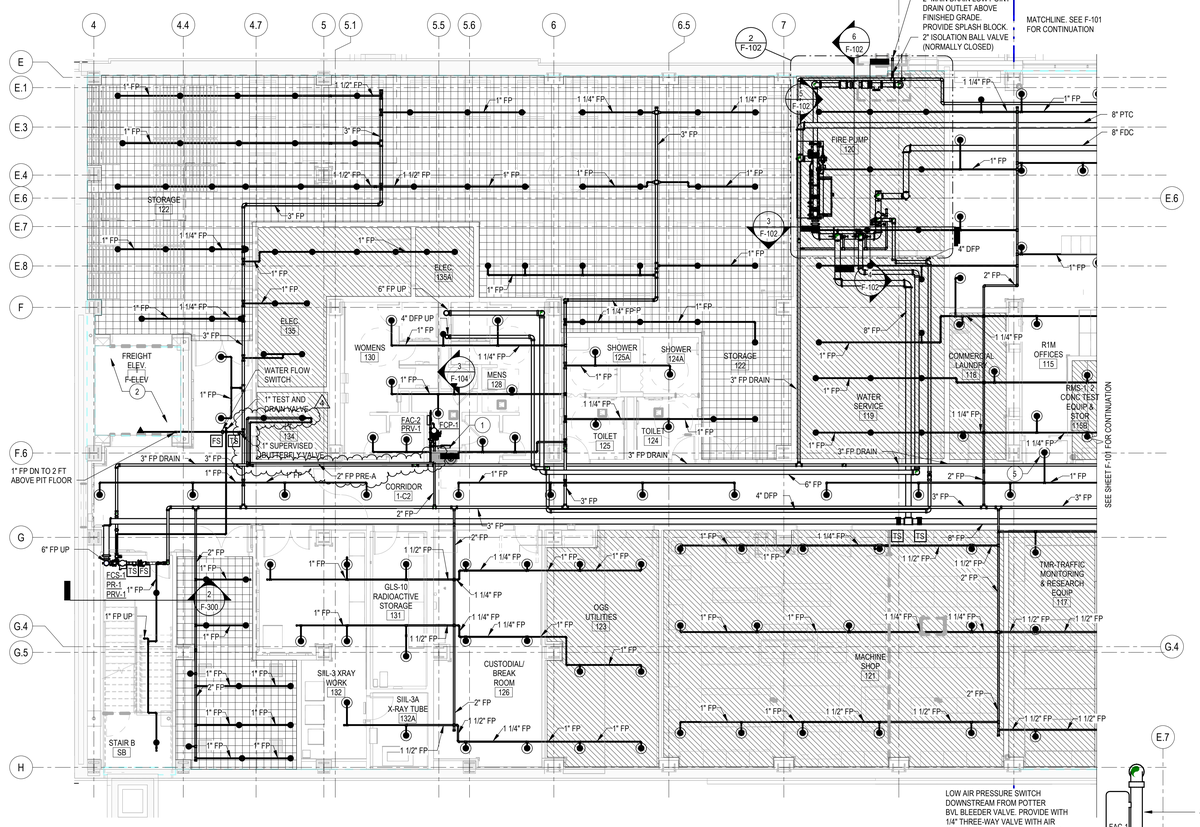
4 FIRE SERVICE SECTION 2
1/4" = 1'-0"

FIRE PROTECTION GENERAL NOTES:

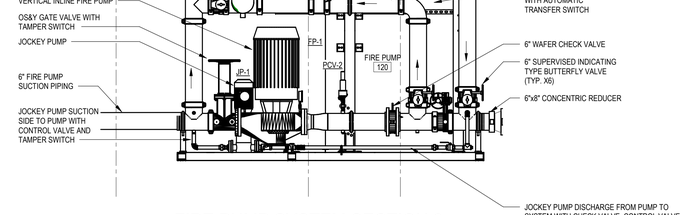
1. PROVIDE PROTECTION THROUGHOUT THE SPACES INDICATED AND IN ACCORDANCE WITH THE DESIGN CRITERIA SPECIFIED ON THIS DRAWING AND NFPA 13 (2016).
2. SPRINKLERS SHALL BE PROVIDED BENEATH ALL OBSTRUCTIONS PER NFPA 13.
3. ALL PIPING TO BE SCHEDULE 40 PIPE. ALL PIPING 1-1/2" AND SMALLER TO BE PROVIDED WITH THREADED ENDS AND CAST-IRON FITTINGS AND COUPLINGS. ALL PIPING 2" AND LARGER TO BE PROVIDED WITH ROLL-GROOVED ENDS WITH GROOVED MECHANICAL FITTINGS AND COUPLINGS. WET SPRINKLER SYSTEM PIPING TO BE BLACK STEEL PIPE.
4. SPRINKLER PIPING SHALL BE PITCHED TO DRAIN IN ACCORDANCE WITH NFPA 13.
5. ALL EXPOSED PIPE TO BE PAINTED WITH ONE COAT OF EPOXY PRIMER AND TWO FINISH COATS OF URETHANE GLASS ENAMEL. REFER TO SPECIFICATION SECTION 099103 - MECHANICAL PAINTING.
6. COORDINATE PIPING AND SPRINKLER HEAD LAYOUT WITH BUILDING STRUCTURE.
7. ALL UNFINISHED SPACES AND SPACES WITHOUT CEILINGS SHALL BE PROVIDED WITH UPRIGHT SPRINKLERS SP-2. SPRINKLERS EXPOSED TO CORROSIVE ENVIRONMENTS TO BE PROVIDED WITH CORROSION RESISTANT FINISH BY MANUFACTURER.
8. ALL FIRE PUMP DISCHARGE PIPE FITTINGS UP TO PRESSURE REDUCING VALVE ON FLOOR CONTROL STATION AND PRESSURE REDUCING HOSE VALVES TO BE CLASS 250 FITTINGS.
9. FIRE WATER SERVICE ISOLATION VALVE LOCATED IN FIRE RATED ENCLOSURE ACCESSIBLE FROM THE EXTERIOR IN ACCORDANCE WITH NFPA 24 (2016) SECTION 6.2.9.

(#) CODED NOTES:

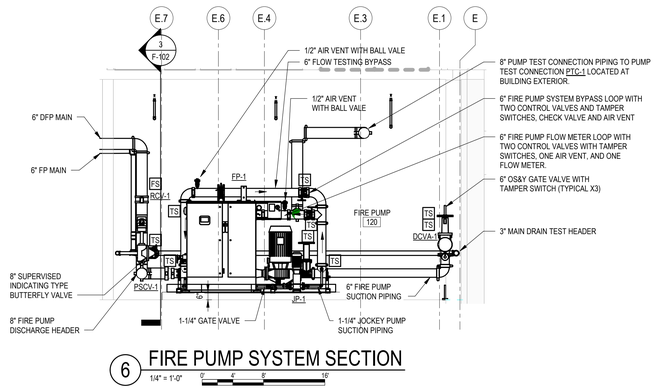
1. PROVIDE PREACTION SYSTEM CONTROL PANEL, POWER AND WIRING TO FIRE ALARM CONTROL PANEL.
2. PROVIDE HORIZONTAL SIDEWALL SPRINKLER WITHIN 2 FT OF ELEVATOR PIT. LOCATE HEAT DETECTOR WITHIN 2 FT OF SPRINKLER HEAD.
3. PROVIDE 6" UNDERGROUND WATER SERVICE THROUGH FOUNDATION WALL. REFER TO SECTION C ON SHEET S-510. PIPE INVERT = 247 FT. CONNECT TO 6" DIP PROVIDED BY SITE UTILITY LOCATED 5 FT FROM BUILDING EXTERIOR. REFER TO RISER CLAMPING DETAIL ON P-401.
4. PROVIDE 36" CLEARANCE INFRONT AND 8" CLEARANCE FROM WALL TO BACK OF DCVA-1 IN ACCORDANCE WITH NYSDOH REQUIREMENTS FOR BACKFLOW PREVENTERS.
5. PROVIDE CONCEALED PENDENT SPRINKLER WITH CUSTOM PAINTED COVER PLATE TO MATCH BENJAMIN MOORE SILVER SATIN-856. REFER TO SPRINKLER HEAD SCHEDULE ON F-501 AND INTERIOR PAINT SCHEDULE ON A-800.
6. PROVIDE SIGNAGE ON ENTRY DOOR STATING "FIRE PUMP ROOM."



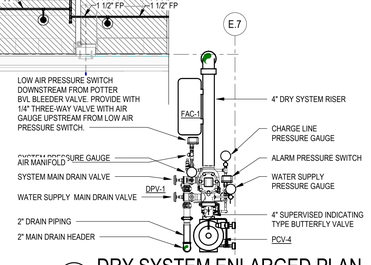
1 LEVEL 1 - FIRE PROTECTION PIPING PLAN - SECTION B
1/8" = 1'-0"



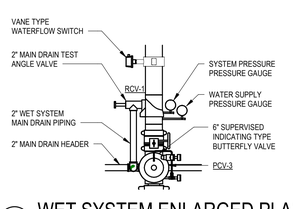
5 FIRE PUMP SYSTEM SECTION 2
1/2" = 1'-0"



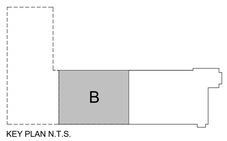
6 FIRE PUMP SYSTEM SECTION
1/4" = 1'-0"



7 DRY SYSTEM ENLARGED PLAN
1/2" = 1'-0"



8 WET SYSTEM ENLARGED PLAN
1/2" = 1'-0"



KEY PLAN N.T.S.

Autodesk Docs://47528 DOT Lab Building/082990-FIRE23-CENTRAL.rvt
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42x30 PLOT SHEET

Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

CHA



REGISTRATION EXPIRES: 07/31/2028

PROJECT NORTH

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

UNIFORM CODE STATEMENT:
TO THE BEST OF REGISTERED DESIGN PROFESSIONAL'S KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THESE PLANS AND/OR SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 UNIFORM CODE.

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WARNING:
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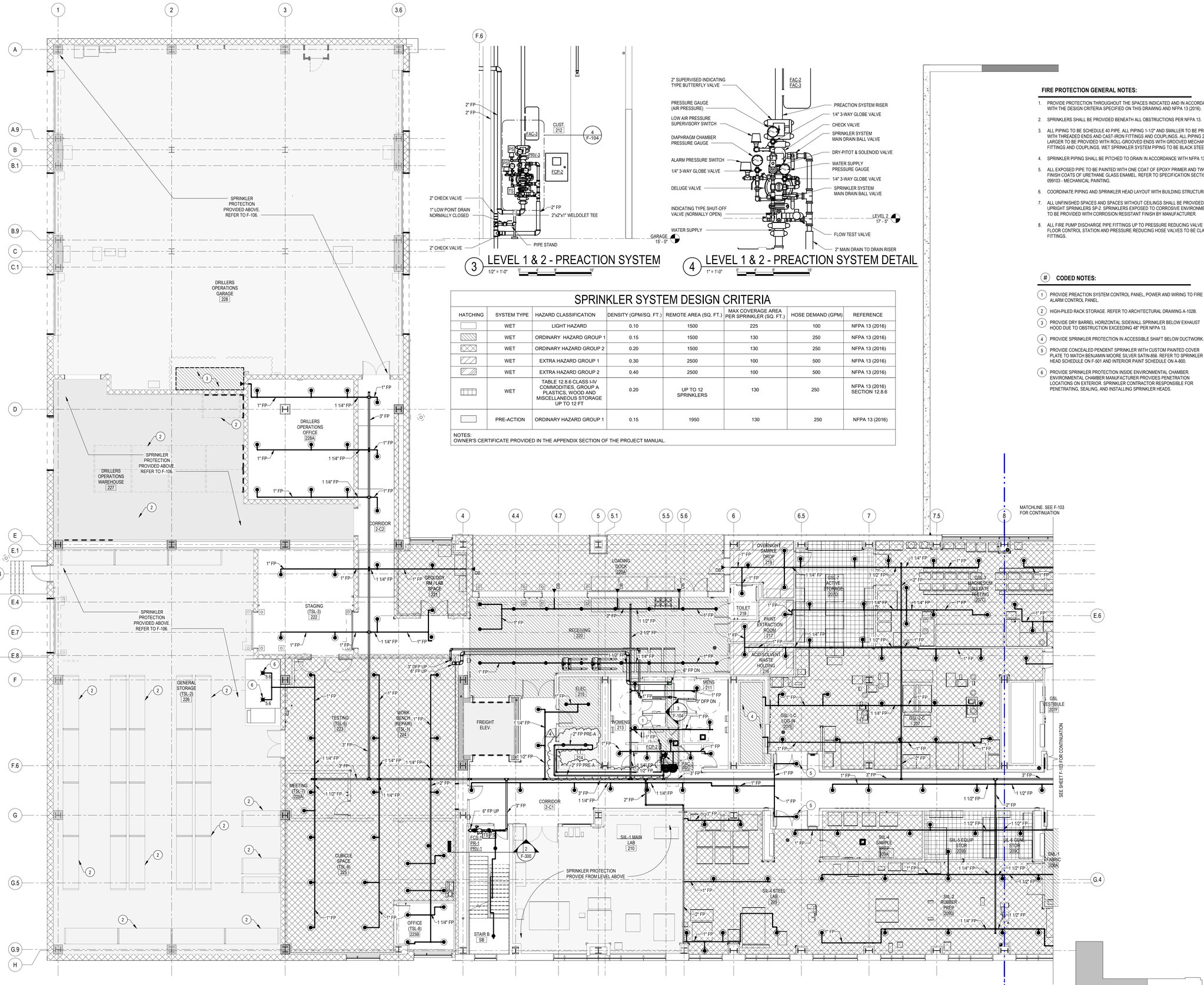
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT
MARK	DATE	DESCRIPTION

PROJECT NUMBER: 47528-C
DESIGNED BY: MJB
DRAWN BY: KMH
FIELD CHECK:
APPROVED:
SHEET TITLE:

LEVEL 1 FIRE PROTECTION PIPING PLAN - SECTION B

DRAWING NUMBER: F-102

SHEET: OF



1 LEVEL 2 - FIRE PROTECTION PIPING PLAN - SECTION B
1/8" = 1'-0"

3 LEVEL 1 & 2 - PREACTION SYSTEM
1/2" = 1'-0"

4 LEVEL 1 & 2 - PREACTION SYSTEM DETAIL
1" = 1'-0"

SPRINKLER SYSTEM DESIGN CRITERIA

HATCHING	SYSTEM TYPE	HAZARD CLASSIFICATION	DENSITY (GPM/SQ. FT.)	REMOTE AREA (SQ. FT.)	MAX COVERAGE AREA PER SPRINKLER (SQ. FT.)	HOSE DEMAND (GPM)	REFERENCE
	WET	LIGHT HAZARD	0.10	1500	225	100	NFPA 13 (2016)
	WET	ORDINARY HAZARD GROUP 1	0.15	1500	130	250	NFPA 13 (2016)
	WET	ORDINARY HAZARD GROUP 2	0.20	1500	130	250	NFPA 13 (2016)
	WET	EXTRA HAZARD GROUP 1	0.30	2500	100	500	NFPA 13 (2016)
	WET	EXTRA HAZARD GROUP 2	0.40	2500	100	500	NFPA 13 (2016)
	WET	TABLE 12.8.6 CLASS I-IV COMMODITIES, GROUP A PLASTICS, WOOD AND MISCELLANEOUS STORAGE UP TO 12 FT	0.20	UP TO 12 SPRINKLERS	130	250	NFPA 13 (2016) SECTION 12.8.6
	PRE-ACTION	ORDINARY HAZARD GROUP 1	0.15	1950	130	250	NFPA 13 (2016)

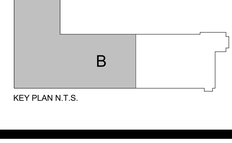
NOTES:
OWNER'S CERTIFICATE PROVIDED IN THE APPENDIX SECTION OF THE PROJECT MANUAL.

FIRE PROTECTION GENERAL NOTES:

1. PROVIDE PROTECTION THROUGHOUT THE SPACES INDICATED AND IN ACCORDANCE WITH THE DESIGN CRITERIA SPECIFIED ON THIS DRAWING AND NFPA 13 (2016).
2. SPRINKLERS SHALL BE PROVIDED BENEATH ALL OBSTRUCTIONS PER NFPA 13.
3. ALL PIPING TO BE SCHEDULE 40 PIPE. ALL PIPING 1-1/2" AND SMALLER TO BE PROVIDED WITH THREADED ENDS AND CAST-IRON FITTINGS AND COUPLINGS. ALL PIPING 2" AND LARGER TO BE PROVIDED WITH ROLL-GROOVED ENDS WITH GROOVED MECHANICAL FITTINGS AND COUPLINGS. WET SPRINKLER SYSTEM PIPING TO BE BLACK STEEL PIPE.
4. SPRINKLER PIPING SHALL BE PITCHED TO DRAIN IN ACCORDANCE WITH NFPA 13.
5. ALL EXPOSED PIPE TO BE PAINTED WITH ONE COAT OF EPOXY PRIMER AND TWO FINISH COATS OF URETHANE GLASS ENAMEL. REFER TO SPECIFICATION SECTION 099103 - MECHANICAL PAINTING.
6. COORDINATE PIPING AND SPRINKLER HEAD LAYOUT WITH BUILDING STRUCTURE.
7. ALL UNFINISHED SPACES AND SPACES WITHOUT CEILINGS SHALL BE PROVIDED WITH UPRIGHT SPRINKLERS SP-2. SPRINKLERS EXPOSED TO CORROSIVE ENVIRONMENTS TO BE PROVIDED WITH CORROSION RESISTANT FINISH BY MANUFACTURER.
8. ALL FIRE PUMP DISCHARGE PIPE FITTINGS UP TO PRESSURE REDUCING VALVE ON FLOOR CONTROL STATION AND PRESSURE REDUCING HOSE VALVES TO BE CLASS 250 FITTINGS.

(#) CODED NOTES:

1. PROVIDE PREACTION SYSTEM CONTROL PANEL, POWER AND WIRING TO FIRE ALARM CONTROL PANEL.
2. HIGH-PILED RACK STORAGE. REFER TO ARCHITECTURAL DRAWING A-102B.
3. PROVIDE DRY BARREL HORIZONTAL SIDEWALL SPRINKLER BELOW EXHAUST HOOD DUE TO OBSTRUCTION EXCEEDING 48" PER NFPA 13.
4. PROVIDE SPRINKLER PROTECTION IN ACCESSIBLE SHAFT BELOW DUCTWORK.
5. PROVIDE CONCEALED PENDENT SPRINKLER WITH CUSTOM PAINTED COVER PLATE TO MATCH BENJAMIN MOORE SILVER SATIN-856. REFER TO SPRINKLER HEAD SCHEDULE ON F-501 AND INTERIOR PAINT SCHEDULE ON A-800.
6. PROVIDE SPRINKLER PROTECTION INSIDE ENVIRONMENTAL CHAMBER. ENVIRONMENTAL CHAMBER MANUFACTURER PROVIDES PENETRATION LOCATIONS ON EXTERIOR. SPRINKLER CONTRACTOR RESPONSIBLE FOR PENETRATING, SEALING, AND INSTALLING SPRINKLER HEADS.



KEY PLAN N.T.S.

Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

CHA

UNIFORM CODE STATEMENT:
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STATE OF NEW YORK · JEFFREY R. CALKINS · 089429 · REGISTERED PROFESSIONAL ENGINEER

REGISTRATION EXPIRES: 07/31/2026

PROJECT NORTH

CONTRACT: CONSTRUCTION

TITLE: Provide Testing Laboratory, Building 14

LOCATION: DOT Region 1, Albany County State Office Building Campus Albany, NY

CLIENT: New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

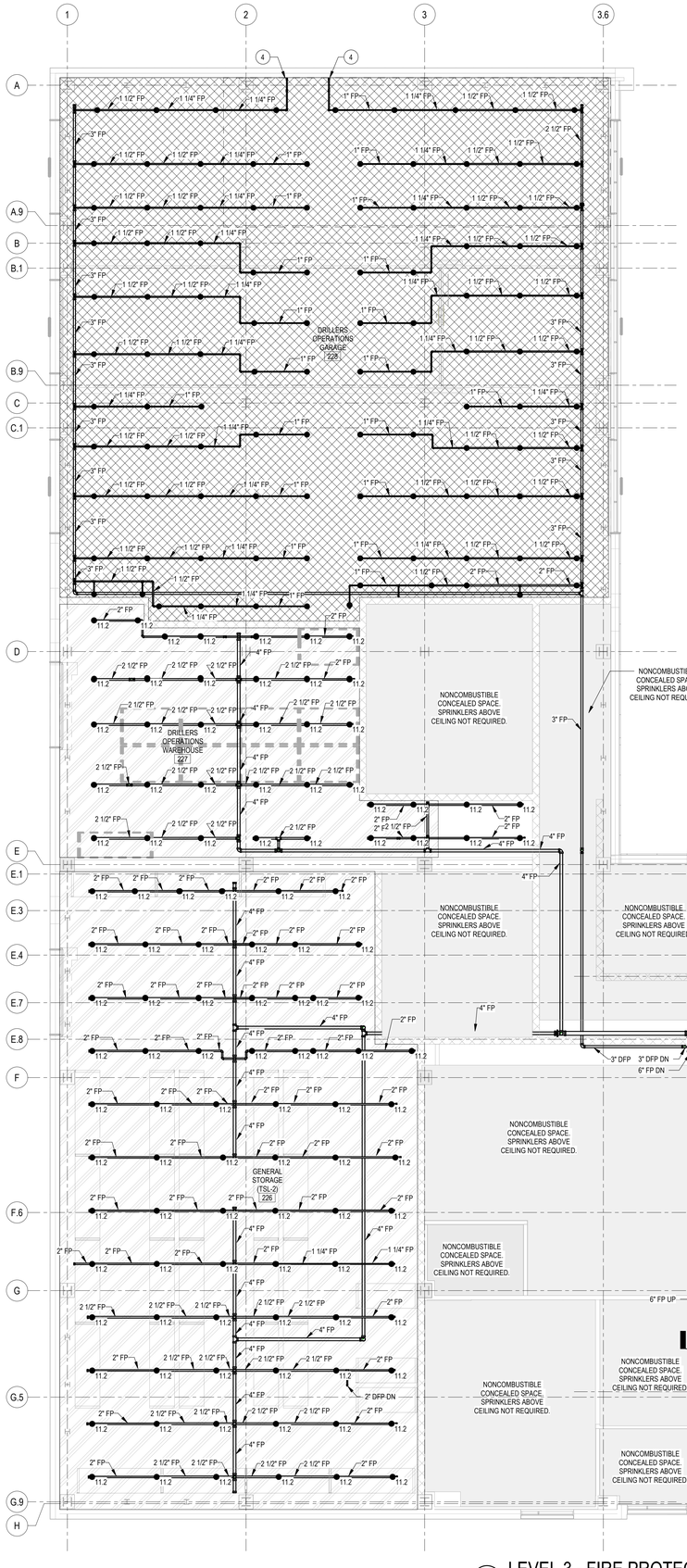
PROJECT NUMBER: 47528-C
DESIGNED BY: MJB
DRAWN BY: KMH
FIELD CHECK:
APPROVED:
SHEET TITLE:

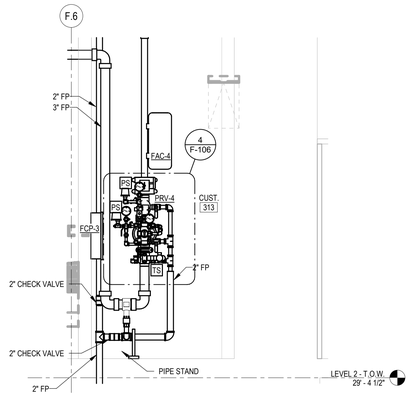
LEVEL 2 FIRE PROTECTION PIPING PLAN - SECTION B

DRAWING NUMBER: F-104

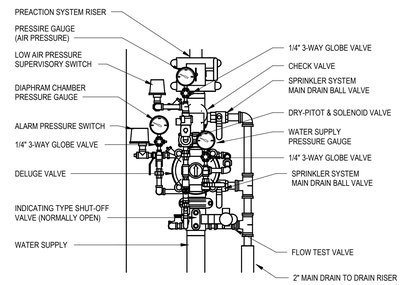
SHEET: OF

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3 LEVEL 3 - PREACTION SYSTEM
1/2" = 1'-0"



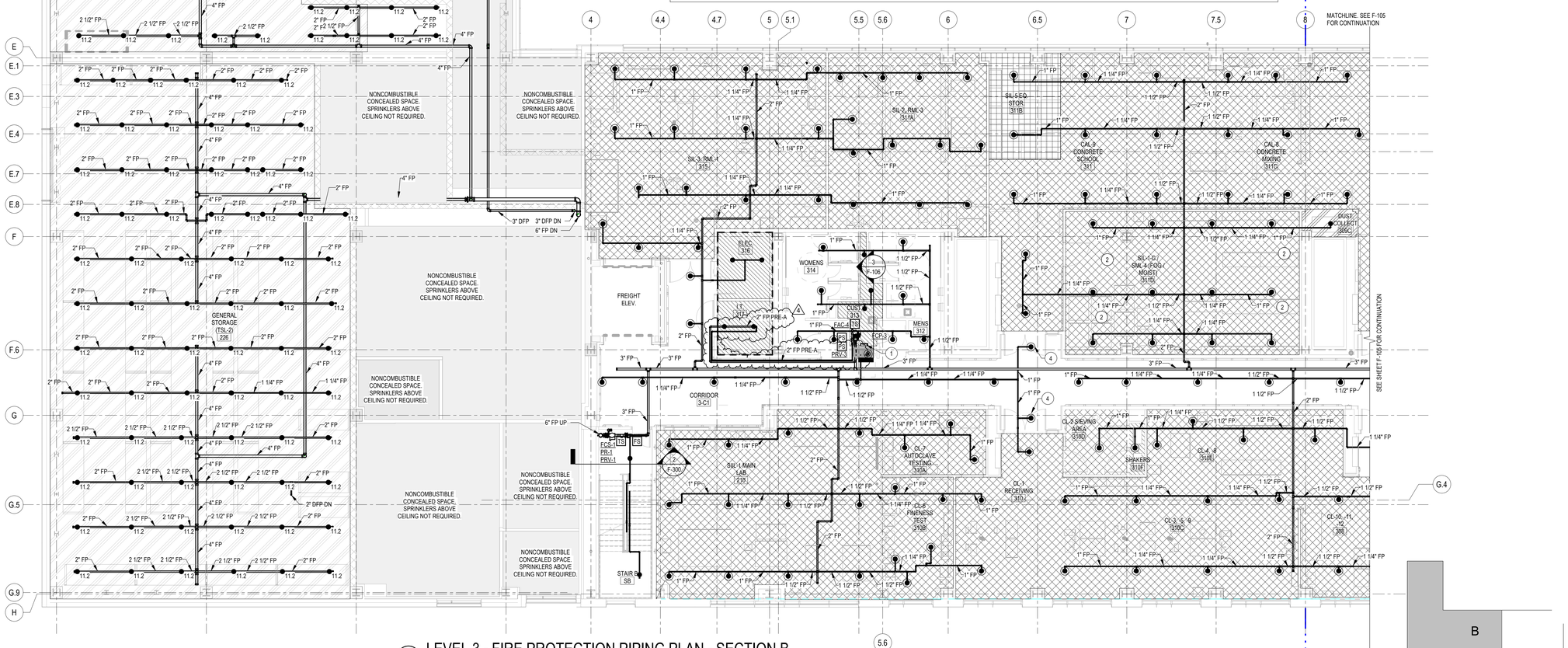
4 LEVEL 3 - PREACTION SYSTEM DETAIL
1" = 1'-0"

SPRINKLER SYSTEM DESIGN CRITERIA

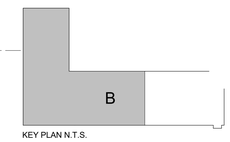
HATCHING	SYSTEM TYPE	HAZARD CLASSIFICATION	DENSITY (GPM/SQ. FT.)	REMOTE AREA (SQ. FT.)	MAX COVERAGE AREA PER SPRINKLER (SQ. FT.)	HOSE DEMAND (GPM)	REFERENCE
	WET	LIGHT HAZARD	0.10	1500	225	100	NFPA 13 (2016)
	WET	ORDINARY HAZARD GROUP 1	0.15	1500	130	250	NFPA 13 (2016)
	WET	ORDINARY HAZARD GROUP 2	0.20	1500	130	250	NFPA 13 (2016)
	WET	EXTRA HAZARD GROUP 1	0.30	2500	100	500	NFPA 13 (2016)
	WET	EXTRA HAZARD GROUP 2	0.40	2500	100	500	NFPA 13 (2016)
	DRY	LIGHT HAZARD	0.10	1500	225	100	NFPA 13 (2016)
	DRY	ORDINARY HAZARD GROUP 1	0.15	1500	130	250	NFPA 13 (2016)
	DRY	ORDINARY HAZARD GROUP 2	0.20	1950	130	250	NFPA 13 (2016)
	WET	HIGH PILED STORAGE	25 PSI MINIMUM PRESSURE	15 SPRINKLERS	100	500	NFPA 13 (2016) TABLE 16.2.2.1 CMSA. SEE NOTE 1 BELOW.
	PRE-ACTION	ORDINARY HAZARD GROUP 1	0.15	1950	130	250	NFPA 13 (2016)

NOTES:
1. COMMODITY CLASSIFICATION SHALL BE CLASSI, II, AND III. SPRINKLER SYSTEM DESIGN CRITERIA SHALL FOLLOW TABLE 16.2.2.1 CMSA SPRINKLER DESIGN CRITERIA FOR RACK STORAGE OF CLASS I THROUGH CLASS IV. MAXIMUM STORAGE HEIGHT SHALL NOT EXCEED 20 FT TO TOP OF STORAGE. MAXIMUM CEILING HEIGHT SHALL NOT EXCEED 30 FT. SPRINKLERS SHALL BE K-11.2 FED FROM A WET SYSTEM WITH A MINIMUM OPERATING PRESSURE OF 25 PSI.

2. OWNER'S CERTIFICATE PROVIDED IN THE APPENDIX SECTION OF THE PROJECT MANUAL.



1 LEVEL 3 - FIRE PROTECTION PIPING PLAN - SECTION B
1/8" = 1'-0"



KEY PLAN N.T.S.

FIRE PROTECTION GENERAL NOTES:

1. PROVIDE PROTECTION THROUGHOUT THE SPACES INDICATED AND IN ACCORDANCE WITH THE DESIGN CRITERIA SPECIFIED ON THIS DRAWING AND NFPA 13 (2016).
2. SPRINKLERS SHALL BE PROVIDED BENEATH ALL OBSTRUCTIONS PER NFPA 13.
3. ALL PIPING TO BE SCHEDULE 40 PIPE. ALL PIPING 1-1/2" AND SMALLER TO BE PROVIDED WITH THREADED ENDS AND CAST-IRON FITTINGS AND COUPLINGS. ALL PIPING 2" AND LARGER TO BE PROVIDED WITH ROLL-GROOVED ENDS WITH GROOVED MECHANICAL FITTINGS AND COUPLINGS. WET SPRINKLER SYSTEM PIPING TO BE BLACK STEEL PIPE.
4. SPRINKLER PIPING SHALL BE PITCHED TO DRAIN IN ACCORDANCE WITH NFPA 13.
5. ALL EXPOSED PIPE TO BE PAINTED WITH ONE COAT OF EPOXY PRIMER AND TWO FINISH COATS OF URETHANE GLASS ENAMEL. REFER TO SPECIFICATION SECTION 099103 - MECHANICAL PAINTING.
6. COORDINATE PIPING AND SPRINKLER HEAD LAYOUT WITH BUILDING STRUCTURE.
7. ALL UNFINISHED SPACES AND SPACES WITHOUT CEILINGS SHALL BE PROVIDED WITH UPRIGHT SPRINKLERS SP-2. SPRINKLERS EXPOSED TO CORROSIVE ENVIRONMENTS TO BE PROVIDED WITH CORROSION RESISTANT FINISH BY MANUFACTURER.
8. ALL FIRE PUMP DISCHARGE PIPE FITTINGS UP TO PRESSURE REDUCING VALVE ON FLOOR CONTROL STATION AND PRESSURE REDUCING HOSE VALVES TO BE CLASS 250 FITTINGS.

(#) CODED NOTES:

1. PROVIDE PREACTION SYSTEM CONTROL PANEL, POWER AND WIRING TO FIRE ALARM CONTROL PANEL.
2. PROVIDE CORROSION RESISTANT FINISH TO SPRINKLER HEADS, PIPING, HANGERS , ECT. IN FOG ROOMS EXPOSED TO CORROSIVE CONDITIONS.
3. PROVIDE CONCEALED PENDENT SPRINKLER WITH CUSTOM COLOR TO MATCH CORRIDOR CEILING PANEL. PROVIDE CONCEALED PENDENT SPRINKLER WITH CUSTOM COLOR TO MATCH CORRIDOR CEILING PANEL. COORDINATE CONCEALER CAP FINISH WITH A-DWGS.
4. PROVIDE DRY SYSTEM INSPECTOR'S TEST CONNECTION. REFER TO DRY SYSTEM INSPECTOR'S TEST CONNECTION DETAIL #2 ON SHEET F-500.

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

CHA

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STATE OF NEW YORK · MICHAEL R. CLARK · 089429 · LICENSED PROFESSIONAL ENGINEER

REGISTRATION EXPIRES: 07/31/2026

PROJECT NORTH

CONTRACT: CONSTRUCTION

TITLE: Provide Testing Laboratory, Building 14

LOCATION: DOT Region 1, Albany County State Office Building Campus Albany, NY

CLIENT: New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

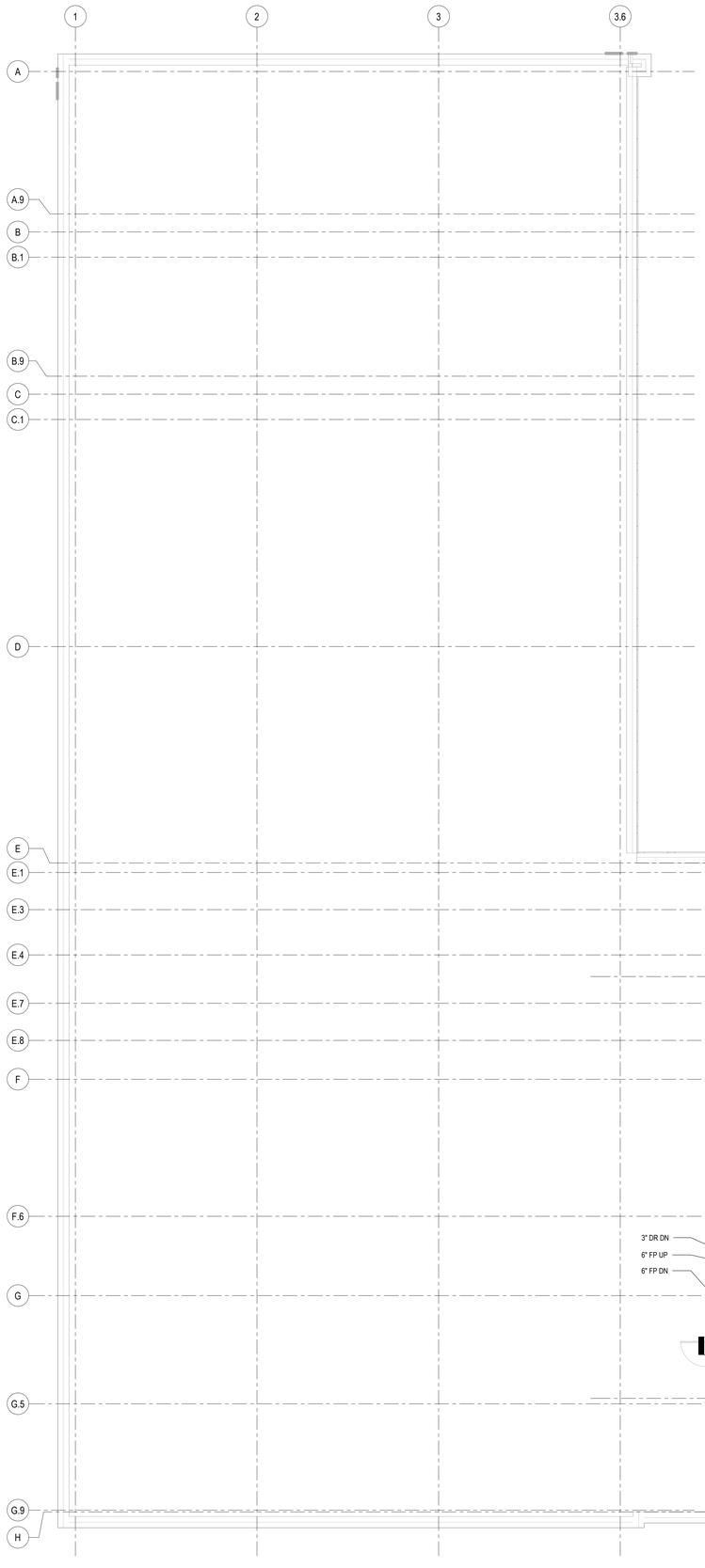
DESIGNED BY: MJB
DRAWN BY: KMH
FIELD CHECK:
APPROVED:

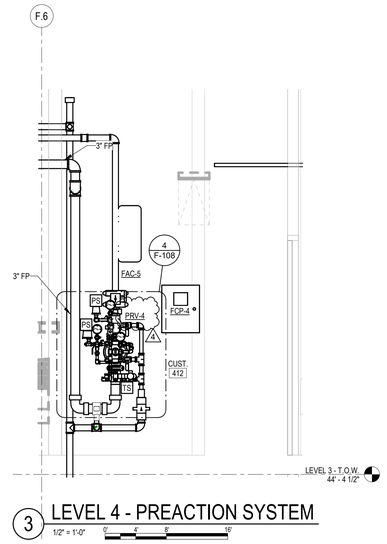
SHEET TITLE: LEVEL 3 FIRE PROTECTION PIPING PLAN - SECTION B

DRAWING NUMBER: F-106

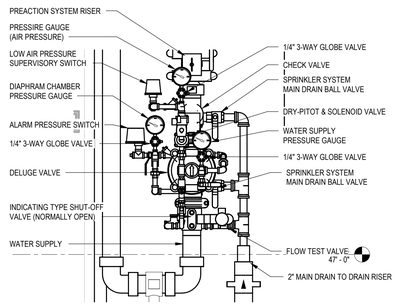
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3 LEVEL 4 - PREACTION SYSTEM
1/2" = 1'-0"

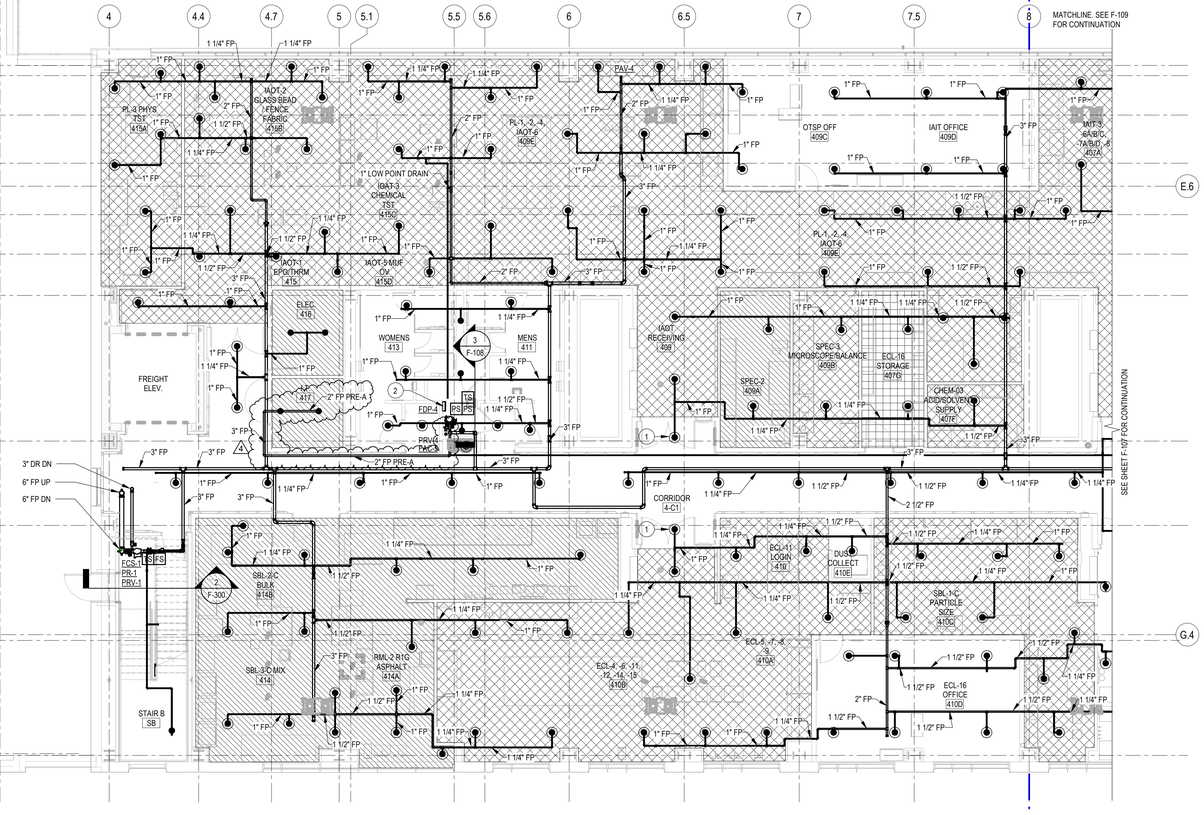


4 PREACTION SYSTEM DETAIL
1" = 1'-0"

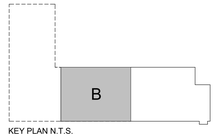
SPRINKLER SYSTEM DESIGN CRITERIA

HATCHING	SYSTEM TYPE	HAZARD CLASSIFICATION	DENSITY (GPM/SQ. FT.)	REMOTE AREA (SQ. FT.)	MAX COVERAGE AREA PER SPRINKLER (SQ. FT.)	HOSE DEMAND (GPM)	REFERENCE
	WET	LIGHT HAZARD	0.10	1500	225	100	NFPA 13 (2016)
	WET	ORDINARY HAZARD GROUP 1	0.15	1500	130	250	NFPA 13 (2016)
	WET	ORDINARY HAZARD GROUP 2	0.20	1500	130	250	NFPA 13 (2016)
	WET	EXTRA HAZARD GROUP 1	0.30	2500	100	500	NFPA 13 (2016)
	WET	EXTRA HAZARD GROUP 2	0.40	2500	100	500	NFPA 13 (2016)
	WET	TABLE 12.8.6 CLASS I-IV COMMODITIES, GROUP A PLASTICS, WOOD AND MISCELLANEOUS STORAGE UP TO 12 FT	0.20	UP TO 12 SPRINKLERS	130	250	NFPA 13 (2016) SECTION 12.8.6
	PRE-ACTION	ORDINARY HAZARD GROUP 1	0.15	1950	130	250	NFPA 13 (2016)

NOTES:
OWNER'S CERTIFICATE PROVIDED IN THE APPENDIX SECTION OF THE PROJECT MANUAL.



1 LEVEL 4 - FIRE PROTECTION PIPING PLAN - SECTION B
1/8" = 1'-0"



KEY PLAN N.T.S.

FIRE PROTECTION GENERAL NOTES:

1. PROVIDE PROTECTION THROUGHOUT THE SPACES INDICATED AND IN ACCORDANCE WITH THE DESIGN CRITERIA SPECIFIED ON THIS DRAWING AND NFPA 13 (2016).
2. SPRINKLERS SHALL BE PROVIDED BENEATH ALL OBSTRUCTIONS PER NFPA 13.
3. ALL PIPING TO BE SCHEDULE 40 PIPE. ALL PIPING 1-1/2" AND SMALLER TO BE PROVIDED WITH THREADED ENDS AND CAST-IRON FITTINGS AND COUPLINGS. ALL PIPING 2" AND LARGER TO BE PROVIDED WITH ROLL-GROOVED ENDS WITH GROOVED MECHANICAL FITTINGS AND COUPLINGS. WET SPRINKLER SYSTEM PIPING TO BE BLACK STEEL PIPE.
4. SPRINKLER PIPING SHALL BE PITCHED TO DRAIN IN ACCORDANCE WITH NFPA 13.
5. ALL EXPOSED PIPE TO BE PAINTED WITH ONE COAT OF EPOXY PRIMER AND TWO FINISH COATS OF URETHANE GLASS ENAMEL. REFER TO SPECIFICATION SECTION 099103 - MECHANICAL PAINTING.
6. COORDINATE PIPING AND SPRINKLER HEAD LAYOUT WITH BUILDING STRUCTURE.
7. ALL UNFINISHED SPACES AND SPACES WITHOUT CEILINGS SHALL BE PROVIDED WITH UPRIGHT SPRINKLERS SP-2. SPRINKLERS EXPOSED TO CORROSIVE ENVIRONMENTS TO BE PROVIDED WITH CORROSION RESISTANT FINISH BY MANUFACTURER.
8. ALL FIRE PUMP DISCHARGE PIPE FITTINGS UP TO PRESSURE REDUCING VALVE ON FLOOR CONTROL STATION AND PRESSURE REDUCING HOSE VALVES TO BE CLASS 250 FITTINGS.

(#) CODED NOTES:

1. PROVIDE CONCEALED PENDENT SPRINKLER WITH CUSTOM PAINTED COVER PLATE TO MATCH BENJAMIN MOORE SILVER SATIN-856. REFER TO SPRINKLER HEAD SCHEDULE ON F-501 AND INTERIOR PAINT SCHEDULE ON A-800.
2. PROVIDE PREACTION SYSTEM CONTROL PANEL, POWER AND WIRING TO FIRE ALARM CONTROL PANEL.

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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STATE OF NEW YORK · JEFFREY K. CALZARA · 089429 · LICENSED PROFESSIONAL ENGINEER

REGISTRATION EXPIRES: 07/31/2026

PROJECT NORTH

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

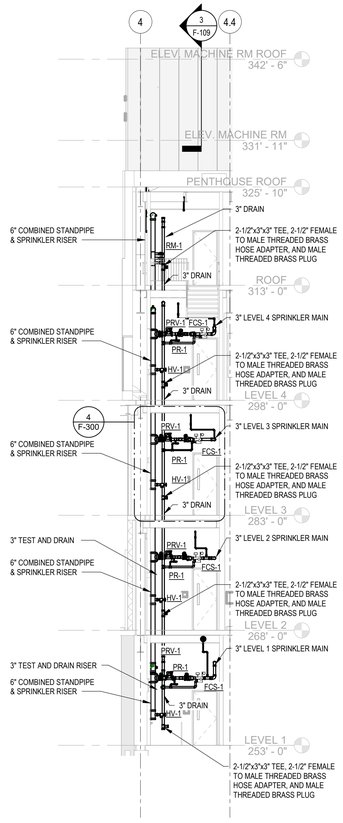
PROJECT NUMBER: 47528-C
DESIGNED BY: MJB
DRAWN BY: KMH
FIELD CHECK:
APPROVED:

SHEET TITLE:
LEVEL 4 FIRE PROTECTION PIPING PLAN - SECTION B

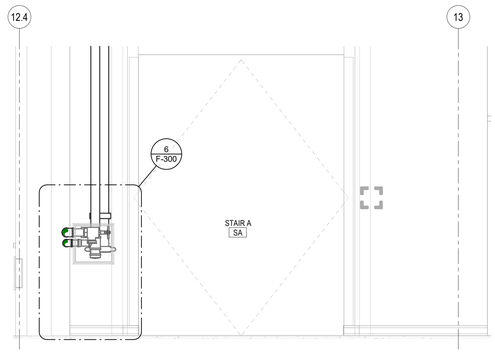
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F-108

SHEET: OF

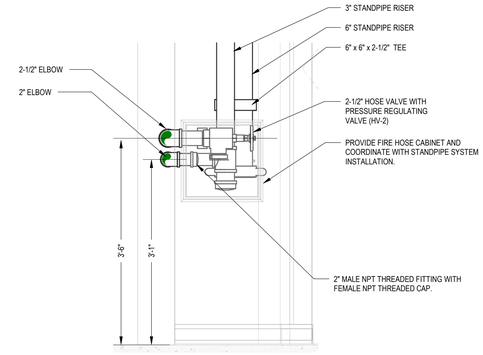
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42x30 PLOT SHEET



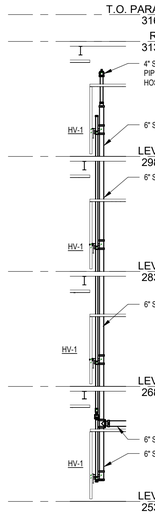
2 STAIR B - STANDPIPE AND SPRINKLER SYSTEM RISER SECTION
1/8" = 1'-0"



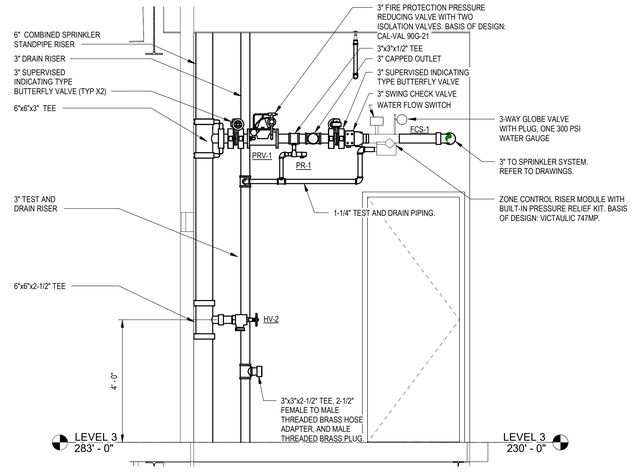
5 FIRE HOSE CABINET DETAIL
1/2" = 1'-0"



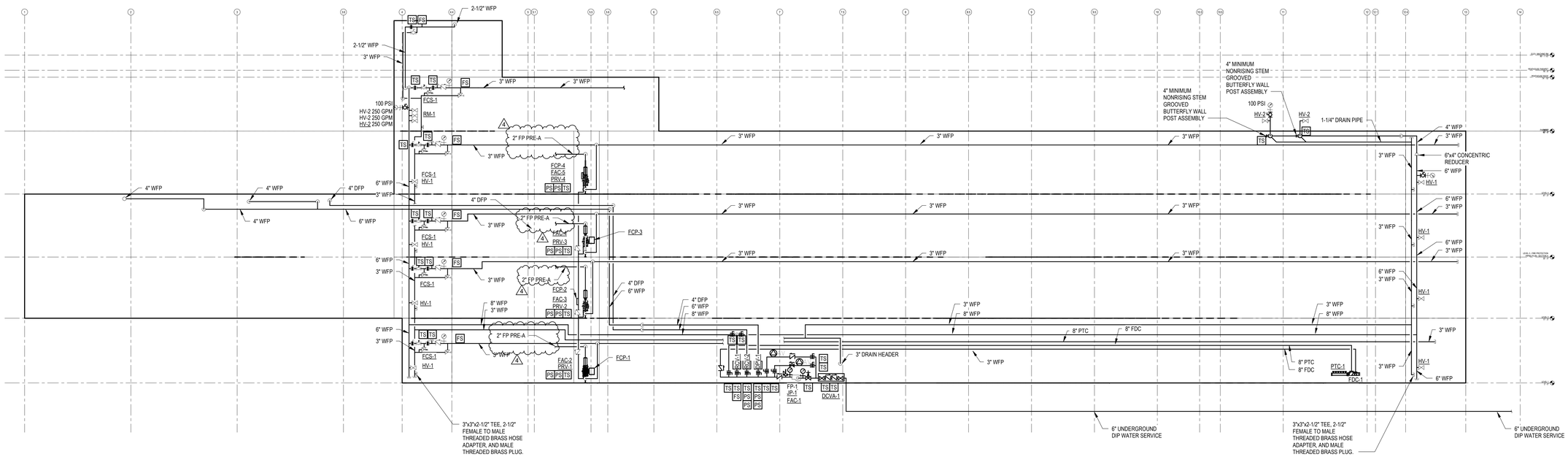
6 FIRE HOSE CABINET ENLARGED PLAN
1" = 1'-0"



3 STAIR A - STANDPIPE RISER SECTION
1/8" = 1'-0"



4 TYPICAL FLOOR CONTROL VALVE ASSEMBLY WITH REDUCING VALVE
1/2" = 1'-0"



1 FIRE PROTECTION RISER DIAGRAM
3/32" = 1'-0"

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FIELD CHECK:
APPROVED:

SHEET TITLE:
FIRE PROTECTION RISER DIAGRAMS

DRAWING NUMBER:
F-300

SHEET: 1 OF

SPRINKLER HEAD SCHEDULE

SYMBOL	STYLE	THREAD TYPE	K-FACTOR	TEMP RATING (DEG F)	RESPONSE	COVERAGE	FINISH	(BASIS OF DESIGN) MANUFACTURER AND MODEL #	TAG	REMARKS
◉	CONCEALED PENDENT	1/2" NPT	5.6	165	QUICK	STANDARD	BRASS	VIKING VK4621	SP-1	PROVIDE WHITE COVER PLATE OR CUSTOM PAINTED COVER PLATE TO MATCH BENJAMIN MOORE SILVER SATIN-866. REFER TO INTERIOR PAINT SCHEDULE ON A-800.
◉ EC	EXTENDED COVERAGE CONCEALED PENDENT	3/4" NPT	11.2	165	QUICK	EXTENDED	BRASS	VIKING VK538	SP-2	PROVIDE WHITE COVER PLATE OR CUSTOM PAINTED COVER PLATE TO MATCH BENJAMIN MOORE SILVER SATIN-866. REFER TO INTERIOR PAINT SCHEDULE ON A-800.
✖ 5.6	RECESSED PENDENT	1/2" NPT	5.6	155	QUICK	STANDARD	ENT	VIKING VK3021	SP-3	PROVIDE WHITE ESCHUTCHEON AND CORROSION RESISTANT FINISH.
●	UPRIGHT	1/2" NPT	5.6	155	QUICK	STANDARD	BRASS	VIKING VK300	SP-4	-
● 11.2	CMSA	1/2" NPT	11.2	175	QUICK	STANDARD	BRASS	VIKING VK540	SP-4	-
○ D	DRY-BARREL RECESSED PENDENT	1" NPT	5.6	155	QUICK	STANDARD	CHROME	VIKING VK150	SP-6	-
◀	HORIZONTAL SIDEWALL	1/2" NPT	5.6	175	QUICK	STANDARD	BRASS	VIKING VK305	SP-7	
◀ DB	DRY-BARREL HORIZONTAL SIDEWALL	1" NPT	5.6	175	QUICK	STANDARD	BRASS	VIKING VK152	SP-8	-

NOTES:

AUTOMATIC AIR RELEASE VALVE SCHEDULE

TAG	LOCATION	END CAP/VENT OUTLET(IN)	ORIENTATION	MANUFACTURER & MODEL#	REMARKS
PAV-1	LEVEL 1 - TRAINING ROOM 104	3"	HORIZONTAL WITH 7900V IN VERTICAL	AGF PURGEnVENT MODEL 7930ECA	SEE BELOW
PAV-2	LEVEL 2 - SML OFFICE TRAINING ROOM 203A	3"	HORIZONTAL WITH 7900V IN VERTICAL	AGF PURGEnVENT MODEL 7930ECA	SEE BELOW
PAV-3	LEVEL 3 - RSO OFFICE 304A	3"	HORIZONTAL WITH 7900V IN VERTICAL	AGF PURGEnVENT MODEL 7930ECA	SEE BELOW
PAV-4	LEVEL 4 - PL-1, -2, -4 IAOT-6 409E	3"	HORIZONTAL WITH 7900V IN VERTICAL	AGF PURGEnVENT MODEL 7930ECA	SEE BELOW
PAV-5	MECHANICAL PENTHOUSE 501	3"	HORIZONTAL WITH 7900V IN VERTICAL	AGF PURGEnVENT MODEL 7930ECA	SEE BELOW
NOTE: 175 PSI MAX WORKING PRESSURE.					

HOSE VALVE SCHEDULE

TAG	LOCATION	INLET/OUTLET (IN)	ORIENTATION	(BASIS OF DESIGN) MANUFACTURER & MODEL#	REMARKS
HV-1	STAIRWELL A AND B	2-1/2"	STRAIGHT	GAURDIAN 5230	SEE BELOW
HV-2	STAIRWELL A AND B	2-1/2"	STRAIGHT	VIKING EASYPAC DN150	SEE BELOW
NOTE: PROVIDE FACTORY ASSEMBLED TRIM. 300 PSI MAX WORKING PRESSURE					

BACKFLOW PREVENTER SCHEDULE

TAG	LOCATION	INLET/OUTLET (IN)	ORIENTATION	(BASIS OF DESIGN) MANUFACTURER & MODEL#	REMARKS
DCVA-1	WATER SERVICE RM 115B	6	HORIZONTAL	ZURN WILKINS MODEL 350	SEE BELOW

PROVIDE BACKFLOW PREVENTION DEVICE ASSEMBLY IN COMPLIANCE WITH THE REQUIREMENTS OF NYS DEPARTMENT OF HEALTH - CROSS CONNECTION CONTROL PROGRAM. SUBMIT APPLICATION (DOH-347 FORM AND PLANS) TO NYS DEPARTMENT OF HEALTH FOR APPROVAL OF THE BACKFLOW PREVENTION DEVICE INSTALLATION.

DOH-347 APPLICATION IS REQUIRED TO INCLUDE, BUT NOT LIMITED TO THE FOLLOWING:
- SITE PLANS (DRAWN TO SCALE OR DIMENSIONED)
- BACKFLOW PREVENTION DEVICE INSTALLATION PLANS: PLAN VIEW, PARTIAL/ENLARGED PLAN, AND SECTION VIEW (DRAWN TO SCALE OR DIMENSIONED)
- ENGINEERS REPORT
- MANUFACTURER'S SPECIFICATION OF DEVICE INSTALLED

FOLLOWING ISSUANCE OF APPROVAL OF PLAN SUBMISSION AND INSTALLATION, PROVIDE TESTING BY A CERTIFIED TESTER. SUBMIT TEST RESULTS AND CERTIFICATION (DOH-1013 FORM) TO APPROVING AGENT FOR ISSUANCE OF A COMPLETED WORKS APPROVAL.

AIR COMPRESSOR SCHEDULE

TAG	LOCATION	DRY SYSTEM CAPACITY (GAL)	FILL CAPACITY (GAL)		COMPRESSOR					(BASIS OF DESIGN) MANUFACTURER & MODEL #	REMARKS
			40 PSI IN 30 MIN	MAX CAPACITY	TYPE	HP	VOLT	PH	HZ		
FAC-1	FIRE PUMP RM 120	550	615	615	OIL-LESS	1	208	1	60	GENERAL AIR OIL615100AC	SEE NOTE 1 BELOW
FAC-2	CUST. 129	77	134	134	OIL-LESS	1/4	120	1	60	RELIABLE MODEL A	SEE NOTE 2 BELOW
FAC-3	CUST. 212	15	134	134	OIL-LESS	1/4	120	1	60	RELIABLE MODEL A	SEE NOTE 2 BELOW
FAC-4	CUST. 313	15	134	134	OIL-LESS	1/4	120	1	60	RELIABLE MODEL A	SEE NOTE 2 BELOW
FAC-5	CUST. 412	70	134	134	OIL-LESS	1/4	120	1	60	RELIABLE MODEL A	SEE NOTE 2 BELOW

NOTE:
1. PROVIDE WITH AIR MAINTENANCE DEVICE AND 5 HP FOR 208V MOTOR LINE STARTER .
2. PROVIDE WITH AIR MAINTENANCE DEVICE AND 1 HP FOR 115V MOTOR LINE STARTER.

PREACTION CONTROL PANEL SCHEDULE

TAG	LOCATION	ELECTRICAL LOADS			(BASIS OF DESIGN) MANUFACTURER & MODEL #	REMARKS
		VOLT	PH	HZ		
FCP-1	CUST. 129	120	1	60	POTTER ARC-100	NONE
FCP-2	CUST. 212	120	1	60	POTTER ARC-100	NONE
FCP-3	CUST. 313	120	1	60	POTTER ARC-100	NONE
FCP-4	CUST. 412	120	1	60	POTTER ARC-100	NONE

ELECTRIC FIRE PUMP (SKID) SCHEDULE

TAG	LOCATION	SERVICE	FLUID	TYPE	ELECTRICAL DATA					RATED CAPACITY		(BASIS OF DESIGN) MANUFACTURER & SIZE (SUCTION X DISCHARGE)	REMARKS
					HP	VOLT	PH	HZ	RPM	GPM	PSI		
FP-1	FIRE PUMP RM	FIRE PROTECTION	WATER	VERTICAL IN LINE	75	480	3	60	3600	750	95	ARMSTRONG VIL 6x4LB-F	SEE BELOW

NOTE:
1. CONNECT ANSI 250 LBS PRESSURE RATED CONCENTRIC REDUCERS TO DISCHARGE FLANGES.
2. PROVIDE TORNATECH GPS-GPU-480/75/3/60 COMBINED MANUAL AND AUTOMATIC FIRE PUMP CONTROLLER WITH AUTOMATIC TRANSFER SWITCH. COORDINATE WIRING WITH ELECTRICAL DRAWINGS.
3. FACTORY ASSEMBLED FIRE PUMP SKID SHALL NOT INCLUDE FIRE PUMP CONTROL PANEL, SUPPORT BRACKET, FLOW METER AND BYPASS PIPING IN ORDER TO FIT THROUGH FIRE PUMP ROOM EXTERIOR DOOR. FIRE PUMP MANUFACTURER TO ASSEMBLE FIRE PUMP SKID WITH FIRE PUMP CONTROL PANEL, SUPPORT BRACKET, FLOW METER AND BYPASS PIPING AFTER FIRE PUMP SKID IS ACHORED TO HOUSEKEEPING PAD INSIDE FIRE PUMP ROOM.
4. CONTRACTOR SHALL OBTAIN APPROVED SHOP DRAWINGS AND HYDRAULIC CALCULATIONS PRIOR TO PURCHASING FIRE PUMP SKID.

JOCKEY PUMP SCHEDULE

TAG	LOCATION	SERVICE	FLUID	TYPE	RATED FLOW (GPM)	HEAD (PSI)	ELECTRICAL DATA					(BASIS OF DESIGN) MANUFACTURER & MODEL#	REMARKS
							HP	VOLT	PH	HZ	RPM		
JP-1	FIRE PUMP RM	FIRE PROTECTION	WATER	VERTICAL INLINE	7.5	95	1.5	480	3	60	1800	ARMSTRONG 4700-VMS-03.07B	SEE BELOW

NOTE:
1. PROVIDE TORNATECH-JP3-480/1/3/60 JOCKEY PUMP CONTROLLER. COORDINATE WIRING WITH ELECTRICAL DRAWINGS.
2. JOCKEY PUMP AND JOCKEY PUMP CONTROLLER INCLUDED WITH FACTORY ASSEMBLED FIRE PUMP SKID.

PUMP TEST CONNECTION SCHEDULE

TAG	LOCATION	TYPE	FINISH	SIZE (IN)	INLET	NUMBER AND SIZE OF HOSE VALVES	(BASIS OF DESIGN) MANUFACTURER & MODEL#	REMARKS
PTC-1	FIRE PUMP RM	FREE STANDING	RED EPOXY COATING	8	WALL-MOUNTED	6 - 2-1/2"	POTTER-ROEMER MODEL 5865	SEE BELOW

NOTE:
1. PROVIDE 300 LBS PRESSURE CLASS.
2. PROVIDE 3 SETS OF POTTER-ROEMER MODEL 4085 HOSE VALVES . HOSE VALVE THREADS TO BE FEMALE NPT x MALE. REFER TO SPECIFICATIONS.

FLOOR CONTROL ASSEMBLY SCHEDULE

TAG	LOCATION	INLET/OUTLET (IN)	ORIENTATION	(BASIS OF DESIGN) MANUFACTURER & MODEL#	REMARKS
FCS-1	STAIRWELL A	3	HORIZONTAL	VIKING EASYPAC FLOOR CONTROL MANIFOLD	PROVIDE 2" TESTANDRAIN VALVE AND PRV
NOTE: PROVIDE FACTORY ASSEMBLED TRIM AND 250 PSI MAXIMUM WATER PRESSURE.					

FIRE DEPARTMENT CONNECTION SCHEDULE

TAG	LOCATION	TYPE	FINISH	SIZE (IN)	NUMBER OF CLAPPERS	(BASIS OF DESIGN) MANUFACTURER & MODEL#	REMARKS
FDC-1	FIRE PUMP RM	FLUSH WALL	CAST BRASS	8" x 2-1/2"	3	POTTER-ROEMER MODEL 5031	SEE BELOW
NOTE: CONTRACTOR TO PROVIDE PLUGS, CHAINS, AND CAST BRASS ESCUTCHEON PLATE. ESCUTCHEON PLATE SHALL BE IDENTIFIED AS "AUTO. SPK. & STANDPIPE."							

PRESSURE RELIEF AND CONTROL VALVES

TAG	LOCATION	INLET/OUTLET (IN)	ORIENTATION	(BASIS OF DESIGN) MANUFACTURER & MODEL#	REMARKS
PCV-1	STAIR B - SB	3	HORIZONTAL	CLA-VAL MODEL 90G-21	SEE BELOW
PCV-2	STAIRWELL B - SB	2	VERTICAL	CLA-VAL MODEL 90G-21	SEE BELOW
PCV-3	FIRE PUMP RM 120 HIGH PILED STORAGE RISER	6	VERTICAL	CLA-VAL MODEL 90G-21	SEE BELOW
PCV-4	FIRE PUMP RM 120 DRY SYSTEM RISER	4	VERTICAL	CLA-VAL MODEL 90G-21	SEE BELOW
PSCV-1	FIRE PUMP RM 120	8	HORIZONTAL	CLA-VAL MODEL 50B-5KG	SEE BELOW
PR-1	STAIRWELL B - SB	1/2	VERTICAL	CLA-VAL MODEL 55L	SEE BELOW
NOTE: 300 PSI MAX WORKING PRESSURE.					

RISER CHECK VALVE SCHEDULE

TAG	LOCATION	INLET/OUTLET (IN)	ORIENTATION	(BASIS OF DESIGN) MANUFACTURER & MODEL#	REMARKS
RCV-1	FIRE PUMP RM	8	VERTICAL	VIKING MODEL F-1	SEE BELOW
RCV-2	FIRE PUMP RM	6	VERTICAL	VIKING MODEL F-1	SEE BELOW
NOTE: PROVIDE FACTORY ASSEMBLED TRIM. 300 PSI MAX WORKING PRESSURE.					

DRY VALVE SCHEDULE

TAG	LOCATION	INLET/OUTLET (IN)	ORIENTATION	(BASIS OF DESIGN) MANUFACTURER & MODEL#	REMARKS
DPV-1	FIRE PUMP RM	4	VERTICAL	VIKING MODEL F-1	SEE BELOW
NOTE: PROVIDE FACTORY ASSEMBLED TRIM. 300 PSI MAX WORKING PRESSURE. PROVIDE POTTER BVL LEVER TYPE BLEEDER VALVE WITH 1/4 IN 3-WAY VALVE WITH AIR GUAGE TO CONNECT TO LOW AIR PRESSURE SWITCH PS40. PROVIDE WITH VIKING MODEL ANTI-COLUMN DEVICE. DRY PIPE SYSTEM CAPACITY EXCEEDS 750 GALLONS. PROVIDE DRY PIPE VALVE WITH MODEL D-2 ACCELERATOR.					

4

PREACTION SYSTEM SCHEDULE

TAG	LOCATION	INLET/OUTLET (IN)	ORIENTATION	(BASIS OF DESIGN) MANUFACTURER & MODEL#	REMARKS
PRV-1	CUSTODIAL ROOM 129	2	VERTICAL	VIKING MODEL VXD (PTR)	SEE BELOW
PRV-2	CUSTODIAL ROOM 212	2	VERTICAL	VIKING MODEL VXD (PTR)	SEE BELOW
PRV-3	CUSTODIAL ROOM 313	2	VERTICAL	VIKING MODEL VXD (PTR)	SEE BELOW
PRV-4	CUSTODIAL ROOM 412	2	VERTICAL	VIKING MODEL VXD (PTR)	SEE BELOW

NOTE: PROVIDE FACTORY ASSEMBLED TRIM. 300 PSI MAX WORKING PRESSURE.

SEQUENCE OF OPERATION:

1. THE ACTIVATION OF BOTH A SINGLE ELECTRIC FIRE DETECTOR AND THE ACTIVATION BY HEAT OF AN AUTOMATIC SPRINKLER HEAD ARE NECESSARY TO CAUSE WATER TO DISCHARGE.
2. THE ACTIVATION OF AN ELECTRIC FIRE DETECTOR BEFORE ACTIVATION BY HEAT OF AN AUTOMATIC SPRINKLER HEAD SHALL:
   A. PUT POTTER ARC-100 INTEGRAL CONTROL PANEL INTO ALARM CONDITION.
   B. ACTIVATE SOLENOID ON TRIM OF PREACTION VALVE.
   C. NOT ALLOW WATER TO ENTER THE SPRINKLER PIPING.
3. THE ACTIVATION BY HEAT OF AN AUTOMATIC SPRINKLER HEAD AFTER ACTIVATION OF AN ELECTRIC FIRE DETECTOR SHALL:
   A. ALLOW WATER TO ENTER THE SPRINKLER PIPING.
   B. DISCHARGE WATER FROM ACTIVATED SPRINKLER HEADS.
4. THE ACTIVATION BY HEAT OF AN AUTOMATIC SPRINKLER HEAD OR A BREAK OR AIR LEAK IN THE SPRINKLER PIPING BEFORE ACTIVATION OF AN ELECTRIC FIRE DETECTOR SHALL:
   A. PUT POTTER ARC-100 INTEGRAL CONTROL PANEL INTO SUPERVISORY CONDITION.
   B. NOT PERMIT WATER TO ENTER THE SPRINKLER PIPING.
5. OPERATION OF THE EMERGENCY MANUAL RELEASE VALVE INTEGRAL WITH THE POTTER ARC-100 SHALL OPEN THE PREACTION VALVE AND ALLOW WATER TO ENTER THE SPRINKLER PIPING.

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3	03/25/26	ADDENDUM 3
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: MJB

DRAWN BY: KMH

FIELD CHECK:

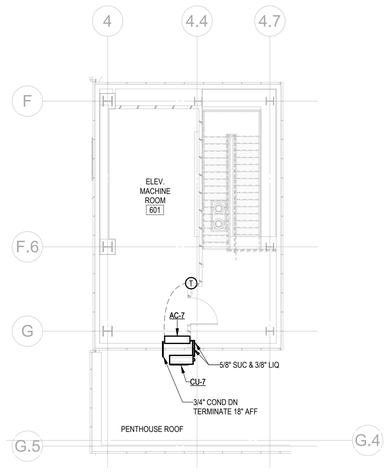
APPROVED:

SHEET TITLE: SCHEDULES

DRAWING NUMBER: F-501

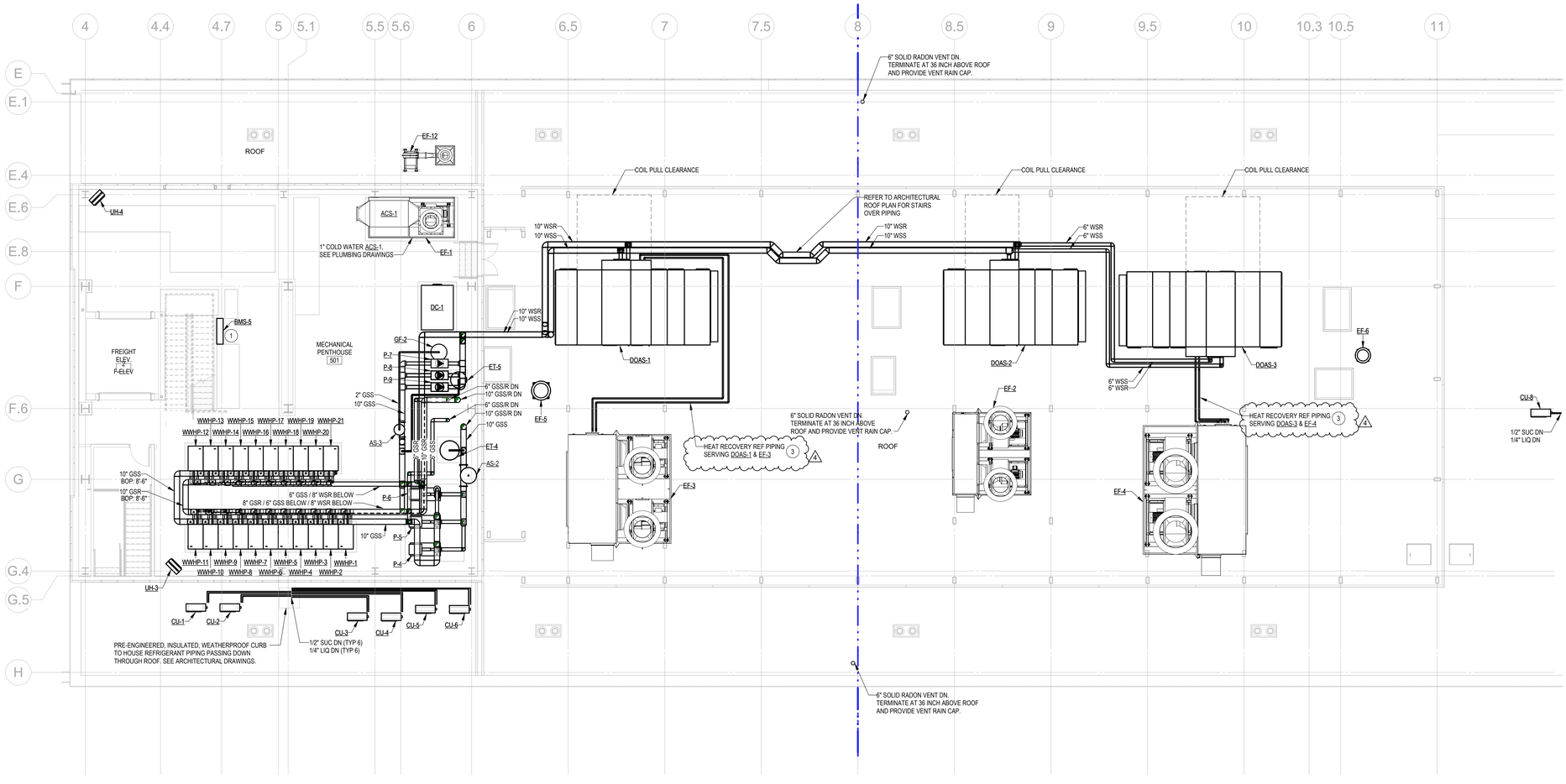
SHEET: OF

Autodesk Docs://47528 DOT Lab Building/082990-FIRE23-CENTRAL.rvt
4/2/26 1:25:4 PM
42x30 PLOT SHEET



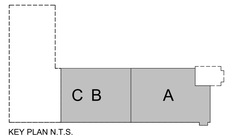
2 PENTHOUSE ROOF & ELEVATOR MACHINE ROOM PIPING PLAN

1/8" = 1'-0"



1 PENTHOUSE & ROOF PIPING PLAN

1/8" = 1'-0"



KEY PLAN N.T.S.

GENERAL NOTES

1. SIZE AND INSTALL REFRIGERANT PIPING PER MANUFACTURER'S REQUIREMENTS.

(#) CODED NOTES

1. PROVIDE MAIN BMS CONTROL PANEL. COORDINATE WITH ELECTRICAL TO PROVIDE POWER.
2. PROVIDE FREE STANDING PIPE SUPPORTS FOR ROOFTOP PIPING SYSTEMS. BASIS OF DESIGN: MIRO INDUSTRIES MODEL 6-RAH-12.
3. PROVIDE REFRIGERANT PIPING TO ENERGY RECOVERY COILS: SIX (6) 1-3/8" VAPOR LINES AND SIX (6) 7/8" LIQUID LINES. DOAS/EXHAUST FAN SYSTEM INCLUDES TWO (2) STACKED COILS.

4

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

CHA

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STATE OF NEW YORK · JEREMY A. LASTER · 089429 · LICENSED PROFESSIONAL ENGINEER

REGISTRATION EXPIRES: 07/31/2026

PROJECT NORTH

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	1/13/26	BID DOCUMENT

PROJECT NUMBER:	47528-C
DESIGNED BY:	PNG
DRAWN BY:	PNG
FIELD CHECK:	
APPROVED:	

SHEET TITLE:

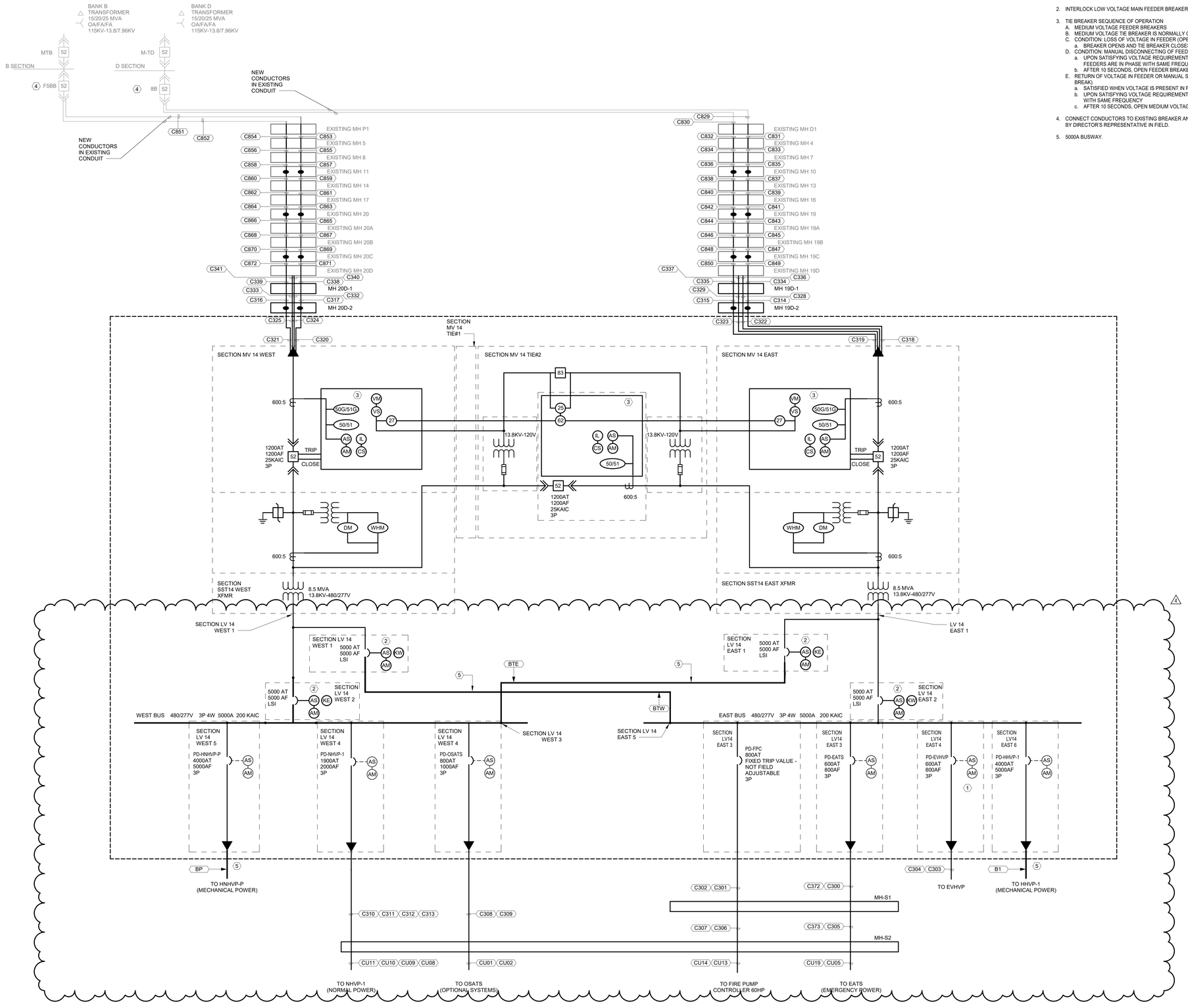
PENTHOUSE & ROOF PIPING PLAN

DRAWING NUMBER:

M-211

SHEET: OF

Autodesk Docs://47528 DOT Lab Building/082990-DOTLAB-MECH23.rvt
4/2/2026 1:32:43 PM
42x30 PLOT SHEET



1 ELECTRICAL SERVICE ONE-LINE

NOT TO SCALE

KEYED NOTES: (#)

1. INTERLOCK WITH FIRE PUMP CONTROLLER TO SHUNT TRIP WHEN FIRE PUMP IS IN OPERATION AND MEDIUM TIE IS CLOSED.
2. INTERLOCK LOW VOLTAGE MAIN FEEDER BREAKERS WITH KEY AS SHOWN.
3. TIE BREAKER SEQUENCE OF OPERATION
   A. MEDIUM VOLTAGE FEEDER BREAKERS
   B. MEDIUM VOLTAGE TIE BREAKER IS NORMALLY OPEN
   C. CONDITION: LOSS OF VOLTAGE IN FEEDER (OPEN TRANSITION)
      a. BREAKER OPENS AND TIE BREAKER CLOSES
   D. CONDITION: MANUAL DISCONNECTING OF FEEDER (CLOSE TRANSITION - MAKE BEFORE BREAK)
      a. UPON SATISFYING VOLTAGE REQUIREMENT, CLOSE MEDIUM VOLTAGE TIE BREAKER WHEN BOTH FEEDERS ARE IN PHASE WITH SAME FREQUENCY
      b. AFTER 10 SECONDS, OPEN FEEDER BREAKER
   E. RETURN OF VOLTAGE IN FEEDER OR MANUAL SELECTION (CLOSE TRANSITION - MAKE BEFORE BREAK)
      a. SATISFIED WHEN VOLTAGE IS PRESENT IN FEEDER FOR MINIMUM OF 15 MINUTES
      b. UPON SATISFYING VOLTAGE REQUIREMENT, CLOSE FEEDER WHEN BOTH FEEDERS ARE IN PHASE WITH SAME FREQUENCY
      c. AFTER 10 SECONDS, OPEN MEDIUM VOLTAGE TIE BREAKER
4. CONNECT CONDUCTORS TO EXISTING BREAKER AND PROGRAM OVERCURRENT SETTINGS AS DIRECTED BY DIRECTOR'S REPRESENTATIVE IN FIELD.
5. 5000A BUSWAY.

Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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STATE OF NEW YORK · RICHARD E. CARDINALE · 066045 · LICENSED PROFESSIONAL ENGINEER
EXPIRES 8/31/2027

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C
DESIGNED BY: APM
DRAWN BY: APM
FIELD CHECK:
APPROVED:

SHEET TITLE:
ELECTRICAL SERVICE ONE-LINE

DRAWING NUMBER:
E-611

SHEET: OF

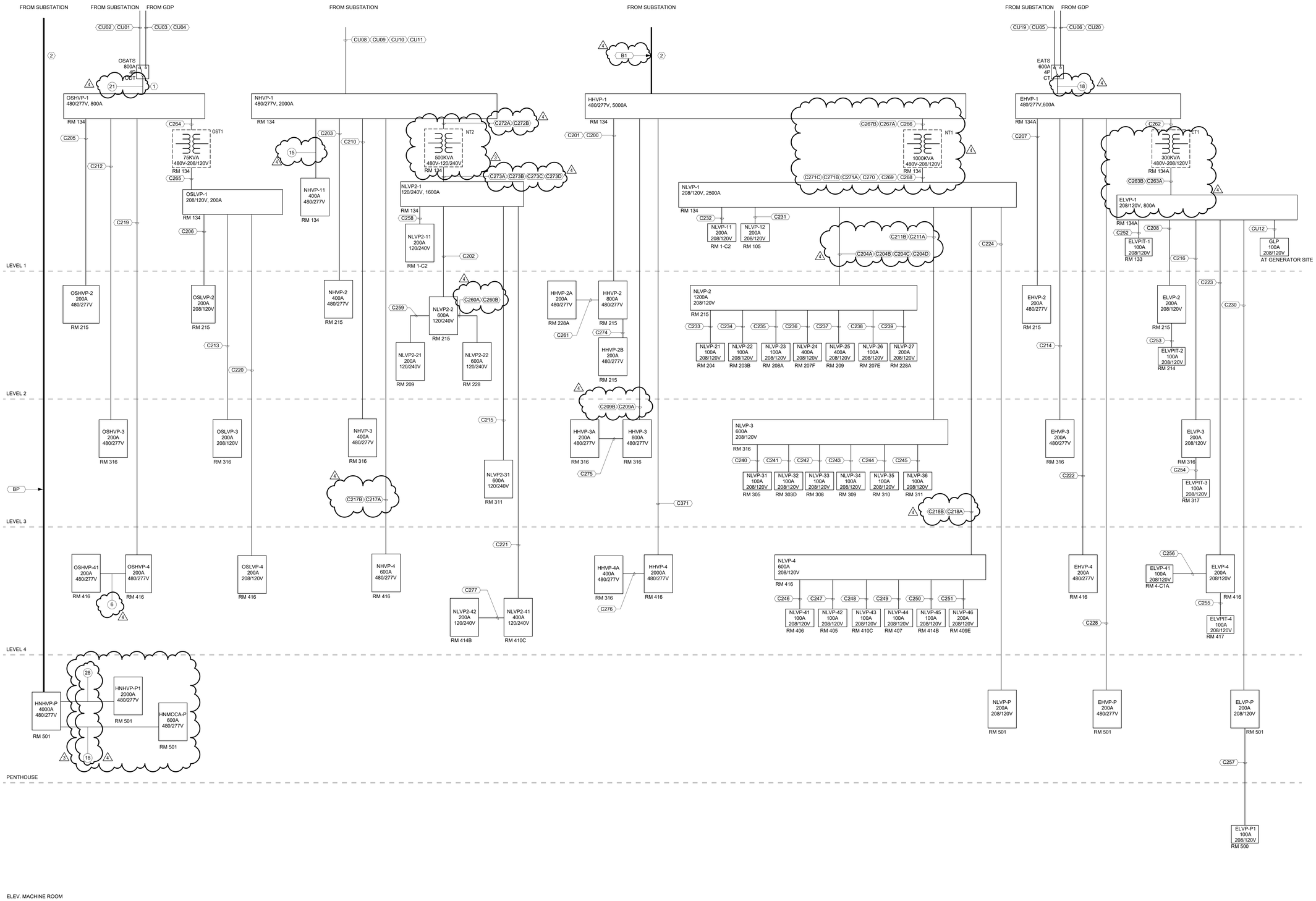
Autodesk Docs://47528 DOT Lab Building/082990-DOTLAB-ELEC23.rvt
4/2/2026 8:50:21 AM
42x30 PLOT SHEET

GENERAL SHEET NOTES:

1. REFER TO COPPER WIRE SIZING SCHEDULE ON E-610 FOR CABLE INFORMATION.
2. ALL PANELS AND TRANSFORMERS ARE LOCATED IN THE RESPECTIVE FLOOR ELECTRICAL ROOM UNLESS OTHERWISE NOTED.

KEYED NOTES: (#)

1. INTERLOCK WITH FIRE PUMP CONTROLLER TO DISABLE WHEN FIRE PUMP IS IN OPERATION.
2. 5000A BUSWAY.



1 ELECTRICAL DISTRIBUTION ONE-LINE

NOT TO SCALE

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42x30 PLOT SHEET

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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STATE OF NEW YORK · RICHARD E. CARRAFIELLO · 066045 · LICENSED PROFESSIONAL ENGINEER
EXPIRES 8/31/2027

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

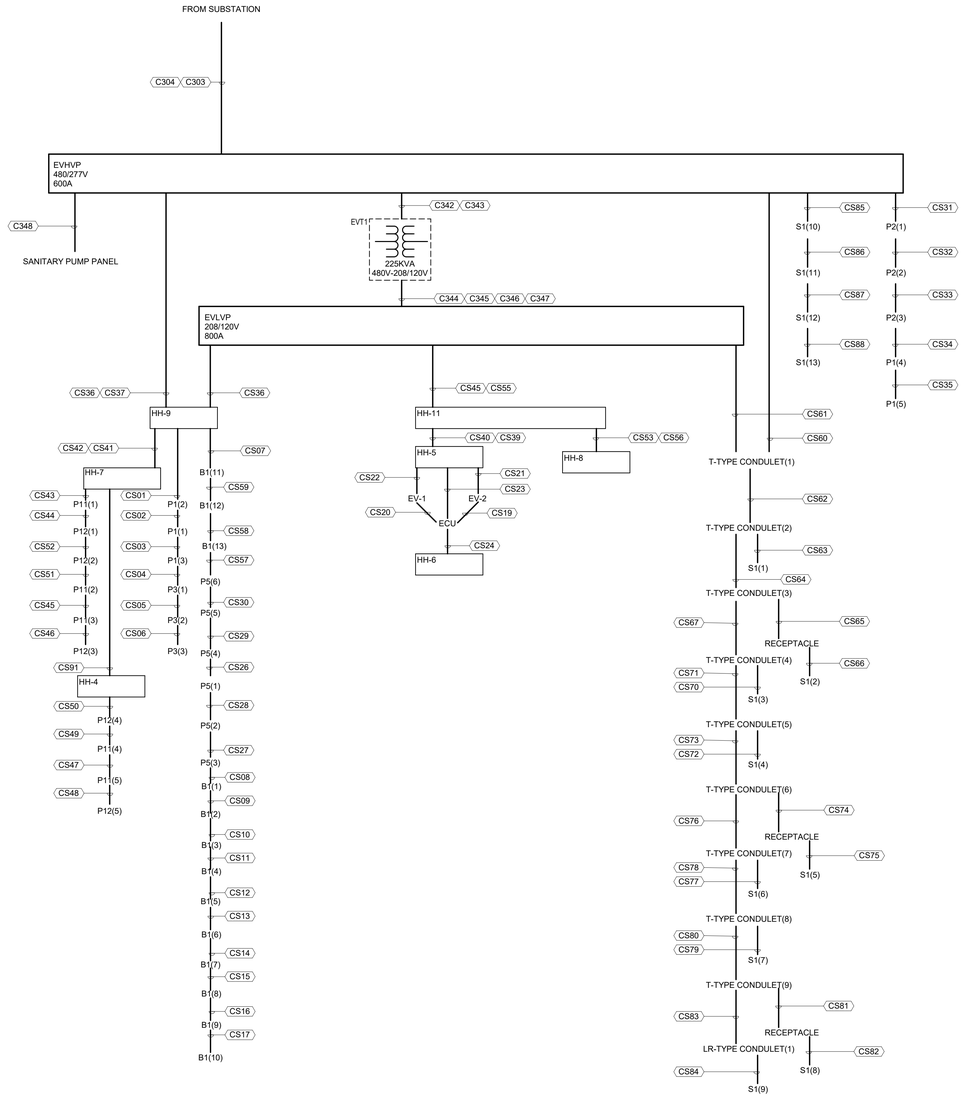
MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
3	03/25/26	ADDENDUM 3
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C
DESIGNED BY: APM
DRAWN BY: APM
FIELD CHECK:
APPROVED:

SHEET TITLE:
ELECTRICAL DISTRIBUTION ONE-LINE

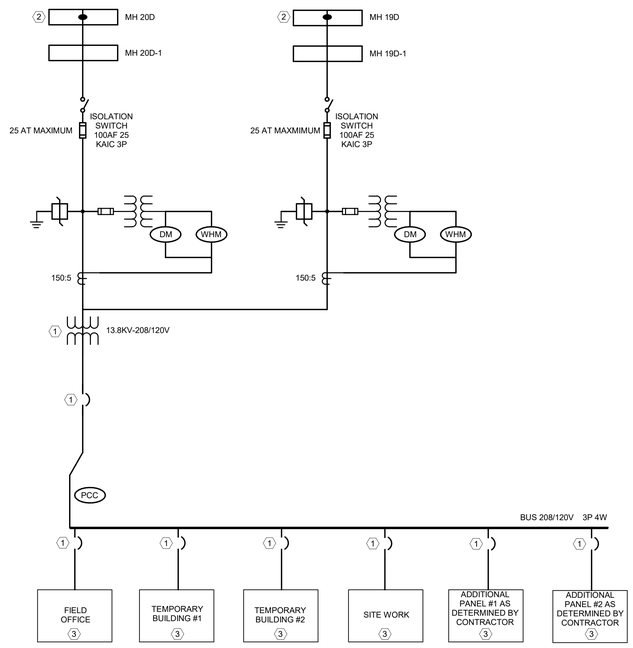
DRAWING NUMBER:
E-612

SHEET: OF



1 ELECTRICAL SITE DISTRIBUTION ONE-LINE

NOT TO SCALE

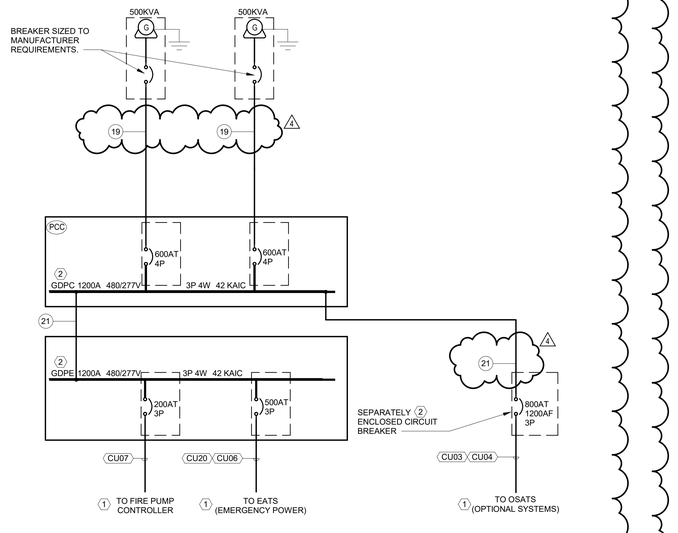


2 ELECTRICAL TEMPORARY SERVICE ONE-LINE

NOT TO SCALE

KEYED NOTES: (#)

1. TO BE SIZED BY CONTRACTOR.
2. SPLICE TO EXISTING CIRCUIT AS DIRECTED BY DIRECTOR'S REPRESENTATIVE WITH 600A 15KV RATED SEPARABLE SPLICES.
3. PROVIDE PANELS AS SHOWN. CONTRACTOR TO DETERMINE LOCATION AND SIZE/CAPACITY.



3 ELECTRICAL GENERATOR ONE-LINE

NOT TO SCALE

GENERAL NOTES:

A. FOR GENERATOR DETAILS, SEE SHEET E-710.

KEYED NOTES: (#)

1. PROVIDED WITH 4 POLE TRANSFER SWITCH.
2. ENCLOSURE TO BE NEMA 3R.

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4/2/2026 7:11:12 AM
42x30 PLOT SHEET

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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STATE OF NEW YORK · RICHARD E. CARNATT · 066045 · PROFESSIONAL ENGINEER

EXPIRES 8/31/2027

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
3	03/25/26	ADDENDUM 3
1	03/09/26	ADDENDUM 1
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: VFM

DRAWN BY: VFM

FIELD CHECK:

APPROVED:

SHEET TITLE:
ELECTRICAL DISTRIBUTION ONE-LINE

DRAWING NUMBER:
E-613

SHEET: OF

CONDUIT AND CABLE SCHEDULE

CONDUIT TAG	ROUTING SOURCE	ROUTING DESTINATION	CONTENTS (CABLES/CONDUCTORS)	CONDUIT SIZE	REMARKS
C100	NLVP-12	FB1(101)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C101	ELVP-1 FROM CEILING SPACE	FB7(101)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C102	NORMAL POWER CIRCUITS FROM CEILING SPACE	JB-N1	(8) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C103	NLVP-12	FB1(101)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C104	NLVP-12	FB1(104)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C105	FB1(104)	FB1(104)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C106	FB1(104)	FB1(104)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C107	FB1(104)	FB1(104)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C108	FB1(104)	FB1(104)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C109	NLVP-12	FB1(104)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C110	FB1(104)	FB1(104)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C111	FB1(104)	FB1(104)	(2) #12, (1) #12G	1.0 RNMC	CONCRETE ENCASED
C112	NLVP-12	FB1(104)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C113	FB1(104)	FB1(104)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C114	FB1(104)	FB1(104)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C115	NLVP-12	FB1(104)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C116	FB1(104)	FB1(104)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C117	FB1(104)	FB1(104)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C118	NLVP-12	FB1(104)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C119	FB1(104)	FB1(104)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C120	FB1(104)	FB1(104)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C121	NLVP-12	FB1(104)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C122	NLVP-12	FB1(103)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C123	FB1(103)	FB1(103)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C124	NLVP-12	FB3(115)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C125	MDF	FB3(115)	(4) CAT6a IN APPROPRIATELY SIZE CONTINOUS INNERDUCT	1.25" RNMC	CONCRETE ENCASED
C126	NLVP-12	FB3(115)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C127	MDF	FB3(115)	(4) CAT6a IN APPROPRIATELY SIZE CONTINOUS INNERDUCT	1.25" RNMC	CONCRETE ENCASED
C128	NLVP-12	FB3(115)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C129	MDF	FB3(115)	(4) CAT6a IN APPROPRIATELY SIZE CONTINOUS INNERDUCT	1.25" RNMC	CONCRETE ENCASED
C130	NLVP-12	FB3(115)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C131	MDF	FB3(115)	(4) CAT6a IN APPROPRIATELY SIZE CONTINOUS INNERDUCT	1.25" RNMC	CONCRETE ENCASED
C132	NLVP-27	FB4(225)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C133	NLVP-27	FB5(224)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C134	FB5(224)	FB5(224)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C139	NLVP-27	FB1(228A)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C140	ELVP-1 FROM CEILING SPACE	FAAP	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C141	EMERGENCY POWER CIRCUITS FROM CEILING SPACE	JB-E1	(6) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C142	STUBBED UP IN WALL	JB-N1	EMPTY CONDUIT WITH PULL STRING	1.0" RNMC	CONCRETE ENCASED
C144	NLVP-27	FB3(225)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C145	FB5(224)	FB5(223)	(2) #12, (1) #12G	1.0" RNMC	CONCRETE ENCASED
C146	FB3(225)	IDF 2	(4) CAT6a IN APPROPRIATELY SIZE CONTINOUS INNERDUCT	1.25" RNMC	CONCRETE ENCASED
CU01	MH-S2	OSATS	(4) #500KCMIL, (1) #1/0G	4.0" RNMC	CONCRETE ENCASED
CU02	MH-S2	OSATS	(4) #500KCMIL, (1) #1/0G	4.0" RNMC	CONCRETE ENCASED
CU03	GDP	OSATS	(4) #500KCMIL, (1) #1/0G	4.0" RNMC	CONCRETE ENCASED
CU04	GDP	OSATS	(4) #500KCMIL, (1) #1/0G	4.0" RNMC	CONCRETE ENCASED
CU05	MH-S2	EATS	(4) #750KCMIL, (1) #2/0G	4.0" RNMC	CONCRETE ENCASED
CU06	GDP	EATS	(4) #750KCMIL, (1) #2/0G	4.0" RNMC	CONCRETE ENCASED
CU07	GDP	FIRE PUMP CONTROLLER	(4) #3/0, (1) #2G	2.5" RNMC	CONCRETE ENCASED
CU08	MH-S2	NHVP-1	(4) #750KCMIL, (1) #2/0G	4.0" RNMC	CONCRETE ENCASED
CU09	MH-S2	NHVP-1	(4) #750KCMIL, (1) #2/0G	4.0" RNMC	CONCRETE ENCASED
CU10	MH-S2	NHVP-1	(4) #750KCMIL, (1) #2/0G	4.0" RNMC	CONCRETE ENCASED
CU11	MH-S2	NHVP-1	(4) #750KCMIL, (1) #2/0G	4.0" RNMC	CONCRETE ENCASED
CU12	ELVP-1	GLP	(4) #2/0, (1) #4G	2.0" RNMC	CONCRETE ENCASED
CU13	MH-S2	FIRE PUMP CONTROLLER	(3) #350KCMIL, (1) #2G	3.0" RNMC	CONCRETE ENCASED
CU14	MH-S2	FIRE PUMP CONTROLLER	(3) #350KCMIL, (1) #2G	3.0" RNMC	CONCRETE ENCASED
CU15	SUBSTATION GROUND	COMMON GROUNDING BAR	(2) #4/0G	2.0" RNMC	CONCRETE ENCASED
CU16	GENERATOR CONTROL PANEL	EATS	(2) BELDEN 9841 - RS9841 - RS485 COMPLIANT SINGLE PAIR 24 GAUGE (7x32) SHIELDED TWISTED PAIR CABLE, (2)#6 & (1)#10G CONDUCTORS IN CONDUIT FOR DC POWER, (2) #12 FOR START CIRCUIT & (2) #12 STATUS CIRCUIT.CABLE, (2)#6 & (1)#10G CONDUCTORS IN APPROPRIATELY SIZE CONTINOUS INNERDUCT	2.0" RNMC	CONCRETE ENCASED
CU17	HHVP-1	HPC-1	(3) #350KCMIL, (1) #2G	3.0" EMT	
CU18	HHVP-1	HPC-1	(3) #350KCMIL, (1) #2G	3.0" EMT	
CU19	MH-S2	EATS	(4) #250KCMIL, (1) #2G	4.0" RNMC	CONCRETE ENCASED
CU20	GDP	EATS	(4) #750KCMIL, (1) #2/0G	4.0" RNMC	CONCRETE ENCASED
C200	HHVP-1	HHVP-2	(4) #500KCMIL, (1) #1/0G	4.0" EMT	
C201	HHVP-1	HHVP-2	(4) #500KCMIL, (1) #1/0G	4.0" EMT	
C202	NLVP2-1	NLVP2-2	(4) #750KCMIL, (1) #2/0G	4.0" EMT	
C203	NHVP-1	NHVP-2	(4) #500KCMIL, (1) #1/0G	4.0" EMT	
C204A	NLVP-1	NLVP-2	(4) #350KCMIL, (1) #2G	3.0" EMT	
C204B	NLVP-1	NLVP-2	(4) #350KCMIL, (1) #2G	3.0" EMT	
C204C	NLVP-1	NLVP-2	(4) #350KCMIL, (1) #2G	3.0" EMT	
C204D	NLVP-1	NLVP-2	(4) #350KCMIL, (1) #2G	3.0" EMT	
C205	OSHVP-1	OSHVP-2	(4) #4/0, (1) #2G	2.25" EMT	
C206	OSLVP-1	OSLVP-2	(4) #4/0, (1) #2G	2.25" EMT	
C207	EHVP-1	EHVP-2	(4) #4/0, (1) #2G	2.25" EMT	
C208	ELVP-1	ELVP-2	(4) #4/0, (1) #2G	2.25" EMT	
C209A	HHVP-1	HHVP-3	(4) #350KCMIL, (1) #2G	3.0" EMT	
C209B	HHVP-1	HHVP-3	(4) #350KCMIL, (1) #2G	3.0" EMT	
C210	NHVP-1	NHVP-3	(4) #500KCMIL, (1) #1/0G	4.0" EMT	
C211A	NLVP-1	NLVP-3	(4) #250KCMIL, (1) #2G	3.0" EMT	
C211B	NLVP-1	NLVP-3	(4) #250KCMIL, (1) #2G	3.0" EMT	
C212	OSHVP-1	OSHVP-3	(4) #4/0, (1) #2G	2.25" EMT	
C213	OSLVP-1	OSLVP-3	(4) #4/0, (1) #2G	2.25" EMT	
C214	EHVP-1	EHVP-3	(4) #4/0, (1) #2G	2.25" EMT	
C215	NLVP2-1	NLVP2-31	(4) #500KCMIL, (1) #1/0G	4" EMT	
C216	ELVP-1	ELVP-3	(4) #4/0, (1) #2G	2.25" EMT	
C217A	NHVP-1	NHVP-4	(4) #350KCMIL, (1) #2G	3.0" EMT	
C217B	NHVP-1	NHVP-4	(4) #350KCMIL, (1) #2G	3.0" EMT	
C218A	NLVP-1	NLVP-4	(4) #350KCMIL, (1) #2G	3.0" EMT	
C218B	NLVP-1	NLVP-4	(4) #350KCMIL, (1) #2G	3.0" EMT	
C219	OSHVP-1	OSHVP-4	(4) #4/0, (1) #2G	2.25" EMT	
C220	OSLVP-1	OSLVP-4	(4) #4/0, (1) #2G	2.25" EMT	
C221	NLVP2-1	NLVP2-41	(4) #500KCMIL, (1) #1/0G	4.0" EMT	
C222	EHVP-1	EHVP-4	(4) #4/0, (1) #2G	2.25" EMT	
C223	ELVP-1	ELVP-4	(4) #4/0, (1) #2G	2.25" EMT	
C224	NLVP-1	NLVP-P	(4) #4/0, (1) #2G	2.25" EMT	
C227	N/A	N/A	EMPTY CONDUIT WITH PULL STRING	4.0" EMT	
C228	EHVP-1	EHVP-P	(3) #4/0, (1) #2G	2.25" EMT	
C229	N/A	N/A	EMPTY CONDUIT WITH PULL STRING	4.0" EMT	
C230	ELVP-1	ELVP-P	(4) #4/0, (1) #2G	2.25" EMT	
C231	NLVP-1	NLVP-11	(4) #3/0, (1) #2G	2.5" EMT	
C232	NLVP-1	NLVP-12	(4) #3/0, (1) #2G	2.5" EMT	
C233	NLVP-2	NLVP-21	(4) #2, (1) #6G	1.5" EMT	
C234	NLVP-2	NLVP-22	(4) #2, (1) #6G	1.5" EMT	
C235	NLVP-2	NLVP-23	(4) #2, (1) #6G	1.5" EMT	
C236	NLVP-2	NLVP-24	(4) #500KCMIL, (1) #1/0G	4.0" EMT	
C237	NLVP-2	NLVP-25	(4) #500KCMIL, (1) #1/0G	4.0" EMT	
C238	NLVP-2	NLVP-26	(4) #2, (1) #6G	1.5" EMT	
C239	NLVP-2	NLVP-27	(4) #3/0, (1) #2G	3" EMT	
C240	NLVP-3	NLVP-31	(4) #2, (1) #6G	1.5" EMT	
C241	NLVP-3	NLVP-32	(4) #2, (1) #6G	1.5" EMT	
C242	NLVP-3	NLVP-33	(4) #2, (1) #6G	1.5" EMT	
C243	NLVP-3	NLVP-34	(4) #2, (1) #6G	1.5" EMT	
C244	NLVP-3	NLVP-35	(4) #2, (1) #6G	1.5" EMT	
C245	NLVP-3	NLVP-36	(4) #2, (1) #6G	1.5" EMT	
C246	NLVP-4	NLVP-41	(4) #2, (1) #6G	1.5" EMT	
C247	NLVP-4	NLVP-42	(4) #2, (1) #6G	1.5" EMT	
C248	NLVP-4	NLVP-43	(4) #2, (1) #6G	1.5" EMT	
C249	NLVP-4	NLVP-44	(4) #2, (1) #6G	1.5" EMT	

CONDUIT AND CABLE SCHEDULE

CONDUIT TAG	ROUTING SOURCE	ROUTING DESTINATION	CONTENTS (CABLES/CONDUCTORS)	CONDUIT SIZE	REMARKS
C250	NLVP-4	NLVP-45	(4) #2, (1) #6G	1.5" EMT	
C251	NLVP-4	NLVP-46	(4) #3/0, (1) #2G	2.5" EMT	
C252	ELVP-1	ELVPIT-1	(4) #2, (1) #6G	1.5" EMT	
C253	ELVP-2	ELVPIT-2	(4) #2, (1) #6G	1.5" EMT	
C254	ELVP-3	ELVPIT-3	(4) #2, (1) #6G	1.5" EMT	
C255	ELVP-4	ELVPIT-4	(4) #2, (1) #6G	1.5" EMT	
C256	ELVP-4	ELVPIT-41	(4) #2, (1) #6G	1.5" EMT	
C257	ELVP-P	ELVPIT-P1	(4) #2, (1) #6G	1.5" EMT	
C258	NLVP2-1	NLVP2-11	(3) #3, (1) #8G	1.5" EMT	
C259	NLVP2-2	NLVP2-21	(3) #500KCMIL, (1) #1/0G	3.5" EMT	
C260A	NLVP2-2	NLVP2-22	(4) #250KCMIL, (1) #2G	3.0" EMT	
C260B	NLVP2-2	NLVP2-22	(4) #250KCMIL, (1) #2G	3.0" EMT	
C261	HHVP-2	HHVP-2A	(4) #250KCMIL, (1) #2G	3.0" EMT	
C262	EHVP-1	ET1	(4) #250KCMIL, (1) #2G	3.0" EMT	
C263A	ET1	ELVP-1	(4) #350KCMIL, (1) #2G	3.0" EMT	
C263B	ET1	ELVP-1	(4) #350KCMIL, (1) #2G	3.0" EMT	
C264	OSHVP-1	OST1	(4) #1/0, (1) #6G	2.0" EMT	
C265	OST1	OSLVP-1	(4) #3/0, (1) #2G	3.0" EMT	
C266	HHVP-1	NT1	(4) #500KCMIL, (1) 1/0G	4.0" EMT	
C267A	HHVP-1	NT1	(4) #500KCMIL, (1) 1/0G	4.0" EMT	
C267B	HHVP-1	NT1	(4) #500KCMIL, (1) 1/0G	4.0" EMT	
C268	NT1	NLVP-1	(4) #750KCMIL, (1) 2/0G	4.0" EMT	
C269	NT1	NLVP-1	(4) #750KCMIL, (1) 2/0G	4.0" EMT	
C270	NT1	NLVP-1	(4) #750KCMIL, (1) 2/0G	4.0" EMT	
C271A	NT1	NLVP-1	(4) #750KCMIL, (1) 2/0G	4.0" EMT	
C271B	NT1	NLVP-1	(4) #750KCMIL, (1) 2/0G	4.0" EMT	
C271C	NT1	NLVP-1	(4) #750KCMIL, (1) 2/0G	4.0" EMT	
C272A	NHVP-1	NT2	(4) #500KCMIL, (1) 1/0G	3.5" EMT	
C272B	NHVP-1	NT2	(4) #500KCMIL, (1) 1/0G	3.5" EMT	
C273A	NT2	NLVP2-1	(4) #500KCMIL, (1) 1/0G	2.5" EMT	
C273B	NT2	NLVP2-1	(4) #500KCMIL, (1) 1/0G	4.0" EMT	
C273C	NT2	NLVP2-1	(4) #500KCMIL, (1) 1/0G	4.0" EMT	
C273D	NT2	NLVP2-1	(4) #500KCMIL, (1) 1/0G	4.0" EMT	
C274	HHVP-2	HHVP-2B	(4) #250KCMIL, (1) #2G	3" EMT	
C275	HHVP-3	HHVP-3A	(4) #250KCMIL, (1) #2G	3" EMT	
C276	HHVP-4	HHVP-4A	(4) #500KCMIL, (1) #1/0G	4.0" EMT	
C277	NLVP2-41	NLVP2-42	(3) #3/0, (1) #2G	2.5" EMT	
C300	SUBSTATION LV EAST	MH-S1	(2) #250KCMIL, (2) #2G	4.0" RNMC	CONCRETE ENCASED.
C301	SUBSTATION LV EAST	MH-S1	(3) #350KCMIL, (1) #2G	3.0" RNMC	CONCRETE ENCASED.
C302	SUBSTATION LV EAST	MH-S1	(3) #350KCMIL, (1) #2G	3.0" RNMC	CONCRETE ENCASED.
C303	SUBSTATION LV EAST	EVHVP	(3) #350KCMIL, (1) #2G	3.0" RNMC	CONCRETE ENCASED.
C304	SUBSTATION LV EAST	EVHVP	(3) #350KCMIL, (1) #2G	3.0" RNMC	CONCRETE ENCASED.
C305	MH-S1	MH-S2	(2) #250KCMIL, (2) #2G	4.0" RNMC	CONCRETE ENCASED.
C306	MH-S1	MH-S2	(3) #350KCMIL, (1) #2G	3.0" RNMC	CONCRETE ENCASED.
C307	MH-S1	MH-S2	(3) #350KCMIL, (1) #2G	3.0" RNMC	CONCRETE ENCASED.
C308	SUBSTATION LV WEST	MH-S2	(4) #500KCMIL, (1) #1/0G	4.0" RNMC	CONCRETE ENCASED.
C309	SUBSTATION LV WEST	MH-S2	(4) #500KCMIL, (1) #1/0G	4.0" RNMC	CONCRETE ENCASED.
C310	SUBSTATION LV WEST	MH-S2	(4) #750KCMIL, (1) #2/0G	4.0" RNMC	CONCRETE ENCASED.
C311	SUBSTATION LV WEST	MH-S2	(4) #750KCMIL, (1) #2/0G	4.0" RNMC	CONCRETE ENCASED.
C312	SUBSTATION LV WEST	MH-S2	(4) #750KCMIL, (1) #2/0G	4.0" RNMC	CONCRETE ENCASED.
C313	SUBSTATION LV WEST	MH-S2	(4) #750KCMIL, (1) #2/0G	4.0" RNMC	CONCRETE ENCASED.
C314	MH 19D-1	MH 19D-2	(3) 15KV RATED #500 KCMIL	4.0" RNMC	CONCRETE ENCASED.
C315	MH 19D-1	MH 19D-2	(3) 15KV RATED #500 KCMIL	4.0" RNMC	CONCRETE ENCASED.
C316	MH 20D-1	MH 20D-2	(3) 15KV RATED #500 KCMIL	4.0" RNMC	CONCRETE ENCASED.
C317	MH 20D-1	MH 20D-2	(3) 15KV RATED #500 KCMIL	4.0" RNMC	CONCRETE ENCASED.
C318	MH 19D-2	SUBSTATION MV...	(3) 15KV RATED #500 KCMIL	4.0" RNMC	CONCRETE ENCASED.
C319	MH 19D-2	SUBSTATION MV...	(3) 15KV RATED #500 KCMIL	4.0" RNMC	CONCRETE ENCASED.
C320	MH 20D-2	SUBSTATION MV...	(3) 15KV RATED #500 KCMIL	4.0" RNMC	CONCRETE ENCASED.
C321	MH 20D-2	SUBSTATION MV...	(3) 15KV RATED #500 KCMIL	4.0" RNMC	CONCRETE ENCASED.
C322	MH 19D-2	SUBSTATION MV...	EMPTY CONDUIT WITH PULL STRING	4.0" RNMC	CONCRETE ENCASED.
C323	MH 19D-2	SUBSTATION MV...	EMPTY CONDUIT WITH PULL STRING	4.0" RNMC	CONCRETE ENCASED.
C324	MH 20D-2	SUBSTATION MV...	EMPTY CONDUIT WITH PULL STRING	4.0" RNMC	CONCRETE ENCASED.
C325	MH 20D-2	SUBSTATION MV...	EMPTY CONDUIT WITH PULL STRING	4.0" RNMC	CONCRETE ENCASED.
C326	SUBSTATION LV EAST	MH-S1	EMPTY CONDUIT WITH PULL STRING	4.0" RNMC	CONCRETE ENCASED.
C327	MH-S1	MH-S2	EMPTY CONDUIT WITH PULL STRING	4.0" RNMC	CONCRETE ENCASED.
C328	MH 19D-1	MH 19D-2	EMPTY CONDUIT WITH PULL STRING	4.0" RNMC	CONCRETE ENCASED.
C329	MH 19D-1	MH 19D-1	EMPTY CONDUIT WITH PULL STRING	4.0" RNMC	CONCRETE ENCASED.
C330	SUBSTATION LV WEST	MH-S2	EMPTY CONDUIT WITH PULL STRING	4.0" RNMC	CONCRETE ENCASED.
C331	SUBSTATION LV WEST	MH-S2	EMPTY CONDUIT WITH PULL STRING	4.0" RNMC	CONCRETE ENCASED.
C332	MH 20D-1	MH 20D-2	EMPTY CONDUIT WITH PULL STRING	4.0" RNMC	CONCRETE ENCASED.
C333	MH 20D-1	MH 20D-2	EMPTY CONDUIT WITH PULL STRING	4.0" RNMC	CONCRETE ENCASED.
C334	EXISTING MH 19D	MH 19D-1	(3) 15KV RATED #500 KCMIL	4.0" RNMC	CONCRETE ENCASED; CONTINUE CABLING THROUGH EXISTING CONDUITS AND MANHOLES AS SHOWN ON E-611 TO BREAKER 8B.
C335	EXISTING MH 19D	MH 19D-1	(3) 15KV RATED #500 KCMIL	4.0" RNMC	CONCRETE ENCASED; CONTINUE CABLING THROUGH EXISTING CONDUITS AND MANHOLES AS SHOWN ON E-611 TO BREAKER 8B.
C336	EXISTING MH 19D	MH 19D-1	(3) #350KCMIL, (1) #2G	4.0" RNMC	CONCRETE ENCASED.
C337	EXISTING MH 19D	MH 19D-1	EMPTY CONDUIT WITH PULL STRING	4.0" RNMC	CONCRETE ENCASED.
C338	EXISTING MH 20D	MH 20D-1	(3) 15KV RATED #500 KCMIL	4.0" RNMC	CONCRETE ENCASED; CONTINUE CABLING THROUGH EXISTING CONDUITS AND MANHOLES AS SHOWN ON E-611 TO BREAKER F5BB.
C339	EXISTING MH 20D	MH 20D-1	(3) 15KV RATED #500 KCMIL	4.0" RNMC	CONCRETE ENCASED; CONTINUE CABLING THROUGH EXISTING CONDUITS AND MANHOLES AS SHOWN ON E-611 TO BREAKER F5BB.

CONDUIT AND CABLE SCHEDULE

CONDUIT TAG	ROUTING SOURCE	ROUTING DESTINATION	CONTENTS (CABLES/CONDUCTORS)	CONDUIT SIZE	REMARKS
C340	MH 20D	MH 20D-1	(3) #350KCMIL, (1) #2G	4.0" RNMC	CONCRETE ENCASED.
C341	MH 20D	MH 20D-1	EMPTY CONDUIT WITH PULL STRING	4.0" RNMC	CONCRETE ENCASED.
C342	EVHVP	EVT1	(3) #350KCMIL, (1) #2G	3.0"	
C343	EVHVP	EVT1	(3) #350KCMIL, (1) #2G	3.0"	
C344	EVT1	EVLVP	(4) #500KCMIL, (1) 1/0G	4.0"	
C345	EVT1	EVLVP	(4) #500KCMIL, (1) 1/0G	4.0"	
C346	EVT1	EVLVP	(4) #500KCMIL, (1) 1/0G	4.0"	
C347	EVT1	EVLVP	(4) #500KCMIL, (1) 1/0G	4.0"	
C348	EVHVP	SANITARY PUMP PANEL	(3) #8, (1) #10G	1.0"	
C349	SUBSTATION LV WEST	MH-S2	EMPTY CONDUIT WITH PULL STRING	4.0" RNMC	CONCRETE ENCASED.
C350	SANITARY PUMP PANEL	JUNCTION BOX	(2) LOW VOLTAGE CONTROL CABLES IN APPROPRIATELY SIZE CONTINOUS INNERDUCT	2.0"	
C351	JUNCTION BOX	MH-S1	(2) LOW VOLTAGE CONTROL CABLES IN APPROPRIATELY SIZE CONTINOUS INNERDUCT	2.0" RNMC	CONCRETE ENCASED.
C352	MH-S1	MH-S2	(2) LOW VOLTAGE CONTROL CABLES IN APPROPRIATELY SIZE CONTINOUS INNERDUCT	2.0" RNMC	CONCRETE ENCASED.
C353	MH-S2	SUBSTATION MONITOR	(2) LOW VOLTAGE CONTROL CABLES IN APPROPRIATELY SIZE CONTINOUS INNERDUCT	2.0" RNMC	CONCRETE ENCASED.
C354	MH-S2	SUBSTATION MONITOR	(3) OUTDOOR RATED F/STP CABLES IN APPROPRIATELY SIZE CONTINOUS INNERDUCT	2.0" RNMC	CONCRETE ENCASED.
C355	SUBSTATION MONITORING PROCESSOR - LV EAST	MH-S1	(1) OUTDOOR RATED F/STP CABLE IN APPROPRIATELY SIZE CONTINOUS INNERDUCT	2.0" RNMC	CONCRETE ENCASED.
C356	MH-S1	MH-S2	(1) OUTDOOR RATED F/STP CABLE IN APPROPRIATELY SIZE CONTINOUS INNERDUCT	2.0" RNMC	CONCRETE ENCASED.
C357	SUBSTATON MONITORING PROCESSOR - MV	SUBSTATON MONITORING PROCESSOR - LV WEST	(1) OUTDOOR RATED F/STP CABLE IN APPROPRIATELY SIZE CONTINOUS INNERDUCT	2.0" RNMC	CONCRETE ENCASED.
C358	SUBSTATON MONITORING PROCESSOR - LV WEST	MH-S2	(2) OUTDOOR RATED F/STP CABLE IN APPROPRIATELY SIZE CONTINOUS INNERDUCT	2.0" RNMC	CONCRETE ENCASED.
C359	N/A	N/A	EMPTY CONDUIT WITH PULLSTRING	4.0"	
C360	N/A	N/A	EMPTY CONDUIT WITH PULLSTRING	4.0"	
C361	N/A	N/A	EMPTY CONDUIT WITH PULLSTRING	4.0"	
C362	NLVP-21	FB3(115)	(2) #12, (1) #12G	1.0"	
C363	NLVP-21	FB3(115)	(2) #12, (1) #12G	1.0" RNMC	IN SLAB.
C364	IDF 2	FB3(115)	(4) CAT6a IN APPROPRIATELY SIZE CONTINUOUS INNERDUCT	1.25"	
C365	IDF 2	FB3(115)	(4) CAT6a IN APPROPRIATELY SIZE CONTINUOUS INNERDUCT	1.25"	
C366	NLVP-25	FB3(115)	(2) #12, (1) #12G	1.0"	
C367	NLVP-25	FB3(115)	(2) #12, (1) #12G	1.0"	
C368	IDF 2	FB3(115)	(4) CAT6a IN APPROPRIATELY SIZE CONTINUOUS INNERDUCT	1.25"	
C369	IDF 2	FB3(115)	(4) CAT6a IN APPROPRIATELY SIZE CONTINUOUS INNERDUCT	1.25"	
C371	HHVP-1	HHVP-4	(3) #350KCMIL, (1) #2G	3.0"	
C372	SUBSTATION LV EAST	MH-S1	(2) #250KCMIL, (2) #2G	4.0" RNMC	CONCRETE ENCASED
C373	MH-S1	MH-S2	(2) #250KCMIL, (2) #2G	4.0" RNMC	CONCRETE ENCASED

GENERAL NOTES:

A. UNLESS INDICATED OTHERWISE, CONDUITS UNDERSLAB TO BE RNMC CONCRETE ENCASED.

B. UNLESS INIDICATED OTHERWISE, ALL INTERIOR CONDUITS NOT UNDERSLAB TO BE EMT.

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

CHA

UNIFORM CODE STATEMENT:
TO THE BEST OF REGISTERED DESIGN PROFESSIONAL'S KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THESE PLANS AND/OR SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 UNIFORM CODE.

ENERGY CODE WRITTEN STATEMENT:
TO THE BEST OF MY KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THE DRAWINGS BEARING MY PROFESSIONAL SEAL AND SIGNATURE MEET OR EXCEED THE 2020 NEW YORK STATE ENERGY CODE CONSISTING OF THE 2018 INTERNATIONAL ENERGY CONSERVATION CODE, 2016 ASHRAE 90.1.

WARNING:
THE ALTERATION OF THIS MATERIAL IN ANY WAY, UNLESS DONE UNDER THE DIRECTION OF A COMPARABLE PROFESSIONAL, I.E. ARCHITECT FOR AN ARCHITECT, ENGINEER FOR AN ENGINEER OR LANDSCAPE ARCHITECT FOR A LANDSCAPE ARCHITECT, IS A VIOLATION OF THE NEW YORK STATE EDUCATION LAW AND/OR REGULATIONS AND IS A CLASS 'A' MISDEMEANOR.

STATE OF NEW YORK — RICHARD E. CARDWELL — 066040 — LICENSED PROFESSIONAL ENGINEER
EXPIRES 8/31/2027

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
1	03/09/26	ADDENDUM 1
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: APM

DRAWN BY: APM

FIELD CHECK:

APPROVED:

SHEET TITLE:

ELECTRICAL CONDUIT SCHEDULE

DRAWING NUMBER: E-649

SHEET: OF

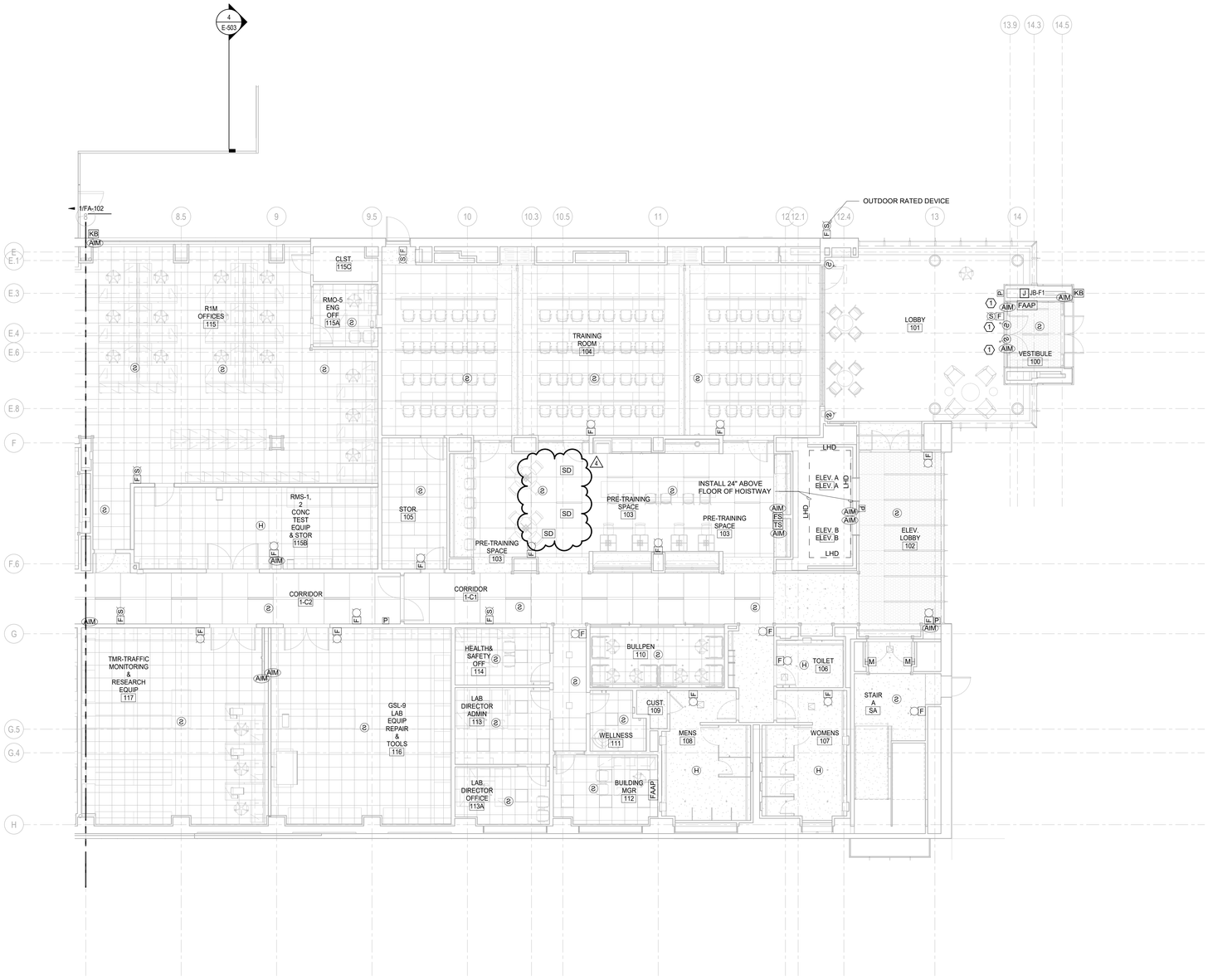
Autodesk Docs://47528 DOT Lab Building/082990-DOTLAB-ELEC23.rvt
4/2/2026 8:54:31 AM
42x30 PLOT SHEET

GENERAL SHEET NOTES:

1. LEVEL 1 FIRE ZONE IS ENTIRE OF FIRE FLOOR SHOWN.
2. PASSENGER ELEVATOR FIRE ZONE IS THE ELEVATOR SHAFT AREA SHOWN ONLY.
3. STAIRWAY A FIRE ZONE IS THE AREA WITHIN STAIR A.
4. ROUTING OF CABLING ON EACH FLOOR SHALL BE VIA CABLE TRAY TO CLOSEST LOCATION NEAR ROOM/AREA OF DEVICES AND THEN ROUTED, THROUGH CEILING SPACE VIA BRIDLE RING SUPPORTS, TO LOCATION DIRECTLY ABOVE CONNECTION POINT. ROUTING OF CABLE THROUGH ALL INACCESSIBLE LOCATIONS SHALL BE IN CONDUIT.
5. SPLICES ARE NOT TO BE MADE IN ANY CIRCUIT OR CABLE UNLESS SHOWN ON CONTRACT DRAWINGS OR AT EACH DEVICE OR IN JUNCTION BOX AT CABLE TRAY.
6. PROVIDE FIRE STOPPING AT ALL FIRE WALL PENETRATIONS. SEE A-620 FOR MORE INFORMATION.
7. COORDINATE ALL TAMPER SWITCH (TS) / WATER FLOW (WF) SWITCH LOCATIONS WITH FIRE PROTECTION DRAWINGS.

KEYED NOTES: (#)

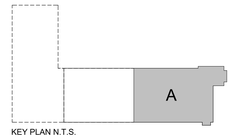
1. SEE SHEET E - 111 FOR UNDERGROUND CONDUIT ROUTING.



1 LEVEL 1 FIRE ALARM PLAN - SECTION A

1/8" = 1'-0"

0' 4' 8' 16'



KEY PLAN N.T.S.

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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UNIFORM CODE STATEMENT:
TO THE BEST OF REGISTERED DESIGN PROFESSIONAL'S KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THESE PLANS AND/OR SPECIFICATIONS ARE IN COMPLIANCE WITH THE 2020 UNIFORM CODE.

ENERGY CODE WRITTEN STATEMENT:
TO THE BEST OF MY KNOWLEDGE, BELIEF, AND PROFESSIONAL JUDGEMENT, THE DRAWINGS BEARING MY PROFESSIONAL SEAL AND SIGNATURE MEET OR EXCEED THE 2020 NEW YORK STATE ENERGY CODE CONSISTING OF THE 2018 INTERNATIONAL ENERGY CONSERVATION CODE, 2016 ASHRAE 90.1.

WARNING:
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STATE OF NEW YORK · RICHARD E. CARDWELL · LICENSED PROFESSIONAL ENGINEER · 066045 · EXPIRES 8/31/2027

PROJECT NORTH

CONTRACT: CONSTRUCTION

TITLE: Provide Testing Laboratory, Building 14

LOCATION: DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT: New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

PROJECT NUMBER:	47528-C
DESIGNED BY:	CEG
DRAWN BY:	CEG
FIELD CHECK:	REG
APPROVED:	REG

SHEET TITLE:

LEVEL 1 FIRE ALARM PLAN - SECTION A

DRAWING NUMBER: FA-101

SHEET: OF

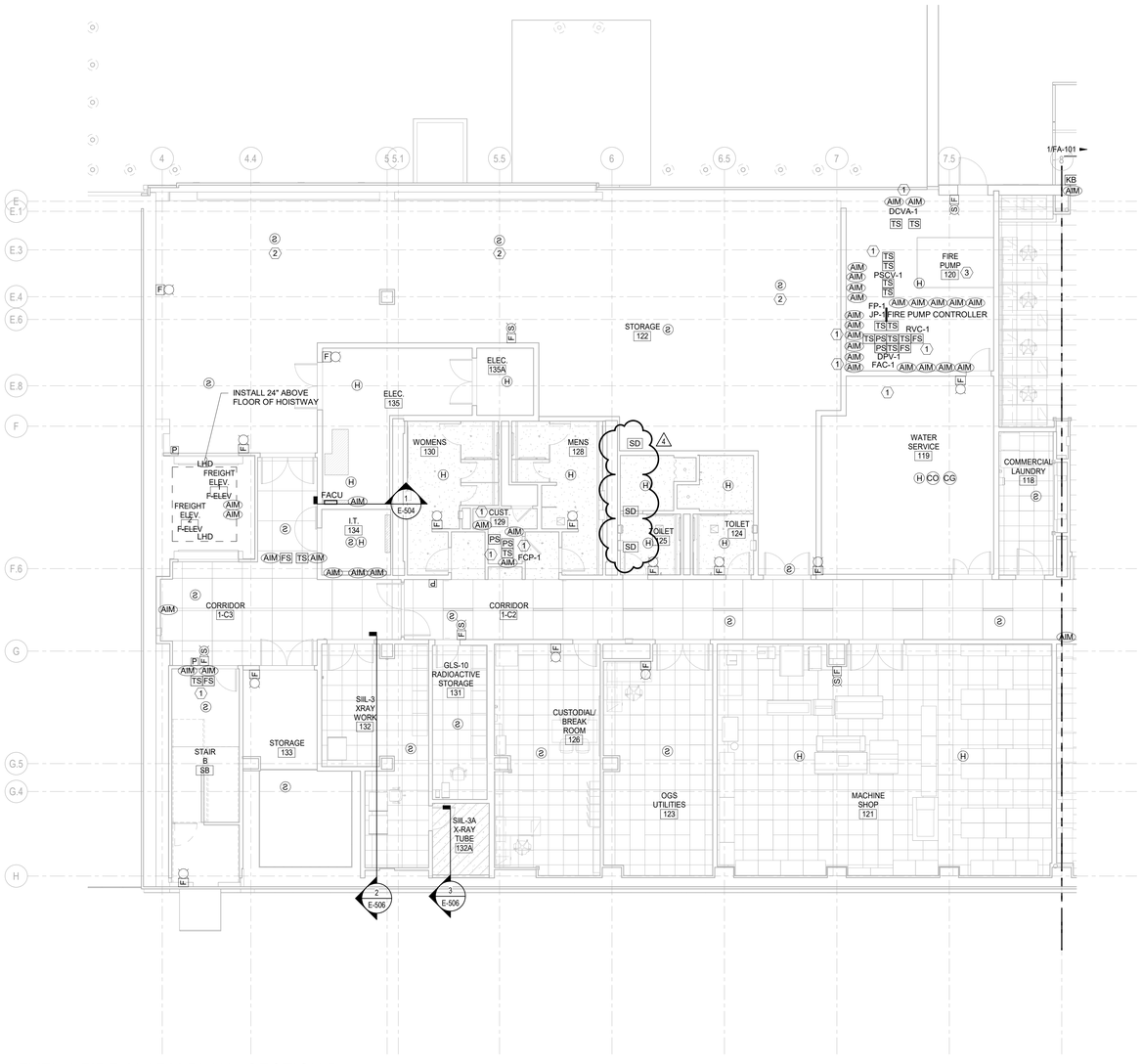
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4/2/26 7:11:28 AM
42x30 PLOT SHEET

GENERAL SHEET NOTES:

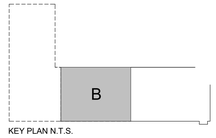
1. LEVEL 1 FIRE ZONE IS ENTIRE OF FIRE FLOOR SHOWN.
2. FREIGHT ELEVATOR FIRE ZONE IS THE ELEVATOR SHAFT AREA SHOWN ONLY.
3. STAIRWAY B FIRE ZONE IS THE AREA WITHIN STAIR B.
4. ROUTING OF CABLING ON EACH FLOOR SHALL BE VIA CABLE TRAY TO CLOSEST LOCATION NEAR ROOM/AREA OF DEVICES AND THEN ROUTED, THROUGH CEILING SPACE VIA BRIDLE RING SUPPORTS, TO LOCATION DIRECTLY ABOVE CONNECTION POINT. ROUTING OF CABLE THROUGH ALL INACCESSIBLE LOCATIONS SHALL BE IN CONDUIT.
5. SPLICES ARE NOT TO BE MADE IN ANY CIRCUIT OR CABLE UNLESS SHOWN ON CONTRACT DRAWINGS OR AT EACH DEVICE OR IN JUNCTION BOX AT CABLE TRAY.
6. PROVIDE FIRE STOPPING AT ALL FIRE WALL PENETRATIONS. SEE A-620 FOR MORE INFORMATION.
7. COORDINATE ALL TAMPER SWITCH (TS) / WATER FLOW (WF) SWITCH LOCATIONS WITH FIRE PROTECTION DRAWINGS.
8. AIM LOCATIONS ARE APPROXIMATE, EXACT LOCATION TO BE DETERMINED AT TIME OF INSTALLATION.

KEYED NOTES: (#)

1. CONNECTIONS INDICATED ON RISER DIAGRAM FA-601
2. ALL SMOKE DETECTORS IN ROOM 122 ARE TO BE MOUNTED TO BOTTOM OF STRUCTURAL BEAMS.
3. FOR EXACT LOCATION OF DEVICES LOOK AT FIRE PROTECTION PLANS, SHEET F-102.



1 LEVEL 1 FIRE ALARM PLAN - SECTION B
1/8" = 1'-0"



KEY PLAN N.T.S.

Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

CHA

UNIFORM CODE STATEMENT:
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STATE OF NEW YORK · RICHARD E. CARNEY · LICENSED PROFESSIONAL ENGINEER · 066045
EXPIRES 8/31/2027

PROJECT NORTH

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

PROJECT NUMBER:	47528-C
DESIGNED BY:	CEG
DRAWN BY:	CEG
FIELD CHECK:	REG
APPROVED:	REG

SHEET TITLE:
LEVEL 1 FIRE ALARM PLAN - SECTION B

DRAWING NUMBER:
FA-102

SHEET: OF

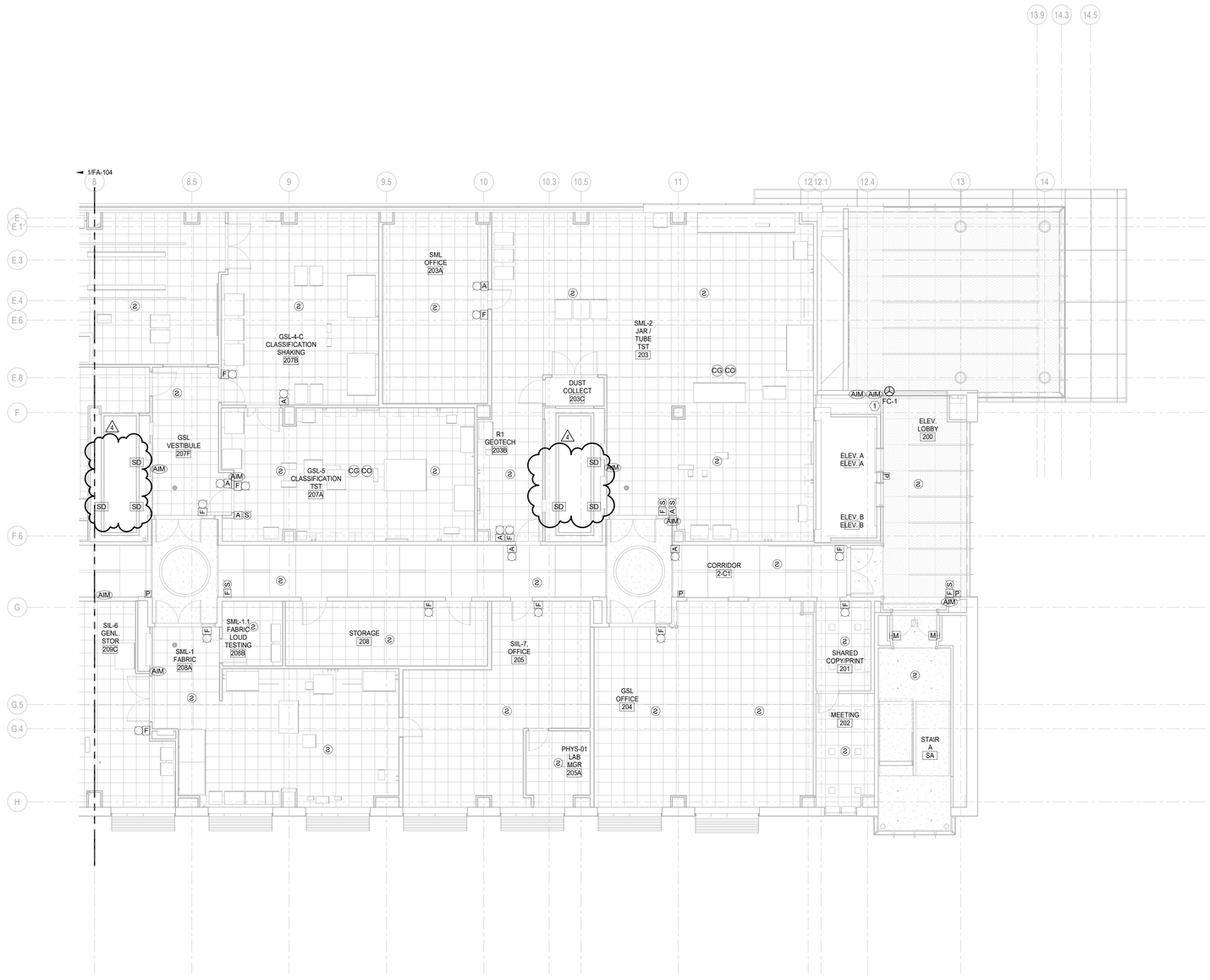
Autodesk Docs://47528 DOT Lab Building/082990-DOTLAB-ELEC23.rvt
4/2/2026 11:13 AM
42x30 PLOT SHEET

GENERAL SHEET NOTES:

1. LEVEL 2 FIRE ZONE IS ENTIRE OF FIRE FLOOR SHOWN.
2. PASSENGER ELEVATOR FIRE ZONE IS THE ELEVATOR SHAFT AREA SHOWN ONLY.
3. STAIRWAY A FIRE ZONE IS THE AREA WITHIN STAIR A.
4. ROUTING OF CABLING ON EACH FLOOR SHALL BE VIA CABLE TRAY TO CLOSEST LOCATION NEAR ROOM/AREA OF DEVICES AND THEN ROUTED, THROUGH CEILING SPACE VIA BRIDLE RING SUPPORTS, TO LOCATION DIRECTLY ABOVE CONNECTION POINT. ROUTING OF CABLE THROUGH ALL INACCESSIBLE LOCATIONS SHALL BE IN CONDUIT.
5. SPLICES ARE NOT TO BE MADE IN ANY CIRCUIT OR CABLE UNLESS SHOWN ON CONTRACT DRAWINGS OR AT EACH DEVICE OR IN JUNCTION BOX AT CABLE TRAY.
6. PROVIDE FIRE STOPPING AT ALL FIRE WALL PENETRATIONS. SEE A-620 FOR MORE INFORMATION.
7. COORDINATE ALL TAMPER SWITCH (TS) / WATER FLOW (WF) SWITCH LOCATIONS WITH FIRE PROTECTION DRAWINGS.

KEYED NOTES: (#)

1. CONNECTIONS INDICATED ON RISER DIAGRAM FA-601



1 LEVEL 2 FIRE ALARM PLAN - SECTION A

1/8" = 1'-0"



KEY PLAN N.T.S.

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4/2/2026 11:03 AM
42x30 PLOT SHEET

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

CHA

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STATE OF NEW YORK · RICHARD E. GARRETT · 066045 · LICENSED PROFESSIONAL ENGINEER
EXPIRES 8/31/2027

PROJECT NORTH

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

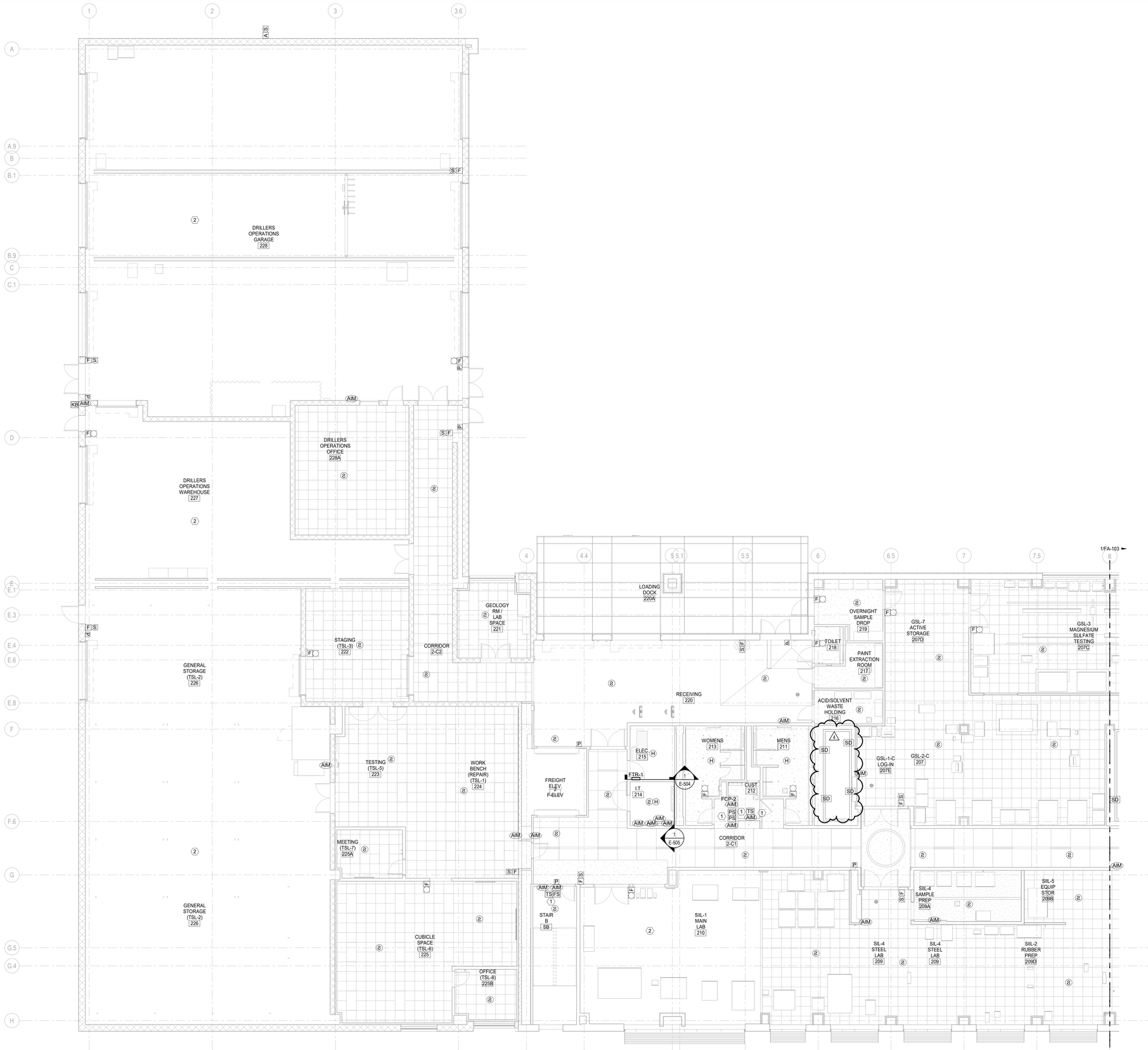
PROJECT NUMBER: 47528-C

DESIGNED BY: CEG
DRAWN BY: CEG
FIELD CHECK: REG
APPROVED: REG

SHEET TITLE:
LEVEL 2 FIRE ALARM PLAN - SECTION A

DRAWING NUMBER:
FA-103

SHEET: OF



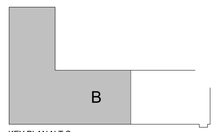
GENERAL SHEET NOTES:

1. LEVEL 2 FIRE ZONE IS ENTIRE OF FIRE FLOOR SHOWN.
2. FREIGHT ELEVATOR FIRE ZONE IS THE ELEVATOR SHAFT AREA SHOWN ONLY.
3. STAIRWAY B FIRE ZONE IS THE AREA WITHIN STAIR B.
4. DRILLERS OPERERATIONS FIRE ZONE IS THAT ARAEAS NORTH OF GRID LINE E.
5. TRAFFIC SIGNAL FIRE ZONE IS THAT AREA SOUTH OF GRID LINE E AND WEST OF GRID LINE 4.
6. ROUTING OF CABLING ON EACH FLOOR SHALL BE VIA CABLE TRAY TO CLOSEST LOCATION NEAR ROOM/AREA OF DEVICES AND THEN ROUTED, THROUGH CEILING SPACE VIA BRIDLE RING SUPPORTS, TO LOCATION DIRECTLY ABOVE CONNECTION POINT. ROUTING OF CABLE THROUGH ALL INACCESSIBLE LOCATIONS SHALL BE IN CONDUIT.
7. SPLICES ARE NOT TO BE MADE IN ANY CIRCUIT OR CABLE UNLESS SHOWN ON CONTRACT DRAWINGS OR AT EACH DEVICE OR IN JUNCTION BOX AT CABLE TRAY.
8. PROVIDE FIRE STOPPING AT ALL FIRE WALL PENETRATIONS. SEE A-620 FOR MORE INFORMATION.
9. COORDINATE ALL TAMPER SWITCH (TS) / WATER FLOW (WF) SWITCH LOCATIONS WITH FIRE PROTECTION DRAWINGS.

KEYED NOTES: (#)

1. CONNECTIONS INDICATED ON RISER DIAGRAM FA-601
2. ROOM 210, 226, 227, AND 228 ARE TWO STORY HIGH BAY AREAS.

1 LEVEL 2 FIRE ALARM PLAN - SECTION B
1/8" = 1'-0"



KEY PLAN N.T.S.

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4/2/2026 7:11:35 AM
42x30 PLOT SHEET

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

CHA

UNIFORM CODE STATEMENT:
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STATE OF NEW YORK · RICHARD E. GARRATT · LICENSED · 066045 · PROFESSIONAL ENGINEER
EXPIRES 8/31/2027

PROJECT NORTH

CONTRACT: CONSTRUCTION

TITLE: Provide Testing Laboratory, Building 14

LOCATION: DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT: New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: CEG
DRAWN BY: CEG
FIELD CHECK: REG
APPROVED: REG

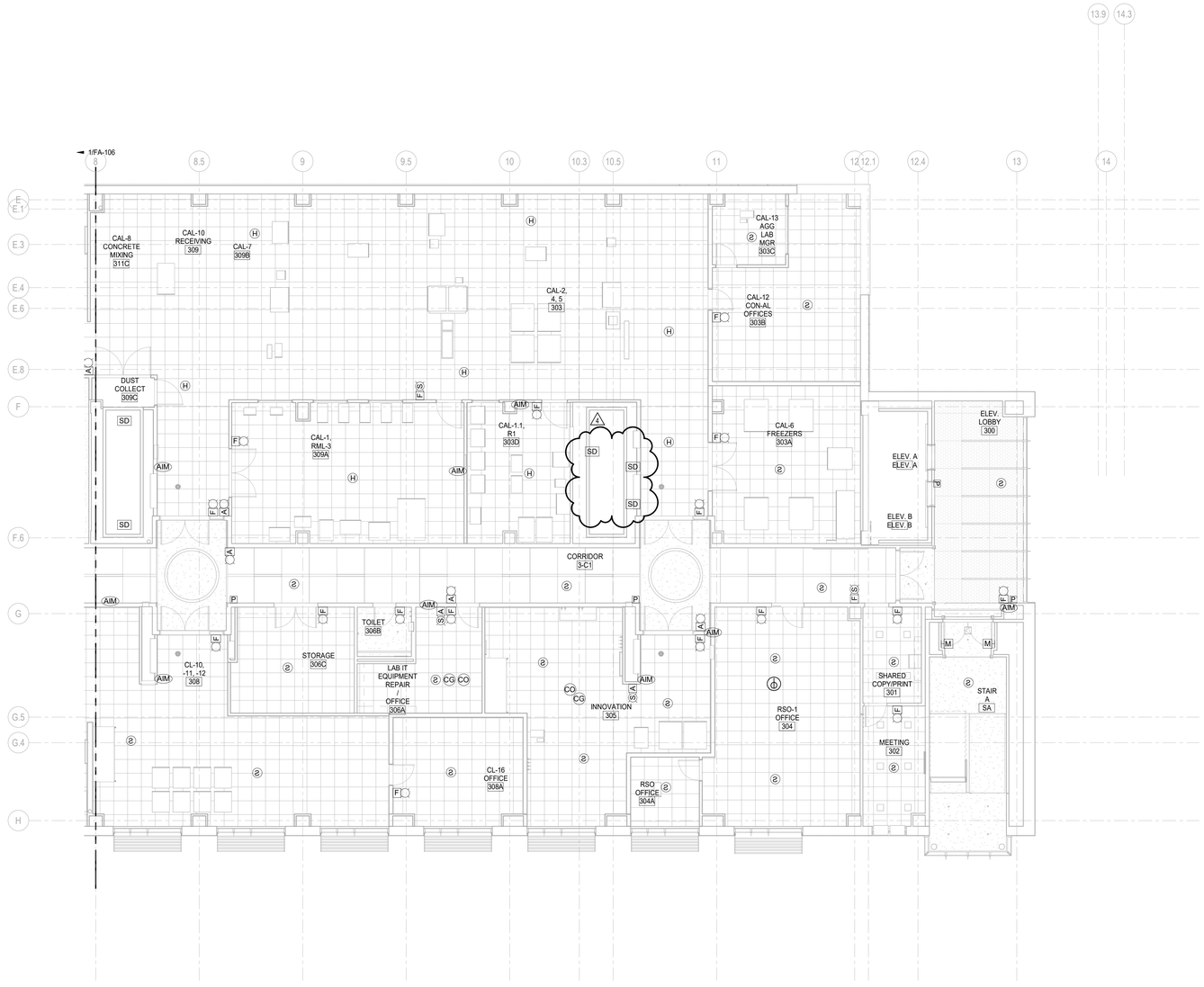
SHEET TITLE: LEVEL 2 FIRE ALARM PLAN - SECTION B

DRAWING NUMBER: FA-104

SHEET: OF

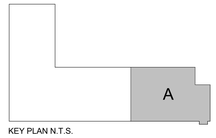
GENERAL SHEET NOTES:

1. LEVEL 3 FIRE ZONE IS ENTIRE OF FIRE FLOOR SHOWN.
2. PASSENGER ELEVATOR FIRE ZONE IS THE ELEVATOR SHAFT AREA SHOWN ONLY.
3. STAIRWAY A FIRE ZONE IS THE AREA WITHIN STAIR A.
4. ROUTING OF CABLING ON EACH FLOOR SHALL BE VIA CABLE TRAY TO CLOSEST LOCATION NEAR ROOM/AREA OF DEVICES AND THEN ROUTED, THROUGH CEILING SPACE VIA BRIDLE RING SUPPORTS, TO LOCATION DIRECTLY ABOVE CONNECTION POINT. ROUTING OF CABLE THROUGH ALL INACCESSIBLE LOCATIONS SHALL BE IN CONDUIT.
5. SPLICES ARE NOT TO BE MADE IN ANY CIRCUIT OR CABLE UNLESS SHOWN ON CONTRACT DRAWINGS OR AT EACH DEVICE OR IN JUNCTION BOX AT CABLE TRAY.
6. PROVIDE FIRE STOPPING AT ALL FIRE WALL PENETRATIONS. SEE A-620 FOR MORE INFORMATION.
7. COORDINATE ALL TAMPER SWITCH (TS) / WATER FLOW (WF) SWITCH LOCATIONS WITH FIRE PROTECTION DRAWINGS.



1 LEVEL 3 FIRE ALARM PLAN - SECTION A

1/8" = 1'-0" 0' 4' 8' 16'



KEY PLAN N.T.S.

NEW YORK STATE Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

CHA

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STATE OF NEW YORK · RICHARD E. GARRETT · LICENSED PROFESSIONAL ENGINEER · 066045 · EXPIRES 8/31/2027

PROJECT NORTH

CONTRACT: CONSTRUCTION

TITLE: Provide Testing Laboratory, Building 14

LOCATION: DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT: New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: CEG
DRAWN BY: CEG
FIELD CHECK: REG
APPROVED: REG

SHEET TITLE: LEVEL 3 FIRE ALARM PLAN - SECTION A

DRAWING NUMBER: FA-105

SHEET: OF

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4/2/2026 11:37 AM
42x30 PLOT SHEET



1 LEVEL 3 FIRE ALARM PLAN - SECTION B

1/8" = 1'-0" 0' 4' 8' 16'

B

KEY PLAN N.T.S.

GENERAL SHEET NOTES:

1. LEVEL 3 FIRE ZONE IS ENTIRE OF FIRE FLOOR SHOWN.
2. FREIGHT ELEVATOR FIRE ZONE IS THE ELEVATOR SHAFT AREA SHOWN ONLY.
3. STAIRWAY B FIRE ZONE IS THE AREA WITHIN STAIR B.
4. DRILLERS OPERERATIONS FIRE ZONE IS THAT ARAEAS NORTH OF GRID LINE E.
5. TRAFFIC SIGNAL FIRE ZONE IS THAT AREA SOUTH OF GRID LINE E AND WEST OF GRID LINE 4.
6. ROUTING OF CABLING ON EACH FLOOR SHALL BE VIA CABLE TRAY TO CLOSEST LOCATION NEAR ROOM/AREA OF DEVICES AND THEN ROUTED, THROUGH CEILING SPACE VIA BRIDLE RING SUPPORTS, TO LOCATION DIRECTLY ABOVE CONNECTION POINT. ROUTING OF CABLE THROUGH ALL INACCESSIBLE LOCATIONS SHALL BE IN CONDUIT.
7. SPLICES ARE NOT TO BE MADE IN ANY CIRCUIT OR CABLE UNLESS SHOWN ON CONTRACT DRAWINGS OR AT EACH DEVICE OR IN JUNCTION BOX AT CABLE TRAY.
8. PROVIDE FIRE STOPPING AT ALL FIRE WALL PENETRATIONS. SEE A-620 FOR MORE INFORMATION.
9. COORDINATE ALL TAMPER SWITCH (TS) / WATER FLOW (WF) SWITCH LOCATIONS WITH FIRE PROTECTION DRAWINGS.

KEYED NOTES: (#)

1. CONNECTIONS INDICATED ON RISER DIAGRAM FA-602.
2. CONNECT TO EQUIPMENT SHUTDOWN.

Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

CHA

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STATE OF NEW YORK
RICHARD E. GARRATT
066045
LICENSED PROFESSIONAL ENGINEER
EXPIRES 8/31/2027

PROJECT NORTH

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

PROJECT NUMBER:	47528-C
DESIGNED BY:	CEG
DRAWN BY:	CEG
FIELD CHECK:	REG
APPROVED:	REG

SHEET TITLE:

LEVEL 3 FIRE ALARM PLAN - SECTION B

DRAWING NUMBER:

FA-106

SHEET: OF

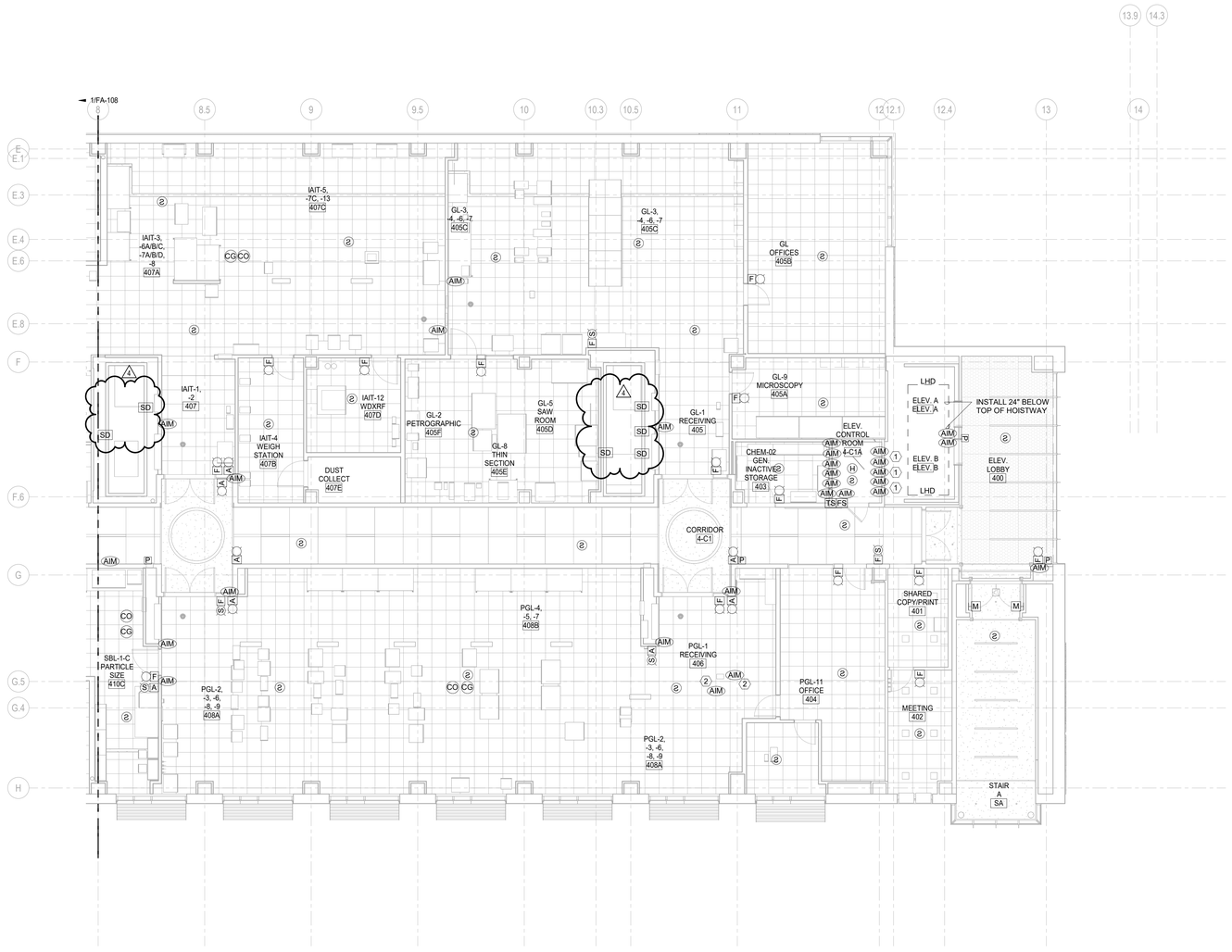
Autodesk Docs://47528 DOT Lab Building/082990-DOTLAB-ELEC23.rvt
4/2/2026 11:39 AM
42x30 PLOT SHEET

GENERAL SHEET NOTES:

1. LEVEL 4 FIRE ZONE IS ENTIRE OF FIRE FLOOR SHOWN.
2. PASSENGER ELEVATOR FIRE ZONE IS THE ELEVATOR SHAFT AND ASSOCIATED MACHINE/CONTROL ROOM AREA SHOWN ONLY.
3. STAIRWAY A FIRE ZONE IS THE AREA WITHIN STAIR A.
4. ROUTING OF CABLING ON EACH FLOOR SHALL BE VIA CABLE TRAY TO CLOSEST LOCATION NEAR ROOM/AREA OF DEVICES AND THEN ROUTED, THROUGH CEILING SPACE VIA BRIDLE RING SUPPORTS, TO LOCATION DIRECTLY ABOVE CONNECTION POINT. ROUTING OF CABLE THROUGH ALL INACCESSIBLE LOCATIONS SHALL BE IN CONDUIT.
5. SPLICES ARE NOT TO BE MADE IN ANY CIRCUIT OR CABLE UNLESS SHOWN ON CONTRACT DRAWINGS OR AT EACH DEVICE OR IN JUNCTION BOX AT CABLE TRAY.
6. PROVIDE FIRE STOPPING AT ALL FIRE WALL PENETRATIONS. SEE A-620 FOR MORE INFORMATION.
7. COORDINATE ALL TAMPER SWITCH (TS) / WATER FLOW (WF) SWITCH LOCATIONS WITH FIRE PROTECTION DRAWINGS.

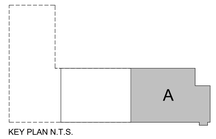
KEYED NOTES: (#)

1. CONNECTIONS INDICATED ON RISER DIAGRAM FA-602
2. CONNECT TO TAMPER SWITCHES MOUNTED ON ROOF.



1 LEVEL 4 FIRE ALARM PLAN - SECTION A

1/8" = 1'-0" 0' 4' 8' 16'



KEY PLAN N.T.S.

Autodesk Docs://47528 DOT Lab Building/082990-DOTLAB-ELEC23.rvt
4/2/26 7:11:41 AM
42x30 PLOT SHEET

Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

CHA

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STATE OF NEW YORK · RICHARD E. GARRETT · LICENSED · 066045 · PROFESSIONAL ENGINEER
EXPIRES 8/31/2027

PROJECT NORTH

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

PROJECT NUMBER:	47528-C
DESIGNED BY:	CEG
DRAWN BY:	CEG
FIELD CHECK:	REG
APPROVED:	REG

SHEET TITLE:
LEVEL 4 FIRE ALARM PLAN - SECTION A

DRAWING NUMBER:
FA-107

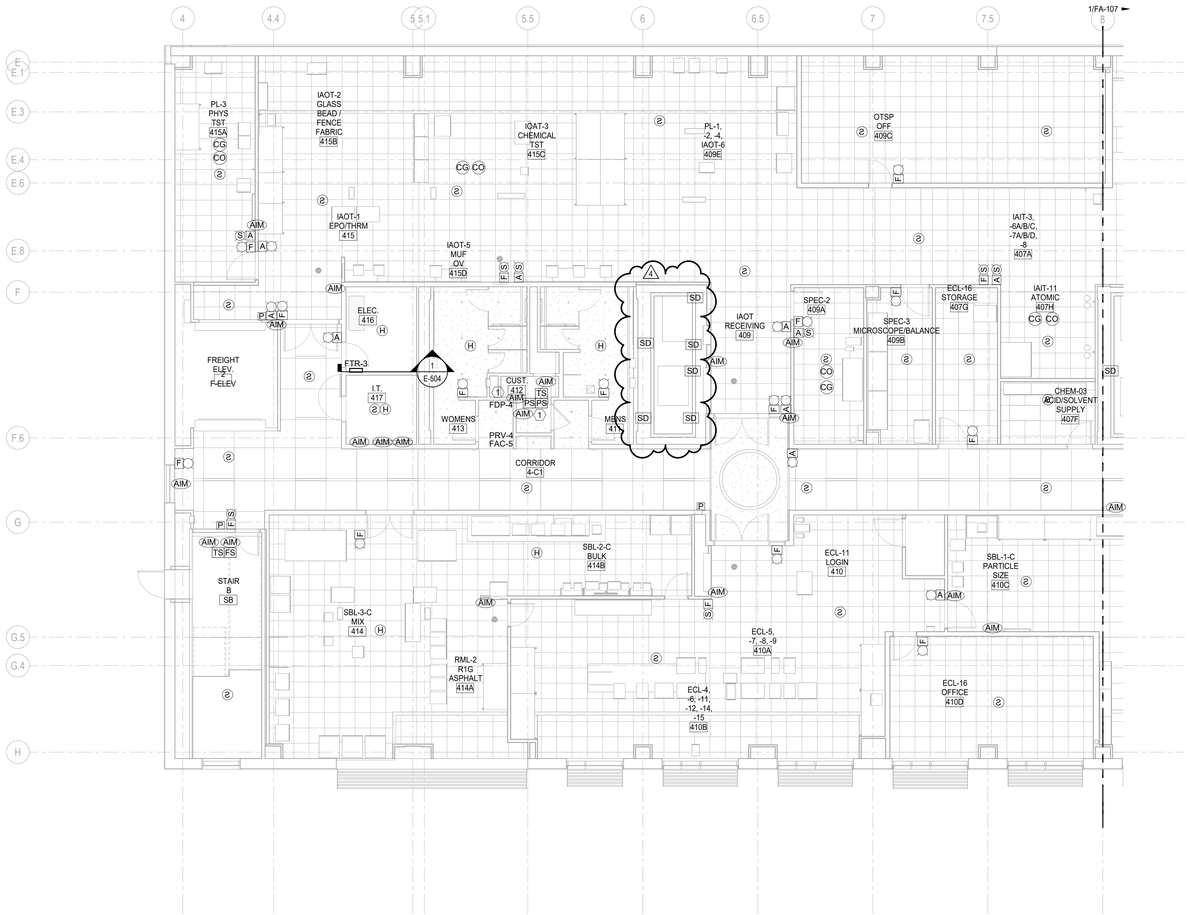
SHEET: OF

GENERAL SHEET NOTES:

1. LEVEL 4 FIRE ZONE IS ENTIRE OF FIRE FLOOR SHOWN.
2. FREIGHT ELEVATOR FIRE ZONE IS THE ELEVATOR SHAFT AREA SHOWN ONLY.
3. STAIRWAY B FIRE ZONE IS THE AREA WITHIN STAIR B.
4. ROUTING OF CABLING ON EACH FLOOR SHALL BE VIA CABLE TRAY TO CLOSEST LOCATION NEAR ROOM/AREA OF DEVICES AND THEN ROUTED, THROUGH CEILING SPACE VIA BRIDLE RING SUPPORTS, TO LOCATION DIRECTLY ABOVE CONNECTION POINT. ROUTING OF CABLE THROUGH ALL INACCESSIBLE LOCATIONS SHALL BE IN CONDUIT.
5. SPLICES ARE NOT TO BE MADE IN ANY CIRCUIT OR CABLE UNLESS SHOWN ON CONTRACT DRAWINGS OR AT EACH DEVICE OR IN JUNCTION BOX AT CABLE TRAY.
6. PROVIDE FIRE STOPPING AT ALL FIRE WALL PENETRATIONS. SEE A-620 FOR MORE INFORMATION..
7. COORDINATE ALL TAMPER SWITCH (TS) / WATER FLOW (WF) SWITCH LOCATIONS WITH FIRE PROTECTION DRAWINGS.

KEYED NOTES: (#)

1. CONNECTIONS INDICATED ON RISER DIAGRAM FA-602



1 LEVEL 4 FIRE ALARM PLAN - SECTION B

1/8" = 1'-0" 0' 4' 8' 16'



KEY PLAN N.T.S.

Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

UNIFORM CODE STATEMENT:
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STATE OF NEW YORK · RICHARD E. CARDWELL · LICENSED PROFESSIONAL ENGINEER · 066045 · EXPIRES 8/31/2027

PROJECT NORTH

CONTRACT: CONSTRUCTION

TITLE: Provide Testing Laboratory, Building 14

LOCATION: DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT: New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

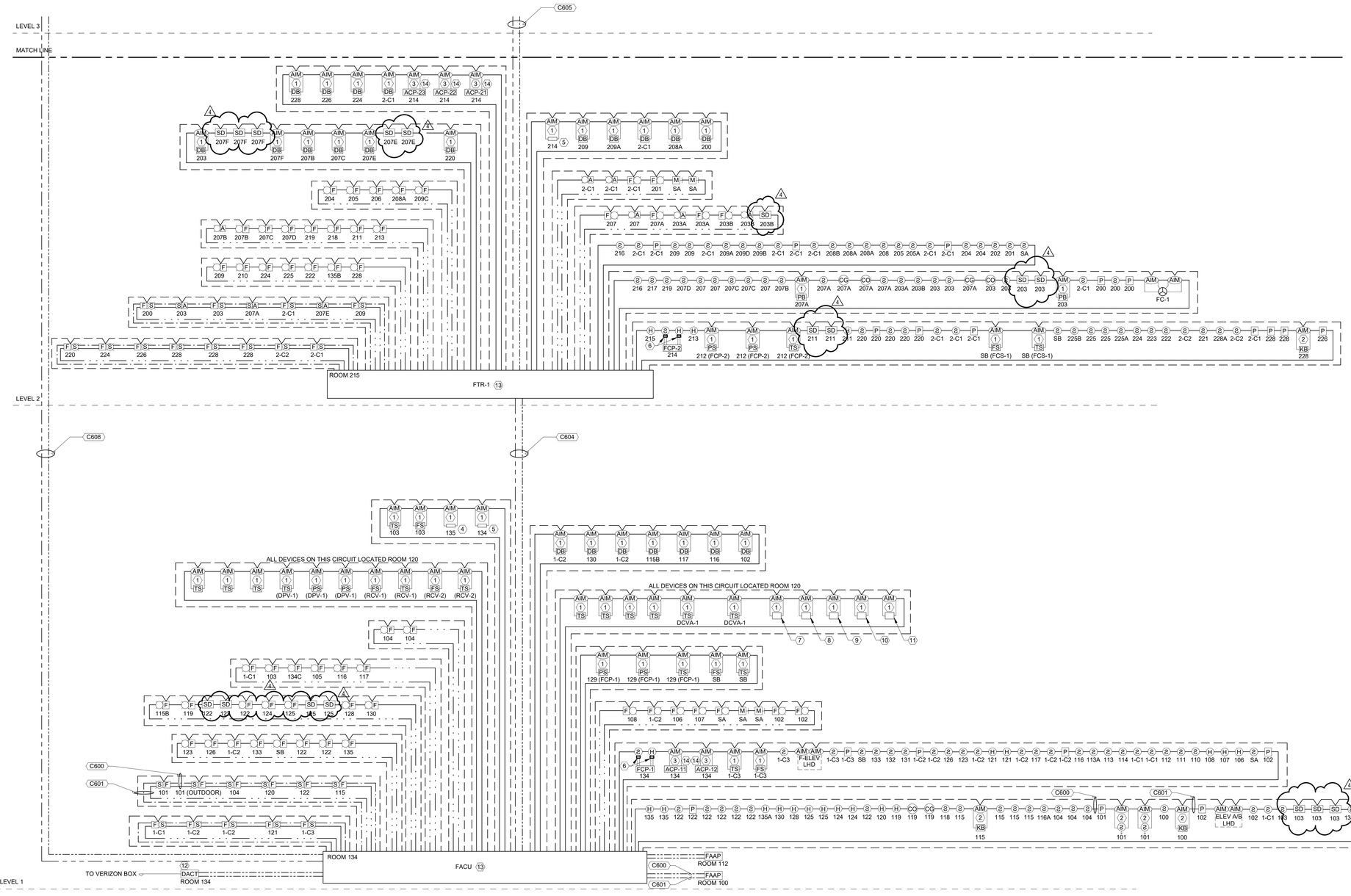
PROJECT NUMBER:	47528-C
DESIGNED BY:	CEG
DRAWN BY:	CEG
FIELD CHECK:	REG
APPROVED:	REG

SHEET TITLE: LEVEL 4 FIRE ALARM PLAN - SECTION B

DRAWING NUMBER: FA-108

SHEET: OF

Autodesk Docs://47528 DOT Lab Building/082990-DOTLAB-ELEC23.rvt
4/2/26 7:11:43 AM
42x30 PLOT SHEET



1 FIRE ALARM RISER FLOORS 1 & 2
NOT TO SCALE

GENERAL NOTES:

A. DEVICES SHOWN MAY NOT BE REPRESENTATIVE OF ACTUAL CONNECTIONS OR DEVICES USED AND ARE FOR ILLUSTRATIVE PURPOSES ONLY.

B. ROUTE ALL FIRE ALARM DEVICE WIRING FOR EACH FLOOR IN SINGLE 1-1/2" C. DISTRIBUTE TO INDIVIDUAL DEVICES USING 3/4"C.

C. ALL FIRE ALARM CIRCUITS SHALL BE SIZED TO A MAXIMUM OF 80% OF CAPACITY.

D. IDENTIFIERS UNDER DEVICES INDICATES THE ROOM NUMBER THE DEVICE IS LOCATED.

E. FOR CONDUCTOR LINE TYPES SEE, SHEET FA-603.

KEYED NOTES: (#)

1. ALL WIRING BETWEEN FIRE ALARM AIM DEVICE AND CONNECTED DEVICES SHALL BE TWO WIRE UTP 14 AWG FPLP.
2. ALL WIRING BETWEEN FIRE ALARM AIM DEVICE AND CONNECTED DEVICES SHALL BE TWO WIRE UTP 16 AWG FPLP FOR SIGNALS AND TWO WIRE UTP 14 AWG FPLP.
3. DEVICE WILL BE NORMALLY CLOSED CONTACT.
4. AIM WITH OUTPUT CONNECTION TO LIGHTING CONTROL PANEL.
5. AIM WITH OUTPUT CONNECTION TO BMS.
6. PROVIDE WITH RELAYS TO ENABLE FCP-X IF EITHER INITIATION DEVICE IS ACTIVATED.
7. FIRE PUMP POWER. (FIRE PUMP SIGNAL FOR FIRE PUMP CONTROLLER)
8. FIRE PUMP PHASE REVERSAL. (FIRE PUMP SIGNAL FOR FIRE PUMP CONTROLLER)
9. FIRE PUMP LOSS OF PHASE. (FIRE PUMP SIGNAL FOR FIRE PUMP CONTROLLER)
10. FIRE PUMP RUNNING. (FIRE PUMP SIGNAL FOR FIRE PUMP CONTROLLER)
11. FIRE PUMP MALFUNCTION (TROUBLE). (FIRE PUMP SIGNAL FOR FIRE PUMP CONTROLLER)
12. COORDINATE WITH CENTRAL MONITORING SERVICE, AS DIRECTED BY DIRECTOR'S REPRESENTATIVE, TO INSURE A FUNCTIONAL SYSTEM. CENTRAL MONITORING SERVICE FUNCTIONS ARE NOT PART OF THIS CONTRACT.
13. PLEASE COORDINATE ELECTRICAL CONNECTIONS FOR POWER CONNECTIONS WITH DRAWING E-502.
14. AIM WITH OUTPUT CONNECTION TO ACCESS CONTROL REFER TO ES DRAWINGS.

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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UNIFORM CODE STATEMENT:
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STATE OF NEW YORK · RICHARD E. CARNAFT · 066045 · LICENSED · PROFESSIONAL ENGINEER
EXPIRES 8/31/2027

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

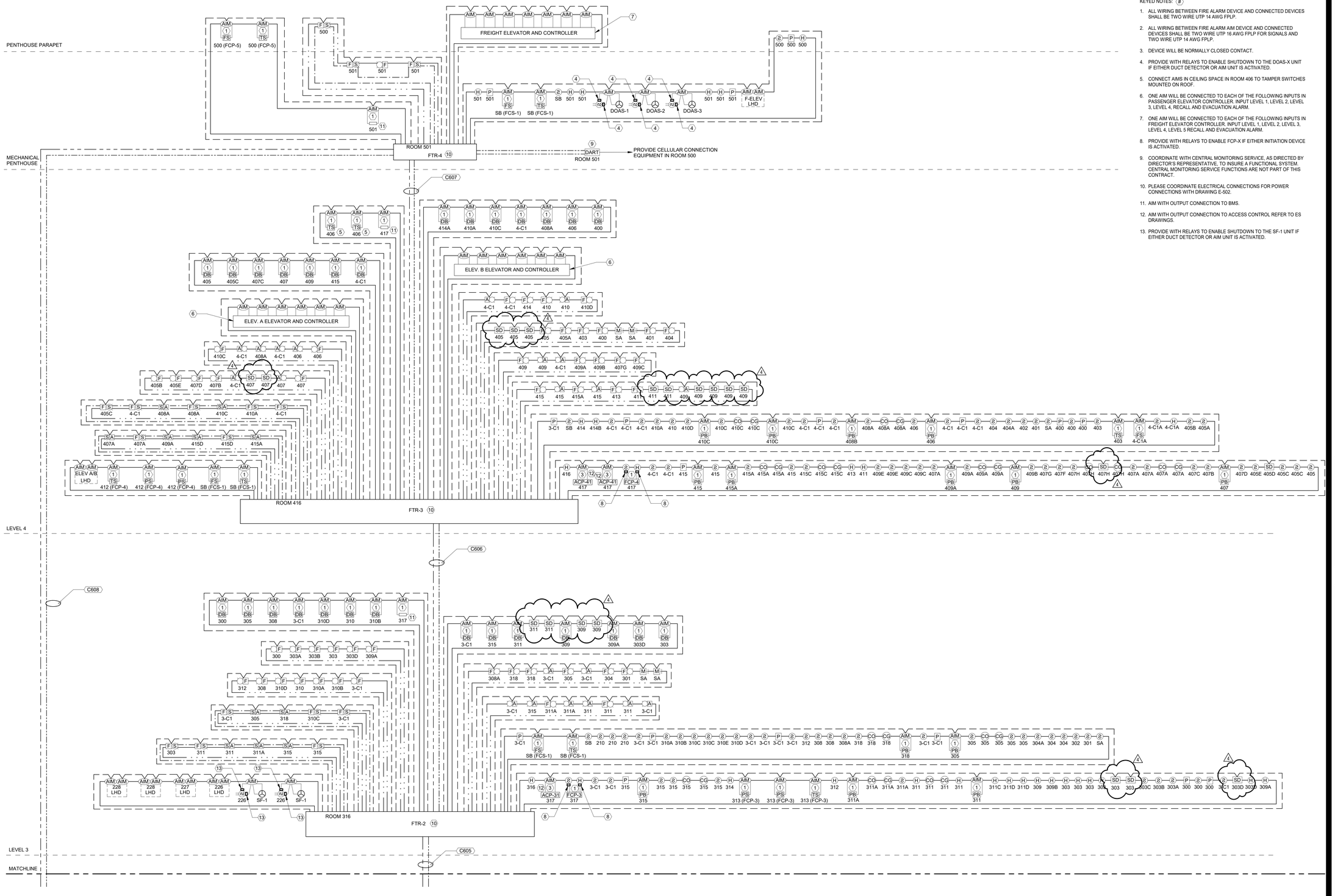
PROJECT NUMBER: 47528-C
DESIGNED BY: CEG
DRAWN BY: CEG
FIELD CHECK: REG
APPROVED: REG
SHEET TITLE:

FIRE ALARM RISER DIAGRAM FLOORS 1 & 2

DRAWING NUMBER: FA-601

SHEET: OF

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4/2/2026 11:45 AM
42x30 PLOT SHEET



1 FIRE ALARM RISER FLOORS 3,4 & PENTHOUSE
NOT TO SCALE

GENERAL NOTES:

A. DEVICES SHOWN MAY NOT BE REPRESENTATIVE OF ACTUAL CONNECTIONS OR DEVICES USED AND ARE FOR ILLUSTRATIVE PURPOSES ONLY.

B. ROUTE ALL FIRE ALARM DEVICE WIRING FOR EACH FLOOR IN SINGLE 1-1/2" C. DISTRIBUTE TO INDIVIDUAL DEVICES USING 3/4"C.

C. ALL FIRE ALARM CIRCUITS SHALL BE SIZED TO A MAXIMUM OF 80% OF CAPACITY.

D. IDENTIFIERS UNDER DEVICES INDICATES THE ROOM NUMBER THE DEVICE IS LOCATED.

KEYED NOTES: (#)

1. ALL WIRING BETWEEN FIRE ALARM DEVICE AND CONNECTED DEVICES SHALL BE TWO WIRE UTP 14 AWG FPLP.
2. ALL WIRING BETWEEN FIRE ALARM AIM DEVICE AND CONNECTED DEVICES SHALL BE TWO WIRE UTP 16 AWG FPLP FOR SIGNALS AND TWO WIRE UTP 14 AWG FPLP.
3. DEVICE WILL BE NORMALLY CLOSED CONTACT.
4. PROVIDE WITH RELAYS TO ENABLE SHUTDOWN TO THE DOAS-X UNIT IF EITHER DUCT DETECTOR OR AIM UNIT IS ACTIVATED.
5. CONNECT AIMS IN CEILING SPACE IN ROOM 406 TO TAMPER SWITCHES MOUNTED ON ROOF.
6. ONE AIM WILL BE CONNECTED TO EACH OF THE FOLLOWING INPUTS IN PASSENGER ELEVATOR CONTROLLER. INPUT LEVEL 1, LEVEL 2, LEVEL 3, LEVEL 4, RECALL AND EVACUATION ALARM.
7. ONE AIM WILL BE CONNECTED TO EACH OF THE FOLLOWING INPUTS IN FREIGHT ELEVATOR CONTROLLER. INPUT LEVEL 1, LEVEL 2, LEVEL 3, LEVEL 4, LEVEL 5 RECALL AND EVACUATION ALARM.
8. PROVIDE WITH RELAYS TO ENABLE FCP-X IF EITHER INITIATION DEVICE IS ACTIVATED.
9. COORDINATE WITH CENTRAL MONITORING SERVICE, AS DIRECTED BY DIRECTOR'S REPRESENTATIVE, TO INSURE A FUNCTIONAL SYSTEM. CENTRAL MONITORING SERVICE FUNCTIONS ARE NOT PART OF THIS CONTRACT.
10. PLEASE COORDINATE ELECTRICAL CONNECTIONS FOR POWER CONNECTIONS WITH DRAWING E-502.
11. AIM WITH OUTPUT CONNECTION TO BMS.
12. AIM WITH OUTPUT CONNECTION TO ACCESS CONTROL REFER TO ES DRAWINGS.
13. PROVIDE WITH RELAYS TO ENABLE SHUTDOWN TO THE SF-1 UNIT IF EITHER DUCT DETECTOR OR AIM UNIT IS ACTIVATED.

Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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STATE OF NEW YORK · RICHARD E. CARRETT · 066040 · LICENSED PROFESSIONAL ENGINEER
EXPIRES 8/31/2027

CONTRACT:
CONSTRUCTION

TITLE:
Provide Testing Laboratory, Building 14

LOCATION:
DOT Region 1, Albany County
State Office Building Campus
Albany, NY

CLIENT:
New York State Department of Transportation

MARK	DATE	DESCRIPTION
4	04/01/26	ADDENDUM 4
	01/13/26	BID DOCUMENT

PROJECT NUMBER:	47528-C
DESIGNED BY:	CEG
DRAWN BY:	CEG
FIELD CHECK:	REG
APPROVED:	REG

SHEET TITLE:
FIRE ALARM RISER DIAGRAM FLOORS 3, 4 & PENTHOUSE

DRAWING NUMBER:
FA-602

SHEET: OF

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