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

ADDENDUM NO. 7 TO PROJECT NO. 47528

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

April 21, 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.

BIDDING REQUIREMENTS

1. DOCUMENT 001117 ADVERTISEMENT FOR BIDS PLA: The last date for receipt of bids is changed from Wednesday, April 29, 2026, to Wednesday, May 13, 2026.

GENERAL REQUIREMENTS

2. SECTION 012100 ALLOWANCES: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 012100 – 1 thru 012100 – 5) noted "Addendum 7 04/17/26".

SPECIFICATIONS

3. SECTION 019119 BUILDING ENCLOSURE COMMISSIONING: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 019119 – 1 thru 019119 – 16) noted "Addendum 7 04/17/26".

4. SECTION 078100 APPLIED FIRE PROTECTION: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 078100 – 1 thru 078100 – 8) noted "Addendum 7 04/17/26".

5. SECTION 084113 ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS: Discard all previously issued versions of this Section and substitute the accompanying Section (pages 084113 – 1 thru 084113 – 15) noted "Addendum 7 04/17/26".

6. SECTION 084413 GLAZED ALUMINUM CURTAIN WALLS: Discard all previously issued versions of this Section and substitute the accompanying Section (pages 084413 – 1 thru 084413 – 14) noted "Addendum 7 04/17/26".

7. SECTION 088000 GLAZING: Discard all previously issued versions of this Section and substitute the accompanying Section (pages 088000 – 1 thru 088000 – 14) noted "Addendum 7 04/17/26".

8. SECTION 105613 METAL STORAGE SHELVING: Paragraph 2.2.B: Change Paragraph to read:

   "B. Wall Ties: Provide manufacturer's "optional wall tie" to supplement floor anchors as applicable. Contractor shall follow the manufacturers anchoring and requirements of the selected system."

9. SECTION 115313 LABORATORY FUME HOODS: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 115313 – 1 thru 115313 – 19) noted "Addendum 7 04/17/26".

10. SECTION 134900 RADIATION PROTECTION: Discard the Section bound in the Project Manual and substitute the accompanying Section (pages 134900 – 1 thru 134900 – 8) noted "Addendum 7 04/17/26".

11. SECTION 281300 CARD ACCESS CONTROL SYSTEM: Paragraph 1.1: Add the following Paragraph:

   "D. Contractor shall install all equipment listed within this specification. Allowance shall cover all parts, programming, licensing, documentation creation, and owner training."

APPENDIX

12. INFORMATION AVAILABLE TO BIDDERS – LAB EQUIPMENT SCHEDULE: Discard the document bound in the Project Manual and substitute the accompanying document (pages 1 thru 12) noted "Addendum 7 04/17/26".

DRAWINGS

13. Drawing No. P-101B:
    a. Callout located on Section Line 7.5: Change "6" WATER METER BY BADGER, MODEL E-SERIES G2" to read "6" WATER METER BY RECORDALL, TURBO SERIES MODEL 2000".

14. Drawing No. P-202A:
    a. Delete Plumbing Note 5.

15. Drawing No. P-202B:
    a. Delete Plumbing Note 3.

16. Drawing No. P-203A:
    a. Delete Plumbing Note 5.

17. Drawing No. P-203B:
    a. Delete Plumbing Note 2.

18. Drawing No. P-204B:
    a. Delete Plumbing Note 4.

19. Revised Drawings:
    a. Drawing Nos. G-003, A-101A, A-101B, A-102B, A-103A, A-104A, A-105B, A-200, A-201, A-202, A-203, A-204, A-205, A-206, A-207, A-311, A-312, A-316, A-317, A-320, A-334, A-608, A-612, A-614, A-615, A-617, A-618, A-619, A-910, ES-001, noted "REVISION 7, 04/17/26, ADDENDUM 7" accompany this Addendum and supersede the same numbered previously issued drawings.

END OF ADDENDUM

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

SECTION 012100 - ALLOWANCES

PART 1 - GENERAL

1.1 DESCRIPTION

A. Include in the contract sum the allowances stated in this Section.

B. Should the net cost be more than the specified amount of the allowance, the contract sum will be adjusted by Order on Contract in accordance with the General Conditions. No Work in excess of the allowance will be permitted except by Order on Contract. Should the net cost be less than the specified amount of the allowance, the balance will be deducted from the final payment.

1.2 TOTAL FOR ALLOWANCES

A. The sum of allowances required by this Contract is $13,359,944.

1.3 ALLOWANCE FOR CONTINGENCIES

A. Include in the contract sum the amount of $7,905,200 to cover the cost of additional labor and materials for contingent activities within the scope of the Contract as directed in writing by Field Order. The Field Order will include a description of the Work and a method for determining the cost of such Work.

B. The value of the directed Work under this allowance will be determined by one or more of the methods authorized in Section 012200 which will be specified in the Field Order.

1.4 ALLOWANCE FOR HONEYWELL BUILDING MANAGEMENT SYSTEM (BMS)

A. Include in the contract sum the amount of $890,672 to cover the cost of providing the Honeywell Building Management System (BMS) as specified in Section 230923 and 230993.11, and as shown on the Drawings.

1. The cost of providing the Work of this allowance will be paid in the amount specified. It is a fixed price allowance. Progress payments will be determined, by the Director, by evaluating the work completed.
2. Include overhead and profit for administering this allowance separately in the contract sum, not in the allowance.
3. Cause the products covered by this allowance to be provided by such persons or firm and for such amount as designated.
4. The amount of the allowance includes furnishing and installing the products in accordance with the requirements of referenced Specification Section(s) and Drawings.
5. Execute agreement with designated persons or firm. Arrange for Samples, Shop Drawings, Product Data, Delivery and Installation in accordance with the requirements of referenced Specification Section(s) and Drawings.

B. Primary Contact Information

1. John Gardiner
   Senior Account Executive
   Honeywell
   Phone: (518) 365-1555
   Email: john.gardiner@honeywell.com

1.5 ALLOWANCE FOR HONEYWELL ACCESS CONTROL SYSTEM

A. Include in the contract sum the amount of $313,783 to cover the cost of providing the Honeywell Access Control System as specified in Section 281300 and as shown on the Drawings.

1. The cost of providing the Work of this allowance will be paid in the amount specified. It is a fixed price allowance. Progress payments will be determined, by the Director, by evaluating the work completed.
2. Include overhead and profit for administering this allowance separately in the contract sum, not in the allowance.
3. Cause the products covered by this allowance to be provided by such persons or firm and for such amount as designated.
4. The amount of the allowance includes furnishing the products, programming, training, documentation, and licensing in accordance with the requirements of referenced Specification Section(s) and Drawings.
5. Execute agreement with designated persons or firm. Arrange for Samples, Shop Drawings, Product Data, Delivery and Installation in accordance with the requirements of referenced Specification Section(s) and Drawings.

B. Primary Contact Information

1. John Gardiner
   Senior Account Executive
   Honeywell
   Phone: (518) 365-1555
   Email: john.gardiner@honeywell.com

1.6 ALLOWANCE FOR JOHNSON CONTROLS SECURITY SOLUTIONS

A. Include in the contract sum the amount of $552,585 to cover the cost of providing the Johnson Controls Security Solutions as specified in Sections 282305 and 284602, and as shown on the Drawings.

1. The cost of providing the Work of this allowance will be paid in the amount specified. It is a fixed price allowance. Progress payments will be determined, by the Director, by evaluating the work completed.
2. Include overhead and profit for administering this allowance separately in the contract sum, not in the allowance.
3. Cause the products covered by this allowance to be provided by such persons or firm and for such amount as designated.

4. The amount of the allowance includes furnishing and installing the products in accordance with the requirements of referenced Specification Section(s) and Drawings.
5. Execute agreement with designated persons or firm. Arrange for Samples, Shop Drawings, Product Data, Delivery and Installation in accordance with the requirements of referenced Specification Section(s) and Drawings.

B. Primary Contact Information

1. Gary Ghent
Manager - Systems Applications – National Accounts
Johnson Controls Security Solutions
Phone: (315) 243-0807
Email: Gary.Ghent@jci.com

1.7 ALLOWANCE FOR NATIONAL GRID NATURAL GAS SERVICE

A. Include in the contract sum the amount of $39,281 to cover the cost of providing the National Grid Natural Gas Service as shown on the Drawings.

1. The cost of providing the Work of this allowance will be paid in the amount specified. It is a fixed price allowance. Progress payments will be determined, by the Director, by evaluating the work completed.
2. Include overhead and profit for administering this allowance separately in the contract sum, not in the allowance.
3. Cause the products covered by this allowance to be provided by such persons or firm and for such amount as designated.
4. The amount of the allowance includes furnishing and installing the products in accordance with the requirements of referenced Drawings.
5. Execute agreement with designated persons or firm. Arrange for Samples, Shop Drawings, Product Data, Delivery and Installation in accordance with the requirements of referenced Drawings.

B. Primary Contact Information

1. Jacqueline Dunlavey
Consumer Representative - Gas Connections
National Grid
Phone: (518) 703-4866
Email: Jacqueline.Dunlavey@nationalgrid.com

1.8 ALLOWANCE FOR INSTRON TEST EQUIPMENT

A. Include in the contract sum the amount of $3,614,657 to cover the cost of providing the Instron Test Equipment as shown on the Drawings and in the Lab Equipment Schedule.

1. The cost of providing the Work of this allowance will be paid in the amount specified. It is a fixed price allowance. Progress payments will be determined, by the Director, by evaluating the work completed.

2. Include overhead and profit for administering this allowance separately in the contract sum, not in the allowance.
3. Cause the products and services covered by this allowance to be furnished by such persons or firm and for such amount as designated.
4. The amount of the allowance includes furnishing the products, loading systems onto transport and delivery to project site. Labor for unloading and installation of the products shall be included in the contract sum (not in the allowance).
5. The amount of the allowance includes applicable taxes.
6. Include unloading and on-site handling costs, storage and protection costs, rigging costs, installation costs, and other expenses separately in the contract sum, not in the allowance.
7. Purchase and Delivery:

    a. Execute purchase agreement with designated supplier.
    b. Arrange for Samples, Shop Drawings, and Product Data as required.
    c. Make arrangements for delivery.
    d. Upon delivery, promptly inspect products for damage or defects. Submit claims for transportation damage.

B. Primary Contact Information

1. Daniel Rapka
   Senior Sales & Application Engineer
   Instron
   Phone: (774) 256-1193
   Email: daniel_rapka@instron.com

1.9 ALLOWANCE FOR ASSETWORKS ECU AND EV CHARGERS

A. Include in the contract sum the amount of $43,766 to cover the cost of providing AssetWorks ECU and EV Chargers as specified in Section 262743 and as shown on the Drawings.

1. The cost of providing the Work of this allowance will be paid in the amount specified. It is a fixed price allowance. Progress payments will be determined, by the Director, by evaluating the work completed.
2. Include overhead and profit for administering this allowance separately in the contract sum, not in the allowance.
3. Cause the products and services covered by this allowance to be furnished by such persons or firm and for such amount as designated.
4. The amount of the allowance includes furnishing the products and services in accordance with the requirements of referenced Specification Section. Labor for installation of the products covered by the referenced Specification Section shall be included in the contract sum (not in the allowance).
5. The amount of the allowance includes delivery to the Site and applicable taxes.
6. Include unloading and on-site handling costs, storage and protection costs, installation costs, and other expenses separately in the contract sum, not in the allowance.
7. Purchase and Delivery:

    a. Execute purchase agreement with designated supplier.
    b. Arrange for Samples, Shop Drawings, and Product Data as required.

c. Make arrangements for delivery.
d. Upon delivery, promptly inspect products for damage or defects. Submit claims for transportation damage.

B. Primary Contact Information

1. Chris Bassett
Fuel & EV Solutions Specialist
AssetWorks
Phone: 954-892-8042
Email: chris.bassett@assetworks.com

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012100

SECTION 019119 – BUILDING ENCLOSURE COMMISSIONING

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Commissioning requirements common to all Building Enclosure-Related Sections.

B. Independent review of the building enclosure-related design documents

C. Documentation of proper installation and performance of representative areas of Building Enclosure materials, systems, and components through observation and testing.

D. Review and comment on the requirements for field mock-up, trial installation and Functional Performance Testing included in the enclosure-related technical specification sections.

E. Preparation and coordination of Building Enclosure Commissioning Report.

1.2 GENERAL DESCRIPTION

A. Statement of Building Enclosure Design Intent (BEDI): The design intent of this building enclosure is to provide a façade and roof assembly which limits air infiltration to the specified levels as required by the individual Building Enclosure (BE) technical sections in Divisions 03 through 09, that eliminates uncontrolled water infiltration (including condensation), provides thermal insulation continuity; and includes products and assemblies that are technically sound, durable and serviceable.

B. Building Enclosure Commissioning (BECx) facilitates a quality-oriented process to document that all building enclosure components are installed and perform collectively according to the BEDI, that the installation is adequately tested and that the specified performance is verified and documented. It serves as a tool to identify deficiencies in the building enclosure during the preconstruction and construction phases in an effort to advance the building enclosure components from mock-up installations, through installation of the separate components on the structure, to a fully integrated, weather-tight assembly prior to occupancy, thereby reducing impact on the building end user.

C. The Building Enclosure Commissioning Coordinator (BECxC) shall work with the Contractor and Contractor's Quality Assurance and Quality Control Plan and personnel to oversee the BECx processes and performance testing. The BECxA will observe tests as deemed appropriate. All required testing, unless otherwise specified in each building enclosure related section will be performed and paid for by the Owner.

1.3 SCOPE

A. This Section includes building enclosure commissioning procedures, including exterior facade enclosure, and roofing or other construction that protects climate-controlled interior spaces from unconditioned spaces and the exterior environment, as follows:

1. Building enclosure construction, above grade including exterior opaque walls, windows, and doors including sheathing, framing, insulation and vapor barrier (as required).
2. Roofing, including roofing system, roofing insulation, skylights, hatches, and other roof openings and penetrations.
3. Foundation water proofing systems and sub-drainage.
4. The aforementioned items including continuity between all sections (where applicable).

B. Materials, Product and Assembly Performance Testing as required by individual sections, and/or as outlined in Part 3 of this specification. All performance values shall be as described within each relevant section of the Project Specification.

C. Record Documents related to BECx.

1.4 RELATED WORK AND DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

B. Commissioning Specifications: See Division 01 Section 019113 - General Commissioning Requirements for general requirements for MEP commissioning including definitions, means and methods for conducting the commissioning process, commissioning team members, Owner's responsibilities, Contractor's responsibilities, and Commissioning Authority's responsibilities.

C. Individual Building Enclosure Specification Sections: Individual building enclosure technical sections (Divisions 03-09) stipulate requirements for material testing, and warranties for the material, product or assembly specified in the Section. Installation, product testing, and assembly testing are stipulated in each section and/or Part 3 of this section.

1.5 DEFINITIONS AND ABBREVIATIONS

A. Action Item (AI): Any issue that requires a response, completion, corrective or additional work, or any other action related to the construction. Examples include a Contractor's Request for Information (RFI), an Architect's Field Directive, a clarification request, or a documented deficiency in the Work. Action Items must be categorized and assigned to the appropriate party for remedial action.

B. Action List (AL): This is a list that is maintained and updated by the BECxA that includes all Action Items that relate to BECx activities, including a summary description of each AI (including photograph where appropriate), the date that each AI was first documented, the appropriate party responsible for remedial action, the date corrective action was performed, and a brief summary of the remediation.

C. A/E: Architect/Engineer-of-Record.

D. Commissioning (Cx): The process of documenting that all building systems perform interactively according to the design intent, the systems are efficient and cost effective and meet the Owner's Project Requirements.

E. Commissioning Provider (CXP): The party in responsible charge for commissioning of the building systems.

F. Building Enclosure Commissioning Provider (BECxA): The Party retained by the Owner will oversee the BECx process, develop and stipulate many of the BECx requirements, manage the BECx process, and validate that building enclosure systems are designed, installed and tested to meet the Owner's requirements and/or contract documents provided by the Architect-of-Record.

G. Commissioning Portal: This is an internet hub for the collaboration on Cx and BECx information. This portal will act as a hub for posting electronic information.

H. Commissioning Report: The Commissioning Report is the final deliverable from the Cx process, and provides the information needed to understand, and maintain the facility's building enclosure. It should be the repository of all updates and corrections as they occur (even through occupancy). The Facility Manual expands the scope of standard O&M documentation to incorporate additional information developed through the commissioning process. This is also often called a 'Systems Manual' throughout ASHRAE Cx references. Traditionally this manual has documented only the MEP systems. For this project, the facility manual will also include the Building Enclosure Commissioning (BECx) Documents.

I. Commissioning Team (CxT): The group of Parties involved in the commissioning process for any given system. The group is typically comprised of representatives from:

1. Owner (PM) and his/her consultants
2. General Contractor and/or Construction Manager (GC or Contractor/CM)
3. Designer and design engineers (particularly the architect and engineers – A/E)
4. Building Enclosure Commissioning Authority (BECxA)
5. Test Technician (TT) (as either trade quality control or BECxA)
6. Building Enclosure subcontractor and their sub-subcontractors (BESC)
7. Specialty subcontractors
8. Any other installing subcontractors or suppliers of materials or systems.

J. Construction Phase: Phase of the project during which the facility is constructed. During this phase the Contractor and subcontractors complete the installation and field-testing requirements.

K. Contract Documents: The documents governing the responsibilities and relationships between Parties involved in the design and construction of this project including (but not necessarily limited to):

1. Agreements/Contracts;
2. Construction Document Drawings and Specifications;
3. Addenda;
4. Change Orders;

L. Construction Documents: Refers generally to the Contract Documents that dictate the details of construction (all but item 1. and 4. above).

M. Deficiency: A condition in the installation or function of a material, assembly, or system that is not in compliance with the Contract Documents (that is, does not perform properly or is not complying with the Design Intent).

N. Contractor: As used herein, 'Contractor' is a general reference to the installing Party and can therefore refer to the GC, subcontractors, or vendors as inferred by its usage.

O. BECx Software: A software tool used for collaborative commissioning information management.

P. Building Enclosure Commissioning (BECx): The process of facilitating the quality installation of the building enclosure materials, components, and systems in accordance with the contract documents and satisfy the requirements of the BEDI.

Q. Building Enclosure Commissioning Coordinator (BECxC): This refers to the Individual that is designated the POC for BECx activities.

R. Factory/Laboratory Testing: Off-Site Testing of Building Enclosure materials, components and systems at the manufacturer's facility and/or independent Testing Agency. This testing will be witnessed and documented by the members of the BECx team as appropriate and as specified in the BE technical specifications.

S. Field Testing Authorized/Accredited Representative: On-site testing of Building Enclosure materials, components and systems conducted by an authorized Manufacturer's Technical Representative and/or independent Testing Agency.

T. Manufacturer's Technical Representative: An individual in direct employ of the manufacturer of the applicable material, component, or system who is technically qualified in the judgment of BECxA to perform the applicable work for which the reference is made.

U. Party: Entity responsible for portion of work.

V. Project Management Consultant (Owner): Project management consultant to the Owner.

W. Point of Contact (POC): General reference to the key individual within each Party.

X. Project Phases: Phases of the project including the Pre-Construction Phase, The Construction Phase, and The Warranty Phase, including Post-Occupancy Evaluation to be completed at the Owner's discretion by the appropriate members of the Commissioning Team for this project.

Y. RFI: Request for Information

Z. Substantial Completion: As defined in the Owner-Contractor agreement. This milestone will coincide with the end of the Construction Period and the acceptance of the Property, or portions thereof, by the Owner. This milestone also coincides with the start of the warranty period.

AA. Testing Agency: An independent agency, fully accredited by the appropriate governing body for each of the materials, components or systems to be tested or evaluated for compliance with

requirements of the contract documents. The Testing Agency shall submit qualifications as required in Section 01450 and individual BE technical sections for review and acceptance by the A/E and BECxA.

BB. Warranty Phase: Beginning on the date of Substantial Completion and continuing through the Warranty Period of each Building Enclosure material, component, and system.

1.6 REFERFENCE STANDARDS

A. ASHRAE NIBS Guideline 3-2012, "Building Enclosure Commissioning Process BECx"

B. ASHRAE Guideline 0-2005, The Commissioning Process

C. ASTM E2813, Standard Practice for Building Enclosure Commissioning

D. ASTM E2947, Standard Guide for Building Enclosure Commissioning

E. Reference standards as identified in the individual Building Enclosure technical sections of the project manual/specification.

1.7 DOCUMENTATION

A. BECxA shall perform a constructability review and provide comments related to the durability, performance and BE conformance with the Owner Project Requirements for consideration by the Owner, A/E and Contractor.

B. The Contractor shall provide to the BECxA the following per the procedures specified herein and in other BE Technical Sections of the specification (Divisions 03-09) for review and comment by the BECxA:

1. Shop Drawings and Product Data: Provide shop drawings and submittal data for materials, products, systems and equipment that will be part of the BECx process. Refer to Section 01 91 00 for additional requirements.

    a. The Contractor shall forward to the BECxA one copy of Shop Drawings and Product Data concurrent with distribution to the A/E. BECxA shall review and provide comments to the Owner and A/E, who will then review and incorporate the BECxA comments at their discretion and return to the Contractor. The Contractor shall then copy BECxA with the reviewed submittal with A/E submittal review stamp.
    b. Any action taken by the A/E or Contractor based in whole or in part on the comments and recommendations provided by the BECx as part of its submittal review shall be the sole responsibility of the A/E or Contractor.

2. Factory/Laboratory Test Reports: The Contractor shall provide any factory or laboratory testing documentation or certified test reports required by the specifications. These shall be provided prior to acceptance and installation of the specific item.
3. Schedule Updates: The Contractor shall issue periodic updates to the construction schedule every two weeks or less as appropriate. Contractor shall use schedule to notify BECx team

of scheduled tests and milestone installation events. Contractor shall coordinate with BECxA for meetings as appropriate prior to and during construction.

4. Action Item Response: Respond to Action Items to which BECx team members assign the Contractor responsibility within 10 business days of issue.
5. Testing Agency Reports. Provide all documentation of work of independent testing agencies required by the specification. These shall be provided prior to acceptance by A/E and installation.

C. Record Drawings: The Contractor shall maintain at the site an updated set of record or 'As-Built' documents reflecting actual installed conditions and all approved changes and modifications to the contract documents. The Contractor shall provide access to the BECxA to review the As-Built and Record Drawings. The Record Drawings shall be maintained concurrently with construction.

1.8 COORDINATION MANAGEMENT PROTOCOLS

A. Unless otherwise defined and agreed to by the parties to the contract documents for this project, coordination responsibilities and management protocols relative to BECx are defined below, subject to further refinement during the Construction Phase BECx pre-construction meeting.

1. Submittals and Shop Drawings: The BECxA shall review submittals and shop drawings in accordance with paragraph 1.7.C.1 above and Section 01 91 00.
2. Deficiencies Identified by the BECxA: When the BECxA identifies a deficiency, the Contractor shall make a good faith assessment of responsible parties. Those parties shall be notified of the perceived deficiency. This communication is for information only and is not a direction to resolve the deficiency. Contractor may accept responsibility and resolve the deficiency voluntarily. If Contractor contests either the deficiency or responsibility for that deficiency, Contractor shall respond to that affect in writing to the BECxA. If a consensus is not reached as a result of this process, then the Contractor shall issue a work directive or RFI response via the normal contractual channels to resolve the issue.
3. Requests for Meetings (beyond regularly scheduled meetings): In general request by the Contractor for additional meetings with the BECxA shall be routed through the Owner who will then confirm the necessity for the meeting. Note that every attempt should be made to deal with BECx issues at regularly scheduled BECx Meetings.
4. Scheduling Coordination – Contractor shall review the BE technical specifications, identify required BECx items (including field and laboratory test requirements, specified test standards, mock-ups, product submissions, milestone installations and similar) and provide a schedule to the BECxA with anticipated dates for each. It is the responsibility of the Contractor to provide adequate time from submission of each BECx requirement to response from the BECx, and resolution of any identified deficiencies without unnecessary deleterious impact on the project schedule.
5. Notification of Completion Milestones – Contractor shall notify Owner and BECxA at least two weeks prior to an anticipated BECx activity or BECx milestone (such as installation of a new façade component). Contractor and BECxA shall then coordinate the scheduling of the activity between all required parties as applicable. Notification shall be via e-mail.
6. Action List: BECxA maintains a categorized Action List which tracks the BECx related action items. All content of the Action List will be available to all parties who have

credentials on the portal. Any party with credentials may post an Action Item. Any party that is copied on an email resulting from an Action Item posting may respond to it and contribute to the dialogue.

1.9 CONTRACTOR'S RESPONSIBILITIES

A. As defined in this Section and in the individual BE technical sections, including but not limited to the following:

1. Attend the routine BECx meetings.
2. Coordinate and Chair preconstruction and construction-phase coordination meetings.
3. Provide summary and schedule of laboratory and field quality control tests and inspections required by the Contract Documents to BECxA.
4. Participate in Pre-construction Mock-Up and Field-testing coordination meetings.
5. Coordinate with the BECxA pre-construction and construction testing and submit laboratory and field quality control testing, field checklists and inspection reports on building enclosure construction to the BECxA. Perform out of sequence work as required to facilitate field tests.
6. Develop and maintain check lists for building enclosure assemblies.
7. Submit maintenance data for products, assemblies, and components to the BECxA.
8. Provide test data, inspection reports, and certificates to BECxA.
9. Review and respond to AI in a timely manner (typically within 10 business days).
10. Contractor is responsible for the cost of all re-tests and compensation of time for Architect and BECxA related to all additional work necessitated by re-testing of specimens following an initial test failure.
11. Provide input for final commissioning documentation.

1.10 A/E RESPONSIBILITIES

A. As defined in this Section and in the individual BE technical sections, including but not limited to the following:

1. Attend the routine BECx meetings.
2. Attend preconstruction and construction-phase coordination meetings.
3. Participate in Pre-construction Mock-Up and Field-testing coordination meetings.
4. Provide resolution to items for which the BECxA and Contractor may be in disagreement.
5. Provide input for final commissioning documentation.

1.11 BECxA RESPONSIBILITIES (BECxA is not to be retained by the Contractor)

A. Develop Construction Phase BECx plan.

B. Provide review comments on the 100% CD's related to the BE for compliance with the design intent and Owner's Project requirements. Refer to Part 1.7A for further information. The CxA shall review the design, identify design issues and/or conflicts that would present a problem for the total system commissioning.

C. Provide comments on submittals related to building enclosure. Provide written comments to A/E for their consideration in their review of the submittals. Refer to Part 1.7B for further information.

D. Convene Preconstruction Commissioning Conference: BECxA will schedule a preconstruction BECx conference before construction of the building enclosure starts, at a time convenient to Owner, A/E and Contractor. The BECxA will conduct the meeting to review commissioning responsibilities and personnel assignments.

1. Attendees: Authorized representatives of Owner, BECxA, Contractor, A/E, and Contractor's superintendent; major BE subcontractors; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with Project and authorized to conclude matters relating to commissioning.
2. Agenda: Discuss items of significance that could affect progress, including the following:

    a. Commissioning Plan and related Specifications
    b. Tentative construction schedule per Contractor.
    c. Phasing and "Building Dry" milestone per Contractor.
    d. Critical work sequencing and long-lead items per Contractor.
    e. Designation of key personnel and their duties.
    f. Field testing schedule, including any special provisions necessary for tests.
    g. Procedures for testing and inspecting.
    h. Submittal procedures.
    i. Coordination of Record Documents.
    j. Owner's occupancy requirements.

3. Minutes: BECxA will record and distribute meeting minutes.

E. Participate in Project-Specific mock-ups and outline the commissioning process and Performance Test procedures. Attend the construction and testing of the mock-up to observe progress and provide written summary report.

F. Witness building enclosure component testing, milestone installations, and perform periodic site visits to document that work is being performed in compliance with the project specifications and Part 3. Conduct visits no less than weekly during construction of the BE.

G. Conduct routine BECx meetings to review progress on AI list/ Portal and resolve issues affecting the building enclosure. Conduct meetings no less than every two weeks during construction of the BE.

H. Compile test data, inspection reports, and certificates and provide them to the CxA for inclusion in the final Commissioning Report.

1.12 PERFORMANCE TESTING (BUILDING ENCLOSURE)

A. Quality Assurance and Control: Specific BECx quality-assurance and quality-control requirements for individual Building Enclosure and materials, methods, and assemblies are specified in the BE Technical Sections relating to those activities. Specified commissioning tests, inspections, and related actions are specified in Part 3 of this section, do not limit Contractor's

other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.

B. The objective of Performance Testing is to demonstrate that each Building Enclosure system, and system-to-system interfaces meet or exceed the performance requirements of the Contract Documents and the BEDI.

C. Costs associated with re-testing caused by failure of the building enclosure tests, during mock-up or construction phase work shall be the responsibility of the Contractor.

1.13 DEFICIENCIES IDENTIFIED DURING BE FUNCTIONAL PERFORMANCE TESTING

A. Non-Conformance. Non-conformance deficiencies identified during Periodic Site Visits or Performance Testing shall be resolved as follows:

1. The BECxA will record the results of the review / functional performance test in the BECx Software project database. All deficiencies or non-conformance issues shall be noted as Action Items and reported to the Contractor.
2. Corrections of identified minor deficiencies may be made during the review / tests at the discretion of the BECxA. In such cases the deficiency and associated resolution will be documented in the database.
3. Every effort will be made by the BECxA to expedite the review / testing process and minimize unnecessary delays, while not compromising the integrity of the procedures.
4. As reviews / tests progress and a deficiency is identified, the BECxA will discuss the issue with the Contractor for follow-up and resolution.

    a. When there is no dispute with respect to the deficiency and the Contractor accepts responsibility to correct it:

        1) The BECxA shall document the deficiency and the Contractor's response. A copy/email/portal issue of the deficiency shall be generated and provided to the Contractor. The Contractor corrects the deficiency, completes the Action Item response certifying that the issue is resolved and /or the product, material or assembly is ready to be retested and notifies the Project Team.
        2) The Contractor reschedules the test and the test is repeated. This process is repeated until the test result(s) meets or exceeds the requirements of the contract documents and, at the discretion of the Owner, the remedial action taken will be implemented on a project-wide basis where applicable. The Contractor is responsible for all retest costs incurred by the BECxA, test agency, Owner and A/E.

    b. If there is a dispute about a deficiency:

        1) The deficiency shall be documented as an Action Item with the Contractor's response, and the Contractor will be notified. The Contractor will track this issue under the construction contract dispute resolution provisions.
        2) Final interpretive authority is with the Owner. Final acceptance authority is with the Owner or A/E.
        3) The BECxA documents the resolution to the Action Item.

4) Once the interpretation and resolution have been decided, the appropriate party corrects the deficiency and responds to the Action Item indicating completion. The Contractor reschedules the review / test and the review / test is repeated until satisfactory performance is achieved. The Action Item is then considered as closed.

B. Failure: As defined in each BE Technical Sections (Divisions 03-09) and/or Part 3. In event of test failure, the Contractor shall provide the Owner with the following:

1. Installer/Manufacturer's response in writing as to the cause of the failure and proposed resolution.
2. Installer/Manufacturer shall implement their proposed resolution on a representative sample of the product.
3. The Owner will determine whether a replacement of all identical units is required or if a repair is acceptable.
4. Upon acceptance, the responsible Party shall replace or repair all identical items at their expense and shall extend the warranty accordingly.
5. Systemic or frequent failures may result in additional testing beyond originally identified to verify performance. Additional costs to test systems due to deficiencies is to be borne by the responsible Contractor.

1.14 COMMISSIONING REPORT CONTENT

A. Report content and format shall be as specified in Section 01 91 00.

B. Commissioning Report

1. Maintenance Schedule: Contractor will provide a summary table that indexes the building enclosure component requiring maintenance and indicates the frequency each component will require repair or replacement (i.e. replacement of sealants, gaskets, IGUs, repair of paints or coatings). Contractor will provide subcontractors with an Excel spreadsheet that will be completed by each applicable subcontractor and returned to the Contractor for incorporation in the Commissioning Report by the BECxA.
2. Maintenance Information Contractor shall provide Maintenance Information for each entry containing the following:

    a. Product Data Sheet: Provide a summary of performance data.
    b. Extended Warranty Information: Include all warranties for products, equipment, components, and sub-components whose duration exceeds one year. Include warranties on components with the system they are a part of. Reference all specific operation and maintenance procedures that must be performed to keep the warranty valid.
    c. Sources of Material: Include reference to contact information where specific materials can be obtained.
    d. Installation and Maintenance Instructions: For each material, component or system.

C. Construction Documentation

1. Record Drawings: Contractor shall provide an index of all record drawings with drawing number, title, and electronic file name(s) including electronically referenced drawings.
2. Record Specifications: Contractor shall provide a detailed index of the record specification. Include sections and major items in the specification all indexed to the appropriate page number.
3. Approved Product Data and Shop Drawings:

    a. Contractor shall provide an index of all product data and shop drawings. This shall list all BE materials, components or systems with the associated submittal number.
    b. contractor shall organize and compile only approved product data and shop drawings. Providing these in a filing format is acceptable provided all files are identified and organized for easy access.
    c. Inclusion of any of this information in previous sections of the Commissioning Report does not allow exclusion in this section.

4. Commissioning Record: BECxA shall provide complete commissioning records including all Performance Test documentation, in both written and electronic format at the discretion of the Owner.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 BE PERFORMANCE TESTING

A. Site Testing: In coordination with the Contractor, the BECxA will evaluate in-service performance of building enclosure assemblies and construction, and submit reports.

1. Provide site testing as scheduled at the end of this Section.
2. Carry out testing in accordance with Section 019113.

B. Adhesion Tests: Arrange for field tests to take place with joint-sealant and adhered membrane manufacture's technical representative present. Field test sealant joints and self-adhering membranes for adhesion to substrates as follows:

1. Test each type of sealant/membrane in each installation at every substrate indicated.
2. Perform sealant tests in compliance with ASTM C1521 Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints, Method A or ASTM D4541 Standard Test Method for Pull-off Strength of Coatings Using Portable Adhesion Testers.
3. For joints between dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
4. For sealants that fail adhesively, retest until satisfactory adhesion is obtained. Do not use sealants that fail to adhere to joint substrates during testing.

C. Fenestration Field Water Tests:

1. Test installed fenestration systems according to AAMA 501.2 “Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems,” ASTM E1105: Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Curtain Walls, and Doors by Uniform or Cyclic Static Air Pressure Differential, and AAMA 501.1 “Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure.”
2. Complete testing prior to installation of interior insulation and gypsum board.
3. Contractor to provide powered scaffold, hose, water supply, communication system and manpower to perform tests.
4. Contractor will work with the Test Engineer and CxA to determine necessity for additional test methods and for field chamber tests based upon evaluation of initial test results. The BECxA will interpret marginal results and adjust the test procedures as appropriate.
5. Contractor to perform out-of-sequence work as required facilitating system tests.

D. Fenestration Field Air Leakage Tests:

1. AAMA 502-08 “Voluntary Specifications for Field Testing of Newly Installed fenestration Products”, and AAMA 503-08 “Voluntary Specification for Field Testing of Newly Installed Storefronts, Curtain Walls and Sloped Glazing Systems”.
2. Test installed fenestration systems and interfaces with adjacent substrates according to ASTM E-783: Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors.
3. Complete testing prior to installation of interior insulation, gypsum wall board and interior finishes or systems that may impede the completion of the tests.
4. Test specimen to include the perimeter material substrate and the perimeter seals.
5. contractor to provide powered scaffold, hose, water supply, communication and manpower to perform tests.
6. Contractor will work with the Test Engineer and BECxA to determine necessity for additional test methods and for field chamber tests based upon evaluation of initial test results. The CxA will interpret marginal results and re-write the test procedures as appropriate.
7. Contractor to perform out-of-sequence work as required facilitating system tests. Contractor to install all air seals / dams concealed within the mullions to facilitate air tests at curtain wall assemblies.

E. Air Barrier Field Air Leakage Tests:

1. Test installed air barrier systems and interfaces with adjacent substrates according to ASTM E1186, “Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems and ASTM E-783 Standard Test Method for Field Measurement of Air Leakage Through Installed Exterior Windows and Doors.
2. Complete testing prior to installation of interior insulation, gypsum wall board and interior finishes.
3. Test specimen to include the perimeter material substrate and the perimeter seals.
4. Provide powered scaffold, water, electric supply, communication and manpower to perform tests.
5. Contractor will work with the Test Engineer and CxA to determine necessity for revised test methods and for field chamber tests based upon evaluation of initial test results. The CxA will interpret marginal results and adjust the test procedures as appropriate.

6. Contractor to perform out-of-sequence work as required facilitating system tests.

F. Roof Field Water and Air Leakage Tests:

1. Test installed roofing systems and interfaces with adjacent substrates using ASTM C1153 Standard Practice for Location of Wet Insulation in Roofing Systems Using Infrared Imaging and Capacitance.
2. Test installed roofing systems and interfaces with adjacent substrates according to ASTM E1186 Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems.
3. Complete testing prior to installation of interior insulation, gypsum wall board and interior ceiling finishes.
4. Contractor will work with the Test Engineer and CxA to determine necessity for revised or supplemental test methods. The CxA will interpret marginal results and adjust the test procedures as appropriate.

3.2 FIELD PERFORMANCE TEST SCHEDULE

A. Performance testing locations to be determined by A/E and BECxA.

B. Performance testing to be performed by contractor with BECxA present to witness and document all testing:

Supplementary Performance Testing schedule:

Location / Test Type	Testing Standard	Description	Criteria	Schedule & Number of Tests
Field Air Leakage Testing:				
Curtain Wall	ASTM E783	Field air leakage testing	<0.09 cfm/sq.ft at 6.24 lbf/sq.ft.	10% and 50% completion: 2 tests
Ribbon Window	ASTM E783	Field air leakage testing	<0.09 cfm/sq.ft at 6.24 lbf/sq.ft.	10% and 50% completion: 2 tests
Air Barrier transitions, laps, field of AB, penetrations (10 locations, measuring 10’ x 20’)	ASTM E1186	Qualitative Field air leakage tests for air barrier assembly	No visible sign of air leakage	Throughout construction (perform 10 bubble gun tests at each location)

Location / Test Type	Testing Standard	Description	Criteria	Schedule & Number of Tests
Field Water Leakage Testing:				
Curtain Wall (± 10' x 10' area) south or west facade	AAMA 501.1	Water penetration resistance testing	No water at 15psf (± 78 mph wind velocity)	1 location @ 10% completion. (1 total test)
Curtain Wall (chamber size to entire rough opening)	ASTM E1105	Field water leakage test	no water at 0.67x (15lbf/sq.ft. or 20% of wind load)	1 location @ 10%, 50%, and 70% completion (3 total tests).
Ribbon Window	ASTM E1105 / AAMA 503	Field water leakage test	no water at 0.67x (15lbf/sq.ft. or 20% of wind load)	1 location @ 10%, 50%, and 70% completion (3 total tests).
Metal wall panels at penthouse (including perimeter conditions)	AAMA 501.2	Field water testing with hose	no leaks	At 10% and 50% completion. 2 total tests each at ±240 liner ft.
Roof scuppers	AAMA 501.2	Field water testing with hose	no leaks	All scuppers at 100% completion
Ribbon Window (including perimeter joint sealants)	AAMA 501.2	Field water testing with hose	no leaks	At 10% and 50% completion of sealant installation = 6 tests total
Curtain Wall (including perimeter joint sealants)	AAMA 501.2	Field water testing with hose	no leaks	At 10% and 50% completion of sealant installation = 6 tests total
Insulated metal wall panels (3 locations - 20' wide x 30' tall panel frame joinery and perimeter conditions)	AAMA 501.2	Field water testing with hose	no leaks	At 10% and 50% completion of sealant installation = 3 tests total

Location / Test Type	Testing Standard	Description	Criteria	Schedule & Number of Tests
Insulated metal wall panels (all penetrations)	AAMA 501.2	Field water testing with hose, 1 minute at all penetrations	no leaks	At completion
Expansion Joints	AAMA 501.2	Field water testing with hose	no leaks	At 100% completion of all EJ including all vertical and horizontal EJs
Louver Sill pan flashing- Sill Dam Test	AAMA 511	Sill dam water testing	no water	5 locations @10% complete, prior to setting louver
Adhesion Testing:				
Below-Grade waterproofing to substrate	ASTM D4541	Pull-off strength using portable adhesion tester	Per manufacturer adhesion test data	10 locations throughout construction
Air Barrier to substrate	ASTM D4541	Pull-off strength using portable adhesion tester	Per manufacturer adhesion test data	10 locations throughout construction
Air Barrier to Silicone transition membrane to fenestration adhesion	ASTM C1521, Method A	Sealant adhesion	Per manufacturer adhesion test data	10 locations throughout construction
Sealant adhesion to all substrates	ASTM C1521, Method A	Sealant adhesion	Per manufacturer adhesion test data	10 locations throughout construction
Roofing				
Roof drain sump areas	ASTM D5957	Flood test all roof drain sump areas	no leaks	At 100% completion, water level remains unchanged for 24 hours min.
Thermography Imaging Survey:				

Location / Test Type	Testing Standard	Description	Criteria	Schedule & Number of Tests
Roof & Exterior Walls	ASTM C1153 ASTM C1060	Wet roof Insulation | Envelope cavity insulation	Diagnostic tool – Address anomalies	In coordination with whole building test
Whole Building Testing:				
Whole Building Air Barrier - above grade	ASTM E1827 or ASTM E779	Whole building Air Leakage testing upon completion	0.25cfm @75 Pascal for above grade enclosure	Whole building at substantial completion of building enclosure.

END OF SECTION 019119

SECTION 078100 - APPLIED FIRE PROTECTION

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. Sprayed fire-resistive materials.

1.3 DEFINITIONS

A. SFRM: Sprayed fire-resistive materials.

B. Fireproofing Manufacturer: Manufacturer of primary fire resistive materials.

C. Fire Resistance Rating: Time rating (in hours) in accordance with Underwriters Laboratories Fire Resistance Directory listings.

1.4 COORDINATION

A. Compatibility Coordination: Coordinate shop paint for structural steel, steel joists, and steel decks with the fireproofing system to ensure that they are compatible.

B. Apply fireproofing prior to installation of ductwork, piping, conduits, and other suspended items. However, hangers, clips and other supports for these items shall be installed before application of fireproofing.

1.5 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: Manufacturer's product descriptions for each required material.

1. Fireproofing: Include fireproofing manufacturer's application instructions, including primer/adhesive requirements and recommended minimum thickness and density for each required hourly rating.

E. Shop Drawings: Framing plans or schedules, or both, indicating the following:

1. Extent of fire protection for each construction and fire-resistance rating.
2. Applicable fire-resistance design designations of a qualified testing and inspecting agency acceptable to authorities having jurisdiction.
3. Minimum sprayed fire-resistive material thicknesses needed to achieve required fire-resistance rating of each structural component and assembly.
4. Treatment of sprayed fire-resistive material after application.

F. Quality Control Submittals:

1. Qualification Data: For Installer.
2. Product Certificates: For each type of sprayed fire-resistive material.

a. UL fire resistance rating certificates.
b. UL fire hazard classification certificates.
c. Fireproofing manufacturer's certification (or confirming independent test reports) that fireproofing meets the performance requirements and physical properties.
d. Affidavit by fireproofing manufacturer (or confirming independent test reports) certifying the fireproofing is free of asbestos.

3. Evaluation Reports: For sprayed fire-resistive material, from ICC-ES.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A firm or individual certified, licensed, or otherwise qualified by sprayed fire-resistive material manufacturer with minimum 5 years' experience and with trained staff, with minimum 1 years' experience, to install manufacturer's products according to specified requirements.

B. Equipment: Use mixing and application equipment recommended by the fireproofing manufacturer.

C. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for materials and execution.

1. Build mockup with an area 100 sq. ft. of each type of fire protection and different substrate including a 10 foot long section of a typical beam or column, as shown on Drawings.
2. Do not proceed with the fireproofing in other areas until the mockup has been reviewed and approved by the Director's Representative.
3. Completely remove rejected mockups.
4. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Director's Representative specifically approves such deviations in writing.

5. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not apply fire protection when ambient or substrate temperature is 68 deg F or lower unless temporary protection and heat are provided to maintain temperature at or above this level for 48 hours before, during, and for 48 hours after product application.

B. Ventilation: Ventilate building spaces during and after application of fire protection, providing complete air exchanges according to manufacturer's written instructions. Use natural means or, if they are inadequate, forced-air circulation until fire protection dries thoroughly.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Assemblies: Provide fire protection, including auxiliary materials, according to requirements of each fire-resistance design and manufacturer's written instructions.

1. Indicated fire resistance hourly rating when applied to the construction assembly shown on the Drawings.

B. Fire Hazard Classification: Fireproofing shall be listed in the Underwriters Laboratories Building Materials Directory with the following performance properties:

1. Flame Spread: 10 or less.
2. Smoke Developed: 5 or less.

C. Source Limitations: Obtain fire protection for each fire-resistance design from single source.

D. Asbestos: Provide products containing no detectable asbestos.

2.2 SPRAYED FIRE-RESISTIVE MATERIALS

A. Sprayed Fire-Resistive Material, Type “High Density SFRM”: Manufacturer's standard, factory-mixed, lightweight, dry formulation, complying with indicated fire-resistance design, and mixed with water at Project site to form a slurry or mortar before conveyance and application.

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. Isolatek International; CAFCO FENDOLITE M-II / ISOLATEK Type M-II
b. Approved equivalent.

2. Application: Designated for exterior and interior use by a qualified testing agency acceptable to authorities having jurisdiction.
3. Bond Strength: Minimum 16,000-lbf/sq. ft. cohesive and adhesive strength based on field testing according to ASTM E736.
4. Density: Not less than density specified in the approved fire-resistance design, according to ASTM E605.
5. Combustion Characteristics: ASTM E136.
6. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
7. Compressive Strength: Minimum 500 psi according to ASTM E761.
8. Corrosion Resistance: No evidence of corrosion according to ASTM E937.
9. Deflection: No cracking, spalling, or delamination according to ASTM E759.
10. Effect of Impact on Bonding: No cracking, spalling, or delamination according to ASTM E760.
11. Air Erosion: Maximum weight loss of 0.000 g/sq. ft. in 24 hours according to ASTM E859.
12. Hardness (Shore D): minimum 65, per ASTM D2240.
13. Finish: Spray-textured finish

B. Sprayed Fire-Resistive Material, ~~Type 4~~ Type "SFRM": Manufacturer's standard, factory-mixed, lightweight, dry formulation, complying with indicated fire-resistance design.

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. Isoltek; Cafco Blaze-Shield II.
    b. Approved equivalent.

2. Application: Designated for interior use by a qualified testing agency acceptable to authorities having jurisdiction.
3. Bond Strength: Minimum 200-lbf/sq. ft. cohesive and adhesive strength based on field testing according to ASTM E736.
4. Density: Not less than density specified in the approved fire-resistance design, according to ASTM E605.
5. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design or ASTM E605, whichever is thicker, but not less than 0.375 inch.
6. Combustion Characteristics: ASTM E136.
7. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
8. Compressive Strength: Minimum 1000 lbf/sq. in. according to ASTM E761.
9. Corrosion Resistance: No evidence of corrosion according to ASTM E937.
10. Deflection: No cracking, spalling, or delamination according to ASTM E759.
11. Effect of Impact on Bonding: No cracking, spalling, or delamination according to ASTM E760.
12. Air Erosion: Maximum weight loss of 0.025 g/sq. ft. in 24 hours according to ASTM E859.
13. Finish: Spray-textured finish

2.3 AUXILIARY MATERIALS

A. Provide auxiliary materials that are compatible with sprayed fire-resistive material and substrates and are approved by UL or another testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance designs indicated.

B. Substrate Primers: Primers approved by sprayed fire-resistive material manufacturer and complying with one or both of the following requirements:

1. Primer and substrate are identical to those tested in required fire-resistance design by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
2. Primer's bond strength in required fire-resistance design complies with specified bond strength for sprayed fire-resistive material and with requirements in UL's "Fire Resistance Directory" or in the listings of another qualified testing agency acceptable to authorities having jurisdiction, based on a series of bond tests according to ASTM E736.

C. Bonding Agent: Product approved by sprayed fire-resistive material manufacturer and complying with requirements in UL's "Fire Resistance Directory" or in the listings of another qualified testing agency acceptable to authorities having jurisdiction.

D. Metal Lath: Expanded metal lath fabricated from material of 3.4 lbs./sq.yd. and configuration, and finish required, according to fire-resistance designs indicated and sprayed fire-resistive material manufacturer's written instructions. Include clips, lathing accessories, corner beads, and other anchorage devices required to attach lath to substrates and to receive sprayed fire-resistive material.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrates and other conditions affecting performance of the Work and according to each fire-resistance design.

1. Verify that substrates are free of dirt, oil, grease, release agents, rolling compounds, mill scale, loose scale, incompatible primers, paints, and encapsulants, or other foreign substances capable of impairing bond of fire protection with substrates under conditions of normal use or fire exposure.
2. Verify that objects penetrating fire protection, including clips, hangers, support sleeves, and similar items, are securely attached to substrates.
3. Verify that substrates receiving fire protection are not obstructed by ducts, piping, equipment, or other suspended construction that will interfere with fire protection application.
4. Check paint on substrate for compatibility with primer/fireproofing and adequacy of bond strength in accordance with fireproofing manufacturer’s instructions.
5. For fireproofing on underside of steel decks, verify that concrete Work on the decks is completed.

6. For fireproofing on underside of roof deck assembly, verify that deck roofing Work is completed.

B. Verify that concrete work on steel deck is complete before beginning Work.

C. Verify that roof construction, installation of rooftop HVAC equipment, and other related work are complete before beginning Work.

D. Conduct tests according to sprayed fire-resistive material manufacturer's written instructions to verify that substrates are free of substances capable of interfering with bond.

E. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

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

3.2 PREPARATION

A. Cover other work subject to damage from fallout or overspray of fire protection materials during application.

B. Clean substrates of substances that could impair bond of fire protection.

C. Prime substrates where included in fire-resistance design and where recommended in writing by sprayed fire-resistive material manufacturer unless compatible shop primer has been applied and is in satisfactory condition to receive fire protection.

D. For applications visible on completion of Project, repair substrates to remove surface imperfections that could affect uniformity of texture and thickness in finished surface of fire protection. Remove minor projections and fill voids that would telegraph through fire-resistive products after application.

3.3 APPLICATION

A. Construct fire protection assemblies that are identical to UL fire-resistance design indicated and products as specified, tested, and substantiated by test reports; for thickness, primers, sealers, topcoats, finishing, and other materials and procedures affecting fire protection Work.

B. Comply with sprayed fire-resistive material manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and apply fire protection; as applicable to particular conditions of installation and as required to achieve fire-resistance ratings indicated.

C. Coordinate application of fire protection with other construction to minimize need to cut or remove fire protection.

1. Do not begin applying fire protection until clips, hangers, supports, sleeves, and other items penetrating fire protection are in place.

2. Defer installing ducts, piping, and other items that would interfere with applying fire protection until application of fire protection is completed.

D. Metal Decks:

1. Do not apply fire protection to underside of metal deck substrates until concrete topping, if any, is completed.
2. Do not apply fire protection to underside of metal roof deck until roofing is completed; prohibit roof traffic during application and drying of fire protection.

E. Install auxiliary materials as required, as detailed, and according to fire-resistance design and sprayed fire-resistive material manufacturer's written instructions for conditions of exposure and intended use. For auxiliary materials, use attachment and anchorage devices of type recommended in writing by sprayed fire-resistive material manufacturer.

F. Spray apply fire protection to maximum extent possible. After the spraying operation in each area, complete the coverage by trowel application or other placement method recommended in writing by sprayed fire-resistive material manufacturer.

1. Apply the fireproofing in a monolithic covering of uniform density and texture, free of seams, staging breaks, holes, voids, and other defects that might impair the fire resistance. Install the fireproofing to the full required thickness over entire area of each surface to be covered.
2. Stop-off application operation at natural stopping points, such as inside corners, wherever possible.
3. Edge of fireproofing adjoining other materials shall be sharp and clean, without overlapping.

G. Extend fire protection in full thickness over entire area of each substrate to be protected.

H. Install body of fire protection in a single course unless otherwise recommended in writing by sprayed fire-resistive material manufacturer.

I. Provide a uniform finish complying with description indicated for each type of fire protection material and matching finish approved for required mockups.

J. Cure fire protection according to sprayed fire-resistive material manufacturer's written instructions.

K. Do not install enclosing or concealing construction until after fire protection has been applied, inspected, and tested and corrections have been made to deficient applications.

L. Finishes: Where indicated, apply fire protection to produce the following finishes:

1. Spray-Textured Finish: Finish left as spray applied with no further treatment.

3.4 FIELD QUALITY CONTROL

A. Special Inspections and Testing Agency: The State will engage a qualified special inspections and testing agency to perform special inspections, tests, and prepare reports. The special inspections and testing agency will interpret the tests and indicate in each report whether the tested work complies with or deviates from project requirements. The special inspections and testing agency will perform tests in accordance with the New York State Uniform Fire Prevention and Building Code (BCNYS).

B. Perform the tests and inspections of completed Work in successive stages. Do not proceed with application of fire protection for the next area until test results for previously completed applications of fire protection show compliance with requirements. Tested values must equal or exceed values as specified and as indicated and required for approved fire-resistance design.

C. Fire protection will be considered defective if it does not pass tests and inspections.

1. Remove and replace fire protection that does not pass tests and inspections, and retest.
2. Apply additional fire protection, per manufacturer's written instructions, where test results indicate insufficient thickness, and retest.

D. Prepare test and inspection reports.

3.5 CLEANING

A. Cleaning: Immediately after completing spraying operations in each containable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.

3.6 PROTECTION

A. Protect fire protection, according to advice of manufacturer and Installer, from damage resulting from construction operations or other causes, so fire protection is without damage or deterioration at time of Substantial Completion.

3.7 REPAIRS

A. As installation of other construction proceeds, inspect fire protection and repair damaged areas and fire protection removed due to work of other trades.

B. Repair fire protection damaged by other work before concealing it with other construction.

C. Repair fire protection by reapplying it using same method as original installation or using manufacturer's recommended trowel-applied product.

END OF SECTION 078100

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aluminum-framed storefront systems, four-side captured ~~and two-side structural silicone glazed types~~.
2. Aluminum-framed entrance door systems, including swinging and sliding doors.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site. Review methods and procedures related to aluminum framed entrances and storefront system including, but not limited to, the following:

1. Inspect and discuss condition of substrate and other preparatory work.
2. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
3. Review required inspecting, testing, and certifying procedures.
4. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions.
5. Review requirements for coordinating installation of aluminum entrances and storefront framing with installation of electrical wiring and electrified hardware concealed in framing members

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 product.

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

E. Shop Drawings: For aluminum-framed entrances and storefronts. 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 aluminum-framed entrances and storefronts, 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~~.
4. Include point-to-point wiring diagrams showing the following:

    a. Power requirements for each electrically operated door hardware.
    b. Location and types of switches, signal device, conduit sizes, and number and size of wires.

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

G. 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.

H. Entrance Door Hardware Schedule: Prepared by or under supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams. Coordinate final entrance door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.

I. Quality Control Submittals:

1. Energy Performance Certificates: For aluminum-framed ~~entrances and storefronts~~ exterior entrance doors, accessories, and components, from manufacturer.

    a. Basis for Certification: NFRC-certified energy performance values for each aluminum-framed ~~entrance and storefront~~ exterior entrance doors.

2. Product Test Reports: For aluminum-framed ~~entrances and storefronts~~ exterior entrance doors, for tests performed by a qualified testing agency.
3. ~~Quality Control Program: Developed specifically for Project, including fabrication and installation, according to recommendations in ASTM C1401. Include periodic quality-control reports.~~
4. ~~Source quality-control reports~~.
5. ~~Field quality-control reports.~~

6. Sample Warranties: For special warranties.

J. Contract Closeout Submittals

1. Maintenance Data: For aluminum-framed entrances and storefronts to include in maintenance manuals.
2. ~~Maintenance Data for Structural Sealant: For structural-sealant-glazed storefront 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. ~~Installer shall be capable of assuming engineering responsibility and performing work of this Section and who is acceptable to manufacturer.~~

1. ~~Engineering Responsibility: Preparation of data for aluminum-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.~~

B. Source Limitations: Obtain all entrance and storefront systems, curtainwall systems and aluminum doors through one source and from a single manufacturer.

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 storefront systems that include structural glazing.~~

~~1.5 BENCHMARK~~

A. ~~Build benchmark 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 according to requirements in "Field Quality Control" Article.~~
3. ~~Approval of benchmark does not constitute approval of deviations from the Contract Documents contained in benchmark unless Director’s Representative specifically approves such deviations in writing.~~

~~1.6 PRECONSTRUCTION TESTING~~

~~A. Preconstruction Adhesion and Compatibility Testing: Submit to structural glazing sealant manufacturer, for testing indicated below, Samples of each glazing material type, tape sealant, gasket, glazing accessory, and glass framing member that is in close proximity to or is touching the structural or nonstructural sealants of a structural glazed system.~~

~~1. Compatibility: Test materials or components using ASTM C1087.~~
~~2. Adhesion: Test for adhesion or lack of adhesion of a structural sealant to the surface of another material or component using ASTM C1135.~~
~~3. Submit no fewer than eight pieces of each type of material, including joint substrates, shims, joint sealant backings, secondary seals, and miscellaneous materials.~~
~~4. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.~~
~~5. For materials failing tests, obtain sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.~~

1.7 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of aluminum-framed entrances and storefronts 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:

a. Framing: 3 years from date of Substantial Completion.
b. Doors: 2 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 factory-applied 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 according to ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested according to 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.

C. ~~Special Finish Warranty, Anodized Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of anodized 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 according to ASTM D 2244.~~
~~b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.~~
~~c. Cracking, peeling, or chipping.~~

~~2. Warranty Period: 10 years from date of Substantial Completion.~~

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain all components of aluminum-framed entrance and storefront system, including framing, doors and accessories, from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

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

1. Aluminum-framed entrances and storefronts shall withstand movements of supporting structure, including, but not limited to, 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: At design wind pressure, as follows:

1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans of up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches or an amount that restricts edge deflection of individual glazing lites to 3/4 inch, whichever is less.

2. Deflection Parallel to Glazing Plane: Limited to 1/360 of clear span or 1/8 inch, whichever is smaller.

    a. Operable Units: Provide a minimum 1/16-inch clearance between framing members and operable units.

D. Structural: Test according to ASTM E330 as follows:

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

E. Water Penetration under Static Pressure: Test according to ASTM E331 as follows:

1. No evidence of water penetration through fixed glazing and framing areas, including entrance doors, when tested according to a minimum static-air-pressure differential of 20 percent of positive wind-load design pressure, but not less than 10 lbf/sq. ft.

F. Energy Performance: Certified and labeled 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 according to NFRC 100.~~

    b. Entrance Doors: U-factor of not more than 0.68 Btu/sq. ft. x h x deg F as determined according to NFRC 100.

2. Solar Heat-Gain Coefficient (SHGC):

    a. ~~Fixed Glazing and Framing Areas: SHGC for the system of not more than 0.26 as determined according to NFRC 200~~.

    b. Entrance Doors: SHGC of not more than 0.22 as determined according to NFRC 200.

3. 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 according to ASTM E283.~~

    b. Entrance Doors: Air leakage of not more than 1.0 cfm/sq. ft. at a static-air-pressure differential of 1.57 lbf/sq. ft.

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, aluminum framed entrances and storefronts 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.~~

2.3 STOREFRONT 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 North America, an Arconic company.
3. YKK AP America Inc.
4. Or equal.

B. ~~Exterior Storefront and Entrance Framing Members: Manufacturer's standard extruded aluminum framing members of thickness required and reinforced as required to support imposed loads. Provide outside captured pressure plate type framing system, front glazed. Provide vertical structural silicone glazed joints where indicated on Drawings.~~

~~1. Thermal Break Construction: Kawneer DUAL Isolock Thermal Break with two (2) nominal 1/4" separations consisting of a two part chemically curing, high density polyurethane, which is mechanically and adhesively joined to aluminum storefront sections. Thermal break shall be designed in accordance with AAMA TIR-A8 and tested in accordance with AAMA 505.~~
~~2. Aluminum vertical and horizontal main frame extrusions shall have a minimum wall thickness of .070.~~
~~3. Provide entrance framing members compatible with glass framing in appearance and provide single acting entrance frames with positive barrier weathering.~~
~~4. Provide heavy wall entrance door frames as required to support 2-1/4" heavy wall doors.~~
~~5. Dimensions of Framing Members: Provide framing with vertical and horizontal framing members having a nominal face dimension of 2 inches and overall depth of 6 inches.~~
~~6. Finish: Permadize Hardcoat finish (50% fluoropolymer resins) with a metallic pearlescence appearance meeting AAMA 2604. Color shall be "Sterling Grey."~~
~~7. Mullion Caps: Custom mullion caps as detailed on the Drawings.~~

8. ~~Basis of Design Products: Provide Trifab Versaglaze 601UT by Kawneer Company, Inc., an Arconic Company.~~

C. Interior Storefront and Entrance Framing Members: Manufacturer's standard extruded-aluminum framing members of thickness required and reinforced as required to support imposed loads. Provide outside glazed non-thermal system, with pressure plate, captured horizontal and vertical mullions. Glazing shall be center set.

1. Dimensions of Framing Members: Provide framing with vertical and horizontal framing members having a nominal face dimension of 2 inches, and overall depth of 4-1/2 inches.
2. Finish: Permadize Hardcoat finish (50% fluoropolymer resins) with a metallic pearlescence appearance meeting AAMA 2604. Color shall be “Sterling Grey.”
3. Basis of Design Products: Subject to compliance with requirements, provide Trifab VG451; Kawneer Company, Inc., an Arconic Company, or equal products of one of the following:

    a. EFCO Corp
    b. YKK

D. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.

E. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

2.4 ENTRANCE DOOR 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 North America, an Arconic company.
3. YKK AP America Inc.
4. Or equal.

B. Exterior Doors: Manufacturer's standard thermally broken glazed doors, for manual swing operation.

1. Door Construction: 2-1/4 inch overall thickness, with minimum 0.125-inch- (3.2-mm-) thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deep penetration and fillet welded.
2. Thermal Break: Thermal break shall be IsoPour utilizing two continuous rows of polypropylene with a nominal 7/32" (5.5 mm) separation consisting of a two-part, chemically curing high density polyurethane which is mechanically and adhesively bonded to the aluminum at door rails and stiles.
3. Glazing Stops and Gaskets: Provide manufacturer's standard snap-on extruded-aluminum glazing stops and preformed gaskets. Provide nonremovable glazing stops on outside of door. Glazing moldings shall be minimum .05" thick.
4. Door Design: Wide stile; 5 inches wide.

a. Top Rail: 5 inches wide
b. Mid Rail (Where indicated): 5 inches wide
c. Bottom Rail: 10 inches wide

5. Finish: Permadize Hardcoat finish (50% fluoropolymer resins) with a metallic pearlescence appearance meeting AAMA 2604. Color shall be “Sterling Grey.”
6. Basis of Design Product: Provide 500T Insulpour Thermal Entrance Doors by Kawneer Company, Inc., an Arconic Company.

C. Interior Swinging Doors: Manufacturer's standard non- thermally broken glazed doors, for manual swing operation.

1. Door Construction: 1-3/4 inch overall thickness, with minimum 0.125-inch- (3.2-mm-) thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deep penetration and fillet welded.
2. Glazing Stops and Gaskets: Provide manufacturer's standard snap-on extruded-aluminum glazing stops and preformed gaskets. Provide nonremovable glazing stops on outside of door. Glazing moldings shall be minimum .05" thick.
3. Door Design: Wide stile; 5 inches wide.

a. Top Rail: 5 inches wide
b. Mid Rail (Where indicated): 5 inches wide
c. Bottom Rail: 10 inches wide

4. Finish: Permadize Hardcoat finish (50% fluoropolymer resins) with a metallic pearlescence appearance meeting AAMA 2604. Color shall be “Sterling Grey.”
5. Basis of Design Product: Provide 500 Standard Entrance Doors by Kawneer Company, Inc., an Arconic Company or equal products of one of the following:

a. EFCO Corp
b. YKK

D. Interior Sliding Doors: Manufacturer's standard non- thermally broken glazed doors, for manual sliding operation.

1. Door Construction: 1-3/4 inch overall thickness, with minimum 0.070-inch-thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deep penetration and fillet welded.
   a. Top Rail: 1-3/8 inches wide
   b. Bottom Rail: 3-1/4 inches wide

2. Door Configuration: Single slide door and fixed panel, as indicated on Drawings.
3. Glazing Stops and Gaskets: Provide manufacturer's standard marine glazed (channel type) PVC gaskets.
4. Finish: Permadize Hardcoat finish (50% fluoropolymer resins) with a metallic pearlescence appearance meeting AAMA 2604. Color shall be “Sterling Grey.”
5. Track: Recessed in floor.
6. Hardware:
   a. One pair of stainless steel tandem rollers per sliding panel
   b. Stainless steel roller track

c. Adams Rite MS 1850A-505 Hookbolt Lock
d. Interior and Exterior Cylinders
e. Flush Face Pulls.

7. Basis of Design Product: Provide Series 1010 Sliding Mall Front by Kawneer Company, Inc., an Arconic Company or equal products of one of the following:

a. EFCO Corp
b. YKK

2.5 ENTRANCE DOOR HARDWARE, SWINGING DOORS

A. Entrance Door Hardware: Hardware not specified in this Section is specified in Section 087100 "Door Hardware."

B. Continuous-Gear Hinges: BHMA A156.26.

C. Strikes: Provide strike with black-plastic dust box for each latch or lock bolt; fabricated for aluminum framing.

D. Weather Stripping: Manufacturer's standard replaceable components.

1. Compression Type: Made of ASTM D2000 molded neoprene or ASTM D2287 molded PVC.
2. Sliding Type: AAMA 701/702, made of wool, polypropylene, or nylon woven pile with nylon-fabric or aluminum-strip backing.

E. Weather Sweeps: Manufacturer's standard exterior-door bottom sweep with concealed fasteners on mounting strip.

F. Thresholds: BHMA A156.21 raised thresholds beveled with a slope of not more than 1:2, with maximum height of 1/2 inch.

2.6 GLAZING

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

B. Glazing Gaskets: Comply with Section 088000 "Glazing."

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

2.7 MATERIALS

A. Sheet and Plate: ASTM B209.

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

C. Extruded Structural Pipe and Tubes: ASTM B429.

D. Structural Profiles: ASTM B308.

E. 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.

F. 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 according to recommendations in SSPC-SP COM and prepare surfaces according to applicable SSPC standard.

2.8 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, complying with 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 storefront and entrance framing manufacturer. Match finish of storefront and entrance framing.

2.9 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 interior for vision glass and exterior for spandrel glazing or metal panels.
6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.

E. ~~Structural-Sealant-Glazed Framing Members: Include accommodations for using temporary support device to retain glazing in place while structural sealant cures.~~

F. Storefront Framing: Fabricate components for assembly using screw-spline system.

G. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.

1. At interior and exterior doors, provide compression weather stripping at fixed stops.

H. Entrance Doors: Reinforce doors as required for installing entrance door hardware.

1. At pairs of exterior doors, provide sliding-type weather stripping retained in adjustable strip and mortised into door edge.
2. At exterior doors, provide weather sweeps applied to door bottoms.

I. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.

J. After fabrication, clearly mark components to identify their locations in Project according to Shop Drawings.

~~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. Seal perimeter and other joints watertight unless otherwise indicated.

G. Metal Protection:

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

H. Set continuous sill members and flashing in full sealant bed, as specified in Section 079200 "Joint Sealants," to produce weathertight installation.

I. Install joint filler behind sealant as recommended by sealant manufacturer.

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 according to 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 according to sealant manufacturer 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, according to sealant manufacturer 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 according to manufacturer's written instructions.~~

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, according to sealant manufacturer's written instructions, to produce weatherproof joints.~~

3.6 INSTALLATION OF ALUMINUM-FRAMED ENTRANCE DOORS

A. Install entrance doors to produce smooth operation and tight fit at contact points.

1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

3.7 ERECTION TOLERANCES

A. Install aluminum-framed entrances and storefronts 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.

~~3.8 FIELD QUALITY CONTROL~~

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

B. ~~Field Quality-Control Testing: Testing agency will perform the following test on mockups.~~

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.~~

C. ~~Structural Sealant Adhesion: Testing agency will test structural sealant according to recommendations in ASTM C1401, Destructive Test Method A, "Hand Pull Tab (Destructive)," Appendix X2.~~

1. ~~Test a minimum of four areas on each building facade.~~
2. ~~Repair installation areas damaged by testing.~~

D. ~~Aluminum-framed entrances and storefronts will be considered defective if they do not pass tests and inspections.~~

E. ~~Prepare test and inspection reports.~~

END OF SECTION 084113

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.

B. Entrance doors are specified in Division 08 Section “Aluminum-Framed Entrances and Storefronts".

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 by a 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.~~ the following:

    a. CW-A#, CW-B# and CW-C#: 15 lbf/sq. ft.
    b. CW-D#: 20 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)~~.the following as determined in accordance with AAMA 1503.

1) CW-A#, CW-B# and CW-C#: 79 (framing) and 76 (glass).
2) CW-D#: 81 (framing) and 73 (glass).

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 Horizontal Joints (Designation CW-A#, CW-B# and CW-C#): 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"~~ 1" 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~~ vertically 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~~ Aluminum
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 1600UT Wall System ~~2~~ 1 with SSG horizontal mullions by Kawneer Company, Inc., an Arconic Company

C. Curtain Wall System 2-Sided Structural Silicone Glazed Vertical Joints (Designation CW-D#): 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 head, sill and jamb members and vertical 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" 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 at jamb, head and sill 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: Aluminum
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 inches, and overall depth of 6 inches.
8. Provide custom mullion extrusion caps as indicated on Drawings.
9. Finish: Permadize® Hardcoat finish (50% fluoropolymer resins) with a metallic pearlescence appearance meeting AAMA 2604. Color shall be “Sterling Grey.”
10. Basis of Design Product: Provide 2-sided structural glazed silicone system 1620UT SSG Wall System by Kawneer Company, Inc., an Arconic Company

D. 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 INSTALLATION OF ALUMINUM-FRAMED ENTRANCE DOORS

A. Install entrance doors to produce smooth operation and tight fit at contact points.

1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware according to entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

3.7 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.

3.8 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 088000 - GLAZING

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. Glass products.
2. Laminated glass.
3. Insulating glass.
4. Glazing sealants.
5. Glazing tapes.
6. Glazing film.
7. Miscellaneous glazing materials.
8. Shadow box for spandrel glazing

B. Related Requirements:

1. Section 084413 "Glazed Aluminum Curtain Walls" for glazing sealants used in structural-sealant-glazed curtain walls.
2. Section 088813 "Fire-Rated Glazing."

1.3 DEFINITIONS

A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.

B. Glass Thicknesses: Indicated by thickness designations in millimeters in accordance with ASTM C1036.

C. IBC: International Building Code the Uniform Code.

A. Interspace: Space between lites of an insulating-glass unit.

1.4 COORDINATION

A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review temporary protection requirements for glazing during and after installation.

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. Product Data: For each type of product.

E. Submit an Environmental Product Declaration (EPD) from the manufacturer for glass 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.*

F. Glass Samples: For each type of the following products; 12 inches (300 mm) square.

1. Tinted glass.
2. Coated glass.
3. Laminated glass.
4. Insulating glass.
5. Spandrel glass.
6. Glazing film

G. Glazing Accessory Samples: For sealants and colored spacers, in 12-inch (300-mm) lengths. Install sealant Samples between two strips of material representative in color of adjoining framing system.

H. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

I. Delegated-Design Submittal: For glass indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by qualified professional engineer responsible for their preparation.

J. Quality Control Submittals:

1. Product Certificates: For glass.
2. Product Test Reports: For fabricated glass and glazing sealants, for tests performed by a qualified testing agency.

    a. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.

3. Preconstruction adhesion and compatibility test report.
4. Sample Warranties: For special warranties.

1.7 QUALITY ASSURANCE

A. Fabricated-Glass Manufacturer Qualifications: A qualified manufacturer of fabricated glass units who is approved and certified by primary glass manufacturer.

B. Installer Qualifications: A qualified glazing contractor for this Project who is certified under the North American Contractor Certification Program (NACC) for Architectural Glass & Metal (AG&M) contractors.

C. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.

D. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C1021 to conduct the testing indicated.

E. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for materials and execution.

1. Install glazing in mockups specified in Section 084113 "Aluminum-Framed Entrances and Storefronts" and Section 084413 "Glazed Aluminum Curtain Walls" to match glazing systems required for Project, including glazing methods.
2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Protect glazing materials in accordance with manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.9 FIELD CONDITIONS

A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or are below 40 deg F (4.4 deg C).

1.10 WARRANTY

A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.

1. Warranty Period: 10 years from date of Substantial Completion.

B. Manufacturer's Special Warranty for Laminated Glass: Manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

1. Warranty Period: 10years from date of Substantial Completion.

C. Manufacturer's Special Warranty for Insulating Glass: Manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is obstruction of vision by dust, moisture, or film on interior surfaces of glass.

1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Glass: Obtain tinted and coated glass from single source from single manufacturer.

B. Source Limitations for Glazing Accessories: For each product and installation method, obtain from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

B. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design glazing.

C. Structural Performance: Glazing shall withstand the following design loads within limits and under conditions indicated determined in accordance with the IBC and ASTM E1300:

1. Design Wind Pressures: As indicated on Drawings.

    a. Wind Design Data: As indicated on Drawings.

2. Maximum Lateral Deflection: For glass supported on all four edges, limit center-of-glass deflection at design wind pressure to not more than 1/50 times the short-side length or 1 inch (25 mm), whichever is less.
3. Differential ShadingThermal Loads: Design glazings to resist thermal stress breakage induced by differential temperature conditions and limited air circulation within individual glass lites and insulated glazing units. es induced by differential shading within individual glass lites.

D. Safety Glazing: Where safety glazing is indicated, provide glazing that complies with 16 CFR 1201, Category II.

E. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:

1. For monolithic-glass lites, properties are based on units with lites of thickness indicated.
2. For laminated-glass lites, properties are based on products of construction indicated.
3. For insulating-glass units, properties are based on units of thickness indicated for overall unit and for each lite.
4. U-Factors: Center-of-glazing values, in accordance with NFRC 100 and based on LBL's WINDOW 7 computer program, expressed as Btu/sq. ft. x h x deg F (W/sq. m x K).
5. SHGC and Visible Transmittance: Center-of-glazing values, in accordance with NFRC 200 and based on LBL's WINDOW 7 computer program.
6. Visible Reflectance: Center-of-glazing values, in accordance with NFRC 300.

2.3 GLASS PRODUCTS, GENERAL

A. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below unless more stringent requirements are indicated. See these publications for glazing terms not otherwise defined in this Section or in referenced standards.

1. NGA Publications: "Laminated Glazing Reference Manual" and "Glazing Manual."

2. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."

B. Safety Glazing Labeling: Where safety glazing is indicated, permanently mark glazing with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction or manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

C. Insulating-Glass Certification Program: Permanently marked either on spacers or on at least one component lite of units with appropriate certification label of the IGCC.

D. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass that complies with performance requirements and is not less than thickness indicated.

1. Minimum Glass Thickness for Exterior Lites: 6 mm.
2. Thickness of Tinted Glass: Provide same thickness for each tint color indicated throughout Project.

E. Strength: Where annealed float glass is indicated, provide annealed float glass, heat-strengthened float glass, or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened float glass is indicated, provide heat-strengthened float glass or fully tempered float glass as needed to comply with "Performance Requirements" Article. Where fully tempered float glass is indicated, provide fully tempered float glass.

2.4 GLASS PRODUCTS

A. Clear Annealed Float Glass: ASTM C1036, Type I, Class 1 (clear), Quality-Q3.

1. Ultra-Clear (Low-Iron) Float Glass: Class I (clear); with a minimum 91 percent visible light transmission and a minimum solar heat gain coefficient of 0.87.
   a. Basis of Design Product: Guardian Ultra Clear or one of the following:
      1) Vitro Architectural Glass; Starphire Ultra-Clear.
      2) Pilkington Optiwhite.

B. Tinted (Light Reducing) Annealed Float Glass: ASTM C1036, Type I, Class 2 (tinted), Quality-Q3.

C. Fully Tempered Float Glass: ASTM C1048, Kind FT (fully tempered), Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

D. Heat-Strengthened Float Glass: ASTM C1048, Kind HS (heat strengthened), Type I, Condition A (uncoated) unless otherwise indicated, Type I, Class 1 (clear) or Class 2 (tinted) as indicated, Quality-Q3.

1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.

E. Reflective- and Low-E-Coated Vision Glass: ASTM C1376.

F. Ceramic-Coated Spandrel Glass: ASTM C1048, Type I, Condition B, Quality-Q3.

2.5 LAMINATED GLASS

A. Laminated Glass: ASTM C1172. Use materials that have a proven record of no tendency to bubble, discolor, or lose physical and mechanical properties after fabrication and installation.

1. Construction: Laminate glass with polyvinyl butyral interlayer to comply with interlayer manufacturer's written instructions.
2. Interlayer Thickness: Provide thickness not less than that indicated and as needed to comply with requirements.
3. Interlayer Color: Clear unless otherwise indicated.

2.6 INSULATING GLASS

A. Insulating-Glass Units: Factory-assembled units consisting of sealed lites of glass separated by a dehydrated interspace, qualified in accordance with ASTM E2190.

1. Sealing System: Dual seal, with manufacturer's standard primary and secondary sealants.
2. Perimeter Spacer: Manufacturer's standard spacer material and construction
3. Desiccant: Molecular sieve or silica gel, or a blend of both.

2.7 GLAZING SEALANTS

A. General:

1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range of industry colors.

B. Neutral-Curing Silicone Glazing Sealant, Class 50: Complying with ASTM C920, Type S, Grade NS, Use NT.

2.8 GLAZING TAPES

A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C1281 and AAMA 800 for products indicated below:

1. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
2. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.

B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:

1. AAMA 810.1, Type 1, for glazing applications in which tape acts as primary sealant.
2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.9 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, recommended in writing by manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

C. Setting Blocks: Silicone with Shore A durometer hardness of 85, plus or minus 5.

D. Spacers: Neoprene blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

E. Edge Blocks: Elastomeric material with Shore A durometer hardness per manufacturer's written instructions.

F. Cylindrical Glazing Sealant Backing: ASTM C1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.

G. Glazing Film:

1. GF-1: Solyx SXJ-0548 DOAL Feather Gradient 60” high
2. GF-2: Solyx SXV-9-1003 Black Gloss at GL-8 only

H. Spandrel Shadow Box Assemblies: Fabricate back pan and front panel ~~from 3/16” thick aluminum sheet~~ with all corners tabbed, spot welded and sealed, and with stiffeners as required. Fill cavity with rigid board mineral wood specified in Section 072100. Finish paint exterior aluminum surfaces in 70% PVDF resin paint system meeting AAMA 2605, color as selected by Architect. Materials and thicknesses of metal back pan and front panel shall be as follows:

1. 1/16” galvanized sheet back pan at concealed locations.
2. 3/32” min thick aluminum back pan with a painted finish to match surrounding curtainwall at back pans exposed to view in rooms 415B and 415C.
3. 1/8” thick aluminum front pan. Provide full range of gray colors for paint finish.

2.10 FABRICATION OF GLAZING UNITS

A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.

1. Allow for thermal movements from ambient and surface temperature changes acting on glass framing members and glazing components.

a. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:

1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
2. Presence and functioning of weep systems.
3. Minimum required face and edge clearances.
4. Effective sealing between joints of glass-framing members.

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

3.2 PREPARATION

A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.

B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that leave visible marks in the completed Work.

3.3 GLAZING, GENERAL

A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.

B. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass includes glass with edge damage or other imperfections that, when installed, could weaken glass, impair performance, or impair appearance.

C. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.

D. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

E. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

F. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).

1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
2. Provide 1/8-inch- (3-mm-) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

G. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and in accordance with requirements in referenced glazing publications.

H. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

I. Set glass lites with proper orientation so that coatings face exterior or interior as specified.

J. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.

K. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended in writing by gasket manufacturer.

L. Attach shadow box assemblies to curtainwall frames behind spandrel panels as indicated on Drawings and seal all edges.

3.4 TAPE GLAZING

A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.

B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.

C. Cover vertical framing joints by applying tapes to heads and sills first, then to jambs. Cover horizontal framing joints by applying tapes to jambs, then to heads and sills.

D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

E. Do not remove release paper from tape until right before each glazing unit is installed.

F. Apply heel bead of elastomeric sealant.

G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.

H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.

B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.

C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended in writing by gasket manufacturer.

D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended in writing by gasket manufacturer.

E. Install gaskets so they protrude past face of glazing stops.

3.6 SEALANT GLAZING (WET)

A. Install continuous spacers, or spacers combined with cylindrical sealant backing, between glass lites and glazing stops to maintain glass face clearances and to prevent sealant from extruding into glass channel and blocking weep systems until sealants cure. Secure spacers or spacers and backings in place and in position to control depth of installed sealant relative to edge clearance for optimum sealant performance.

B. Force sealants into glazing channels to eliminate voids and to ensure complete wetting or bond of sealant to glass and channel surfaces.

C. Tool exposed surfaces of sealants to provide a substantial wash away from glass.

3.7 CLEANING AND PROTECTION

A. Immediately after installation, remove nonpermanent labels and clean surfaces.

B. Protect glass from contact with contaminating substances resulting from construction operations. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains.

1. If, despite such protection, contaminating substances do contact with glass, remove substances immediately as recommended in writing by glass manufacturer. Remove and replace glass that cannot be cleaned without damage to coatings.

C. Remove and replace glass that is damaged during construction period.

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

3.8 MONOLITHIC GLASS SCHEDULE

A. Clear Glass Type GL-9: Clear annealed low-iron float glass.

1. Minimum Thickness: ¼ inch (6 mm.)
2. Basis of Design Product: Guardian Ultraclear

3.9 LAMINATED GLASS SCHEDULE

A. Clear Laminated Glass Type GL-10: Two plies of clear annealed low-iron float glass.

1. Minimum Thickness of Each Glass Ply: ¼ inch (3 mm).
2. Interlayer Thickness: 0.030 inch (0.76 mm).
3. Basis of Design Low Iron Glass Product: Guardian Ultraclear

B. Clear, Noise-Reducing Laminated Glass Type GL-11: 1/4” and 3/8” thick laminated glass, by acoustically rated window manufacturer.

3.10 INSULATING GLASS SCHEDULE

A. Low-E-Coated, Tinted Insulating Glass Type GL-1:

1. Overall Unit Thickness: 1 inch (25 mm).
2. Minimum Thickness of Each Glass Lite: ¼ inch (6 mm).
3. Outdoor Lite: Annealed gray tinted float glass with low e coating on second surface.

a. Basis of Design Tinted Glass: Guardian Crystal Gray

b. Basis of Design Low e coating: Guardian Sunguard SNR50

4. Interspace Content: Argon.
5. Indoor Lite: Annealed, clear float glass.
6. Winter Nighttime U-Factor: 0.24 maximum.
7. Visible Light Transmittance: 34 percent minimum.
8. SHGC: 0.20 maximum.
9. Shading Coefficient: 0.24
10. LSG: 1.71

B. Back Painted Low-E, Insulating Spandrel Glass Type GL-2:

1. Overall Unit Thickness: 1 inch (25 mm).
2. Minimum Thickness of Each Glass Lite: ¼ inch (6 mm).
3. Outdoor Lite: Tinted heat-strengthened float glass low-E coated on the second surface.

a. Basis of Design Tinted Glass: Guardian Crystal Gray
b. Basis of Design Low e coating: Guardian Sunguard SNR50

4. Interspace Content: Argon.
5. Indoor Lite: Clear heat-strengthened float glass back painted on the #3 surface.

a. Back Painted Coating

1) Basis of Design Product: Guardian DECO HT
2) Color: Warm Gray

6. Winter Nighttime U-Factor: .29 maximum.
7. Summer Daytime U-Factor: .29 maximum.

C. Acid Etched Low-E, Insulating Glass Type GL-4:

1. Overall Unit Thickness: 1 inch (25 mm).
2. Minimum Thickness of Each Glass Lite: ¼ inch (6 mm).
3. Outdoor Lite: Tinted heat-strengthened float glass low-E coated on the second surface.

a. Basis of Design Tinted Glass: Guardian Crystal Gray
b. Basis of Design Low e coating: Guardian Sunguard SNR50

4. Interspace Content: Argon.
5. Indoor Lite: Clear heat-strengthened float glass acid etched on the #3 surface.

a. Acid Etching Basis of Design Product: Guardian SATINDECO

6. Winter Nighttime U-Factor: .24 maximum.
7. Visible Light Transmittance: 33 percent minimum.
8. SHGC: 0.21 maximum.
9. Shading Coefficient: 0.24
10. LSG: 1.71

D. IGU Vision Glazing with Shadowbox – GL-7: Same as GL-1 but with a shadowbox

E. IGU Vision Glazing with Window Film – GL-8: Same as GL-1 but with window film

3.11 INSULATING-TEMPERED GLASS SCHEDULE

A. Low-E-Coated, Tinted Insulating, Tempered-Glass Type GL-3:

1. Overall Unit Thickness: 1 inch (25 mm)
2. Minimum Thickness of Outdoor Lite: ¼ inch (6 mm).
3. Outdoor Lite: Tinted annealed float glass low-E coated on the second surface.
   a. Basis of Design Tinted Glass: Guardian Crystal Gray
   b. Basis of Design Low e coating: Guardian Sunguard SNR50
4. Interspace Content: Argon, ½ inch.
5. Indoor Lite: Clear tempered float glass, ¼ inch (6 mm) thick.
6. Winter Nighttime U-Factor: <0.29 maximum.
7. Visible Light Transmittance: 54 percent minimum
8. SHGC: 0.24 maximum.

END OF SECTION 088000

SECTION 115313 - LABORATORY FUME HOODS

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. Bench-top laboratory fume hoods.
2. Piping and wiring within fume hoods for service fittings, light fixtures, fan switches, and other electrical devices included with fume hoods.
3. Fume hood base cabinets.

4. Work tops within fume hoods.
5. Laboratory sinks and cup sinks in fume hoods.
6. Water, laboratory gas, and electrical service fittings in fume hoods.

B. Related Requirements:

1. Section 061053 "Miscellaneous Rough Carpentry" for wood blocking for anchoring fume hoods.
2. Section 092216 "Non-Structural Metal Framing" for reinforcements in metal-framed partitions for anchoring fume hoods.
3. Section 096513 "Resilient Base and Accessories" for resilient base applied to fume hood base cabinets.
4. Section 230593 "Testing, Adjusting, and Balancing for HVAC" for field quality-control testing of fume hoods.
5. Section 230923 "Direct Digital Control (DDC) System for HVAC" for VAV controls for fume hood exhaust.

1.3 DEFINITIONS

A. High Performance Fume Hood: Low velocity high performance fume hoods are hoods designs that provide a reduction in the required air volume, when compared to the volume required for the same size fume hood to operate with a face velocity of 100 FPM through a fully opened vertical sash and provide containment levels equivalent or superior to ASHRAE 110 tracer gas test ratings of 4.0 AM 0.05, and 4.0 AI/AU 0.10, with a face velocity of 60 FPM or less through the fully opened vertical sash and receiving a “PASS” rating when tested as per ASHRAE 110..

B. SEFA: Scientific Equipment & Furniture Association.

C. Acid Fume Hood: Acid Digestion laboratory fume hood designed for use with acids, including hydrofluoric acid but not perchloric acid.

D. Perchloric Acid Fume Hood: Laboratory fume hood designed to withstand reaction from perchloric acid.

1.4 REFERENCES

A. SEFA 1, Scientific Equipment and Furniture Association, Recommended Practices for Laboratory Fume HOOD.

B. SEFA 8, Recommended Practices for Laboratory Grade Metal Casework, 8.0 Cabinet Surface Finish Tests.

C. NFPA 45, National Fire Protection Association, Fire Protection for Laboratories Using Chemicals.

D. ASTM E84-09C, ANSI 2.5, NFPA 255, UL 723, UBC 8-1 (42-1), Standard Test method for Surface Burning Characteristics of Building materials.

E. ASHRAE 110, American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Method of Testing Performance of Laboratory Fume Hoods.

F. ANSI/AIHA Z9.5, American Industrial Hygiene Association, Laboratory Ventilation.

G. NFPA 45 Standards in Fire Protection for Laboratories using Chemicals

H. OSHA, Federal Register 29 CFR Part 1910, Occupational Safety & Health Administration, U.S. Department of Labor, Occupational exposures to hazardous chemicals in laboratories.

1.5 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.6 COORDINATION

A. Coordinate layout and installation of framing and reinforcements for lateral support of fume hoods.

B. Coordinate installation of fume hoods with laboratory casework and other laboratory equipment.

1.7 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. Submittals Package: Provide all submittals, except samples and closeout submittals, as a single submittal package.

E. Product Data: For each type of product.

F. Shop Drawings: For laboratory fume hoods.

1. Include plans, elevations, sections, and attachment details.
2. Indicate details for anchoring fume hoods to permanent building construction including locations of blocking and other supports.
3. Indicate locations and types of service fittings together with associated service supply connection required.
4. Indicate duct connections, electrical connections, and locations of access panels.
5. Include roughing-in information for mechanical, plumbing, and electrical connections.
6. Show adjacent walls, doors, windows, other building components, laboratory casework, and other laboratory equipment. Indicate clearances from the above items.
7. Include layout of fume hoods in relation to lighting fixtures and air-conditioning registers and grilles.
8. Include coordinated dimensions for laboratory equipment specified in other Sections.

G. Samples: For fume hood exterior finishes, interior lining, epoxy sinks, and epoxy work tops.

H. Delegated-Design Submittal: For fume hoods indicated to comply with performance requirements and design criteria.

I. Product Test Reports: Showing compliance with specified performance requirements for as-manufactured containment and static pressure loss, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency.

J. Source quality-control reports.

K. Certifications:

1. As manufactured Certification that Fume Hoods meet the performance requirements for a High Performance Fume Hood.
2. Conformance to referenced standards and requirements.

L. Field quality-control reports.

1. As Installed certification of meeting performance requirements for each hood.

1.8 MAINTENANCE SUBMITTALS

A. Furnish complete touchup kit for each type and color of fume hood finish provided. Include fillers, primers, paints, and other materials necessary to perform permanent repairs to damaged fume hood finish.

B. Maintenance and Operational manuals for each type of fume hood and associated equipment.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Protect finished surfaces during handling and installation with protective covering of polyethylene film or another suitable material.

1.10 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install fume hoods until building is enclosed, wet work and utility roughing-in are complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Locate concealed framing, blocking, and reinforcements that support fume hoods by field measurements before being enclosed, and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. High Performance Bench Mounted Restricted Bypass Fume Hoods with Steel Exterior:

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. Kewaunee Scientific Corporation
b. Lab Crafters, Inc
c. Labconco Corporation.
d. Approved equivalent.

B. Source Limitations: Obtain laboratory fume hoods from single manufacturer.

1. Obtain laboratory fume hoods from same source from same manufacturer as laboratory casework.

C. Product Designations: Drawings indicate sizes, types, and configurations of fume hoods as indicated in the Drawings and Specifications. Other manufacturers' fume hoods of similar sizes,

types, and configurations, and complying with the Specifications, may be considered. See Section 016000 "Product Requirements."

2.2 PERFORMANCE REQUIREMENTS

A. Containment: Provide fume hoods that comply with the following when tested according to ASHRAE 110 as modified below:

1. As-Manufactured (AM) Rating: AM 0.05 (0.05 ppm)
2. As-Installed (AI) Rating: AI 0.05 (0.05 ppm)
3. Average Face Velocity:

    a. General Chemical use Fume Hoods: 70 fpm plus or minus 10 percent with sashes fully open.

        1) All fume hoods unless otherwise noted.

    b. Fume Hoods for Acid Use: 100 fpm plus or minus 10 percent with sashes fully open.
    c. Fume Hoods for Perchloric Acid Use: 100 fpm plus or minus 10 percent with sashes fully open.

4. Face-Velocity Variation: Not more than 10 percent of average face velocity across the face opening with sashes fully open.
5. Sash Position: Fully open.

    a. Test hoods with horizontal sashes with maximum opening on one side, with maximum opening in the center, and with one opening at each side equal to half of maximum opening.
    b. Test hoods with combination sashes fully raised, with maximum opening on one side, with maximum opening in the center, and with one opening at each side equal to half of maximum opening.

6. Release Rate: 4.0 L/min.
7. Test Setup Modifications: Conduct tests with a minimum of three and a maximum of five people in the test room and with two 1-gal. round paint cans, one 12-by-12-by-12-inch cardboard box, and three 6-by-6-by-12-inch cardboard boxes in the fume hood during the test. Position items from 6 to 10 inches behind the sash, randomly distributed, and supported off the work surface by 2-by-2-inch blocks.
8. Walk-by Test: At the conclusion of containment test, execute three rapid walk-bys at 30-second intervals, 12 inches behind the mannequin. Test-gas concentration during each walk-by shall not exceed 0.1 ppm and shall return to specified containment value within 15 seconds.

B. Static-Pressure Loss: Not more than 1/2-inch wg at 70-fpm face velocity with sash fully open when measured at four locations 90 degrees apart around the exhaust duct and at least three duct diameters downstream from duct collar.

C. Delegated Design: Engage a qualified professional engineer, licensed in the State of New York, to design fume hood gravity load and supports.

2.3 FUME HOODS

A. Product Standards: Comply with SEFA 1, "Laboratory Fume Hoods - Recommended Practices." Provide fume hoods UL listed and labeled for compliance with UL 1805.

B. Restricted Bypass Fume Hoods: Provide bypass fume hoods where indicated. Compensating bypass above the sash opens as sash is closed. Provide sufficient bypass capacity so that face velocity with sash opening of 6 inches does not exceed 3 times the face velocity with sash fully open.

C. VAV Control: Where indicated, equip fume hoods with an electronic control unit with a sensing device that monitors face velocity, and a motorized damper on the exhaust connection that maintains a constant face velocity by controlling air volume in response to control unit. Equip units with manual override switch that opens motorized damper to provide maximum exhaust capacity regardless of sash position.

1. Provide output transmitter on electronic control unit that produces zero- to 10-V dc signal proportional to fume hood exhaust volume for interface with building's HVAC control system.
2. Provide electronic control unit that also monitors sash position and anticipates changes in face velocity caused by abrupt changes in sash position.

2.4 MATERIALS

A. Steel Sheet: Cold-rolled, commercial steel (CS) sheet, complying with ASTM A1008; matte finish; suitable for exposed applications.

B. Stainless Steel Sheet: ASTM A240 or ASTM A666, Type 304, stretcher-leveled standard of flatness.

1. For perchloric acid fume hoods, use Type 316L instead of Type 304.

C. Glass-Fiber-Reinforced Polyester: Polyester laminate with a chemical-resistant gel coat on exposed faces, and having a flame-spread index of 25 or less according to ASTM E84.

D. Epoxy: Factory molded, modified epoxy-resin formulation with smooth, nonspecular finish.

1. Physical Properties:

a. Flexural Strength: Not less than 10,000 psi.
b. Modulus of Elasticity: Not less than 2,000,000 psi.
c. Hardness (Rockwell M): Not less than 100.
d. Water Absorption (24 Hours): Not more than 0.02 percent.
e. Heat Distortion Point: Not less than 260 deg F.
f. Flame-Spread Index: 25 or less according to ASTM E84.

2. Chemical Resistance: As follows when tested with indicated reagents according to NEMA LD 3, Test Procedure 3.4.5:

a. No Effect: Acetic acid (98 percent), acetone, ammonium hydroxide (28 percent), benzene, carbon tetrachloride, dimethyl formamide, ethyl acetate, ethyl alcohol, ethyl ether, methyl alcohol, nitric acid (70 percent), phenol, sulfuric acid (60 percent), and toluene.
b. Slight Effect: Chromic acid (60 percent) and sodium hydroxide (50 percent).

3. Color: As indicated in the Drawings to match adjacent epoxy resin countertops.

E. Polypropylene: Unreinforced polypropylene complying with ASTM D4101, Group 01, Class 1, Grade 2.

F. Glass: Clear, laminated tempered glass complying with ASTM C1172, Kind LT, Condition A, Type I, Class I, Quality-Q3; with two plies not less than 3.0 mm thick and with clear, polyvinyl butyral interlayer.

1. Ultraclear Glass: Glass plies each have visible light transmission not less than 91 percent.
2. Safety Glass: Provide products complying with testing requirements in 16 CFR 1201 for Category II materials.
3. Permanently mark safety glass with certification label of the SGCC or another certification agency acceptable to authorities having jurisdiction. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.
4. Location: At all fume hoods unless otherwise specified.

G. Polycarbonate Glazing: Clear, uncoated polycarbonate sheet manufactured by extrusion process and complying with the following requirements:

1. Impact Resistance: 12 to 16 ft-lbf/in. according to ASTM D256, Method A.
2. Elongation and Modulus of Elasticity: 110 percent maximum and 340,000 psi, respectively, according to ASTM D638.
3. Heat Deflection: 270 deg F at 264 psi according to ASTM D638.
4. Flame-Spread Index: 25 or less according to ASTM E84.
5. Location: At all acid fume hoods.

a. Provide clear laminated safety glass at perchloric acid hoods.

H. 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.

1. Receptacles shall be individually wired to field wiring box, and each rated at 20 Amperes.
2. Each shall be 115 volt, 60 Hz, three-wire polarized and grounded electrical duplex, with Ground Fault Circuit Interruption (GFCI).
3. Covers:

a. Cover plates shall be acid resistant thermoplastic.
b. Type 316 stainless steel at Acid and perchloric acid hoods.

I. Fasteners: Provide stainless steel fasteners where exposed to fumes.

2.5 FABRICATION

A. General: Assemble fume hoods in factory to greatest extent possible. Disassemble fume hoods only as necessary for shipping and handling limitations. Fume hoods shall be capable of being partly disassembled as necessary to permit movement through a 35-by-79-inch door opening.

B. Steel Exterior: Fabricate from steel sheet, 0.048 inch (18 ga) thick, with component parts screwed together to allow removal of end panels, front fascia, and airfoil and to allow access to plumbing lines and service fittings. Apply chemical-resistant finish to interior and exterior surfaces of component parts before assembly.

C. Product Option: Provide either steel or stainless steel exterior as specified above.

D. Ends: Fabricate with double-wall end panels without projecting corner posts or other obstructions to interfere with smooth, even airflow. Close area between double walls at front of fume hood and as needed to house sash counterbalance weights, utility lines, and remote-control valves.

E. Splay top and sides of face opening to provide an aerodynamic shape to ensure smooth, even flow of air into fume hood.

F. Interior Lining: Provide one of the following unless otherwise indicated:

1. Glass-fiber-reinforced polyester, not less than 3/16 inch thick.

a. At all Fume Hoods Unless otherwise specified/

G. Lining Assembly: Unless otherwise indicated, assemble with stainless steel fasteners or epoxy adhesive, concealed where possible. Seal joints by filling with chemical-resistant sealant during assembly.

1. Fasten lining components together with stainless steel cleats or angles to form a rigid assembly to which exterior panels are attached.
2. At Fume Hoods for Perchloric Acid Use, Fasten lining components to a rigid frame assembly fabricated from stainless steel and to which exterior panels are attached.
3. Punch fume hood lining side panels to receive service fittings and remote controls. Provide removable plug buttons for holes not used for indicated fittings.
4. Fasteners exposed to chemical environment are not acceptable.

H. Molded Glass-Fiber-Reinforced Polyester Lining: Molded unit consisting of end panels, back panel, preset rear baffle, and top bonded together into a single piece; reinforced to form a rigid assembly to which exterior is attached.

1. Punch fume hood lining side panels to receive service fittings and remote controls. Provide removable plug buttons for holes not used for indicated fittings.
2. .

I. Rear Baffle: Unless otherwise indicated, provide baffle, of same material as fume hood lining, at rear of hood with openings at top and bottom. Secure baffle to cleats at rear of hood with stainless steel screws. Fabricate baffle for easy removal for cleaning behind baffle.

1. Provide preset baffles unless otherwise indicated.
2. Provide adjustable baffles with integral remote-control adjustment as required to provide safe containment of fumes as per ASHRAE 110 testing for a High performance Fume Hood.
3. Provide epoxy-coated, stainless steel screen at bottom baffle opening to prevent paper from being drawn into the exhaust plenum behind baffles.

J. Exhaust Plenum: Full width of fume hood and with adequate volume to provide uniform airflow from hood, of same material as hood lining, and with duct stub for exhaust connection.

1. Duct-Stub Material: stainless steel.
2. Duct-Stub Material for Perchloric Acid Hoods: Stainless steel.
3. Ducting shall go inside the duct collar to ensure condensate travels into the hood and evaporates. Duct collars that allow duct connection over the collar are not acceptable.

K. Bypass Grilles: Provide grilles at bypass openings of fume hoods..

1. Shall offer a significant restriction to the by-pass opening to allow the use of a VAV mechanical system.

L. Sashes: Provide operable sashes of type indicated.

1. Type: Provide combination horizontal/vertical type sashes at all fume hoods.

    a. Sash to operate from top hung rollers in a formed chemical resistant coated steel track.
    b. Horizontal sides of panels to be protected with clear PVC molding.
    c. Provide one finger operation at any position without creep.
    d. Provide chain and sprocket system to prevent sash drop in event of chain or sprocket failure.

2. Fabricate from 0.050-inch-(18 ga) thick stainless steel - thick steel sheet, with chemical-resistant finish. Form into four-sided frame with bottom corners welded and finished smooth. Make top member removable for glazing replacement. Set glazing in chemical-resistant, U-shaped gaskets.
3. Glaze with laminated safety glass.
4. Glaze with 0.236-inch- thick polycarbonate glazing where indicated.
5. Counterbalance vertical-sliding sash with sash weight and stainless steel chain and sprocket system to hold sash in place regardless of position. Provide ball-bearing sheaves, plastic glides in stainless steel guides, and stainless steel lift handles. Provide rubber bumpers at top and bottom of each sash unit.
6. Fabricate horizontal-sliding sashes hung from adjustable nylon-tired, ball-bearing sheaves supported on an overhead stainless steel track. Provide a lower track for guiding sashes only. Sashes shall bypass and be removable. Provide flush finger pulls and rubber bumpers at both stiles of each sash.
7. Fabricate sashes from 0.236-inch- thick, unframed polycarbonate sliding in polypropylene tracks. Counterbalance sashes with PVC-encased weights hung from polypropylene ropes that run over polypropylene pulleys.

8. Where full viewing height is greater than maximum sash height, provide 0.25” thick fixed clear tempered safety glazing panel at top of fume hood opening.

M. Airfoil: Unless otherwise indicated, provide airfoil at bottom of fume hood face opening with 1-inch space between airfoil and work top. Sash closes on top of airfoil, leaving 1-inch opening for air intake. Airfoil directs airflow across work top to remove heavier-than-air gases and to prevent reverse airflow.

1. Fabricate airfoil from Type 316 stainless steel.

N. Light Fixtures: Provide vaporproof, UL Listed, LED lighting systems, at each fume hood. Shield LED lighting from hood interior with 1/4-inch- thick laminated glass or 3-mm-thick tempered glass, sealed into hood with chemical-resistant rubber gaskets.

1. The LED light assemblies shall be serviceable from outside the fume hood cavity, without the use of tools.
2. Light switch to be included on the lower right corner post, at heights compliant with the Americans with Disabilities Act (ADA).
3. Provide LED lighting equivalent color temperature of 3500 K and minimum color-rendering index of 85.
4. Provide manufacture’s recommended corresponding length LED fixture for Fume Hood width.
5. Average lighting level: Minimum 80 foot candles (860lx). Work area shall be defined as the area inside the superstructure from side to side and from face of baffle to the inside face of sash, and from the working surface to a height of 28-inches.

O. Filler Strips: Provide as needed to close spaces between fume hoods adjacent building construction. Fabricate from same material and with same finish as fume hoods.

P. Ceiling Extensions: Provide filler panels matching fume hood exterior to enclose space above fume hoods at front and sides of fume hoods and extending from tops of fume hoods to ceiling.

1. Where Fume Hoods are mounted with all sides exposed, provide filler panels front, back and sides of fume hoods.

Q. Finished Back Panels: Where rear surfaces of fume hoods are exposed to view, provide finished back panels matching rest of fume hood enclosure.

R. Comply with requirements in other Sections for installing water and laboratory gas service fittings, piping, electrical devices, and wiring. Install according to Shop Drawings. Securely anchor fittings, piping, and conduit to fume hoods unless otherwise indicated.

S. Fume Hood Services: Plumbing and electrical service connections shall be concealed, entering from the top of the fume hood. Inside the hood they shall be fully concealed and protected within the fume hood superstructure.

2.6 ACID AND PERCHLORIC ACID FUME HOODS

A. General: Laboratory bench top bypass fume hood for use with acids. Acid and Perchloric Acid Fume Hood shall comply with General Fume Hood requirements except as specified in this Article.

B. Average Face Velocity:

1. Fume Hoods for Acid Use: 100 fpm plus or minus 10 percent with sashes fully open.
2. Fume Hoods for Perchloric Acid Use: 100 fpm plus or minus 10 percent with sashes fully open

C. Perchloric Acid Hood Exterior: Fabricate from stainless steel sheet, 0.050 inch (18 ga) thick, with component parts screwed together to allow removal of end panels, front fascia, and airfoil and to allow access to plumbing lines and service fittings

D. Interior Lining:

1. Acid Fume Hood: manufacturer's recommended Type 1 Unplasticized PVC, not less than 1/4 inch thick for use in hoods for acid use.
2. Perchloric Acid Hood Stainless Steel Lining Assembly: Welded unit consisting of end panels, back panel, top, and work top; reinforced to form a rigid assembly to which exterior is attached.

    a. Type 316 stainless steel, not less than 0.050 inch thick with epoxy coating
    b. For perchloric acid hood linings, cove corners and weld seams completely, and grind surfaces smooth and polish as needed to produce uniform, directionally textured finish with no evidence of welds and free of cross scratches. Passivate and rinse surfaces; remove embedded foreign matter and leave surfaces clean.

E. Sash Type:

1. Vertical Rising Sash System: Hoods shall have a single vertical-rising sash counterbalanced by a single weight suspended by two vinyl-coated stainless steel cables that pass through ball bearing pulleys. The sash shall operate smoothly without tilting when raised or lowered from either end and shall remain at rest in any open position. All sashes shall be framed with extruded epoxy-coated aluminum and PVC.
2. Sash Glazing:

    a. Acid Fume Hood: Minimum 1/4" thick Polycarbonate surrounded by an epoxy-coated aluminum and PVC frame.

        1) Glazing to not fog or etch when exposed to hydrofluoric fumes.

    b. Perchloric Acid Hood: Minimum 3/16" thick tempered safety glass surrounded by an epoxy-coated aluminum and PVC frame.

F. Worktops: For acid and perchloric acid fume hoods, provide stainless steel work tops with 1/2-inch raised front edge and integral drain trough at back of top with top sloped to trough.

1. Cup Sinks: 3-by-6-inch oval stainless steel cup sinks with stainless steel strainers and integral tailpieces.
2. Cup sinks shall be located as per manufacturer's left side of the Fume Hood cabinet, as viewed by the operator
3. Fume Hood C-FHA6-08 (Hydrofluoric use): Provide custom 12" x 12" x 6-inches deep ~~stainless steel~~ polypropylene sink integrated into ~~stainless steel~~ polypropylene worksurface with marine edge.
4. Provide stainless steel worktop at Fume Hood FH8-02.

G. Washdown System: Provide acid and perchloric acid fume hoods with washdown system consisting of stainless steel spray nozzles, washdown valve, and associated piping. Design system to thoroughly rinse all surfaces of fume hood interior, including areas behind and above baffles, and to direct rinse water toward drain trough at rear of work top. Provide T-fitting for extending system to additional spray nozzles in exhaust ducts.

1. Provide manufacturer's recommended number of spray nozzles for size of hood.
2. Provide Manufacturer's recommended wash rings.
3. Perchloric Acid Fume Hood exhaust system to comply with NFPA 45 Standards in Fire Protection for Laboratories using Chemicals.

    a. See Mechanical and Plumbing Documents for exhaust system requirements

2.7 FUME HOOD WORK TOPS, SINKS AND SERVICE FITTINGS

A. Comply with Section 123553.13 "Metal Laboratory Casework."

B. Work Tops: Epoxy

1. Work-Top Configuration: Raised (marine) edge with beveled or rounded edge and corners.
2. Where acid storage cabinets are indicated beneath fume hoods, provide holes in work tops as need to accommodate cabinet vents.
3. Where epoxy sinks occur in epoxy work tops, provide integral sinks bonded to tops with invisible joint line.
4. Where stainless steel sinks, cup sinks, or troughs occur in stainless steel tops, factory weld into one integral unit.
5. For acid and perchloric acid fume hoods, provide stainless steel work tops with 1/2-inch raised front edge and integral drain trough at back of top with top sloped to trough.
6. Cup Sinks: Epoxy 3-by-6-inch oval.

    a. Provide with polypropylene strainers and integral tailpieces.
    b. Cup sinks shall be located as per manufacturer's left side of the Fume Hood cabinet, as viewed by the operator.

C. Service fittings: Fume Hoods shall be factory pre-piped to a point of connection 2-inches above hood roof. Pressure test all pre-piped lines in the factory.

2.8 CHEMICAL-RESISTANT FINISH

A. General: Prepare, treat, and finish welded assemblies after welding. Prepare, treat, and finish components that are to be assembled with mechanical fasteners before assembling. Prepare, treat, and finish concealed surfaces same as exposed surfaces.

B. Preparation: Clean steel surfaces, other than stainless steel, of mill scale, rust, oil, and other contaminants. After cleaning, apply a conversion coating suited to the organic coating to be applied over it.

C. Chemical-Resistant Finish: Immediately after cleaning and pretreating, apply fume hood manufacturer's standard two-coat, chemical-resistant, baked-on finish consisting of prime coat and thermosetting topcoat. Comply with coating manufacturer's written instructions for applying and baking to achieve a minimum dry film thickness of 2 mils.

1. Chemical and Physical Resistance of Finish System: Finish complies with acceptance levels of cabinet surface finish tests in SEFA 8M. Acceptance level for chemical spot test shall be no more than four Level 3 conditions.
2. Colors for Fume Hood Finish: As selected by Director’s Representative from manufacturer's full range, including custom and premium colors.

2.9 ACCESSORIES

A. Airflow Indicator and Alarm: Provide each fume hood with manufacturer's standard airflow indicator with audible and visual alarm that activates when airflow sensor reading is outside of preset range.

B. Airflow Indicator: Provide each fume hood with airflow indicator of the following type(s):

C. Indicator Type: Thermal anemometer that measures fume hood face velocity and indicates whether it is below normal, normal, or above normal.

1. Indicator Type: Thermal anemometer that measures fume hood face velocity and displays data as digital readout.
2. Velocity shall be displayed digitally on the user facing LCD in fpm or m/s.
3. LED lights display red for alarm, yellow for caution, and green for normal operation.
4. Must include external alarm and night setback function.
5. UL listed components.
6. Alarm mute shall be accessible from the front of the monitor; visual alarm must remain activated until alarm condition is corrected.

D. Airflow Alarm: Provide fume hoods with audible and visual alarm that activates when airflow sensor reading is outside of preset range.

1. Provide with thermal-anemometer airflow sensor.
2. Provide with reset and test switches.
3. Provide with switch that silences audible alarm and automatically resets when airflow returns to within preset range.

4. Velocity shall be displayed digitally on the user facing LCD in fpm or m/s.
5. LED lights display red for alarm, yellow for caution, and green for normal operation.
6. Must include external alarm and night setback function.
7. UL listed components.
8. Alarm mute shall be accessible from the front of the monitor; visual alarm must remain activated until alarm condition is corrected.

E. Sash Alarm: Provide fume hoods with audible and visual alarm that activates when sash is opened beyond preset position.

1. Provide with silence and test switches.

F. Sash Stops: Provide fume hoods with sash stops to limit hood opening to 50 percent of sash height. Sash stops can be manually released to open sash fully for cleaning fume hood and for placing large apparatus within fume hood.

G. Bypass Grille Blank-off Panel: Provide fume hoods with blank-off panel on bypass grille designed for use with sash stops to reduce exhaust air volume and provide design face velocity with sash at 50 percent open position.

H. Signage

1. Chemical Hood Safety Practices Label: Corrosion resistant plate attached to the corner post of each fume hood with the following Hood Safety Practices:

a. For use with substances that produce hazardous levels of airborne chemicals: gas, fumes, vapors, dust.
b. Do not put your head in the hood.
c. Minimize drafts and sudden movements in front of the hood.
d. Work a minimum of six inches inside the hood.
e. Elevate equipment above the work surface.
f. Keep sill and baffle unobstructed.
g. Do not use the hood for storage.
h. Adjust the sash to smallest opening possible when in use.
i. Close sash when unattended.
j. Do not remove any of the hood components.
k. Do not place flammable solvents near heat, flame or sparks.
l. Do not evaporate large amounts of flammable liquids.
m. Wipe up spills immediately.
n. Routinely validate airflow.
o. If the ventilation system malfunctions, or airflow alarm indicates unsafe condition, close sash and discontinue hood operation immediately-call for help.
p. Do not use with Biohazards, Hydrofluoric or Perchloric Acid.

1) For Acid Hoods delete “Do not use with Biohazards, Hydrofluoric or Perchloric Acid” and substitute “Do not use with Biohazards, Hydrofluoric or Perchloric Acid.”
2) For Perchloric Acid Hoods:

a) Delete Do not use with Biohazards, Hydrofluoric or Perchloric Acid" and substitute "Do not use with Biohazards or Hydrofluoric Acid."
b) Add "Perchloric Acid may be used in this Fume Hood."

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 fume hoods.

B. Proceed with installation only after unsatisfactory conditions have been corrected. Commencement of installation shall indicate acceptance of field conditions.

3.2 INSTALLATION

A. General: Install fume hoods according to manufacturer's written instructions. Install level, plumb, and true; shim as required, using concealed shims, and securely anchor to building and adjacent laboratory casework. Securely attach access panels but provide for easy removal and secure reattachment. Where fume hoods abut other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.

B. Comply with requirements in Section 123553.13 "Metal Laboratory Casework" for installing fume hood work tops, and sinks.

C. Comply with requirements for installing water and laboratory gas service fittings and electrical devices.

1. Install fittings according to Shop Drawings, installation requirements in SEFA 2.3, and manufacturer's written instructions. Set bases and flanges of sink and work top-mounted fittings in sealant recommended by manufacturer of sink or work-top material. Securely anchor fittings to fume hoods unless otherwise indicated.

3.3 FIELD QUALITY CONTROL

A. Field test installed fume hoods according to ASHRAE 110 as modified in "Performance Requirements" Article to verify compliance with performance requirements.

1. Adjust fume hoods, hood exhaust fans, and building's HVAC system, or replace hoods and make other corrections until tested hoods perform as specified.
2. After making corrections, retest fume hoods that failed to perform as specified.

a. If, upon the second retesting, the hood continues to fail, replace hood.

3.4 ADJUSTING AND CLEANING

A. Adjust moving parts for smooth, near silent, accurate sash operation with one hand. Adjust sashes for uniform contact of rubber bumpers. Verify that counterbalances operate without interference.

B. Clean finished surfaces, including both sides of glass; touch up as required; and remove or refinish damaged or soiled areas to match original factory finish, as approved by Director's Representative.

3.5 FUME HOOD SCHEDULE

A. Fume Hood Type Designation:

1. FH designates General Chemical Fume Hood
2. FHA designates an Acid Fume Hood
3. FHP designates a Perchloric Acid Fume Hood
4. The first number after the fume hood type designation is the nominal width of the fume hood in feet.
5. The second number is a unique identifier for each fume hood.

B. Bench-Top Fume Hood Type C-FH#-##

1. Exterior: Steel with chemical-resistant finish.
2. Ventilation Type: Restricted bypass, with VAV control.
3. Sash Configuration:

    a. Operation: Combination sash consisting of two, three or four horizontal-sliding, bypassing sashes retained in a vertical-sliding, single-hung frame.

        1) Provide number of horizontal panels based on manufacturer's standard for width of hood.

    b. Full Opening Height: 27 to 30 inches.
    c. Operation Height: 18-inches.

4. Work Top: Epoxy.

    a. At Fume Hood FH8-02 provide stainless steel worktop with 1/2-inch raised front edge and integral drain trough at back of top with top sloped to trough.

5. Cup Sinks: As indicated in the Fume Hood Service Fitting Schedule.
6. Service Fittings: As indicated in the Fume Hood Service Fitting Schedule.

C. Bench-Mounted Acid Fume Hood Type C-FHA#-##

1. Exterior: Steel with chemical-resistant finish
2. Ventilation Type: Restricted bypass, with VAV control.
3. Sash Configuration:

a. Operation: Vertical-sliding, independently operable, double-hung sashes.
b. Opening Height: 27 to 30 inches.
c. Operation Height: 18-inches.

4. Worktop: Stainless Steel
5. Sinks: Custom stainless steel sink as per 115313 2.6 F.3.
6. Service Fittings: As indicated in the Fume Hood Service Fitting Schedule
7. Provide as per Article 2.6 Acid and Perchloric Acid Fume Hoods for acid hoods.

D. Bench-Mounted Perchloric Acid Fume Hood Type C-FHP#-##

1. Exterior: Stainless steel with chemical-resistant finish
2. Ventilation Type: Restricted bypass, with VAV control.
3. Sash Configuration:

a. Operation: Vertical-sliding, independently operable, double-hung sashes.
b. Opening Height: 27 to 30 inches.
c. Operation Height: 18-inches.

4. Worktop: Stainless Steel
5. Cup Sinks: Stainless steel, where indicated in the Fume Hood Service Fitting Schedule.
6. Service Fittings: As indicated in the Fume Hood Service Fitting Schedule
7. Provide as per Article 2.6 Acid and Perchloric Acid Fume Hoods for acid hoods.

3.6 FUME HOOD SERVICE FITTING SCHEDULE

A. Comply with requirements in Section 123553.13 "Metal Laboratory Casework".

B. Electric Power (Elec Power): Provide two (2) 120 V Duplex Receptacles stacked on fume hood post. On hoods 6ft or wider, provide two (2) duplex receptacles on the right and left side of the hood. Where fume hood schedule indicates water or distilled water in the hood, provide GFCI receptacles. Duplex receptacles shall be located outside the hood.

C. Water: Cold water service with cup sink and drains. Sink to be mounted in the fume hood work surface. Provide one (1) laboratory gooseneck service fitting and one (1) cup sink.

D. Distilled Water (DIST Water): Distilled water service with cup sink and drain. Sink to be mounted in the fume hood work surface. Provide one pure water (1) laboratory gooseneck service fitting and one (1) cup sink.

E. Gas, Compressed Air (Comp Air) and Vacuum service fittings: See plumbing documents for service line and connection requirements.

F. See Attached Fume Hood Service Schedule attached to the end of this Article.

FUME HOOD SERVICE FITTING SCHEDULE									
Type	Room			Electric Power	Water	Distilled Water	Compressed Air	Gas	Vacuum
C-FH6-01	310B	Fineness	Fume Hood	■					
C-FH8-02	308	CL-10	Fume Hood	■					
C-FH8-03	305	Innovation	Fume Hood	■	■	■	■	■	■
C-FHA8-04	405C	GL-3	Acid Fume Hood	■	■				
C-FH4-05	405F	GL-2	Fume Hood	■			■		■
C-FH4-06	407A	IAIT-3	Fume Hood	■		■		■	■
C-FH4-07	407A	IAIT-3	Fume Hood	■		■		■	■
C-FHA6-08	407A	IAT-3	Acid Fume Hood	■		■		■	■
C-FH6-09	407A	IAT-3	Fume Hood	■		■		■	■
C-FH5-10	408B	PGL-4	Fume Hood	■			■	■	■
C-FH5-11	408B	PGL-4	Fume Hood	■			■	■	■
C-FH5-12	408B	PGL-4	Fume Hood	■			■	■	■
C-FH5-13	408B	PGL-4	Fume Hood	■			■	■	■
C-FH5-14	408B	PGL-4	Fume Hood	■			■	■	■
C-FH5-15	408B	PGL-4	Fume Hood	■			■	■	■
C-FH6-16	410B	ECL-4	Fume Hood	■					
C-FH6-17	410B	ECL-4	Fume Hood	■			■	■	■
C-FH6-18	410B	ECL-4	Fume Hood	■	■				
C-FH6-19	410B	ECL-4	Fume Hood	■	■		■	■	■
C-FH6-20	410C	SBL-1-C	Fume Hood	■	■		■	■	■
C-FH6-21	410C	SBL-1-C	Fume Hood	■	■		■	■	■
C-FH4-22			Not Used						
C-FH6-23	414A	RML-2	Fume Hood	■			■	■	■
C-FH4-24	415	IAOT-1	Fume Hood	■	■		■	■	■
C-FH4-25	415	IAOT-1	Fume Hood	■	■		■	■	■
C-FH6-26	415	IAOT-1	Fume Hood	■	■		■	■	■
C-FH6-27	415A	IAOT-2	Fume Hood	■					
C-FH6-28	415D	IAOT-5	Fume Hood	■	■		■	■	■
C-FHP6-29	415D	IAOT-5	Fume Hood	■	■		■	■	■
C-FH6-30	415D	IAOT-5	Fume Hood	■	■		■	■	■
C-FH6-31	415D	IAOT-5	Fume Hood	■	■		■	■	■
C-FH4-32	207A	GSL-5	Fume Hood	■	■				

END OF SECTION 115313

SECTION 134900 - RADIATION PROTECTION

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. Lead sheet, strip, and plate.
2. Lead bricks.
3. Lead-lined softwood plywood.
4. Lead-lined hollow-metal doors.
5. Lead-lined hollow-metal frames.
6. Informational signs.

1.3 DEFINITIONS

A. Lead Equivalence: The thickness of lead that provides the same attenuation (reduction of radiation passing through) as the material in question under the specified conditions.

1. Lead equivalence specified for materials used in diagnostic x-ray rooms is as measured at 100 kV unless otherwise indicated.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to radiation protection, including, but not limited to, the following:

a. Sequence and schedule of radiation protection work in relation to other work.
b. Supplementary lead shielding at duct, pipe, and conduit penetrations of radiation protection.
c. Methods of attaching other construction and equipment to lead-lined finishes.
d. Notification procedures for work that requires modifying radiation protection.
e. Requirements for field quality control.

1.5 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. Doors and Frames: Include construction details, material descriptions, core descriptions, and finishes.

E. Shop Drawings: Show layout of radiation-protected areas, indicating lead thickness or lead equivalence of components. Show components and installation conditions not fully dimensioned or detailed in product data.

1. Show ducts, pipes, conduit, and other objects that penetrate radiation protection; include details of penetrations.
2. Show details of joints between radiation protection materials.
3. Show details of securing lead bricks to structure.
4. Include door details, including elevations, frame dimensions and profile, and clearances and undercuts.

F. Samples: For units with factory-applied color finishes.

G. Product Schedule: For doors and frames, prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final door hardware schedule.

H. Coordination Drawings: For assemblies with radiation protection materials, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

1. Miscellaneous metal members that support lead bricks

2. Items penetrating radiation protection materials, including the following:

a. Electrical services.
b. Air outlets and inlets.
c. Sprinklers.
d. Access panels.

I. Sample Warranty: For warranty.

J. Installer Qualification Data: Demonstrating compliance with requirements stated in “Quality Assurance” Article.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: ~~Fabricator of products~~. Work must be performed by a firm having not less than five (5) years successful experience in comparable radiation protection work including work on at least three (3) projects installing radiation shielding materials and assemblies. in the last five years and employing personnel skilled in the installation processes and operations indicated.

1. Proof of successful experience in comparable radiation protection work shall be documented by submission of copies of field tests and inspections performed on the work after radiology equipment has been installed and placed in operating condition.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Lead-Lined Plywood: Store inside under cover, and keep dry and protected against weather, condensation, direct sunlight, construction traffic, and other potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

B. Lead-Lined, Hollow-Metal Doors and Frames: Comply with requirements in Section 081113 "Hollow Metal Doors and Frames" for delivery, storage, and handling.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install radiation protection until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain each type of radiation protection product from single source from single manufacturer unless otherwise indicated.

2.2 PERFORMANCE REQUIREMENTS

A. Provide materials and workmanship, including joints and fasteners, that maintain continuity of radiation protection at all points and in all directions equivalent to materials specified in thicknesses and locations indicated.

B. Materials, thicknesses, and configurations of radiation protection products indicated are based on radiation protection design prepared by State's radiation health physicist. This design is available to Contractor upon request.

C. Lead-Lined Assemblies: Unless otherwise indicated, provide lead thickness in lead-lined assemblies of not less than lead thickness indicated for assemblies in which they are installed.

2.3 LEAD SHEET, STRIP, AND PLATE

A. ASTM B749, Alloy UNS No. L51121 (chemical-copper lead).

2.4 LEAD BRICKS

A. Cast- or extruded-lead bricks with interlocking tongue and grooves or wedge-shape edges, made from pig lead complying with ASTM B29 with 1/2 percent antimony added.

1. Refer to Drawings for thickness of lead.

2.5 LEAD-LINED SOFTWOOD PLYWOOD

A. Lead-Lined Softwood Plywood: DOC PS 1, Exposure 1; fire-retardant-treated with touch-sanded C-plugged veneer on face to receive lead lining. 3/4-inch- thick plywood of width and length required for support spacing, with a single sheet of lead laminated to the back of the panel.

1. Lead Sheet Lining: Full width of panel and height as indicated on Drawings. Extend lead sheet lining 1 inch beyond one vertical edge of panel.

2.6 LEAD-LINED HOLLOW-METAL DOORS

A. Steel doors complying with NAAMM-HMMA 861, except as indicated.

1. Provide single continuous sheet of lead of thickness as specified on the Door Schedule on the Drawings extending from top to bottom and edge to edge, supported by hat-channel stiffeners. Do not weld stiffeners through lead lining.
2. Line-inverted channels at top and bottom of doors with lead sheet of same thickness used in door and close with filler channels to provide flush top and bottom edges.
3. Shield cutouts for locksets with lead sheet of same thickness used in door. Overlap lining of cutouts with lining of door by 1 inch.
4. Factory fit doors to suit frame-opening sizes indicated with 1/16-inch clearance at heads and jambs and minimum clearance at bottom.
5. Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.

2.7 LEAD-LINED HOLLOW-METAL FRAMES

A. Hollow-Metal Frames: Steel frames complying with NAAMM-HMMA 861, except as indicated.

1. Provide fully welded frames
2. Furnish with additional reinforcements and internal supports to adequately carry the weight of lead-lined doors. Install reinforcements and supports before installing lead lining.
3. Line frame with lead sheet of thickness not less than that required for doors and walls where frames are used. Form lead sheet to match frame contour, continuous in each jamb and across the head, lapping the stops. Form lead shields around areas prepared to receive hardware. Fabricate lead lining wide enough to maintain an effective lap with lead of adjacent shielding.
4. Finish: Apply manufacturer's standard primer immediately after cleaning and pretreating.

2.8 INFORMATIONAL SIGNS

A. Panel Signs (Type 3F): Comply with Section 101423.16 "Room Identification Panel Signage."

1. Color: As indicated on the Drawings for the sign type.
2. Provide copy indicated on the Drawings.
3. Indicate lead equivalence in millimeters and heights of radiation protection in inches.

B. Rooms Where the Level of Protection Is Not Uniform Throughout: Provide one sign for each room with different lead equivalences in different locations. Indicate, in tabular form, lead equivalence of each wall, partition, ceiling, floor, door, and window. Indicate height of radiation protection above floor, or indicate that partitions are radiation protected to full height. Indicate where lead equivalence changes or is not continuous. Refer to Drawings for Sign Type 3F

C. Mounting: Provide manufacturer's standard two-faced tape or adhesive

2.9 DOOR AND DOOR FRAME FABRICATION

A. Hardware Preparation: Factory prepare doors and frames to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping in accordance with door hardware schedule and templates furnished, as specified in Section 087100 "Door Hardware.

2.10 MISCELLANEOUS MATERIALS

A. Accessories and Fasteners: Manufacturer's standard fasteners and accessories as required for installation, maintaining same lead equivalence as rest of system.

B. Asphalt Coating: Cold-applied asphalt emulsion complying with ASTM D1187.

C. Asphalt Felt: ASTM D226.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates with Installer present for compliance with requirements, installation tolerances, and other conditions affecting performance of radiation protection.

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

3.2 INSTALLATION OF LEAD BRICKS

A. Remove projections from concrete surfaces to receive lead bricks, and apply one layer of asphalt felt to prevent contact between lead bricks and concrete.

B. Install lead bricks to dimensions indicated, tightly fitted together, with joints offset in succeeding courses. Cut bricks neatly at joints with adjacent materials for a snug fit, with edges straight and true and at right angles.

C. Secure lead bricks to structure, as indicated on approved Shop Drawings.

3.3 INSTALLATION OF LEAD-LINED PLYWOOD

A. Install fastener shields to framing before installing lead strips at joints.

B. Install lead strips 2 inches wide and same thickness as lead lining to face of framing and blocking. Secure lead strips with construction adhesive.

C. Provide shims at face of supports and blocking, where lead lining does not overlap, to provide a uniform, plane across panel surfaces.

D. Install lead-lined plywood panels with long edge parallel to supports and lead lining facing supports. Provide blocking at end joints. Fasten lead-lined plywood panels to framing, with adhesive and steel drill screws spaced as recommended in writing by panel manufacturer.

3.4 INSTALLATION OF LEAD-LINED DOORS AND DOOR FRAMES

A. Install lead-lined steel doors and door frames in accordance with Section 081113 "Hollow Metal Doors and Frames."

1. Apply a coat of asphalt mastic or paint to lead lining in door frames where lead comes in contact with masonry or concrete.

B. Install lead-lined wood doors in accordance with Section 081416 "Flush Wood Doors."

C. Lead-Lined Hollow-Metal Door Frames: Comply with ANSI/NAAMM-HMMA 840 unless otherwise indicated. Except for frames located in existing walls or partitions, place frames before constructing walls. Set frames accurately in position, plumb, and brace securely until permanent anchors are set.

1. Provide three anchors per jamb, located adjacent to hinge on hinge jamb and at corresponding heights on strike jamb.
2. In masonry construction, use wire or T-strap anchors, and apply a coat of asphalt mastic or paint to lead lining where lead comes in contact with masonry or grout.
3. In metal stud construction, use wall anchors attached to studs with screws.
4. In wood stud construction, use strap anchors attached to studs with screws.

D. Lap lead lining of frames over lining in walls at least 1 inch.

E. Lead Lining of Frames: Line inside of frames with lead of thickness of not less than that required in doors and walls where frames are used. Form lead to match frame contour, continuous in each jamb and across the head, lapping the stops. Form lead shields around areas prepared to receive hardware. Lap lining over lining in walls at least 1 inch.

F. Install leaded side of frame on radiation side of wall. Lap lead lining of frames over lining in walls at least 1 inch.

G. Hardware: Line covers, escutcheons, and plates to provide effective shielding at cutouts and penetrations of frames and doors. See Section 087100 "Door Hardware" for other installation requirements.

3.5 INSTALLATION OF PENETRATING ITEMS

A. At penetrations of lead linings, provide lead shields to maintain continuity of protection.

B. Provide lead linings, sleeves, shields, and other protection in thickness of not less than that required in assembly being penetrated.

C. Secure shields at penetrations using adhesive or wire ties but not penetrating fasteners unless indicated on Drawings.

D. Outlet Boxes and Conduit: Cover or line with lead sheet lapped over adjacent lead lining at least 1 inch. Wrap conduit with lead sheet for a distance of not less than 10 inches from box.

E. Duct Openings: Unless otherwise indicated, line or wrap ducts with lead sheet for distance from partition/ceiling equal to 3 times the largest opening dimension. Lap lead sheet with adjacent lead lining at least 1 inch.

F. Piping: Unless otherwise indicated, wrap piping with lead sheet for a distance of not less than 10 inches from point of penetration.

3.6 FIELD QUALITY CONTROL

A. Testing Agency: Director's Representative will engage a qualified testing agency to perform tests and inspections after radiology equipment has been installed and placed in operating condition.

B. Correct deficiencies in or remove and replace radiation protection that inspection reports indicate does not comply with specified requirements.

3.7 PROTECTION

A. Lock radiation-protected rooms once doors and locks are installed, and limit access to only those persons' performing work in the rooms.

END OF SECTION 134900

Information Available to Bidders

Lab Equipment Schedule

KEY, WATER: Tap-general building water; Dist-distilled; DI-deionized
KEY, DRAIN: Stand-standard; Silt-silt trap; Floor-with silt trap as needed; Acid-acid neutralizing scrubber
KEY: MOUNTING: F-floor/C-ceiling/W-wall/U-undercounter /B-bench or counter/I-inside equipment
KEY: FURNISH through FINAL CONNECT: C-contractor/O-owner/F-Furniture

LAB	ROOM(S)	MARK	QUANTITY (dash indicates see plan for quantities)	DESCRIPTION	MAKE / MODEL NUMBER (Basis of Design)	SIZE (W x D x H)	CLEARANCE For Equipment	WEIGHT (lbs.) *LOADED WEIGHT	HEAT LOAD (BTU)	MOUNTING (F, C, W, U, B, I)	New - new item Ex - exist. item	SPECIFIER (Design Team, DOT/OGS)	LONG LEAD TIME (Y, N)	SPECIAL PURCH. (SOLE SOURCE, ETC.)	FURNISH (C - CONTR., O-EX - OWNER EXIST., O-OWNER, F-FURN)	INSTALL (C, O, F)	Blocking (C-Contractor)	Final Connections (C, O, V)	Exhaust (D-direct, I-indirect, S-snorkel)	Exh. Issue (C-chem. H-heat, P-Particulate)	COLD WATER	HOT WATER	DIST / DI	DRAIN	GAS	C. AIR	VAC	POWER (GENERAL COLLECTED INFO)	Assumed actual Voltage	Actual Load	Connection type	UPS Batt.	DATA	NOTES, ENVIRONMENTAL FACTORS	MARK (Repeated for ref.)
Common Element (C-)	Various	C-AED	--	External Defibrillator	TBD by Owner	To Be Determined	--	--	--	I*	New	DOT			O	O	--	--	--	--	--	--	--	--	--	--	--	--	Battery	--	--	--	--	--	*Placed within C-EM-A safety station	C-AED
Common Element (C-)	Various	C-AID	--	First Aid Kit	TBD by Owner	To Be Determined	--	--	--	I*	New	DOT			O	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	*Placed within C-EM-A safety station	C-AID
Common Element (C-)	Various	C-AVIBE-PLAT	--	Anti-Vibration Platform; size TBD	TBD by Owner	Varies - to Be Determined	--	--	--	B/F	New	DOT			O	O	--	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Common item to various Labs and rooms; benchtop for small equipment, floor standing for larger equipment	C-AVIBE-PLAT
Common Element (C-)	Various	C-AVIBE-TAB	--	Anti-Vibration Table; size TBD; custom size as required	TBD by Owner	Varies - to Be Determined	--	--	--	F	New	DOT			O	O	--	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Common item to various Labs and rooms	C-AVIBE-TAB
Common Element (C-)	Various	C-BARCD	--	Sitemanager barcode reader	TBD by Owner	To Be Determined	--	--	--	W	New	DOT			O	O	--	O	--	--	--	--	--	--	--	--	--	--	TBC	--	--	--	--	--	TBC	C-BARCD
Common Element (C-)	Various	C-BUCKET	--	5-Gallon Bucket	TBD by Owner	12" Diameter x 15" High	--	--	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Portable, shown in limited locations for coordination with engineering requirements for reference only	C-BUCKET
Common Element (C-)	Various	C-CART	--	Cart, Utility	TBD by Owner	24" x 36" x 33"	--	--	--	F	New	DOT			O	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		C-CART
Common Element (C-)	Various	C-CART-L	--	Cart, Utility, Large; for heavy items	TBD by Owner	30" x 54" x 36"	--	--	--	F	New	DOT			O	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		C-CART-L
Common Element (C-)	Various	C-CUT	--	12" Guillotine Paper Cutter	TBD by Owner	approx. 14" x 20" x 4" high	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		C-CUT
Common Element (C-)	Various	C-DI-1	--	Deionized Water Machine; Type I	TBD by Owner	To Be Determined	--	--	--	B	New	Des			O	O	--	O	--	--	Tap	--	--	--	--	--	--	--	120v				--	--	Machine could have multiple parts	C-DI-1
Common Element (C-)	Various	C-DI-2	--	Deionized Water Machine; Type II	TBD by Owner	To Be Determined	--	--	--	B	New	Des			O	O	--	--	--	--	Tap	--	--	--	--	--	--	--	120v				--	--	Machine could have multiple parts	C-DI-2
Common Element (C-)	Various	C-ENCL-D	--	Enclosure for Computers and Printers for Dust	American Products Co. DustShield / Custom Enclosure	Size varies to accommodate equipment	--	--	--	B	New	DOT			O	O	--	O	--	--	--	--	--	--	--	--	--	--	Verify	--	--	--	--	--	Custom size & openings configuration based on individual equipment needs for PC, printer or label printer. Power and HVAC options available	C-ENCL-D
Common Element (C-)	Various	C-ENCL-S	--	Enclosure for Computers and Printers to Contain Sound	MS Noise USA / Custom Enclosure	Size varies to accommodate equipment	--	--	--	B	New	DOT			O	O	--	O	--	--	--	--	--	--	--	--	--	--	Verify	120v	--	5-20R	--	--	Custom size & openings configuration based on individual equipment needs	C-ENCL-S
Common Element (C-)	Various	C-FLAM	--	Flammable Storage Cabinet with Self-Closing Doors, 45 Gallon Capacity	Eagle / 4510X	43" x 18" x 65" High	--	--	--	F	New	DOT			O	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		C-FLAM
Common Element (C-)	Various	C-HAZ	--	Hazardous Materials Cabinet; approximate size shown on plan	(TBD)	Approximate size shown on plan	--	--	--	F	New	DOT			O	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		C-HAZ
Common Element (C-)	Various	C-LKOUT	--	Lockout Station with top-hinged cover; clips and tags for securing equipment	(TBD)	22.5" wide x 3"deep x 16" high; mounting board top at 5'-6" AFF	Front clearance for access	--	--	W	Ex/ New	DOT			O	O	C	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Mount top at 5'-6" above floor	C-LKOUT
Common Element (C-)	Various	C-PC	--	PC Workstation; UPS Battery	(TBD by Owner)	allocated area in Labs typically 36" wide	--	--	--	B	New	DOT			O	O	--	O	--	--	--	--	--	--	--	--	--	--	Standard*	120v	--	5-20R	--	Y	*Standard power and data connections for PC. Common item to various Labs and rooms	C-PC
Common Element (C-)	Various	C-PEG	--	Peg Board with stainless Steel Drip Trough and Drain Hose (drying rack near sink)	Casework item, indicated on schedule for equipment coordination only	20" x 2.5" x 30" high	--	--	--	W	New	Des			C	C	--	C	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Hose from drip trough to sink	C-PEG
Common Element (C-)	Various	C-PH-W	--	Phone, Wall Mounted	(TBD by Owner)	--	--	--	--	W	New	DOT			O	O	--	O	--	--	--	--	--		--	--	--	--	Standard*	None needed	None needed	None needed	--	Y	*Standard power for this item type. Common item to various Labs and rooms	C-PH-W
Common Element (C-)	Various	C-PLT-BB	--	Pallet, for Bridge Bearings in Strength Lab	(TBD by Owner)	Allocated size, 42" x 42" x 24" with bridge bearings	--	--	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		C-PLT-BB
Common Element (C-)	Various	C-PLT-L	--	Pallet, Large	(TBD by Owner)	Allocated size, 40" x 48" x 30"	--	--	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		C-PLT-L
Common Element (C-)	Various	C-PLT-PR	--	Pallet rack for BB bridge bearing pallets; open at floor with (1) shelf to stack pallets above; shelf to hold (1) C-PLT-BB with pallets on floor below shelf	Steel King SK3000	5'-0" x 3'-6" x height per notes	Front clearance for forklift access	See Notes*	--	F	New	Des			C	C	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3" x 3" posts with 4'-6' beams x 3'-6" shelf depth. 3'-0" clear below shelf for pallet at floor. *Shelf load capacity 5,000 lbs., to be verified	C-PLT-PR
Common Element (C-)	Various	C-PLT-S	--	Pallet, Small	(TBD by Owner)	Allocated size, 30" x 36" x 30"	--	--	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		C-PLT-S
Common Element (C-)*	Various	C-PRT	--	Print / Copy / Scan, Countertop	(TBD by Owner)	Allocated size, 24" x 24" x 24"	--	--	--	B	New	DOT			O	O	--	O	D	P	--	--	--	--	--	--	--	--	Standard	120v	--	5-20R	--	Y	Where indicated on plan, locate inside Dust Control Enclosure with filter and positive pressure	C-PRT
Common Element (C-)	Various	C-PRT-S	--	Print / Copy / Scan; Small, Countertop	(TBD by Owner)	Allocated size, 24" x 24" x 24"	--	--	--	B	New	DOT			O	O	--	O	--	--	--	--	--	--	--	--	--	--	Standard	120v	--	5-20R	--	Y	Common item to various Labs and rooms	C-PRT-S
Common Element (C-)	Various	C-RECYCLE-L	--	Recycling Container, Large Wastbasket, 41 Quart; Blue with Recycling Symbol	Rubbermaid Commercial / Model FG295773BLUE	11.25" x 15.25" x 20" High	--	--	--	F	New	Des			F	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Common item to various Labs and rooms	C-RECYCLE-L
Common Element (C-)	Various	C-SPILL	--	Spill Kit	(TBD by Owner)	To Be Determined	--	--	--	I*	New	DOT			O	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	*Placed within C-EM-A safety station	C-SPILL
Common Element (C-)	Various	C-TRASH-U	--	Trash Container, Undercounter; 13 Gallon "Slim Jim"; Sloped Front Opening; Gray	Rubbermaid Commercial / Model 2026695	11.7" x 22.23" x 26.09" High	--	--	--	F	New	Des			F	F	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Common item to various Labs and rooms	C-TRASH-U
Common Element (C-)*	Various	C-VAC	--	Shop vac; rolling	(TBD by Owner)	Approx. 18" x 25" x 25"	--	--	--	F	New	DOT			O	O	--	--	--	--	--	--	--	--	--	--	--	--	120v 60 Hz 11.6A	120v	11.6A	5-20R	--	--	minimum 10 gal tank size. Hepa filter	C-VAC
Common Element (C-)	Various	FE-1s, NOTE #1	4	Specialty Fire Extinguisher - Class ABC Dry Chemical Agent: Sodium Hydroxide	(TBD by Owner)	-	-	-	-	-	New	DOT			O	O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Sheet G-004 NOTE #1 (FE-1s – See "Life Safety Plan Diagrams – Graphic Legend" for more information). Room Locations: 303 - CAL-2, 4, 5 (in Safety Station) 309 - CAL-10 RECEIVING (in Safety Station) 311E – CONCRETE LAB VESTIBULE (in Safety Station) 405 – GL-1 RECEIVING (in Safety Station)	FE-1s, NOTE #1
Common Element (C-)	Various	FE-1s, NOTE #2	2	Specialty Fire Extinguisher - Class ABC Dry Chemical Agents: Sulfuric Acid, Nitric Acid, Sodium Hydroxide	(TBD by Owner)	-	-	-	-	-	New	DOT			O	O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Sheet G-004 NOTE #2 (FE-1s – See "Life Safety Plan Diagrams – Graphic Legend" for more information). Room Locations: 407 IAIT-1, -2 (in Safety Station) 409 IAQT RECEIVING (in Safety Station)	FE-1s, NOTE #2
Common Element (C-)	Various	FE-1s, NOTE #3	2	Specialty Fire Extinguisher - Class ABC Dry Chemical Agents: Sulfuric Acid, Nitric Acid, Sodium Hydroxide, Potassium Hydroxide	(TBD by Owner)	-	-	-	-	-	New	DOT			O	O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Sheet G-004 NOTE #3 (FE-1s – See "Life Safety Plan Diagrams – Graphic Legend" for more information). Room Locations: 406 PGL-1 RECEIVING (in Safety Station) 408A PGL-2, -3, -6, -8, -9 (in Safety Station)	FE-1s, NOTE #3
Common Element (C-)	Various	FE-2c, NOTE #4	2	Specialty Fire Extinguisher - Class AC w/ Water as Agent (for Ammonium Nitrate Hazard)	(TBD by Owner)	-	-	-	-	-	New	DOT			O	O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Sheet G-004 NOTE #4 (FE-2c – See "Life Safety Plan Diagrams – Graphic Legend" for more information). Room Locations: 407A IAIT-3, -6A/B/C, -7A/B/D, -8 409E PL-1, -2, -4, IAQT-6	FE-2c, NOTE #4
Common Element (C-)	Various	FE-3c/d, NOTE #5	2	Specialty Fire Extinguisher - Class D Chemical Agents (for Combustible Metal Hazard): Met-L-X, Dry Sand, Dry Sodium Chloride	(TBD by Owner)	-	-	-	-	-	New	DOT			O	O	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Sheet G-004 NOTE #5 (FE-3c/d – See "Life Safety Plan Diagrams – Graphic Legend" for more information). Room Locations: 407A IAIT-3, -6A/B/C, -7A/B/D, -8 415C IQAT-3 CHEMICAL TST	FE-3c/d, NOTE #5
GSL-General Soils	GSL-2-C	GSE-1	2	Multiscreen Sieve Shaker, Large	Gilson / TM 6F	28" x 35" x 50"	--	700	--	F	New / Ex	DOT			O-EX	O	--	C	D	P	--	--	--	--	--	--	--	--	230V 50Hz 7.2A	208v, 1 Phase	7.2A	Hardwired	--	--	Noise, vibration; dust; connected to GSE-7	GSE-1
GSL-General Soils	GSL-2-C	GSE-10	300	Sample Tare (tray)	--	2' x 2' x 3"	--	--	--	I	Ex/ New	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Provide 3 pallets (30x36 for storage of 2'x2' sample tare trays	GSE-10
GSL-General Soils	GSL-3	GSE-101	1	Sulfate mix vessel	--	24" diameter x 30" high	--	--	--	F	EX	DOT			O-EX	O	--	--	--	--	--	Tap	--	--	--	--	--	--	110	120v	--	5-20R	--	--	Hose connection to hot water source	GSE-101
GSL-General Soils	GSL-3	GSE-101a	1	Immersion Heater for Sulfate Solution	--	Verify	--	--	--	I	EX	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	--	110	120v	--	5-20R	--	--	Verify	GSE-101a
GSL-General Soils	GSL-3	GSE-103	--	Cylinder hand cart	--	2' x 2'	--	--	--	F	EX	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	for moving buckets	GSE-103
GSL-General Soils	GSL-3	GSE-104	--	Wall mounted slat board		4' x 3'	--	--	--	W	EX	DOT			O-EX	O	C*	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Slat wall board	GSE-104

KEY, WATER: Tap-general building water; Dist-distilled; DI-deionized
KEY, DRAIN: Stand-standard; Silt-silt trap; Floor-with silt trap as needed; Acid-acid neutralizing scrubber
KEY: MOUNTING: F-floor/C-ceiling/W-wall/U-undercounter /B-bench or counter/I-inside equipment
KEY: FURNISH through FINAL CONNECT: C-contractor/O-owner/F-Furniture

LAB	ROOM(S)	MARK	QUANTITY (dash indicates see plan for quantities)	DESCRIPTION	MAKE / MODEL NUMBER (Basis of Design)	SIZE (W x D x H)	CLEARANCE For Equipment	WEIGHT (lbs.) *LOADED WEIGHT	HEAT LOAD (BTU)	MOUNTING (F, C, W, U, B, I)	New - new Item Ex - exist. item	SPECIFIER (Design Team, DOT/OGS)	LONG LEAD TIME (Y, N)	SPECIAL PURCH. (SOLE SOURCE, ETC.)	FURNISH (C - CONTR., O-EX - OWNER EXIST., O-OWNER, F-FURN)	INSTALL (C, O, F)	Blocking (C-Contractor)	Final Connections (C, O, V)	Exhaust (D-direct, I-indirect, S-snorkel)	Exh. Issue (C-chem., H-heat, P-Particulate)	COLD WATER	HOT WATER	DIST / DI	DRAIN	GAS	C. AIR	VAC	POWER (GENERAL COLLECTED INFO)	Assumed actual Voltage	Actual Load	Connection type	UPS Batt.	DATA	NOTES, ENVIRONMENTAL FACTORS	MARK (Repeated for ref.)
GSL-General Soils	GSL-2-C	GSE-105	--	Platform Lift Cart: 800 lb Load Capacity, Dual. Hydraulic Foot Pump	Granger Corrosion-Resistant Manual Mobile Scissor-Lift Table: Item 2TKY1	20" x 39.5" x 39.5"	--	--	--	F	New	DOT			O	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--				GSE-105
GSL-General Soils	GSL-2-C	GSE-106	1	Screen Tray Storage Rack	Gilson / TSA 156	21" x 28" x 23"	--	--	--	--	Ex	DOT			O-EX	--	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--			Holds up to (7) trays	GSE-106
GSL-General Soils	GSL-2-C, CAL-1, CAL-1.1	GSE-107	(2) in GSL-2-C, (1) in CAL-1, (1) in CAL-1.1	Sample Splitter	Gilson / SP-1	29" x 19" x 39" high	--	--	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	--	--			Manual operation	GSE-107
GSL-General Soils	GSL-2-C	GSE-108	--	10 gal galvinized can			--	--	--	--	Ex	DOT			O-EX	--	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--				GSE-108
GSL-General Soils	GSL-2-C	GSE-109	Approx. 125 existing Approx. 125 new	10 qt galvinized bucket			--	--	--	--	Ex/ New	DOT			O	--	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--			~250 buckets	GSE-109
GSL-General Soils	GSL-2-C, GSL-3, GSL-4-C, GSL-5	GSE-111	*	metal sample tares 4" diam & 12" Diam			--	--	--	--	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--			*300+ of each (not shown on drawings)	GSE-111
GSL-General Soils	GSL-5	GSE-113	--	Proctor auto hammer	Gilson / HM 580	27.75" x 21.5" x 66.25"	--	635	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	115V, 60Hz or 230V, 50Hz	120v	--	5-20R	--	--	bolted down on platform	GSE-113
GSL-General Soils	GSL-5	GSE-114	--	Fridge/freezer		~3' x 3' x 6'	--	--	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	Verify	120v	--	5-20R	--	--		GSE-114
GSL-General Soils	GSL-5	GSE-115	--	Hydrometer Bath		4' x 2' x 3'	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	sink access to fill and drain by hose; on platform	GSE-115
GSL-General Soils	GSL-5	GSE-116	--	High temp furnace	thermo Scientific / Thermolyne	~2' x 2' x 3'	--	--	--	B	Ex	DOT			O-EX	O	--	O	D	H	--	--		--	--	--	--	--	--	--	--	--	--	--*	--	--	~650 C operating temperature *plan shows 5-20R	GSE-116
GSL-General Soils	GSL-2-C	GSE-117	1	Tray Cleaning Stand	Gilson Clean-N-Weigh	19" x 30" x 30"	--	60	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	Used with shaker	GSE-117
GSL-General Soils	GSL-3	GSE-12	2	Oven, for Sulfate, 112° C	*(Existing) Blue M Electric Co. / BI-32G-I	*78.75" x 35.25" x 91.75"	--	*2100	?	F	New	DOT			O	O	--	V	I	H	--	--		--	--	--	--	--	--	--	*208V, 3 Phase 60 Hz 14 Kw	208v, 3 Phase	14 KW	Hardwired	--	--	Heat source. *Information based on existing oven.	GSE-12
GSL-General Soils	GSL-3	GSE-15	22	Baskets with Catch Pans for Sulfate Tanks; Stackable, Stainless Steel	--	24" x 14.5" x 11"	--	--	--	I	New	DOT			O	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	With handles / hooks for use with GSE-14	GSE-15
GSL-General Soils	GSL-4-C	GSE-16	3	Oven, Floor - Forced air	Blue M / LO-850	40.2 x 35.4 x 79.1in	--	--	?	F	New	DOT			O	O	--	O	I	H	--	--		--	--	--	--	--	--	--	230V 1Ph 60Hz	208v. 1 Phase	20A 4 KW	Hardwired	--	--	Heat source	GSE-16
GSL-General Soils	GSL-3, GSL-4-C	GSE-18	(4) in GSL-3, (1) in GSL-4-C	Cart for Sulfate Tank Baskets	--	26" x 16" x 30"	--	750*	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	Baskets stacked (5) high	GSE-18
GSL-General Soils	GSL-3	GSE-19	2	Sulfate Chemical Storage Tank; Round, Plastic; 50 Gallons (shown on GSE-18 cart)	--	18" dameter x 30" high	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--		GSE-19
GSL-General Soils	GSL-3	GSE-20	1	Sulfate Chemical Storage Tank; Round, Plastic; 25 Gallons	--	18" dameter x 30" high	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--		GSE-20
GSL-General Soils	GSL-3	GSE-20A	1	Sulfate Solution Pump	--	approx. 18" x 12" x 12"	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	5-20R	--	--		GSE-20A
GSL-General Soils	GSL-5	GSE-21	2	Oven, Large Table Top Gravity Convection; ˚110c	VWR / 89511-406	22" x 25" x 32"	--	170	?	B	New	DOT			O	O	--	O	I	H	--	--		--	--	--	--	--	--	--	120v, 15.8A	120v	15.8A	5-20R	--	--	Heat source; heat released when door opened	GSE-21
GSL-General Soils	GSL-5	GSE-23	(2) in GSL-5	Drybox / Desicator	Labconco	18" x 15" x 16"	--	40	?	B	Ex	DOT			O-EX	O	--	O	I	--	--	--		--	--	--	--	--	Yes	Manual	--	--	--	--	--		GSE-23
GSL-General Soils	GSL-5	GSE-24	1	Particle Size Analyzer	Malvern Panalytical	28" X 12" X 18"	--	66	--	B	New	DOT			O	O	--	O	I	--	--	--		--	--	--	--	--	--	--	110V*	120v	--	5-20R	--	--	*Power for computer	GSE-24
GSL-General Soils	GSL-2-C,	GSE-3 (a)	2	Platform Scale (lbs.) - Platform	--	22" x 18" x 6"	--	--	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	Sensitive to vibration? Connects to control unit for power	GSE-3 (a)
GSL-General Soils	GSL-2-C	GSE-3 (b)	2	Platform Scale (lbs.) - Control Unit	--	10" x 6" x 6"	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--	Control unit for scale platform	GSE-3 (b)
GSL-General Soils	GSL-9	GSE-37	1	Cabinet Sand Blaster with Siphon Blast Cabinet and 100 cfm Dust Collector and Lighting	Econoline / Sandblast Cabinet 36-1 Super	63" x 39" x 25"	--	280	--	F	Ex	DOT			O-EX	O	--	C	--	--	--	--		--	--	Yes	--	Verify	120V	--	5-20R	--	--	Integral Dust Collector	GSE-37
GSL-General Soils	GSL-2-C, GSL-4-C, GSL-5	GSE-4	(2) in GSL-2-C, (2) in GSL-4-C, (2) GSL-5	Benchtop Scale (g)	Mettler Toledo	8" x 15" X 11"	--	--	--	B	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--		GSE-4
GSL-General Soils	GSL-2-C	GSE-5	4	Oven, Truck Oven to hold Cart	TBD	56" x 67" x 74"	2' at right and left	2500	?	F	New	DOT			O	O	--	O	D	H	--	--		--	--	--	--	--	--	--	208v	208v, 3 Ph	12.65kW	Hardwired	--	--	Heat source. *Choice of 208 volt, 230 volt or 460 volt, 3-phase, 60 HZ – other input power available	GSE-5
GSL-General Soils	GSL-2-C	GSE-6	2	Cart for Truck Oven	Grieve	3' x 3' x 4'-6"	--	75	--	F	Ex/ New	DOT			O	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--		GSE-6
GSL-General Soils	GSL-2-C	GSE-6a	4	Stainless Steel Shelf for Truck Oven	Grieve / SHLFSS	--	--	--	--	I	New	DOT			O	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--		GSE-6a
GSL-General Soils	GSL-2-C, GSL-3, GSL-4-C	GSE-8	(2) in GSL-2-C, (4) in GSL-3, (4) in GSL-4-C	Sieve Shaker, Small (e.g. Mary Ann type)	Rainhart	2' x 3' x 4'	--	100	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--		GSE-8
GSL-General Soils	GSL-3, GSL-4-C	GSE-9	(1) in GSL-3, (1) in GSL-4-C	Downdraft Table; Rolling. Use GSE-9A if clearance issues	Donaldson / RDB-3000	*78" x 52" x 63" high; 38" high worksurface	--	150	--	F	Ex	DOT			O	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	Integral Dust Collector	GSE-9
GSL-General Soils	GSL-3	GSE-9A	(as needed)	Downdraft Table; Rolling	Donaldson / RDB-2000	*52" x 52" x 63" high; 38" high worksurface	--	150	--	F	Ex	DOT			O	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	Integral Dust Collector	GSE-9A
SML-Soil Mechanics	SML-2	CE-12	4	Balance	Mettler / PE 6001	9" x 12" x 8"*	--	10	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--	*Plus plastic breeze surround	CE-12

KEY, WATER: Tap-general building water; Dist-distilled; DI-deionized
KEY, DRAIN: Stand-standard; Silt-silt trap; Floor-with silt trap as needed; Acid-acid neutralizing scrubber
KEY: MOUNTING: F-floor/C-ceiling/W-wall/U-undercounter /B-bench or counter/I-inside equipment
KEY: FURNISH through FINAL CONNECT: C-contractor/O-owner/F-Furniture

LAB	ROOM(S)	MARK	QUANTITY (dash indicates see plan for quantities)	DESCRIPTION	MAKE / MODEL NUMBER (Basis of Design)	SIZE (W x D x H)	CLEARANCE For Equipment	WEIGHT (lbs.) *LOADED WEIGHT	HEAT LOAD (BTU)	MOUNTING (F, C, W, U, B, I)	New - new Item Ex - exist. item	SPECIFIER (Design Team, DOT/OGS)	LONG LEAD TIME (Y, N)	SPECIAL PURCH. (SOLE SOURCE, ETC.)	FURNISH (C - CONTR., O-EX - OWNER EXIST., O-OWNER, F-FURN)	INSTALL (C, O, F)	Blocking (C-Contractor)	Final Connections (C, O, V)	Exhaust (D-direct, I-indirect, S-snorkel)	Exh. Issue (C-chem., H-heat, P-Particulate)	COLD WATER	HOT WATER	DIST / DI	DRAIN	GAS	C. AIR	VAC	POWER (GENERAL COLLECTED INFO)	Assumed actual Voltage	Actual Load	Connection type	UPS Batt.	DATA	NOTES, ENVIRONMENTAL FACTORS	MARK (Repeated for ref.)
SML-Soil Mechanics	SML-2	SME-13	1	Sample Extrusion Jack*	Custom Made	30" x 18" x 60"*	4' below floor level*	200	?	F	New	DOT			O	O	--	--	--	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--	* The floor that the jack is anchored to must have a penetration to permit the push rod to retract. The jack's push rod extends 3 to 4 feet below floor level	SME-13
SML-Soil Mechanics	SML-2	SME-14	2	Load Trac 2 Consolidation Unit*/**	Geocomp Corp. / LoadTrac II	8' x 3' x 5' (shown combined for 2 units)	--	500	?	B	New	DOT			O	O	--	--	--	--	--	--	--	--	--	Yes ***	--	120v	120v	--	5-20R	--	Y	* (2) units networked to (1) computer and printer. Machines adjacent but 1-3 feet apart. No direct sunlight. 12' of open countertop needed for sample prep. ** Requires sink nearby for waste; no direct plumbing connections. ***Compressed air needed for each of the (2) units	SME-14
SML-Soil Mechanics	SML-2	SME-16	3	Load Trac 2 Traixial Strength Unit */**	Geocomp Corp./ LoadTrac 2 & FlowTrac 2	15' x 3' x 5' (shown combined for 3 units)	--	300 (total for 3)	?	B	New	DOT			O	O	--	--	--	--	--	--	--	--	--	--	--	120v	120v	--	5-20R	--	Y	* (3) units networked to (1) computer and printer. Machines adjacent but 1-3 feet apart. No direct sunlight. Open countertop needed for sample prep. ** Requires sink nearby for waste; no direct plumbing connections	SME-16
SML-Soil Mechanics	SML-2	SME-2	1	Shear Trac II Direct Shear	Geocomp, Shear Trac II	3.5' x 2' x 3'	--	100	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--	No direct sunlight allowed; Countertop unit networked with a shared computer and a larger Direct Shear Unit. Proximity to Large Direct Shear unit and computer required.	SME-2
SML-Soil Mechanics	SML-2	SME-3	1	Large Scale Direct Shear	Geocomp, Large Shear Trac II	7' x 4' x 4'	--	1000	--	F	Ex or New?	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--	No Direct sunlight allowed. (Causes uneven expansion and contraction). This unit is networked with a smaller Direct Shear unit and shared computer. Close Proximity required between Large and Small Direct Shear machines and shared computer.	SME-3
SML-Soil Mechanics	SML-2	SME-8a	2	Oven, Large Table Top Gravity Convection; ´110c	VWR / 89511-406	22" x 25" x 32"	--	170	?	B	New	DOT			O	O	--	--	I	--	--	--	--	--	--	--	--	120v, 15.8A	120v	15.8A	5-20R	--	--	Heat source; heat released when door opened; same as GSE-21	SME-8a
SML-Soil Mechanics	SML-2	SME-8b	4	Oven, Large Table Top Gravity Convection; ´110c		33" x 26" x 36" High	--	--	--	B	New	DOT			O	O	--	--	I	--	--	--	--	--	--	--	--	Verify	120v	15.8A	5-20R	--	--	Heat source; heat released when door opened	SME-8b
SML-Soil Mechanics	SML-2	SME-AC	1	Balance	Mettler / PE 6001	9" x 12" x 8"*	--	10	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--	*Plus plastic breeze surround	SME-AC
GL-Geology Lab	GL-2	CAE-AB	1	Splitter	TBD (existing)	36" x 18" x 48"	--	?	--	F	Ex	DOT			O-EX	O	--	O	D	--	--	--	--	--	--	--	--	110v	None needed	None needed	None needed	--	--	Bolted to floor. Noise, vibration, dust	CAE-AB
GL-Geology Lab	GL-8	GE-1	1	Cutting Machine	Geocut 302	35"x 37"x 26" high	--	550	--	B	New	DOT			O	O	--	O	--	--	--	--	--	--	--	--	--	400V 3 phase 50/60Hz	480v, 3 Phase	4.32 KVA	Hardwired	--	--	Equip Listed on RDS; no EDS	GE-1
GL-Geology Lab	GL-9	GE-15	8	Microscopy Slide/Index Oils Cabinet	Verify	50" x 20"x 21"	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	No EDS	GE-15
GL-Geology Lab	GL-8	GE-16	1	Ultrasonic Cleaner	Branson / 8510	12" x 8" x 10"	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	Verify	120v	--	5-20R	--	--	No EDS	GE-16
GL-Geology Lab	GL-3	GE-17	1	Precision Balance	Mettler Toledo / XS8001S	8" x 15" x 5"	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--	Sensitive to vibration	GE-17
GL-Geology Lab	GL-3	GE-18	1	Precision Balance	Mettler Toledo / MS6001S/03	8" x 15" x 5"	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--	Sensitive to vibration	ITE-7
GL-Geology Lab	GL-3	GE-19	1	Precision Balance	Mettler Toledo / MS6001S/03	8" x 15" x 5"	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--	Sensitive to vibration	GE-19
GL-Geology Lab	GL-3	GE-20	1	Precision Balance	Mettler Toledo / PG8001	14" x 15" x 5"	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--	Sensitive to vibration	GE-20
GL-Geology Lab	GL-2, GL-3	GE-27	(2) in GL-2, (2) in GL-3	Oven, Convection*	Thermolyne 9000	2.75' x 2.75' x 2'	--	--	--	B	Ex	DOT			O-EX	O	--	--	I	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--		GE-27
GL-Geology Lab	GL-3	GE-28 (a)	--	Hot Plate - With External Control*	Anallab A3 FluoroPlate	17" x 13" x 5"	--	--	--	I*	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	120v	120v	--	5-20R	--	--	*Within Fume Hood C-FHA8-04, with wired external control GE-28 (b) on adjacent counter	GE-28 (a)
GL-Geology Lab	GL-3	GE-28 (b)	--	External Control for Hot Plate*	Anallab A3 FluoroPlate	Approx. 8"x 8" x 5" high	--	--	--	B*	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	120v	120v	--	5-20R	--	--	*On counter adjacent to Fume Hood C-FHA8-04, wired external control for GE-28 (a)	GE-28 (b)
GL-Geology Lab	GL-9	GE-29	1	Digital Microscope Camera	--	3" x 3" x 3"	--	--	--	I*	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--	*On GE-32 microscope	GE-29
GL-Geology Lab	GL-8	GE-3	--	Vacuum Impregnated Unit	Vacumet 52	18" x 29" x 14"	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	110-120v	120v	--	5-20R	--	--	Equip Listed on RDS; no EDS	GE-3
GL-Geology Lab	?	GE-30	--	Air Compressor, Small (1/6 hp)	--	12" x 12" x 12"	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--		GE-30
GL-Geology Lab	GL-9	GE-31	1	Microscope, Polarized	Olympus Bx60	13" x 22" x 16"	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--	Sensitive to vibration	GE-31
GL-Geology Lab	GL-9	GE-32	--	Microscope, Stereo with Camera	Olympus SZH10	13" x 22" x 16"	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--	Sensitive to vibration	GE-32
GL-Geology Lab	GL-9	GE-33	1	Mechanical Stage, Programmable	New England Affiliated Technologies	12" x 12" x 4"	--	11	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--		GE-33
GL-Geology Lab	GL-2	GE-34	1	Shaker, Small	Rainhart Category No. 635	12" x 18" x 30"	--	--	--	F*	Ex	DOT			O-EX	O	--	O	D	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--	*On stand. Noise, vibration; dust	GE-34
GL-Geology Lab	GL-3	GE-35	2	Magnifier Lamp**; 3-Pivot K-Arm Ring Light with1.75x Magnifying Lens in Center	Luxo / KMF 18113LG	45" long swing-arm	--	--	--	B*	Ex	DOT			O-EX	O	--	O	--	--	--	--	--	--	--	--	--	110v, 9w	120v	9W	5-20R	--	--	*Clamp mounting to bench counter or shelf / **Acid Resistant	GE-35
GL-Geology Lab	GL-3	GE-36	2	Magnifier Lamp; 3-Pivot K-Arm Ring Light with 2.25x Magnifying Lens in Center	Luxo / KMF 18313LG	45" long swing-arm	--	--	--	B*	Ex	DOT			O-EX	O	--	O	--	--	--	--	--	--	--	--	--	110v, 9w	120v	9W	5-20R	--	--	*Clamp mounting to bench counter or shelf	GE-36
GL-Geology Lab	GL-4	GE-37	10	Cabinets; Coarse Aggregate Reference Samples	Model 245	30" x 27.75" x 44"	--	--	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	(8) 30" wide cabinets with GE-38 fine aggregate shelves on top	GE-37
GL-Geology Lab	GL-4	GE-38	--	Shelves, Reference; Fine Aggregate Reference Samples	--	21' x 2.5' x 1.5'*	--	--	--	B*	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	*On GE-37 cabinets; stepped racks for vertical tubes; fills top of GE-37	GE-38
GL-Geology Lab	GL-8	GE-4	1	Oven, Convection	Thermolyne 9000	33" x 27" x 36"	--	--	--	B	Ex	DOT			O-EX	O	--	--	I	--	--	--	--	--	--	--	--	110-120v	120v	--	5-20R	--	--	Equip Listed on RDS; no EDS	GE-4
GL-Geology Lab	GL-8	GE-43	--	Cutting/Grinding Machine	Geoform 102	33" x 31" x 18"	--	220	--	B	New	DOT			O	O	--	--	--	--	--	--	--	--	--	--	--	220v & 110v	120v	--	5-20R	--	--		GE-43
GL-Geology Lab	GL-8	GE-44	--	Automatic preparation system p.1	Forcipol-TS	18" x 29" x 14"	--	11	--	B	New	DOT			O	O	--	--	--	--	--	--	--	--	--	--	--	120V	120v	.75KW	5-20R	--	--		GE-44
GL-Geology Lab	GL-8	GE-45	--	Automatic preparation system p.2	Forcimat-TS	8" x 8" x 15"; above GE-44 Forcipol	--	35	--	B	New	DOT			O	O	--	--	--	--	--	--	--	--	--	--	--	120V	--	--	Powered from Forcipol-TS (GE-44)	--	--		GE-45
GL-Geology Lab	GL-8	GE-46	--	Automatic preparation system p.3	Dosimat 52	8" x 29" x 22"	--	33	--	B	New	DOT			O	O	--	--	--	--	--	--	--	--	--	--	--	120V	--	--	Powered from Forcipol-TS (GE-44)	--	--		GE-46
GL-Geology Lab	GL-8	GE-47	--	Automatic preparation system p.4	Geofix	6" x 12" x 25"	--	--	--	B	New	DOT			O	O	--	--	--	--	--	--	--	--	--	--	--	120V	--	--	Powered from Forcipol-TS (GE-44)	--	--		GE-47
GL-Geology Lab	GL-8	GE-48	--	Automatic preparation system p.5	Hot Plate for Geofix	12" x 12"	--	--	--	B	New	DOT			O	O	--	--	--	--	--	--	--	--	--	--	--	220v & 110v	None Needed	None Needed	None Needed	--	--		GE-48
GL-Geology Lab	GL-2	GE-5	1	Ultrasonic Cleaner, 1-2 gallon capacity	Aquasonic 550HT	10" x 10" x 13"	--	--	--	B	Ex	DOT			O-EX	O	--	O	--	--	--	--	--	--	--	--	--	110-120v	120v	--	5-20R	--	--	Equip Listed on RDS; no EDS	GE-5
GL-Geology Lab	GL-8	GE-50	1	Preparation Table	any	60" x 40" min	--	--	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		GE-50
GL-Geology Lab	GL-3	GE-56	8 (1 for each bench)	Precision Balance	Mettler Toledo / XS8001S	8" x 15" x 5"	--	--	--	B	Ex	DOT			O-EX	O	--	O	--	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--	Sensitive to vibration?	GE-56
GL-Geology Lab	GL-3	GE-57	8 (1 for each bench)	Micriscope, petrographic/external light	Sciencescope/on stand	13" X 24" x 24"				B	Ex	DOT			O-EX	O	--	O	--	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--		GE-57
GL-Geology Lab	GL-3	GE-58	--	Micriscope, petrographic/external light	Sciencescope/on stand	13" X 24" x 24"				B	Ex	DOT			O-EX	O	--	O	--	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--		GE-58
GL-Geology Lab	GL-3	GE-59	--	Micriscope, petrographic/external light	Sciencescope/on stand	13" X 24" x 24"				B	Ex	DOT			O-EX	O	--	O	--	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--		GE-59
GL-Geology Lab	GL-3	GE-60	--	Micriscope, petrographic/external light	Sciencescope/on boom	13" X 30" x 24"				B	Ex	DOT			O-EX	O	--	O	--	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--		GE-60
GL-Geology Lab	GL-3	GE-61	--	Micriscope, petrographic/external light	Sciencescope/on boom	13" X 30" x 24"				B	Ex	DOT			O-EX	O	--	O	--	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--		GE-61
GL-Geology Lab	GL-3	GE-62	--	Photo Station for Reference Samples	--	5' x 3' x 3'	--	--	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--		GE-62
GL-Geology Lab	GL-2/GL-8	GE-63	--	Refrigerator with ice-maker	TBD	35" x 31" x 71"	--	--	--	F	New	DOT			O	O	--	O	--	--	Tap	--	--	--	--	--	--	110v	120v	--	5-20R	--	--		GE-63
GL-Geology Lab	GL-3	GE-64	1	Supply Cabinet; Plan-File Type Drawers	--	30" x 27" x 41"	--	--	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		GE-64
GL-Geology Lab	GL-5	GE-9	2	Work/Prep Table	--	72"x30"	--	--	--	F	New	Des			F	F	--	C	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		GE-9
GL-Geology Lab	GL-9	GE-AA	--	Portable Digital Microscope	Keyence	15" x 15" x 10"	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--	On RDS; no EDS	GE-AA
GL-Geology Lab	GL-8	GE-AB	--	Ultrasonic Cleaner, 5 gallon capacity	Branson /1510	24" x 18" x 14.5"				B	New	DOT			O	O	--	--	--	--	--	--	--	--	--	--	--	110v	120v	--	5-20R	--	--		GE-AB

KEY, WATER: Tap-general building water; Dist-distilled; DI-deionized
KEY, DRAIN: Stand-standard; Silt-silt trap; Floor-with silt trap as needed; Acid-acid neutralizing scrubber
KEY: MOUNTING: F-floor/C-ceiling/W-wall/U-undercounter /B-bench or counter/I-inside equipment
KEY: FURNISH through FINAL CONNECT: C-contractor/O-owner/F-Furniture

LAB	ROOM(S)	MARK	QUANTITY (dash indicates see plan for quantities)	DESCRIPTION	MAKE / MODEL NUMBER (Basis of Design)	SIZE (W x D x H)	CLEARANCE For Equipment	WEIGHT (lbs.) *LOADED WEIGHT	HEAT LOAD (BTU)	MOUNTING (F, C, W, U, B, I)	New - new item Ex - exist. item	SPECIFIER (Design Team, DOT/OGS)	LONG LEAD TIME (Y, N)	SPECIAL PURCH. (SOLE SOURCE, ETC.)	FURNISH (C - CONTR., O-EX - OWNER EXIST., O-OWNER, F-FURN)	INSTALL (C, O, F)	Blocking (C-Contractor)	Final Connections (C, O, V)	Exhaust (D-direct, I-indirect, S-snorkel)	Exh. Issue (C-chem., H-heat, P-Particulate)	COLD WATER	HOT WATER	DIST / DI	DRAIN	GAS	C. AIR	VAC	POWER (GENERAL COLLECTED INFO)	Assumed actual Voltage	Actual Load	Connection type	UPS Batt.	DATA	NOTES, ENVIRONMENTAL FACTORS	MARK (Repeated for ref.)
GL-Geology Lab	GL-8	GE-AC	1	Video Monitor, 110V	TBD	(allocated area, 32" x 6" x 24")				W	New?	DOT			O	O	--	O	--	--	--	--		--	--	--	--	--	110v	120v	--	5-20R	--	--	on wall between microscopes	GE-AC
GL-Geology Lab	GL-8	GE-AD	1	Image Analysis Computer w/ LIMS & Internet	TBD	(allocated area, 12" x 24" x 24")				B/U	New?	DOT			O	O	--	O	--	--	--	--		--	--	--	--	--	110v	120v	--	5-20R	--	Y	below counter	GE-AD
AL-Aggregate Lab	CAL-1.1	CAE-10	1	Crusher (Small)	Bico	2' x 2.5' x 2.5'	12" at sides	400	--	F	Ex	DOT			O-EX	O	--	O	I	P	--	--		--	--	--	--	--	208v, 3ph	208v, 3ph	2 Hp, 6.8A	Hardwired	--	--	Concrete pad for mounting equipment. Dust collection required. Noise and vibration source.	CAE-10
AL-Aggregate Lab	CAL-6	CAE-13	(2) Existing (2) New	Freeze / Thaw Chamber; max. temperature 200° F	Tenney / T20S	42" x 56" x 84"	--	1800*	--	F	Ex / New	DOT			O-EX	O	--	O	I	--	--	--		--	--	--	--	--	208v 23A 60Hz 1 phase	208v, 1ph	23A	6-50R	--	--	Room and equipment shared with CON Concrete Lab. Heat source; heat released when door opened; units will run 24/7 and the AC needs to be on all the time in this room. Temp control required.	CAE-13
AL-Aggregate Lab	CAL-1.1	CAE-15	2	Tray Cleaning Stand	Gilson Clean-N-Weigh	19" x 30" x 30"	--	60	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	Used with shaker	CAE-15
AL-Aggregate Lab	CAL-1.1	CAE-16	3 (CAL), 1 (R1M)	Shaker, Tray Sieve	Gilson / TM-1	31" x 25" x 45"	--	370	--	F	Ex	DOT			O-EX	O	--	O	D*	--	--	--		--	--	--	--	--	110v	120v	--	5-20R	--	--	*Ducted to dust collector. Noise, vibration, dust. Bolted to floor	CAE-16
AL-Aggregate Lab	CAL-1	CAE-18	2	Shaker, 12" Diameter Tray Sieve	Gilson / SS-12R	21.5" x 12.5" x 41"	--	170	--	B*	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	110v	120v	--	5-20R	--	--	*On 24" high counter above open shelving. Noise, vibration, dust.	CAE-18
AL-Aggregate Lab	CAL-6*	CAE-20(a)	1	Freezer; Rapid Freeze, Cabinet	Humboldt / H-3185B	84" x 32" x 35.75"	--	400	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	208v 30A 1 phase	208v, 1ph	30A	Hardwired	--	--	*Room and equipment shared with CON Concrete Lab. Equipment in (2) parts; floor-standing cabinet and wall-mounted controller	CAE-20(a)
AL-Aggregate Lab	CAL-6*	CAE-20(b)	1	Freezer; Rapid Freeze, Controller	Humboldt / H-3185B	17" x 6" x 23"	--	400	--	W	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	208v 30A 1 phase	208v, 1ph	30A	Hardwired	--	--	*Room and equipment shared with CON Concrete Lab. Equipment in (2) parts; floor-standing cabinet and wall-mounted controller	CAE-20(b)
AL-Aggregate Lab	CAL-4	CAE-22	1	Balance (8,000g) with Plexiglass Shield	Mettler / PE 8,001	9" x 12" x 8"	--	10	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	110v	120v	--	5-20R	--	--	Adjacent to sink and barrel waste, avoid direct drafts. Sensitive to vibration	CAE-22
AL-Aggregate Lab	CAL-5, *CAL-7	CAE-23	(1) in CAL-5, (1) in CAL-7	Balance (16,000g); Benchtop	Mettler / Pm 16,001	15" x 15" x 7"	--	30	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	110v	120v	--	5-20R	--	--	*CAL-7 Room and equipment shared with CON Concrete Lab. Adjacent to sink. Sensitive to vibration	CAE-23
AL-Aggregate Lab	CAL-5	CAE-23A	1	Balance (16,000g): mounted on floor stand with suspension cable and 30 gallon water tank below	Mettler / Pm 16,001	15" x 15" x 7" (plus floor stand height)	--	30	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	110v	120v	--	5-20R	--	--	*CAL-7 Room and equipment shared with CON Concrete Lab. Adjacent to sink. Sensitive to vibration	CAE-23A
AL-Aggregate Lab	CAL-5	CAE-26	1	Specific Gravity Test Frame	HMA Lab Supply	30" x 24" x 40"	5" on sides,	450+		F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	110v	120v	--	5-20R			On wheels, needs water, power, floor drain	CAE-26
AL-Aggregate Lab	CAL-4	CAE-27	1	Bench Scale	Mettler MS8001S/03	9" x 12" x 8"				B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	110v	120v	--	5-20R			Adjacent to sink and barrel waste, avoid direct drafts. Sensitive to vibration	CAE-27
AL-Aggregate Lab	CAL-1.1	CAE-28	2 (CAL),1 (R1M)	Stackable storage for CAE-16		2' x 2.5' x 2					Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--		--	--	--			Stackable Storage for CAE-16, 2 easily stacked, 3 possible	CAE-28
AL-Aggregate Lab	CAL-1.1	CAE-29	1	Bench Scale (24,000g)	OHAUS	14" x 1.5' x 4"	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	110V	120v	--	5-20R			Avoid direct drafts. Sensitive to vibration. Coarse agg scale for shaker room. Has detachable display that can be moved.	CAE-29
AL-Aggregate Lab	CAL-7	CAE-30	2	Sample Splitter	Gilson	1' x 1.5' x 1.5'	Side clearance needed	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	Mechanical splitter. Flat and level surface required. Top loaded, but unloaded on sides.	CAE-30
AL-Aggregate Lab	CAL-7	CAE-31	1	Sample Splitter	--	15" x 22" x 21"	Side clearance needed	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	Mechanical splitter. Flat and level surface required. Top loaded, but unloaded on sides.	CAE-31
AL-Aggregate Lab	CAL-1	CAE-32	(2) Ex (3) New	Enclosed Sieve Shaker	Gilson SS-22	18" x 33" x 61"	Front clearance	--	--	F	Ex/ New	DOT			O	O	--	--	--	--	--	--		--	--	--	--	--	110V	--	--	--	--	--	Enclosed shaker cabinet mounted on wheeled frame. Has standard power cable hookup. No bench required.	CAE-32
AL-Aggregate Lab	CAL-2	CAE-4	(3) Ex (1) New	Oven	Despatch / LDB 2-18	43" x 32" x 51"	Serviced from above* Vent adjustment in rear (19" from bottom)	300 + Load	--	B	Ex	DOT			O-EX	O	--	--	I	--	--	--		--	--	--	--	--	240v, 16.6A, 1ph	240v, 1Phase	16.6A	L6-30R	--	--	Heat source; heat released when door opened. *Oven serviced from above, provide clearance at canopy hood; *dimensions are verified and includes vent*	CAE-4
AL-Aggregate Lab	CAL-1	CAE-6	1	50 Ton Press	K. R. Wilson / Special	37" x 31" x 96"	--	Approx. 1000*	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	*Approximate weight from internet search, 900 to 1,000 lbs.	CAE-6
AL-Aggregate Lab	CAL-6	CAE-8	1	Crusher (Large)	--	2' x 3' x 2'	--	400	--	F	Ex	DOT			O-EX	O	--	O	I	P	--	--		--	--	--	--	--	208v, 3ph	208V 3 Phase	3 HP 9.3A	Hardwired	--	--	Dust collection required. Noise and vibration source.	CAE-8
AL-Aggregate Lab	CAL-1	CAE-9	1	Pulverizer	Bico	3' x 2' x 3'	--	400	--	F	Ex	DOT			O-EX	O	--	O	I	P	--	--		--	--	--	--	--	208v, 3ph	208V 3 Phase	3 HP 9.3A	Hardwired	--	--	Dust collection required. Noise and vibration source.	CAE-9
AL-Aggregate Lab	CAL-1	CAE-AA	1	Drill Press	--	4' x 6' x 5'	--	200	--	F	Ex	DOT			O-EX	O	--	--	S	P	--	--		--	--	--	--	--	220v*	240V 1 Phase	--	Special receptacle	--	--	GFI connection needed; moved instead of SIE-3 now located in Crusher Room CAL-1	CAE-AA
AL-Aggregate Lab	CAL-6	CE-21	1	Environmental Chamber	Associated ENV Systems / Model LH10	38" x 43.1" x 52.8"	--	550	--	F	New	DOT			O	O	--	O	TBD**	--	--	--		--	--	--	--	--	NEMA 5-20	120V	--	5-20R	--	--	* CON investigating new unit; ** Verify venting requirements	CE-21
AL-Aggregate Lab	RML-3*	RMM-14	2	Scale, (2) parts; Scale on Bench, Control / Display on Wall	DYMO Pelouze / 4010	12" x 12.5" x 7"	--	--	--	B, W*	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	110v*	120V	18W	5-20R	--	--	Designated as RMM-9 on RDS. *9v at device (same as RMC-5 in Concrete Lab)	RMM-14
AL-Aggregate Lab	RML-3*	RMM-8	1	Box Furnace; Temperature to 1,200° F	Lindberg / Blue M	32" x 24" x 46"	--	280	--	B	Ex	DOT			O-EX	O	--	O	I	--	--	--		--	--	--	--	--	240V	240V 1Phase	27A - 6400W	Special receptacle	--	--	*RML-3 Room and equipment shared with CON Concrete Lab. Heat source; heat released when door opened	RMM-8
OTSP-Organic/Spec/Paint	IAOT-5	OTE-10	1	Specific Gravity Balance		2' x 2' x 2'	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	110v	120V	--	5-20R	--	--		OTE-10
OTSP-Organic/Spec/Paint	IAOT-6	OTE-12	2	Centrifuge, Table Top	ThermoFisher\Sorvall Legend X1	17" x 23" x 16"	--	--	--	B	New?	DOT			O	O	--	--	--	--	--	--		--	--	--	--	--	110v	120V	--	5-20R	--	--	Existing	OTE-12
OTSP-Organic/Spec/Paint	IAOT-6*	OTE-13	1	Refrigerator, Small, Single Door	VWR Scientific	22" x 24" x 33"	--	--	--	U	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	110v	120V	--	5-20R	--	--	Existing. RM-IAOT	OTE-13
OTSP-Organic/Spec/Paint	IAOT-6*	OTE-14	1	Freezer, Small	Fisher ISO Temp Freezer	22" X 24" X 33"	--	--	--	U	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	110v	120V	--	5-20R	--	--	Existing. RM-IAOT	OTE-14
OTSP-Organic/Spec/Paint	SPEC-3, IAOT-2, IAOT-3	OTE-18	(1) SPEC-3, (1) IAOT-2, (1) IAOT-3	Scale, 2100 Gram Max. Capacity	Ohaus Explorer EX202	8" x 15" x 4"	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	110v	120V	--	5-20R	--	--	Existing. Quantity - 3	OTE-18
OTSP-Organic/Spec/Paint	SPEC-3	OTE-19	3	Balance, Analytical, 210 Gram Capacity	Ohaus Analytical Plus \ AP-210	8" x 15" x 11"	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	110v	120V	--	5-20R	--	--	Existing	OTE-19
OTSP-Organic/Spec/Paint	IAOT-1, IAOT-2	OTE-20	(2) IAOT-1, (1) IAOT-2	Hot Plate with Stirring	(Unknown)	approx. 12" x 12" x 12"	--	**	--	B	New	DOT			O	O	--	--	--	--	--	--		--	--	--	--	--	120v	120V	--	5-20R	--	--		OTE-20
OTSP-Organic/Spec/Paint	IAOT-3	OTE-21	1	High Speed Blender for Rock Salt	(Unknown)	approx. 10" x 10" x 22"	--	**	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	120v	120V	--	5-20R	--	--		OTE-21
OTSP-Organic/Spec/Paint	?*	OTE-23		Digital Buret, 50 ml Capacity	Jencons / Digitrate Pro	9" x 12" x 15"	--	--	--	B	New	DOT			O	O	--	--	--	--	--	--		--	--	--	--	--	Battery	None needed	None needed	None needed	--	--	Existing. RM - IAOT	OTE-23
OTSP-Organic/Spec/Paint	?*	OTE-24	2	pH / ISE Meter	Thermo Orion / Dual Star 001N0008	6.7" x 9.5" x 3.5"	--	--	--	B	New?	DOT			O	O	--	--	--	--	--	--		--	--	--	--	--	100-240v	120V	--	5-20R	--	--	Existing. RM - IAOT	OTE-24
OTSP-Organic/Spec/Paint	SPEC-3	OTE-24 (a)	1	Microscope and PC; Stereomicroscopy Image Analysis	--	--	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	100-240v 50/60 Hz	120V	--	5-20R	--		Listed on EDS, not RDS	OTE-24 (a)
OTSP-Organic/Spec/Paint	IAOT-1, IAOT-2, IAOT-3	OTE-3	(3) IAOT-1, (1) IAOT-2, (1) IAOT-3	Oven, Gravity Convection Oven	Lindberg Blue M / G01310A-1	18" X 18" X 32"	--	--	--	B	New?	DOT			O	O	--	--	I	H	--	--		--	--	--	--	--	110v/7.4A/900W	120V	--	5-20R	--	--	Temp to 260 C. 3 units required. Canopy.	OTE-3
OTSP-Organic/Spec/Paint	IAOT-3	OTE-5	1	FTIR (Fourier-transform Infrared) Spectrometer; PC Station with printer adjacent	Perkin Elmer*	3' x 2' x 1'	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	110v	120V	--	5-20R	--	Y	Existing, but to be replaced soon. Size and installation requirements not expected to change. Temperature & humidity sensitive	OTE-5
OTSP-Organic/Spec/Paint	IAOT-3	OTE-6	1	UV-Visible Spectrophotometer	ThermoFisher / Genesys 150	15" x 15" x 9"	--	--	--	B	New?	DOT			O	O	--	--	--	--	--	--		--	--	--	--	--	110v	120V	--	5-20R	--	Y	Temperature & humidity sensitive	OTE-6
OTSP-Organic/Spec/Paint	IAOT-2	OTE-7	1	Rapidstill (Kjeldahl Distillation)	Labconco / RapidStill II model 65200	18" x 13" x 30"	--	60	--	B	New?	DOT			O	O	--	--	--	--	Tap	Tap		--	--	--	--	--	110v / 15A	120V	--	5-20R	--	--	Not hard plumbed. Connects to water supply via tubing and hose clamps to barb fitting on a faucet. Drains via tubing into a sink. Next to a sink & faucet.	OTE-7
OTSP-Organic/Spec/Paint	IAOT-5	OTE-9	2	Oven, Muffle; to 1100 Degrees Celsius	Ney \ Vulcan 3-550 PD	16" x 16" x 16"	--	--	--	B	New?	DOT			O	O	--	--	I	H	--	--		--	--	--	--	--	110v/11A	120V	--	5-20R	--	--	2 units, canopy.	OTE-9
OTSP-Organic/Spec/Paint	IAOT-2	OTE-AA	1	Roundometer	Verify	Verify	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	120V	--	5-20R	--	--		OTE-AA

KEY, WATER: Tap-general building water; Dist-distilled; DI-deionized
KEY, DRAIN: Stand-standard; Silt-silt trap; Floor-with silt trap as needed; Acid-acid neutralizing scrubber
KEY: MOUNTING: F-floor/C-ceiling/W-wall/U-undercounter /B-bench or counter/I-inside equipment
KEY: FURNISH through FINAL CONNECT: C-contractor/O-owner/F-Furniture

LAB	ROOM(S)	MARK	QUANTITY (dash indicates see plan for quantities)	DESCRIPTION	MAKE / MODEL NUMBER (Basis of Design)	SIZE (W x D x H)	CLEARANCE For Equipment	WEIGHT (lbs.) *LOADED WEIGHT	HEAT LOAD (BTU)	MOUNTING (F, C, W, U, B, I)	New - new item Ex - exist. item	SPECIFIER (Design Team, DOT/OGS)	LONG LEAD TIME (Y, N)	SPECIAL PURCH. (SOLE SOURCE, ETC.)	FURNISH (C - CONTR., O-EX - OWNER EXIST., O-OWNER, F-FURN)	INSTALL (C, O, F)	Blocking (C-Contractor)	Final Connections (C, O, V)	Exhaust (D-direct, I-indirect, S-snorkel)	Exh. Issue (C-chem. H-heat, P-Particulate)	COLD WATER	HOT WATER	DIST / DI	DRAIN	GAS	C. AIR	VAC	POWER (GENERAL COLLECTED INFO)	Assumed actual Voltage	Actual Load	Connection type	UPS Batt.	DATA	NOTES, ENVIRONMENTAL FACTORS	MARK (Repeated for ref.)
OTSP-Organic/Spec/Paint	PL-1	PE-10	1	Viscosity Tester	Brookfield / KU-2	11" x 15" x 20"	--	25	--	B	New?	DOT			O	O	--	--	--	--	--	--		--	--	--	--	110v	120V	--	5-20R	--	--	Paint Lab	PE-10
OTSP-Organic/Spec/Paint	PL-1	PE-11	1	Color Matching Booth	GTI / Color Matcher	30"x 24" x 32"	--	--	--	B	New?	DOT			O	O	--	--	--	--	--	--		--	--	--	--	110v	120V	--	5-20R	--	--	Paint Lab	PE-11
OTSP-Organic/Spec/Paint	PL-1	PE-15	1	Incubator / Water Bath	Fisher / IsoTemp 2333	24" x 16" x 17"	--	--	--	B	New	DOT			O	O	--	--	--	--	--	--		--	--	--	--	230v/5A/1ph	120V	--	5-20R	--	--	Humidity source. Should be convenient to sink for filling and emptying	PE-15
OTSP-Organic/Spec/Paint	PL-1	PE-20	1	Paint Shaker	TBD	3' x 18" x 18"	--		--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	120v	120V	--	5-20R	--	--	Existing	PE-20
OTSP-Organic/Spec/Paint	PL-1	PE-4		Colorimeter	Hunter / LabScan XE	8" x 12" x 16"	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	110v	120V	--	5-20R	--	--	Existing. Located in Paint Lab. To be replaced before lab move. Specs should not change much.	PE-4
OTSP-Organic/Spec/Paint	PL-1	PE-5	2	Centrifuge, Table Top, to 13,500 rpm	ThermoFisher / Sorvall Legend X1	17" x 23" x 16"	--	202	--	B	New?	DOT			O	O	--	--	--	--	--	--		--	--	--	--	120v/9.5A	120V	--	5-20R	--	--	Existing	PE-5
OTSP-Organic/Spec/Paint	PL-3	PE-7	1	Rotary Abrasion Tester	Taber Abraser 5155	20" x 19" x 15"	--	91	--	B	New?	DOT			O	O	--	--	**	--	--	--		--	--	--	--	120v	120V	--	5-20R	--	--	Existing. Paint Lab. In isolated room for noise control. Needs shop-vac type attachment	PE-7
OTSP-Organic/Spec/Paint	PL-3	PE-8	1	Rotary Abrasion Tester	Taber Abraser 5150	20" x 19" x 15"	--	91	--	B	New?	DOT			O	O	--	--	**	--	--	--		--	--	--	--	120v	120V	--	5-20R	--	--	Existing. Paint Lab. In isolated room for noise control. Needs shop-vac type attachment	PE-8
OTSP-Organic/Spec/Paint	PL-2	PE-9	1	Wrist Action Shaker	Burrell / Model 75	40" x 15.3" x 18"	--	70	--	B	New?	DOT			O	O	--	--	--	--	--	--		--	--	--	--	120v	120V	--	5-20R	--	--	Existing	PE-9
OTSP-Organic/Spec/Paint	SPEC-2	SPE-1 (a)	1	Emission Spectrometer	Thermo Scientific / ARL 3460 Advantage OES Metals Analyzer	67" x 31" x 48", including excitation stand	--	992	--	F	New?	DOT			O	O	--	O	--	--	--	--		--	Y*	--	--	230v 12A	--	--	Powered from SPE-1 (b)	--	--	*See SPE-1 (b)	SPE-1 (a)
OTSP-Organic/Spec/Paint	SPEC-2	SPE-1 (b)	1	Shielded Transformer for Emission Spectrometer	(Existing)	23" x 22" x 28"	6" all sides	--	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	Verify*	208V	5 KVA	Hardwired	--	--	*EDS indicates it can be wired 110, 208, or 240; hardwired	SPE-1 (b)
OTSP-Organic/Spec/Paint	SPEC-2	SPE-1 (c)	1	Argon Gas Cylinder for SPE-1 (a)	--	9" diameter x 42"	--	--	--	F	Ex	DOT			O-EX	O	C*	O	--	--	--	--		--	Y	--	--	--	--	--	--	--	--	*Contractor provide blocking & safety strap/chains	SPE-1 (c)
OTSP-Organic/Spec/Paint	PL-3	SPE-3	1	Combination Belt / Disc Sanders; 6" x 48" Belt Sander; 12" Dia. Disc Sander	Jet	27" x 18" x 58"	--	270	--	F	New?	DOT			O	O	--	--	D*	P	--	--		--	--	--	--	115v 12.8A	120V	--	5-20R	--	--	*Dust collection system required for both disc and belt sections; provide storage for accessories	SPE-3
IAIT-Inst. An. Inorganic T.	IAIT-11	ITE-1 (a)	1	Atomic Absorption Spectrophotometer	Perkin Elmer / PinAAcle Series	38" x 27" x 29"	--	207.2	--	B	Ex	DOT			O-EX	O	--	O	I	H,C	--	--		--	Y*	Y	--	230v 30A	120V	5.3A	5-20R	--	--	*Nitrous oxide, acetylene, compressed air. Dust-free and vibration-free environment. Must have space below bench for plastic drainage carboy (currently 12" diameter x 14.5"). Notable heat source and large open flame when active.	ITE-1 (a)
IAIT-Inst. An. Inorganic T.	IAIT-11	ITE-1 (b)	1	Nitrous Oxide Gas Cylinder	--	9" diameter x 51"	--	106	--	F, W	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	--	--	--	Nitrous Oxide and Acetylene gas contained in separate gas cabinets with safety straps or chains	ITE-1 (b)
IAIT-Inst. An. Inorganic T.	IAIT-11	ITE-1 (c)	1	Acetylene Gas Cylinder	--	12" diameter x 46.7"	--	169.1	--	F, W	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	--	--	--	Nitrous Oxide and Acetylene gas contained in separate gas cabinets with safety straps or chains	ITE-1 (c)
IAIT-Inst. An. Inorganic T.	IAIT-7C	ITE-10	1	Water Bath	Fisher Scientific Isotemp Water Bath 15-462-210 (233)	16.38" x 15.38" x 8.88"	--	16.5	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	120v 5.8A 50/60 Hz	120V	5.8A	5-20R	--	--	*Should be near a sink with a distilled line.	ITE-10
IAIT-Inst. An. Inorganic T.	IAIT-12	ITE-11 (a)	1	Wavelength Dispersive X-ray Fluorescence (WDXRF), PC Workstation Adjacent (Hard Wired)	Rigaku ZSX Primus IVi	33.1" x 40.4" x 56.7"	12" on all sides	1102	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	Y*	--	--	***	***	***	**	--	--	*Connected to P10 and Helium tanks. Room temp and humidity to be maintained with high consistency. **Connected to external ITE-7 and ITE-11 (d). Anti-vibration platform.	ITE-11 (a)
IAIT-Inst. An. Inorganic T.	IAIT-12	ITE-11 (b)	1	Helium Gas Cylinder for ITE-11 (a)	--	9.25" diameter x 55"	--	132	--	F, W	Ex	DOT			O-EX	O	C*	O	--	--	--	--		--	Y	--	--	--	--	--	--	--	--	*Contractor provide blocking & safety strap/chains	ITE-11 (b)
IAIT-Inst. An. Inorganic T.	IAIT-12	ITE-11 (c)	1	P10 Gas Cylinder for ITE-11 (a)	--	9" diameter x 51"	--	106	--	F, W	Ex	DOT			O-EX	O	C*	O	--	--	--	--		--	Y	--	--	--	--	--	--	--	--	*Contractor provide blocking & safety strap/chains	ITE-11 (c)
IAIT-Inst. An. Inorganic T.	IAIT-12	ITE-11 (d)	1	Power Conditioner for WDXRF	--	16" x 20" x 27"	--	--	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	200-240V AC ±10%, 50/60Hz 1Ø 40 Amp.	208V 1 Phase	40A	Hardwired	--	--	Power Conditioner for WDXRF	ITE-11 (d)
IAIT-Inst. An. Inorganic T.	IAIT-7A	ITE-12	1	Mixer / Mill	Spex Sample Prep / Mixer / Mill 8000M	19" x 14" x 18"	--	76	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	115v 60 Hz	120V	--	5-20R	--	--	Locate with ITE-7. Needs snorkel. Loud, vibrations	ITE-12
IAIT-Inst. An. Inorganic T.	IAIT-7D	ITE-13	1	Rotary Mixer	Custom Fabricated In-House	40" x 17" X 20"	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	115v 60Hz	120V	--	5-20R				ITE-13
IAIT-Inst. An. Inorganic T.	IAIT-13	ITE-14	1	Sonicator	Cole Palmer	15" x 12" x 7"	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	115v 60Hz	120V	--	5-20R			Loud and high-pitched, provide sound-enclosure cabinet	ITE-14
IAIT-Inst. An. Inorganic T.	IAIT-7B	ITE-15	1	Vaccuum Filtration Apparatus	Custom	48" x 24" x 6"	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	None Needed	None Needed	None Needed				ITE-15
IAIT-Inst. An. Inorganic T.	IAIT-4	ITE-2	5	Balance, Analytical	Mettler Toledo / XS204DR	10.5" x 18" x 13"	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	100-240v	120V	--	5-20R	--	--	Must be in vibration free environment. Temp and humidity-controlled environment.	ITE-2
IAIT-Inst. An. Inorganic T.	IAIT-5	ITE-4	1	Convection Oven to 260C, also referred to as Moisture Oven	Lindberg Blue M	25" x 22." x 32"	--	150	--	B	Ex	DOT			O-EX	O	--	--	I*	H	--	--		--	--	--	--	120v 10.8A	120V	10.8A	5-20R	--	--	*Open hood/Canopy	ITE-4
IAIT-Inst. An. Inorganic T.	IAIT-13*	ITE-5 (a)	1	Fusion Instrument*	SPEX / Katanex X-600	41" x 27" x 22"	12" sides & back; 18-23" above to canopy hood	210	--	B	Ex	DOT			O-EX	O	--	--	S	H,C	--	--		--	--	--	--	195-250VAC, 50-60 Hz, 20A, 4000W	208V, 1Ph	4 KW	L6-20R	--	--		ITE-6
IAIT-Inst. An. Inorganic T.	IAIT-13	ITE-5 (b)	1	Fusion Instrument*	SPEX / Katanex X-300	19" x 25" x 20"	12" sides & back; 18-23" above to canopy hood	100	--	B	Ex	DOT			O-EX	O	--	--	S	H,C	--	--		--	--	--		195-250VAC, 50-60 Hz, 20A, 3000W	208V, 1Ph	3 KW	L6-20R	--	--		ITE-5 (b)
IAIT-Inst. An. Inorganic T.	IAIT-5	ITE-6	(2) Existing (1) New	Muffle Furnace. To 1125 Degrees Celsius	Fisher Scientific	20.5" x 24" x 29.5"	6" clearance all sides	110	--	B	Ex/ New	DOT			O	O	--	--	I*	H	--	--		--	--	--	--	240v 19.2A	240V 1Phase	7.5A	6-20R	--	--	*Canopy hood. High heat souce	ITE-6
IAIT-Inst. An. Inorganic T.	IAIT-12	ITE-7	1	External Water-To-Air Chiller	Haskris LX-3 Chiller	19" x 33.5" x 34"	36" front, 6" sides and rear	275	29250 BTU/hr	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	208V AC ±10%, 60Hz 1Ø 25Amp	208V, 1Ph	3 KW	L6-30R	--	--	*Connected to ITE-11 (a) WDXRF.	ITE-7
IAIT-Inst. An. Inorganic T.	IAIT-7A	ITE-8 (a)	1	pH / ISE Meter	Thermo Orion / Dual Star 001N0008	6.7" x 9.5" x 3.5"	--	--	--	B	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	100-240v	120V	--	5-20R	--	--		ITE-8 (a)
IAIT-Inst. An. Inorganic T.	IAIT-7A	ITE-8 (b)	1	Stir plate (companion to ITE-8 (a)	Fisher Scientific Analog Stir Plate	8" x 10" x 5"*	--	3	--	B	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	110v	120V	--	5-20R	--	--	Exact model does not matter but information for extant device.	ITE-8 (b)
IAIT-Inst. An. Inorganic T.	IAIT-9	ITE-9	1	Dishwasher; Glassware	Labconco Steamscrubber	24.2" x 27.5" x 36.2"	--	235	--	U	Ex	DOT			O-EX	O	--	O	--	--	Dist/ DI*	--		Drain	--	--	--	115v 16A 60 Hz	120V	16A	5-20R	--	--	*Deionized water, min 1.25 gal/min, if additional DI water needed in addition to C-DI-1 located on counter, carboy will be provided by DOT (9/26/24 email from Adam N.)	ITE-9
PGL-Perform. Grade Binder	PGL-3	PGE-1	(2) Existing DSR E (2) New Kinexus Pro	Dynamic Shear Rheometer (DSR); Hot Plate, DSR, PC, Electronic Control Box, Printer on Bench; Heat Exchanger on Bench; (with PGE-1a and PGE-1b)	Malvern/Kinexus Pro and Netzsch/DSR E. Two of each, total of four.	166"x27"x26" instrument and associated equipment. DSR is 20" x 20" x 25"	--	--	--	B, U	Ex/ New	DOT			O-EX	O	--	O	--	--	--	--		--	--	Y*	--	120v -1000W	120V	1 KW 10A	5-20R	--	--	Size is for instrument & associated equip.: PC, Monitor, printer, bottle rack and oven. No below-bench baths on current DSRs, now all benchtop heat exchangers. *Compressed air is filtered and dried by PGE-1 (b).	PGE-1
PGL-Perform. Grade Binder	PGL-5	PGE-1 (a)	-	Annealing Oven for DSR setup	Verify	30" x 24" x 26"	--	--	--	B	New	DOT			O-EX	O	--	O	Verify	Verify	--	--		--	--	Y*	--	240V 25A	120V	11A	5-20R	--	--	*Compressed air is filtered and dried house air.	PGE-1 (a)

KEY, WATER: Tap-general building water; Dist-distilled; DI-deionized
KEY, DRAIN: Stand-standard; Silt-silt trap; Floor-with silt trap as needed; Acid-acid neutralizing scrubber
KEY: MOUNTING: F-floor/C-ceiling/W-wall/U-undercounter /B-bench or counter/I-inside equipment
KEY: FURNISH through FINAL CONNECT: C-contractor/O-owner/F-Furniture

LAB	ROOM(S)	MARK	QUANTITY (dash indicates see plan for quantities)	DESCRIPTION	MAKE / MODEL NUMBER (Basis of Design)	SIZE (W x D x H)	CLEARANCE For Equipment	WEIGHT (lbs.) *LOADED WEIGHT	HEAT LOAD (BTU)	MOUNTING (F, C, W, U, B, I)	New - new item Ex - exist. item	SPECIFIER (Design Team, DOT/OGS)	LONG LEAD TIME (Y, N)	SPECIAL PURCH. (SOLE SOURCE, ETC.)	FURNISH (C - CONTR., O-EX - OWNER EXIST., O-OWNER, F-FURN)	INSTALL (C, O, F)	Blocking (C-Contractor)	Final Connections (C, O, V)	Exhaust (D-direct, I-indirect, S-snorkel)	Exh. Issue (C-chem., H-heat, P-Particulate)	COLD WATER	HOT WATER	DIST / DI	DRAIN	GAS	C. AIR	VAC	POWER (GENERAL COLLECTED INFO)	Assumed actual Voltage	Actual Load	Connection type	UPS Batt.	DATA	NOTES, ENVIRONMENTAL FACTORS	MARK (Repeated for ref.)
PGL-Perform. Grade Binder	PGL-5	PGE-1 (b)	-	Regulator and Air Drier for PGE-1. Mount below counter on custom freestanding panel or mount to side of cabinet	Custom	--	--	--	--	U	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	Y*	--	--	--	--	--			*Filtering and drying of house compressed air	PGE-1 (b)
PGL-Perform. Grade Binder	PGL-5	PGE-10	-	Oven, Cleaning	Barnstead/Thermolyne Pyro-Clean.	30" x 32" x 57"	--	--	--	B	New	DOT			O	O	--	--	I*	H,C	--	--		--	--	--	--	240V 25A	240V 1Phase	6000W / 25A	6-30R	--	--	*Canopy hood.	PGE-10
PGL-Perform. Grade Binder	PGL-8	PGE-11	1	Ice Maker	--	15" x 21" x 27.5"	--	--	--	B	Ex	DOT			O-EX	O	--	O	--	--	Y	--		--	--	--	--	120v	120V	2.5A	5-20R	--	--		PGE-11
PGL-Perform. Grade Binder	PGL-2, PGL-3	PGE-4	1	Rotational Viscometer (RV) setup, includes small oven for sample prep (no canopy hood)	Brookfield Instruments / DV II T	84" x 24" for setup (RV unit is 30" x 24" x 24")	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	120v	120V	2A	5-20R	--	--		PGE-4
PGL-Perform. Grade Binder	PGL-2, PGL-3	PGE-4a	1	Oven (for RV setup)	Verify	Verify (allocated 18" x 18" x 18")	--	--	--	B	Ex	DOT			O-EX	O	--	--	Verify	Verify	--	--		--	--	--	--	120v 10A	120V	10A	5-20R	--	--		PGE-4a
PGL-Perform. Grade Binder	PGL-4	PGE-5	4	Oven, Rolling Thin Film (RTFO)	James A. Cox & Sons / RTF-325A	40"x32"x25" each unit. Total of four units	(2) ovens facing (2) ovens on other bench; rear access for maintenance	--	--	B	New	DOT			O	O	--	O	I*	H,C	--	--		--	--	--	--	208/240v/15A	208V, 1 Phase	15A	L6-30R	--	--	Height of unit is 25", not including 6" blocks. Blocks not needed, but desired for ease of maintenance (access to bottom), *Canopy hood. One oven for each of (4) test modules. ** House compressed air. RFTO get turned on every Monday and turned off End of Day on Thursday.	PGE-5
PGL-Perform. Grade Binder	PGL-6	PGE-6 (a)	2	Pressure Aging Vessel (PAV)	Prentex	24" x 24" x 30"	--	--	--	B	New	DOT			O	O	--	O	--	--	--	--		--	--	--	--	208/240v (B) 120v (C & D)	120V	10A	5-20R	--	--	*Compressed air currently from tanks. Currently using cylinders, (1) for each of (3) vessels	PGE-6 (a)
PGL-Perform. Grade Binder	PGL-6	PGE-6 (b)	2	Compressed Air Cylinders	--	9" diameter x 42"*	--	--	--	F	New	DOT			O	O	C*	O	--	--	--	--		--	--	--	--	110V	None needed	None needed	None needed	--	--	*Contractor provide blocking & safety strap/chains, Provide compressed air cylinders	PGE-6 (b)
PGL-Perform. Grade Binder	PGL-8	PGE-7	4	Bending Beam Rheometer (BBR) Testing Unit; BBR and PC / printer Workstation on Bench with associated Chiller / Circulator (15"W x 17"D x 18"H) Below Bench	Cannon Instruments/ TE-BBR	84" x 30" x 24" for BBR and associated equipment. BBR alone is 24" x 21" x 24"	--	--	--	B, U	New	DOT			O	O	--	O	--	--	--	--		--	--	--	--	120v 20A	120V	20A	5-20R	--	--	*House filtered compressed air. All items on and below bench fit within given footprint.	PGE-7
PGL-Perform. Grade Binder	PGL-8	PGE-7a	4	Chiller / Circulator Below Bench; for Bending Beam Rheometer (BBR)	Verify	15" x 17" x 18"	Clear air flow at front and rear	--	--	U	New	DOT			O	O	--	--	--	--	--	--		--	--	--	--	Verify	120V	20A	5-20R	--	--		PGE-7a
PGL-Perform. Grade Binder	PGL-7	PGE-9	2	Oven, Vacuum Degassing with Integral vacuum Pumps	Prentex 9900	14" x 18" x 20" one unit. Two units side-by-side	--	--	--	B	Ex	DOT			O-EX	O	--	--	I*	H,C	--	--		--	--	--	--	120v 10A	120V	10A	5-20R	--	--	*Canopy hood. Two units with 2" gap between them. Units have integral vacuum pumps.	PGE-9
EASB-Emul & Asph-SBL-Bit	ECL-9	ECE-1	1	Penetrometer	Herzog / 91358	1.5' x 2' x 3'	--	20	--	B	New	DOT			O	O	--	--	--	--	--	--		--	--	--	--	110v	120V	1.18A	5-20R	--	--		ECE-1
EASB-Emul & Asph-SBL-Bit	ECL-3, ECL-4, ECL-5, ECL-7, ECL-11	ECE-13	(1) in ECL-3, (1) in ECL-4, (1) in ECL-5, (1) in ECL-11	Scale (Balances)	Mettler PB80001S, MS8001TS00, VP214CN	1' x 2' x 1'	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	110v	120V	--	5-20R	--	--		ECE-13
EASB-Emul & Asph-SBL-Bit	ECL-10	ECE-14	1	Penetrometer	Controls / 81-B0101/E	1.5' x 2' x 2'	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	110v	120V	--	5-20R	--	--		ECE-14
EASB-Emul & Asph-SBL-Bit	ECL-9	ECE-2	1	Saybolt Furol; Constant Temp. Bath for Viscosity Testing	Koehler Instrument	29" x 25" x 33"	--	94	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	115v 12.3A	120V	12.3A	5-20R	--	--		ECE-2
EASB-Emul & Asph-SBL-Bit	ECL-5, ECL-9	ECE-3	(2) Existing (2) New	Oven, Gravity Convection	Cole-Parmer	29.2" x 24.6" x 36.3"	--	75	--	B	Ex/ New	DOT			O-EX	O	--	--	I	H,C	--	--		--	--	--	--	120v 6.7A	120V	6.7A	5-20R	--	--		ECE-3
EASB-Emul & Asph-SBL-Bit	ECL-2, ECL-6, ECL-7, ECL-10, ECL-11	ECE-4 (b)	2	Water Bath (for ECE-14)	Thermo Scientific / SC100	40"(W) x 18"(D) x 18"(H)	--	50	--	B	New	DOT			O	O	--	--	--	--	--	--		--	--	--	--	120v / 11.5A	120V	11.5A	5-20R	--	--	Unit has an intergrated circulator that is mounted on top of the unit	ECE-4 (b)
EASB-Emul & Asph-SBL-Bit	ECL-8	ECE-5	1	Particle Charge Tester	Humboldt / H-2540	1' x 1.5' x 1'	--	5	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	110v	120V	--	5-20R	--	--		ECE-5
EASB-Emul & Asph-SBL-Bit	ECL-7	ECE-6	1	Water Bath, 120; protective sheild at center of water bath	Forma Scientific / CHP	2' x 3' x 18"	--	200	--	B	New	DOT			O	O	--	--	--	--	--	--		--	--	--	--	110v	120V	--	5-20R	--	--		ECE-6
EASB-Emul & Asph-SBL-Bit	ECL-12	ECE-7	1	Elastic Recovery Testing Machine (Ductilometer)	Humboldt Manuf.	10' x 2' x 1.5'	--	200	--	B	Ex?	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	110v	120V	--	5-20R	--	--		ECE-7
EASB-Emul & Asph-SBL-Bit	ECL-14	ECE-8	1	Thermometer Calibration Bath/Melting Pot	Wenesco/MPM21D	1.5' x 1.5' x 1.5'	--	50	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	Y*	Y	Y	120v	120V	--	5-20R	--	--	*Building-supplied natural gas. This unit is used in a vent hood	ECE-8
EASB-Emul & Asph-SBL-Bit	SBL-1-C	ECE-9	1	Cleveland Open-Cup Flash Point Test, (3) Parts: Electronic Box, Flash Point Tester, Under Canopy Hood	Walter Herzog Inc / 1450	4' x 3' x 2'	--	50	--	B	Ex	DOT			O-EX	O	--	--	I*	H,C	--	--		--	--	--	--	120v	120V	--	5-20R	--	--	*Indirect venting. Requires dimmable lighting conditions	ECE-9
EASB-Emul & Asph-SBL-Bit	RML-2	RMA-10	4	Pycnometer, Vacuum	U.S. Gauge	11" dimeter x 4"*	--	--	--	I	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	None needed	None needed	None needed	--	--	Used w/ SBE-7, Requires a shelf above the setup, requires vacuum pump manifold along the rear wall to SBE-7	RMA-10
EASB-Emul & Asph-SBL-Bit	RML-2	RMA-11	4	Shaker, Small; Vibrating Table for Vacuum Pycnometer	Humboldt Testing Co / H-1756	11" dimeter x 15.5"*	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	115v,.5A	120V	0.5A each	5-20R	--	--	Used with RMA-10	RMA-11
EASB-Emul & Asph-SBL-Bit	RML-2	RMA-12	1	Water Bath, Specific Gravity. Stand with Top for Balance and water bath below. Used With RMA-14 and Balance*	Gilson / Specific Gravity Bench SG-12, plus accessories	27" x 22" x 20"	--	--	--	F	New	DOT			O	O	--	--	--	--	--	--		Floor	--	--	--	--	None needed	None needed	None needed	--	--	Water bath filled by hose	RMA-12
EASB-Emul & Asph-SBL-Bit	RML-2	RMA-14	1	Heater / Circulator Pump; Used in RMA-12	Unknown	Used in RMA-12	--	--	--	I	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	120v	120V	0.6A + 0.3A	5-20R	--	--	Used insice RMA-12 water bath	RMA-14
EASB-Emul & Asph-SBL-Bit	RML-12	RMA-16	1	Hot Plat; max. temperature 550F	Corning	10" x 10" x 6"	--	5	--	B	Ex	DOT			O-EX	O	--	--	I	--	--	--		--	--	--	--	120v	120v	13.3A	5-20R	--	--		RMA-16
EASB-Emul & Asph-SBL-Bit	RML-2	RMA-4	2	Oven, Stabil Therm, to 260 Degrees Celsius	Blue M Electric Co / Stabil-Therm OV-490A-2	25.6" x 27.2" x 37.2"	--	150	--	B	Ex	DOT			O-EX	O	--	--	I	H, C	--	--		--	--	--	--	120v	120V	1600W	5-20R	--	--		RMA-4
EASB-Emul & Asph-SBL-Bit	RML-2	RMA-8	3	Scale, Benchtop	MettlerTToledo; models vary	14" x 14" x 6"*	--	25	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	110v	120V	0.3A	5-20R	--	--	*Approximate dimensions	RMA-8
EASB-Emul & Asph-SBL-Bit	RML-2	RMA-9	1	Vacuum Pump	Sargent-Welch / 1405	20" x12" x 15"	--	112	--	U*	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	115v	120V	1/2 HP	5-20R	--	--	*Below bench; Owner to connect to SBE-2(a)	RMA-9
EASB-Emul & Asph-SBL-Bit	SBL-1-C, SBL-2-C, SBL-3-C	SBE-1	(3) in SBL-1-C, (1) in SBL-2-C, (4) in SBL-3-C	Scale, Benchtop*	Mettler Toledo; PG8001-S, PC16, PM30000-K, PE11, SB16001, XPR8002S	14" x 14" x 6"	--	25	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	110v	120V	--	5-20R	--	--	*Six scales listed	SBE-1
EASB-Emul & Asph-SBL-Bit	SBL-1-C, SBL-2-C, SBL-3-C	SBE-14	(1) in SBL-1-C, (2) in SBL-2-C	Oven	HERAtherm / Oms 180	25.2" x 32.3" x 48.2"	--	150	--	B	Ex	DOT			O-EX	O	--	--	I	H,C	--	--		--	--	--	--	120v	120V	--	5-20R	--	--	165deg C	SBE-14
EASB-Emul & Asph-SBL-Bit	STORAGE	SBE-15	1	AMPT Asphalt Mixture Performance Tester	IPC Global / AMPT	55" x 30" x 53.5"	--	500	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--*	--	240v and 120v	240V	50A	HBL2521	--	--	*internal compressor. Item to Storage, on cart. Not shown on plans	SBE-15
EASB-Emul & Asph-SBL-Bit	SBL-1-C	SBE-16	3	Oven, Ignition, Asphalt Furnace	Thermolyne / F85930	25.75" x 21.75" x 36.75"	--	280	--	B	New?	DOT			O	O	--	O	D	H,C	--	--		--	--	--	--	240v 20A 4800w	240V	4.8KW	L6-30R	--	--	Direct independent vent out to roof, no bends; on rolling cart (for servicing) w/ open shelving below	SBE-16
EASB-Emul & Asph-SBL-Bit	SBL-3-C	SBE-17	2	Gyratory Compactor, Superpave (Asphalt)	Troxler / 5650	27" x 31" x 69"	--	600	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	115v 15A 60Hz	120V	15A	5-20R	--	--		SBE-17
EASB-Emul & Asph-SBL-Bit	SBL-2-C	SBE-18	3	CoreDry	Instrotek	19" x 26" x 17"	--	100	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	110v	120V	--	5-20R	--	--		SBE-18
EASB-Emul & Asph-SBL-Bit	SBL-3-C	SBE-19	1	Load Frame*	Gilson MS398	25" x 32" x 60"	--	230	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	120v	120V	--	#NAME?	--	--	On Owner-provided cart. Maximum cart size 30" x 30"	SBE-19
EASB-Emul & Asph-SBL-Bit	SBL-2-C	SBE-2	4	Vacuum Pycnometer setup, benchtop	Humboldt H-1750, H-1756A	12" x 24" x 36"	--	250	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	120v 6A	120V	6A	5-20R	--	--	Used w/ SBE-7, Requires a shelf above the setup, requires vacuum pump manifold along the rear wall to SBE-7	SBE-2
EASB-Emul & Asph-SBL-Bit	SBL-2-C	SBE-2(a)	2	Vacuum Pump Manifold for four Connections with Riser Brackets for Wall Mounting	--	--	--	--	--	W	New	Des			O	O	C	O	--	--	--	--		--	--	--	--	--	--	--	--	--	--	Manifolds along the rear wall for Owner to connect compressed air from SBE-7 and RMA-9 to (4) SBE-2 and (4) RMA-10	SBE-2(a)
EASB-Emul & Asph-SBL-Bit	SBL-3-C	SBE-20	3	Oven	Thermo /HERAtherm OGS 400	32" x 34" x 65"	--	400	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	208-240v 11A	208V	11A	6-20R	--	--	(Added EDS)	SBE-20
EASB-Emul & Asph-SBL-Bit	SBL-1-C	SBE-21	1	Solvent Extractor, Automated		56" x 30" x 60"	--	530	--	F	Ex	DOT			O-EX	O	--	O	I	C	--	--		--	--	--	--	220v 60hz 3ph	240V 3 Phase	6080W	Hardwired	--	--	Instrument on order, not yet delivered. Requires external chiller unit (see SBE-25 below)	SBE-21
EASB-Emul & Asph-SBL-Bit	SBL-3-C	SBE-22	1	Mixer, Drum	Controls BITUMIX 77-PV007/CRZ	60" x 30" x 50"	2 to 3 ft, left side	800	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	240v/3ph/ 7000W	208V 3 Phase	7000W	Hardwired	--	--	(Added EDS)	SBE-22
EASB-Emul & Asph-SBL-Bit	SBL-3-C	SBE-23	1	Hamburg Wheel	Instrotek / SmarTracker	60" x 48" x 51"	2 to 3 ft each side, 1 ft in back	1450	--	F	Ex	DOT			O-EX	O	--	O	--	--	Tap	Tap		Floor	--	--	--	240v	208V 3 Phase	7000W	Hardwired	--	--	(Added EDS)	SBE-23

KEY, WATER: Tap-general building water; Dist-distilled; DI-deionized
KEY, DRAIN: Stand-standard; Silt-silt trap; Floor-with silt trap as needed; Acid-acid neutralizing scrubber
KEY: MOUNTING: F-floor/C-ceiling/W-wall/U-undercounter /B-bench or counter/I-inside equipment
KEY: FURNISH through FINAL CONNECT: C-contractor/O-owner/F-Furniture

LAB	ROOM(S)	MARK	QUANTITY (dash indicates see plan for quantities)	DESCRIPTION	MAKE / MODEL NUMBER (Basis of Design)	SIZE (W x D x H)	CLEARANCE For Equipment	WEIGHT (lbs.) *LOADED WEIGHT	HEAT LOAD (BTU)	MOUNTING (F, C, W, U, B, I)	New - new item Ex - exist. item	SPECIFIER (Design Team, DOT/OGS)	LONG LEAD TIME (Y, N)	SPECIAL PURCH. (SOLE SOURCE, ETC.)	FURNISH (C - CONTR., O-EX - OWNER EXIST., O-OWNER, F-FURN)	INSTALL (C, O, F)	Blocking (C-Contractor)	Final Connections (C, O, V)	Exhaust (D-direct, I-indirect, S-snorkel)	Exh. Issue (C-chem., H-heat, P-Particulate)	COLD WATER	HOT WATER	DIST / DI	DRAIN	GAS	C. AIR	VAC	POWER (GENERAL COLLECTED INFO)	Assummed actual Voltage	Actual Load	Connection type	UPS Batt.	DATA	NOTES, ENVIRONMENTAL FACTORS	MARK (Repeated for ref.)
EASB-Emul & Asph-SBL-Bit	SBL-3-C	SBE-24	1	Asphalt Roller Compactor	Instrotek / ARC	41" x 87" x 96"**	**104" (W) x 166" (D) x 8'-0" high	3600	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--			--	--	--	--	240v / 1ph / 3600W	240V	3.6KW	L6-30R	--	--	Instrument on order, not yet delivered. Will produce vibrations and some noise. **Recommended area of 104" (W) x 166" (D). Clearances 40" front, back, and left side; 24" right side. Cover opens to 8 ft. high.	SBE-24
EASB-Emul & Asph-SBL-Bit	SBL-1-C	SBE-25	1	Chiller (for SBE-21, Solvent Extractor, Automated)	Controls / PV5X146	24" x 24" x 30" (est)	--	150	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	220V 60Hz 3ph	208V 3 Phase	--	L14-30R	--	--	Instrument on order, not yet delivered. Chiller for above SBE-21 PaveLab50	SBE-25
EASB-Emul & Asph-SBL-Bit	SBL-1-C	SBE-26	2	Sieve Shaker	Haver & Boecker / EML 315 Digital Plus	16" x 17.5" x 39.5"	--	117	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	110v 50-60 Hz	120V	--	5-20R	--	--		SBE-26
EASB-Emul & Asph-SBL-Bit	SBL-2-C	SBE-27	1	Water Bath	Marshall Water Bath 8.3 Gallon on cart	24.5" x 16.5" x 15" high (excluding cart)	--	--	--	B*	New	DOT			O	O	--	--	--	--	--	--		--	--	--	--	120v 13A; 220v 7A	--	--	--	--	--	On Owner-provided cart. Maximum cart size 30" x 30"	SBE-27
EASB-Emul & Asph-SBL-Bit	SBL-2-C	SBE-2A	--	Vacuum Pycnometer setup, wall mounted compressed air manifold	Humboldt H-1750, H-1756A	--	--	--	--	W	New	DOT			O	O	--	O	--	--	--	--		--	--	y	--	--	120V	--	5-20R	--	--	compressed air manifold along the rear wall for SBE-2	SBE-2A
EASB-Emul & Asph-SBL-Bit	SBL-2-C	SBE-3	1	Water Bath, Circulating	Precision / 270	5' x 2' x 2'	--	85	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	120v 12.9A	120V	12.9A	5-20R	--	--		SBE-3
EASB-Emul & Asph-SBL-Bit	SBL-2-C	SBE-4	3	Corlok Sample Sealer	InstroTek / 1225	20" x 25" x 20"	--	100	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	120v	120V	--	5-20R	--	--		SBE-4
EASB-Emul & Asph-SBL-Bit	SBL-1-C	SBE-5	1	Reclaimer Still	Resolv / R-2	18" x 24" x 24" (w/ stand 45" H)	--	100	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	120v	120V	--	5-20R	--	--		SBE-5
EASB-Emul & Asph-SBL-Bit	SBL-3-C	SBE-7	1	Vacuum Pump	Sargent-Welch / 1402	20" x 12.4" x 14.8"	--	128	--	U*	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	120v	120V	--	5-20R	--	--	*Below bench SBE-2 (DOT to confirm quantities)	SBE-7
CL-Cement Lab	CL-2	CAE-17	2	Shaker, 8" Diameter Tray Sieve	W. S. Tyler / Ro-Tap	33" x 17" x 30"	--	100	--	B*	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	110v	120v	--	5-20R	--	--	*On 24" high concrete platform. Bolted to platform. Noise, vibration, dust.	CAE-17
CL-Cement Lab	CL-4	CE-1	1	Universal Testing Machine; 135K UTM	Instron /600DX-G7-E1	3'-3" x 4' x 9'-7"	1'-6" min. overhead clearance; soffit ceiling to 11'-2"	5265	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	Yes	--	200-250V 50/60 Hz 3 Ph 15A	208V 3 Phase	15A	L6-15R	--	Y	Heavy; overhead service clearance. Adjacent to CE-2 Model based on Instron recommendation	CE-1
CL-Cement Lab	CL-6	CE-11	1	45 um Apparatus; Regulates Water Pressure	Humboldt	1'-6" x 1'-6" x 3'	--	15	--	B*	Ex	DOT			O-EX	O	--	O	--	--	Tap	Tap		--	--	--	--	--	--	--	--	--	--	*Mounted to sink faucet	CE-11
CL-Cement Lab	CL-	CE-12	1	Balance	Mettler / PE 6001	9" x 12" x 8"*	--	10	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	110v	120V	--	5-20R	--	--	*Plus plastic breeze surround	CE-12
CL-Cement Lab	CL-5	CE-13	1	Balance	Mettler / PM 16,001	15" x 15" x 7"	--	30	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	110v	120V	--	5-20R	--	--		CE-13
CL-Cement Lab	CL-3	CE-14	4	Balance	Mettler / PE 8001	8" x 15" x 5"	--	10	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	110v	120V	--	5-20R	--	--		CE-14
CL-Cement Lab	CL-6	CE-15	1	Balance, Analytical	Ohause / GA110	9" x 17" x 14"	--	20	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	110v	120V	--	5-20R	--	--		CE-15
CL-Cement Lab	CL-6	CE-17	2	Baine (Air Permeability Finenss Tester)	Precision Scientific / 24360	23" x 20" x 20"	--	30	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	110v	None needed	None needed	None needed	--	--	Adjacent to CE-15 (picture on EDS sheet is for different style of equipment)	CE-17
CL-Cement Lab	CL-3, CL-5	CE-18	(3) in CL-3, (1) in CL-5	Flow Table	Soiltest / CT-21, Humboldt / H-3624	30" x 24" x 38"	--	300	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	110v	120V	5-20R	5-20R	--	--	Adjacent to sink and rolling barrel waste	CE-18
CL-Cement Lab	CL-6	CE-19	1	Ultrasonic Cleaner	Branson / 8510	26" x 19" x 16"	--	60	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	110v	120V	5-20R	5-20R	--	--		CE-19
CL-Cement Lab	CL-8	CE-2	1	Moisture Cabinet, Shapco	Shapco / Type H	11' x 2'-6" x 7'-6"*	--	**	--	F*	New?	DOT			O	O	--	O	--	--	Tap	Tap		Floor	--	--	--	115v 20A	120V	20A	Hardwired	--	--	**Verify weight	CE-2
CL-Cement Lab	CL-6	CE-20	1	Water Bath	Pine / PW160	16" x 19" x 18"	--	100	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	*	--	--	110v	120V	--	5-20R	--	--	Adjaecnt to kerosene storage	CE-20
CL-Cement Lab	CL-6	CE-22	1	Length comparator	CDI / BGZ600	10" x 12" x 20"	--	25	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	110v	120V	--	5-20R	--	--	*Equipment not listed on RDS; listed on EDS. Indicated as adjacent to CE-2 (CL-8), CE-7 (CL-7) and sink	CE-22
CL-Cement Lab	CL-5	CE-23	1	Hot Plate	(Unknown)	approx. 12" x 12" x 6"	--	**	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	120v	120V	--	5-20R	--	--		CE-23
CL-Cement Lab	CL-3, CL-8	CE-3	(4) in CL-3, (4) in CL-8	Vicat Tester (Models Vary)	Soiltest, Humboldt, E & A, Arthur Thomas	6" x 6" x 12"	--	10	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	Manual	None needed	None needed	None needed	--	--		CE-3
CL-Cement Lab	CL-7	CE-7	3	Autoclave, Cement	Boekel / 25515-016	28" x 17" x 4'*	--	200	--	B/F*	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	208/220v	120V	15.7, 18KW	Special receptacle	--	--	*Size for (1) autoclave per website. **Low bench, approx. 12" AFF.	CE-7
CL-Cement Lab	CL-3	CE-8	1	Videographic Recorder; Measure Mixing Area Temperature & Humidity	Angus / VGR-6-120/6-RS232	3' x 1' x 1'	--	30	--	W	Ex / New?	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	110v	120V	--	5-20R	--	--		CE-8
CL-Cement Lab	CL-3, CL-5	CE-9	(4) in CL-3, (1) in CL-5	Stand Mixer, 5 Quart	Hobart / N50	10.375" x 15" x 17"	--	45	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	120v 15A	120V	--	5-20R	--	--		CE-9
CON-Concrete Lab	CAL-8	CAE-11	1	Mixer; 2.0 Cubic Foot	Lancaster	4' x 6' x 8.5'	--	--	--	F	New	DOT			O	O	--	O	S	P	--	--		--	--	--	--	208v, 3ph	208V, 3 Phase	15.2A	Hardwired	--	--	Size verified (includes concrete base). Need 1' height clearance. Looking into buying new - waiting to hear back from manufacturer with specs	CAE-11
CON-Concrete Lab	CAL-8	CAE-24	1	Platform Scale (150 lbs.)	Mettler / Wildcat	17" x 25.5" x 31.5"	--	30	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	110v	120V	--	5-20R	--	--	Adjacent to sink	CAE-24
CON-Concrete Lab	CAL-8	CAE-25	1	Platform Scale (500 lbs.)	Mettler / Panther	24" x 37" x 48"	--	30	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	110v	120V	--	5-20R	--	--	Adjacent to sink	CAE-25
CON-Concrete Lab	CAL-8	CE-10	1	Stand Mixer, 20 Quart	Toledo TM-20	22" x 22" x 34"	--	210	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	115V 5.6A 60 hz 1 phase	120V	6A	5-20R	--	--		CE-10
CON-Concrete Lab	SIL-2	GE-7	3	Slab Saw, free standing	Covington	18" x 29" X 41"	--	--	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	110v	120V	--	5-20R	--	--	Equip Listed on RDS; no EDS; move to SIL-2/RML-3	GE-7
CON-Concrete Lab	RML-1	RMC-5	--	Scale, (2) parts; Scale on Bench, Control / Display on Wall	DYMO Pelouze / 4010	12" x 12.5" x 7"	--	--	--	B, W*	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	110v*	120V	18W	5-20R	--	--	*9v at device	RMC-5
CON-Concrete Lab	RML-1	RMM-12	--	Cart, Heavy-Duty	--	Approx. 30" x 48" x 36"	--	--	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--		RMM-12
CON-Concrete Lab	RML-1	RMM-4	--	Computer, Local UPS Battery	--	--	--	--	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	110v	120V	--	5-20R	--	Y		RMM-4
CON-Concrete Lab	SIL-2	RMM-5	--	Masonry Saw (Wet Saw)	Target	22" x 47.5" x 57.5"	2' each side	150	--	F	Ex	DOT			O-EX	O	--	O	--	--	Tap	--		Floor	--	--	--	220v	240 V 1 Phase	21.5A	L6-30R	--	--		RMM-5
CON-Concrete Lab	SIL-1-C	SIE-1	1	Fog Room Soak Tank with Cover	--	2' x 3' x 2' high	--	35 empty	--	F*	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	*On plastic pallet that comes with the tank. Tank filld by hose	SIE-1
CON-Concrete Lab	SIL-3	SIE-10	1	Oven; HPA	VWR / 1600	4' x 4' x 8'	--	500	--	B	Ex	DOT			O-EX	O	--	--	I	--	--	--		--	--	--	--	220v	240V, 1 Phase	50A	6-50R	--	--	Heat source; heat released when door opened	SIE-10
CON-Concrete Lab	SIL-3	SIE-11	2	Concrete Cylinder Universal Testing Machine; 450K UTM; Compression Only	Test Mark Industries / CM-4000 Series	39.875" x 20" x 61.25" high	Front, rear and sides	1,620	--	F	New	DOT			O	O	--	O	--	--	--	--		--	--	Yes	--	Verify	120V	--	Hardwired	--	Y	Placeholder; product TBD; less than 10,000 lbs and less than 10' tall	SIE-11
CON-Concrete Lab	SIL-3	SIE-12	1	Capping Table	--	2' x 3' x 3'	--	200	--	F, W	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	Related tools hung from board on wall	SIE-12
CON-Concrete Lab	SIL-3	SIE-14	1	Boil Tank; Vented Exhaust; Open Hood Above	--	30" x 30" x 36"	--	200 empty	--	F	Ex	DOT			O-EX	O	--	O	I	--	--	--		Floor	Y*	--	--	110v	120V	--	Hardwired	--	--	Floor drain nearby *Natural gas. Heat source	SIE-14
CON-Concrete Lab	SIL-3	SIE-15	1	Water Bath; Soak Tank	Custom Unit	7' x 2' x 2'	9" at rear for plumbing	200 empty	--	F	Ex	DOT			O-EX	O	--	O	--	--	Tap	Tap		Floor*	--	--	--	--	--	--	--	--	--	*Trench Drain with silt trap	SIE-15
CON-Concrete Lab	SIL-3	SIE-16	1	HPA (High Pressure Air) Chambers; muliple chambers & piping within footprint; piping and piping support on platform by installing vendor	Custom Unit	6' x 4' x 3'	9" at rear for piping	500	--	F	Ex	DOT			O-EX	O	C**	O	--	--	Tap	Tap		Floor*	--	Yes	--	--	--	--	--	--	--	*Trench Drain with silt trap **Custom platform specified. PC and balance adjacent, near SIE-15 Water Bath	SIE-16

KEY, WATER: Tap-general building water; Dist-distilled; DI-deionized
KEY, DRAIN: Stand-standard; Silt-silt trap; Floor-with silt trap as needed; Acid-acid neutralizing scrubber
KEY: MOUNTING: F-floor/C-ceiling/W-wall/U-undercounter /B-bench or counter/I-inside equipment
KEY: FURNISH through FINAL CONNECT: C-contractor/O-owner/F-Furniture

LAB	ROOM(S)	MARK	QUANTITY (dash indicates see plan for quantities)	DESCRIPTION	MAKE / MODEL NUMBER (Basis of Design)	SIZE (W x D x H)	CLEARANCE For Equipment	WEIGHT (lbs.) *LOADED WEIGHT	HEAT LOAD (BTU)	MOUNTING (F, C, W, U, B, I)	New - new item Ex - exist. item	SPECIFIER (Design Team, DOT/OGS)	LONG LEAD TIME (Y, N)	SPECIAL PURCH. (SOLE SOURCE, ETC.)	FURNISH (C - CONTR., O-EX - OWNER EXIST., O-OWNER, F-FURN)	INSTALL (C, O, F)	Blocking (C-Contractor)	Final Connections (C, O, V)	Exhaust (D-direct, I-indirect, S-snorkel)	Exh. Issue (C-chem., H-heat, P-Particulate)	COLD WATER	HOT WATER	DIST / DI	DRAIN	GAS	C. AIR	VAC	POWER (GENERAL COLLECTED INFO)	Assummed actual Voltage	Actual Load	Connection type	UPS Batt.	DATA	NOTES, ENVIRONMENTAL FACTORS	MARK (Repeated for ref.)
CON-Concrete Lab	SIL-3	SIE-17	1	Oven; Bench Top	Blue M / OV-510A-3	27" x 21" x 37"	--	100	--	B	New	DOT			O	O	--	O	I	--	--	--		--	--	--	--	--	220v	208V 3 Phase	10.8A	Hardwired	--	--	Heat source; heat released when door opened	SIE-17
CON-Concrete Lab	SIL-3	SIE-18	1	Scale; Table Top	Mettler MS 8001	8" x 12" x 5"	--	25	--	B	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	110v	120V	--	5-20R	--	--		SIE-18
CON-Concrete Lab	SIL-3	SIE-19	1	Scale; Table Top	Mettler MS16001	14" x 14" x 6"	--	25	--	B	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	110v	120V	--	5-20R	--	--		SIE-19
CON-Concrete Lab	SIL-1-C	SIE-2	*See Notes	Sample Racks; Rust-Proof for heavy concrete cylinders; *Contractor to refinish and provide new overhead bracing connecting units together and to wall	Custom Units	*See Notes	--	--	--	F, W	Ex	DOT			O-EX/C	C	C	C	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	*Repair any existing damage or damage caused during relocation and installation. Refinish metal as specified. See Equipment Plan for shelving quantity, sizes, layout and bracing. Match shelving tube steel size for new overhead bracing and finsh bracing to match shelving.	TSL-2
CON-Concrete Lab	SIL-3	SIE-20	1	Linear Traverse and Table; Includes microscope with camera, PC	Custom Unit	6' x 4' x 4'	--	250	--	B	New	DOT			O	O	--	--	--	--	--	--		--	--	--	--	--	110v	120V	--	5-20R	--	Y	Currently on desk; anti-vibration table requuired	SIE-20
CON-Concrete Lab	CAL-9	SIE-42 (a)	1	Temperature Chart Recorder; mount centered at 5'-4" AFF; electrical power adapter; connected to remote sensor*	Dickson Model KT8PO	9.2" x 9.2" x 3.1"	--	9	--	W	Ex	DOT			O-EX	O	C	--	--	--	--	--		--	--	--	--	--	--	--	--	5-20R*	--	--	*Receptacle at 5'-0" adjacent to recorder	REC-1
CON-Concrete Lab	SIL-1-C	SIE-42 (b)	1	Temperature Chart Recorder Remote Sensor*	Dickson Model KT8PO	--	--	--	--	W	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	*Conduit by Contractor through wall at 5'-0" AFF for remote sensor	SIE-42 (b)
CON-Concrete Lab	SIL-2	SIE-5	1	Core Drill	DeWalt / DW 194	4' x 6' x 5'	2' each side, 1' rear for access to hoses	200	--	F	Ex	DOT			O-EX	O	--	O	--	--	Tap ***	Tap ***		Silt*	--	--	--	110v*	120V	20A	5-20R	--	--	*GFI connection needed; enclosing side walls for spray protection. **Trench drain at equipment. ***Mixing valve	REC-2
CON-Concrete Lab	SIL-2	SIE-6	1	Concrete Wet Saw	Clipper / BH-25	4' x 8' x 4'	2' each side, 1' rear for access to hoses	200	--	F	Ex	DOT			O-EX	O	--	O	--	--	Tap ***	Tap ***		Silt*	--	--	--	220v*	208V 1Phase	2 HP	L6-30R	--	--	*GFI connection needed; enclosing side walls for spray protection. **Trench drain at equipment. ***Mixing valve	SIE-6
CON-Concrete Lab	SIL-2	SIE-7	1	Shelves, Heavy-Duty, Rust Resistant; (6) compartments horiz. x (13) rows vertical	Existing custom unit to be retained	4' x 3' x 7'	--	1700*	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	*Unit approx. 200 lbs. Min. capacity 250 lbs. per shelf, 1,500 per unit. For hand tools and misc. items	SIE-7
CON-Concrete Lab	SIL-2	SIE-AA	1	End Grinder with rolling cart; wall storage board for grinder plate	Utest UTC1040	5' x 4' x 5.5'	2' all sides	TBD	--	F*	Ex	DOT			O-EX	O	C**	O	--	--	Tap ***	Tap ***		Silt*	--	--	--	110v	120V	20A	5-20R	--	--	*Trench drain at equipment. **Contractor to provide blocking for wall storage/slot board. *** Mixing valve	SIE-AA
CON-Concrete Lab	SIL-2, SIL-3	SIE-AB	2	Waste Drum, 55gal, on 30x36 pallet	--	--	--	--	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--		SIE-AB
CON-Concrete Lab	SIL-1-C	SME-AB	1	Tube Holder; rust-proof plastic	Custom Unit	10' x 1.5' x 6"	--	--	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	(60) holes total: 3.75" diameter, spaced 6" on center	SME-AB
SIL-Strength of Materials I	SIIL-1 (near SIL-4)	SIE-21	1	Universal Testing Machine; 133K UTM	Instron / 600DX-G8	38.31" x 47.44" x 115"	1'-6" min. overhead clearance	5265	--	F	New	DOT			C	C	--	C	--	--	--	--		--	--	--	--	--	200-250V 50/60 Hz 3 Ph 15A	208V 3 Phase	15A	Hardwired	--	Y	Heavy; overhead service clearance. Must be in SILL-1 high-bay area. Model based on Instron recommendation	SIE-21
SIL-Strength of Materials I	SIL-4	SIE-22 (a)	1	Universal Testing Machine; 675K UTM	Instron / 2000 KPX-J3D	71.5" x 55.5" x 220"	Overhead clearance required	21,240	--	F	New	DOT			C	C	--	C	--	--	--	--		--	--	--	--	--	208-230V 50/60 Hz 3 Ph 40A	208V 3 Phase	40A	Hardwired	--	Y	Heavy; overhead service clearance Model based on Instron recommendation	SIE-22 (a)
SIL-Strength of Materials I	SIL-4	SIE-22 (b)	1	Hydraulic Pump Unit / Console for 675K UTM Universal Testing Machine	Instron / 3500KPX-J3D	4'-6" x 3'-2" x 3'-5"	Verify clearance	1,500	--	F	New	DOT			C	C	--	C	--	--	--	--		--	--	--	--	--	208-230V 50/60 Hz 3 Ph 40A	208V 3 Phase	40A	Hardwired	--	Y	Based on Instron recommendation	SIE-22 (b)
SIL-Strength of Materials I	SIL-4	SIE-23	1	Hardness Tester; Table Top Rockwell Hardness Tester	Wilson / Model 534R	10" x 24" x 34"	--	200	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	110v	120V	--	5-20R	--	--		SIE-23
SIL-Strength of Materials I	SIL-4	SIE-24	1	Hardness Tester; Floor Standing Brinnel Hardness Tester	Wilson / Model K Brinnel	2' x 3' x 6'*	Min 2' each side	500	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	110v	120V	--	5-20R	--	--	*Width includes control box	SIE-24
SIL-Strength of Materials I	SIL-4	SIE-25	1	Rebar Bending Machine*	Custom Unit	6' x 4' x 6'	--	1500	--	F	New	DOT			O	O	--	O	--	--	--	--		--	--	--	--	--	220v	240V, 3 Phase	40A	Hardwired	--	--	* Requires protection cage	SIE-25
SIL-Strength of Materials I	SIL-4	SIE-26	1	Shelves, Heavy-Duty, Rust Resistant; (6) compartments horizontal x (13) rows vertical	Existing custom unit to be retained	4'x 3' x 7'	--	1700*	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	*Unit approx. 200 lbs. Min. capacity 250 lbs. per shelf, 1,500 per unit. For hand tools and misc. items	SIE-26
SIL-Strength of Materials I	SIL-4	SIE-28	1	Scale; Table Top	Mettler MS16001	14" x 14" x 6"	--	25	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	110v	120V	--	5-20R	--	--		SIE-28
SIL-Strength of Materials I	SIL-4	SIE-32	1	Universal Testing Machine; 90k UTM	Instron / 5988	63" x 38" x 123"	--	4960	--	F	New	DOT			C	C	--	C	--	--	--	--		--	--	--	--	--	208-240V 50/60 Hz 3 Ph 20A	208V 3 Phase	20A	Hardwired	--	Y	Model based on Instron recommendation	SIE-32
SIL-Strength of Materials I	SIL-4	SIE-40	1	Belt / Disc Sander	Jet / J-4200A	29" x 19" x 58"	--	--	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	115v	120V	--	5-20R	--	--		SIE-40
SIL-Strength of Materials I	SIL-4	SIE-41	1	Dust Collector for Metal Dust from SIE-40	Grizzley Industrial Inc. Model T28798	20" x 28.5" x 43"	18" each side	183	--	F	New	DOT			O	O	--	--	--	--	--	--		--	--	--	--	--	240v, 1 phase*	--	--	6-15	--	--	*9A full load, min. 15A circuit size Item purchased and connected by DOT to SIE-40	SIE-41
SIL-Strength of Materials I	SML-1	SME-10	1	Permittivity	Custom Unit	3' x 3' x 2'	4' on bench at left side for scale & oxygen	150	--	B	Ex	DOT			O-EX	O	--	O	--	--	--	--	--	Yes	--	Yes	--	220v & 110v	120V	--	5-20R	--	--	Used with SME-11, SME-6 (b) for water source, plus items not on equipment list: adjacent scale and oxygen meter	SME-10
SIL-Strength of Materials I	SML-1	SME-11	1	Permittivity De-Airing Machine	Geokon / Nold DeAerator	Approx. 24" x 24" x 15" high for all components	--	--	--	B	New	DOT			O	O	--	O	--	--	--	--	--	--	--	Yes	--	220v & 110v	120V	--	5-20R	--	--		SME-11
SIL-Strength of Materials I	SML-1	SME-4 (a)	2	Wide Width & Puncture Test Unit	Tinius Olsen / H100K-S	5' x 4' x 7'	--	800 each	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	110v	120V	--	5-20R	--	--	(2) units together; dimensions are for each unit; high pressure compressed air from SME-1	SME-4 (a)
SIL-Strength of Materials I	SML-1	SME-4 (b)	1	Wide Width & Puncture Test Unit Printer	--	2' x 2' x 3'	--	--	--	B	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	110v	120V	--	5-20R	--	Y	Shared printer on bench for (2) SME--4 (a) and (2) SME-5	SME-4 (b)
SIL-Strength of Materials I	SML-1	SME-5	2	Grab Tear & Trap Tear Unit (2)	Tinius Olsen / H5K-S	3' x 2' x 4'	--	150 each	--	B	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	Yes*	--	110v	120V	--	5-20R	--	--	(2) units together; dimensions are for each unit; high pressure compressed air from SME-5(a)	SME-5
SIL-Strength of Materials I	SML-1	SME-5 (a)	2	Hydraulic Compressor for SME-5	--	12" wide x 24"deep x 10" high	--	--	--	B	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	110v				--	--	Compressor for (2) SME-5 units	SME-5 (a)
SIL-Strength of Materials I	SML-1	SME-6 (a)	1	Transmissivity Unit; uses SME-6 (b) Elevated Water Tanks	Custom Unit	5' x 3' x 7'	30" to right of unit	450	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--	--	Floor	--	Yes	--	110v	120V	--	5-20R	--	--	Water from SME-6 (b) elevated tanks	SME-6 (a)
SIL-Strength of Materials I	SML-1	SME-6 (b)	2	150 Gallon Elevated Water Tank for De-Aired Water	Ace Roto-Mold / Model HZ0150-32	52" x 32" x 36" high; bottom of tank 72" AFF	6" above tanks for water supply	300 each*	--	C	New	DOT			C	C	Yes*	O	--	--	--	--	--	**	--	--	--	--	--	--	--	--	--	--	*Contractor to suspend tanks from structure above. Bottom of tanks 6' AFF; water supply conection & valves above. **Plumbed drains for overhead tanks	SME-6 (b)
SIL-Strength of Materials I	SML-1	SME-AA	1	Fabric Cutting Press for Geotextile Sampling	Tippmann Model CLK7	12" x 19" x 13"	--	260	--	B	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	Yes	--		--	--	--	--	--	No power required, house air	SME-AA
SIL-Strength of Materials I	SML-1.1	SME-AE	2	Shaker, 8" Diameter Tray Sieve	W. S. Tyler / Ro-Tap	33" x 17" x 30"	--	100	--	B*	Verify	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	110v	120V	--	5-20R	--	--	*On 24" high concrete platform with steel deck, secured against vibration. Bolted to platform. Noise, vibration, dust.	SME-AE

KEY, WATER: Tap-general building water; Dist-distilled; DI-deionized
KEY, DRAIN: Stand-standard; Silt-silt trap; Floor-with silt trap as needed; Acid-acid neutralizing scrubber
KEY: MOUNTING: F-floor/C-ceiling/W-wall/U-undercounter /B-bench or counter/I-inside equipment
KEY: FURNISH through FINAL CONNECT: C-contractor/O-owner/F-Furniture

LAB	ROOM(S)	MARK	QUANTITY (dash indicates see plan for quantities)	DESCRIPTION	MAKE / MODEL NUMBER (Basis of Design)	SIZE (W x D x H)	CLEARANCE For Equipment	WEIGHT (lbs.) *LOADED WEIGHT	HEAT LOAD (BTU)	MOUNTING (F, C, W, U, B, I)	New - new item Ex - exist. item	SPECIFIER (Design Team, DOT/OGS)	LONG LEAD TIME (Y, N)	SPECIAL PURCH. (SOLE SOURCE, ETC.)	FURNISH (C - CONTR., O-EX - OWNER EXIST., O-OWNER, F-FURN)	INSTALL (C, O, F)	Blocking (C-Contractor)	Final Connections (C, O, V)	Exhaust (D-direct, I-indirect, S-snorkel)	Exh. Issue (C-chem., H-heat, P-Particulate)	COLD WATER	HOT WATER	DIST / DI	DRAIN	GAS	C. AIR	VAC	POWER (GENERAL COLLECTED INFO)	Assumed actual Voltage	Actual Load	Connection type	UPS Batt.	DATA	NOTES, ENVIRONMENTAL FACTORS	MARK (Repeated for ref.)
SIIL-Strength of Materials II	SIIL-1	SIIE-1 (a)	1	Universal Testing Machine; 1,300K UTM	Instron / 6000KPX Compression Only	107" x 75" x 171" (29"~ recessed below slab, 142"~ AFF)	36" at sides, rear, and 36" between UTM & the Console	104,000	--	F**	New	DOT	Y		C	C	--	C	--	--	--	--		--	--	--	--	--	--	208-230V 50/60 Hz 3 Ph 40A	208V 3 Phase	40A	Hardwired	--	Y	Recessed into slab	SIIE-1 (a)
SIIL-Strength of Materials II	SIIL-1	SIIE-1 (b)	1	Universal Testing Machine; Stand-Alone Hydraulics and Control Console	Instron / 6000KPX	4'-6" x 3'-2" x 3'-5"	--	1500	--	F*	New	DOT	Y		C	C	--	C	--	--	--	--		--	--	--	--	--	--	208-230V 50/60 Hz 3 Ph 40A	208V 3 Phase	40A	Hardwired	--	Y	Adjacent to SME-1 (a)	SIIE-1 (b)
SIIL-Strength of Materials II	SIIL-2	SIIE-11	1	Universal Testing Machine; 1K UTM; Control panel mounted to right side	Instron / 6800 Table Model Series 68TM-5	48"* x 28" x 65" (test frame) on 60" x 30" table	--	307	--	B	Ex / New?	DOT			O	O	--	O	--	--	--	--		--	--	--	--	--	--	1400VA	120V	11A	5-20R	--	Y	*30" UTM wide plus 18" wide attached control panel at right side	SIIE-11
SIIL-Strength of Materials II	SIIL-3	SIIE-12 (a)	1	Computed Radiography System (CRS); Equipment on and below benchtop	Associated X-Ray, Inc.	30" x 30" x 24" above counter, also equip. below counter	--	80	--	B/U	New	DOT			O	C	--	C	--	--	--	--		--	--	--	--	--	--	110v	120V	12.5A	5-20R	--	--	*Mount equipment below counter	SIIE-12 (a)
SIIL-Strength of Materials II	SIIL-3	SIIE-12 (b)	1	Computed Radiography System; PC Digital Viewing Station Adjacent to CRS	Associated X-Ray, Inc.	30" x 24" x 24" above counter, also CPU mounted below counter	--	--	--	B/U	New	DOT			O	C	--	C	--	--	--	--		--	--	--	--	--	--	110v	120V	--	5-20R	--	Y	*Mount CPU holder below counter if shelf not available	SIIE-12 (b)
SIIL-Strength of Materials II	SIIL-3	SIIE-13	1	X-Ray Controller; direct cabling to, and power source for SIIE-14	Associated X-Ray, Inc.	2' x 2' x 1'	--	50	--	B	New	DOT			O	C	--	C	--	--	--	--		--	--	--	--	--	--	208v*	208V 1Ph or 3 Ph?	12A	L18-20R	--	--	*Special plug **See description for cabling requirements	SIIE-13
SIIL-Strength of Materials II	SIIL-3A	SIIE-14 (a)	1	X-Ray Tubehead; Custom lead sheilding at tubehead; Radiation Shielding For Room Required; directly cabled to SIIE-13	Associated X-Ray, Inc.	Dimension for custom table: 48" x 30" x 30"	--	80	--	B*	New	DOT			O	C	--	C	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	X-Ray Tubehead in enclosure within radiation-shielded room. *Custom table with slide for samples ** See description for cabling requirements	SIIE-14 (a)
SIIL-Strength of Materials II	SIIL-3A	SIIE-14 (b)	1	Positioner; on table with Tubehead	Associated X-Ray, Inc.	--	--	--	--	B*	New	DOT			O	C	--	C	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--		SIIE-14 (b)
SIIL-Strength of Materials II	SIIL-3A	SIIE-15 (a)	1	X-Ray Warning Sign, Lighted: Text "X-Ray In Use Do Not Enter"	Associated X-Ray, Inc.	18" x 15" x 4"	--	40	--	W	New	DOT			O	C	C*	C	--	--	--	--		--	--	--	--	--	--	110v	120V	--	Hardwired	--	--	*Blocking for wall mounting. Mounted outside shielded room and at corridor door, adjacent to door	SIIE-15 (a)
SIIL-Strength of Materials II	SIIL-3, 2-C1	SIIE-15 (b)	1	X-Ray Warning Sign, Lighted: Text "X-Ray In Use Do Not Enter"	Associated X-Ray, Inc.	18" x 15" x 4"	--	40	--	W	New	DOT			O	C	C*	C	--	--	--	--		--	--	--	--	--	--	110v	120V	--	Hardwired	--	--	*Blocking for wall mounting. Mounted outside shielded room and at corridor door, adjacent to door	SIIE-15 (b)
SIIL-Strength of Materials II	SIIL-2	SIIE-16	2	Oven, Bench Top; up to 212F	Hot Pak / Supermatic Oven Model 213022	2' x 2' x 2'	--	--	--	B	Ex	DOT			O-EX	O	--	O	I	--	--			--	--	--	--	--	--	250v 30A	120V	12.5A	5-20R	--	--	Heat source	SIIE-16
SIIL-Strength of Materials II	SIIL-1	SIIE-18	1	Battery Charger for Forklift	Yuasa Model SGN-12-550	30" x 30" x 30"	Cords from right side and front	--	--	F*	New?	DOT			O	O	--	O	--	--	--	--		--	--	--	--	--	--	240v 14A	240v 1 Phase	14A	L14-30R	--	--	*On rolling dolly	SIIE-18
SIIL-Strength of Materials II	SIIL-1	SIIE-2	1	Universal Testing Machine; 67K UTM; Control panel mounted to right side	Instron/68FM-300-E2	44.8"* x 30.9" x 109.7"	--	2,089	--	F	New	DOT			C	C	--	C	--	--	--	--		--	--	--	--	--	--	3000VA 1 Ph; 4200VA 3 Ph	208V 3 Phase	20A	Special receptacle	--	Y	*44.8" UTM wide plus 18" wide attached control panel at right side	SIIE-2
SIIL-Strength of Materials II	SIIL-3	SIIE-21	1	Door Interlock Switch on Door into Room with X-Ray Tube	Associated X-Ray, Inc.	--	--	--	--	W	New	DOT			O	C	C*	C	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	*Blocking for wall mounting. Mounted outside shielded room, adjacent to door	SIIE-21
SIIL-Strength of Materials II	SIIL-3	SIIE-22	1	Interface/Distribution Box	Associated X-Ray, Inc.	12" x 12"x 12"	Wall mounted above 80" AFF	40	--	W	New	DOT			O	C	C*	C	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	*Blocking for wall mounting	SIIE-22
SIIL-Strength of Materials II	SIIL-3A	SIIE-25	1	Prewarning and X-Ray Warning system with Shut Off per CFR1020.40	Associated X-Ray, Inc.	2' x 1' x 2'	Wall mounted above 80" AFF	40	--	W	New	DOT			O	C	C*	C	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	*Blocking for wall mounting. Mounted within radiation-shielded room	SIIE-25
SIIL-Strength of Materials II	SIIL-4	SIIE-26	2	Freezer, Chest	Revco / ULT350-5-A31	36" X 36" X 36"	Top Access	200 empty	--	F	New	DOT			O	O	--	O	--	--	--	--		--	--	--	--	--	--	110v 12A	120V	12A	5-20R	--	--		SIIE-26
SIIL-Strength of Materials II	STORAGE	SIIE-3	1	Hydraulic Press NOTE: to be moved to general storage, not shown on equipment plan	Enerpac / A258*	29" x 13" x 40"**	--	100	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	Yes	--	--	--	120v 8.5A	120V	8.5A	5-20R	--	--	**Plus hoses & gauges. 90 psi compressed air; on its own cart, no bench needed - NOTE: to be moved to general storage	SIIE-3
SIIL-Strength of Materials II	SIIL-4	SIIE-30	1	Hydraulic Press	Enerpac / A258*	48" x 36" x 42"	--	--	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	Yes	--	--	--	110v	120V	5-20R	5-20R	--	--	Verify model number; see item SIIE-3. Uses house compressed air. This item on wheels	SIIE-30
SIIL-Strength of Materials II	SIIL-4	SIIE-31	1	Drop Weight Machine	Custom Unit	36" x 36" x 120"	Min. ceiling height 10'-6"	1000	--	F	Ex	DOT			O-EX	O	C*	O	--	--	--	--		--	--	--	--	--	--	110v 10A	120V	10A	5-20R	--	--	Blocking for wall brace and for control cable hook. Anchor to floor and brace to wall at top of structure. 10' high. Heavy, impact/vibration and noise. Wall hook for control cable	SIIE-31
SIL-Strength of Materials II	SIL-4	SIIE-32	1	Shelves, Heavy-Duty, Slanted Upper Shelves, Small Compartments Below	Existing custom unit to be retained	Approx. 36" x 24" x 72"	--	--	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	*Unit approx. 200 lbs. Min. capacity 250 lbs. per shelf, 1,500 per unit. For hand tools and misc. items	SIIE-32
SIIL-Strength of Materials II	SIIL-2	SIIE-4	2	Buffer, Emerson	Emerson Apparatus Co.	34" x 21" x 17"	Min. 2' above	100	--	B	Ex	DOT			O-EX	O	--	O	S	P	--	--		--	--	Yes	--	--	--	110v 6A	120V	6A	Hardwired	--	--	Bolt to countertop. 90 psi compressed air	SIIE-4
SIIL-Strength of Materials II	SIIL-2	SIIE-5	1	Grinder	Dayton Commercial 42908A	18" x 10" x 12"	--	50	--	B	Ex	DOT			O-EX	O	--	O	S*	P	--	--		--	--	--	--	--	--	110v 7.8A	120V	7.6A	5-20R	--	--	Bolt to countertop *Portable dust collector	SIIE-5
SIIL-Strength of Materials II	SIIL-2	SIIE-6	1	Slicer	Hobart / 1612P	18" x 23" x 23"	--	50	--	B	Ex	DOT			O-EX	O	--	O	S	P	--	--		--	--	--	--	--	--	110v 5.8A	120V	5.8A	5-20R	--	--	Water / Glycerin Mix. No plumbing required	SIIE-6
SIIL-Strength of Materials II	SIIL-2	SIIE-7	1	Durometer "D"	Shore Instruments / Intr 902	14" x 6" 14"	--	30	--	B	New	DOT			O	O	--	--	--	--	--	--		--	--	--	--	--	--	110v 4A	120V	4A	5-20R	--	--		SIIE-7
SIIL-Strength of Materials II	SIIL-2	SIIE-8	1	Durometer "A"	Shore Instruments / Instron MUPE 902	14" x 6" 14"	--	30	--	B	New	DOT			O	O	--	--	--	--	--	--		--	--	--	--	--	--	110v	120V	--	5-20R	--	--		SIIE-8
SIIL-Strength of Materials II	SIIL-2	SIIE-9	1	Rockwell Hardness Tester	Wilson / Series 500	10" x 20" x 29	--	100	--	B	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	110v 3A	120V	3A	5-20R	--	--		SIIE-9
SIIL-Strength of Materials II	SIIL-1	SIIE-AA	1	Fork Lift (Large)	TBD	5' x 8' x 6' (parked/travel height)	--	Verify	--	F	Verify	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	110v 3A	120V	5A	5-20R	--	--	Existing or new to be verified	SIIE-AA
SIIL-Strength of Materials II	SIIL-1	SIIE-AB	1	Pallet Jack	Assuming 6000lb capacity Grainger Dayton	27"W x 63"L x 48"H	--	Verify	--	F	Verify	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	Existing or new to be verified	SIIE-AB
MS-Machine Shop	MS-1 (from DOC-6)	DOE-20	1	Pipe Threader	Oster / 784 Pipe & Bolt Machine	69" x 41" x 52"	--	1950	--	F	Ex	DOT			O-EX	O	--	C	--	--	--	--		--	--	--	--	--	--	Verify	120V	--	5-20R	--	--		DOE-20
MS-Machine Shop	MS-1 (from DOC-6)	DOE-22	1	hydraulic Shop Press; 50-ton continuous force	Torin / Big Red Model TRD55002	33" x 25" x 63"	--	563	--	F	Ex	DOT			O-EX	O	--	C	--	--	--	--		--	--	--	--	--	--	--	None needed	None needed	None needed	--	--		DOE-22
MS-Machine Shop	MS-1 (from DOC-6)	DOE-40	1	Metal Shear (4')	Tennsmith / Foot Squaring Shear # 52	Verify	--	950	--	F	Ex	DOT			O-EX	O	--	C	--	--	--	--		--	--	--	--	--	--	Manual	--	--	--	--	--		DOE-40
MS-Machine Shop	MS-1 (from DOC-6)	DOE-41	1	Metal Hand Brake (Bending / Forging)	Tennsmith / Box & Pan Hand Brake #HBU48-12	76" x 36" x 53"	--	1330	--	F	Ex	DOT			O-EX	O	--	C	--	--	--	--		--	--	--	--	--	--	Manual	--	--	--	--	--		DOE-41
MS-Machine Shop	MS-1 (from DOC-6)	DOE-42	1	Vertical Band Saw	DoAll / 20" Vertical Contour Saw #2013-V3	53" x 45" x 80"	--	1250	--	F	Ex	DOT			O-EX	O	--	C	--	--	--	--		--	--	--	--	--	--	Verify	208V 3phase	10.7A	Hardwired	--	--	Verify if both this item and MSE-3 are required	DOE-42
MS-Machine Shop	MS-1 (from DOC-6)	DOE-43	1	Spot Welder	Similar to Miller / MPS-10 FT	Verify	--	Verify	--	F	Ex	DOT			O-EX	O	--	C	I*	--	--	--		--	--	--	--	--	--	Verify	240V, 1 Phase	45A	Special receptacle	--	--	*Verify venting requirements, if any	DOE-43
MS-Machine Shop	MS-1 (from DOC-6)	DOE-7	1	Cabinet Sand Blaster with Siphon Blast Cabinet and 100 cfm Dust Collector and Lighting	Econoline / Sandblast Cabinet 36-1 Super	63" x 39" x 25"	--	280	--	F	Ex	DOT			O-EX	O	--	C	--	--	--	--		--	--	Yes	--	--	--	Verify	120V	--	5-20R	--	--	Integral Dust Collector	DOE-7
MS-Machine Shop	MS-1 (DOC-2)	DOE-80	1	Storage Cabinet, Double Door, Shelving Combination, Tall	Tennsco / 7820PY	36" x 24" x 78"	--	192	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--		DOE-80
MS-Machine Shop	MS-1 (DOC-2, 3)	DOE-81	5	Storage Cabinet, Double Door, Adjustable shelves, Tall	Tennsco / 7824PY	36" x 24" x 78"	--	178	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--		DOE-81

KEY, WATER: Tap-general building water; Dist-distilled; DI-deionized
KEY, DRAIN: Stand-standard; Silt-silt trap; Floor-with silt trap as needed; Acid-acid neutralizing scrubber
KEY: MOUNTING: F-floor/C-ceiling/W-wall/U-undercounter /B-bench or counter/I-inside equipment
KEY: FURNISH through FINAL CONNECT: C-contractor/O-owner/F-Furniture

LAB	ROOM(S)	MARK	QUANTITY (dash indicates see plan for quantities)	DESCRIPTION	MAKE / MODEL NUMBER (Basis of Design)	SIZE (W x D x H)	CLEARANCE For Equipment	WEIGHT (lbs.) *LOADED WEIGHT	HEAT LOAD (BTU)	MOUNTING (F, C, W, U, B, I)	New - new item Ex - exist. item	SPECIFIER (Design Team, DOT/OGS)	LONG LEAD TIME (Y, N)	SPECIAL PURCH. (SOLE SOURCE, ETC.)	FURNISH (C - CONTR., O-EX - OWNER EXIST., O-OWNER, F-FURN)	INSTALL (C, O, F)	Blocking (C-Contractor)	Final Connections (C, O, V)	Exhaust (D-direct, I-indirect, S-snorkel)	Exh. Issue (C-chem. H-heat, P-Particulate)	COLD WATER	HOT WATER	DIST / DI	DRAIN	GAS	C. AIR	VAC	POWER (GENERAL COLLECTED INFO)	Assummed actual Voltage	Actual Load	Connection type	UPS Batt.	DATA	NOTES, ENVIRONMENTAL FACTORS	MARK (Repeated for ref.)
MS-Machine Shop	MS-1 (DOC-2)	DOE-82	1	Open Shelving Unit with Solid panels, (6) adjustable Shelves, 20ga. Steel, Starter Unit; 1050 lb. shelf capacity	Edsal / Model #1	36" x 18" x 85"	--	123	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	--	--	--			DOE-82
MS-Machine Shop	MS-1 (DOC-2)	DOE-82a	3	Open Shelving Unit with Solid panels, (6) adjustable Shelves, 20ga. Steel, Add-On Unit; 1050 lb. shelf capacity	Edsal / Model #1	36" x 18" x 85"	--	138	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	--	--	--			DOE-82a
MS-Machine Shop	MS-1 (DOC-3)	DOE-83	1	Open Shelving Unit with Solid panels, (8) adjustable Shelves, 20ga. Steel, Starter Unit; 1100 lb. shelf capacity	Edsal / Model #1	36" x 24" x 85"	--	164	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	--	--	--			DOE-83
MS-Machine Shop	MS-1 (DOC-3)	DOE-83a	4	Open Shelving Unit with Solid panels, (8) adjustable Shelves, 20ga. Steel, Add-On Unit; 1100 lb. shelf capacity	Edsal / Model #1	36" x 24" x 85"	--	172	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	--	--	--			DOE-83a
MS-Machine Shop	MS-1 (DOC-4, 5)	DOE-84	2	Open Shelving Unit with Solid panels, (5) adjustable Shelves, 20ga. Steel, Starter Unit; 1100 lb. shelf capacity	Edsal / Model #1	36" x 24" x 85"	--	119	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	--	--	--		Same item as used in DOC Drilling Operations Center	DOE-84
MS-Machine Shop	MS-1 (DOC-4, 5)	DOE-84a	4	Open Shelving Unit with Solid panels, (5) adjustable Shelves, 20ga. Steel, Add-On Unit; 1100 lb. shelf capacity	Edsal / Model #1	36" x 24" x 85"	--	136	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	--	--	--		Same item as used in DOC Drilling Operations Center	DOE-84a
MS-Machine Shop	MS-1 (DOC-2)	DOE-84b	1	Open Shelving Unit with Solid panels, (5) adjustable Shelves, 20ga. Steel, Freestanding Unit; 1100 lb. shelf capacity	Edsal / Model #1	36" x 24" x 85"	--	118	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	--	--	--			DOE-84b
MS-Machine Shop	MS-1 (DOC-4, 5)	DOE-85	3	Open Shelving Unit with Solid panels, (6) adjustable Shelves, 20ga. Steel, Starter Unit; 1100 lb. shelf capacity	Edsal / Model #1	36" x 24" x 85"	--	149	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	--	--	--			DOE-85
MS-Machine Shop	MS-1 (DOC-4, 5)	DOE-85a	10	Open Shelving Unit with Solid panels, (6) adjustable Shelves, 20ga. Steel, Add-On Unit; 1100 lb. shelf capacity	Edsal / Model #1	36" x 24" x 85"	--	149	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	--	--	--			DOE-85a
MS-Machine Shop	MS-1 (DOC-5)	DOE-86	3	Storage Cabinet, Double Door, Adjustable shelves, Tall	Hallovell / HW6SC8478-4CL	48" X 24" X 78"	--	376	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	--	--	--			DOE-86
MS-Machine Shop	MS-1 (DOC-3)	DOE-87	3	Storage Cabinet, Double Door, Adjustable shelves, Tall	Hallovell / HW6SC6478-4CL	36" X 24" X 78"	--	324	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	--	--	--		Same item as used in DOC Drilling Operations Center	DOE-87
MS-Machine Shop	MS-1 (DOC-4)	DOE-88	2	Open Shelving Unit for Bin Storage, 10 Shelves, 45 Bins, 400 lb. shelf capacity	Quatum Storage Systems / 1275-202YL	36" X 12" X 75"*	--	103	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	--	--	--		*Individual bins 6.625" wide x 11.635" deep x 6" high	DOE-88
MS-Machine Shop	MS-1 (DOC-4)	DOE-89	1	Open Shelving without vertical panels, Metal Frame with 5 Particleboard Shelves	Edsal / EBM-P4818S	48" x 18" x 84"	--	127	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	--	--	--			DOE-89
MS-Machine Shop	MS-1 (from DOC-6)	DOE-9	1	Horizontal Band Saw (Metal Cutting); Wet Cut for Blade Cooling	Baileigh Indust. / Horiz. Band Saw BS-300M	70" x 23" x 49"	--	842	--	F	Ex	DOT			O-EX	O	--	C	--	--	Ver*	--		Floor	--	--	--	220v 1 phase	240V, 1Ph	12.5A	Hardwired	--	--	*Clarify water supply & dran for blade cooling	DOE-9
MS-Machine Shop	MS-1	MSE-1	1	Chop Saw	Milwaukee / 6177-20	Verify	--	Verify	--	B	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	Verify	120V	15A	5-20R	--	--		MSE-1
MS-Machine Shop	MS-1	MSE-10	1	Drill Press	Powermatic / 1150A	Verify	--	Verify	--	F	Ex	DOT			O-EX	O	--	C	--	--	--	--		--	--	--	--	--	--	--	110v 1 phase	120V	10A	5-20R	--	--		MSE-10
MS-Machine Shop	MS-1	MSE-11	1	Large Drill Pressq	Buffalo Forge / #2B	Verify	--	Verify	--	F	Ex	DOT			O-EX	O	--	C	--	--	--	--		--	--	--	--	--	--	--	208v 3 phase	None needed	None needed	--	--	--		MSE-11
MS-Machine Shop	MS-1	MSE-2	1	Horizontal Band Saw	DoAll / C-6	Verify	--	Verify	--	F	Ex	DOT			O-EX	O	--	C	--	--	--	--		--	--	--	--	--	--	--	208v 3 phase	None needed	None needed	--	--	--		MSE-2
MS-Machine Shop	MS-1	MSE-3	1	Vertical Band Saw	DoAll / DBW-15	Verify	--	Verify	--	F	Ex	DOT			O-EX	O	--	C	--	--	--	--		--	--	--	--	--	--	--	208v 1 phase	208V 1 Phase	34.1A	Hardwired	--	--	Verify if both this item and DOE-42 are required	MSE-3
MS-Machine Shop	MS-1	MSE-4	1	Sanding Station	Wilton / 4200A	Verify	--	Verify	--	F	Ex	DOT			O-EX	O	--	C	--	--	--	--		--	--	--	Ver*	Ver*	--	--	208v 1 phase	240V 1 Phase	--	L14-20R	--	--	*Verify if compressed air and/or vacuum required	MSE-4
MS-Machine Shop	MS-1	MSE-5	1	Surface Grinder	Acer / 1224AHD	Verify	--	Verify	--	F	Ex	DOT			O-EX	O	--	C	--	--	--	--		--	--	--	--	--	--	--	208v 3 phase	None needed	None needed	--	--	--		MSE-5
MS-Machine Shop	MS-1	MSE-6	1	Lathe	SuperMax / LG-1440	Verify	--	Verify	--	F	Ex	DOT			O-EX	O	--	C	--	--	--	--		--	--	--	--	--	--	--	208v	240V 1 Phase	8.5A	Hardwired	--	--		MSE-6
MS-Machine Shop	MS-1	MSE-7	1	Milling Machine	SuperMax / CYM	Verify	--	Verify	--	F	Ex	DOT			O-EX	O	--	C	--	--	--	--		--	--	--	--	--	--	--	208v 3 phase	208V 3Phase	3hp	Hardwired	--	--		MSE-7
MS-Machine Shop	MS-1	MSE-8	1	Tool Grinder, 6"	Rockwell / 438-02-314-0298	Verify	--	Verify	--	F	Ex	DOT			O-EX	O	--	C	--	--	--	--		--	--	--	--	--	--	--	110v 1 phase	None needed	None needed	--	--	--		MSE-8
MS-Machine Shop	MS-1	MSE-9	1	MIG Welder, Rolling	Miller	Verify	--	Verify	--	F	Ex	DOT			O-EX	O	--	C	I*	--	--	--		--	--	--	--	--	--	--	220v 50A	208V 1 Phase	50A	L6-50R	--	--	*Verify venting requirements, if any	MSE-9
DOC-Drilling Ops Center	DOC-6	DOE-1	1	Work Bench / Welding Table; Surface for Welding; Heavy-Duty, Heavy Loads	Custom Item	24' min. overall length x 4' deep x verify ht.*	--	--	--	F	Ex	DOT			C	C	--	C	I	--	--	--		--	--	--	--	--	--	--	110v 220v**	120V	--	5-20R	--	--	*Verify height. **Power supplied at tables	DOE-1
DOC-Drilling Ops Center	DOC-6	DOE-10	1	Chop Saw (Metal Cutting)	DeWalt / 14" Multi-Cutter Saw DW872	Verify	--	47	--	B	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	Verify	120V	--	5-20R	--	--		DOE-10
DOC-Drilling Ops Center	DOC-6	DOE-11	1	Drill Press, Floor Mounted (Heavy Duty), Adjustable Table, Fixed Table Vise	Eq to current Rockwell 70-6X0	Verify	--	Verify	--	B	Ex	DOT			O-EX	O	--	C	--	--	--	--		--	--	--	--	--	--	--	240v	240V	50A	10-50R	--	--		DOE-11
DOC-Drilling Ops Center	DOC-6	DOE-12	1	Drill Press, Floor Mounted (Light Duty)	Craftsman / 15" Drill Press with Laser and LED Model Z15116B	18" (with 11" base) x 30" x 61"	--	130	--	F	Ex	DOT			O-EX	O	--	C	--	--	--	--		--	--	--	--	--	--	--	Verify	120V	--	5-20R	--	--	Bolted to floor	DOE-12
DOC-Drilling Ops Center	DOC-6	DOE-13	1	Air Compressor	Ingersoll Rand / Model 2545K10-V	46" x 51" x 83"	--	920	--	F	Ex	DOT			O-EX	O	--	C	--	--	--	--		--	--	--	--	--	--	--	460v, 10Hp, 3Ph	480V, 3 Ph	10hp	Hardwired	--	--	Verify need if building / centralized compressed air available; Hardwired from 10/4 on site meeting and call with Eric.	DOE-13
DOC-Drilling Ops Center	DOC-6	DOE-14A	1	Jack Stand	Mohawk Resources / Model JS-4774-18	37" diameter x 45.5" (lowered)	--	195	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	Manual	--	--	--	--	--		DOE-14A
DOC-Drilling Ops Center	DOC-6	DOE-15	1	Air-Operated End Lift	Hein-Werner / 2.5 Ton Air-Operated End Lift HW93696A	14" X 15" X 36"	--	210	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	*	--	--	--	--	--	--	--	--	--	*Min. Air Pressure – 200 PSI; confirm if compressed air required	DOE-15
DOC-Drilling Ops Center	DOC-6	DOE-16	1	Hydraulic Service jack (Floor)	Westward / 5-Ton Quick Lifting Jack SML69	52" + 40" handle x 15" x 45"	--	--	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	Manual	--	--	--	--	--		DOE-16
DOC-Drilling Ops Center	DOC-8 (Wareh.)	DOE-17	1	Fork Lift (Small); Fixed Base Hydraulic Stacker	Dayton / Model 4VME3	63" x 29" x 82"	--	700	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	Manual	--	--	--	--	--	2000 lb. load capacity, 118" maximum lift height	DOE-17
DOC-Drilling Ops Center	DOC-6	DOE-18	1	Hydraulic Floor Crane	Westward / Hydraulic Engine Crane 3ZX71	63" X 33" X 58"	--	319	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	Manual	--	--	--	--	--	1000 to 4000 lb. load capacity, 48" to 77" boom length	DOE-18
DOC-Drilling Ops Center	DOC-6	DOE-19	1	Hot Pressure Washer	Kleanline / KVC 2004	32" x 27" x 36"	--	335	--	F	Ex	DOT			O-EX	O	--	C	--	--	Ver*	Ver*		Floor	--	--	--	--	--	--	230v, 30A, 1 Ph	240V, 1Ph	30A	Special receptacle	--	--	Verify water supply & drain requirements	DOE-19
DOC-Drilling Ops Center	DOC-6	DOE-21	1	Belt / Disc Sander	Jet / J-4200A	29" x 19" x 58"	--	--	--	F	Ex	DOT			O-EX	O	--	C	--	--	--	--		--	--	--	--	--	--	--	115v	120V	--	5-20R	--	--		DOE-21

KEY, WATER: Tap-general building water; Dist-distilled; DI-deionized
KEY, DRAIN: Stand-standard; Silt-silt trap; Floor-with silt trap as needed; Acid-acid neutralizing scrubber
KEY: MOUNTING: F-floor/C-ceiling/W-wall/U-undercounter /B-bench or counter/I-inside equipment
KEY: FURNISH through FINAL CONNECT: C-contractor/O-owner/F-Furniture

LAB	ROOM(S)	MARK	QUANTITY (dash indicates see plan for quantities)	DESCRIPTION	MAKE / MODEL NUMBER (Basis of Design)	SIZE (W x D x H)	CLEARANCE For Equipment	WEIGHT (Lbs.) *LOADED WEIGHT	HEAT LOAD (BTU)	MOUNTING (F, C, W, U, B, I)	New - new item Ex - exist. item	SPECIFIER (Design Team, DOT/OGS)	LONG LEAD TIME (Y, N)	SPECIAL PURCH. (SOLE SOURCE, ETC.)	FURNISH (C - CONTR., O-EX - OWNER EXIST., O-OWNER, F-FURN)	INSTALL (C, O, F)	Blocking (C-Contractor)	Final Connections (C, O, V)	Exhaust (D-direct, I-indirect, S-snorkel)	Exh. Issue (C-chem., H-heat, P-Particulate)	COLD WATER	HOT WATER	DIST / DI	DRAIN	GAS	C. AIR	VAC	POWER (GENERAL COLLECTED INFO)	Assumed actual Voltage	Actual Load	Connection type	UPS Batt.	DATA	NOTES, ENVIRONMENTAL FACTORS	MARK (Repeated for ref.)
DOC-Drilling Ops Center	DOC-6	DOE-23	3	Flammable Storage Cabinet with Manual Doors; 45 Gallon Capacity	Securall / A145 Yellow	43" x 18" x 65"	--	357	--	F	Ex	DOT			C	C	--	O	--	--	--	--		--	--	--	--	--	--	--	--	--	--			DOE-23
DOC-Drilling Ops Center	DO WAREHOUSE - 135B	DOE-24	3	Open Shelving - Heavy; 5 Shelves, 4000 lb Shelf Capacity	Edsal HCU-482484	48" X 24" X 84"	--	220	--	F	Ex	DOT			O-EX	O	O	--	--	--	--		--		--	--	--	--	--	--	--	--	--			DOE-24
DOC-Drilling Ops Center	DO WAREHOUSE - 135B	DOE-25	1	High-Pile Pallet racking system (STRUCTURAL CHANNEL): 10'-0" wide shelf beam x 3'-6" deep x 20'-0" tall. POST AND BEAM MEMBER SIZING REQUIRED FOR Shelf load capacity OF: 1,800 lbs. number of shelves as shown on elevations	Steel King SK300	10' X 3'-6" X 20'	--		--	F	New	Des			C	--	O	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--			DOE-25
DOC-Drilling Ops Center	DO WAREHOUSE - 135B	DOE-26	--	High-Pile Pallet racking system (STRUCTURAL CHANNEL): 8'-0" wide shelf beam x 5'-0" deep x 20'-0" tall. POST AND BEAM MEMBER SIZING REQUIRED FOR Shelf load capacity OF: 6,380 lbs. number of shelves as shown on elevations	Steel King SK300	8' X 5' X 20'	--		--	F	New	Des			C	--	O	--	--	--	--		--		--	--	--	--	--	--	--	--	--	--			DOE-26
DOC-Drilling Ops Center	DO WAREHOUSE - 135B	DOE-27	1	PVC PIPE RACK UNIT: 36" DEEP x 144" LONG. WALL MOUNTED.	Unknown	12' X 3'X ?	--		--	W	Ex	DOT			O-EX	O	O	--	--	--	--		--		--	--	--	--	--	--	--	--	--			DOE-27
DOC-Drilling Ops Center	DOC-6	DOE-3	1	Stick Welder	Lincoln Electric / Idealarc 250 (K1053-8)	27" x 19" x 21.5"*	--	350	--	F**	Ex	DOT			O-EX	O	--	C	I***	--	--	--		--	--	--	--	--	--	--	230/460/575 /1/60	208V 1 Phase	55A	10-50R	--	--	*Verify dimensions. **Verify floor or benchtop mounting. ***Venting per item DOE-2	DOE-3
DOC-Drilling Ops Center	DOC-8 (Wareh.)	DOE-30	TBD	Bar & Pipe Cradle Truck	Little Giant / Model BCT-2860	60" x 28" x 30"	--	213	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--		DOE-30
DOC-Drilling Ops Center	DOC-7A	DOE-31	1	Stress Path Triaxial and Uniaxial Fully Automatic Test System	Controls	42" x 18" x 60"	--	264	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	110v	120V	--	5-20R	--	--		DOE-31
DOC-Drilling Ops Center	DOC-7A	DOE-32	1	Laboratory Core Trimmer, Cut-Off and Grinding Machine	Controls	34' x 30" x 36"	--	374	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	110v 220v	120V	--	5-20R	--	--		DOE-32
DOC-Drilling Ops Center	DOC-7A	DOE-33	1	Rock Core Sander	DMT Group / DMT CoreScan 3	54" x 30" x 50"	--	282	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	110v	120V	--	5-20R	--	--		DOE-33
DOC-Drilling Ops Center	DOC-6	DOE-4	1	MIG Welder, Rolling (Wire Feed)	Lincoln Electric / Power MIG 350MP (K2403-2)	Verify	--	255	--	F	Ex	DOT			O-EX	O	--	C	I	--	--	--		--	--	--	--	--	--	--	208/230/460 /575/1/60	240V 1 Phase	50A	6-50R	--	--		DOE-4
DOC-Drilling Ops Center	DOC-6	DOE-5	1	MIG Welder, Rolling, Aluminum (Wire Feed)	Hobart Bros. / IronMan 230 MIG (#500536)	18.9" x 31.5" x 38.5"	--	185	--	F	Ex	DOT			O-EX	O	--	C	I	--	--	--		--	--	--	--	--	--	--	230v, 1 phase	240V 1 Phase	35A	6-50R	--	--		DOE-5
DOC-Drilling Ops Center	DOC-8 (Wareh.)	DOE-50	1	Overhead Wire Rope Hoist and Trolly; 10,000 Lb. Capacity; Cableed Cord or Remote Lift Control	R&M Materials Handling / Spacemaster	Verify	--	Verify	--	C*	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	110v	120V	?	Powered from building	--	--	*Mount to structure. Verify rail / beam requirements and travel distance	DOE-50
DOC-Drilling Ops Center	DOC-6	DOE-6	1	Plasma Cutter	Victor / Cutmaster 82	15" x 24" x 12"	--	43	--	B	Ex	DOT			O-EX	O	--	O	*	--	--	--		--	--	--	--	**	--	--	208-230v 20-80A 50/60 Hz 1 phase	208V 1 Phase	80A	6-50R	--	--	*Verify venting requirements. **Verify gas requirements	DOE-6
DOC-Drilling Ops Center	DOC-6	DOE-8	1 Minimum	Bench Vice / Anvil	Wilton / Tradesman 8" Round Channel Vice Model 1780A	Verify	--	Verify	--	B	Ex	DOT			O-EX	O	C*	C	--	--	--	--		--	--	--	--	--	--	--	Manual	--	--	--	--	--	*Bolted to benchtop	DOE-8
DOC-Drilling Ops Center	DOC-6, DOC-7A	DOE-87	(3) in DOC-6, (2) in DOC-7A	Storage Cabinet, Double Door, Adjustable shelves, Tall	Hallovell / HW6SC6478-4CL	36" X 24" X 78"	--	324	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	Same item as used in MS Machine Shop	DOE-87
DOC-Drilling Ops Center	DOC-6	RMM-15	1	Generator, Rolling; Produces 120v / 240v, approx. 5700 watts	Homelite / 176B140-A	39" x 28" x 30"	--	100	--	F	Ex	DOT			O-EX	O	--	O	--	--	--	--		--	--	--	--	Y*	--	--	--	--	--	--	--	--	*Gasoline. Exhaust not required, operated outdoors	RMM-15
DOC-Drilling Ops Center	DOC-6	RMM-17	1	Power Washer, Rolling	Generac / Pro30 #01539	24" x 32" x 38"	--	100	--	F	Ex	DOT			O-EX	O	--	O	D*	C	--	--		--	--	--	--	Y**	--	--	--	--	--	--	--	--	*Exhaust gas vapprs. **Gasoline	RMM-17
R1M-Region 1 Materials	RMS-1	RMM-16	1	Core Drill	Black & Decker / 83380267	12" x 18" x 48"	--	100~	--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	120v	None needed	None needed	None needed	--	--		RMM-16
TRAFFIC SIGNALS LAB (TSL)	General Storage (TSL-2)	TSL-1	1	Environmental Walk-In Chamber	Thermotron WP-563-THCM2-6-6-AC	170"w x 93"d x 126"h	as denoted on plans			F	New	Des			C	C	C	C														--	--	--				TSL-1
TRAFFIC SIGNALS LAB (TSL)	Work Bench Repair (TSL-1)	TSL-2	6	Ductless Snorkel Unit (Portable Fume Extraction System)	BVX-201-KIT1	20" x 10" x 15.3"	sits on floor under workstation unit	20 lbs.		F	New	DOT		?	O	O																85 watts	--	--				TSL-2
TRAFFIC SIGNALS LAB (TSL)	Various	TSL-3a	--	High-Pile Pallet racking system (Structual Channel): 11'-6" wide shelf beam x 3'-6" deep x 20'-0" tall. 3'-0" clear below shelf for C-PLT-BB pallets on floor. Post and beam member sizing required shelf load capacity of: 2,500lbs - 3,000lbs (3-pallet shelf).	Steel King SK300	11'-6" wide x 3'-6" deep x 20'-0" tall	Front clearance for forklift access	See Notes*	--	F	New	Des			C	C	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		TSL-1
TRAFFIC SIGNALS LAB (TSL)	Various	TSL-3b	--	High-Pile Pallet racking system (Structual Channel): 8'-0" wide shelf beam x 3'-6" deep x 20'-0" tall. 3'-0" clear below shelf for C-PLT-BB pallets on floor. Post and beam member sizing required shelf load capacity of: 2,500lbs - 3,000lbs (3-pallet shelf).	Steel King SK300	8'-0" x 3'-6" x 20'-0"	Front clearance for forklift access	See Notes*	--	F	New	Des			C	C	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		TSL-3b
Room 216	ACID/SOLVENT WASTE HOLDING - 216	ASW-CORR	1	Corrosive Cabinet (Existing)	DOT to confirm	42 W X 65" H X 18" D			--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--			DOT to move over from existing facility	ASW-CORR
Room 216	ACID/SOLVENT WASTE HOLDING - 216	ASW-FLAM	1	Flammables Cabinet (Existing)	DOT to confirm	DOT to work within allocated space in room			--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--			DOT to move over from existing facility	ASW-FLAM
Room 216	ACID/SOLVENT WASTE HOLDING - 216	ASW-HAZ	1	Hazardous Materials Cabinet (Existing)	DOT to confirm	DOT to work within allocated space in room			--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--			DOT to move over from existing facility	ASW-HAZ
RECEVING / LOADING DOCK	Receiving - 220	REC-1	2	Custodial Gondola (Existing)		36" X 72"			--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--			DOT to move over from existing facility	REC-1
RECEVING / LOADING DOCK	Receiving - 220	REC-2	2	Electric Pallet Stacker (at Charging Location)		approx size shown on plan			TBD	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--			DOT to move over from existing facility	REC-2
RECEVING / LOADING DOCK	Receiving - 220	REC-3	4	Clt Flatbed Cart		30" x 60"			--	F	Ex	DOT			O-EX	O	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--			DOT to move over from existing facility	REC-3

BUILDING OCCUPANT COUNT TABLE - FUNCTION OF SPACE | OCCUPANCY CLASSIFICATION & USE DESIGNATION

FUNCTION OF SPACE	LOAD FACTOR	OCCUPANCY & USE - PER LEVEL (FUNCTION OF SPACE CATEGORIZED BY OCCUPANCY & USE FOR USE IN CALCULATING TOILET FIXTURE COUNTS)										FUNCTION OF SPACE TOTALS
		LEVEL 1				LEVEL 2		LEVEL 3	LEVEL 4	MECH. PENTHOUSE	ELEV. MACHINE RM	
		B	S-1	A-2	A-3	B	S-1	B	B	B	B	
BUSINESS AREAS	150 GROSS	16,340 sf	-	-	-	27,162 sf	-	21,242 sf	22,390 sf	-	-	
		109 occ.	-	-	-	182 occ.	-	142 occ.	150 occ.	-	-	583 occ.
ACCESSORY STORAGE & MECHANICAL EQUIP.	300 GROSS	-	4,530 sf	-	-	-	5,848 sf	-	-	3,692 sf	732 sf	
		-	16 occ.	-	-	-	20 occ.	-	-	13 occ.	3 occ.	52 occ.
ASSEMBLY - UNCONCENTRATED (TABLES AND CHAIRS)	15 NET	-	-	431 sf	-	-	-	-	-	-	-	
		-	-	29 occ.	-	-	-	-	-	-	-	29 occ.
ASSEMBLY - CONCENTRATED (CHAIRS ONLY, NOT FIXED)	7 NET	-	-	-	1,882 sf	-	-	-	-	-	-	
		-	-	-	269 occ.	-	-	-	-	-	-	269 occ.
WAREHOUSES	500 GROSS	-	-	-	-	-	6,211 sf	-	-	-	-	
		-	-	-	-	-	13 occ.	-	-	-	-	13 occ.
LEVEL TOTALS		423 occ.				215 occ.		142 occ.	150 occ.	13 occ.	3 occ.	
BUILDING TOTAL		946 occ.										

occ. = OCCUPANTS

OCCUPANCY / USE GROUP DESCRIPTIONS
B (Business Use Group – Office, Lab Spaces)
S-1 (Storage Use Group – Garage, warehouse, mechanical, storage)
A-2 (Coffee Bar - Break Area)
A-3 (Conference rooms)

LIFE SAFETY PLAN DIAGRAMS - GRAPHIC LEGEND

NOTE: SEE ELECTRICAL FOR FIRE ALARM DEVICES AND ILLUMINATED EXIT SIGNAGE

EXIT FROM A FLOOR OR SPACE:
- O.C 220 / O.L 140 — OCCUPANT CAPACITY, (FACTOR: 0.15 INCH/PERSON) / OCCUPANT LOAD (ACTUAL)
- STAIR 0 0 0 — EGRESS COMPONENT
- WIDTH (INCHES) — OCCUPANT LOAD (ACTUAL) / OCCUPANT CAPACITY, (FACTOR: 0.2 INCH/PERSON)
- 1-HOUR FIRE-BARRIER WALL
- 2-HOUR FIRE-BARRIER WALL

EXIT ACCESS TRAVEL & COMMON PATH OF TRAVEL DISTANCE TAG
- DISTANCE / PATH # — TRAVEL DISTANCE / PATH NUMBER ID
- DISTANCE / CPT — TRAVEL DISTANCE / COMMON PATH OF EGRESS TRAVEL

NOTE: TAG LEADER LOCATED AT END OF COMMON PATH

- EGRESS TRAVEL PATH (SHOWN PER NFPA 101, CHAPTER 7.6.1)

FIRE EXTINGUISHERS (FE)
- TAG KEY: FE-1b
- EXTINGUISHER TYPE (number): FE-1 = CLASS: ABC, DRY CHEMICAL (OWNER PROVIDED); FE-2 = CLASS: AC, WET (WATER) (OWNER PROVIDED) (for ammonium nitrate hazard); FE-3 = CLASS: D, WET CHEMICAL (OWNER PROVIDED) (for combustible metal hazard). Note: Owner to determine sizing based on the specific combustible metal, physical particle size, area covered and recommendation by the fire extinguisher manufacturer
- MOUNTING / HOUSING TYPE (letter): FE-b = BRACKET (OWNER PROVIDED); FE-c = CABINET (RECESSED); FE-d - DOLLY/WHEELED UNIT (OWNER PROVIDED). Note: dolly/wheeled unit dependant on extinguisher size determination, see note above for FE-3; FE-s = SAFETY STATION SEE SHEETS A-420.1 & A-420.2
- GRAPHIC LEGEND: FE-4b FE-4c FE-4d FE-4s — WALL

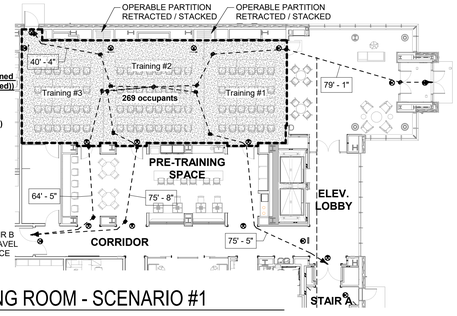
AUTOMATED EXTERNAL DEFIBRILLATORS (AED)
- C-AEDc — WALL
- AUTOMATED EXTERNAL DEFIBRILLATOR HOUSING TYPES: C- AEDc = AED WITHIN AED CABINET, RECESSED INSTALLATION AT DRYWALL/STUD WALLS, SURFACE MOUNTED AT CMU WALLS. (OWNER PROVIDED) C- AEDs = AED (OWNER PROVIDED) WITHIN LAB SAFETY STATION, SEE SHEETS 420.1 & 420.2

TRAINING ROOM - CONFIGURATIONS / OCCUPANCY SCENARIOS

= ILLUMINATED EXIT SIGNAGE, SEE ELECTRICAL LIGHTING PLANS

TRAINING #1, #2, #3 Combined (Operable Partitions retracted))
1,882 sf
(7 sf/person)

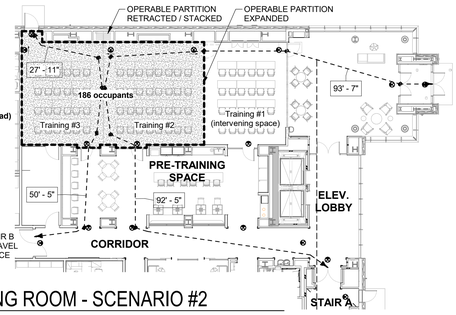
269 occupants (design load)



3 TRAINING ROOM - SCENARIO #1 — 1/16" = 1'-0"

TRAINING #2, #3
1,300 sf
(7 sf/person)

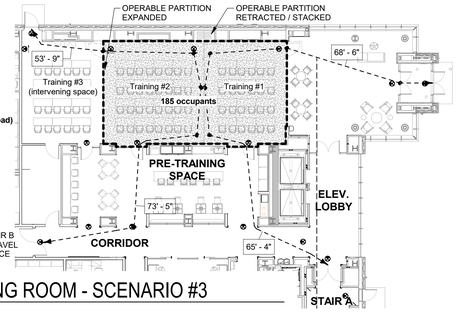
186 occupants (design load)



4 TRAINING ROOM - SCENARIO #2 — 1/16" = 1'-0"

TRAINING #1, #2
1,292 sf
(7 sf/person)

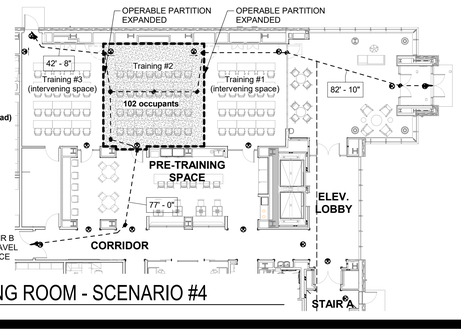
185 occupants (design load)



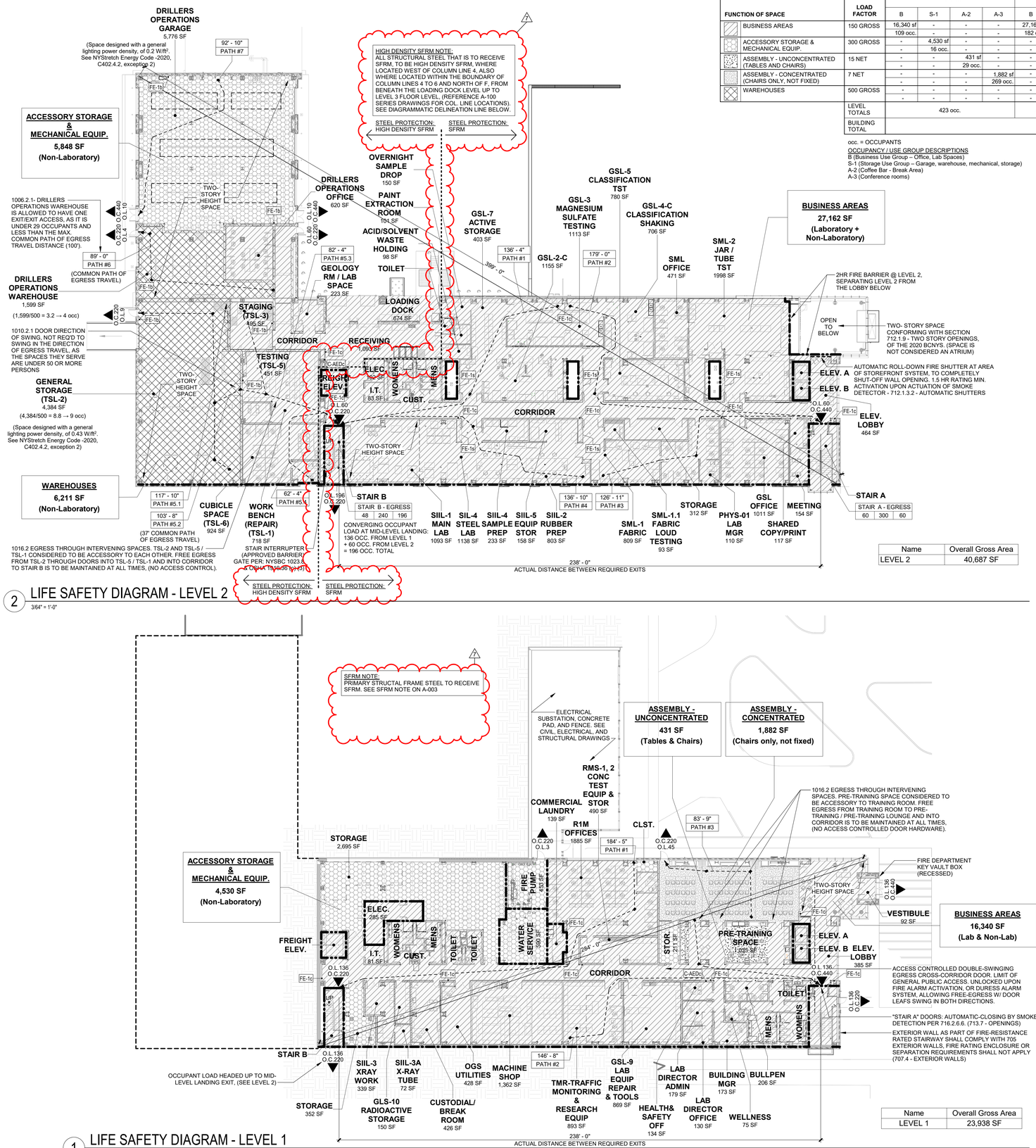
5 TRAINING ROOM - SCENARIO #3 — 1/16" = 1'-0"

TRAINING #2
710 sf
(7 sf/person)

102 occupants (design load)



6 TRAINING ROOM - SCENARIO #4 — 1/16" = 1'-0"



Name	Overall Gross Area
LEVEL 2	40,687 SF

2 LIFE SAFETY DIAGRAM - LEVEL 2 — 3/64" = 1'-0"

Name	Overall Gross Area
LEVEL 1	23,938 SF

1 LIFE SAFETY DIAGRAM - LEVEL 1 — 3/64" = 1'-0"

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Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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REGISTERED ARCHITECT ALEKSANDAR JANJIC 13 STATE OF NEW YORK
REGISTRATION EXPIRES: 03/31/2028

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

MARK	DATE	DESCRIPTION
7	04/17/26	ADDENDUM 7
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C
DESIGNED BY: SMD
DRAWN BY: JJS
FIELD CHECK:
APPROVED:

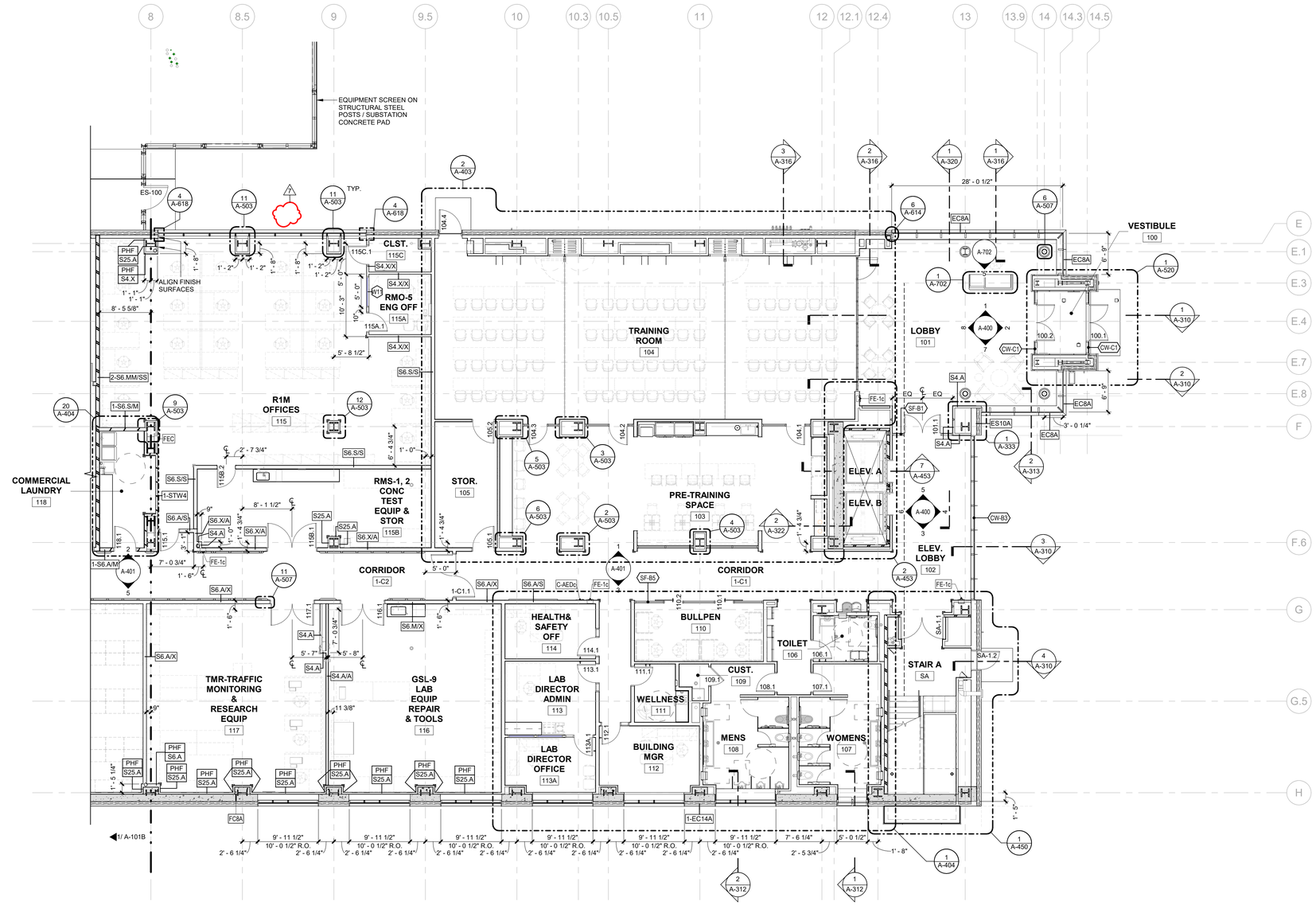
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DRAWING NUMBER: G-003

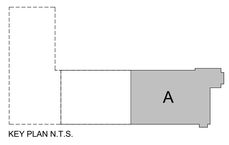
SHEET: OF

FLOOR PLAN NOTES

1. SEE SHEET A-001 FOR ADDITIONAL NON-LABORATORY PLAN GENERAL NOTES
2. SEE SHEET A-002 FOR ADDITIONAL LABORATORY PLAN GENERAL NOTES
3. SEE A-420 & A-430 SERIES DRAWINGS FOR LABORATORY SPECIFIC FLOOR PLAN INFORMATION.
4. FURNITURE NOT IN CONTRACT. SHOWN FOR SPACE PLANNING PURPOSES ONLY, (SHOWN WITH GRAY-DASHED LINEWORK).
5. LAB AND NON-LAB EQUIPMENT TAGGED IN PLAN AND REFERENCE THE EQUIPMENT MATRIX PROVIDED IN THE PROJECT MANUAL FOR INFORMATION.



1 LEVEL 1 - AREA A - FLOOR PLAN
1/8" = 1'-0"



KEY PLAN N.T.S.

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CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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REGISTERED ARCHITECT ALEKSANDAR JANJIC 035711 STATE OF NEW YORK

REGISTRATION EXPIRES: 03/31/2028

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

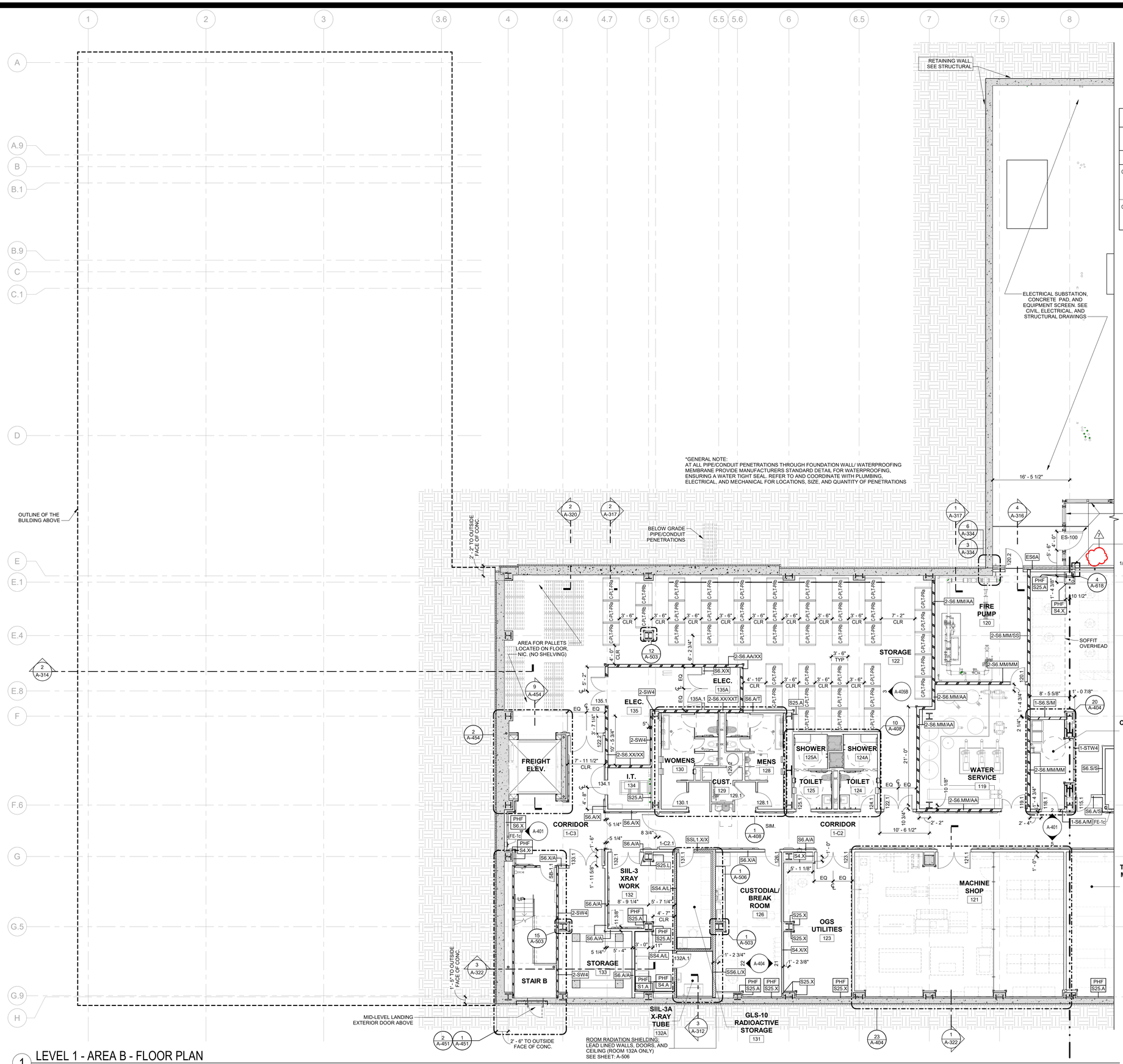
MARK	DATE	DESCRIPTION
7	04/17/26	ADDENDUM 7
6	04/14/26	ADDENDUM 6
5	04/06/26	ADDENDUM 5
	01/13/26	BID DOCUMENT

PROJECT NUMBER:	47528-C
DESIGNED BY:	SMD
DRAWN BY:	JJS
FIELD CHECK:	
APPROVED:	

SHEET TITLE: LEVEL 1 - AREA A - FLOOR PLAN

DRAWING NUMBER: A-101A

SHEET: OF



1 LEVEL 1 - AREA B - FLOOR PLAN
1/8" = 1'-0"

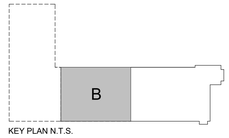
FLOOR PLAN NOTES

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2. SEE SHEET A-002 FOR ADDITIONAL LABORATORY PLAN GENERAL NOTES
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5. LAB AND NON-LAB EQUIPMENT TAGGED IN PLAN AND REFERENCE THE EQUIPMENT MATRIX PROVIDED IN THE PROJECT MANUAL FOR INFORMATION.

EQUIPMENT LEGEND
LEVEL 1 STORAGE

NOTE: SEE TECHNICAL SPECIFICAILNS AND EQUIPMENT SCHEDULE IN APPENDIX OF PROJECT MANUAL FOR MORE INFORMATION.

MARK	DESCRIPTION
C-PLT-PRa	PALLET RACK FOR BB BRIDGE BEARING PALLETS - NO BOTTOM SHELF: • 4'-6" BEAM WIDTH x 3'-6" DEEP x 7'-8" TALL (TOP SHELF HEIGHT) • 3" X 3" POSTS WITH 4'-6" BEAMS X 3'-6" SHELF DEPTH. 3'-0" CLEAR BELOW SHELF FOR PALLET AT FLOOR. • SHELF LOAD CAPACITY 5,000 LBS.
C-PLT-PRb	PALLET RACK FOR BB BRIDGE BEARING PALLETS - INCLUDE BOTTOM SHELF: • 4'-6" BEAM WIDTH x 3'-6" DEEP x 7'-8" TALL (TOP SHELF HEIGHT) • 3" X 3" POSTS WITH 4'-6" BEAMS X 3'-6" SHELF DEPTH. • SHELF LOAD CAPACITY 5,000 LBS.



KEY PLAN N.T.S.

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CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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REGISTERED ARCHITECT ALEKSANDAR JANJIC 031128 STATE OF NEW YORK

REGISTRATION EXPIRES: 03/31/2028

PROJECT NORTH

CONTRACT: CONSTRUCTION

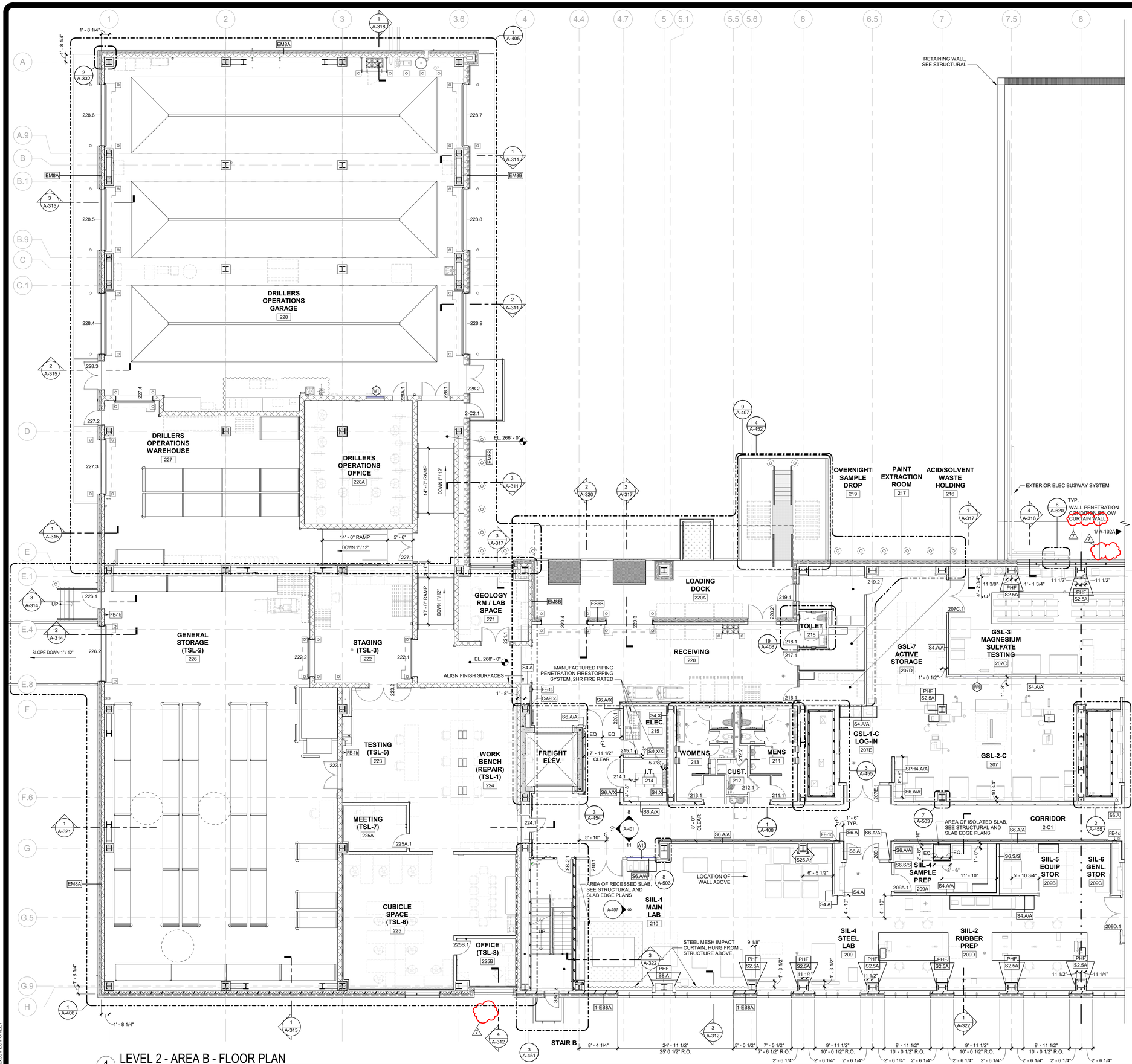
TITLE: Provide Testing Laboratory, Building 14

LOCATION: DOT Region 1, Albany County State Office Building Campus Albany, NY

CLIENT: New York State Department of Transportation

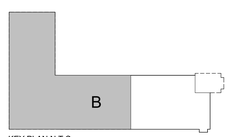
7	04/17/26	ADDENDUM 7
6	04/14/26	ADDENDUM 6
	01/13/26	BID DOCUMENT
MARK	DATE	DESCRIPTION

PROJECT NUMBER: 47528-C
DESIGNED BY: SMD
DRAWN BY: JJS
FIELD CHECK:
APPROVED:
SHEET TITLE: LEVEL 1 - AREA B - FLOOR PLAN
DRAWING NUMBER: A-101B
SHEET: OF



1 LEVEL 2 - AREA B - FLOOR PLAN
1/8" = 1'-0"

KEY PLAN N.T.S.



FLOOR PLAN NOTES

1. SEE SHEET A-001 FOR ADDITIONAL NON-LABORATORY PLAN GENERAL NOTES
2. SEE SHEET A-002 FOR ADDITIONAL LABORATORY PLAN GENERAL NOTES
3. SEE A-420 & A-430 SERIES DRAWINGS FOR LABORATORY SPECIFIC FLOOR PLAN INFORMATION.
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5. LAB AND NON-LAB EQUIPMENT TAGGED IN PLAN AND REFERENCE THE EQUIPMENT MATRIX PROVIDED IN THE PROJECT MANUAL FOR INFORMATION.

GRAPHIC LEGEND

SEE SHEET A-001 FOR ADDITIONAL ABBREVIATIONS, SYMBOLS, AND MATERIALS LEGEND.

EQUIPMENT, FURNITURE AND FURNISHINGS NOT IN CONTRACT (BY FACILITY OR FURNITURE CONTRACT), FOR GENERAL INFORMATION AND CONTRACTOR COORDINATION ONLY. SEE THE LAB EQUIPMENT SCHEDULE IN THE PROJECT MANUAL FOR ADDITIONAL EQUIPMENT INFORMATION AND REQUIREMENTS. (SHAPES / CONFIGURATIONS VARY)

1/4" / 12" FLOOR SLOPE (ARROW INDICATING DOWN DIRECTION)

BUILDING ELEMENT ABBREVIATIONS

CJ	CONTROL JOINT (IN GWB)
C-PH-W	WALL PHONE
B-BD	BOLLARD, BOLT-DOWN, (INTERIOR & EXTERIOR ON FROST PROTECTED SLABS)
B-S	BOLLARD, SITE (EXTERIOR) POST IN CONCRETE FOOTING, REFER TO SITE / CIVIL
FD	FLOOR DRAIN
FSC	FLOOR SANITARY CLEANOUT
	PROVIDE 2 HR. RATED PENETRATION FIRESTOPPING AT ANNULAR SPACE OF FLOOR PENETRATIONS. COORDINATE FINAL LOCATIONS WITH PLUMBING WORK, SEE PLUMBING DRAWINGS.
FE-##	FIRE EXTINGUISHER. SEE PLANS & LEGEND ON G-003 & G-004 FOR MORE INFOMRATION, INCLUDING FE TYPE AND MOUNTING/HOUSING TYPE
OHD-CS	OVERHEAD DOOR CONTROL STATION (SURFACE MOUNTED) BOTTOM OF DEVICE = 5'-0" AFF

NEW YORK STATE Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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REGISTRATION EXPIRES: 03/31/2028

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

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7	04/17/26	ADDENDUM 7
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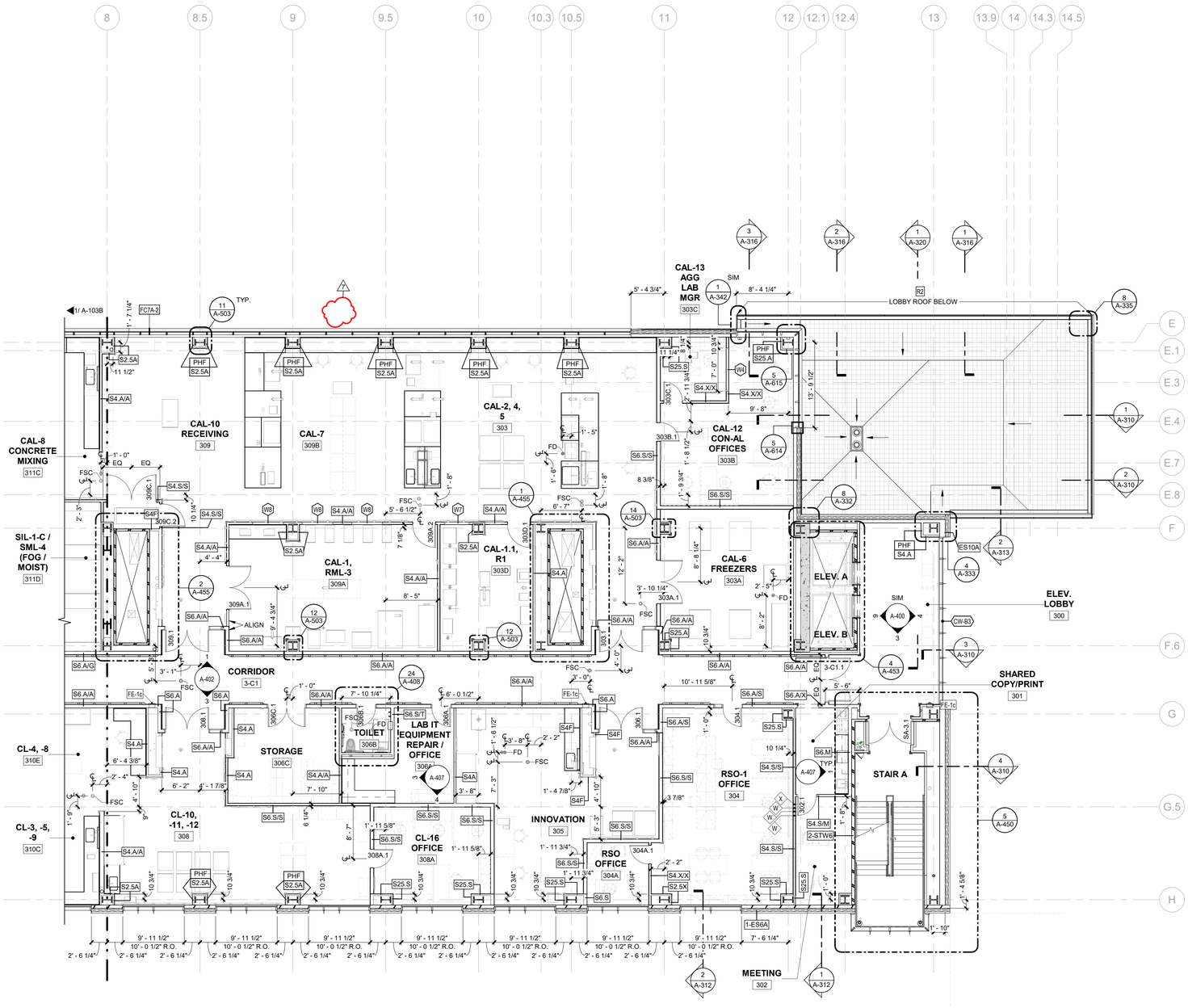
PROJECT NUMBER:	47528-C
DESIGNED BY:	SMD
DRAWN BY:	JJS
FIELD CHECK:	
APPROVED:	

SHEET TITLE: LEVEL 2 - AREA B - FLOOR PLAN

DRAWING NUMBER: A-102B

SHEET: OF

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1 LEVEL 3 - AREA A - FLOOR PLAN
1/8" = 1'-0"

FLOOR PLAN NOTES

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2. SEE SHEET A-002 FOR ADDITIONAL LABORATORY PLAN GENERAL NOTES
3. SEE A-420 & A-430 SERIES DRAWINGS FOR LABORATORY SPECIFIC FLOOR PLAN INFORMATION.
4. FURNITURE NOT IN CONTRACT. SHOWN FOR SPACE PLANNING PURPOSES ONLY, (SHOWN WITH GRAY-DASHED LINEWORK).
5. LAB AND NON-LAB EQUIPMENT TAGGED IN PLAN AND REFERENCE THE EQUIPMENT MATRIX PROVIDED IN THE PROJECT MANUAL FOR INFORMATION.

TOILET / SHOWER ROOM ACCESSORY LEGEND & INTERIOR EQUIPMENT

A	AUTOMATIC SOAP DISPENSER, WALL MOUNT
B	SEAT-COVER DISPENSER, RECESSED
C	SANITARY-NAPKIN AND TAMPON VENDOR, RECESSED
D	SANITARY-NAPKIN DISPOSAL UNIT
E	TOILET TISSUE (JUMBO ROLL) DISPENSER
F	TOILET TISSUE (ROLL) DISPENSER
G	GRAB BAR 18" VERTICAL
H	GRAB BAR 36", 42" AND 18" VERTICAL, AT ACCESSIBLE TOILET
I	MIRROR UNIT - 24" X 60"
J	COMBINATION TOWEL DISPENSER/WASTE RECEPTACLE - 12 GALLON
K	COMBINATION TOWEL DISPENSER/WASTE RECEPTACLE - 18 GALLON
L	SHELF/HOOK BROOM HOLDER
M	PAPER TOWEL DISPENSER, SURFACE MOUNT
N	AUTOMATIC SOAP DISPENSER, COUNTER SET
O	PAPER TOWEL DISPENSER, COUNTER SET
P	SHOWER SEAT - SEE SPEC FOR SHOWER UNIT
Q	SHOWER CURTAIN ROD, CURTAIN, AND HOOKS
R	MIRROR UNIT - 24" X 36" - PROVIDE BLOCKING
S	MIRROR UNIT - 36" X 48" - PROVIDE BLOCKING
T	MIRROR UNIT - 62" X 48" - PROVIDE BLOCKING
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V	DIAPER-CHANGING STATION
W	HOOK - 48" AFF
X	HOOK - 60" AFF
Y	PAPER TOWEL DISPENSER + WASTE - RECESSED
Z	COAT RACK - 24"
AA	COAT RACK - 48"
BB	PAPER TOWEL DISPENSER, PAPER ROLL
CC	*NOT USED*
DD	FLOATING BENCH - SEE TYP. MILLWORK DETAIL SHEET
EE	FLAT PANEL DISPLAY/MOUNTING BRACKET - SEE TA SERIES DRAWINGS PROVIDE MANUFACTURER RECOMMENDED IN/WALL BLOCKING AS REQUIRED
FF	*NOT USED*
GG	*NOT USED*
HH	FEMININE NAPKIN DISPENSER - SEMI-RECESSED

APPLIANCES KEY NOTES

A-1	REFRIGERATOR / FREEZER W/ ICE MAKER
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A-5	MICROWAVE - COUNTERTOP
A-6	COMMERCIAL WASHER MACHINE
A-7	COMMERCIAL DRYER MACHINE
A-8	PLUMBED SUPPLY WATER LINE FOR FUTURE COFFE MACHINE SYSTEM (BY OWNER), SEE PLUMBING DWGS.

GRAPHIC LEGEND

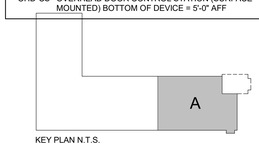
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1/4" / 12" FLOOR SLOPE (ARROW INDICATING DOWN DIRECTION)

BUILDING ELEMENT ABBREVIATIONS

CJ	CONTROL JOINT (IN GWB)
C-PH-W	WALL PHONE
B-BD	BOLLARD, BOLT-DOWN, (INTERIOR & EXTERIOR ON FROST PROTECTED SLABS)
B-S	BOLLARD, SITE (EXTERIOR) POST IN CONCRETE FOOTING, REFER TO SITE / CIVIL
FD	FLOOR DRAIN
FSC	FLOOR SANITARY CLEANOUT — PROVIDE 2 HR. RATED PENETRATION FIRESTOPPING AT ANNULAR SPACE OF FLOOR PENETRATIONS. COORDINATE FINAL LOCATIONS WITH PLUMBING WORK, SEE PLUMBING DRAWINGS.
FE-##	FIRE EXTINGUISHER. SEE PLANS & LEGEND ON G-003 & G-004 FOR MORE INFOMRATION, INCLUDING FE TYPE AND MOUNTING/HOUSING TYPE
OHD-CS	OVERHEAD DOOR CONTROL STATION (SURFACE MOUNTED) BOTTOM OF DEVICE = 5'-0" AFF



KEY PLAN N.T.S.

Autodesk Docs://47528 DOT Lab Building/082990_OGS-DOT-LabBuilding_ARCH-CORE_R23.rvt
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42x30 PLOT SHEET

Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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REGISTERED ARCHITECT ALEKSANDAR JANJIC 031128 STATE OF NEW YORK

REGISTRATION EXPIRES: 03/31/2028

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

MARK	DATE	DESCRIPTION
7	04/17/26	ADDENDUM 7
6	04/14/26	ADDENDUM 6
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: SMD

DRAWN BY: JJS

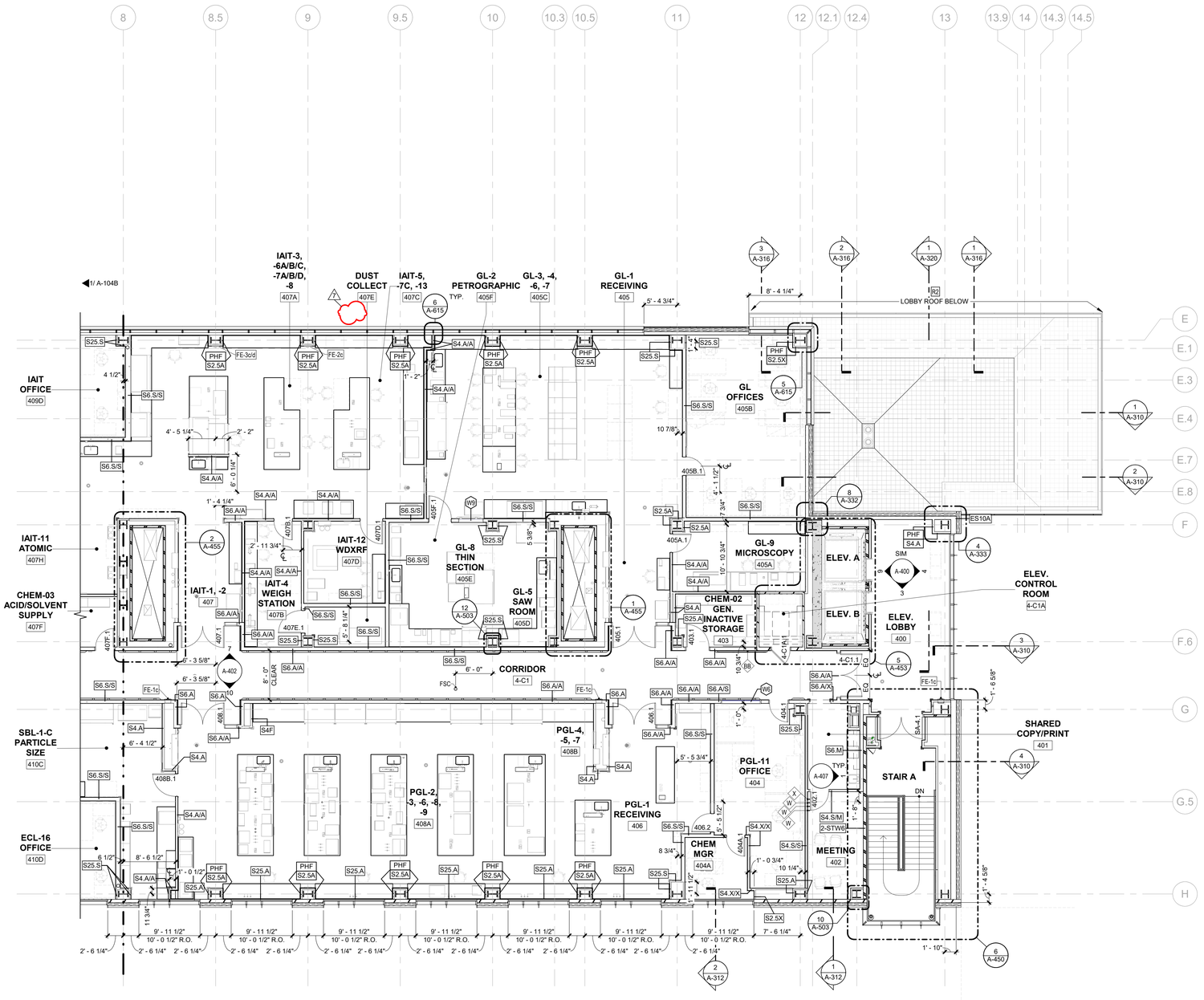
FIELD CHECK:

APPROVED:

SHEET TITLE: LEVEL 3 - AREA A - FLOOR PLAN

DRAWING NUMBER: A-103A

SHEET: OF



1 LEVEL 4 - AREA A - FLOOR PLAN

1/8" = 1'-0"

FLOOR PLAN NOTES

1. SEE SHEET A-001 FOR ADDITIONAL NON-LABORATORY PLAN GENERAL NOTES
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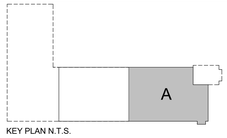
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KEY PLAN N.T.S.

Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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REGISTERED ARCHITECT ALEKSANDAR JANJIC 15 AA 071126 STATE OF NEW YORK

REGISTRATION EXPIRES: 03/31/2026

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
7	04/17/26	ADDENDUM 7
6	04/14/26	ADDENDUM 6
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: SMD

DRAWN BY: JJS

FIELD CHECK:

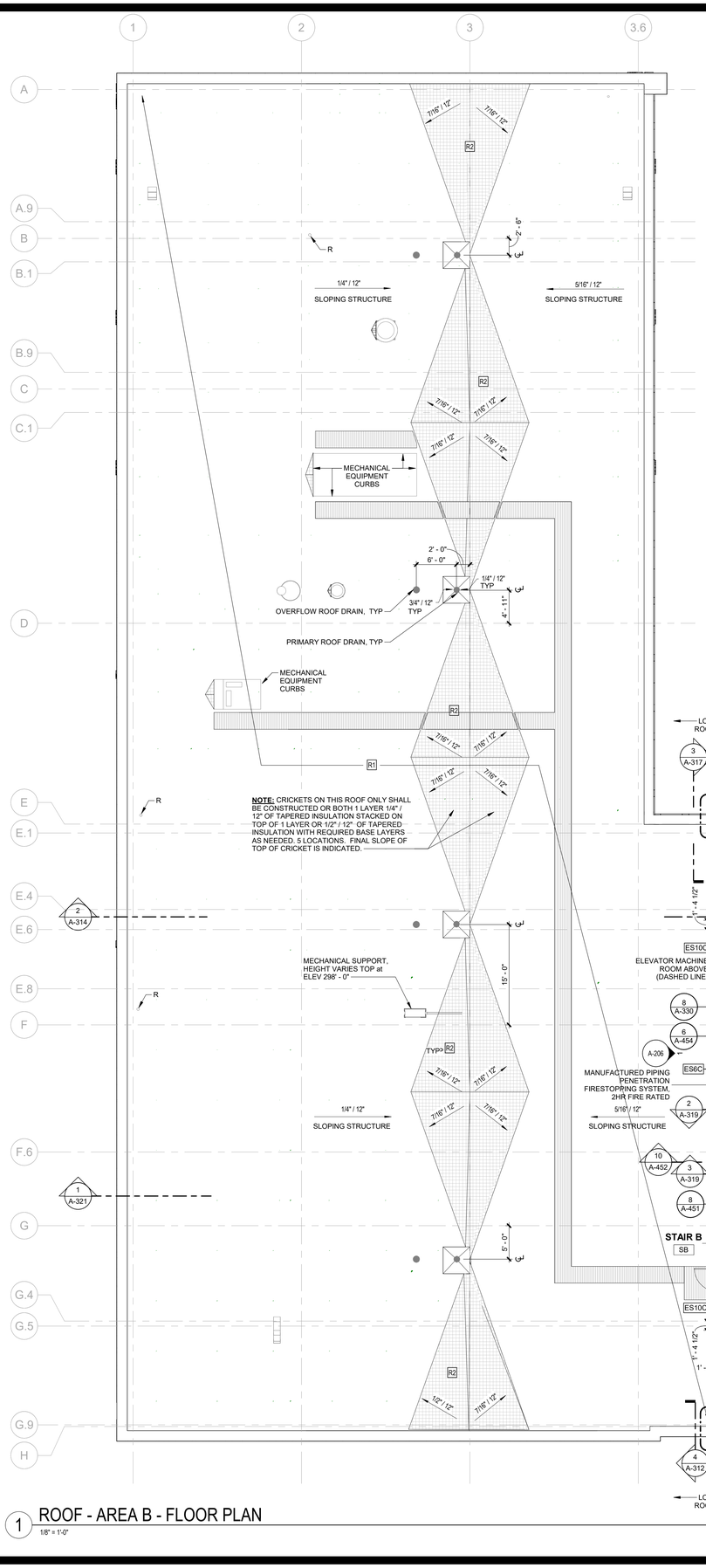
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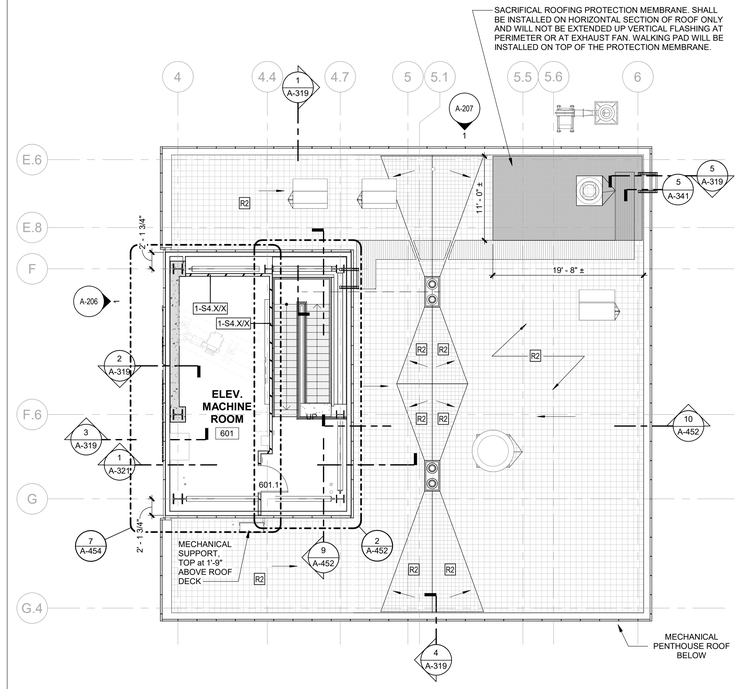
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SHEET: OF

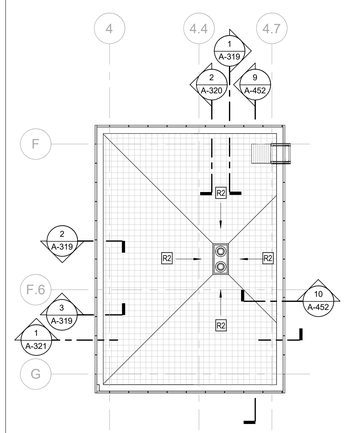
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1 ROOF - AREA B - FLOOR PLAN
1/8" = 1'-0"



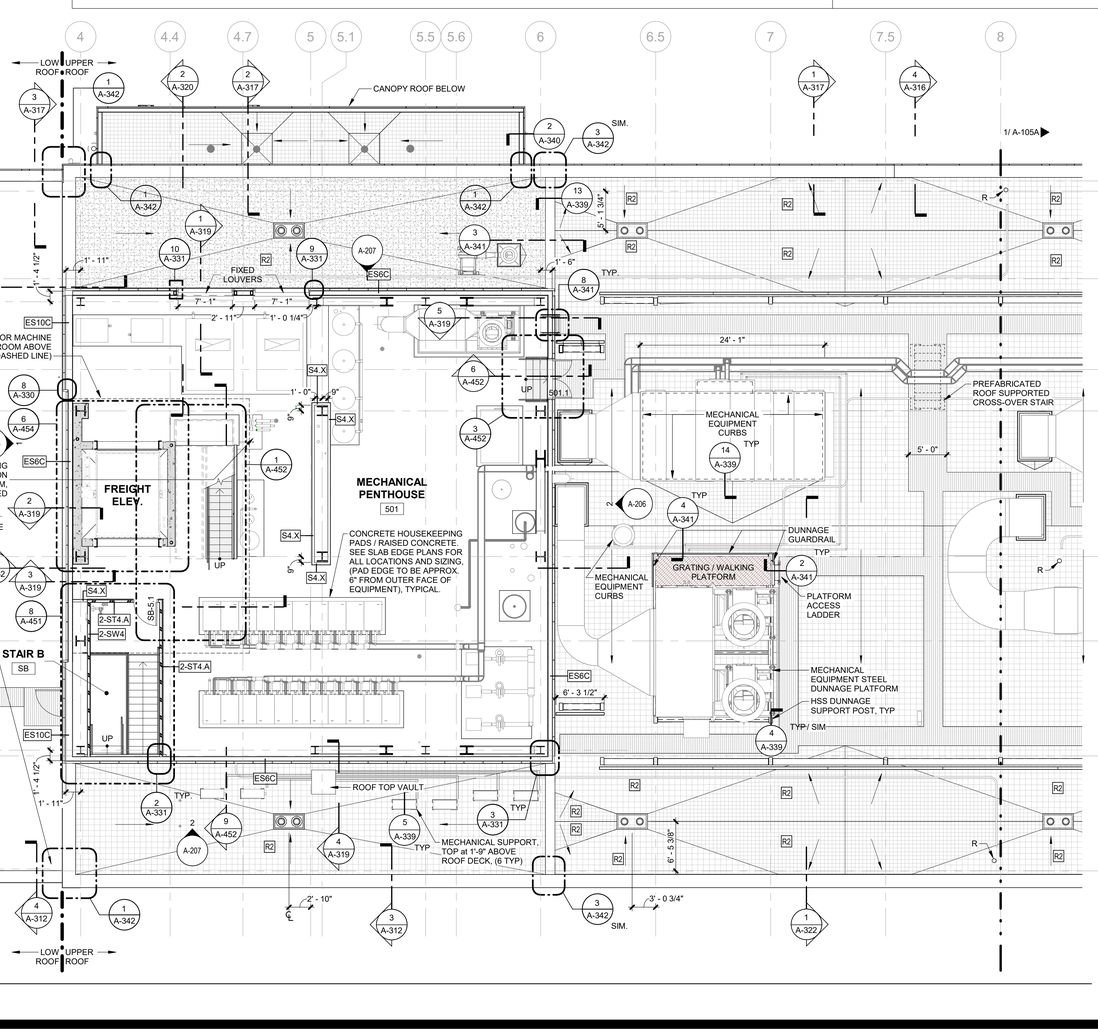
3 ELEV MACHINE RM PLAN / MECHANICAL PENTHOUSE ROOF PLAN
1/8" = 1'-0"



2 ELEV. MACHINE RM ROOF PLAN
1/8" = 1'-0"

ROOF GENERAL NOTES

1. SEE SHEET A-105A FOR ROOF GENERAL NOTES.



ROOF LEGEND GRAPHIC LEGEND:

ROOF SYSTEMS - SEE TYPICAL ASSEMBLIES SHEET

EJ - BUILDING EXPANSION JOINT

TB - TOP OF PARAPET BLOCKING (HEIGHT FROM LEVEL 1)

LAD - ROOF LADDER

RWPP - ROOF WALKWAY PROTECTION PAD

ROOF DRAIN - COMBINATION DRAIN WITH 4x4 SUMP

TAPERED INSULATION - 1/4"/FT MIN SLOPE

TAPERED INSULATION - 1/2"/FT MIN SLOPE

TAPERED INSULATION CRICKET - 1/2"/FT MIN SLOPE

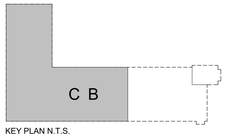
ROOF EPDM MEMBRANE (SACRIFICIAL LAYER) OF 90-MIL, ADHERED TO THE PRIMARY ROOF MEMBRANE BENEATH AND EDGES TO BE LAP SEALED. REFERENCE ROOF ASSEMBLIES ON SHEET A-004.

APPROXIMATE ZONE OF WALKWAY PROTECTION PADS - TO BE PLACED AT ALL EQUIP. SERVICE AREAS, DOORS, AND LADDERS . SHALL BE LOCATED 10' MIN AWAY FROM ROOF EDGES.

ROOF SLOPE (ARROW INDICATING DOWN DIRECTION. SEE INSULATION TYPES FOR AMOUNT OF SLOPE)

M INDICATES ROOFTOP MECHANICAL UNITS THAT ARE TO BE CURB MOUNTED. CONFIRM ALL LOCATIONS AND ANY ADDITIONAL EQUIPMENT NOT NOTED ON THE ROOF PLAN WITH MEP DRAWINGS. NO CURB MOUNTED EQUIPMENT TO BE LOCATED WITHIN 10' OF ROOF EDGE.

R RADON VENT STACK, SEE MECHANICAL PIPING PLANS



KEY PLAN N.T.S.

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REGISTERED ARCHITECT ALEXANDAR JANIC 035711 STATE OF NEW YORK

REGISTRATION EXPIRES: 03/31/2026

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

7	04/17/26	ADDENDUM 7
	01/13/26	BID DOCUMENT
MARK	DATE	DESCRIPTION

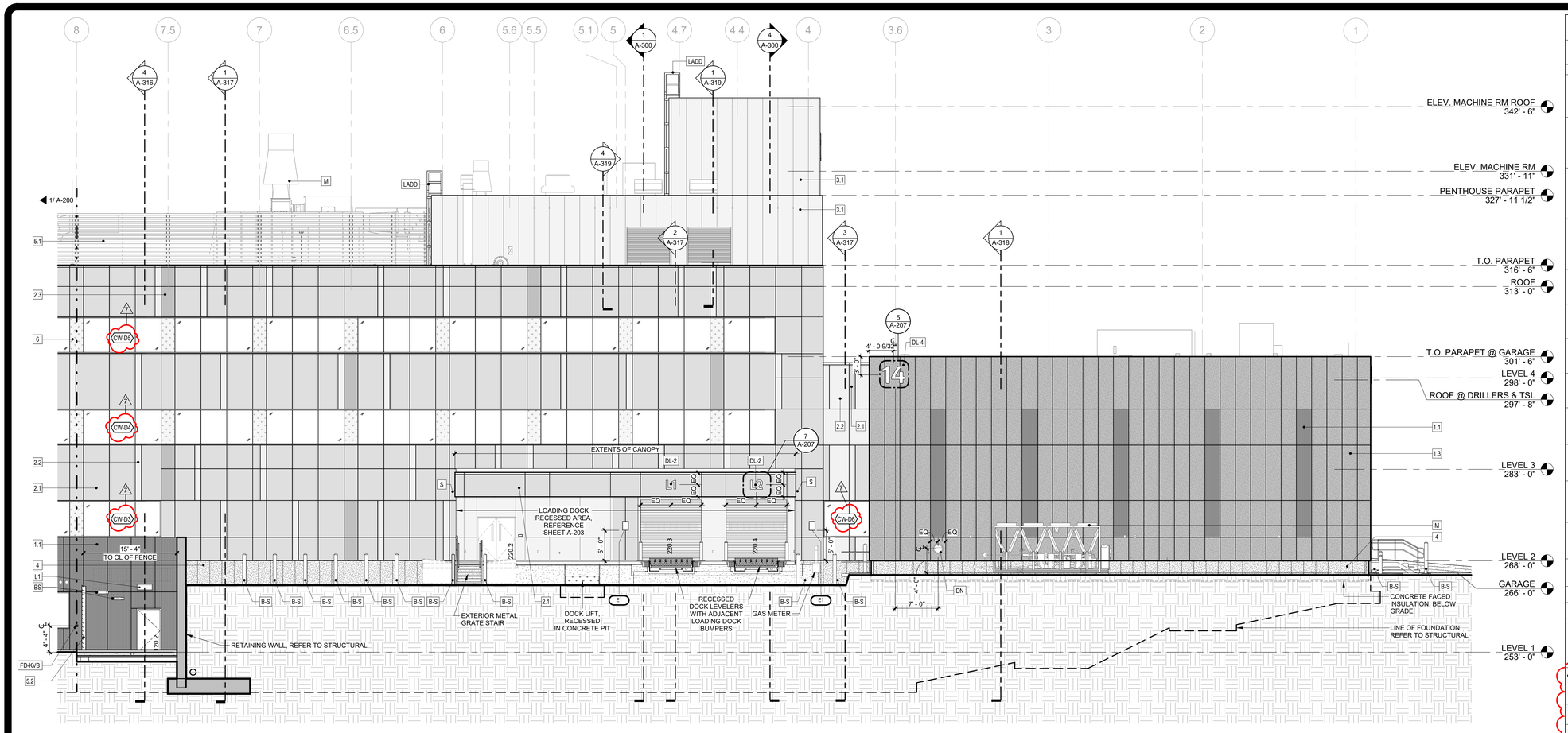
PROJECT NUMBER: 47528-C
DESIGNED BY: SMD
DRAWN BY: JJS
FIELD CHECK:
APPROVED:

SHEET TITLE: ROOF - AREA B - MECH. PENTHOUSE & ELEV. MACHINE RM

DRAWING NUMBER: A-105B

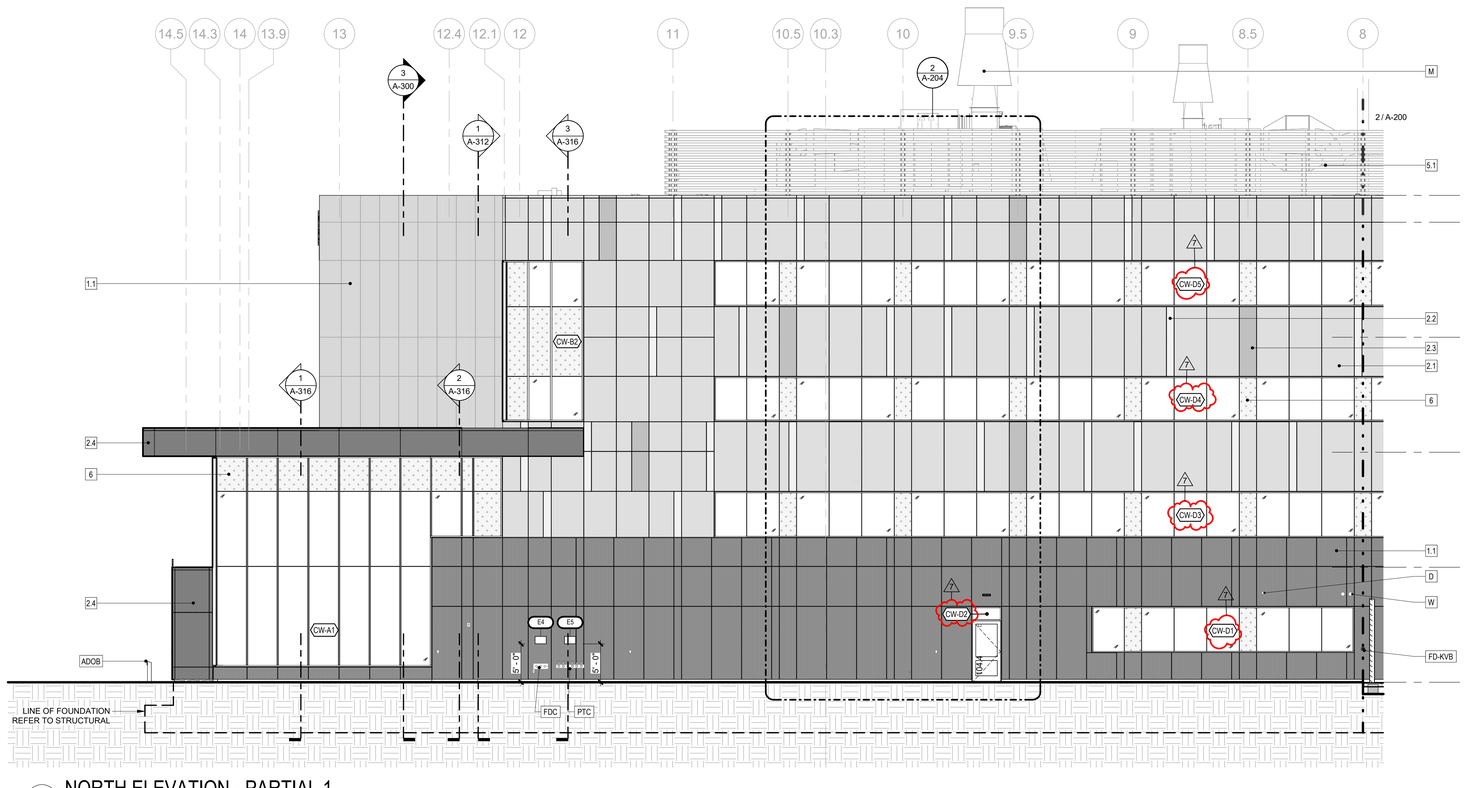
SHEET: OF

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42x30 PLOT SHEET



2 NORTH ELEVATION - PARTIAL 2

1/8" = 1'-0"



1 NORTH ELEVATION - PARTIAL 1

1/8" = 1'-0"

EXTERIOR COMPONENT & MATERIALS LEGEND

MATERIALS AND PRODUCTS LISTED BELOW ARE BASIS OF DESIGN SELECTIONS. REFERENCE SPECIFICATIONS FOR APPROVED EQUAL MATERIALS AND PRODUCTS.

TAG	COMPONENT
1.0	CP-1: CAST IN PLACE PLASTIC FORMLINER MFR: RECKLI PATTERN:2/211 SAMBRE FINISH: SMOOTH COLOR: BLACK
1.1	FC-1: FIBER CEMENT PANEL, TYPE 1 MFR: EQUITONE TEXTURE: LINEA COLOR: LT85 PANEL THICKNESS: 8MM SYSTEM: FACE FIXING
1.2	FC-2: FIBER CEMENT PANEL, TYPE 2 MFR: EQUITONE TEXTURE: NATURA COLOR: N161 PANEL THICKNESS: 8MM SYSTEM: FACE FIXING
1.3	FC-3: FIBER CEMENT PANEL, TYPE 3 MFR: EQUITONE TEXTURE: TECTIVA COLOR:TE20 PANEL THICKNESS: 8MM SYSTEM: FACE FIXING
2.1	ACM-1: ALUMINUM COMPOSITE PANEL, TYPE 1 MFR: ALUCOBOND COLOR: PLATINUM MICA SYSTEM: ROUTE & RETURN
2.2	ACM-2: ALUMINUM COMPOSITE PANEL, TYPE 2 MFR: ALUCOBOND COLOR: ANODIC SATIN MICA SYSTEM: ROUTE & RETURN
2.3	ACM-3: ALUMINUM COMPOSITE PANEL, TYPE 3 MFR: ALUCOBOND COLOR: BRILLIANT SILVER METALLIC SYSTEM: ROUTE & RETURN
2.4	ACM-4: ALUMINUM COMPOSITE PANEL, TYPE 4 MFR: ALUCOBOND COLOR: SERPENTINE METALLIC SYSTEM: ROUTE & RETURN
3.1	IMP-1: INSULATED METAL PANEL MFR: CENTRIA PRODUCT: FORMAWALL COLOR: #9967 XL PEWTER
3.2	IMP-2: INSULATED METAL PANEL MFR: CENTRIA PRODUCT: FORMAWALL COLOR: #9989 PLATINUM
4	C1: CONCRETE FACED INSULATION MFR: T-CLEAR PRODUCT: WALLGUARD PAINT: MASONRY ACRYLIC LATEX, COLOR: (EP-1)
5.1	EQUIPMENT SCREENING - ROOFTOP MECH. PER SECTION 108213.13
5.2	EQUIPMENT SCREEN AT - ELEC. SUBSTATION REFERENCE CIVIL/SITE, STRUCTURAL DRAWINGS AND SPECIFICATIONS
6	SPANDREL PANEL
7	OUTRIGGER SUNSHADE
CW-#	CURTAIN WALL SYSTEM TAG ALL CURTAIN WALL TYPES TO RECEIVE CUSTOM MULLION CAP AT SILL, JAMB AND HEAD
FCW-##	FIRE RATED CURTAIN WALL TAG ALL STOREFRONT TYPES TO RECEIVE CUSTOM MULLION CAP AT SILL, JAMB AND HEAD
M	ROOF MOUNTED MECHANICAL EQUIPMENT, SEE MEP DRAWINGS
B-S	BOLLARD, SITE (REFERENCE CIVIL)
B-BD	BOLLARD, BOLT-DOWN
LADD	ROOFTOP ACCESS LADDER
FD-KVB	FD-KVB - FIRE DEPARTMENT KEY VAULT BOX MFR: KNOX PRODUCT: ELECTRONIC KNOXVAULT 4400 COLOR: BLACK INSTALLATION: RECESS MOUNT
DL-1	DL-1 - DIMENSIONAL LETTER SIGNAGE, 12" TALL, BOTTOM BACK ANGLE BRACKET CAST ALUMINUM, BLACK ANODIZED HALO LIT
DL-2	DL -2 - DIMENSIONAL LETTER SIGNAGE, 12" TALL, PROJECTED STAND OFF CAST ALUMINUM, BLACK ANODIZED HALO LIT
DL-3	DL-3 - DIMENSIONAL LETTER SIGNAGE, 8" TALL LETTERS, 12" TALL NUMBERS PROJECTED STAND OFF CAST ALUMINUM , BLACK ANODIZED NO LIGHTING
DL-4	DL-4 - DIMENSIONAL LETTER SIGNAGE, 24" TALL, PROJECTED STAND OFF CAST ALUMINUM, BLACK ANODIZED HALO LIT
DL-5	DL-5 - DIMENSIONAL LETTER SIGNAGE, 9" TALL LETTERING, 15" TALL LETTERING CUSTOM LOGO ACRYLIC FACE - COLOR: DARK GRAY TRANSLUCENT TITANIUM SATIN BLACK RETURN FACELIT - TRIMLESS
CR	CR - CARD READER (DOOR ACCESS CONTROL, SEE SECURITY DWGS)
FDC	FDC - FIRE DEPARTMENT CONNECTION, SEE FIRE PROTECTION DWGS
PTC	PTC - PUMP TEST CONNECTION, SEE FIRE PROTECTION DWGS
DN	DN - DOWNSPOUT NOZZLE/COVER, SEE PLUMBING DWGS
ADOB	AUTOMATIC DOOR OPERATOR BOLLARD - SEE DOOR HARDWARE SPECIFICATION
ELF	EXTERIOR LIGHT FIXTURE - SEE ELECTRICAL DRAWINGS
L1	LOUVER, REFER TO MECHANICAL
L2	LOUVER, REFER TO MECHANICAL
S	THROUGH WALL SCUPPER MATCH ADJACENT COLOR OF FACADE
BS	THROUGH WALL BUSWAY SYSTEM, - SEE ELECTRICAL DRAWINGS PENETRATION DETAIL: 6 / A-620
W	WATER HEATER VENT, REFER TO MECHANICAL
D	DRYER VENT, REFER TO MECHANICAL

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REGISTERED ARCHITECT ALEKSANDAR JANJIC 031173 STATE OF NEW YORK

REGISTRATION EXPIRES: 03/31/2028

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
7	04/17/26	ADDENDUM 7
6	04/14/26	ADDENDUM 6
3	03/25/26	ADDENDUM 3
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: SMD

DRAWN BY: JJS

FIELD CHECK:

APPROVED:

SHEET TITLE: NORTH EXTERIOR ELEVATIONS

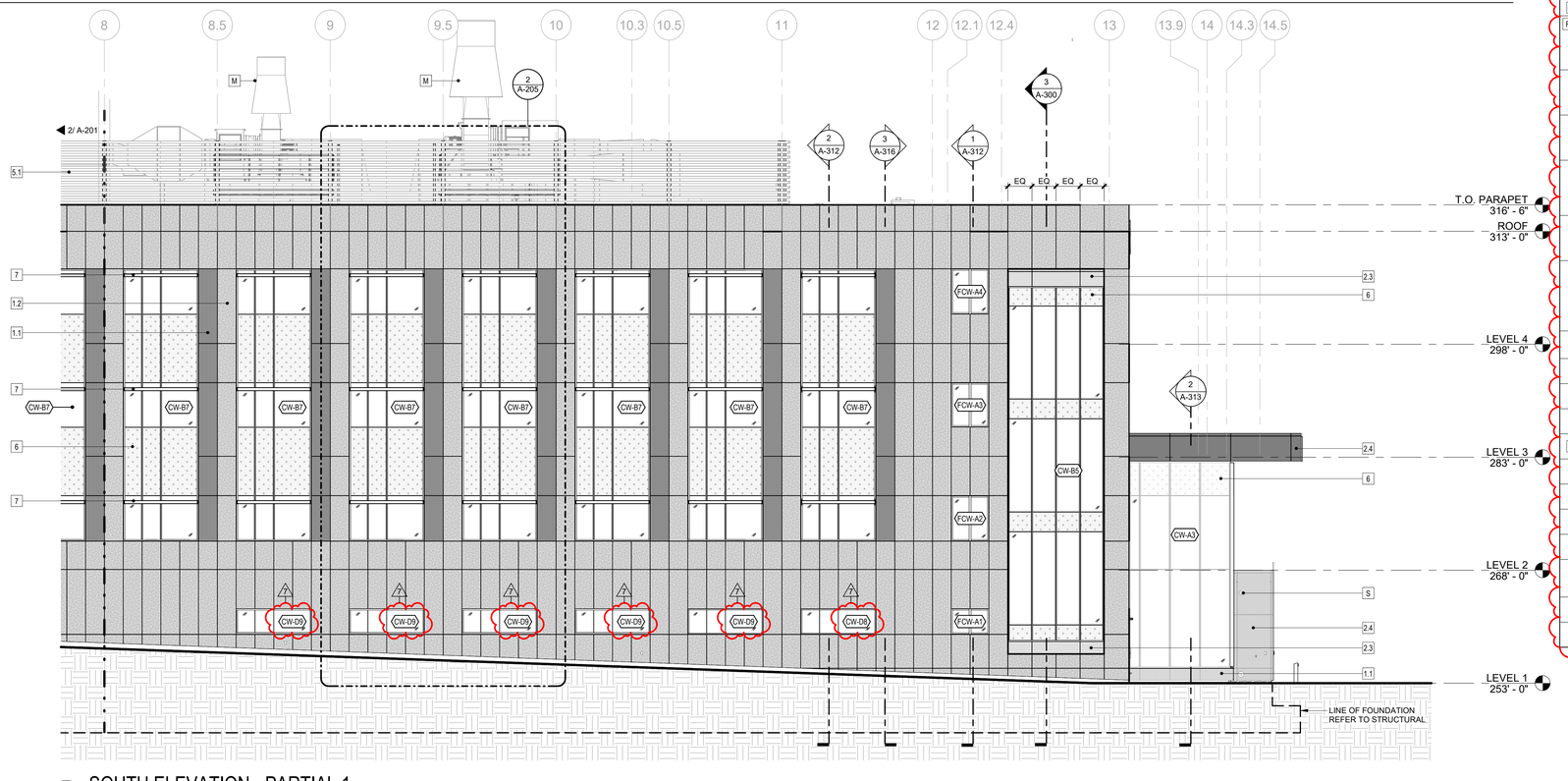
DRAWING NUMBER: A-200

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4/16/2026 6:05:27 PM
42x30 PLOT SHEET



2 SOUTH ELEVATION - PARTIAL 2
1/8" = 1'-0"



1 SOUTH ELEVATION - PARTIAL 1
1/8" = 1'-0"

EXTERIOR COMPONENT & MATERIALS LEGEND

MATERIALS AND PRODUCTS LISTED BELOW ARE BASIS OF DESIGN SELECTIONS. REFERENCE SPECIFICATIONS FOR APPROVED EQUAL MATERIALS AND PRODUCTS.

TAG	COMPONENT
1.0	CP-1: CAST IN PLACE PLASTIC FORMLINER MFR: RECKLI PATTERN:2/211 SAMBRE FINISH: SMOOTH COLOR: BLACK
1.1	FC-1: FIBER CEMENT PANEL, TYPE 1 MFR: EQUITONE TEXTURE: LINEA COLOR: LT85 PANEL THICKNESS: 8MM SYSTEM: FACE FIXING
1.2	FC-2: FIBER CEMENT PANEL, TYPE 2 MFR: EQUITONE TEXTURE: NATURA COLOR: N161 PANEL THICKNESS: 8MM SYSTEM: FACE FIXING
1.3	FC-3: FIBER CEMENT PANEL, TYPE 3 MFR: EQUITONE TEXTURE: TECTIVA COLOR:TE20 PANEL THICKNESS: 8MM SYSTEM: FACE FIXING
2.1	ACM-1: ALUMINUM COMPOSITE PANEL, TYPE 1 MFR: ALUCOBOND COLOR: PLATINUM MICA SYSTEM: ROUTE & RETURN
2.2	ACM-2: ALUMINUM COMPOSITE PANEL, TYPE 2 MFR: ALUCOBOND COLOR: ANODIC SATIN MICA SYSTEM: ROUTE & RETURN
2.3	ACM-3: ALUMINUM COMPOSITE PANEL, TYPE 3 MFR: ALUCOBOND COLOR: BRILLIANT SILVER METALLIC SYSTEM: ROUTE & RETURN
2.4	ACM-4: ALUMINUM COMPOSITE PANEL, TYPE 4 MFR: ALUCOBOND COLOR: SERPENTINE METALLIC SYSTEM: ROUTE & RETURN
3.1	IMP-1: INSULATED METAL PANEL MFR: CENTRIA PRODUCT: FORMAWALL COLOR: #9967 XL PEWTER
3.2	IMP-2: INSULATED METAL PANEL MFR: CENTRIA PRODUCT: FORMAWALL COLOR: #9989 PLATINUM
4	C1: CONCRETE FACED INSULATION MFR: T-CLEAR PRODUCT: WALLGUARD PAINT: MASONRY ACRYLIC LATEX, COLOR: (EP-1)
5.1	EQUIPMENT SCREENING - ROOFTOP MECH. PER SECTION 108213.13
5.2	EQUIPMENT SCREEN AT - ELEC. SUBSTATION REFERENCE CIVIL/SITE, STRUCTURAL DRAWINGS AND SPECIFICATIONS
6	SPANDREL PANEL
7	OUTRIGGER SUNSHADE
CW-#	CURTAIN WALL SYSTEM TAG ALL CURTAIN WALL TYPES TO RECEIVE CUSTOM MULLION CAP AT SILL, JAMB AND HEAD
FCW-##	FIRE RATED CURTAIN WALL TAG ALL STOREFRONT TYPES TO RECEIVE CUSTOM MULLION CAP AT SILL, JAMB AND HEAD
M	ROOF MOUNTED MECHANICAL EQUIPMENT, SEE MEP DRAWINGS
B-S	BOLLARD, SITE (REFERENCE CIVIL)
B-BD	BOLLARD, BOLT-DOWN
LADD	ROOFTOP ACCESS LADDER
FD-KVB	FD-KVB - FIRE DEPARTMENT KEY VAULT BOX MFR: KNOX PRODUCT: ELECTRONIC KNOXVAULT 4400 COLOR: BLACK INSTALLATION: RECESS MOUNT
DL-1	DL-1 - DIMENSIONAL LETTER SIGNAGE, 12" TALL, BOTTOM BACK ANGLE BRACKET CAST ALUMINUM, BLACK ANODIZED HALO LIT
DL-2	DL -2 - DIMENSIONAL LETTER SIGNAGE, 12" TALL, PROJECTED STAND OFF CAST ALUMINUM, BLACK ANODIZED HALO LIT
DL-3	DL-3 - DIMENSIONAL LETTER SIGNAGE, 8" TALL LETTERS, 12" TALL NUMBERS PROJECTED STAND OFF CAST ALUMINUM , BLACK ANODIZED NO LIGHTING
DL-4	DL-4 - DIMENSIONAL LETTER SIGNAGE, 24" TALL, PROJECTED STAND OFF CAST ALUMINUM, BLACK ANODIZED HALO LIT
DL-5	DL-5 - DIMENSIONAL LETTER SIGNAGE, 9" TALL LETTERING, 15" TALL LETTERING CUSTOM LOGO ACRYLIC FACE - COLOR: DARK GRAY TRANSLUCENT TITANIUM SATIN BLACK RETURN FACELIT - TRIMLESS
CR	CR - CARD READER (DOOR ACCESS CONTROL, SEE SECURITY DWGS)
FDC	FDC - FIRE DEPARTMENT CONNECTION, SEE FIRE PROTECTION DWGS
PTC	PTC - PUMP TEST CONNECTION, SEE FIRE PROTECTION DWGS
DN	DN - DOWNSPOUT NOZZLE/COVER, SEE PLUMBING DWGS
ADOB	AUTOMATIC DOOR OPERATOR BOLLARD - SEE DOOR HARDWARE SPECIFICATION
ELF	EXTERIOR LIGHT FIXTURE - SEE ELECTRICAL DRAWINGS
L1	LOUVER, REFER TO MECHANICAL
L2	LOUVER, REFER TO MECHANICAL
S	THROUGH WALL SCUPPER MATCH ADJACENT COLOR OF FACADE
BS	THROUGH WALL BUSWAY SYSTEM, - SEE ELECTRICAL DRAWINGS PENETRATION DETAIL: 6 / A-620
W	WATER HEATER VENT, REFER TO MECHANICAL
D	DRYER VENT, REFER TO MECHANICAL

7

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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REGISTERED ARCHITECT ALEKSANDAR JANJIC 037122 STATE OF NEW YORK

REGISTRATION EXPIRES: 03/31/2026

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

7	04/17/26	ADDENDUM 7
6	04/14/26	ADDENDUM 6
3	03/25/26	ADDENDUM 3
	01/13/26	BID DOCUMENT

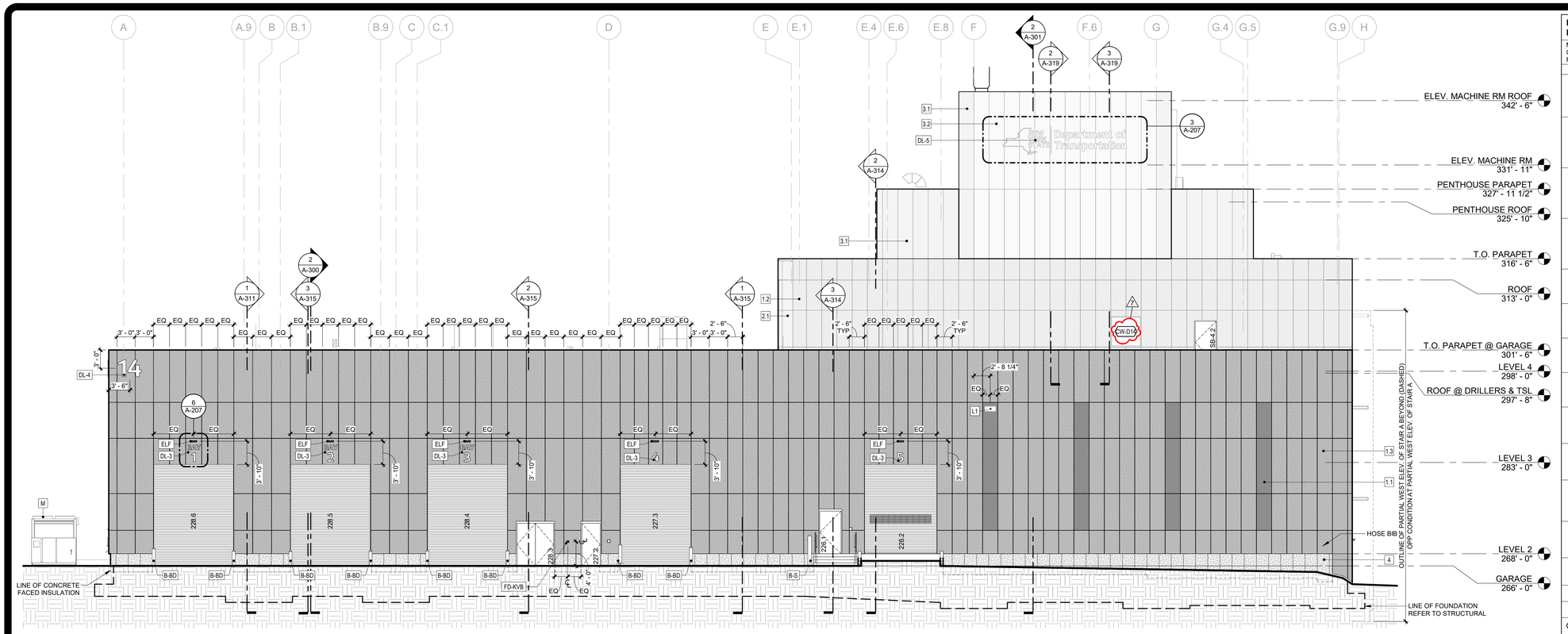
MARK	DATE	DESCRIPTION
PROJECT NUMBER:	47528-C	
DESIGNED BY:	SMD	
DRAWN BY:	JJS	
FIELD CHECK:		
APPROVED:		

SHEET TITLE:
SOUTH EXTERIOR ELEVATIONS

DRAWING NUMBER:
A-201

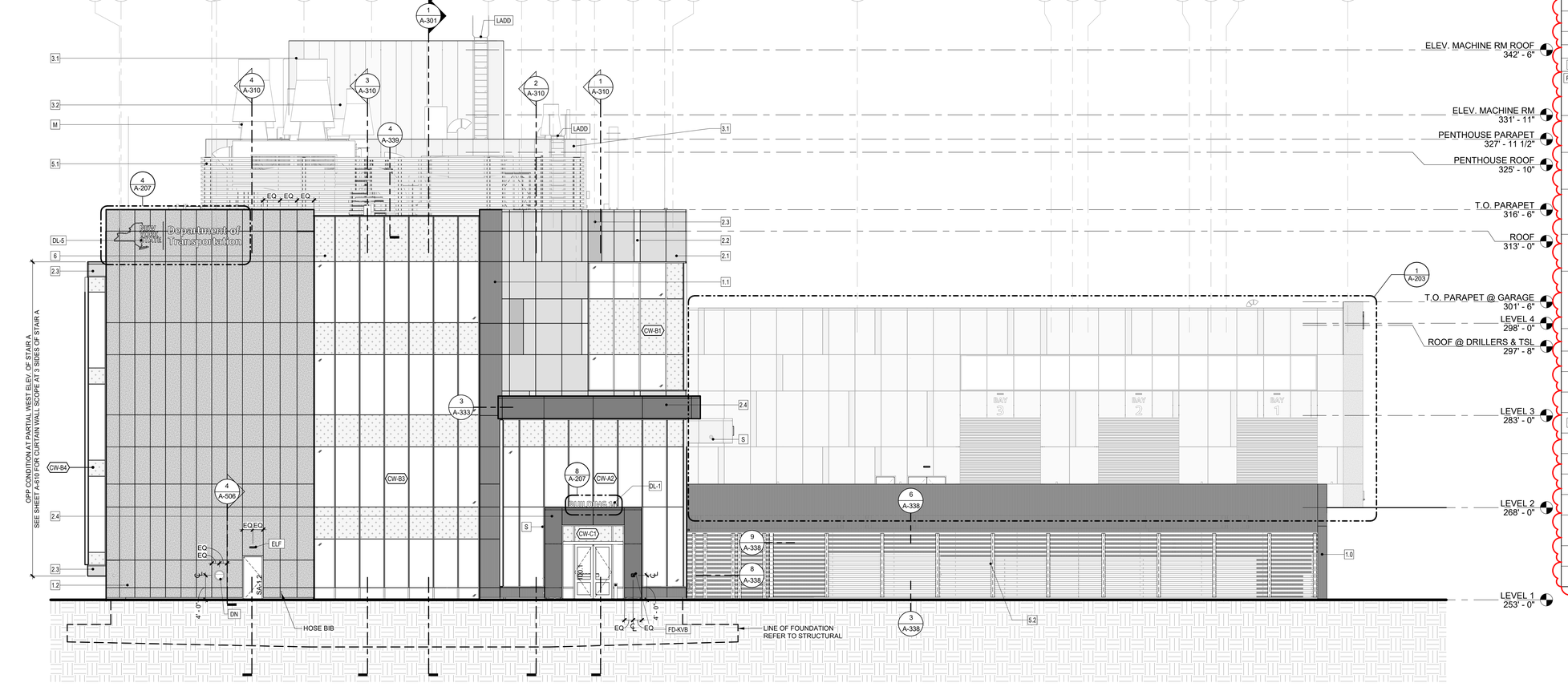
SHEET: OF

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42x30 PLOT SHEET



2 WEST ELEVATION

1/8" = 1'-0"



1 EAST ELEVATION 1

1/8" = 1'-0"

EXTERIOR COMPONENT & MATERIALS LEGEND

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TAG	COMPONENT
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1.2	FC-2: FIBER CEMENT PANEL, TYPE 2 MFR: EQUITONE TEXTURE: NATURA COLOR: N161 PANEL THICKNESS: 8MM SYSTEM: FACE FIXING
1.3	FC-3: FIBER CEMENT PANEL, TYPE 3 MFR: EQUITONE TEXTURE: TECTIVA COLOR:TE20 PANEL THICKNESS: 8MM SYSTEM: FACE FIXING
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DL-4	DL-4 - DIMENSIONAL LETTER SIGNAGE, 24" TALL, PROJECTED STAND OFF CAST ALUMINUM, BLACK ANODIZED HALO LIT
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CR	CR - CARD READER (DOOR ACCESS CONTROL, SEE SECURITY DWGS)
FDC	FDC - FIRE DEPARTMENT CONNECTION, SEE FIRE PROTECTION DWGS
PTC	PTC - PUMP TEST CONNECTION, SEE FIRE PROTECTION DWGS
DN	DN - DOWNSPOUT NOZZLE/COVER, SEE PLUMBING DWGS
ADOB	AUTOMATIC DOOR OPERATOR BOLLARD - SEE DOOR HARDWARE SPECIFICATION
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L1	LOUVER, REFER TO MECHANICAL
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S	THROUGH WALL SCUPPER MATCH ADJACENT COLOR OF FACADE
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W	WATER HEATER VENT, REFER TO MECHANICAL
D	DRYER VENT, REFER TO MECHANICAL

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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REGISTERED ARCHITECT ALEKSANDAR JANJIC 017126 STATE OF NEW YORK

REGISTRATION EXPIRES: 03/31/2026

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
7	04/17/26	ADDENDUM 7
6	04/14/26	ADDENDUM 6
3	03/25/26	ADDENDUM 3
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: SMD

DRAWN BY: JJS

FIELD CHECK:

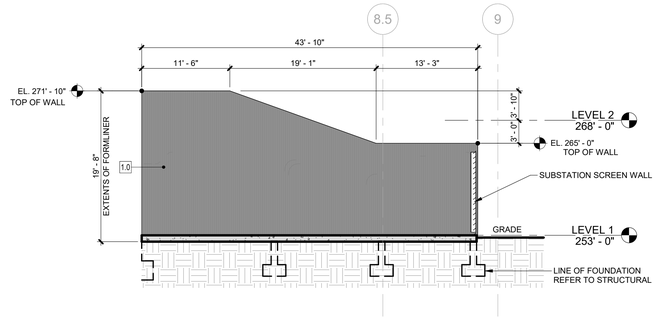
APPROVED:

SHEET TITLE: EAST AND WEST EXTERIOR ELEVATIONS

DRAWING NUMBER: A-202

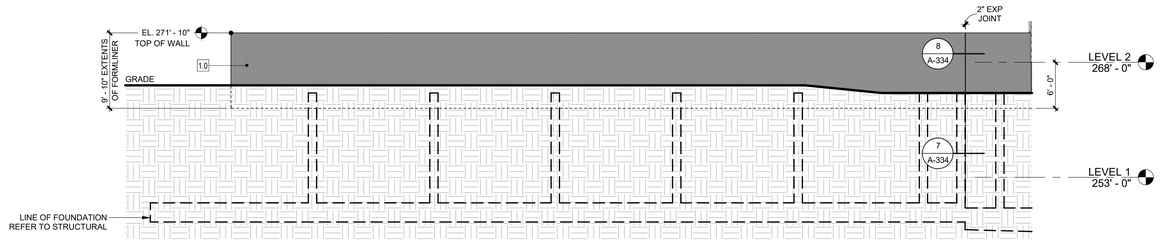
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42x30 PLOT SHEET



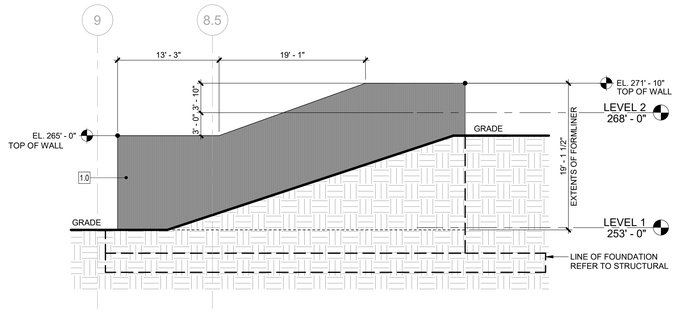
8 RETAINING WALL COORDINATION - SOUTH ELEVATION

1/8" = 1'-0"



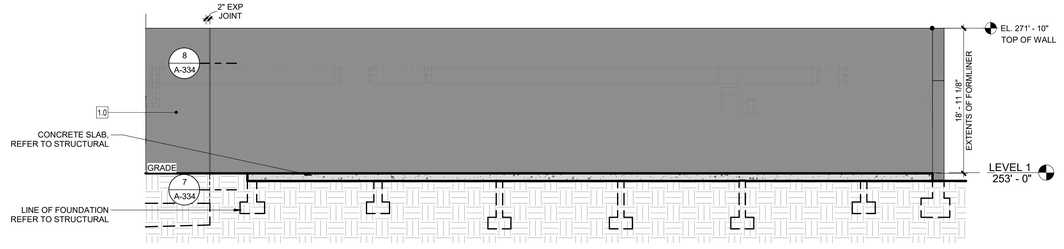
7 RETAINING WALL COORDINATION - WEST ELEVATION

1/8" = 1'-0"



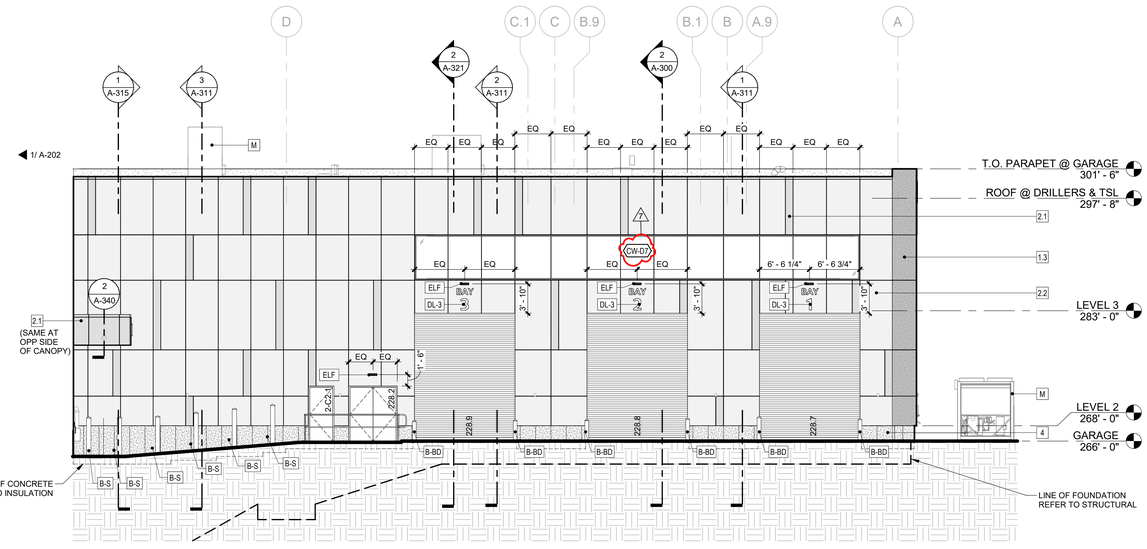
6 RETAINING WALL COORDINATION - NORTH ELEVATION

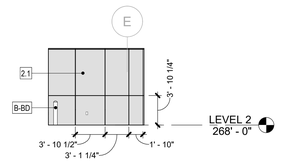
1/8" = 1'-0"



5 RETAINING WALL COORDINATION - EAST ELEVATION

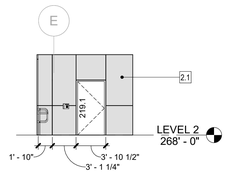
1/8" = 1'-0"





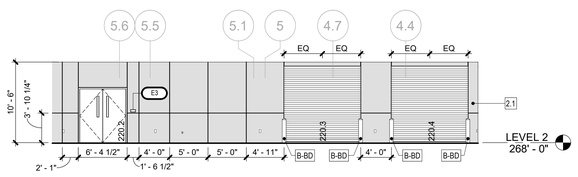
4 LOADING DOCK - WEST ELEVATION

1/8" = 1'-0"



3 LOADING DOCK - EAST ELEVATION

1/8" = 1'-0"



2 LOADING DOCK - NORTH ELEVATION

1/8" = 1'-0"

1 EAST ELEVATION 2

1/8" = 1'-0"

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7	OUTRIGGER SUNSHADE
CW-#	CURTAIN WALL SYSTEM TAG
	ALL CURTAIN WALL TYPES TO RECEIVE CUSTOM MULLION CAP AT SILL, JAMB AND HEAD
FCW-##	FIRE RATED CURTAIN WALL TAG
	ALL STOREFRONT TYPES TO RECEIVE CUSTOM MULLION CAP AT SILL, JAMB AND HEAD
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L1	LOUVER, REFER TO MECHANICAL
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S	THROUGH WALL SCUPPER MATCH ADJACENT COLOR OF FACADE
BS	THROUGH WALL BUSWAY SYSTEM, - SEE ELECTRICAL DRAWINGS PENETRATION DETAIL: 6 / A-620
W	WATER HEATER VENT, REFER TO MECHANICAL
D	DRYER VENT, REFER TO MECHANICAL

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

CHA

envision ARCHITECTS

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ENERGY CODE WRITTEN STATEMENT:
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REGISTERED ARCHITECT
ALEKSANDAR JANJIC
NEW YORK
STATE OF NEW YORK
REGISTRATION EXPIRES: 03/31/2028

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
7	04/17/26	ADDENDUM 7
3	03/25/26	ADDENDUM 3
	01/13/26	BID DOCUMENT

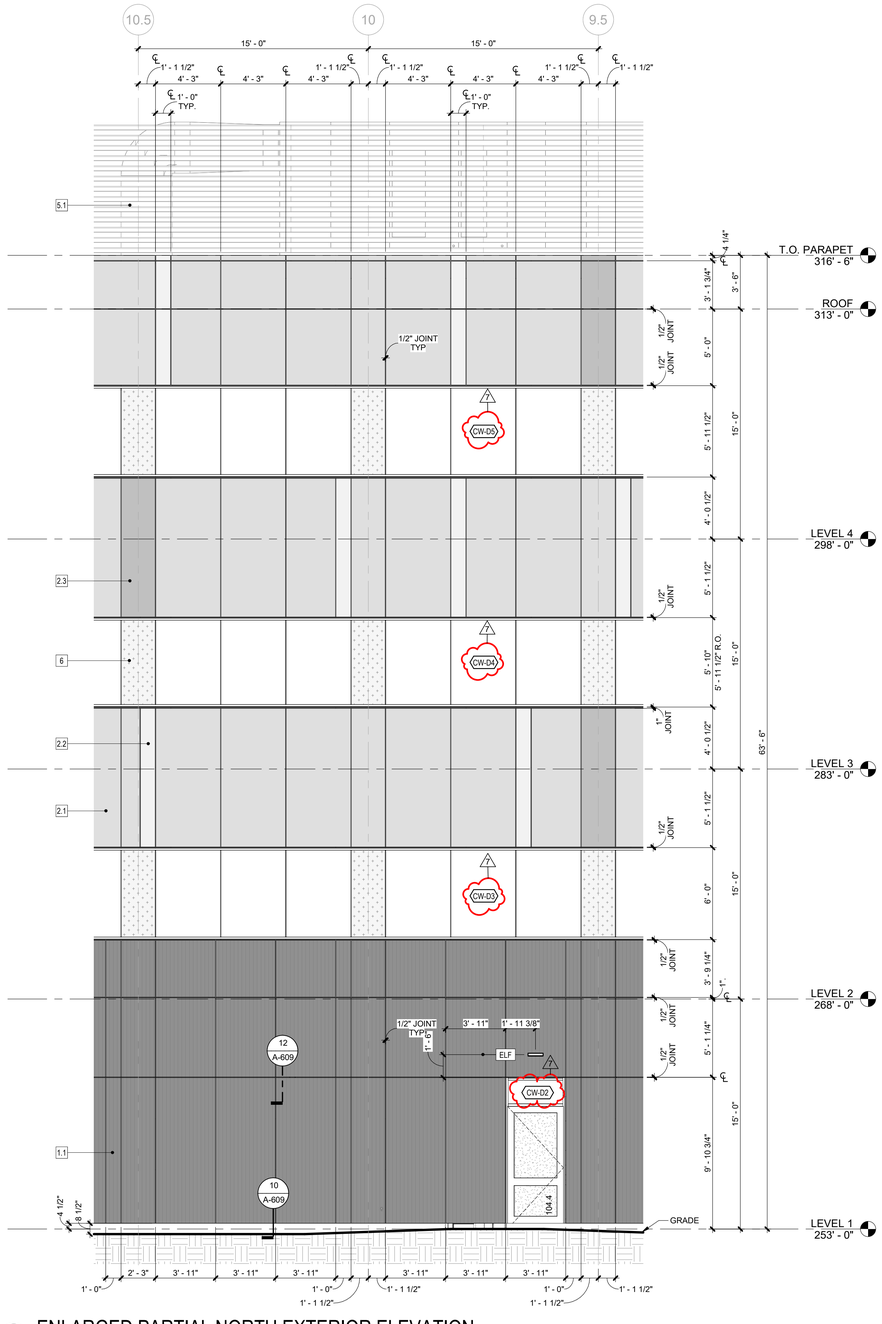
PROJECT NUMBER: 47528-C
DESIGNED BY: SMD
DRAWN BY: JJS
FIELD CHECK:
APPROVED:

SHEET TITLE:
PARTIAL EAST AND NORTH EXTERIOR ELEVATIONS, RETAINING WALL ELEVATIONS

DRAWING NUMBER:
A-203

SHEET: OF

Autodesk Docs://47528 DOT Lab Building/082990_OGS-DOT-LabBuilding_ARCH-CORE_R23.rvt
4/16/2026 6:06:15 PM
42x30 PLOT SHEET



2 ENLARGED PARTIAL NORTH EXTERIOR ELEVATION

1/4" = 1'-0"



1 NORTH FACADE AXON

EXTERIOR COMPONENT & MATERIALS LEGEND

MATERIALS AND PRODUCTS LISTED BELOW ARE BASIS OF DESIGN SELECTIONS. REFERENCE SPECIFICATIONS FOR APPROVED EQUAL MATERIALS AND PRODUCTS.

TAG	COMPONENT
1.0	CP-1: CAST IN PLACE PLASTIC FORMLINER MFR: RECKLI PATTERN:2/211 SAMBRE FINISH: SMOOTH COLOR: BLACK
1.1	FC-1: FIBER CEMENT PANEL, TYPE 1 MFR: EQUITONE TEXTURE: LINEA COLOR: LT85 PANEL THICKNESS: 8MM SYSTEM: FACE FIXING
1.2	FC-2: FIBER CEMENT PANEL, TYPE 2 MFR: EQUITONE TEXTURE: NATURA COLOR: N161 PANEL THICKNESS: 8MM SYSTEM: FACE FIXING
1.3	FC-3: FIBER CEMENT PANEL, TYPE 3 MFR: EQUITONE TEXTURE: TECTIVA COLOR:TE20 PANEL THICKNESS: 8MM SYSTEM: FACE FIXING
2.1	ACM-1: ALUMINUM COMPOSITE PANEL, TYPE 1 MFR: ALUCOBOND COLOR: PLATINUM MICA SYSTEM: ROUTE & RETURN
2.2	ACM-2: ALUMINUM COMPOSITE PANEL, TYPE 2 MFR: ALUCOBOND COLOR: ANODIC SATIN MICA SYSTEM: ROUTE & RETURN
2.3	ACM-3: ALUMINUM COMPOSITE PANEL, TYPE 3 MFR: ALUCOBOND COLOR: BRILLIANT SILVER METALLIC SYSTEM: ROUTE & RETURN
2.4	ACM-4: ALUMINUM COMPOSITE PANEL, TYPE 4 MFR: ALUCOBOND COLOR: SERPENTINE METALLIC SYSTEM: ROUTE & RETURN
3.1	IMP-1: INSULATED METAL PANEL MFR: CENTRIA PRODUCT: FORMAWALL COLOR: #9967 XL PEWTER
3.2	IMP-2: INSULATED METAL PANEL MFR: CENTRIA PRODUCT: FORMAWALL COLOR: #9989 PLATINUM
4	C1: CONCRETE FACED INSULATION MFR: T-CLEAR PRODUCT: WALLGUARD PAINT: MASONRY ACRYLIC LATEX, COLOR: (EP-1)
5.1	EQUIPMENT SCREENING - ROOFTOP MECH. PER SECTION 108213.13
5.2	EQUIPMENT SCREEN AT - ELEC. SUBSTATION REFERENCE CIVIL/SITE, STRUCTURAL DRAWINGS AND SPECIFICATIONS
6	SPANDREL PANEL
7	OUTRIGGER SUNSHADE
CW-#	CURTAIN WALL SYSTEM TAG ALL CURTAIN WALL TYPES TO RECEIVE CUSTOM MULLION CAP AT SILL, JAMB AND HEAD
FCW-##	FIRE RATED CURTAIN WALL TAG ALL STOREFRONT TYPES TO RECEIVE CUSTOM MULLION CAP AT SILL, JAMB AND HEAD
M	ROOF MOUNTED MECHANICAL EQUIPMENT, SEE MEP DRAWINGS
B-S	BOLLARD, SITE (REFERENCE CIVIL)
B-BD	BOLLARD, BOLT-DOWN
LADD	ROOFTOP ACCESS LADDER
FD-KVB	FD-KVB - FIRE DEPARTMENT KEY VAULT BOX MFR: KNOX PRODUCT: ELECTRONIC KNOXVAULT 4400 COLOR: BLACK INSTALLATION: RECESS MOUNT
DL-1	DL-1 - DIMENSIONAL LETTER SIGNAGE, 12" TALL, BOTTOM BACK ANGLE BRACKET CAST ALUMINUM, BLACK ANODIZED HALO LIT
DL-2	DL -2 - DIMENSIONAL LETTER SIGNAGE, 12" TALL, PROJECTED STAND OFF CAST ALUMINUM, BLACK ANODIZED HALO LIT
DL-3	DL-3 - DIMENSIONAL LETTER SIGNAGE, 8" TALL LETTERS, 12" TALL NUMBERS PROJECTED STAND OFF CAST ALUMINUM , BLACK ANODIZED NO LIGHTING
DL-4	DL-4 - DIMENSIONAL LETTER SIGNAGE, 24" TALL, PROJECTED STAND OFF CAST ALUMINUM, BLACK ANODIZED HALO LIT
DL-5	DL-5 - DIMENSIONAL LETTER SIGNAGE, 9" TALL LETTERING, 15" TALL LETTERING CUSTOM LOGO ACRYLIC FACE - COLOR: DARK GRAY TRANSLUCENT TITANIUM SATIN BLACK RETURN FACELIT - TRIMLESS
CR	CR - CARD READER (DOOR ACCESS CONTROL, SEE SECURITY DWGS)
FDC	FDC - FIRE DEPARTMENT CONNECTION, SEE FIRE PROTECTION DWGS
PTC	PTC - PUMP TEST CONNECTION, SEE FIRE PROTECTION DWGS
DN	DN - DOWNSPOUT NOZZLE/COVER, SEE PLUMBING DWGS
ADOB	AUTOMATIC DOOR OPERATOR BOLLARD - SEE DOOR HARDWARE SPECIFICATION
ELF	EXTERIOR LIGHT FIXTURE - SEE ELECTRICAL DRAWINGS
L1	LOUVER, REFER TO MECHANICAL
L2	LOUVER, REFER TO MECHANICAL
S	THROUGH WALL SCUPPER MATCH ADJACENT COLOR OF FACADE
BS	THROUGH WALL BUSWAY SYSTEM, - SEE ELECTRICAL DRAWINGS PENETRATION DETAIL: 6 / A-620
W	WATER HEATER VENT, REFER TO MECHANICAL
D	DRYER VENT, REFER TO MECHANICAL

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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envision ARCHITECTS

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REGISTERED ARCHITECT ALEKSANDAR JANJIC STATE OF NEW YORK

REGISTRATION EXPIRES: 03/31/2028

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
7	04/17/26	ADDENDUM 7
6	04/14/26	ADDENDUM 6
3	03/25/26	ADDENDUM 3
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: SMD

DRAWN BY: JJS

FIELD CHECK:

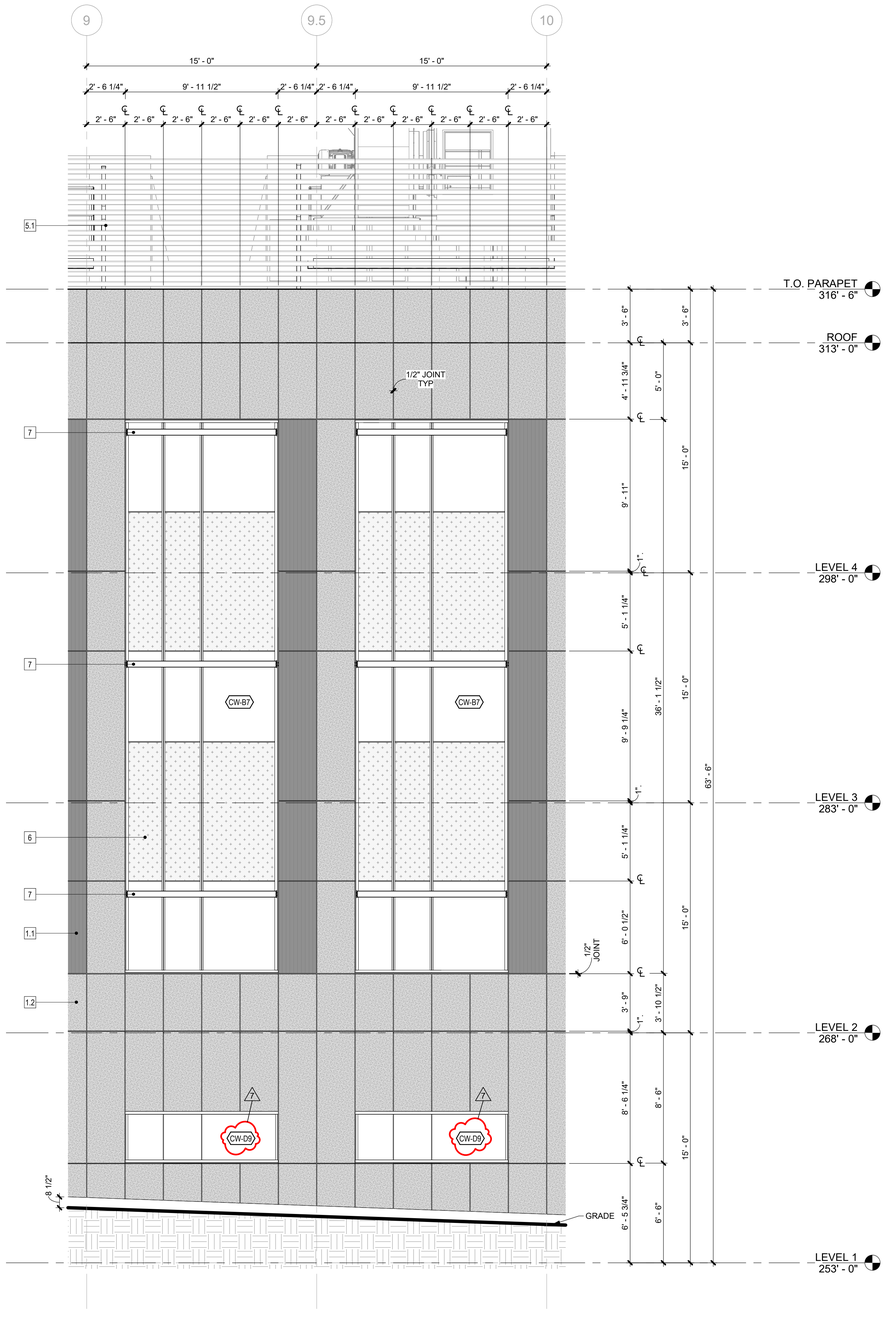
APPROVED:

SHEET TITLE: ENLARGED PARTIAL NORTH EXTERIOR ELEVATION

DRAWING NUMBER: A-204

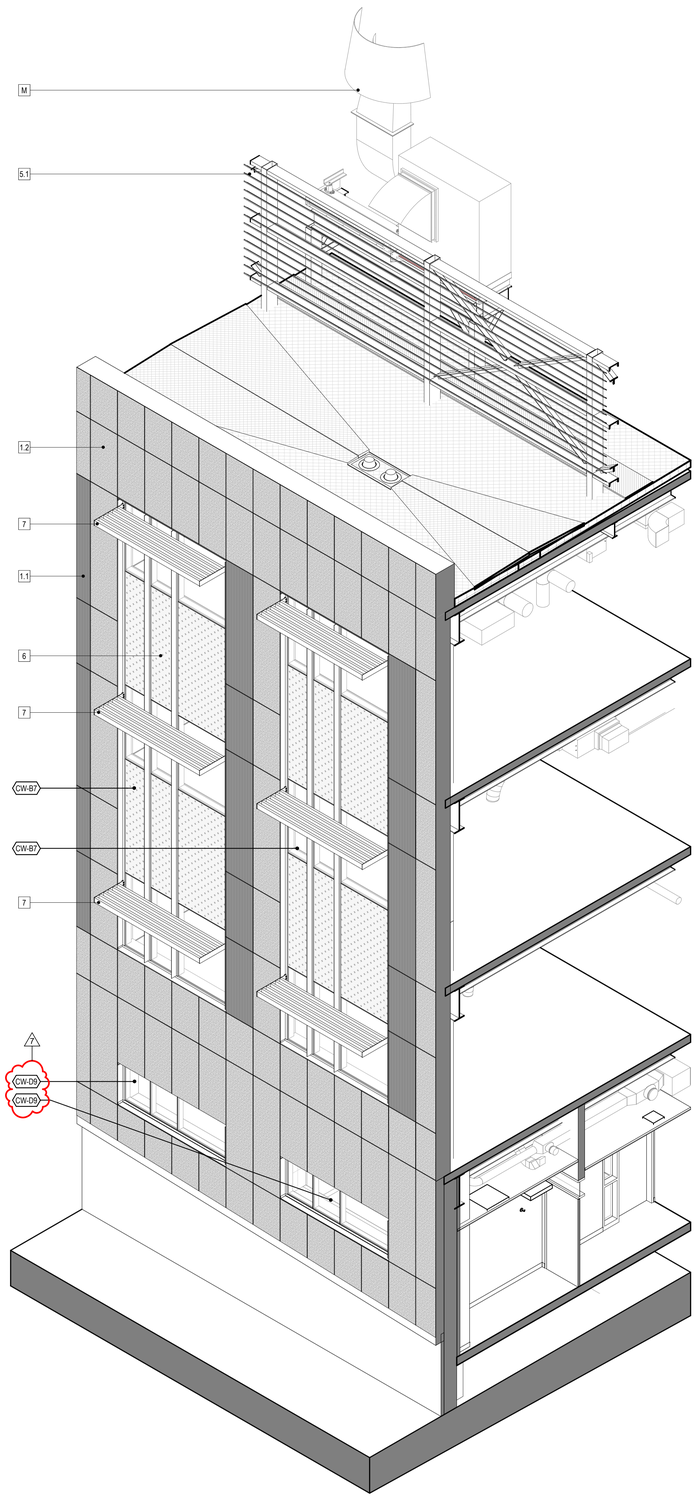
SHEET: OF

Autodesk Docs://47528 DOT Lab Building/082990_OGS-DOT-LabBuilding_ARCH-CORE_R23.rvt
4/16/2026 6:06:09 PM
42x30 PLOT SHEET



2 ENLARGED PARTIAL SOUTH EXTERIOR ELEVATION

1/4" = 1'-0"



1 SOUTH FACADE AXON

EXTERIOR COMPONENT & MATERIALS LEGEND

MATERIALS AND PRODUCTS LISTED BELOW ARE BASIS OF DESIGN SELECTIONS. REFERENCE SPECIFICATIONS FOR APPROVED EQUAL MATERIALS AND PRODUCTS.

TAG	COMPONENT
1.0	CP-1: CAST IN PLACE PLASTIC FORMLINER MFR: RECKLI PATTERN:2/211 SAMBRE FINISH: SMOOTH COLOR: BLACK
1.1	FC-1: FIBER CEMENT PANEL, TYPE 1 MFR: EQUITONE TEXTURE: LINEA COLOR: LT85 PANEL THICKNESS: 8MM SYSTEM: FACE FIXING
1.2	FC-2: FIBER CEMENT PANEL, TYPE 2 MFR: EQUITONE TEXTURE: NATURA COLOR: N161 PANEL THICKNESS: 8MM SYSTEM: FACE FIXING
1.3	FC-3: FIBER CEMENT PANEL, TYPE 3 MFR: EQUITONE TEXTURE: TECTIVA COLOR:TE20 PANEL THICKNESS: 8MM SYSTEM: FACE FIXING
2.1	ACM-1: ALUMINUM COMPOSITE PANEL, TYPE 1 MFR: ALUCOBOND COLOR: PLATINUM MICA SYSTEM: ROUTE & RETURN
2.2	ACM-2: ALUMINUM COMPOSITE PANEL, TYPE 2 MFR: ALUCOBOND COLOR: ANODIC SATIN MICA SYSTEM: ROUTE & RETURN
2.3	ACM-3: ALUMINUM COMPOSITE PANEL, TYPE 3 MFR: ALUCOBOND COLOR: BRILLIANT SILVER METALLIC SYSTEM: ROUTE & RETURN
2.4	ACM-4: ALUMINUM COMPOSITE PANEL, TYPE 4 MFR: ALUCOBOND COLOR: SERPENTINE METALLIC SYSTEM: ROUTE & RETURN
3.1	IMP-1: INSULATED METAL PANEL MFR: CENTRIA PRODUCT: FORMAWALL COLOR: #9967 XL PEWTER
3.2	IMP-2: INSULATED METAL PANEL MFR: CENTRIA PRODUCT: FORMAWALL COLOR: #9989 PLATINUM
4	C1: CONCRETE FACED INSULATION MFR: T-CLEAR PRODUCT: WALLGUARD PAINT: MASONRY ACRYLIC LATEX, COLOR: (EP-1)
5.1	EQUIPMENT SCREENING - ROOFTOP MECH. PER SECTION 108213.13
5.2	EQUIPMENT SCREEN AT - ELEC. SUBSTATION REFERENCE CIVIL/SITE, STRUCTURAL DRAWINGS AND SPECIFICATIONS
6	SPANDREL PANEL
7	OUTRIGGER SUNSHADE
CW-#	CURTAIN WALL SYSTEM TAG ALL CURTAIN WALL TYPES TO RECEIVE CUSTOM MULLION CAP AT SILL, JAMB AND HEAD
FCW-##	FIRE RATED CURTAIN WALL TAG ALL STOREFRONT TYPES TO RECEIVE CUSTOM MULLION CAP AT SILL, JAMB AND HEAD
M	ROOF MOUNTED MECHANICAL EQUIPMENT, SEE MEP DRAWINGS
B-S	BOLLARD, SITE (REFERENCE CIVIL)
B-BD	BOLLARD, BOLT-DOWN
LADD	ROOFTOP ACCESS LADDER
FD-KVB	FD-KVB - FIRE DEPARTMENT KEY VAULT BOX MFR: KNOX PRODUCT: ELECTRONIC KNOXVAULT 4400 COLOR: BLACK INSTALLATION: RECESS MOUNT
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CR	CR - CARD READER (DOOR ACCESS CONTROL, SEE SECURITY DWGS)
FDC	FDC - FIRE DEPARTMENT CONNECTION, SEE FIRE PROTECTION DWGS
PTC	PTC - PUMP TEST CONNECTION, SEE FIRE PROTECTION DWGS
DN	DN - DOWNSPOUT NOZZLE/COVER, SEE PLUMBING DWGS
ADOB	AUTOMATIC DOOR OPERATOR BOLLARD - SEE DOOR HARDWARE SPECIFICATION
ELF	EXTERIOR LIGHT FIXTURE - SEE ELECTRICAL DRAWINGS
L1	LOUVER, REFER TO MECHANICAL
L2	LOUVER, REFER TO MECHANICAL
S	THROUGH WALL SCUPPER MATCH ADJACENT COLOR OF FACADE
BS	THROUGH WALL BUSWAY SYSTEM, - SEE ELECTRICAL DRAWINGS PENETRATION DETAIL: 6 / A-620
W	WATER HEATER VENT, REFER TO MECHANICAL
D	DRYER VENT, REFER TO MECHANICAL

7

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CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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REGISTERED ARCHITECT ALEKSANDAR JANJIC 037126 STATE OF NEW YORK

REGISTRATION EXPIRES: 03/31/2028

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
7	04/17/26	ADDENDUM 7
6	04/14/26	ADDENDUM 6
3	03/25/26	ADDENDUM 3
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: SMD

DRAWN BY: JJS

FIELD CHECK:

APPROVED:

SHEET TITLE:

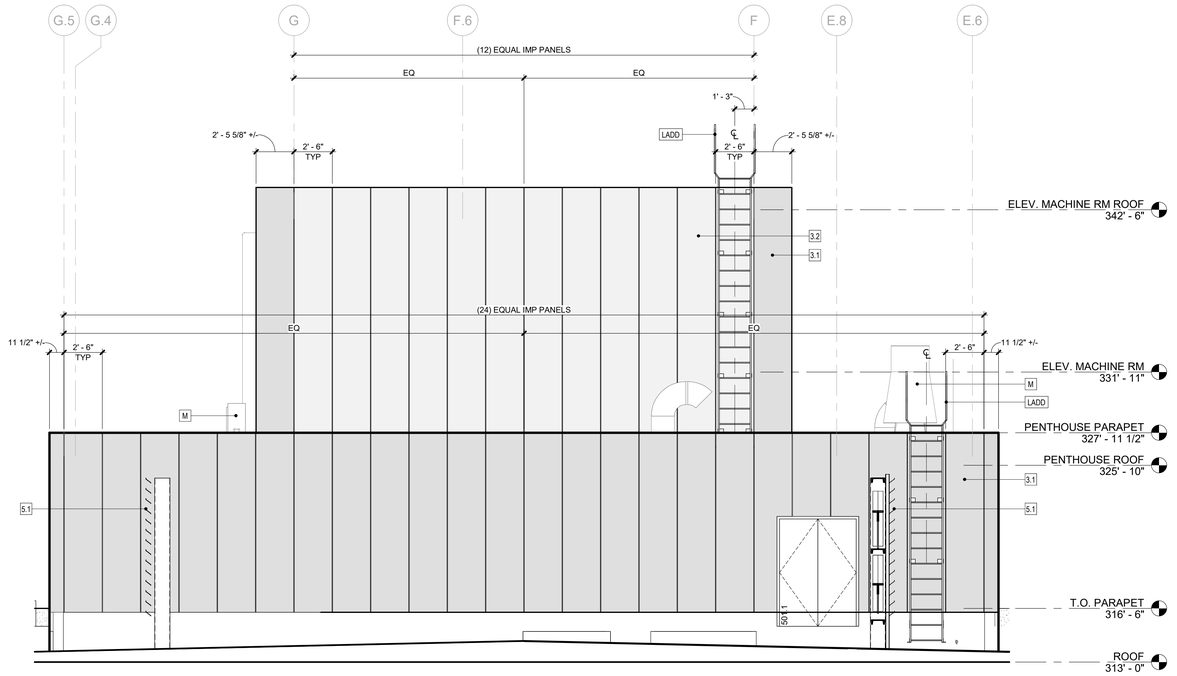
ENLARGED PARTIAL SOUTH EXTERIOR ELEVATION

DRAWING NUMBER:

A-205

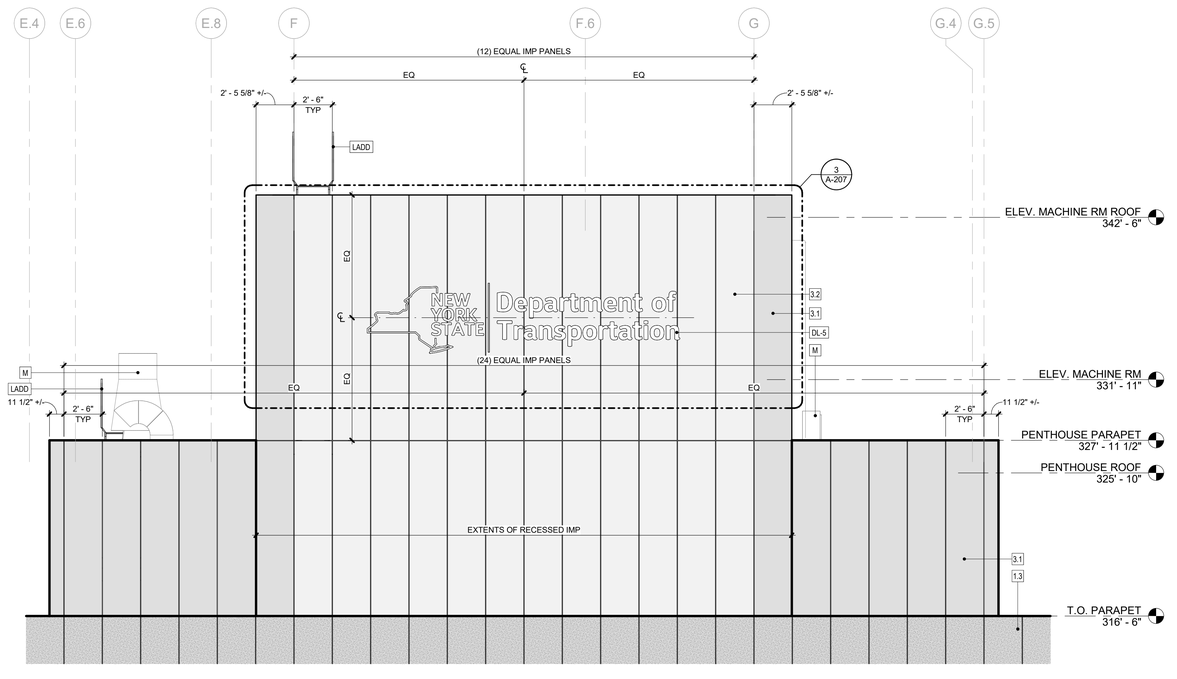
SHEET: OF

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4/16/2026 5:06:14 PM
42x30 PLOT SHEET



2 PENTHOUSE ENLARGED ELEVATION - EAST

1/4" = 1'-0"



1 PENTHOUSE ENLARGED ELEVATION - WEST

1/4" = 1'-0"

EXTERIOR COMPONENT & MATERIALS LEGEND

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2.3	ACM-3: ALUMINUM COMPOSITE PANEL, TYPE 3 MFR: ALUCOBOND COLOR: BRILLIANT SILVER METALLIC SYSTEM: ROUTE & RETURN
2.4	ACM-4: ALUMINUM COMPOSITE PANEL, TYPE 4 MFR: ALUCOBOND COLOR: SERPENTINE METALLIC SYSTEM: ROUTE & RETURN
3.1	IMP-1: INSULATED METAL PANEL MFR: CENTRIA PRODUCT: FORMAWALL COLOR: #9967 XL PEWTER
3.2	IMP-2: INSULATED METAL PANEL MFR: CENTRIA PRODUCT: FORMAWALL COLOR: #9989 PLATINUM
4	C1: CONCRETE FACED INSULATION MFR: T-CLEAR PRODUCT: WALLGUARD PAINT: MASONRY ACRYLIC LATEX, COLOR: (EP-1)
5.1	EQUIPMENT SCREENING - ROOFTOP MECH. PER SECTION 108213.13
5.2	EQUIPMENT SCREEN AT - ELEC. SUBSTATION REFERENCE CIVIL/SITE, STRUCTURAL DRAWINGS AND SPECIFICATIONS
6	SPANDREL PANEL
7	OUTRIGGER SUNSHADE
CW-#	CURTAIN WALL SYSTEM TAG ALL CURTAIN WALL TYPES TO RECEIVE CUSTOM MULLION CAP AT SILL, JAMB AND HEAD
FCW-##	FIRE RATED CURTAIN WALL TAG ALL STOREFRONT TYPES TO RECEIVE CUSTOM MULLION CAP AT SILL, JAMB AND HEAD
M	ROOF MOUNTED MECHANICAL EQUIPMENT, SEE MEP DRAWINGS
B-S	BOLLARD, SITE (REFERENCE CIVIL)
B-BD	BOLLARD, BOLT-DOWN
LADD	ROOFTOP ACCESS LADDER
FD-KVB	FD-KVB - FIRE DEPARTMENT KEY VAULT BOX MFR: KNOX PRODUCT: ELECTRONIC KNOXVAULT 4400 COLOR: BLACK INSTALLATION: RECESS MOUNT
DL-1	DL-1 - DIMENSIONAL LETTER SIGNAGE, 12" TALL, BOTTOM BACK ANGLE BRACKET CAST ALUMINUM, BLACK ANODIZED HALO LIT
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DL-5	DL-5 - DIMENSIONAL LETTER SIGNAGE, 9" TALL LETTERING, 15" TALL LETTERING CUSTOM LOGO ACRYLIC FACE - COLOR: DARK GRAY TRANSLUCENT TITANIUM SATIN BLACK RETURN FACELIT - TRIMLESS
CR	CR - CARD READER (DOOR ACCESS CONTROL, SEE SECURITY DWGS)
FDC	FDC - FIRE DEPARTMENT CONNECTION, SEE FIRE PROTECTION DWGS
PTC	PTC - PUMP TEST CONNECTION, SEE FIRE PROTECTION DWGS
DN	DN - DOWNSPOUT NOZZLE/COVER, SEE PLUMBING DWGS
ADOB	AUTOMATIC DOOR OPERATOR BOLLARD - SEE DOOR HARDWARE SPECIFICATION
ELF	EXTERIOR LIGHT FIXTURE - SEE ELECTRICAL DRAWINGS
L1	LOUVER, REFER TO MECHANICAL
L2	LOUVER, REFER TO MECHANICAL
S	THROUGH WALL SCUPPER MATCH ADJACENT COLOR OF FACADE
BS	THROUGH WALL BUSWAY SYSTEM, - SEE ELECTRICAL DRAWINGS PENETRATION DETAIL: 6 / A-620
W	WATER HEATER VENT, REFER TO MECHANICAL
D	DRYER VENT, REFER TO MECHANICAL

NEW YORK STATE | Office of General Services

CONSULTANT:

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REGISTERED ARCHITECT ALEKSANDAR JANJIC 031712 STATE OF NEW YORK

REGISTRATION EXPIRES: 03/31/2026

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
3	03/25/26	ADDENDUM 3
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: SMD
DRAWN BY: JJS
FIELD CHECK:
APPROVED:

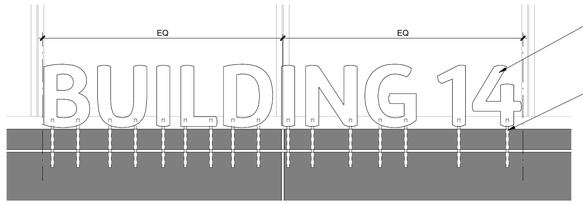
SHEET TITLE:

PENTHOUSE ENLARGED ELEVATIONS

DRAWING NUMBER: A-206

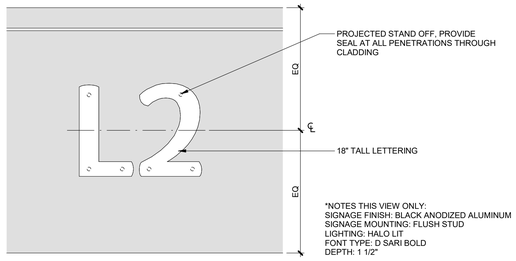
SHEET: OF

Autodesk Docs://47528 DOT Lab Building/082990_OGS-DOT-LabBuilding_ARCH-CORE_R23.rvt
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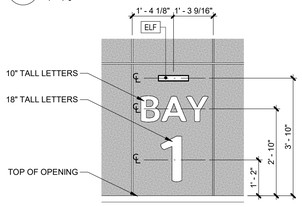
*NOTES THIS VIEW ONLY:
SIGNAGE FINISH: BLACK ANODIZED ALUMINUM
SIGNAGE MOUNTING: TOP STUD MOUNT
FONT TYPE: D SARI BOLD
DEPTH: 1 1/2"

8 DL-1 - ENLARGED ELEVATION
1" = 1'-0"



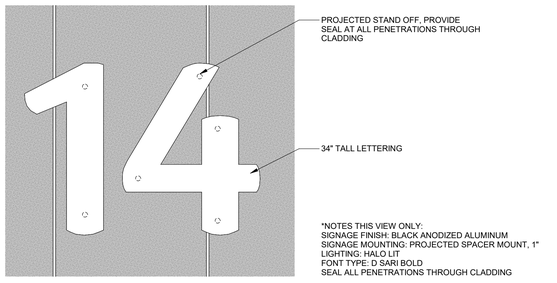
*NOTES THIS VIEW ONLY:
SIGNAGE FINISH: BLACK ANODIZED ALUMINUM
SIGNAGE MOUNTING: FLUSH STUD
LIGHTING: HALO LIT
FONT TYPE: D SARI BOLD
DEPTH: 1 1/2"

7 DL-2 - ENLARGED ELEVATION
1" = 1'-0"



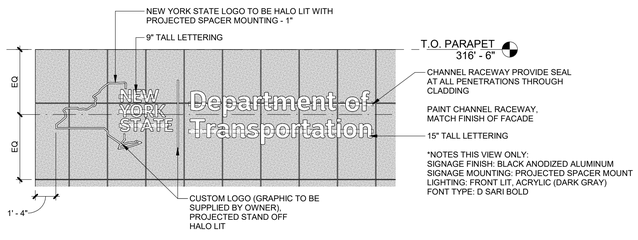
*NOTES THIS VIEW ONLY:
SIGNAGE FINISH: BLACK ANODIZED ALUMINUM
SIGNAGE MOUNTING: FLUSH STUD
FONT TYPE: D SARI BOLD
DEPTH: 1 1/2"
SEAL ALL PENETRATIONS THROUGH CLADDING.

6 DL-3 - ENLARGED ELEVATION
1/2" = 1'-0"



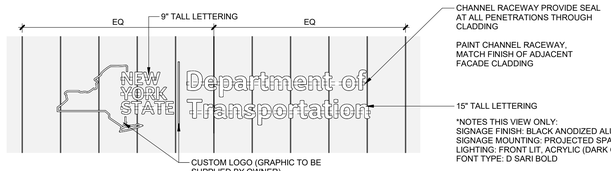
*NOTES THIS VIEW ONLY:
SIGNAGE FINISH: BLACK ANODIZED ALUMINUM
SIGNAGE MOUNTING: PROJECTED SPACER MOUNT, 1"
LIGHTING: HALO LIT
FONT TYPE: D SARI BOLD
SEAL ALL PENETRATIONS THROUGH CLADDING

5 DL-4 - ENLARGED ELEVATION
1" = 1'-0"



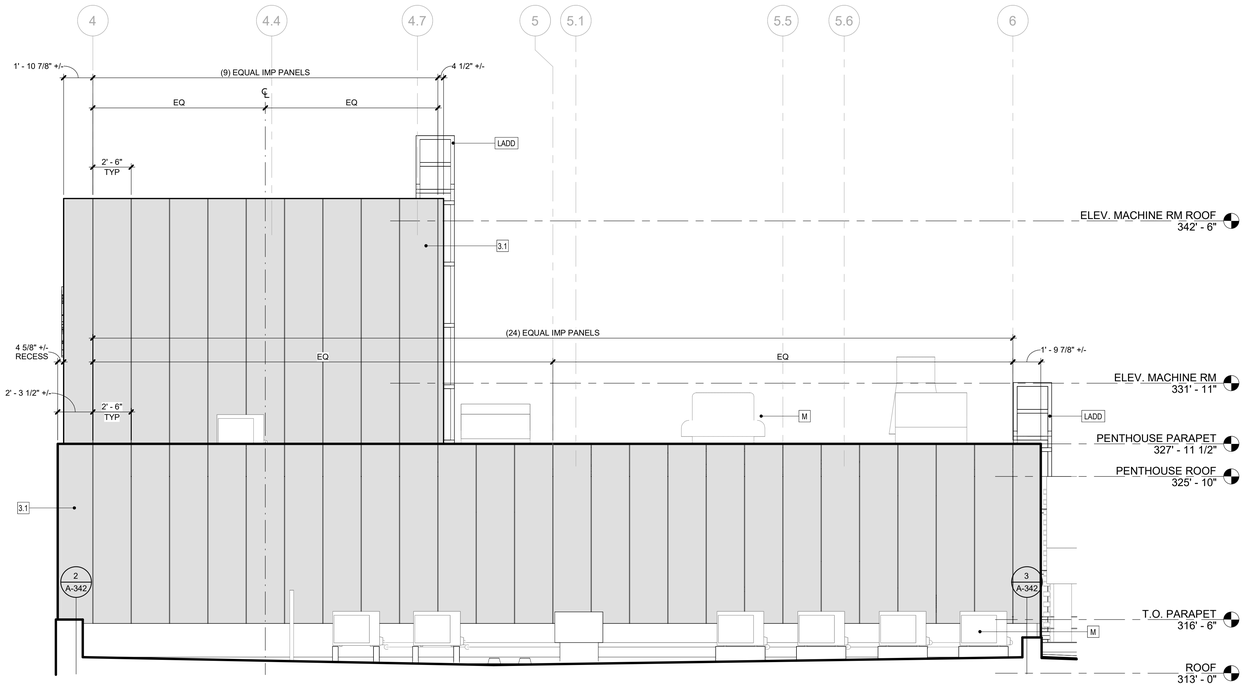
*NOTES THIS VIEW ONLY:
SIGNAGE FINISH: BLACK ANODIZED ALUMINUM
SIGNAGE MOUNTING: PROJECTED SPACER MOUNT
LIGHTING: FRONT LIT, ACRYLIC (DARK GRAY)
FONT TYPE: D SARI BOLD

4 DL-5 - EAST ENGLARD ELEVATION
1/4" = 1'-0"

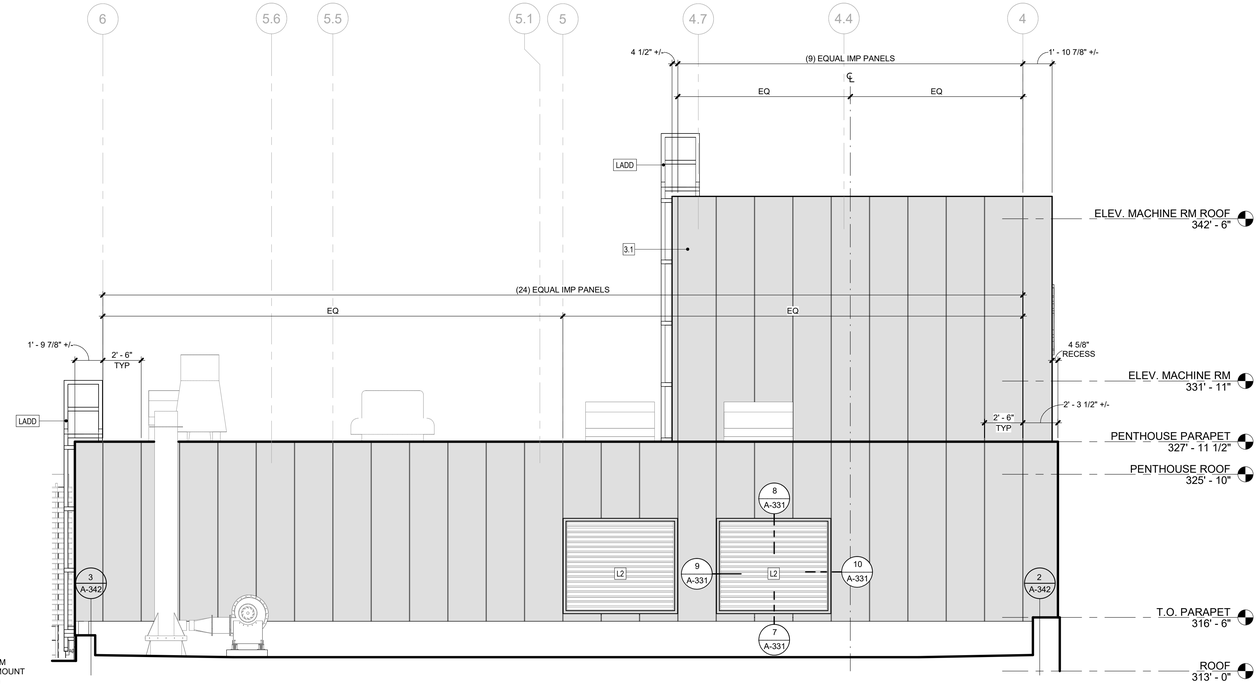


*NOTES THIS VIEW ONLY:
SIGNAGE FINISH: BLACK ANODIZED ALUMINUM
SIGNAGE MOUNTING: PROJECTED SPACER MOUNT
LIGHTING: FRONT LIT, ACRYLIC (DARK GRAY)
FONT TYPE: D SARI BOLD

3 DL-5 SIGNAGE - WEST PENTHOUSE ENLARGED ELEVATION
1/4" = 1'-0"



2 PENTHOUSE ENLARGED ELEVATION - SOUTH
1/4" = 1'-0"



1 PENTHOUSE ENLARGED ELEVATION - NORTH
1/4" = 1'-0"

EXTERIOR COMPONENT & MATERIALS LEGEND

MATERIALS AND PRODUCTS LISTED BELOW ARE BASIS OF DESIGN SELECTIONS. REFERENCE SPECIFICATIONS FOR APPROVED EQUAL MATERIALS AND PRODUCTS.

TAG	COMPONENT
1.0	CP-1: CAST IN PLACE PLASTIC FORMLINER MFR: RECKLI PATTERN:2/211 SAMBRE FINISH: SMOOTH COLOR: BLACK
1.1	FC-1: FIBER CEMENT PANEL, TYPE 1 MFR: EQUITONE TEXTURE: LINEA COLOR: LT85 PANEL THICKNESS: 8MM SYSTEM: FACE FIXING
1.2	FC-2: FIBER CEMENT PANEL, TYPE 2 MFR: EQUITONE TEXTURE: NATURA COLOR: N161 PANEL THICKNESS: 8MM SYSTEM: FACE FIXING
1.3	FC-3: FIBER CEMENT PANEL, TYPE 3 MFR: EQUITONE TEXTURE: TECTIVA COLOR:TE20 PANEL THICKNESS: 8MM SYSTEM: FACE FIXING
2.1	ACM-1: ALUMINUM COMPOSITE PANEL, TYPE 1 MFR: ALUCOBOND COLOR: PLATINUM MICA SYSTEM: ROUTE & RETURN
2.2	ACM-2: ALUMINUM COMPOSITE PANEL, TYPE 2 MFR: ALUCOBOND COLOR: ANODIC SATIN MICA SYSTEM: ROUTE & RETURN
2.3	ACM-3: ALUMINUM COMPOSITE PANEL, TYPE 3 MFR: ALUCOBOND COLOR: BRILLIANT SILVER METALLIC SYSTEM: ROUTE & RETURN
2.4	ACM-4: ALUMINUM COMPOSITE PANEL, TYPE 4 MFR: ALUCOBOND COLOR: SERPENTINE METALLIC SYSTEM: ROUTE & RETURN
3.1	IMP-1: INSULATED METAL PANEL MFR: CENTRIA PRODUCT: FORMAWALL COLOR: #9967 XL PEWTER
3.2	IMP-2: INSULATED METAL PANEL MFR: CENTRIA PRODUCT: FORMAWALL COLOR: #9989 PLATINUM
4	C1: CONCRETE FACED INSULATION MFR: T-CLEAR PRODUCT: WALLGUARD PAINT: MASONRY ACRYLIC LATEX, COLOR: (EP-1)
5.1	EQUIPMENT SCREENING - ROOFTOP MECH. PER SECTION 108213.13
5.2	EQUIPMENT SCREEN AT - ELEC. SUBSTATION REFERENCE CIVIL/SITE, STRUCTURAL DRAWINGS AND SPECIFICATIONS
6	SPANDREL PANEL
7	OUTRIGGER SUNSHADE
CW-#	CURTAIN WALL SYSTEM TAG
	ALL CURTAIN WALL TYPES TO RECEIVE CUSTOM MULLION CAP AT SILL, JAMB AND HEAD
FCW-##	FIRE RATED CURTAIN WALL TAG
	ALL STOREFRONT TYPES TO RECEIVE CUSTOM MULLION CAP AT SILL, JAMB AND HEAD
M	ROOF MOUNTED MECHANICAL EQUIPMENT, SEE MEP DRAWINGS
B-S	BOLLARD, SITE (REFERENCE CIVIL)
B-BD	BOLLARD, BOLT-DOWN
LADD	ROOFTOP ACCESS LADDER
FD-KVB	FD-KVB - FIRE DEPARTMENT KEY VAULT BOX MFR: KNOX PRODUCT: ELECTRONIC KNOXVAULT 4400 COLOR: BLACK INSTALLATION: RECESS MOUNT
DL-1	DL-1 - DIMENSIONAL LETTER SIGNAGE, 12" TALL, BOTTOM BACK ANGLE BRACKET CAST ALUMINUM, BLACK ANODIZED HALO LIT
DL-2	DL -2 - DIMENSIONAL LETTER SIGNAGE, 12" TALL, PROJECTED STAND OFF CAST ALUMINUM, BLACK ANODIZED HALO LIT
DL-3	DL-3 - DIMENSIONAL LETTER SIGNAGE, 8" TALL LETTERS, 12" TALL NUMBERS PROJECTED STAND OFF CAST ALUMINUM , BLACK ANODIZED NO LIGHTING
DL-4	DL-4 - DIMENSIONAL LETTER SIGNAGE, 24" TALL, PROJECTED STAND OFF CAST ALUMINUM, BLACK ANODIZED HALO LIT
DL-5	DL-5 - DIMENSIONAL LETTER SIGNAGE, 9" TALL LETTERING, 15" TALL LETTERING CUSTOM LOGO ACRYLIC FACE - COLOR: DARK GRAY TRANSLUCENT TITANIUM SATIN BLACK RETURN FACELIT - TRIMLESS
CR	CR - CARD READER (DOOR ACCESS CONTROL, SEE SECURITY DWGS)
FDC	FDC - FIRE DEPARTMENT CONNECTION, SEE FIRE PROTECTION DWGS
PTC	PTC - PUMP TEST CONNECTION, SEE FIRE PROTECTION DWGS
DN	DN - DOWNSPOUT NOZZLE/COVER, SEE PLUMBING DWGS
ADOB	AUTOMATIC DOOR OPERATOR BOLLARD - SEE DOOR HARDWARE SPECIFICATION
ELF	EXTERIOR LIGHT FIXTURE - SEE ELECTRICAL DRAWINGS
L1	LOUVER, REFER TO MECHANICAL
L2	LOUVER, REFER TO MECHANICAL
S	THROUGH WALL SCUPPER MATCH ADJACENT COLOR OF FACADE
BS	THROUGH WALL BUSWAY SYSTEM, - SEE ELECTRICAL DRAWINGS PENETRATION DETAIL: 6/ A-620
W	WATER HEATER VENT, REFER TO MECHANICAL
D	DRYER VENT, REFER TO MECHANICAL

7

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CONSULTANT:

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REGISTERED ARCHITECT ALEXANDAR JANJIC 031128 STATE OF NEW YORK

REGISTRATION EXPIRES: 03/31/2026

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

3	03/25/26	ADDENDUM 3
	01/13/26	BID DOCUMENT

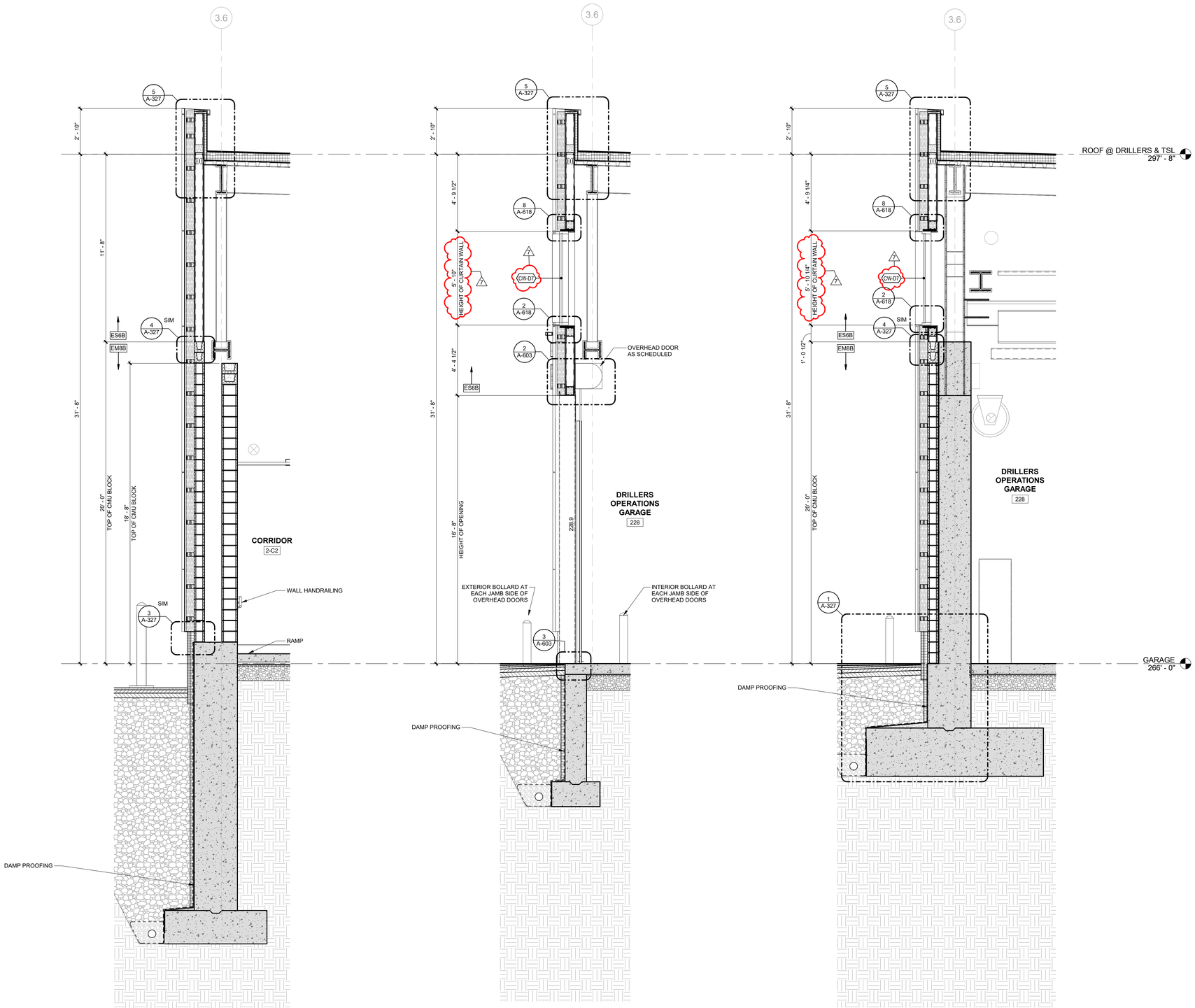
MARK	DATE	DESCRIPTION
PROJECT NUMBER:	47528-C	
DESIGNED BY:	SMD	
DRAWN BY:	JJS	
FIELD CHECK:		
APPROVED:		

SHEET TITLE: PENTHOUSE ENLARGED ELEVATIONS

DRAWING NUMBER: A-207

SHEET: OF

Autodesk Docs://47528 DOT Lab Building/082890_OGS-DOT-LabBuilding_ARCH-CORE_R23.rvt
4/16/2026 6:06:21 PM
42x30 PLOT SHEET



3 WALL SECTION - EAST 7
3/8" = 1'-0"

2 WALL SECTION - EAST 6
3/8" = 1'-0"

1 WALL SECTION - EAST 5
3/8" = 1'-0"

Autodesk Docs://47528 DOT Lab Building/082990_OGS-DOT-LabBuilding_ARCH-CORE_R23.rvt
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NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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REGISTERED ARCHITECT
ALEKSANDAR JANJIC
044112
STATE OF NEW YORK

REGISTRATION EXPIRES:
03/31/2028

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
7	04/17/26	ADDENDUM 7
6	04/14/26	ADDENDUM 6
	01/13/26	BID DOCUMENT

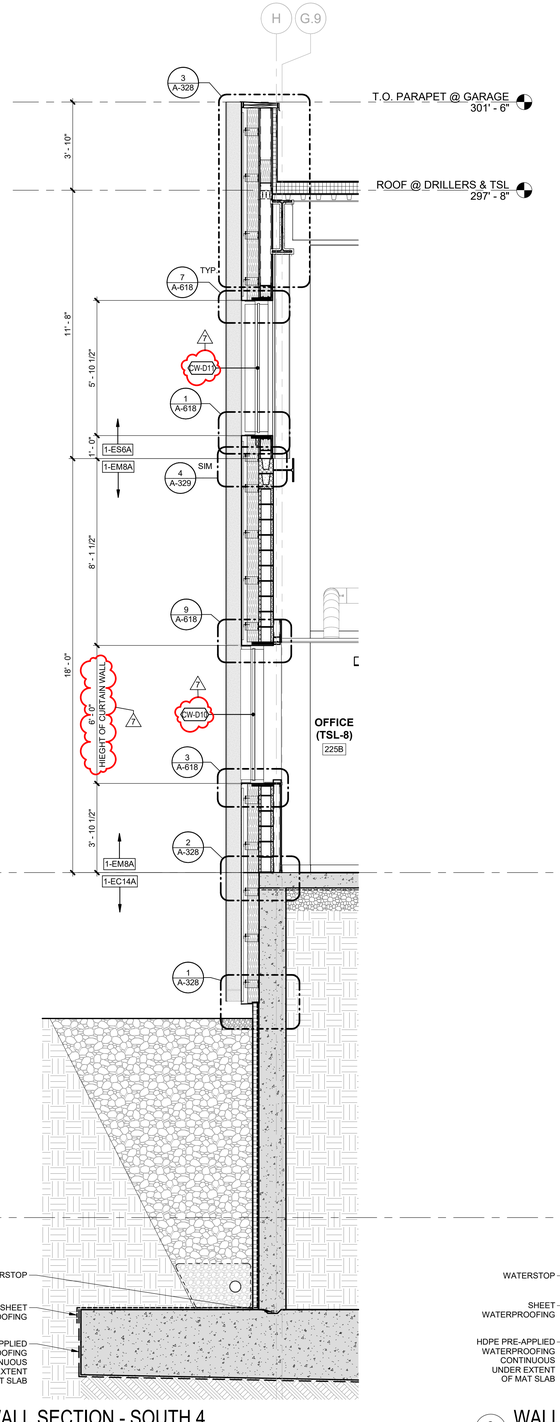
PROJECT NUMBER: 47528-C

DESIGNED BY: SMD
DRAWN BY: JJS
FIELD CHECK:
APPROVED:

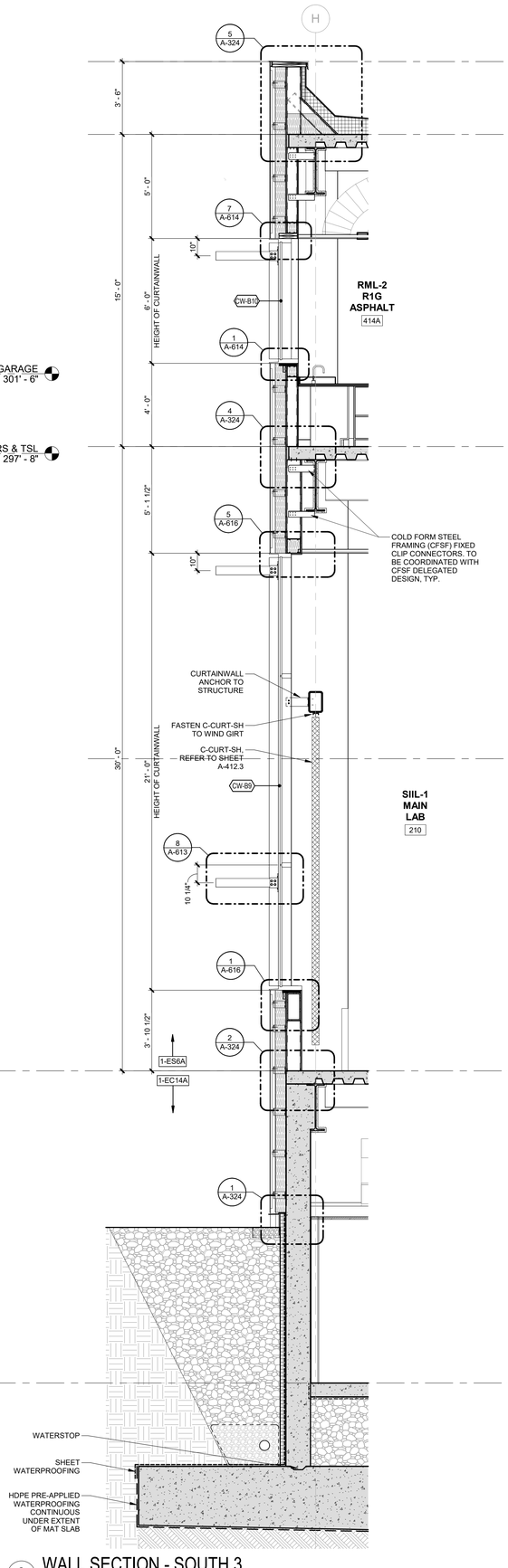
SHEET TITLE:
WALL SECTIONS - EAST DRILLERS GARAGE

DRAWING NUMBER:
A-311

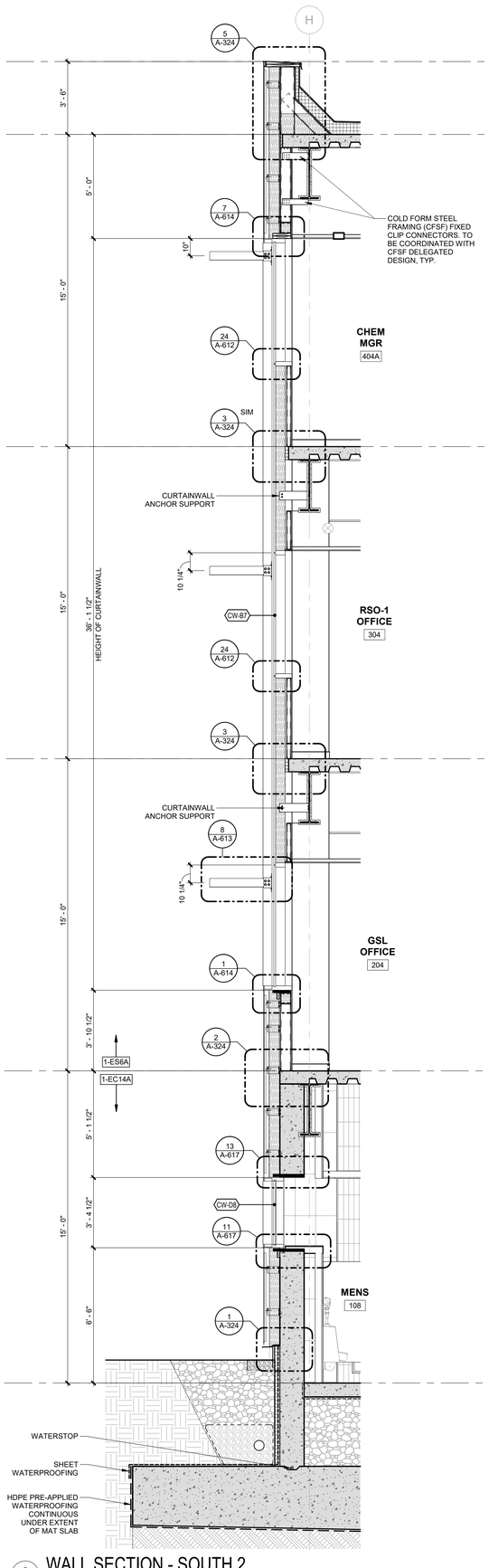
SHEET: OF



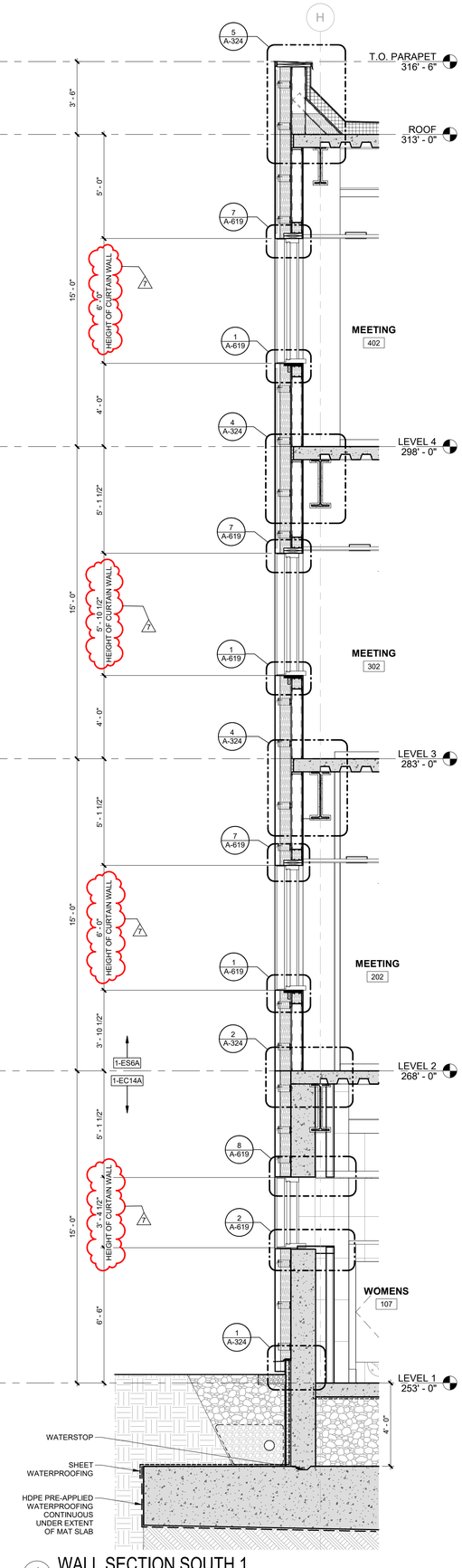
4 WALL SECTION - SOUTH 4
3/8" = 1'-0"



3 WALL SECTION - SOUTH 3
3/8" = 1'-0"



2 WALL SECTION - SOUTH 2
3/8" = 1'-0"



1 WALL SECTION SOUTH 1
3/8" = 1'-0"

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42x30 PLOT SHEET

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CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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ALEKSANDAR JANJIC
NEW YORK
STATE OF NEW YORK

REGISTRATION EXPIRES:
03/31/2028

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

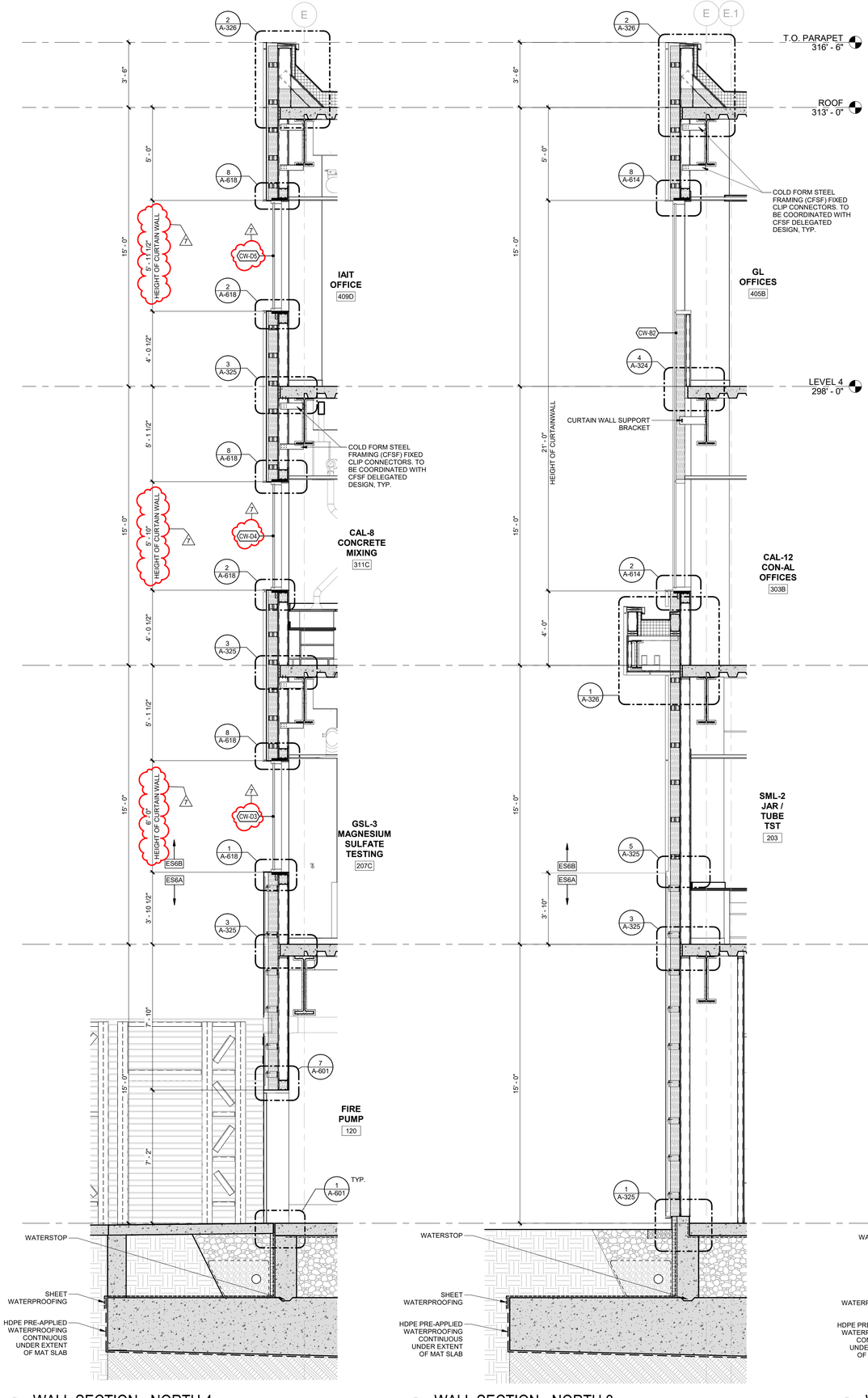
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7	04/17/26	ADDENDUM 7
6	04/14/26	ADDENDUM 6
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C
DESIGNED BY: SMD
DRAWN BY: JJS
FIELD CHECK:
APPROVED:

SHEET TITLE:
WALL SECTIONS - SOUTH

DRAWING NUMBER:
A-312

SHEET: OF



4 WALL SECTION - NORTH 4
3/8" = 1'-0"

3 WALL SECTION - NORTH 3
3/8" = 1'-0"

2 WALL SECTION - NORTH 2
3/8" = 1'-0"

1 WALL SECTION - NORTH 1
3/8" = 1'-0"

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42x30 PLOT SHEET

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REGISTRATION EXPIRES: 03/31/2028

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

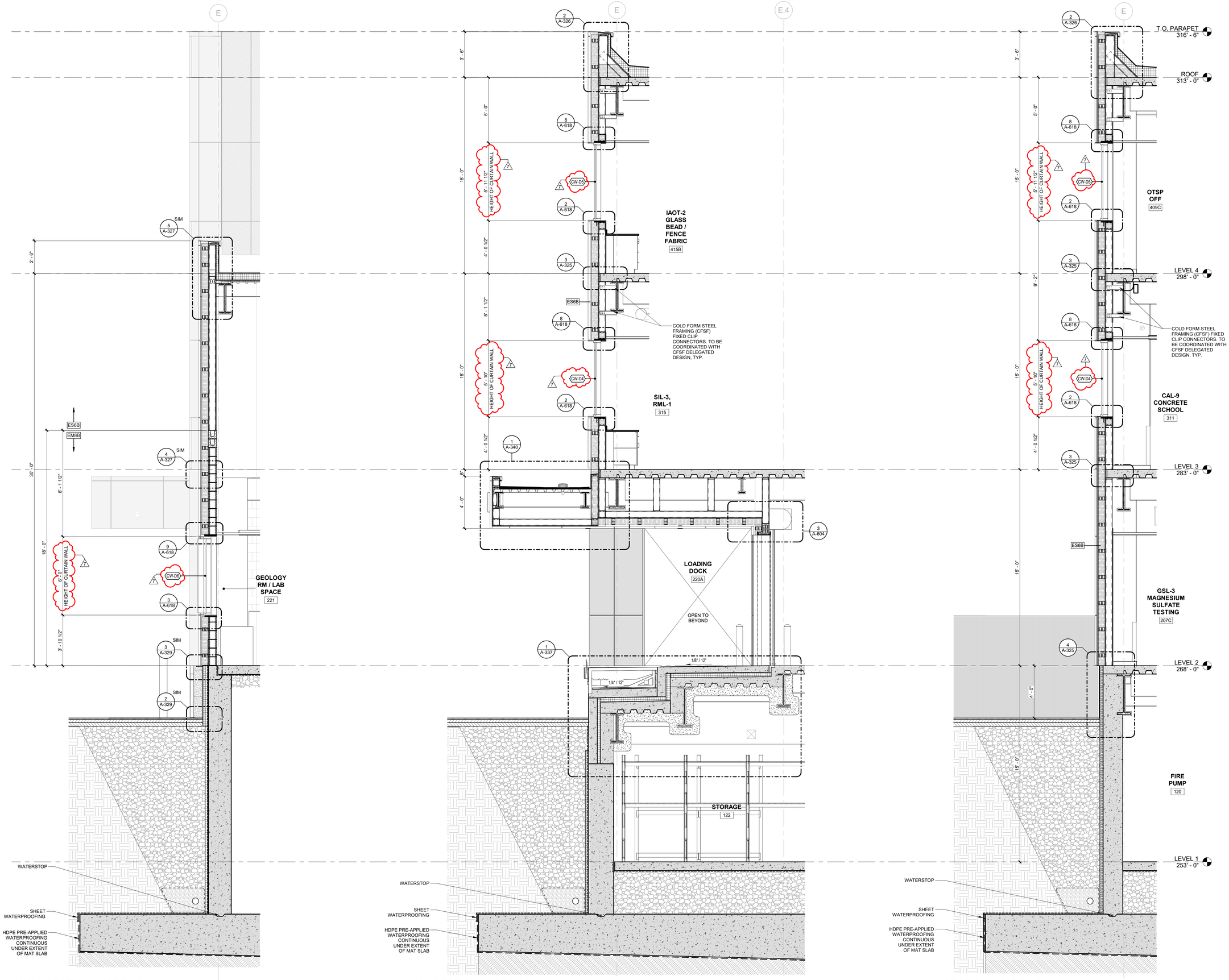
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6	04/14/26	ADDENDUM 6
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C
DESIGNED BY: SMD
DRAWN BY: JJS
FIELD CHECK:
APPROVED:

SHEET TITLE: WALL SECTIONS - NORTH

DRAWING NUMBER: A-316

SHEET: OF



3 WALL SECTION - NORTH 7
3/8" = 1'-0"

2 WALL SECTION - NORTH 6
3/8" = 1'-0"

1 WALL SECTION - NORTH 5
3/8" = 1'-0"

Autodesk Docs://47528 DOT Lab Building/082990_OGS-DOT-LabBuilding_ARCH-CORE_R23.rvt
4/16/2026 6:06:32 PM
42x30 PLOT SHEET

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REGISTRATION EXPIRES: 03/31/2028

CONTRACT: CONSTRUCTION

TITLE: Provide Testing Laboratory, Building 14

LOCATION: DOT Region 1, Albany County State Office Building Campus Albany, NY

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MARK	DATE	DESCRIPTION
7	04/17/26	ADDENDUM 7
6	04/14/26	ADDENDUM 6
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: SMD

DRAWN BY: JJS

FIELD CHECK:

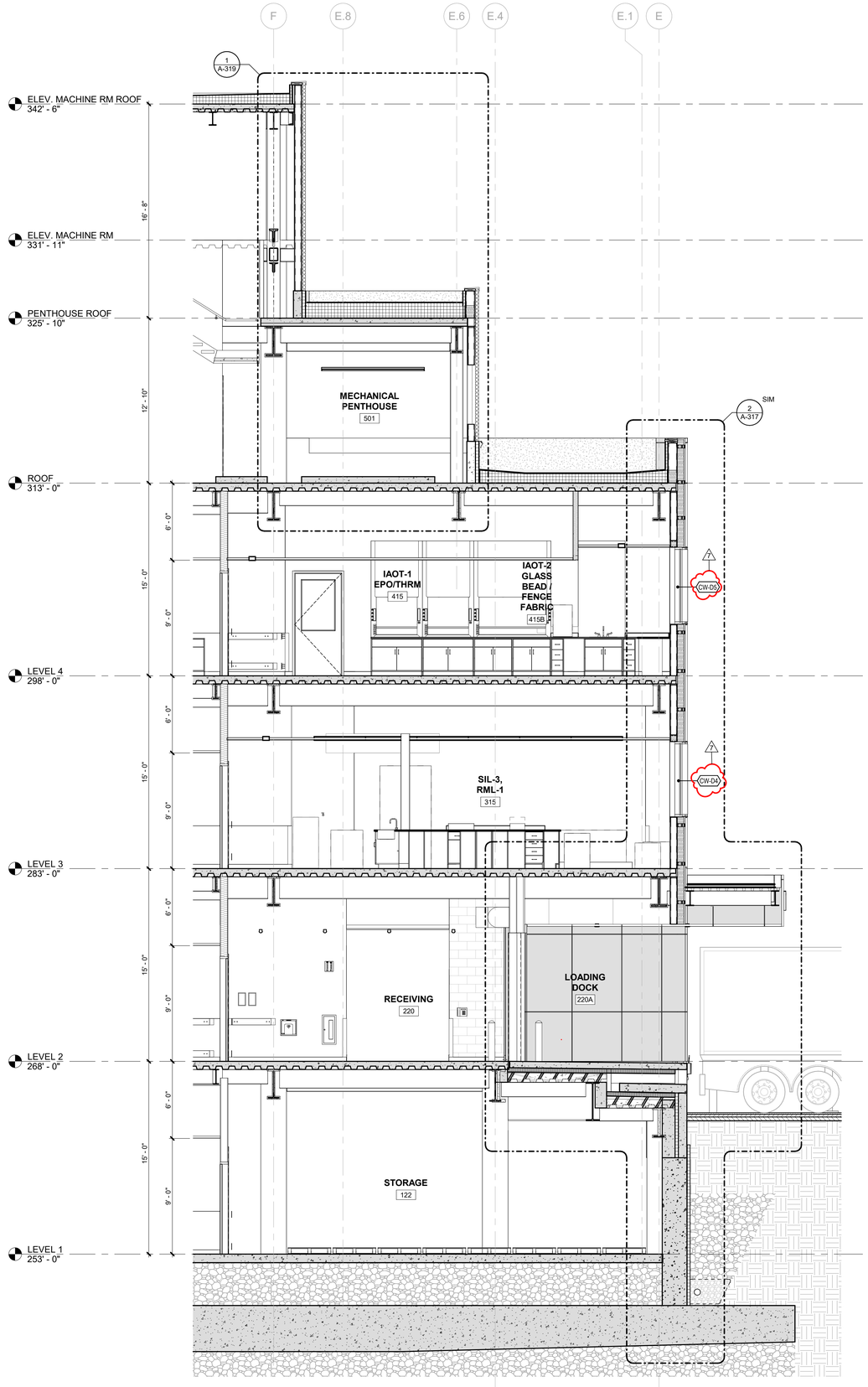
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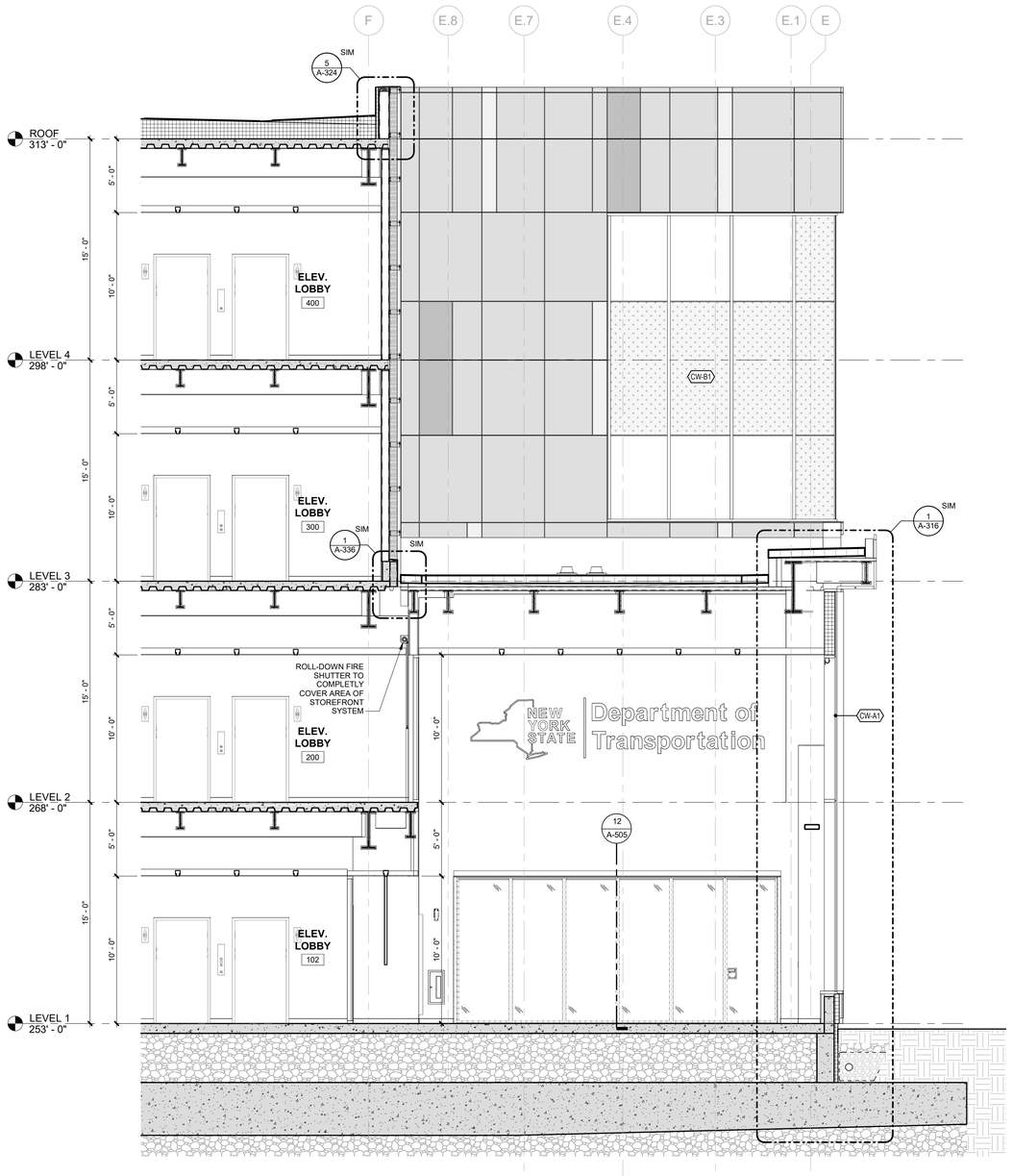
WALL SECTIONS - NORTH

DRAWING NUMBER: A-317

SHEET: OF



2 SECTION @ LOADING DOCK
1/4" = 1'-0"



1 SECTION 1 @ LOBBY
1/4" = 1'-0"

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4/16/2026 5:06:38 PM
42x30 PLOT SHEET

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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ARCHITECTS

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REGISTERED ARCHITECT
ALEKSANDAR JANJIC
STATE OF NEW YORK

REGISTRATION EXPIRES:
03/31/2028

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

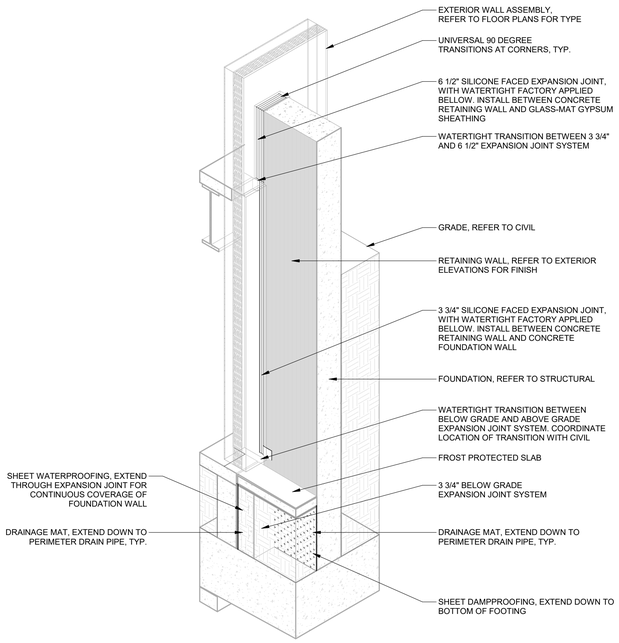
MARK	DATE	DESCRIPTION
7	04/17/26	ADDENDUM 7
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C
DESIGNED BY: SMD
DRAWN BY: JJS
FIELD CHECK:
APPROVED:

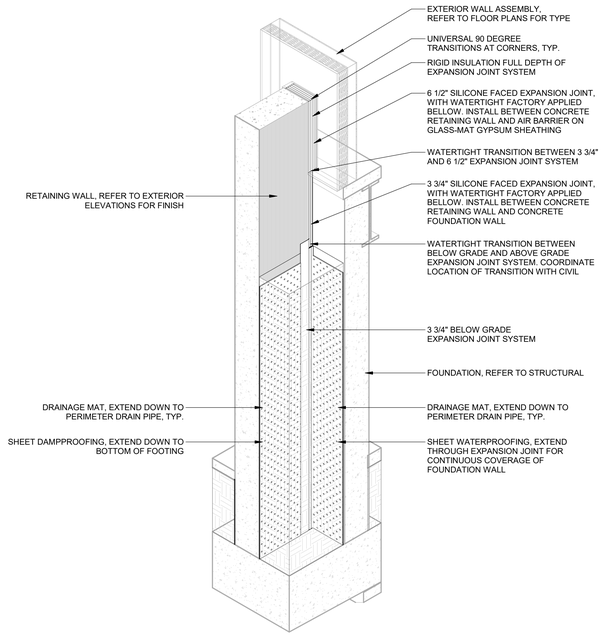
SHEET TITLE:
PARTIAL BUILDING SECTIONS

DRAWING NUMBER:
A-320

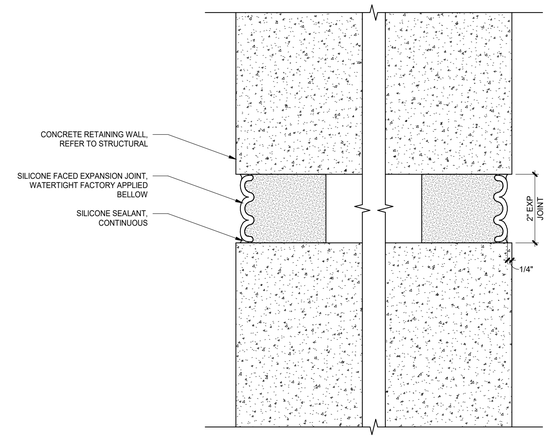
SHEET: OF



6 EXP. JOINT @ BLDG FNDN AND SUBSTATION RETAINING WALL -2

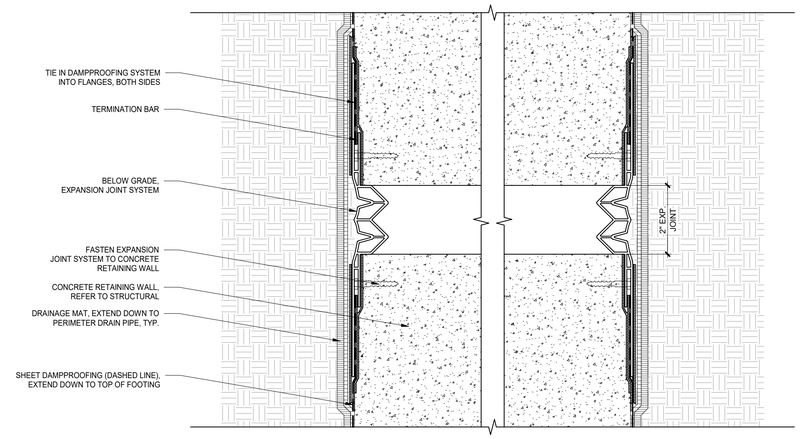


3 EXP. JOINT @ BLDG FNDN AND SUBSTATION RETAINING WALL - 1



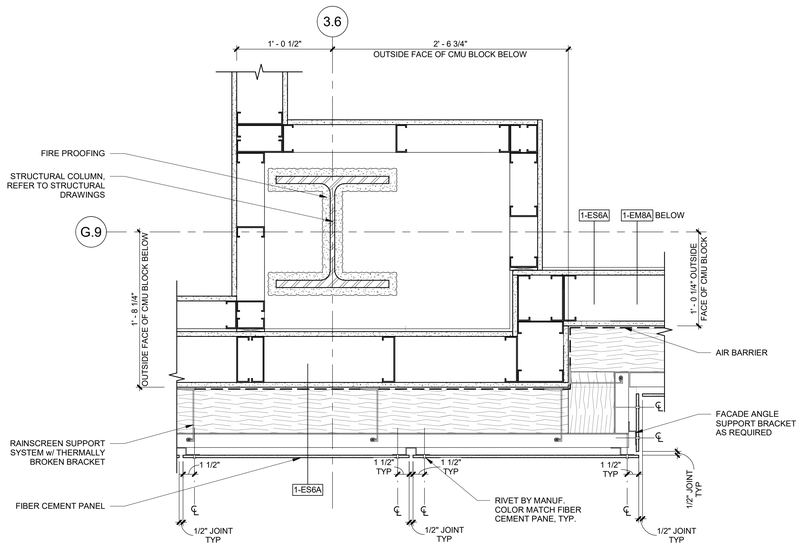
8 PLAN DETAIL AT EXPANSION - RETAINING WALL - ABOVE GRADE

3" = 1'-0"



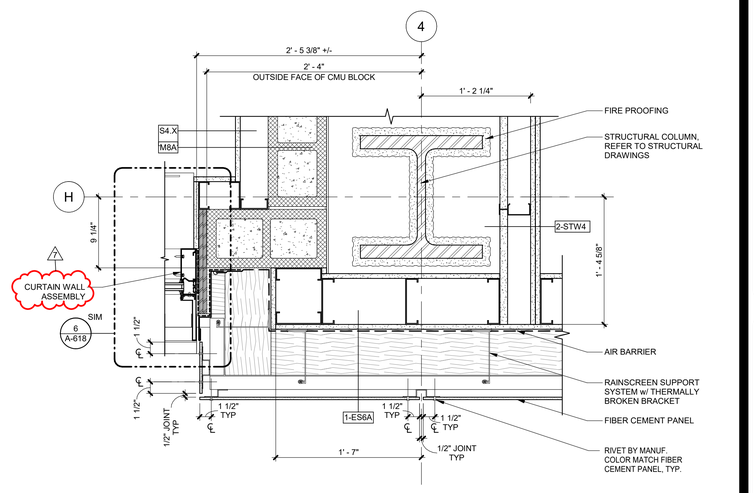
7 PLAN DETAIL AT EXPANSION JOINT - RETAINING WALL - BELOW GRADE

3" = 1'-0"



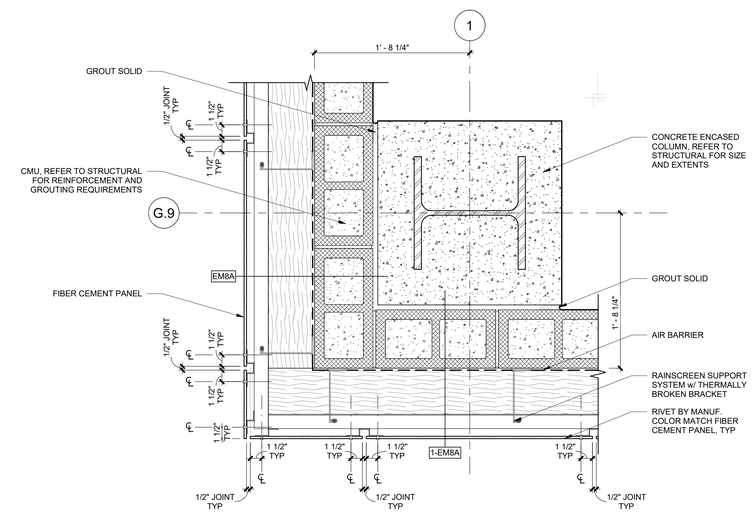
5 PLAN DETAIL AT OUTSIDE CORNER - COLUMN LINE 3.6 AND G.9 - THIRD FLOOR

1 1/2" = 1'-0"



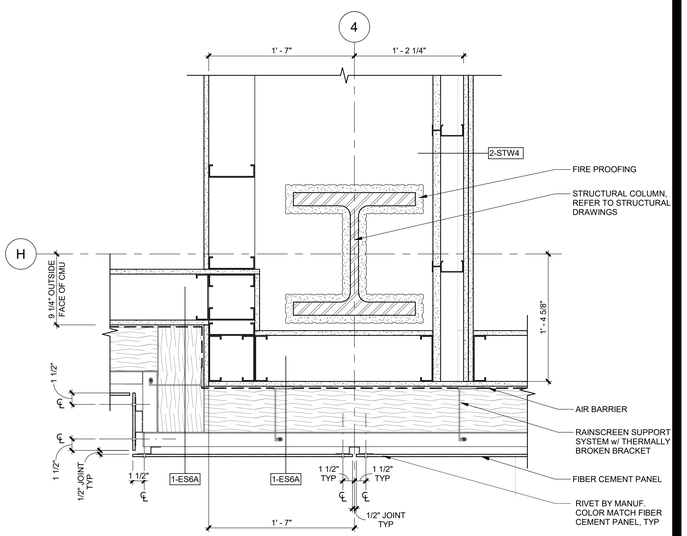
4 PLAN DETAIL AT OUTSIDE CORNER - COLUMN LINE 4 AND H - SECOND FLOOR

1 1/2" = 1'-0"



2 PLAN DETAIL AT OUTSIDE CORNER - COLUMN LINE 1 AND H

1 1/2" = 1'-0"



1 PLAN DETAIL AT OUTSIDE CORNER - COLUMN LINE 4 AND H - THIRD FLOOR

1 1/2" = 1'-0"

Autodesk Docs://47528 DOT Lab Building/082990_OGS-DOT-LabBuilding_ARCH-CORE_R23.rvt
4/16/2026 6:06:40 PM
42x30 PLOT SHEET

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REGISTERED ARCHITECT ALEKSANDAR JANIC 031128 STATE OF NEW YORK

REGISTRATION EXPIRES: 03/31/2028

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

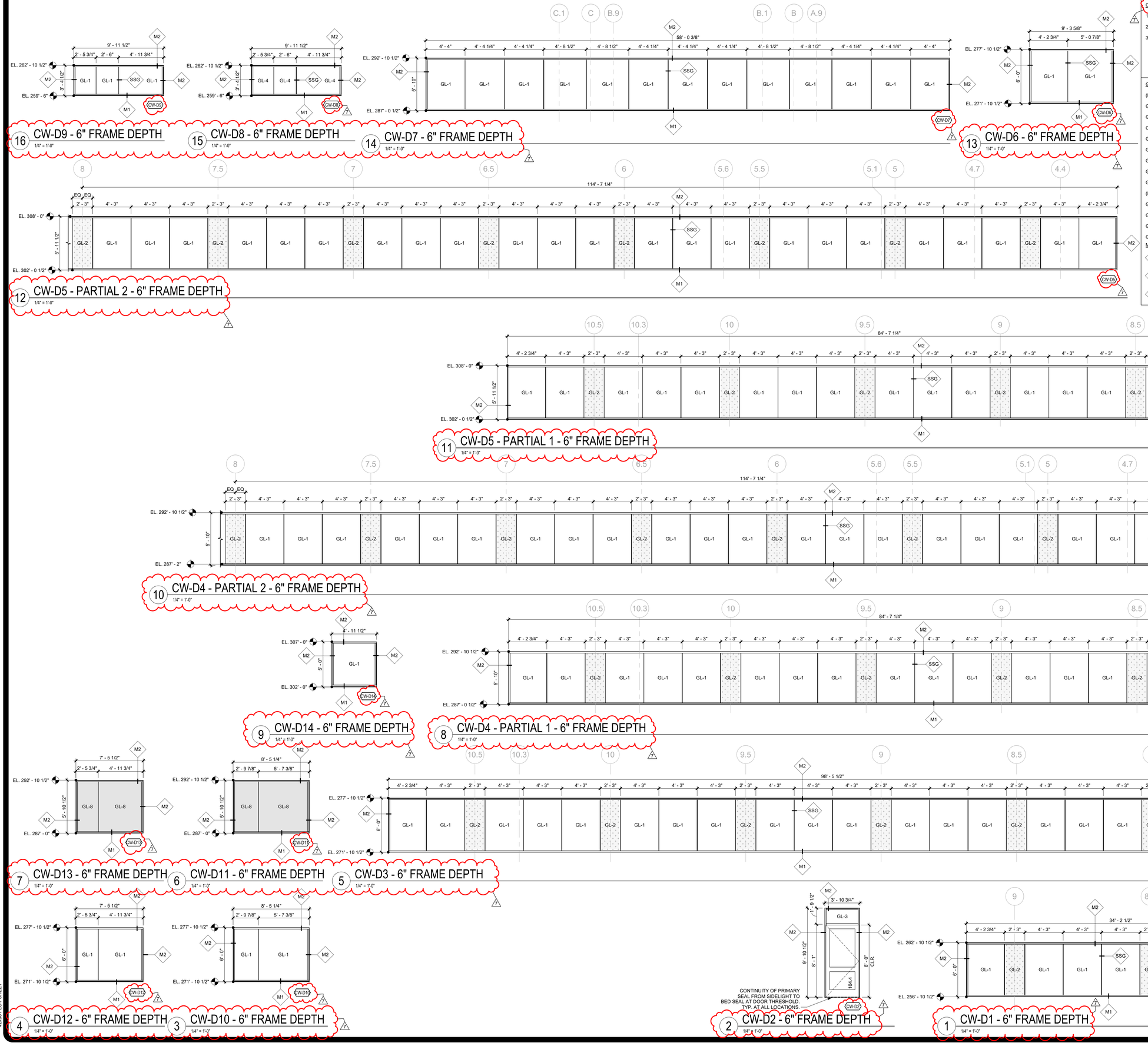
MARK	DATE	DESCRIPTION
7	04/17/26	ADDENDUM 7
6	04/14/26	ADDENDUM 6
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C
DESIGNED BY: SMD
DRAWN BY: JJS
FIELD CHECK:
APPROVED:

SHEET TITLE: ENVELOPE PLAN DETAILS

DRAWING NUMBER: A-334

SHEET: OF



CURTAIN WALL GENERAL NOTES

1. FIELD VERIFY ALL LOCATIONS AND DIMENSIONS, ROUGH OPENINGS PRIOR TO SUBMITTAL OF SHOP DRAWINGS.
2. MULLION PROFILES TYPICAL OF SYSTEM UNLESS NOTED OTHERWISE.
3. PROVIDE TEMPERED GLAZING AT ALL LOCATIONS AS REQUIRED BY CODE INCLUDING BUT NOT LIMITED TO:
   A. GLAZING IN DOORS.
   B. GLAZING W/ IN 24" OF DOORS, WHOSE BOTTOM EDGE IS BELOW 60".
   C. GLAZING ADJACENT TO RAMPS AND NEXT TO LANDINGS (60" OF LANDINGS).

GLAZING LEGEND

(EXTERIOR GLAZING)

GL-1	IGU / VISION GLAZING
GL-2	IGU / SPANDREL GLAZING
GL-3	IGU / VISION GLAZING / LAMINATED GLAZING
GL-4	IGU / TRANSLUCENT GLAZING
GL-5	IGU / FIRE RATED
GL-6	IGU / FIRE RATED / TRANSLUCENT GLAZING
GL-7	IGU / VISION GLAZING / SHADOW BOX
GL-8	IGU / VISION GLAZING / APPLIED WINDOW FILM (GF-2)

(INTERIOR GLAZING)

GL-9	VISION GLAZING
GL-10	SAFETY GLAZING
GL-11	ACOUSTIC GLAZING
GL-12	FIRE RATED GLAZING

MULLION LEGEND

M1	6" CUSTOM MULLION PROFILE CAP - SILL 1/A-617
M2	6" CUSTOM MULLION PROFILE CAP - JAMB / HEAD 2/A-617
SSG	STRUCTURAL SILICONE GLAZING 9/A-617, 10/A-617

NEW YORK STATE | Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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REGISTERED ARCHITECT ALEKSANDAR JANIC STATE OF NEW YORK
REGISTRATION EXPIRES: 03/31/2028

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
7	04/17/26	ADDENDUM 7
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

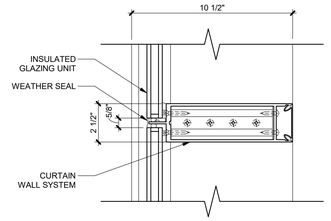
DESIGNED BY: SMD
DRAWN BY: JJS
FIELD CHECK:
APPROVED:

SHEET TITLE: EXTERIOR CURTAIN WALL ELEVATION TYPES

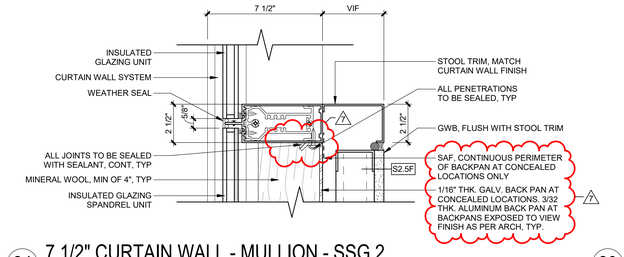
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SHEET: OF

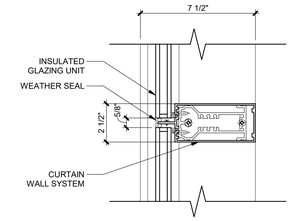
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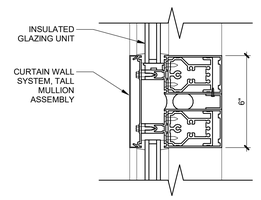
25 10 1/2" CURTAIN WALL - SSG - HORZ.
3" = 1'-0"



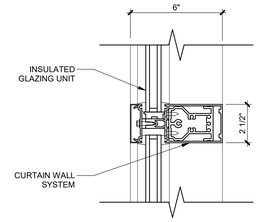
24 7 1/2" CURTAIN WALL - MULLION - SSG 2
3" = 1'-0"



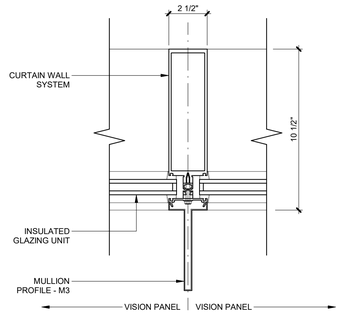
23 7 1/2" CURTAIN WALL - MULLION - SSG
3" = 1'-0"



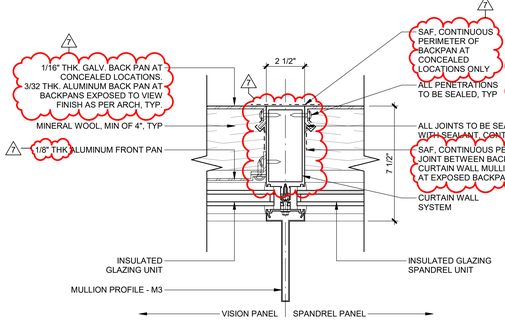
22 6" CURTAIN WALL - MULLION - TALL
3" = 1'-0"



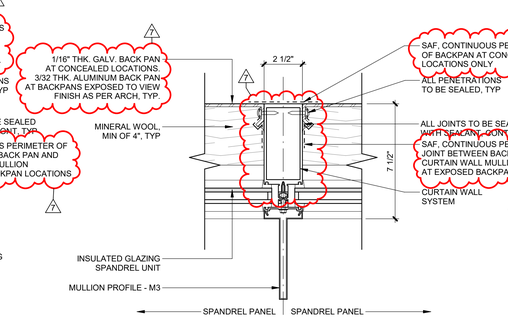
21 6" CURTAIN WALL - MULLION TYP.
3" = 1'-0"



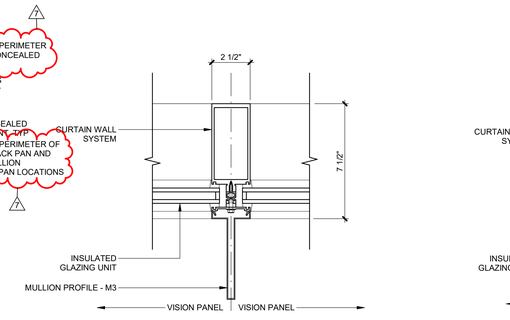
20 10 1/2" CURTAIN WALL - MULLION - M3
3" = 1'-0"



19 7 1/2" CURTAIN WALL - MULLION - 1
3" = 1'-0"

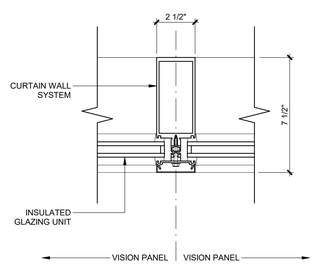


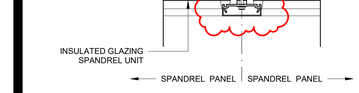
18 7 1/2" CURTAIN WALL - MULLION - 2
3" = 1'-0"



17 7 1/2" CURTAIN WALL - MULLION - M3
3" = 1'-0"

16 7 1/2" CURTAIN WALL - MULLION
3" = 1'-0"

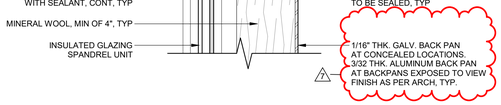




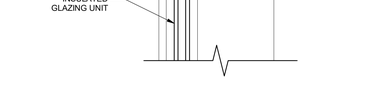
15 6" CURTAIN WALL - INTER. MULLION
3" = 1'-0"



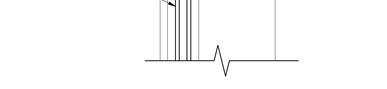
14 10 1/2" CURTAIN WALL - HEAD MULLION
3" = 1'-0"



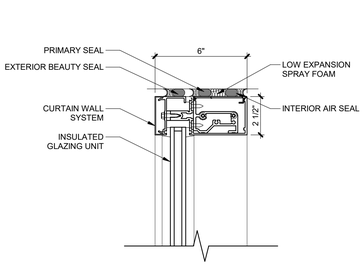
13 7 1/2" CURTAIN WALL - HEAD MULLION - PARAPET
3" = 1'-0"



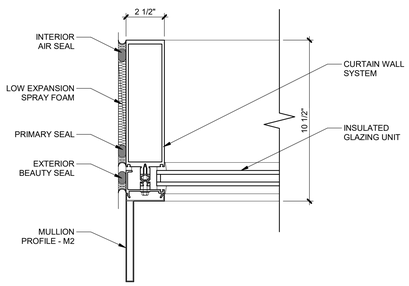
12 7 1/2" CURTAIN WALL - HEAD MULLION - M2
3" = 1'-0"



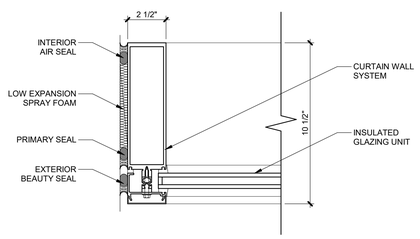
11 7 1/2" CURTAIN WALL - HEAD MULLION
3" = 1'-0"



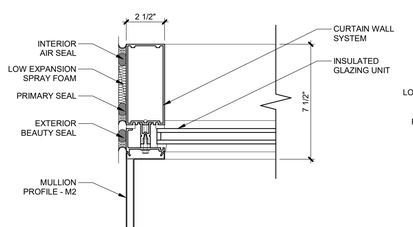
10 6" CURTAIN WALL - HEAD MULLION
3" = 1'-0"



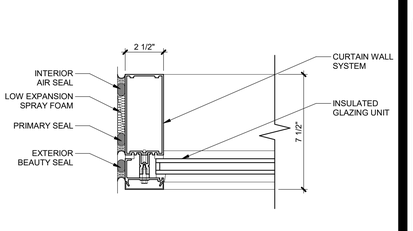
9 10 1/2" CURTAIN WALL - JAMB MULLION - M2
3" = 1'-0"



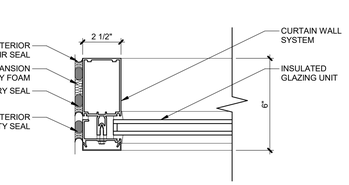
8 10 1/2" CURTAIN WALL - JAMB MULLION
3" = 1'-0"



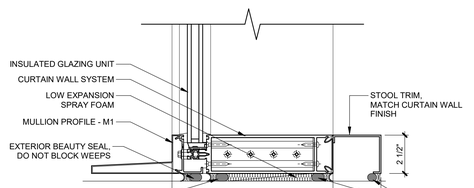
7 7 1/2" CURTAIN WALL - JAMB MULLION - M2
3" = 1'-0"



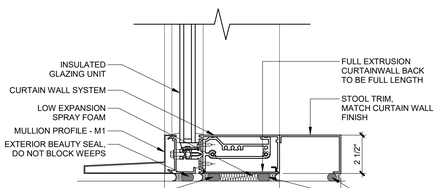
6 7 1/2" CURTAIN WALL - JAMB MULLION
3" = 1'-0"



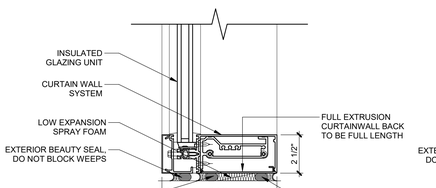
5 6" CURTAIN WALL - JAMB MULLION
3" = 1'-0"



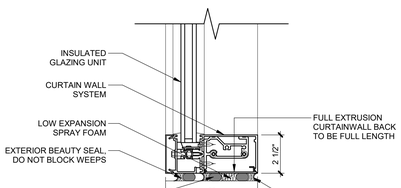
4 10 1/2" CURTAIN WALL - SILL MULLION - M1
3" = 1'-0"



3 7 1/2" CURTAIN WALL - SILL MULLION - M1
3" = 1'-0"



2 7 1/2" CURTAIN WALL - SILL MULLION
3" = 1'-0"



1 6" CURTAIN WALL - SILL MULLION
3" = 1'-0"

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CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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REGISTERED ARCHITECT ALEKSANDAR JANJIC 031126 STATE OF NEW YORK

REGISTRATION EXPIRES: 03/31/2026

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
7	04/17/26	ADDENDUM 7
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: SMD

DRAWN BY: JJS

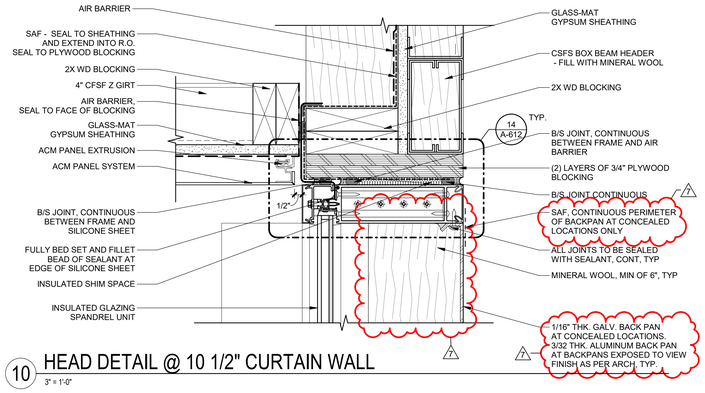
FIELD CHECK:

APPROVED:

SHEET TITLE: STANDARD CURTAIN WALL DETAILS

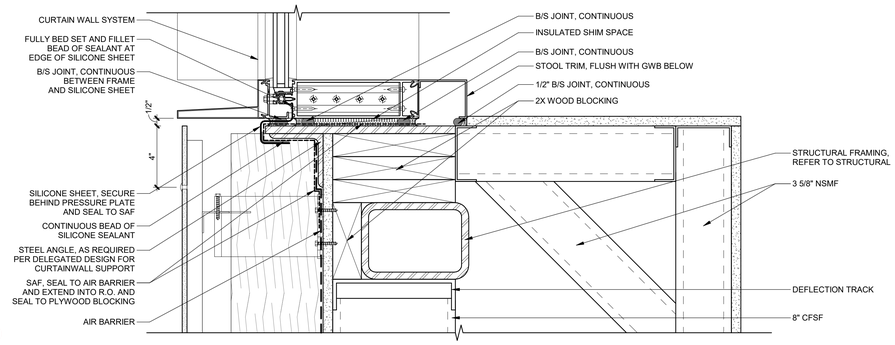
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SHEET: OF



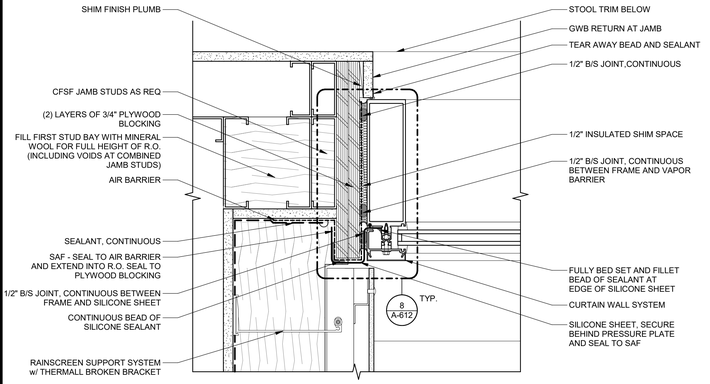
10 HEAD DETAIL @ 10 1/2" CURTAIN WALL

3" = 1'-0"



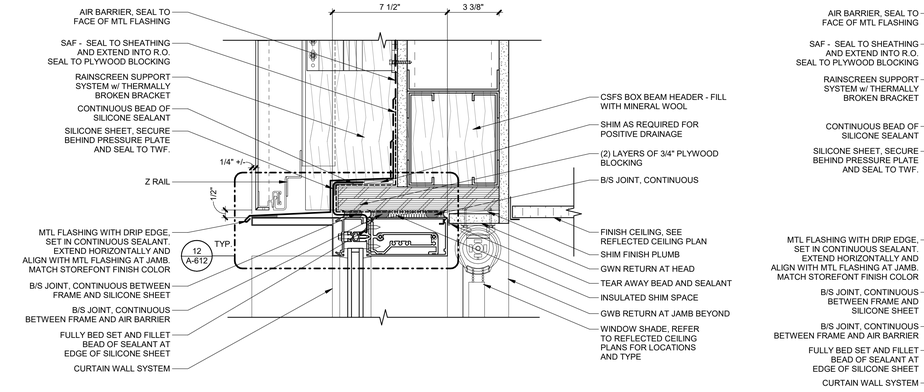
11 SILL DETAIL @ 10 1/2" CURTAIN WALL - HIGH

3" = 1'-0"



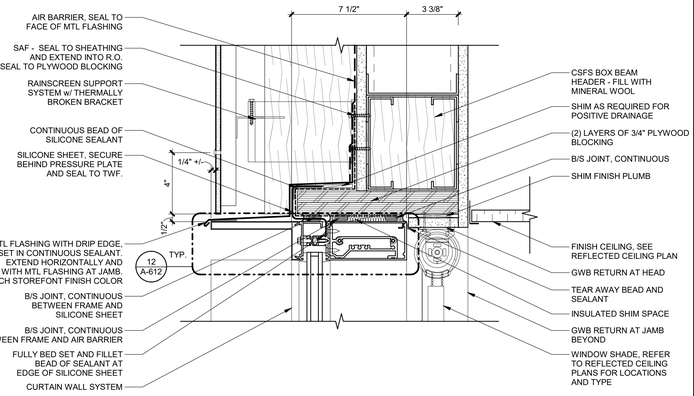
9 JAMB DETAIL @ 10 1/2" CURTAIN WALL - 2

3" = 1'-0"



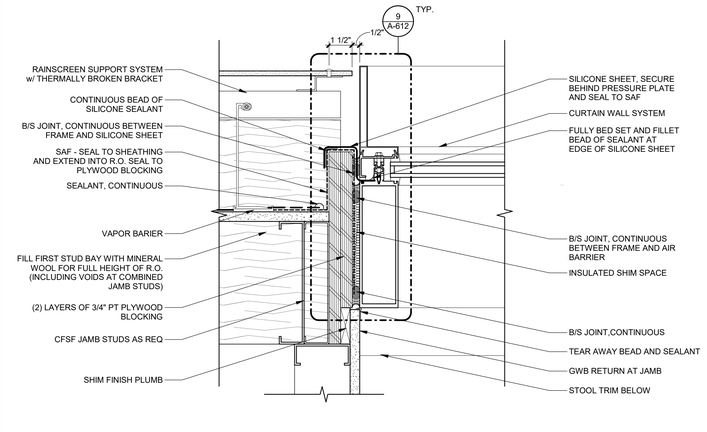
8 HEAD DETAIL @ 7 1/2" CURTAIN WALL - ACM PANELING

3" = 1'-0"



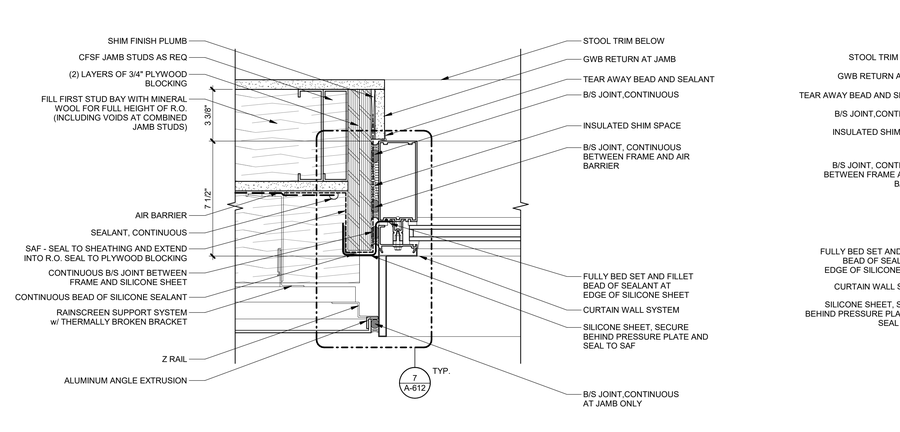
7 HEAD DETAIL @ 7 1/2" CURTAIN WALL - FIBER CEMENT PANELING

3" = 1'-0"



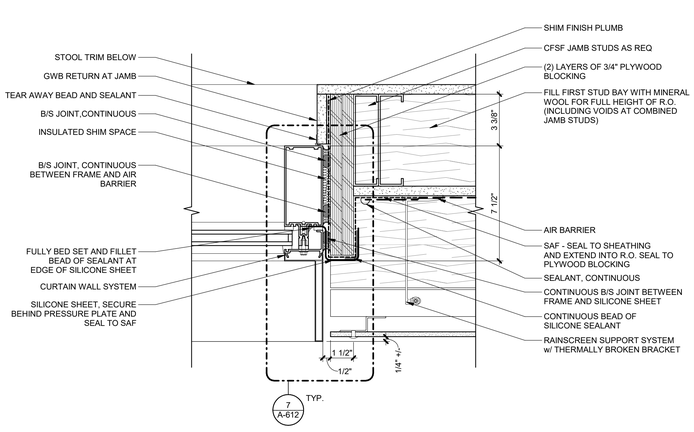
6 JAMB DETAIL @ 10 1/2" CURTAIN WALL - 1

3" = 1'-0"



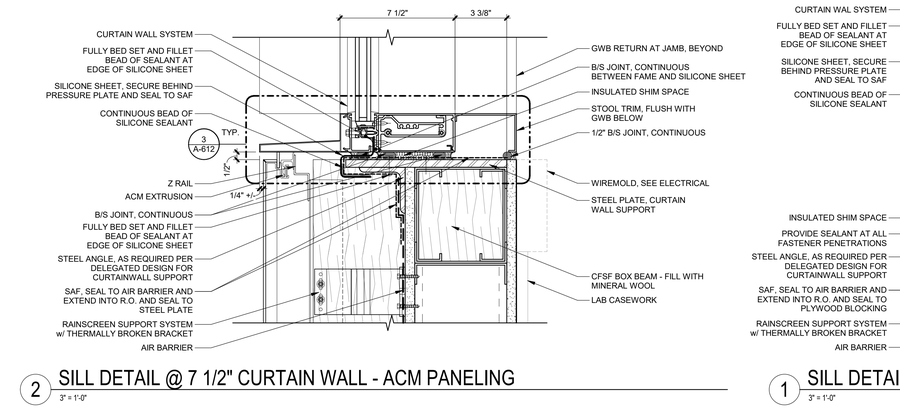
5 JAMB DETAIL @ 7 1/2" CURTAIN WALL - ACM PANELING

3" = 1'-0"



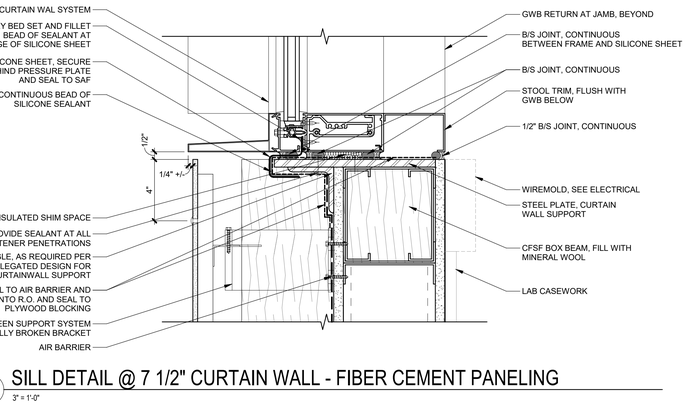
4 JAMB DETAIL @ 7 1/2" CURTAIN WALL - FIBER CEMENT PANELING

3" = 1'-0"



3 SILL DETAIL @ 10 1/2" CURTAIN WALL

3" = 1'-0"



2 SILL DETAIL @ 7 1/2" CURTAIN WALL - ACM PANELING

3" = 1'-0"

1 SILL DETAIL @ 7 1/2" CURTAIN WALL - FIBER CEMENT PANELING

3" = 1'-0"

Autodesk Docs://47528 DOT Lab Building/082990_OGS-DOT-LabBuilding_ARCH-CORE_R23.rvt
4/16/2026 10:56:48 PM
42x30 PLOT SHEET

NEW YORK STATE | Office of General Services

CONSULTANT:

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REGISTERED ARCHITECT ALEKSANDAR JANJIC STATE OF NEW YORK

REGISTRATION EXPIRES: 03/31/2028

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
7	04/17/26	ADDENDUM 7
6	04/14/26	ADDENDUM 6
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: SMD

DRAWN BY: JJS

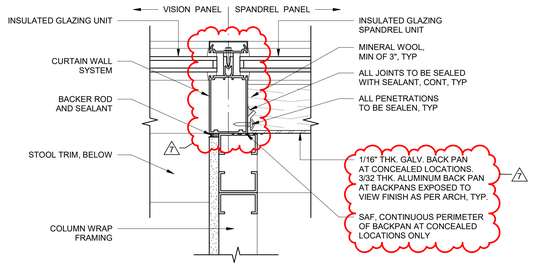
FIELD CHECK:

APPROVED:

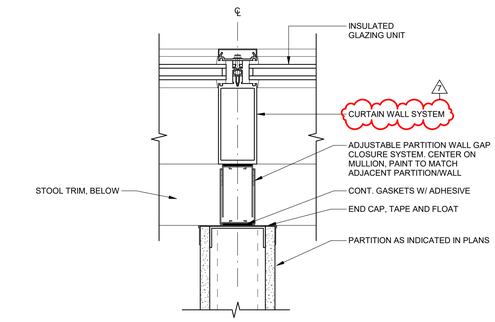
SHEET TITLE: CURTAIN WALL DETAILS

DRAWING NUMBER: A-614

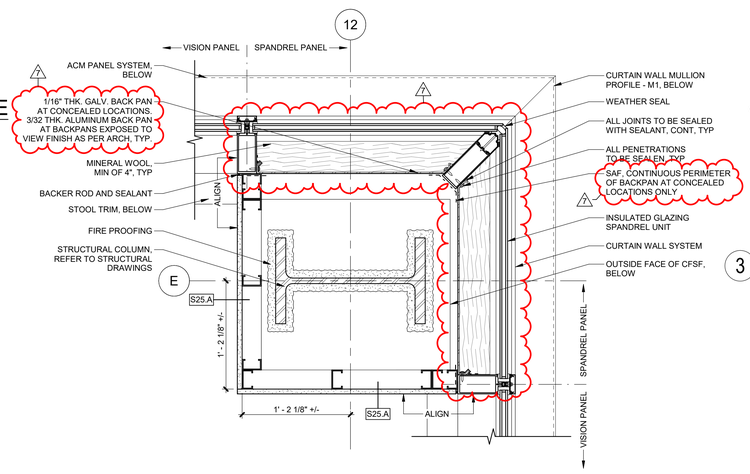
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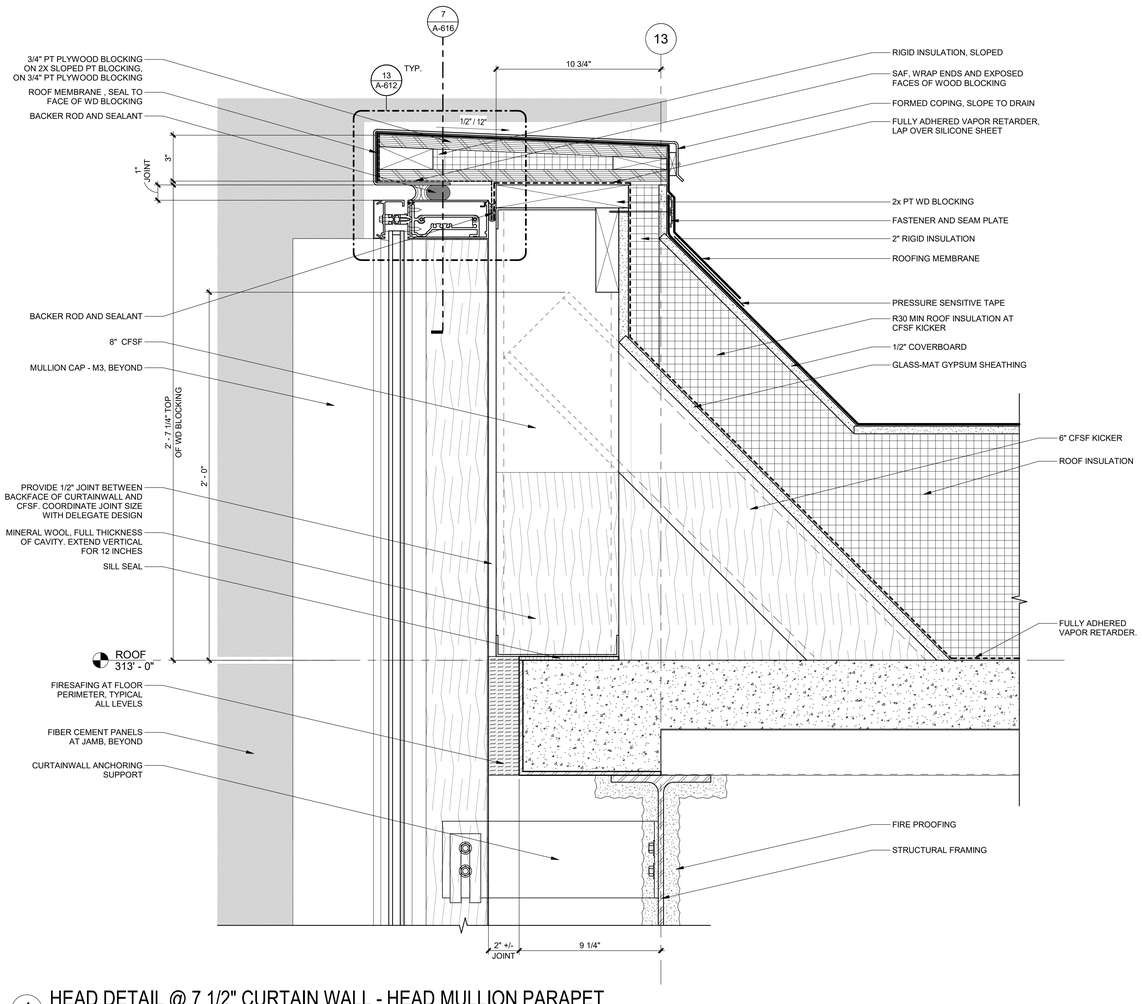
7 TYP. PLAN DETAIL AT WALL AND COLUMN ENCLOSURE
3" = 1'-0"



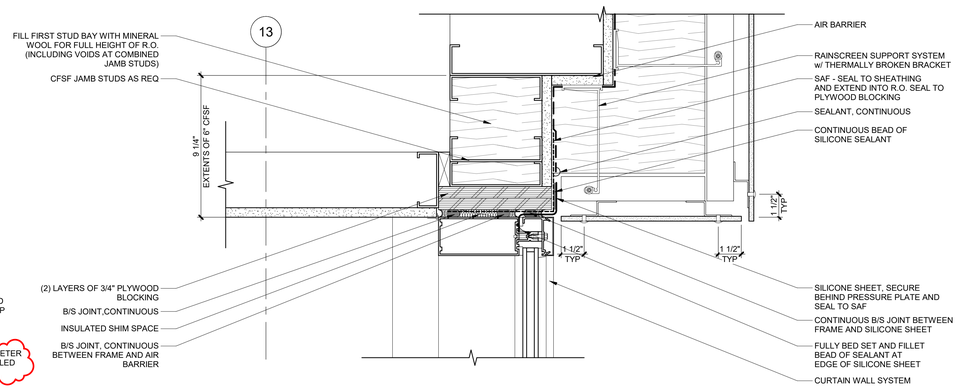
6 TYP. PLAN DETAIL AT WALL AND MULLION INTER.
3" = 1'-0"



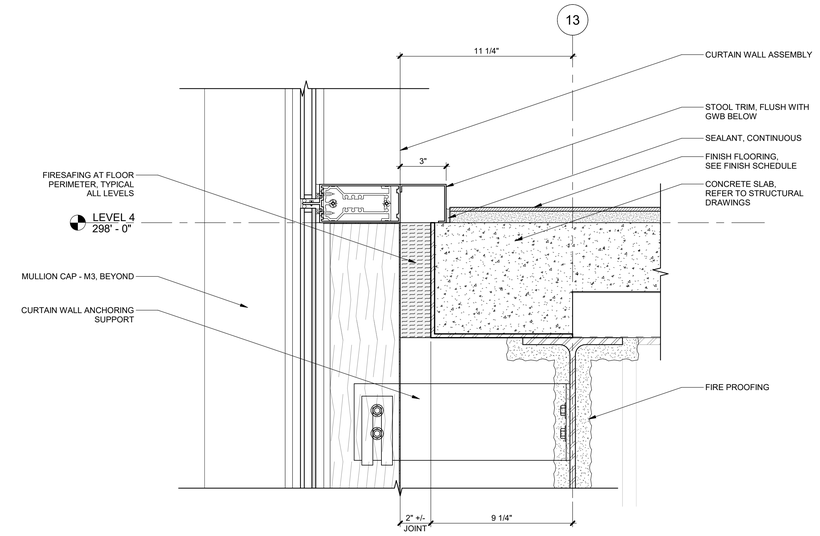
5 OUTSIDE CORNER AT CURTAIN WALL - SPANDREL PANEL
1 1/2" = 1'-0"



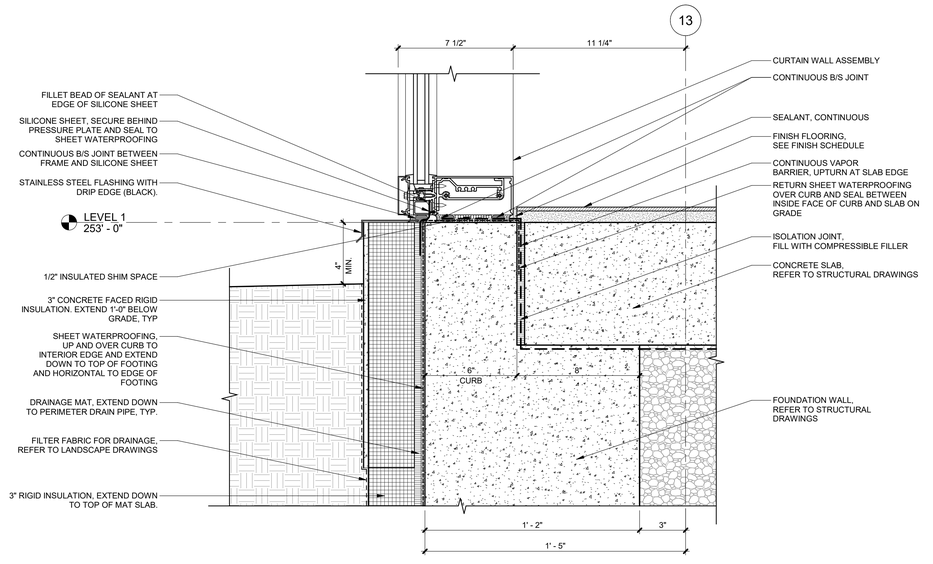
4 HEAD DETAIL @ 7 1/2" CURTAIN WALL - HEAD MULLION PARAPET
3" = 1'-0"



3 JAMB DETAIL @ 7 1/2" CURTAIN WALL - FIBER CEMENT PANELING - RECESSED
3" = 1'-0"



2 SILL DETAIL @ 7 1/2" CURTAIN WALL - INTERMEDIATE FLOOR
3" = 1'-0"



1 BOTTOM OF WALL DETAIL - CURTAIN WALL - AT GRADE
3" = 1'-0"

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4/16/2026 6:56:50 PM
42x30 PLOT SHEET

NEW YORK STATE Office of General Services

CONSULTANT:

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REGISTERED ARCHITECT ALEXANDAR JANJIC STATE OF NEW YORK

REGISTRATION EXPIRES: 03/31/2028

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
7	04/17/26	ADDENDUM 7
6	04/14/26	ADDENDUM 6
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: SMD

DRAWN BY: JJS

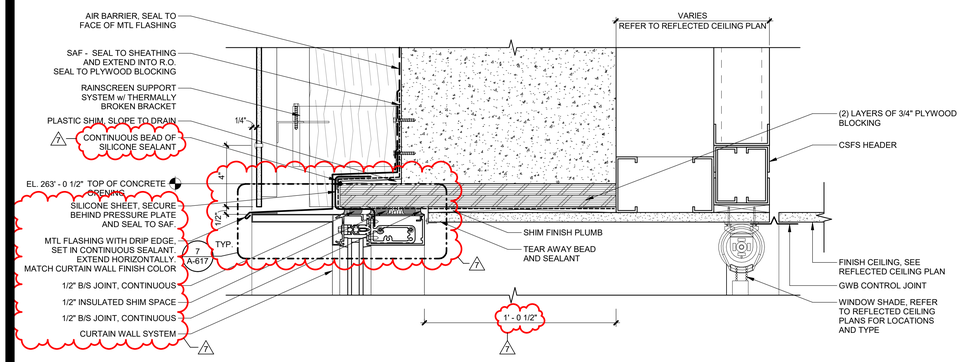
FIELD CHECK:

APPROVED:

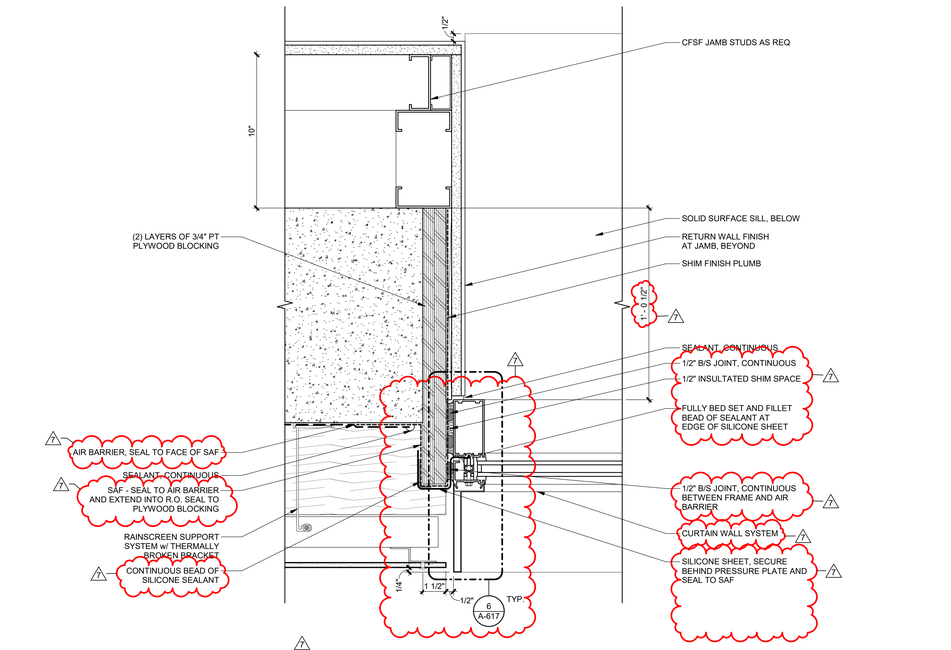
SHEET TITLE: CURTAIN WALL DETAILS

DRAWING NUMBER: A-615

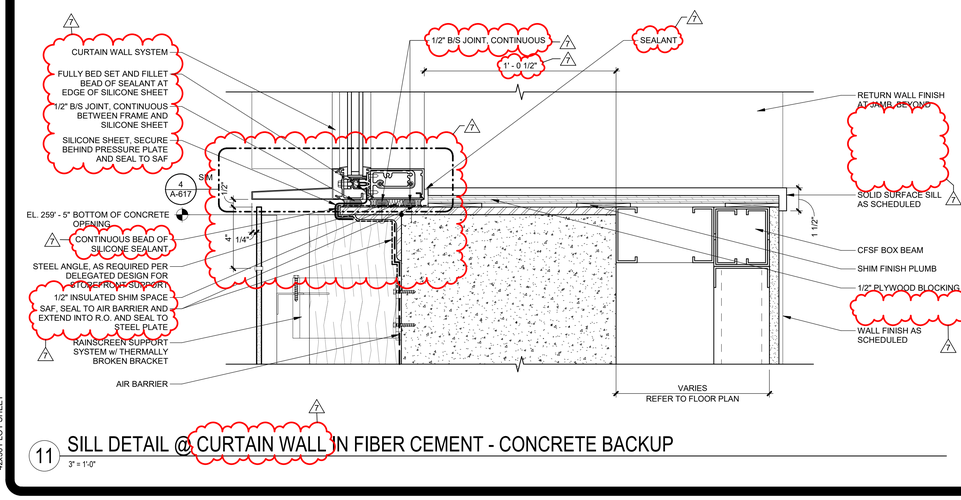
SHEET: OF



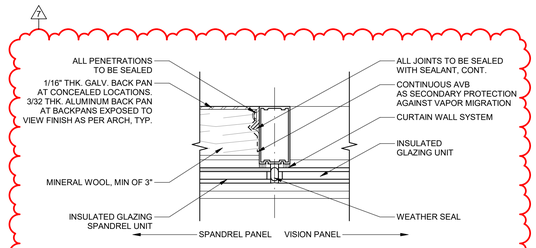
13 HEAD DETAIL @ CURTAIN WALL IN FIBER CEMENT - CONCRETE BACKUP
3" = 1'-0"



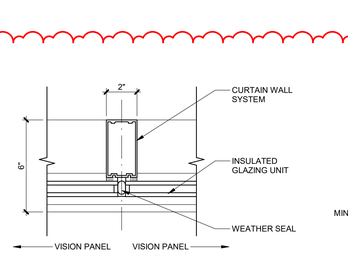
12 JAMB DETAIL @ CURTAIN WALL IN FIBER CEMENT - CONCRETE BACKUP
3" = 1'-0"



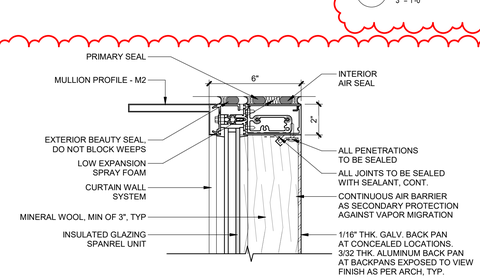
11 SILL DETAIL @ CURTAIN WALL IN FIBER CEMENT - CONCRETE BACKUP
3" = 1'-0"



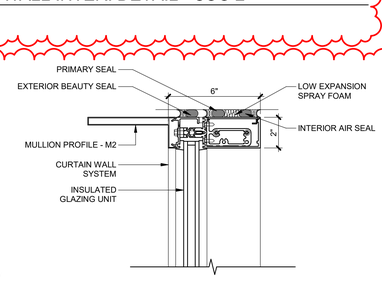
10 CURTAIN WALL INTER. DETAIL - SSG 2
3" = 1'-0"



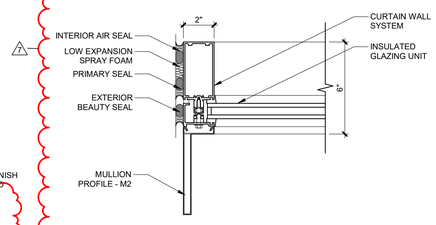
9 CURTAIN WALL INTER. DETAIL - SSG
3" = 1'-0"



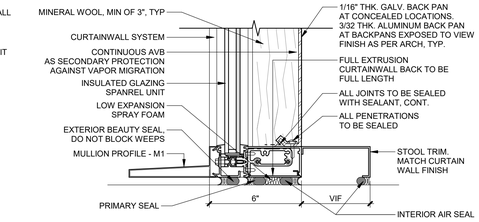
8 CURTAIN WALL HEAD MULLION - SPANDREL
3" = 1'-0"



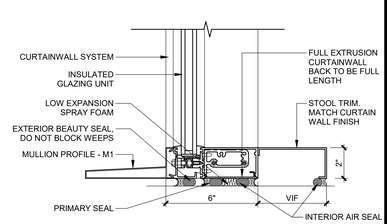
7 CURTAIN WALL HEAD MULLION
3" = 1'-0"



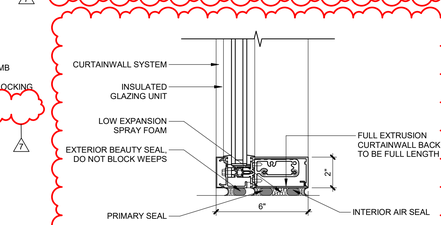
6 CURTAIN WALL JAMB MULLION
3" = 1'-0"



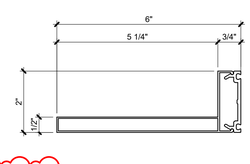
5 CURTAIN WALL SILL MULLION - SPANDREL
3" = 1'-0"



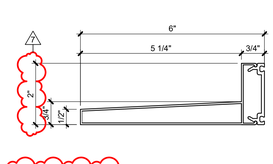
4 CURTAIN WALL SILL MULLION
3" = 1'-0"



3 CURTAIN WALL SILL MULLION - GRADE
3" = 1'-0"



2 CW MULLION PROFILE - M2.
3" = 1'-0"



1 CW MULLION PROFILE - M1.
3" = 1'-0"

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CERTIFICATE OF AUTHORIZATION #: 021745

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REGISTERED ARCHITECT ALEKSANDAR JANIC 031712 STATE OF NEW YORK

REGISTRATION EXPIRES: 03/31/2028

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
7	04/17/26	ADDENDUM 7
6	04/14/26	ADDENDUM 6
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: SMD

DRAWN BY: JJS

FIELD CHECK:

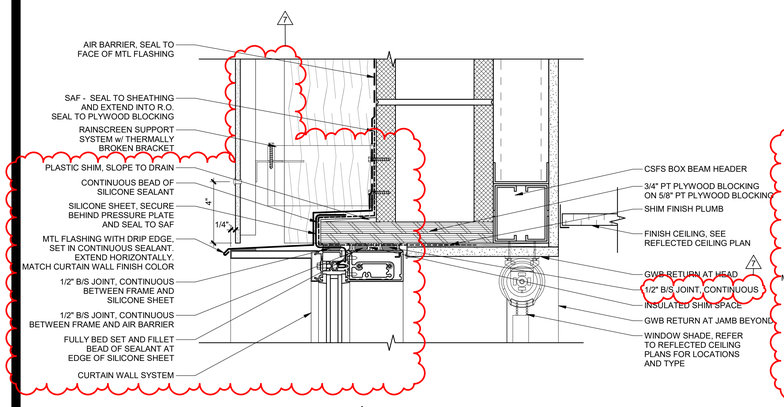
APPROVED:

SHEET TITLE: STANDARD CURTAINWALL DETAILS AND CURTAIN WALL DETAILS

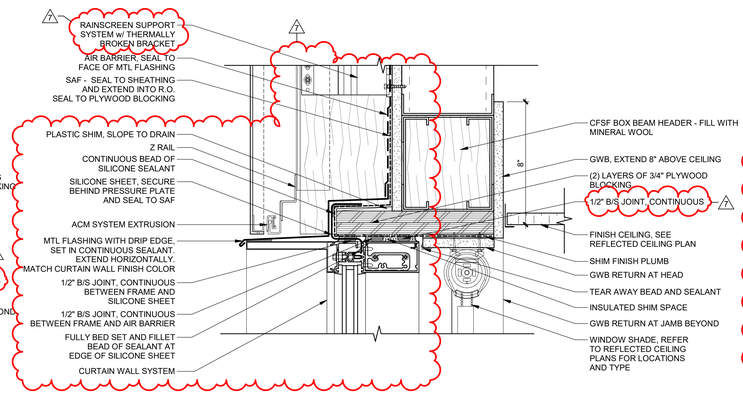
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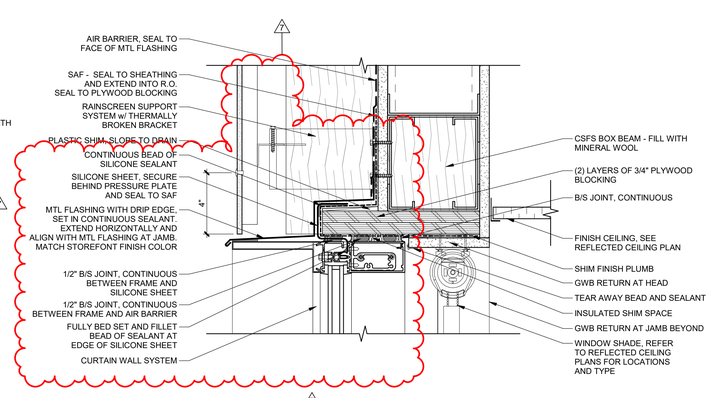
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42x30 PLOT SHEET



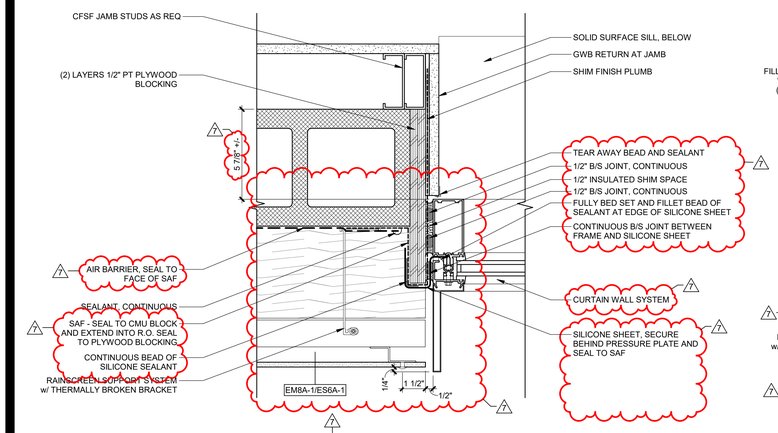
9 HEAD DETAIL @ CURTAIN WALL - CMU BACKUP
3" = 1'-0"



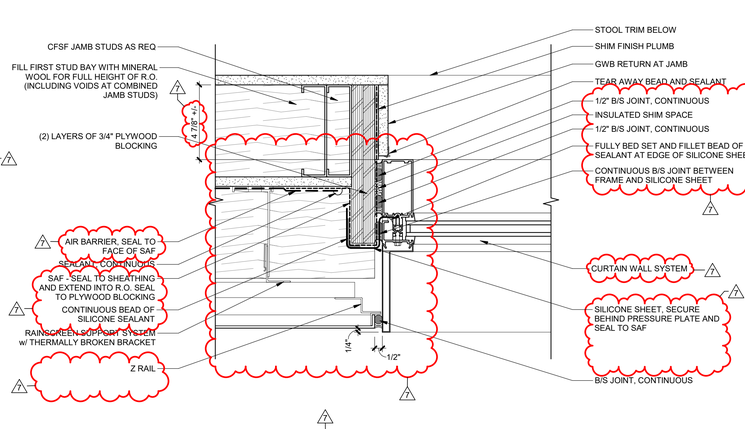
8 HEAD DETAIL @ CURTAIN WALL IN ACM PANEL
3" = 1'-0"



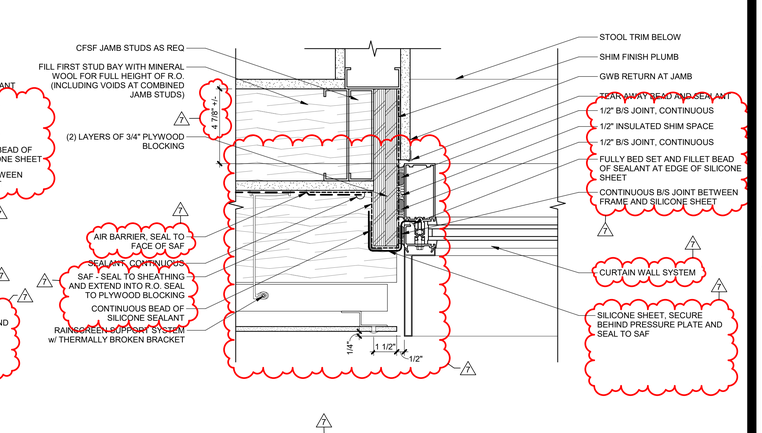
7 HEAD DETAIL @ CURTAIN WALL IN FIBER CEMENT
3" = 1'-0"



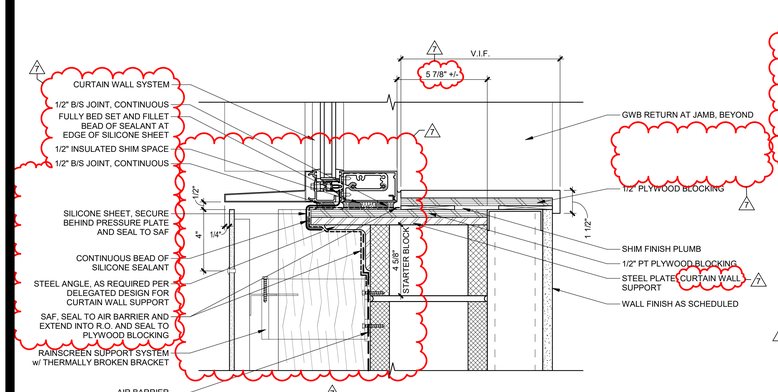
6 JAMB DETAIL @ CURTAIN WALL - CMU BACKUP
3" = 1'-0"



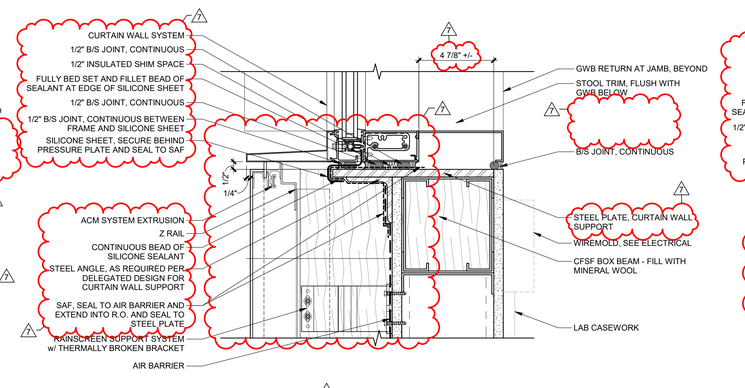
5 JAMB DETAIL @ CURTAIN WALL IN ACM PANEL
3" = 1'-0"



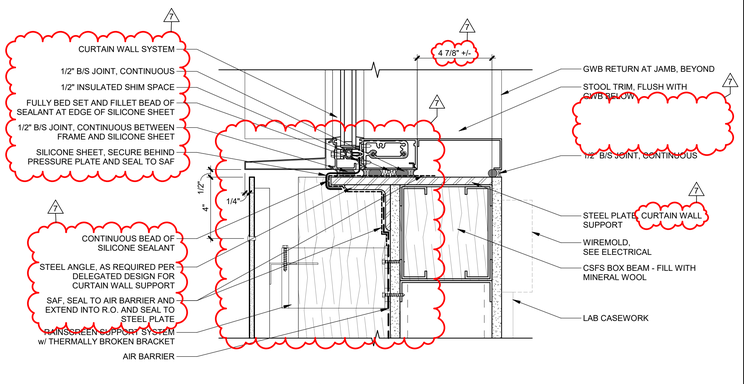
4 JAMB DETAIL @ CURTAIN WALL IN FIBER CEMENT
3" = 1'-0"



3 SILL SETAIL @ CURTAIN WALL - CMU BACKUP
3" = 1'-0"



2 SILL DETAIL @ CURTAIN WALL IN ACM PANEL
3" = 1'-0"



1 SILL DETAIL @ CURTAIN WALL IN FIBER CEMENT
3" = 1'-0"

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4/16/2026 5:06:57 PM
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REGISTRATION EXPIRES: 03/31/2028

CONTRACT: CONSTRUCTION

TITLE: Provide Testing Laboratory, Building 14

LOCATION: DOT Region 1, Albany County State Office Building Campus Albany, NY

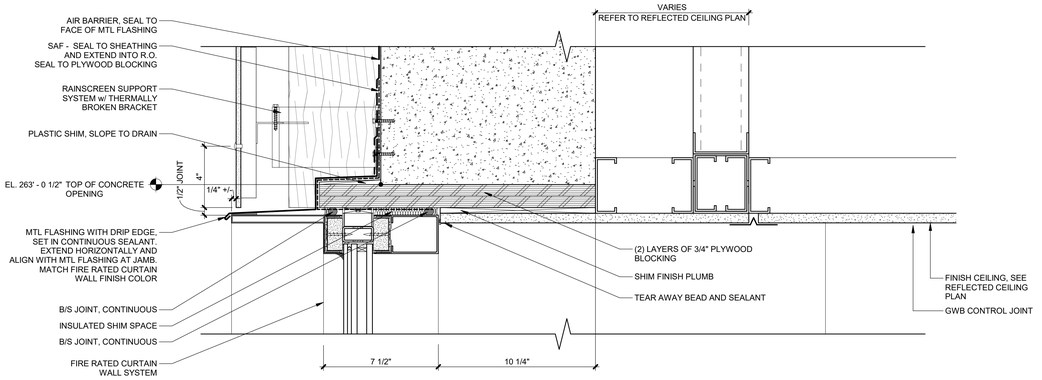
CLIENT: New York State Department of Transportation

MARK	DATE	DESCRIPTION
7	04/17/26	ADDENDUM 7
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C
DESIGNED BY: SMD
DRAWN BY: JJS
FIELD CHECK:
APPROVED:
SHEET TITLE: CURTAIN WALL DETAILS

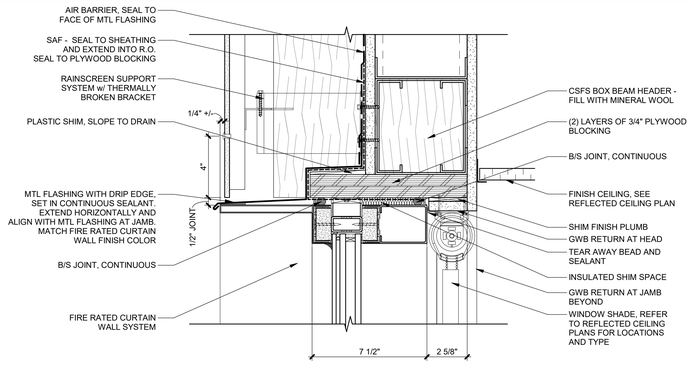
DRAWING NUMBER: A-618

SHEET: OF



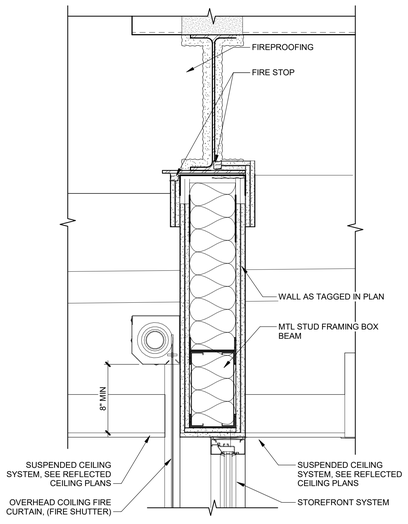
8 HEAD DETAIL @ FIRE RATED CURTAIN WALL - CONCRETE BACKUP

3" = 1'-0"



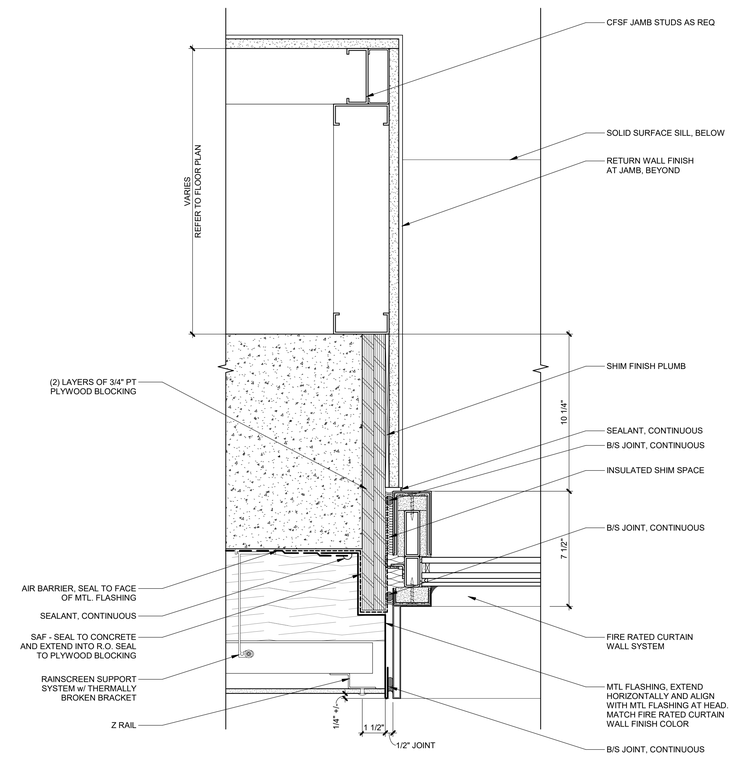
7 HEAD DETAIL @ FIRE RATED CURATAIN WALL

3" = 1'-0"



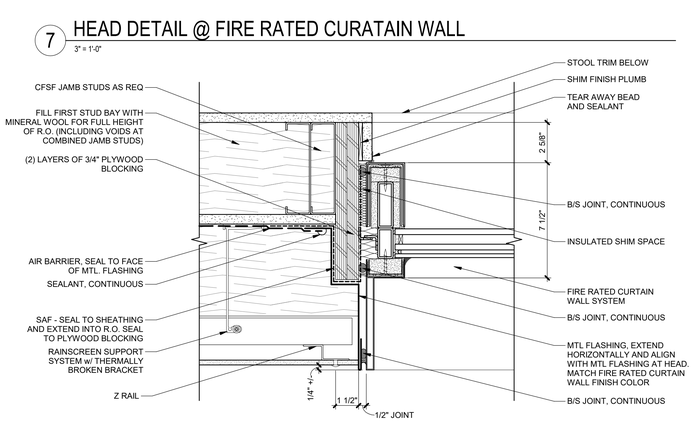
6 HEAD DETAIL @ STOREFRONT - FIRE SHUTTER

1 1/2" = 1'-0"



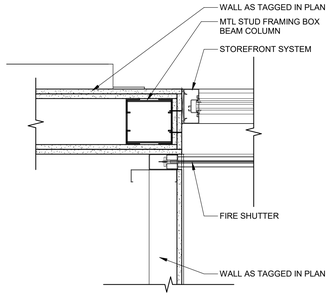
5 JAMB DETAIL @ FIRE RATED CURTAIN WALL - CONCRETE BACKUP

3" = 1'-0"



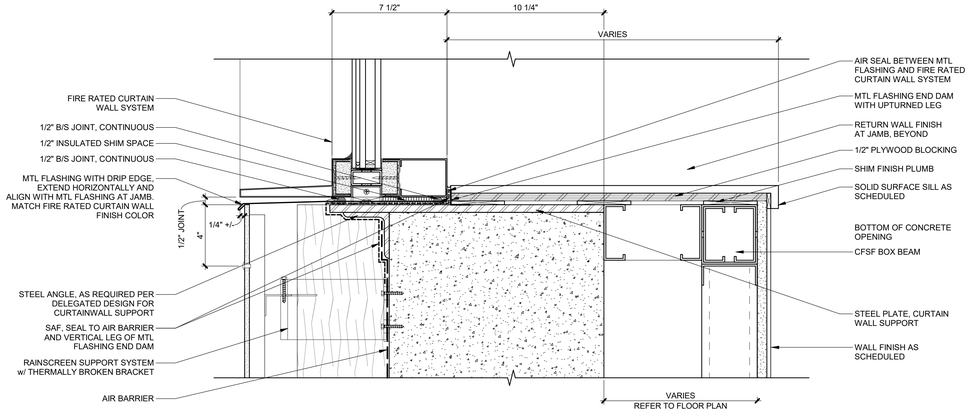
4 JAMB DETAIL @ FIRE RATED CURTAIN WALL

3" = 1'-0"



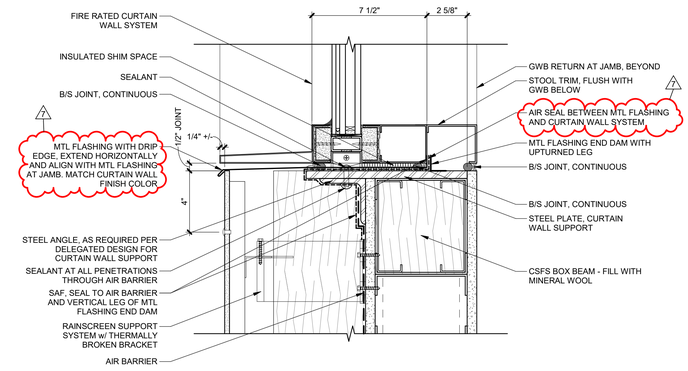
3 JAMB DETAIL @ STOREFRONT - FIRE SHUTTER

1 1/2" = 1'-0"



2 SILL DETAIL @ FIRE RATED CURTAIN WALL - CONCRETE BACKUP

3" = 1'-0"



1 SILL DETAIL @ FIRE RATED CURTAIN WALL

3" = 1'-0"

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Office of General Services

CONSULTANT:

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REGISTERED ARCHITECT
ALEKSANDAR JANJIC
STATE OF NEW YORK
REGISTRATION EXPIRES: 03/31/2028

CONTRACT: CONSTRUCTION

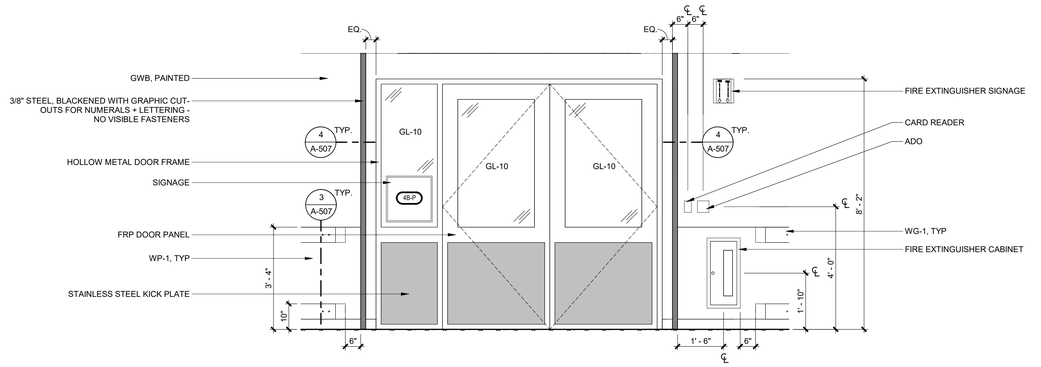
TITLE: Provide Testing Laboratory, Building 14

LOCATION: DOT Region 1, Albany County State Office Building Campus Albany, NY

CLIENT: New York State Department of Transportation

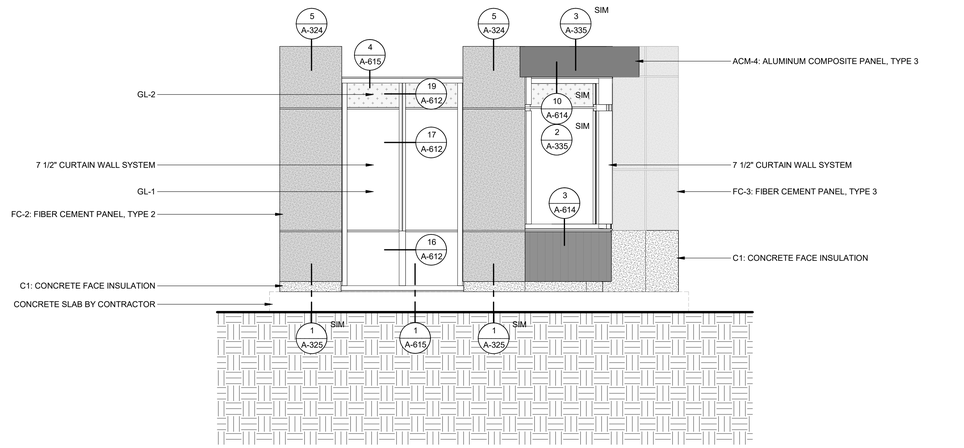
MARK	DATE	DESCRIPTION
7	04/17/26	ADDENDUM 7
6	04/14/26	ADDENDUM 6
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C
DESIGNED BY: SMD
DRAWN BY: JJS
FIELD CHECK:
APPROVED:
SHEET TITLE: FIRE RATED CURTAIN WALL DETAILS
DRAWING NUMBER: A-619
SHEET: OF



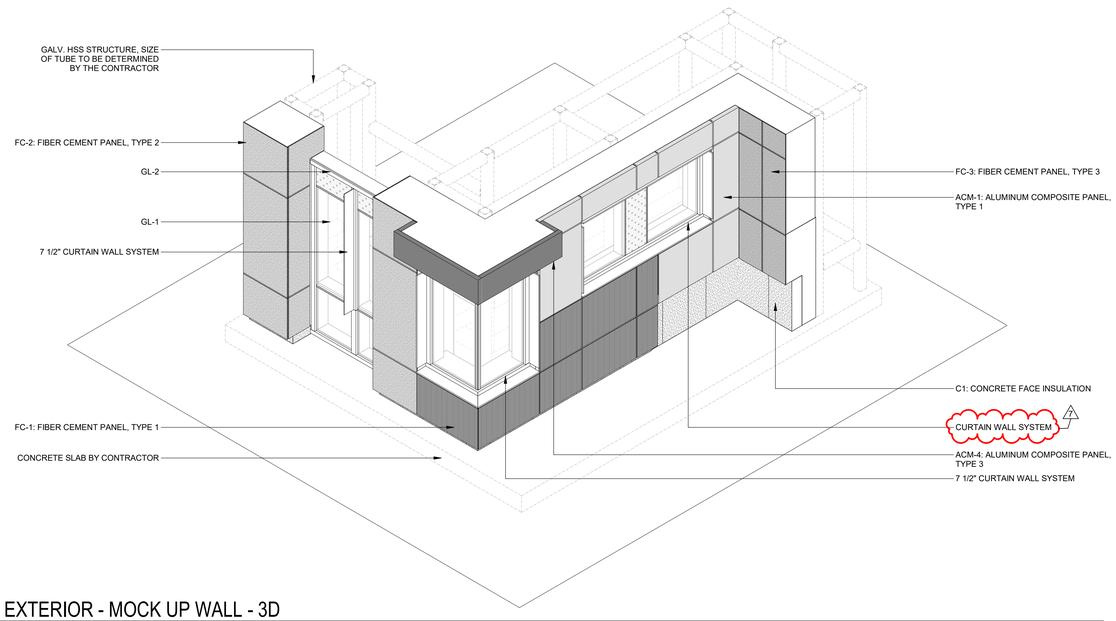
5 INTEGRATED LABORATORY ENTRANCE MOCKUP

1/2" = 1'-0"

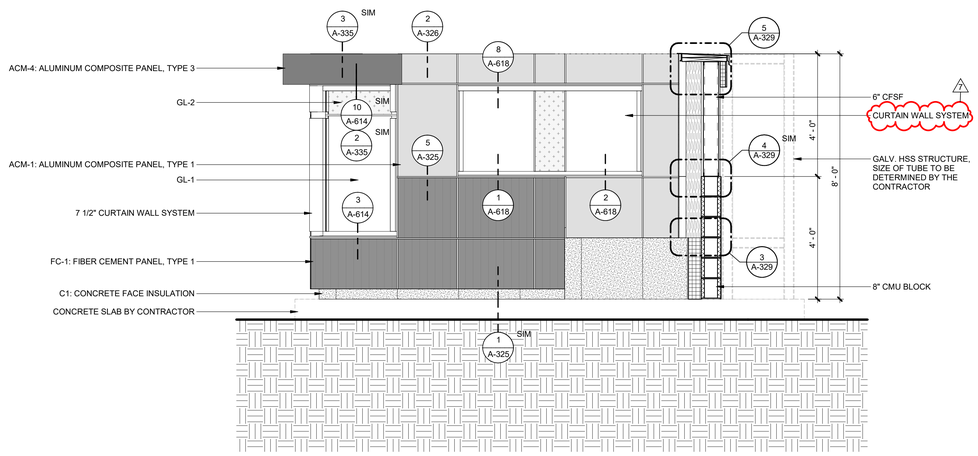


4 MOCK UP WALL - ELEVATION 2

1/2" = 1'-0"

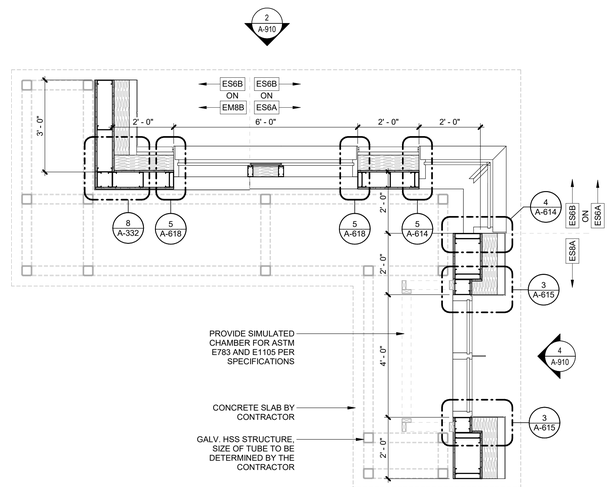


3 EXTERIOR - MOCK UP WALL - 3D



2 MOCK UP WALL - ELEVATION 1

1/2" = 1'-0"



1 MOCK UP WALL - FLOOR PLAN

1/2" = 1'-0"

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NEW YORK STATE Office of General Services

CONSULTANT:

CERTIFICATE OF AUTHORIZATION #: 021745

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REGISTRATION EXPIRES: 03/31/2028

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

MARK	DATE	DESCRIPTION
7	04/17/26	ADDENDUM 7
	01/13/26	BID DOCUMENT

PROJECT NUMBER:	47528-C
DESIGNED BY:	SMD
DRAWN BY:	JJS
FIELD CHECK:	
APPROVED:	

SHEET TITLE: MOCK-UP WALL

DRAWING NUMBER: A-910

SHEET: OF

SECURITY ABBREVIATIONS

A	AMPERE
AC	ALTERNATING CURRENT
ACP	ACCESS CONTROL PANEL
AFF/G	ABOVE FINISHED FLOOR/GRADE
AWG	AMERICAN WIRE GAUGE
BAT	BATTERY
BLDG	BUILDING
℄	CENTERLINE
C	CONDUIT
CCTV	CLOSED-CIRCUIT TELEVISION
CKT	CIRCUIT
CMS	CABLE MANAGEMENT SYSTEM
CPI	CAMERA POE INJECTOR
CPP	COPPER PATCH PANEL
CR	CARD READER
CS	CAMERA STATION
CSP	CAMERA SURGE PROTECTION
°	DEGREE(S)
DBIM	DURESS BUTTON INPUT MODULE
DBOM	DURESS BUTTON OUTPUT MODULE
DBP	DURESS BUTTON PANEL
DO	DOOR OPERATOR
DPS	DOOR POSITION SWITCH
DWG	DRAWING
EA	EACH
ELEC	ELECTRIC(AL)
EQUIP	EQUIPMENT
ES	ETHERNET SWITCH
G,GND	GROUND
ID	IDENTIFY, IDENTIFICATION
IP	INTERNET PROTOCOL
I.T.	INFORMATION TECHNOLOGY
JB	JUNCTION BOX
KB	KEYBOARD
KP	KEYPAD
KVA	KILO VOLT AMPERE
KVM	KEYBOARD/VIDEO/MOUSE
KW	KILOWATT
LAN	LOCAL AREA NETWORK
MON	MONITOR
MTD	MOUNTED
MUTOA	MULTI-USER TELECOMMUNICATIONS OUTLET ASSEMBLY
NEC	NATIONAL ELECTRICAL CODE
NIC	NOT IN CONTRACT
NO/#	NUMBER
NTP	NETWORK TIME PROTOCOL
OFTR	OPTICAL FIBER TERMINATION RACK
POE	POWER OVER ETHERNET
POE-E	POWER OVER ETHERNET EXTENDER
PS	POWER SUPPLY
PTZ	PAN-TILT-ZOOM
PWR	POWER
PX	PUSH BUTTON
REX	REQUEST TO EXIT
RGS	RIGID GALVANIZED STEEL
RM	ROOM, RACK MOUNT
SERV	SERVER
SMS	SYSTEM MAIN SERVER, SHORT MESSAGE SERVICE
TYP	TYPICAL
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTIBLE POWER SUPPLY
UTP	UNSHEILDED TWISTED PAIR
V	VOLT, VOLTS
VA	VOLT-AMPERES
VAC	VOLTS, AC
W	WATT, WIRE, WATERBUG SURFACE SENSOR
W/	WITH
WS	WORKSTATION

GENERAL

- (#) — NUMBER IN CIRCLE, WITH OR WITHOUT ARROW OR LEADER, REFER TO MATCHING NUMBERED CODED NOTE
- # / XXX — DETAIL CALLOUT
  - # - INDICATES DETAIL/PLAN NUMBER
  - XXX - INDICATES DRAWING NUMBER
- CS ####— CAMERA STATION CALLOUT
  - #### - INDICATES DEVICE NUMBER, REFER TO DEVICE NUMBERING SCHEME ON THIS SHEET FOR ADDITIONAL INFORMATION
- (#) — DOOR TAG
  - # - INDICATES DOOR/OPENING NUMBER
- (#) — CABLE CALLOUT
  - # - INDICATES CABLE SCHEDULE NOTE
- XXX / # / Ref — ELEVATION CALLOUT
  - # - INDICATES DETAIL/PLAN NUMBER
  - XXX - INDICATES DRAWING NUMBER

SECURITY

- DOOR POSITION SWITCH
- CARD READER
- ELECTRO-MECHANICAL LOCK W/ BUILT-IN REQUEST TO EXIT AND LATCH BOLT MONITORING
  - SUBSCRIPT L - INDICATES LATCH RETRACTION ELETRONIC LOCK WITH BUILT-IN REQUEST TO EXIT AND LATCH BOLT MONITORING WITH POWER SUPPLY LOCATED AT DOOR (POWER SUPPLY BY DIV 08
  - SUBSCRIPT G - INDICATES ELECTRONIC GATE LOCK WITH WITH BUILT-IN REQUEST TO EXIT AND LATCH BOLT MONITORING.
- ACP — ACCESS CONTROL PANEL
- PS — POWER SUPPLY
- OFTR — OPTICAL FIBER TERMINATION RACK / FIBER TERMINATION PIGTAIL CASSETTE
- POE — POWER OVER ETHERNET SWITCH
- CPP — COPPER PATCH PANEL
- CMS — CABLE MANAGEMENT SYSTEM
- SERVER — SERVER
  - SUBSCRIPT ACS - INDICATES SERVER TO ACCESS CONTROL SYSTEM
  - SUBSCRIPT DUR - INDICATES SERVER FOR DURESS BUTTON SYSTEM
- NVR — NETWORK VIDEO RECORDER FOR CCTV SYSTEM
- SP — SURGE PROTECTION
- INDOOR/OUTDOOR FIXED CAMERA STATION
  - SUBSCRIPT C - INDICATES CORNER MOUNT CAMERA
- MULTI-SENSOR CAMERA STATION
- SECURITY EQUIPMENT RACK. DOOR INDICATES FRONT OF SECURITY EQUIPMENT RACK.
- DURESS BUTTON
- JB — JUNCTION BOX
- DO — DOOR OPERATOR
- PX — TOUCHLESS CIRCULAR PUSH BUTTON
- DBIM — DURESS BUTTON INPUT MODULE
- DBOM — DURESS BUTTON OUTPUT MODULE
- DBP — DURESS BUTTON PANEL
- GO — GATE OPERATOR
- LONG RANGE CARD READER
- MON — MONITOR
  - SUBSCRIPT 24" - INDICATES 24" MONITOR SIZE
- WORKSTATION WITH KEYBOARD AND MOUSE
  - SUBSCRIPT ACS - INDICATES ACCESS CONTROL SYSTEM WORKSTATION
  - SUBSCRIPT CCTV - INDICATES CCTV WORKSTATION
  - SUBSCRIPT VMS - INDICATES VISITOR MANAGEMENT SYSTEM WORKSTATION
- NETWORK DATA OUTLET. MOUNT AT 18" AFF UON. PROVIDE 4" SQ. BOX WITH SINGLE GANG MUD RING AND 2-PORT RJ 45 COVER PLATE. PROVIDE 3/4" C. TO ABOVE ACCESSIBLE CEILING. PROVIDE J-HOOKS TO NEAREST CABLE TRAY FOR ROUTING OF CAT 6A CABLE TO ASSOCIATED POE.
- DIALER — DIALER FOR DURESS BUTTON SYSTEM
- NTP — NETWORK TIME PROTOCOL SERVER
- GPS OUTDOOR ANTENNA WITH 50' MANUFACTURED ANTENNA CABLE
- RM-KVM — RACK MOUNT KEYBOARD/VIDEO/MOUSE

LINETYPES

- ——UG—— UNDERGROUND CONDUIT WITH WIRING
- —— – —— – —— LINETYPE INDICATES RISER DIAGRAM EQUIPMENT LOCATIONS
- ———— LINETYPE INDICATES PROPOSED EQUIPMENT/WIRING

CAMERA / DEVICE NUMBERING SCHEME

X ## — NUMERAL/LETTER INDICATES LOCATION
- 1 - 1ST FLOOR
- 2 - 2ND FLOOR
- 3 - 3RD FLOOR
- 4 - 4TH FLOOR
- S - SITE

NUMERALS INDICATE DEVICE NUMBER

SECURITY GENERAL NOTES

1. INSTALL CAT6A IN CONTINUOUS LENGTH FROM TERMINATION POINT TO TERMINATION POINT AND LABELED AT EACH END POINT PER ANSI/TIA/EIA-606-A.
2. PROVIDE ANY AND ALL EQUIPMENT LIFTS TO ACCOMPLISH TASKS. CONTRACTOR SHALL FOLLOW ALL FACILITY RESTRICTIONS/LIMITATIONS FOR UTILIZING LIFTS. COORDINATE LIFT RESTRICTIONS/LIMITATIONS WITH OWNER.
3. UTILIZE CABLE TRAY SHOWN ON EACH LEVEL DRAWINGS FOR CABLE ROUTING. PROVIDE CONDUIT AND WIRING FROM DEVICES TO CABLE TRAY AS REQUIRED.
4. ALL LOW VOLTAGE WIRING SHALL BE TESTED, CERTIFIED AND DOCUMENTED FOR GROUND, SHORT AND OPENS.
5. CAMERA STATION AIMING:
   A. IN AREAS WHERE MULTIPLE CAMERA STATIONS ARE SHOWN, THE STATIONS SHALL BE LOCATED AND AIMED SO THAT THE ENTIRE SPACE IS COMPLETELY VIEWED BY THE CAMERAS IN THAT AREA. THERE SHALL BE NO LOCATION WITHIN THE SPACE THAT IS NOT UNDER SURVEILLANCE BY AT LEAST ONE CAMERA STATION.
   B. IN AREAS WHERE A SINGLE CAMERA STATION IS SHOWN, THE CAMERA STATION SHALL BE LOCATED AND AIMED TO PROVIDE AS MUCH SURVEILLANCE OF THE SPACE AS POSSIBLE WITHIN THE FIELD OF VIEW LIMITS OF THE CAMERA STATION LENS.
   C. PRIOR TO INSTALLATION, CONFIRM APPROPRIATE PLACEMENT OF EACH INTERIOR/EXTERIOR CAMERA STATION.
7. SEPARATE ALL SYSTEM CABLING AND ROUTE TO APPROPRIATE ELECTRONIC EQUIPMENT RACK AND/OR ACCESS CONTROL PANEL AS INDICATED ON DRAWINGS. ALL CABLES SHALL BE LABELED WITH BRADY MARKERS OR EQUAL. NO SPLICES ALLOWED UNLESS OTHERWISE NOTED.
8. PROVIDE A NAMEPLATE AT EACH DEVICE LOCATION, INDICATING DEVICE NAME OR NUMBER.
9. REFER TO ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL, AND FIRE ALARM DRAWINGS AND SPECIFICATIONS FOR COORDINATION.
10. ALL CONDUIT SHALL BE 3/4" UNLESS OTHERWISE NOTED.
11. PROVIDE ALL CONDUIT AND LOW VOLTAGE CABLING FOR EACH SECURITY SYSTEM ALONG WITH ALL REQUIRED FIBER OPTIC CABLING INCLUDING TERMINATIONS AND TESTING.
12. PROVIDE PULL STRING IN ALL CONDUIT AND PULL BOXES. ALL CONDUIT SHALL HAVE PLASTIC BUSHINGS INSTALLED AT OPEN ENDS PRIOR TO PULLING WIRE.
13. ALL PULL BOXES SHALL BE FLUSH MOUNTED OR CONCEALED UNLESS OTHERWISE NOTED.
14. ALL CABLE RUNS IN CEILING AREAS WHERE CONDUIT OR CABLE TRAY IS NOT SPECIFIED SHALL BE SUPPORTED WITH SIMILAR SUPPORT OR WITH USE OF J- HOOKS AT 5' INTERVALS ABOVE CEILING TILES.
15. ALL BACK BOXES MOUNTED WITHIN FIRE RATED PARTITIONS SHALL MEET THE FIRE RATING OF THE PARTITION AS REQUIRED BY CODE.
16. CONDUIT RUNS SHOWN ARE DIAGRAMMATIC UON. EXACT LOCATION OF ALL CONDUIT RUNS SHALL BE DETERMINED IN THE FIELD. COORDINATE INSTALLATIONS AND AVOID CONFLICT WITH PIPING, DUCTWORKS, AND ACCESS DOORS.
17. CONCEAL CONDUITS AND/OR WIRING WITHIN WALLS, UNDER FLOORS AND/OR ABOVE SUSPENDED CEILINGS WHEREVER POSSIBLE.
18. SURGE PROTECTION SHALL BE PROVIDED FOR ALL EXTERIOR DEVICES.
19. UTILIZE VELCRO STRAPS FOR CABLE MANAGEMENT.
20. PROVIDE PULL BOX EVERY 150' OR 180° IN CONDUIT BENDS FOR COMMUNICATION CONDUITS.
21. OPTICAL FIBER CABLE TEST: ALL FIBER TESTING SHALL BE PERFORMED ON ALL FIBERS IN THE COMPLETED END-TO-END LINK TESTS ACCORDING TO TIA/EIA-568-B.1 AND TIA/EIA-568-B.3.
22. LINK END-TO-END TESTS: TEST AT 850 OR 1300 NM IN 1 DIRECTION ACCORDING TO TIA-526-14-A, METHOD B. DB LOSS SHALL BE LESS THAN REQUIREMENTS OF TIA/EIA-568-B.1.
23. TEST UTP BACKBONE COPPER CABLING FOR DC LOOP RESISTANCE, SHORTS, OPENS, INTERMITTENT FAULTS, AND POLARITY BETWEEN CONDUCTORS. TEST OPERATION OF SHORTING BARS IN CONNECTION BLOCKS. TEST CABLES AFTER TERMINATION BUT NOT CROSS-CONNECTION.
   A. TEST INSTRUMENTS SHALL MEET OR EXCEED APPLICABLE REQUIREMENTS IN TIA/EIA-568-B.2. PERFORM TESTS WITH A TESTER THAT COMPLIES WITH PERFORMANCE REQUIREMENTS IN "TEST INSTRUMENTS (NORMATIVE)" ANNEX, COMPLYING WITH MEASUREMENT ACCURACY SPECIFIED IN "MEASUREMENT ACCURACY (INFORMATIVE)" ANNEX. USE ONLY TEST CORDS AND ADAPTERS THAT ARE QUALIFIED BY TEST EQUIPMENT MANUFACTURER FOR CHANNEL OF LINK TEST CONFIGURATION.
24. UTP PERFORMANCE TESTS:
   A. TEST FOR EACH OUTLET AND MUTOA. PERFORM THE FOLLOWING TESTS ACCORDING TO TIA/EIA-568-B.1 AND TIA/EIA-568-B.2:
      1) WIRE MAP.
      2) LENGTH (PHYSICAL VS. ELECTRICAL) AND LENGTH REQUIREMENTS.
      3) INSERTION LOSS.
      4) NEAR-END CROSSTALK (NEXT) LOSS.
      5) POWER SUM NEAR-END CROSSTALK (PSNEXT) LOSS.
      6) EQUAL-LEVEL FAR-END CROSSTALK (ELFEXT).
      7) POWER SUM EQUAL-LEVEL FAR-END CROSSTALK (PSELFEXT)
      8) RETURN LOSS.
      9) PROPAGATION DELAY.
      10) DELAY SKEW.
25. ALL CABLES SHALL BE PLENUM RATED WHERE REQUIRED.
26. COORDINATE ALL WORK. MECHANICAL EQUIPMENT INDICATED ON 'M', 'P' AND 'FP' DRAWINGS WILL BE FURNISHED BY DIVISION 21, 22, 23, 25 AND WIRED COMPLETE BY DIVISION 26, 27 AND 28 UNLESS OTHERWISE NOTED. REFER TO MECHANICAL, PLUMBING AND FIRE PROTECTION SCHEDULES.
27. GENERAL NOTES APPLY TO ALL CONTRACT DRAWINGS.
28. CENTER SECURITY CAMERAS IN CEILING TILES UNLESS NOTED OTHERWISE.

CAT 6 CONDUIT SCHEDULE

(1)-(3) CAT 6	3/4"
(4)-(5) CAT 6	1"
(6)-(9) CAT 6	1-1/4"
(10)-(12) CAT 6	1-1/2"
(13)-(20) CAT 6	2"
(21)-(24) CAT 6	2-1/2"

GENERAL NOTE:
1. UTILIZE THE ABOVE CONDUIT SIZES UON. CONDUITS ARE SIZED ASSUMING CAT 6 CABLING WITH A NOMINAL OUTSIDE DIAMETER OF 0.295" OR LESS WILL BE UTILIZED. CONDUITS SHALL BE RESIZED PER NEC IF LARGER NOMINAL OUTSIDE DIAMETER CABLE IS UTILIZED.

RESPONSIBILITY SCHEDULE

	GENERAL CONTRACTOR	JOHNSON CONTROL SECURITY SOLUTIONS ALLOWANCE	HONEYWELL SECURITY SYSTEMS ALLOWANCE
DIVISION 08	F&I		
DOOR POSITION SWITCHES	F&I		
ELECTRO-MECHANICAL LOCKSET	7 F&I		
TOUCHELESS CIRCULAR PUSH BUTTON	F&I		
DOOR OPERATOR	F&I		
DIVISION 26	F&I		
CONDUIT/BACKBOXES/JUNCTION BOXES	F&I		
SECURITY SYSTEMS(DIVISION 28) WIRING	F&I		
WIRE TESTING/LABELING	F&I		
DIVISION 27	F&I		
OPTICAL FIBER TERMINATION RACKS	F&I		
SECURITY EQUIPMENT RACK	F&I		
OPTICAL FIBER CABLE	F&I		
CABLE TRAY	F&I		
COPPER PATCH PANELS (DIVISION 28)	F&I		
DIVISION 32	F&I		
GATE OPERATOR	F&I		
SPECIFICATION 281300 (UNLESS OTHERWISE NOTED)	I		F 7
ACCESS CONTROL SYSTEM EQUIPMENT (UNLESS OTHERWISE NOTED)	I		F
ACCESS CONTROL SYSTEM PROGRAMMING	I		F
ACCESS CONTROL SYSTEM SOFTWARE AND LICENSING	I		F
ACCESS CONTROL SYSTEM TESTING	I		F
ACCESS CONTROL SYSTEM TRAINING	I		F
SPECIFICATION 282304 (UNLESS OTHERWISE NOTED)		F&I	
CCTV SYSTEM EQUIPMENT (UNLESS OTHERWISE NOTED)		F&I	
CCTV SYSTEM PROGRAMMING		F&I	
CCTV SYSTEM SOFTWARE AND LICENSING		F&I	
CCTV SYSTEM TESTING		F&I	
CCTV SYSTEM TRAINING		F&I	
SPECIFICATION 284602 (UNLESS OTHERWISE NOTED)		F&I	
DURESS BUTTON SYSTEM EQUIPMENT (UNLESS OTHERWISE NOTED)		F&I	
DURESS BUTTON SYSTEM PROGRAMMING		F&I	
DURESS BUTTON SYSTEM SOFTWARE AND LICENSING		F&I	
DURESS BUTTON SYSTEM TESTING		F&I	
DURESS BUTTON SYSTEM TRAINING		F&I	

KEY:
F - FURNISH
I - INSTALL
F&I - FURNISH & INSTALL

7

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CERTIFICATE OF AUTHORIZATION #: 021745

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STATE OF NEW YORK — MICHAEL IMPICCIATORE — 101200 — LICENSED PROFESSIONAL ENGINEER

REGISTRATION EXPIRES: 07/31/2027

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
7	04/17/26	ADDENDUM 7
	01/13/26	BID DOCUMENT

PROJECT NUMBER: 47528-C

DESIGNED BY: MPI
DRAWN BY: CDS
FIELD CHECK:
APPROVED:

SHEET TITLE:
LEGEND, ABBREVIATIONS, SYMBOLS, AND GENERAL NOTES

DRAWING NUMBER:
ES-001

SHEET: OF