

ADDENDUM NO. 001

PROJECT NAME: Morrison Center Addition Project
UNL PROJECT NUMBER: **A126P003**
UNL BID INVITATION NUMBER: **909061-11**

CONSULTANT: Farris Engineering
ADDRESS: **11239 Chicago Circle**

ADDENDUM DATE OF ISSUANCE: November 22, 2011
DATE OF BID OPENING: **December 7, 2011**

The bid documents dated **May 26, 2011** for the above referenced project is amended by this addendum.

NOTICE: This Addendum is issued to all interested prospective bidders as an amendment to the project manual or other parts of the bidding (contract) documents for the above named project. Reference to this Addendum must be included in the Bid proposal. The information contained herein shall be fully incorporated into the contract documents as though originally included therein.

NOTICE: This addendum is applicable to the referenced project and is issued to all known planholders prior to receipt of proposals. The information contained herein shall be fully incorporated into the Bid Contract Documents as though originally incorporated. Failure to acknowledge all amendments may be cause for rejection of the bid.

TO: Bidders and Others Concerned

Changes to the Project Manual

1. SECTION 01 50 00 TEMPORARY FACILITIES ARRA: Delete paragraphs 1.3.C and 1.3.D in their entirety and replace with the following new paragraphs:
 - "C. Site-specific Storm Water Pollution Prevention Plans (SWPPP): For construction sites of one (1) acre or more, before any dirt is moved, the contractor must submit an NPDES Form CSW-NOI and a location map to the Nebraska Dept. of Environmental Quality (NDEQ) for approval. The NPDES form CSW-NOI and the location map have been prepared and will be provided to the contractor for signature and submittal to the NDEQ. Per NDEQ requirements, a site-specific Storm Water Pollution Prevention Plan (SWPPP) has been prepared and will be provided to the contractor for their use.
 - D. CSW-NOI, CSW-NOT, and CSW-Transfer: Submit the CSW-NOI to NDEQ at least 7 days prior to land disturbing activities. Upon completion of the construction activity, submit the CSW-NOT form to NDEQ if the contractor will be responsible for final stabilization OR submit the CSW-Transfer to UNL if UNL will be responsible for final stabilization."
2. SECTIONS DIVISION 03 THROUGH DIVISION 14 Delete paragraph 2.1A., from Divisions 03 through Division 14 with the except of Sections 03 30 00, 08 06 10, 08 71 0 and 09 06 10.
3. SECTION 03 30 00, CAST-IN-PLACE CONCRETE: Delete this section in its entirety and replace with the attached new section.

4. SECTION 08 06 00, DOOR SCHEDULE: Delete this section in its entirety and replace with the attached new section.
5. SECTION 08 71 00 DOOR HARDWARE: Delete this section in its entirety and replace with the attached new section.
6. SECTION 09 60 10, ROOM FINISH SCHEDULE: Delete this section in its entirety and replace with the attached new section.
7. SECTION 09 67 23, RESINOUS COATINGS: Delete this section in its entirety and replace with the attached new section.
8. SECTION 11 53 13 LABORATORY FUME HOODS: Delete this section in its entirety.
9. SECTION 11 53 43 LABORATORY SERVICE FITTINGS AND FIXTURES: Delete this section in its entirety and replace with the attached new section.
10. SECTION 12 35 53, LABORATORY CASEWORK: Delete this section in its entirety and replace with the attached new section.
11. SECTION 22 62 19, VACUUM EQUIPMENT: Change paragraph 2.2.B, vacuum pump mark from (VP-1) to (VP-3).
12. SECTION 22 62 19, VACUUM EQUIPMENT: Paragraph 2.2 B. Change vacuum pump mark from (VP-1) to (VP-3).
13. SECTION 23 31 13, METAL DUCTS: Paragraph 1.2 A. Change pressure class from -2 to -6 in the first sentence.
14. SECTION 23 31 13 METAL DUCTS: Reference page 5, paragraph 2.5.F., change Type 316 stainless steel to read Type 304 stainless steel.
15. SECTION 32 92 00, TURFS AND GRASSES: Under Specification name, add the following: (This Section is for Information Only – Owner Provided)
16. SECTION 32 93 00, PLAT MATERIALS: Under Specification name, add the following: (This Section is for Information Only – Owner Provided)

Changes to the Drawings

1. SHEET NVM-0002, MECHANICAL GENERAL NOTES AND COORDINATION RESPONSIBILITIES: "Coordination of Responsibilities Matrix", Item: Automatic Control Damper Actuators, change Set By from "MC" to "UNL BSM". Also, Item: Automatic Control Dampers, change Set By from "UNL BSM" to "MC".
2. SHEET NVM-0002, MECHANICAL GENERAL NOTES AND COORDINATION RESPONSIBILITIES: General Mechanical, Plumbing, Fire Protection Notes, the "Buy American" clauses no longer apply to this job.
3. SHEETS NVMH1-E-, NVMH2-E-, NVMH3-E-, NVMH4-E-, MECHANICAL - HVAC SECTOR E FIRST (SECOND, THIRD, FORTH) LEVEL FLOOR PLAN: Any VAV that has a single supply diffuser or return grill, does not need the volume damper, since no balancing or isolation will be necessary if there is a single diffuser/grill. For example, 1st Floor, Office 160, no volume damper to the diffuser is required. Conversely, 1st Floor Open Office 158, still requires the volume dampers to the 3 supply diffusers, since the individual diffusers will need the volume damper for balancing.

4. SHEET NVMH1-E-, MECHANICAL - HVAC SECTOR E FIRST LEVEL FLOOR PLAN: Rooms Women 164 and Men 166 will no longer be served by two 5" Supply VAV boxes individually, and will now be served both by a single 6" Supply VAV box, VAV-164-6 (400 CFM). See attached Plate 1 of 9.
5. SHEET NVMH4-E-, MECHANICAL - HVAC SECTOR E FORTH LEVEL FLOOR PLAN: Silencer next to VAV-400-12R shall be keynoted to identify it as a silencer. Keynote shall read "Ductwork Silencer."
6. SHEET NVMH4-E-, NVMH5-E-, MECHANICAL - HVAC SECTOR E FORTH (ROOF) LEVEL FLOOR PLAN: Roof Hood RH-7, damper, and ductwork associated with the elevator shaft, shall be deleted. These are no longer needed.
7. SHEET NVMP0-E-, MECHANICAL - PIPING SECTOR E BASEMENT LEVEL FLOOR PLAN: Keynote 3 should read "2" ", rather than "1-1/2" ".
8. SHEET NVMP1-E-, MECHANICAL - PIPING SECTOR E FIRST LEVEL FLOOR PLAN: VAV boxes VAV-164-5 and VAV-166-5 get deleted, and replaced with VAV-164-6, at 2.00 GPM, 3/4" piping. All other branch sizes will remain the same.
9. SHEET NVMP0DM, MECHANICAL – PIPING BASEMENT LEVEL FLOOR PLAN-DEMOLITION: Add the follow sentence to keynote 1: "Contractor to turn FCU removed over to UNL-BSM", per Plate 3 of 9.
10. SHEET NVMP1DM, MECHANICAL – PIPING SECTOR E FIRST LEVEL FLOOR PLAN-DEMOLITION (Per Plate 4 of 9):
 - A. Add the follow sentence to keynote 1: "Contractor to turn unit heater removed over to UNL-BSM."
 - B. Add the follow sentence to keynote 2: "Contractor to turn cabinet unit heater removed over to UNL-BSM."
 - C. Add keynote 1 label to existing unit heater UH-1.
 - D. Change keynote label at existing CUH-1 to read 2 in lieu of 3 shown.
11. SHEET NVMP1-E-, MECHANICAL – PIPING SECTOR E FIRST LEVEL FLOOR PLAN: VAV boxes VAV-164-5 and VAV-166-5 get deleted and replaced with VAV-164-6, at 2.00 GPM, 3/4" piping. All other branch sizes will remain the same.
12. SHEET NVMP4-E-, MECHANICAL - HVAC PIPING SECTOR E FORTH LEVEL FLOOR PLAN: Change routing of 3/4" condensate drain serving FCU-20 per attached Plates 5 and 6 of 9..
13. SHEET NVMW0-E-, MECHANICAL - PLUMBING SECTOR E BASEMENT LEVEL FLOOR PLAN: Near columns X and 8.7, revise note to read 4" SAN up to WCO in lieu of "X" SAN up to WCO.
14. SHEET NVMW1-E-, MECHANICAL - PLUMBING SECTOR E FIRST LEVEL FLOOR PLAN: Near columns Z and 6.8, revise 4" San IE= 1173.90' to read 4" Storm IE=1173.90'.
15. SHEET NVMW3-E-, MECHANICAL - PLUMBING SECTOR E THIRD LEVEL FLOOR PLAN: Extend two sanitary cleanouts shown on level 3 up to penthouse on level 4. The cleanouts are shown on column line 8.7 between columns Y and X, and located between column lines 7 and 7.7 and Y and X.
16. SHEET NVMF2-E-, FIRE PROTECTION SECTOR E SECOND LEVEL FLOOR PLAN: Delete keynote 8 from the Fire Protection Keynotes. Delete keynote 8 label in cold room 269.

17. SHEET NVMF2-E, FIRE PROTECTION SECTOR E SECOND LEVEL FLOOR PLAN: Provide dry style sprinklers to serve Cold Room 269.
18. SHEET NVM-0100, MECHANICAL SCHEDULES: Delete this drawing in its entirety and replace with the attached new drawings.
19. SHEETS NVM-0101, NVM-0102, NVM-0103, MECHANICAL SCHEDULES: All Schedules will have "Buy American Act Requirement" Remark removed. This no longer applies to the project.
20. SHEET NVM-0101, MECHANICAL SCHEDULES: SCHEDULE: "VAV - Non-Lab Terminal Unit Schedule", VAV-XXX-16 gets Remark 7 added to it. Remark 7 reads " SUPPLY SILENCER SHALL BE VIBRO-ACOUSTICS RECTANGULAR FILM-LINED, MEDIUM VELOCITY, LOWEST F-NUMBER AVAILABLE. SUPPLY SILENCER - 24" X 18" CONN./OVERALL SIZE, 3' LONG". See updated drawing. See Plate 7 of 9.
21. SHEET NVM-0102, MECHANICAL SCHEDULES: SCHEDULE: "1st Floor, AHU-6 - VAV Terminal Unit and Room Balance Schedule", Women 164 and Men 166 get consolidated to a single supply box, VAV-164-6. See attached Plate 8 of 9.
22. SHEET NVM-0103, MECHANICAL SCHEDULES: SCHEDULE: " VAV Terminal Unit and Room Balance Schedule", Women 164 and Men 166 get consolidated to a single supply box, VAV-164-6. See attached Plate 9 of 9.
23. SHEET NVEL1-E, ELECTRICAL - LIGHTING SECTOR E FIRST LEVEL FLOOR PLAN: Elev. 156; Provide a 120V 4 foot strip light with wire guard and (2) F32/735 T8 lamps in elevator pit and at each landing of the hoistway. Provide three-way switch adjacent to luminaire near access to elevator pit and four-way switches at each landing. Switches shall control all luminaires in the hoistway. Connect the luminaires to the luminaire shown at the top of the hoistway on sheet NVEL4-E. Luminaires shall be connected to circuit M1A-15 as indicated on sheet NVEP1-E.
24. SHEET NVEP1-E, ELECTRICAL – POWER SECTOR E FIRST LEVEL FLOOR PLAN : Elev. 156; change luminaire indicated in keynote '5' to luminaire indicated above.
25. SHEET NVEY1-E, ELECTRICAL – SPECIAL SYSTEMS SECTOR E FIRST LEVEL FLOOR PLAN: Storage 162; Card reader control box: change 'SHEET NVM-0300' to 'SHEET NVE-7603'.
26. SHEET NVEY3-E, ELECTRICAL – SPECIAL SYSTEMS SECTOR E THIRD LEVEL FLOOR PLAN : Card reader control box: change 'SHEET NVM-0300' to 'SHEET NVE-7603'.
27. SHEET NVEY3-E, ELECTRICAL – SPECIAL SYSTEMS SECTOR E THIRD LEVEL FLOOR PLAN : Card reader control box: Provide 2" conduit from control box to chase south of Storage 351 and up to penthouse for card readers on penthouse level.
28. SHEET NVEL4-E, ELECTRICAL – LIGHTING SECTOR E PENTHOUSE LEVEL FLOOR PLAN : Add the following exit signs in MECHANICAL ROOM 459: Provide one type 'X' approximately 2'-0" west of grid line 7.7 and centered between grid lines Z and Y. Provide one type 'X' approximately 6'-0" west of grid line 8.7 and centered between grid lines Z and Y. Provide one type 'XA' approximately 2'-0" west of grid line 7.7 and 13'-0" north of grid line X. Provide one type 'X' approximately 6'-0" west of grid line 8.7 and 6'-0" south of grid line W. Connect all to emergency lighting circuit.

Clarifications

1. Site-specific Storm Water Pollution Prevention Plans (SWPPP): For construction sites of one (1) acre or more, before any dirt is moved, the contractor must submit a NPDES Form CSW-NOI and a location

map to the Nebraska Dept. of Environmental Quality (NDEQ) for approval. The NPDES Form CSW-NOI and the location map have been prepared and will be provided to the contractor for signature and submittal to the NDEQ. Per NDEQ requirements, a site-specific Storm Water Pollution Prevention Plan (SWPPP) has been prepared and will be provided to the contractor for their use.

Answer: See Addendum No. 1 Changes to the Project Manual.

2. Form CSW-Start, Form CSW-End: Following approval of the CSW-NOI and upon commencement of the construction activity, submit the CSW-start to the LPSNRD. Upon completion of the construction activity, submit the CSW-End form to LPSNRD.

Answer: See Addendum No. 1 Changes to the Project Manual.

3. Where is the existing fire pump located and what GPM capacity and total head is it rated at?

Answer: The existing fire pump is located in Fire Pump Room NV004 on the basement level of the existing building. Reference Sheet NVMW7000 for location in northeast corner. The fire pump is rated at 750 GPM at 150 total feet head. Discharge pressure is 100 feet.

4. In the Cast-In-Place Concrete Specifications 03 30 00 – 3.16 you call for the Owner to provide testing services but in the Concrete Paving Section 32 13 13 – 3.11 you appear to call for the contractor to provide the testing services for the concrete paving.

Answer: The Contractor will be responsible for testing costs for the concrete paving. Specification 01 40 00 states that the contractor is responsible for testing costs unless explicitly assigned to the Owner.

5. Per Temporary Facilities and Controls Specification 01 50 00 – 3.2.A it calls for the GC to pay for the temp utilities usage. If this is the case please provide some rate information for use in estimating these costs for inclusion in our bid.

Answer:

Utility Rates					
	CY 2010	CY 2011	Inc/Dec	CY 2012	Inc/Dec
Steam	\$ 15.4000	\$ 12.9000	-16.2%	\$ 11.5500	-10.5%
Chilled Water	\$ 0.0430	\$ 0.0445	3.5%	\$ 0.0500	12.4%
Electric	\$ 0.0490	\$ 0.0490	0.0%	\$ 0.0540	10.2%
Facilities Charge	\$ -	\$ 0.0018		\$ 0.0021	
P&D - State	\$ 1.0770	\$ 0.8160	-24.2%	\$ 0.8470	3.8% sq ft
P&D - Aux	\$ 0.7320	\$ 0.7560	3.3%	\$ 0.7847	3.8% sq ft

6. Per Temporary Facilities and Controls Specification 01 50 00 – 3.4C calls for the GC to provide adequate temporary heat and to select safe equipment. Paragraph 3.4D calls for the use of LP gas or fuel oil heaters. Is it acceptable to utilize electric heaters for temporary heating in lieu of the gas/fuel fired units as the electric will not induce additional moisture into the project?

Answer: Use of temporary electrical heat is acceptable to the University. The contractor's temporary electrical service shall be sized accordingly.

7. In the specs, Section 26 05 33, page 3, item B4 it talks any pipe over 2" in size needs to be GRC instead of EMT. Is this correct? Also is there a lay out for the existing basement where MSB is located?

Answer: Per Specification Section 26 05 33, EMT conduit is not allowed for sizes larger than 2-inches. Rigid conduit shall be provided in sizes larger than 2-inches. See sheet NVEP0-E for basement layout.

Miscellaneous

1. See attached Pre-Bid Agenda.
2. See attached Pre-Bid Meeting Attendance Sheet.
3. See attached Information Needs Sheet with all Architectural questions and answers.
4. Davis Bacon Wage Rates - The link to obtain information regarding current Davis Bacon rates is identified in Spec Sect 00 21 13 - Section 22.0, Item C. Current Davis Bacon Wage rates are scheduled to be updated Jan. 1, 2012. Rates in place on the date of contract execution will apply.
5. Construction Progress Mtgs are anticipated to be held on a bi-weekly basis, or as required to address project issues.
6. Existing Morrison Center fire exits & security, including door card access systems, will be required to be maintained throughout the project. General Contractor to coordinate with owner.
7. Spec Section 00 21 20 - List of Schedules. - Disregard December 12,2011 date listed on 7th line of schedule dates.
8. UNL Landscape Service will perform all finish grading. Rough grading to be established - 6" to -8" below finish grading.

Attachments

1. Section 03 30 00 Cast-In-Place Concrete
2. Section 08 06 00 Door Schedule.
3. Section 08 71 00 Door Hardware.
4. 09 60 10 – Room Finish Schedule.
5. Section 09 67 23 Resinous Coatings.
6. Section 11 53 43 Laboratory Service Fittings and Fixtures.
7. Section 12 35 53 Laboratory Casework
8. NVA-0001
9. NVA-0002
10. NVA-1-E-
11. NVA-3-E-
12. NVA-2-E-
13. NVA-4-E-
14. NVA-7301
15. NVA-7302
16. NVA-7303
17. NVA-7401
18. NVA-7402
19. NVA-7503
20. NVAL-3-E-
21. NVM-0100

- 22. NVM-0101
- 23. NVM-0102
- 24. NVM-0103
- 25. NVM-0-
- 26. NVMP0DM
- 27. NVMP1-0-
- 28. NVMP3-0-
- 29. NVMP4-0-
- 30. Pre-Bid Agenda
- 31. Pre-Bid Attendance Sheet
- 32. IDC Information Needs Sheet

--END--

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SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section specifies cast-in place concrete, including formwork, reinforcement, concrete materials, mix design, placement procedures, and finishes.
- B. Related Sections include the following:
 - 1. Division 31 Section "Earthwork" for drainage course under slabs-on-grade.
 - 2. Division 32 Sections "Asphaltic Concrete Paving and Portland Cement Concrete Paving" and "Curbs and Sidewalks" for concrete pavement and walks.
 - 3. Division 09 Section "Room Finish Schedule" for locations of concrete sealer hardener finish.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with fly ash.

1.4 SUBMITTALS

- A. Product Data: For each type of manufactured material and product indicated.
- B. Design Mixes: For each concrete mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.
 - 1. Indicate amounts of mix water to be withheld for later addition at Project site.
- C. Steel Reinforcement Shop Drawings: Details of fabrication, bending, and placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement." Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement. Include special reinforcement required for openings through concrete structures.
- D. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork. Design and engineering of formwork are Contractor's responsibility.
 - 1. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and installing and removing reshoring.

- E. Welding Certificates: Copies of certificates for welding procedures and personnel.
- F. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:
- G. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:
 - 1. Cementitious materials and aggregates.
 - 2. Form materials and form-release agents.
 - 3. Steel reinforcement and reinforcement accessories.
 - 4. Fiber reinforcement.
 - 5. Admixtures.
 - 6. Waterstops.
 - 7. Curing materials.
 - 8. Floor and slab treatments.
 - 9. Bonding agents.
 - 10. Adhesives.
 - 11. Vapor retarders.
 - 12. Epoxy joint filler.
 - 13. Joint-filler strips.
 - 14. Repair materials.
- H. Minutes of preinstallation conference.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who has completed concrete Work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for formwork and shoring and reshoring installations that are similar to those indicated for this Project in material, design, and extent.
- C. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
 - 1. Manufacturer must be certified according to the National Ready Mixed Concrete Association's Certification of Ready Mixed Concrete Production Facilities.
- D. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

- E. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.
- F. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code--Reinforcing Steel."
- G. ACI Publications: Comply with the following, unless more stringent provisions are indicated:
 - 1. ACI 301, "Specification for Structural Concrete."
 - 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
- H. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Meetings."
 - 1. Before submitting design mixes, review concrete mix design and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixes.
 - c. Ready-mix concrete producer.
 - d. Concrete subcontractor.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle steel reinforcement to prevent bending and damage.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 - 1. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - a. High-density overlay, Class 1, or better.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.
- D. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.
- E. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- F. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
1. Furnish units that will leave no corrodible metal closer than 1 ½ inch to the plane of the exposed concrete surface.
 2. Furnish ties that, when removed, will leave holes not larger than 1 inch in diameter in concrete surface.
 3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.2 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Reinforcing Bars to be Welded: ASTM A 706/A 706M, deformed.
- C. Steel Bar Mats: ASTM A 184/A 184M, assembled with clips.
1. Steel Reinforcement: ASTM A 615/A 615M, Grade 60, deformed bars.
 2. Steel Reinforcement to be Welded: ASTM A 706/A 706M, deformed bars.
- D. Plain-Steel Wire: ASTM A 82, as drawn.
- E. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

- A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:
1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected or CRSI Class 2 stainless-steel bar supports.
- B. Mechanical Couplers: ICBO-approved mechanical connections developing in tension or compression at least 125 percent of specified yield strength of reinforcing steel.
- C. Mechanical Rebar Termination: ICBO-approved mechanical rebar termination developing in tension or compression at least 125 percent of specified yield strength of reinforcing steel.
- D. Joint Dowel Bars: Plain-steel smooth round bars, ASTM A36. Cut bars true to length with ends square and free of burrs.
- E. Products: Subject to compliance with requirements, provide one of the following:

1. Mechanical Couplers:
 - a. Bar-Lock Coupler System.
 - b. Erico Lenton Rebar Splicing System.
 2. Mechanical Rebar Termination:
 - a. Erico Lenton Terminator.
- 2.4 CONCRETE MATERIALS
- A. Portland Cement: ASTM C 150, Type I/II.
1. Fly Ash: ASTM C 618, Class F.
 - a. Fly ash is not permitted in concrete exposed to view.
- B. Normal-Weight Aggregate: ASTM C 33, uniformly graded, and as follows:
1. Class: As follows:
 - a. Typical, unless noted otherwise: Moderate weathering region, but not less than 3M.
 - b. At concrete such as exterior slabs, perimeter walls and foundations, and exterior curbs and gutters which will be subject to freezing temperatures while wet during the life of the structure: Severe weathering region, but not less than 3S.
 2. Nominal Maximum Aggregate Size:
 - a. Typical, unless noted otherwise: 3/4 inch
 3. Combined Aggregate Gradation: Well graded from coarsest to finest with not more than 18 percent and not less than 8 percent retained on an individual sieve, except that less than 8 percent may be retained on coarsest sieve and on No. 50 sieve, and less than 8 percent may be retained on sieves finer than No. 50.
- C. Water: Potable and complying with ASTM C 94.
- 2.5 ADMIXTURES
- A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material and to be compatible with other admixtures and cementitious materials. Do not use admixtures containing calcium chloride.
- B. Air-Entraining Admixture: ASTM C 260.
- C. Water-Reducing Admixture: ASTM C 494, Type A.
- D. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.

E. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.

F. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

2.6 FIBER REINFORCEMENT

A. Synthetic Fiber: Fibrillated or monofilament polypropylene fibers engineered and designed for use in concrete, complying with ASTM C 1116, Type III, 1/2 to 1-1/2 inches long.

2.7 WATERSTOPS

A. Flexible PVC Waterstops: CE CRD-C 572, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.

1. Profile: Ribbed without center bulb.

B. Self-Expanding Strip Waterstops: Manufactured rectangular or trapezoidal strip, sodium bentonite or other hydrophylic material for adhesive bonding to concrete.

2.8 VAPOR RETARDERS

A. Vapor Retarder: 15-mil thick polyolefin geomembrane manufactured from ISO certified virgin resins.

1. Water vapor retarder: ASTM E 1745, meets or exceeds Class B.

2. Water vapor transmission rate: ASTM E 96, 0.006 gr/ft²/hr or lower.

3. Permeance rating: ASTM E 96, 0.01 gr/ft²/hr or lower.

4. Puncture resistance: ASTM E 1745, minimum 1970 grams.

5. Tensile strength: ASTM E 1745, minimum 45.0 lbf/in.

6. Available Product: Subject to compliance with requirements, a product that may be incorporated into the Work includes, but is not limited to, "Stego Wrap" (15 mil) Vapor Retarder by Stego Industries, LLC.

2.9 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

2.10 SEALER AND HARDENER (S/H)

A. Deep penetrating lithium silicate type treatment to harden surface, reduce dusting and protect surface from damage caused by water and chemical attack.

B. Characteristics:

1. Solvent free. VOC content no greater than 50 grams per liter.
2. Total solids: 16%.
3. PH: 11.0

C. Provide sealer hardener treatment only on exterior, horizontal, exposed concrete surfaces of loading dock and in rooms identified in Section 09 06 10, Room Finish Schedule.D. Basis of design product: PROSOCO, Inc., Consolideck LS, to match Phase 1.

2.11 RELATED MATERIALS

- A. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.
- B. Epoxy Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Shore A hardness of 80 per ASTM D 2240.
- C. Epoxy-Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class and grade to suit requirements, and as follows:
 1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- D. Reglets: Fabricate reglets of not less than 0.0217-inch- thick galvanized steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

2.12 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
 4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C 109M.
- B. Repair Topping: Traffic-bearing, cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch.
 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.

2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
4. Compressive Strength: Not less than 5700 psi at 28 days when tested according to ASTM C 109/C 109M.

2.13 CONCRETE MIXES

- A. Prepare design mixes for each type and strength of concrete determined by either laboratory trial mix or field test data bases, as follows:
 1. Proportion normal-weight concrete according to ACI 211.1 and ACI 301.
- B. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the laboratory trial mix basis.
- C. Footings and Foundation Walls: Proportion normal-weight concrete mix as follows:
 1. Compressive Strength (28 Days): As shown on the Drawings.
 2. Maximum Slump: As shown on the Drawings.
- D. Slab-on-Grade: Proportion normal-weight concrete mix as follows:
 1. Compressive Strength (28 Days): As shown on the Drawings.
 2. Maximum Water/Cementitious Materials Ratio: 0.45.
 3. Maximum Slump: As shown on the Drawings.
- E. Suspended Slabs: Proportion normal-weight concrete mix as follows:
 1. Compressive Strength (28 Days): As shown on the Drawings.
 2. Maximum Slump: As shown on the Drawings.
- F. Building Frame Members: Proportion normal-weight concrete mix as follows:
 1. Compressive Strength (28 Days): As shown on the Drawings.
 2. Maximum Slump: As shown on the Drawings.
- G. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
 1. Fly Ash: 25 percent.
- H. Maximum Water-Cementitious Materials Ratio: 0.50 for concrete required to have low water permeability.
- I. Maximum Water-Cementitious Materials Ratio: 0.45 for concrete at exterior slabs, perimeter walls and foundations, and exterior curbs and gutters which will be subject to freezing temperatures while wet during the life of the structure.

- J. Air Content: At concrete not exposed to freezing temperatures while wet during the life of the structure, add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 2 to 4 percent, unless otherwise indicated.
 - K. Air Content: At concrete such as exterior slabs, perimeter walls and foundations, and exterior curbs and gutters which will be subject to freezing temperatures while wet during the life of the structure, add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content as follows:
 - 1. Air Content: 5 percent minimum, 7.5 percent maximum.
 - L. Do not air entrain concrete to trowel-finished interior floors and suspended slabs. Do not allow entrapped air content to exceed 3 percent.
 - M. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
 - N. Synthetic Fiber: Uniformly disperse in concrete mix at manufacturer's recommended rate, but not less than 1.5 lb/cu. yd..
 - 1. Provide at concrete fill at metal stair treads and landings only.
 - O. Admixtures: Use admixtures according to manufacturer's written instructions.
 - 1. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.
 - 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 - 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
- 2.14 FABRICATING REINFORCEMENT
- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."
- 2.15 CONCRETE MIXING
- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94, and furnish batch ticket information.
 - 1. Do not add water to concrete mix during delivery, at Project site, or during placement unless submitted mix designs indicate amounts of mix water to be withheld for later addition. Water to be added to concrete mix shall be added only by the designated quality-control representative of the ready-mixed concrete supplier.
 - a. Do not add water to concrete after adding high-range water-reducing admixtures to mix.

2. Discharge of the concrete shall be completed within 90 minutes, or before the drum has revolved 300 revolutions, whichever comes first, after the introduction of the mixing water to the cement and aggregates or the introduction of the cement to the aggregates.
3. The temperature of concrete as delivered shall not exceed 90 degrees F.

PART 3 - EXECUTION

3.1 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until concrete structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117 or the following standards of the University of Nebraska – Lincoln, whichever is stricter:
 1. Variations From the Plumb:
 - a. In lines and surfaces of columns, piers, walls and in arrises: $\frac{1}{4}$ inch in any 10 foot length; 1 inch maximum for entire length.
 - b. Exposed corner columns, control joint grooves and other conspicuous lines: $\frac{1}{4}$ inch in any 20 foot length; $\frac{1}{2}$ inch maximum for entire length.
 2. Variations From Level or From the Grades Indicated on the Drawings:
 - a. In slab soffits, ceilings, beam soffits, and in arrises: $\frac{1}{4}$ inch in any 10 foot length; $\frac{3}{8}$ inch in any 20 foot length; $\frac{3}{4}$ inch maximum for entire length.
 - b. In exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines: $\frac{1}{4}$ inch in any bay or in any 20 foot length; $\frac{1}{2}$ inch maximum for entire length.
 3. Variations in Distance Between Walls, Columns, Partitions and Beams: $\frac{1}{4}$ inch per 10 foot of distance but not more than $\frac{1}{2}$ inch in any one bay, and not more than 1 inch total variation.
 4. Variation in Linear Building Lines from Established Position in Plan: 1 inch.
 5. Variation in the Sizes and Locations of Sleeves, Floor Openings, and Wall Openings: minus $\frac{1}{4}$ inch.
 6. Variations in Cross-Sectional Dimensions of Columns and Beams and in the Thickness of Slabs and Walls: Minus $\frac{1}{4}$ inch; plus $\frac{1}{2}$ inch.
 7. Footings:
 - a. Variations in Dimensions in Plan: Minus $\frac{1}{2}$ inch or plus 2 inches when formed, or plus 3 inches when placed against unformed excavation.

- b. Misplacement or Eccentricity: 2 percent of the footing width in the direction of misplacement but not more than 2 inches.
- 8. Variation in Steps:
 - a. In Flight of Stairs: Rise minus 1/8 inch; tread minus 1/4 inch.
 - b. In Consecutive Steps: Rise minus 1/16 inch; tread minus 1/8 inch.
- C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
 - 1. Class A, 1/8 inch for exterior and interior formed concrete to be prominently exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting.
 - 2. Class C, 1/2 inch for formed concrete to be permanently exposed but not prominently to public view.
 - 3. Class D, 1 inch for formed concrete to be permanently concealed.
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal.
 - 1. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use Setting Drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 1. Install anchor bolts and embedded plates, accurately located, to elevations required.
 - 2. Tolerances for placement of anchor bolts in cast-in-place concrete for structural steel construction shall be in conformance with the AISC Code of Standard Practice for Steel Buildings and Bridges.
 - 3. Install reglets to receive top edge of foundation sheet waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3.3 REMOVING AND REUSING FORMS

- A. General: Formwork, for sides of beams, walls, columns, and similar parts of the Work, that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete provided concrete is hard enough to not be damaged by form-removal operations and provided curing and protection operations are maintained.
- B. Leave formwork, for beam soffits, joists, slabs, and other structural elements, that supports weight of concrete in place until concrete has achieved the following:
 - 1. At least 75 percent of 28-day design compressive strength.
 - 2. Determine compressive strength of in-place concrete by testing representative field- or laboratory-cured test specimens according to ACI 301.
 - 3. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- C. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- D. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect/Engineer.

3.4 SHORES AND RESHORES

- A. Comply with ACI 318, ACI 301, and recommendations in ACI 347R for design, installation, and removal of shoring and reshoring.
- B. In multistory construction, extend shoring or reshoring over a sufficient number of stories to distribute loads in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.

- C. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.5 VAPOR RETARDERS

- A. Vapor Retarder: Place, protect, and repair vapor-retarder sheets according to ASTM E 1643 and manufacturer's written instructions.
 - 1. Unroll vapor retarder with the longest dimension parallel with the direction of the pour.
 - 2. Lap vapor retarder over footings and seal to foundation walls.
 - 3. Overlap joints 6 inches and seal with pressure sensitive tape.
 - 4. Seal all penetrations including pipes with pipe boot made from vapor retarder and tape.
 - 5. No penetration of the vapor retarder is allowed except for reinforcing steel and permanent utilities.
 - 6. Repair damaged areas by cutting patches of vapor retarder, overlapping damaged area 6 inches and taping all four sides with pressure sensitive tape.

3.6 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
 - 1. Shop- or field-weld reinforcement according to AWS D1.4, where indicated.
- D. Placement Tolerances: Concrete shall not be placed if reinforcement placement does not conform to the tolerances given below. Any concrete placed in violation of this requirement be removed at the Contractor's expense.
 - 1. Tolerances for "d" (effective depth) and for minimum clear concrete protection in flexural members and walls and compression members:
 - a. Where "d" is 8 inches or less, depth tolerance is plus or minus 3/8 inch; tolerance for minimum concrete cover is minus 3/8 inch.
 - b. Where "d" is more than 8 inch, depth tolerance is plus or minus 1/2 inch; tolerance for minimum concrete cover is minus 1/2 inch.

- c. Notwithstanding the above requirements, the tolerance on the clear distance to formed soffits is minus $\frac{1}{4}$ inch, and in no case should the tolerance on cover exceed minus 33 percent of the minimum cover stipulated on the structural drawings or in the Specifications.
- 2. Tolerances for longitudinal locations of bends and ends of bars should be limited to plus or minus 2 inches, except at discontinuous ends of members where tolerances should be limited to plus or minus $\frac{1}{2}$ inch.
- 3. As long as the total number of bars specified is maintained, a reasonable tolerance in spacing individual bars is plus or minus 1 inch, except where openings, inserts, embedded items, or similar provisions might require some additional shifting of bars.
 - a. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
 - b. Install welded wire fabric in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

3.7 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect/Engineer.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - 2. Form from preformed galvanized steel, plastic keyway-section forms, or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches into concrete.
 - 3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 - 4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
 - 5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
 - 6. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness, as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Division 7 Section "Joint Sealants," are indicated.
 2. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
 - a. Dowel Joints: Install dowel sleeves and dowels or dowel bar and support assemblies at joints where indicated.
 - (1) Use dowel sleeves or lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.8 WATERSTOPS

- A. Flexible Waterstops: Install in construction joints as indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of Work. Field-fabricate joints in waterstops according to manufacturer's written instructions.
- B. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, bonding or mechanically fastening and firmly pressing into place. Install in longest lengths practicable.

3.9 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B. Before placing concrete, water may be added at Project site up to amount allowed in design mix, subject to limitations of ACI 301.
 1. Do not add water to concrete after adding high-range water-reducing admixtures to mix.
- C. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation.

- D. Deposit concrete in forms in horizontal layers no deeper than 24 inches and in a manner to avoid inclined construction joints. Place each layer while preceding layer is still plastic, to avoid cold joints.
1. Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.
 2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the vibrator. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix constituents to segregate.
- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 2. Maintain reinforcement in position on chairs during concrete placement.
 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 4. Slope surfaces uniformly to drains where required.
 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, free of humps or hollows, before excess moisture or bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- F. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
1. When air temperature has fallen to or is expected to fall below 40 deg F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F and not more than 80 deg F at point of placement.
 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.
- G. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows, when hot-weather conditions exist:
1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.10 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched. Remove fins and other projections exceeding ACI 347R limits for class of surface specified.
 1. Apply to concrete surfaces not exposed to public view or not to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8 inch in height.
 1. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting.
 2. Do not apply rubbed finish to smooth-formed finish unless noted otherwise.
- C. Rubbed Finish: Apply the following to smooth-formed finished concrete where noted:
 1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.11 FINISHING FLOORS AND SLABS

- A. General: Comply with recommendations in ACI 302.1R for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes.
 1. Apply scratch finish to surfaces indicated and to surfaces to receive concrete floor topping or mortar setting beds for ceramic or quarry tile, portland cement terrazzo, and other bonded cementitious floor finishes.

- C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.
1. Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.
- D. Trowel Finish: After applying float finish, apply first trowel finish and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
1. Apply a trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system
 2. Finish surfaces to the following tolerances, measured within 24 hours according to ASTM E 1155/E 1155M for a randomly trafficked floor surface:
 - a. Specified overall values of flatness, F(F) 35; and levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and levelness, F(L) 17; for slabs-on-grade.
 - b. Specified overall values of flatness, F(F) 30; and levelness, F(L) 20; with minimum local values of flatness, F(F) 24; and levelness, F(L) 15; for suspended slabs.
- E. Trowel and Fine-Broom Finish: Apply a partial trowel finish, stopping after second troweling, to surfaces indicated and to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set method. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with a fine broom.
- F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.
1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect/Engineer before application.

3.12 MISCELLANEOUS CONCRETE ITEMS

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

- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates of manufacturer furnishing machines and equipment.
- D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel-finish concrete surfaces.

3.13 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with recommendations in ACI 305R for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing by one or a combination of the following methods:
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces, by one or a combination of the following methods:
 - 1. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - a. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover.

3.14 SEALER AND HARDENER

- A. Prep surface and apply in accordance with sealer hardener manufacturer's instructions.
- B. Mask vertical surfaces adjacent to application areas to prevent discoloration of adjacent surfaces and to create straight consistent borders.

3.15 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
 - 1. Defer joint filling until concrete has aged at least six months. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, and sealers from joints; leave contact faces of joint clean and dry.

- C. Install semirigid epoxy joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.16 CONCRETE SURFACE REPAIRS

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

5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least 3/4 inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mix as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Architect/Engineer's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Architect/Engineer's approval.
- 3.17 FIELD QUALITY CONTROL
- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement. Sampling and testing for quality control may include those specified in this Article.
- B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mix exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
 - a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mix, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
 2. Slump: ASTM C 143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
 3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.

4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 deg F and below and when 80 deg F and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C 31/C 31M; cast and laboratory cure one set of four standard cylinder specimens for each composite sample.
6. Compressive-Strength Tests: ASTM C 39; test one laboratory-cured specimens at 7 days and two at 28 days. Hold one cylinder for additional information, as required.
 - a. A compressive-strength test at 28 days shall be the average compressive strength from two specimens obtained from same composite sample and tested at age indicated.
- C. Strength of each concrete mix will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
- D. Test results shall be reported in writing to Architect/Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7-and 28-day tests.
- E. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect/Engineer but will not be used as sole basis for approval or rejection of concrete.
- F. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect/Engineer. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42 or by other methods as directed by Architect/Engineer.

END OF SECTION

SECTION 08 06 10 - DOOR SCHEDULE**General Notes:**

- A. See plan drawings for additional head, jamb and sill details.
 B. Door number indicates door location.
 C. For glazing type(s), "G-", refer to Specifications Section 08 80 00.
 D. For door and frame types, refer to Architectural Drawing Legend Sheet, NVA-0002.
 E. For Fire Rated Glazed Wall and Door Assemblies refer to Specification Section 08 43 43
 F. Unless noted otherwise: Paint all interior HM doors and frames P57-A. Paint all exterior HM doors and frames P51 in a color to match adjacent siding.
 G. Install rated and non-rated HM frames in walls per Specification Section 08 11 26 unless noted otherwise.

Abbreviations:

- ALUM = Aluminum
 CL = Chain link
 CR = Card reader
 FACT = Factory
 G - # = Glazing type
 GALV = Galvanized
 HM = Hollow Metal
 HR = Hour
 LSS = Life safety System
 CYL = Cylinder
 HDWR = Hardware
 MIN = Minute
 P-XXX-XX = Paint-System-Color
 PR = Pair
 SIM = Similar
 STL = Steel
 TO = Trimmed opening
 WD = Wood
 WM = Wire mesh
 FRGW = Fire Rated Glazed Door Assembly

Keved Notes:

- Undercut door bottom 1 inch.
- Factory prep frame and door for elec. hardware.
- Coordinate with GAF manufacturer.
- Keyed removeable mullion between door leafs.
- Magnetic hold-open.
- CR and exterior actuator button on bollard.
- Insulated door.
- Access panel see specification section 08 31 00.
- Use hardware salvaged from door NV433A in phase 1.
- Confirm existing door is labled as a rated door. If not rated, provide a lable from a qualified agency or replace the door with a new rated door to match existing function and apearence.

Door Number	Door				Frame			Detail			HDWR Set	CYL Type	LSS Code	Glazing Type	Fire Label	Remarks
	Opening Size (WxHxT)	Material	Type	Finish	Material	Type	Finish	Head	Jamb	Sill						
LEVEL 0																
50.1	2'-6"x2'-6"	FACT	FACT	FACT	FACT	FACT	FACT				148				2 hour	8
LEVEL 1																
122.1	Existing										135				90 min	10
122.2	3'-0"x8'-0"x1-3/4" (Existing)	HM	N		HM	D		14/7606	18/7606		149					salvaged door, 2
122.3	8'-0"x8'-0"x2"	FACT	OHC		FACT	FACT		13/7606	17/7606		123					salvaged door, repaint to match current finish.
122A.1	3'-0"x7'-0"x1-3/4"	HM	N		HM	D					119			G-4		
150.1	3'-0"x7'-0"x1-3/4"	ALUM	FG		ALUM	DTSL					136			G-2		3,4
150.2	3'-0"+1'-6" x 7'-0"x 1-3/4" PR	WD	N/F		HM	D/D					135			G-5	90 min	
151.1	3'-0"x 7'-0"x1-3/4"	WD	F		HM	D					101				45 min	
152.1	3'-0"+3'-0" x 7'-0"x1-3/4" PR	FRGW	FGR/FGR		FRGW	D/DR					150			FRGW	90 min	2
152.2	3'-0"+3'-0" x 7'-0"x1-3/4" PR	ALUM	FG/FG		ALUM	D/DT					151			G-4/G-7	trans	2,3, G-7 @ transom
152.3	3'-0"+3'-0" x 7'-0"x1-3/4" PR	HM	F/F		HM	D/D					152					5
153.1	3'-6"x7'-0"x1-3/4"	WD	F		HM	D					108				45 min	2
154.1	3'-6"x 7'-0"x1-3/4"	WD	F		HM	D					101				45 min	
158.1	3'-0"x7'-0"x1-3/4"	WD	F		HM	D					138				45 min	2
159.1	3'-0"x7'-0"x1-3/4"	WD	F		HM	D					113					
160.1	3'-0"x7'-0"x1-3/4"	WD	F		HM	DSL					138			G-5	45 min	2
162.1	3'-0"x 7'-0"x 1-3/4"	WD	F		HM	D					108				45 min	2
163.1	3'-0"+1'-6"x7'-0"x1-3/4" PR	WD	N/F		HM	D/D					139			G-5	45 min	2
163A.1	3'-6"x7'-0"x1-3/4"	WD	F		HM	D					119					
164.1	3'-0"x 7'-0"x 1-3/4"	WD	F		HM	D					137				45 min	
166.1	3'-0"x 7'-0"x 1-3/4"	WD	F		HM	D					137				45 min	

SECTION 08 06 10 - DOOR SCHEDULE**General Notes:**

- A. See plan drawings for additional head, jamb and sill details.
- B. Door number indicates door location.
- C. For glazing type(s), "G-", refer to Specifications Section 08 80 00.
- D. For door and frame types, refer to Architectural Drawing Legend Sheet, NVA-0002.
- E. For Fire Rated Glazed Wall and Door Assemblies refer to Specification Section 08 43 43
- F. Unless noted otherwise: Paint all interior HM doors and frames P57-A. Paint all exterior HM doors and frames P51 in a color to match adjacent siding.
- G. Install rated and non-rated HM frames in walls per Specification Section 08 11 26 unless noted otherwise.

Abbreviations:

ALUM	= Aluminum	CYL	=Cylinder
CL	= Chain link	HDWR	=Hardware
CR	= Card reader	MIN	= Minute
FACT	= Factory	P-XXX-XX	= Paint-System-Color
G - #	= Glazing type	PR	= Pair
GALV	= Galvanized	SIM	= Similar
HM	= Hollow Metal	STL	= Steel
HR	= Hour	TO	= Trimmed opening
LSS	= Life safety System	WD	= Wood
		WM	= Wire mesh
		FRGW	= Fire Rated Glazed Door Assembly

Keved Notes:

- Undercut door bottom 1 inch.
- Factory prep frame and door for elec. hardware.
- Coordinate with GAF manufacturer.
- Keyed removeable mullion between door leafs.
- Magnetic hold-open.
- CR and exterior actuator button on bollard.
- Insulated door.
- Access panel see specification section 08 31 00.
- Use hardware salvaged from door NV433A in phase 1.
- Confirm existing door is labled as a rated door. If not rated, provide a lable from a qualified agency or replace the door with a new rated door to match existing function and apearence.

Door Number	Door				Frame			Detail			HDWR Set	CYL Type	LSS Code	Glazing Type	Fire Label	Remarks
	Opening Size (WxHxT)	Material	Type	Finish	Material	Type	Finish	Head	Jamb	Sill						
169.1	3'-0"x7'-0"x1-3/4" PR	WD	F/F		HM	D/D					140				45 min	2
169.2	3'-0"x7'-0"x1-3/4"	WD	F		HM	D/D					102				90 min	
169A.1	4'-0"x 9'-0"x 1-3/4" (3 panels)	WD	SL2		HM	D/D					141					Custom sliding barn door.
169B.1	4'-0"x 9'-0"x 1-3/4" (3 panels)	WD	SL2		HM	D/D					141					Custom sliding barn door
170A.1	3'-0"x8'-7-1/2"x1-3/4" PR	ALUM	FG/FG		ALUM	D/DT					142			G-2		2,3,4,6
170.1	3'-0"x8'-0"x1-3/4" PR	ALUM	FG/FG		ALUM	D/DT					143			G-4		2,3
180.1	3'-0"x7'-0"x1-3/4"	WD	N		HM	D					106				90 min	2
180.2	3'-0"x7'-5-3/4"x1-3/4"	ALUM	FG		ALUM	D					120			G-2		3
LEVEL 2																
250.1	4'-0"x7'-0"x1-3/4"	WD	F		HM	D					106				90 min	2
250A.1	3'-0"x7'-0"x1-3/4"	WD	F		HM	D					113					
251.1	3'-6"x7'-0"x1-3/4"	WD	F		HM	D	P84-A				144				45 min	
252.1	3'-0"x 7'-0"x 1-3/4"	WD	F		HM	D					145				45 min	
253.1	3'-6"x7'-0"x1-3/4"	WD	F		HM	D					108				45 min	2
254.1	3'-0"x7'-0"x1-3/4"	WD	F		HM	D					145				45 min	
257.1	3'-0"+1'-6"x7'-0"x1-3/4" PR	WD	N/F		HM	D/D					139				45 min	2
258.1	3'-0"x 7'-0"x 1-3/4"	WD	F		HM	D					138				45 min	2
259.1	3'-0"x7'-0"x1-3/4"	WD	F		HM	D					113					
260.1	3'-0"x 7'-0"x 1-3/4"	WD	F		HM	DSL					138				45 min	2
262.1	3'-0"x 7'-0"x 1-3/4"	WD	F		HM	DSL					138				45 min	2
264.1	3'-0"x 7'-0"x 1-3/4"	WD	F		HM	D					138				45 min	2
265.1	3'-0"+1'-6"x7'-0"x1-3/4" PR	WD	N/F		HM	D/D					139			G-5	45 min	2

SECTION 08 06 10 - DOOR SCHEDULE

General Notes:

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- D. For door and frame types, refer to Architectural Drawing Legend Sheet, NVA-0002.
- E. For Fire Rated Glazed Wall and Door Assemblies refer to Specification Section 08 43 43
- F. Unless noted otherwise: Paint all interior HM doors and frames P57-A. Paint all exterior HM doors and frames P51 in a color to match adjacent siding.
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Abbreviations:

ALUM	= Aluminum	CYL	=Cylinder
CL	= Chain link	HDWR	=Hardware
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FACT	= Factory	P-XXX-XX	= Paint-System-Color
G - #	= Glazing type	PR	= Pair
GALV	= Galvanized	SIM	= Similar
HM	= Hollow Metal	STL	= Steel
HR	= Hour	TO	= Trimmed opening
LSS	= Life safety System	WD	= Wood
		WM	= Wire mesh
		FRGW	= Fire Rated Glazed Door Assembly

Keved Notes:

- Undercut door bottom 1 inch.
- Factory prep frame and door for elec. hardware.
- Coordinate with GAF manufacturer.
- Keyed removeable mullion between door leafs.
- Magnetic hold-open.
- CR and exterior actuator button on bollard.
- Insulated door.
- Access panel see specification section 08 31 00.
- Use hardware salvaged from door NV433A in phase 1.
- Confirm existing door is labled as a rated door. If not rated, provide a lable from a qualified agency or replace the door with a new rated door to match existing function and apearence.

Door Number	Door				Frame			Detail			HDWR Set	CYL Type	LSS Code	Glazing Type	Fire Label	Remarks
	Opening Size (WxHxT)	Material	Type	Finish	Material	Type	Finish	Head	Jamb	Sill						
265A.1	3'-6"x8'-0"x 1-3/4"	WD	F		HM	D					119					
267.1	3'-0"x 7'-0"x 1-3/4"	WD	F		HM	D					108				45 min	2
268.1	3'-0"x 7'-0"x 1-3/4"	WD	F		HM	DSL					138			G-5	45 min	2
269.1	3'-0"x 7'-0"x 1-3/4"	FACT	F		FACT	D					122					by manufacturer
270.1	3'-0"x 7'-0"x 1-3/4"	WD	F		HM	D					138				45 min	2
271.1	3'-0"+1'-6"x7'-0"x1-3/4" PR	WD	N/F		HM	D/D					139			G-5	45 min	2
271A.1	3'-6"x8'-0"x1-3/4"	WD	F		HM	D					119					
273.1	3'-0"x7'-0"x1-3/4"	WD	F		HM	D					113					
280.1	3'-0"x7'-0"x1-3/4"	WD	N		HM	D					106				90 min	2
LEVEL 3																
350.1	4'-0"x7'-0"x1-3/4"	WD	F		HM	D					106				45 min	2
350A.1	3'-0"x7'-0"x1-3/4"	WD	F		HM	D					113					
351.1	3'-6"x7'-0"x1-3/4"	WD	F		HM	D	P84-A				144				45 min	
352.1	3'-0"x 7'-0"x 1-3/4"	WD	F		HM	D					145				45 min	
353.1	3'-6"x7'-0"x1-3/4"	WD	F		HM	D					108				45 min	2
354.1	3'-0"x7'-0"x1-3/4"	WD	F		HM	D					145				45 min	
357.1	3'-0"+1'-6"x7'-0"x1-3/4" PR	WD	N/F		HM	D/D					139			G-5	45 min	2
358.1	3'-0"x 7'-0"x 1-3/4"	WD	F		HM	D					138				45 min	2
359.1	3'-0"x7'-0"x1-3/4"	WD	F		HM	D					113					
360.1	3'-0"x 7'-0"x 1-3/4"	WD	F		HM	DSL					138			G5	45 min	2
362.1	3'-0"x 7'-0"x 1-3/4"	WD	F		HM	DSL					138			G-5	45 min	2
364.1	3'-0"x 7'-0"x 1-3/4"	WD	F		HM	D					138				45 min	2

SECTION 08 06 10 - DOOR SCHEDULE**General Notes:**

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- D. For door and frame types, refer to Architectural Drawing Legend Sheet, NVA-0002.
- E. For Fire Rated Glazed Wall and Door Assemblies refer to Specification Section 08 43 43
- F. Unless noted otherwise: Paint all interior HM doors and frames P57-A. Paint all exterior HM doors and frames P51 in a color to match adjacent siding.
- G. Install rated and non-rated HM frames in walls per Specification Section 08 11 26 unless noted otherwise.

Abbreviations:

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GALV	= Galvanized	SIM	= Similar
HM	= Hollow Metal	STL	= Steel
HR	= Hour	TO	= Trimmed opening
LSS	= Life safety System	WD	= Wood
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Keved Notes:

- Undercut door bottom 1 inch.
- Factory prep frame and door for elec. hardware.
- Coordinate with GAF manufacturer.
- Keyed removeable mullion between door leafs.
- Magnetic hold-open.
- CR and exterior actuator button on bollard.
- Insulated door.
- Access panel see specification section 08 31 00.
- Use hardware salvaged from door NV433A in phase 1.
- Confirm existing door is labled as a rated door. If not rated, provide a lable from a qualified agency or replace the door with a new rated door to match existing function and apearence.

Door Number	Door				Frame			Detail			HDWR	CYL	LSS	Glazing	Fire	Remarks
	Opening Size (WxHxT)	Material	Type	Finish	Material	Type	Finish	Head	Jamb	Sill	Set	Type	Code	Type	Label	
365.1	3'-0"+1'-6"x7'-0"x1-3/4" PR	WD	N/F		HM	D/D					139			G-5	45 min	2
365A.1	3'-6"x8'-0"x1-3/4"	WD	F		HM	D					119					
367.1	3'-0"x 7'-0"x 1-3/4"	WD	F		HM	D					108				45 min	2
368.1	3'-0"x 7'-0"x 1-3/4"	WD	F		HM	DSL					138			G-5	45 min	2
369.1	3'-0"x 7'-0"x 1-3/4"	FACT	F		FACT	D					122					by manufacturer
370.1	3'-0"x 7'-0"x 1-3/4"	WD	F		HM	D					138				45 min	2
371.1	3'-0"+1'-6"x7'-0"x1-3/4" PR	WD	N/F		HM	D/D					139			G-5	45 min	2
371A.1	3'-6"x8'-0"x1-3/4"	WD	F		HM	D					119					
373.1	3'-0"x7'-0"x1-3/4"	WD	F		HM	D					113					
380.1	3'-0"x7'-0"x1-3/4"	WD	N		HM	D					106				90 min	2
LEVEL 4																
433A	3'-0"x7'-0"x1-3/4"	HM	F		HM	D					149				90 min	2,9
450.1	4'-0"x7'-0"x1-3/4"	HM	F		HM	D					101				90 min	
450.2	3'-0"x7'-0"x1-3/4"	HM	F		HM	D4		15/7606	19/7606	16/7606	130					7
454.1	3'-0"x7'-0"x1-3/4"	HM	F		HM	D					108				45 min	2
457.1	3'-0"x7'-0"x1-3/4" PR	HM	F/F		HM	D					146				45 min	2
457.2	3'-0"x7'-0"x1-3/4"	HM	F		HM	D4		15/7606	19/7606	16/7606	130					7
459.1	3'-0"x7'-0"x1-3/4"	HM	F		HM	D					108				45 min	2
459.2	3'-0"x7'-0"x1-3/4"	HM	F		HM	D					101				45 min	
459.3	3'-0"x7'-0"x1-3/4"	HM	F		HM	D4		15/7606	19/7606	16/7606	130					7

SECTION 08 71 00

DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Door hardware for wood doors, steel doors, glazed aluminum-framed entrance doors, and miscellaneous hardware items.
- B. Provide hardware not described herein but otherwise required for proper completion of the project, conforming to size, function, quality, and finish of other specified hardware.
- C. Related Sections:
 - 1. The Contract.
 - 2. Division 01 sections included in the project specifications.
 - 3. Section 08 06 10 - Door Schedule.
 - 4. Section 08 11 26 - Steel Doors and Frames.
 - 5. Section 08 14 00 - Wood Doors.
 - 6. Section 08 33 23 - Overhead Coiling Doors.
 - 7. Section 08 40 13 - Glazed Aluminum-Framed Systems.
 - 8. Division 26 - Service and Distribution - Electrical power supply to electric hardware devices.
- D. CAUTION: Use of this Section without including the above-listed items results in omission of basic requirements.

1.2 REFERENCED STANDARDS

- A. American National Standards Institute (ANSI):
 - 1. ANSI A117.1 Accessible and Usable Buildings and Facilities
- B. Builders Hardware Manufacturers Association (BHMA):
 - 1. BHMA A156.1 Butts and Hinges
 - 2. BHMA A156.3 Exit Devices
 - 3. BHMA A156.4 Door Controls - Closers
 - 4. BHMA A156.6 Architectural Door Trim
 - 5. BHMA A156.7 Template Hinge Dimensions
 - 6. BHMA A156.8 Door Controls - Overhead Stops and Holders
 - 7. BHMA A156.13 Mortise Locks and Latches
 - 8. BHMA A156.14 Sliding and Folding Door Hardware
 - 9. BHMA A156.15 Closer Holder Release Devices
 - 10. BHMA A156.16 Auxiliary Hardware

11. BHMA A156.18 Materials & Finishes
12. BHMA A156.19 Power Assist & Low Energy Power Operated Doors
13. BHMA A156.21 Thresholds
14. BHMA A156.22 Door Gasketing Systems
15. BHMA A156.23 Electromagnetic Locks
16. BHMA A156.24 Delayed Egress Locks
17. BHMA A156.25 Electrified Locking Devices
18. BHMA A156.28 Master Keying Systems
19. BHMA A156.30 High Security Locks

C. Door and Hardware Institute (DHI):

1. DHI A115 Steel Door Preparation Standards
2. DHI A115W Wood Door Preparation Standards
3. DHI A115.IG Installation Guide for Doors and Hardware
4. DHI Keying Systems and Nomenclature
5. DHI Sequence and Format for the Hardware Schedule

D. International Building Code (IBC)

E. National Fire Protection Association (NFPA):

1. NFPA 80 Fire Doors and Fire Windows
2. NFPA 252 Fire Tests of Door Assemblies

F. Underwriters Laboratories Inc. (UL):

1. UL 10C Positive Pressure Fire Tests Of Door Assemblies
2. UL 305 Panic Hardware
3. UL 437 Drill and Pick Resistant Key Cylinders

1.3 SUBMITTALS

A. Products other than those designated herein must be approved as substitutions prior to submittal of Door Hardware Schedule.

B. Submit Door Hardware Schedule in vertical format conforming to DHI "Sequence and Format for the Hardware Schedule." Horizontal format schedules will be rejected without review. Organize Schedule into headings, grouping doors to receive same hardware items, indicating quantity and complete designations of every item required for each door opening. The schedule shall include:

1. Cover sheet indicating name and location of Project; name of Architect; name of Contractor; name, address and phone of hardware supplier, name of hardware consultant preparing the schedule; date of submittal or revised submittal.
2. A list of abbreviations used in schedule.
3. An index of door openings, listed in numerical order, with hardware heading identification cross-referenced to Architect's set identification.
4. Hardware headings shall be listed in numerical order corresponding, as closely as possible, with numerical order of Architect's set numbers.

5. Each hardware heading shall have each door listed in numerical order according to door numbers in the Architect's door schedule, and denoting: location, configuration (single, pair, etc.), type (elevation, etc.), door and frame size(s), door and frame material(s), handing, fire rating, and key set identification.
 6. Type, style, function, size, hand, and finish of each door hardware item.
 7. Manufacturer of each item.
 8. Fastenings and other pertinent information.
 9. Description and Sequence of Operation of each electrified door hardware function, including location, and interface with fire alarm, access control, and security systems as applicable. Include description of component functions that occur when authorized person wants to enter; authorized person wants to exit; unauthorized person wants to enter; and unauthorized person wants to exit.
- C. Submit manufacturer's technical product data / catalog cut sheets, clearly marked for each hardware item, including installation details, material descriptions, dimensions of individual components and profiles, and finishes.
- D. Wiring Diagrams: No later than 14 days after receipt of approved hardware schedule submittal, submit wiring diagrams for all electrified openings. Detail wiring for power, signal, and control systems; differentiate between manufacturer-installed and field-installed wiring. Include the following:
1. Elevation of each door detailing interface between electrified door hardware and fire alarm, access control, and security systems as applicable.
 2. Point-to-point wiring diagram.
- E. Keying Schedule: Detailing Owner's final keying instructions for locks. Format shall conform to DHI "Keying Systems and Nomenclature."
- F. Operation and Maintenance Data: Provide complete operating and maintenance instructions listing routine maintenance procedures, possible breakdowns and repairs, and troubleshooting guides.
- G. Qualification Data: For firms and persons specified in "Quality Assurance" Article.
- H. Warranties: Special warranties specified in this Section.
- 1.4 QUALITY ASSURANCE
- A. Obtain each type and variety of door hardware from a single manufacturer, unless otherwise indicated.
- B. Manufacturers, Hardware Supplier, and Installer shall have no less than five years experience in the provision of Door Hardware for projects similar in size, complexity and type to this Project.

- C. Hardware and keying schedule submittals shall be prepared by, or under supervision of, a Hardware Consultant who is a member of the Door and Hardware Institute, holding the credentials of Architectural Hardware Consultant (AHC), or being able to demonstrate equivalent training and experience. In either case, Hardware Consultant shall have no less than five years experience in the scheduling of Door Hardware for projects similar in size, complexity and type to this Project; and shall be available at no additional cost during the course of the Work to consult with Contractor, Architect, and Owner about door hardware and keying.

1.5 REGULATORY REQUIREMENTS

- A. Fire-Rated Door Assemblies: Provide door hardware for assemblies complying with all applicable requirements of the most current versions of NFPA 80, IBC, and UBC 7-2; listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction.
- B. Comply with all applicable accessibility guidelines as set forth in Americans with Disabilities Act (ADA) -- Accessibility Guidelines for Buildings and Facilities (ADAAG).
- C. Latching and locking doors that are hand-activated and that are in a path of travel shall be operable with a single effort by lever-type hardware, panic bars, push-pull activating bars, or other hardware designed to provide passage without requiring the ability to grasp the opening hardware.
 - 1. All hand-activated hardware shall be mounted between 30 inches and 44 inches above finished floor.
- D. Latches, locks, and exit devices shall require no more than 15 lbf to release latch; from egress side shall not require the use of a key, tool, or special knowledge for operation.
- E. At sliding doors, when fully open, operating hardware shall be exposed and usable from both sides.
- F. Door closing devices shall comply with the following maximum opening-force requirements:
 - 1. Interior Hinged Doors: 5 lbf applied perpendicular to door at latch.
 - 2. Exterior Hinged Doors: 8.5 lbf applied perpendicular to door at latch.
 - 3. Sliding or Folding Doors: 5 lbf applied parallel to door at latch.
 - 4. Fire Rated Doors: Minimum force allowable by the appropriate administrative authority, not to exceed 15 lbf applied perpendicular to door at latch.
- G. Where door closers are provided, adjust sweep speed so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.
- H. Thresholds shall be maximum 1/2 inch in height above floor and landing on both sides of openings. Bevel raised thresholds with a slope of not more than 1:2.
- I. Electrified door hardware shall be listed and labeled by a testing agency acceptable to authorities having jurisdiction.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Each article of hardware shall be delivered individually packaged in the manufacturer's standard commercial carton or container, and shall be properly marked or labeled to be readily identifiable with the approved hardware schedule.
- B. Manufacturer's printed installation instructions, fasteners, and special tools shall be included in each package.
- C. Hardware shall be stored in a dry, secure locked area, complete with shelving for unpacking and sorting of the door hardware.
- D. Deliver all master keys by restricted, receipted delivery directly from the manufacturer to the Owner.

1.7 COORDINATION

- A. Provide hardware templates to the parties involved for doors, frames, and other work specified to be factory prepared for door hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.
- B. When required by door or frame fabricator, furnish physical samples of each mortised and recessed hardware item required.
- C. Furnish as required any hardware items or accessories requiring factory or shop installation.
- D. Coordinate layout and installation of recessed pivots and closers with floor construction.
- E. Electrical System Rough-in: Coordinate layout and installation of electrified door hardware with connections to power supplies, fire alarm system and detection devices, access control system, and security system as applicable.
- F. Pre-Installation Conference: Arrange a conference at the job site to coordinate door, frame, hardware and electronic security hardware installation; to be attended by the Architect, Owner, Contractor and representative personnel of firms involved in the provision and installation of said items.
- G. Keying Conference: Conduct conference at Project site with Owner or designated representative. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including, but not limited to, the following:
 - 1. Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
 - 2. Preliminary key system schematic diagram.
 - 3. Requirements for key control system.

1.8 WARRANTY

- A. In addition to, and not precluding, other warranty requirements in the Contract Documents, the following hardware items shall carry extended minimum warranties as indicated:
 - 1. Hinges: Ten years from date of Substantial Completion.

2. Locks: Five years from date of Substantial Completion.
3. Exit Devices: Three years from date of Substantial Completion.
4. Door Closers: Ten years from date of Substantial Completion.

1.9 MAINTENANCE

- A. Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements herein, provide products by one of the following manufacturers for each type of hardware:
 1. Butt Hinges: Hager Companies (HAG), Mc Kinney (MCK), Stanley (STA).
 2. Pivot Hinges: Ives (IVE), Rixson (RIX), Rockwood (ROC).
 3. Cylinders and Keying: Same manufacturer as for locksets, Unless Otherwise Noted.
 4. Locksets and Latchsets: Schlage Lock Co. (SCH), or UNL approved equal.
 5. Exit Devices: Von Duprin (VON), or UNL approved equal.
 6. Electromagnetic Lock Assemblies: Locknetics (LOC), Security Door Controls (SDC), or UNL approved equal.
 7. Electrical Power Transfers: Von Duprin (VON), or UNL approved equal.
 8. Door Position Switches: Sentrol (SEN), or UNL approved equal.
 9. Power Supplies for Electrified Hardware: Security Door Controls (SDC), Von Duprin (VON), or UNL approved equal.
 10. Flush Bolts and Door Coordinators: Door Controls International (DCI), Ives (IVE), Rockwood (ROC), Trimco (TRI), or UNL approved equal.
 11. Surface Door Closers: LCN (LCN) 4000 Series, or UNL approved equal.
 12. Overhead Holders And Stops: Glynn-Johnson (GLY), Rixson (RIX), Rockwood (ROC), or UNL approved equal.
 13. Automatic / Low Energy Door Operators and Accessories: LCN (LCN), MS Sedco (SED), Wikk Industries (WIK) or UNL approved equal.
 14. Architectural Door Trim: Ives (IVE), Rockwood (ROC), Trimco (TRI) or UNL approved equal.
 15. Auxiliary Hardware: Ives (IVE), Rockwood (ROC), Trimco (TRI), or UNL approved equal.

16. Door Bottoms, Metal Thresholds, Weatherstripping and Gaskets: National Guard Products (NGP), Pemko (PEM), Reese Enterprises (RSE), or UNL approved equal.
17. Folding and Sliding Door Hardware: Accurate Hardware (ACC), Johnson Hardware (JOH), or UNL approved equal.

2.2 MATERIALS AND FABRICATION

- A. Requirements for grade, materials, size, and other distinctive qualities of each type of door hardware are indicated herein. Furnish items in types, sizes or weight, in accordance with manufacturer's standards, appropriate for the conditions of installation and service, unless otherwise indicated.
- B. Products named or identified by make or model number, or other designation and described herein are base products. Base products establish the standards of type, in-service performance, physical properties, appearance, warranty, cost, and other characteristics required by the Project. Requirements for design, function, finish, and other distinctive qualities of each type of door hardware at specific openings are indicated in the Door Hardware Sets at the end of Part 3.
- C. Door hardware units shall be produced of base metal, fabricated by forming method indicated, using manufacturer's standard metal alloy, composition, temper, and hardness. Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18 for finishes. Do not furnish manufacturer's standard materials or forming methods if different from specified standard.

2.3 FASTENERS

- A. Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to commercially recognized industry standards for application intended. Provide Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated.
- B. Provide concealed fasteners for hardware items on exterior doors which are exposed when door is closed. Sex bolts, through bolts, or machine screws and grommet nuts, where used on reverse-bevel exterior doors shall employ one-way screws or other approved tamper proof screws.
- C. Combination machine screws and expansion shields shall be used for attaching hardware to concrete or masonry. Plastic sleeve and rawl plug anchors are not acceptable.
- D. Fasteners exposed to the weather in the finished work shall be of brass, bronze, or stainless steel.

2.4 BUTT HINGES

- A. Butt hinges shall meet BHMA A156.1 requirements.
- B. Hinge dimensions shall conform to BHMA A156.7.
- C. Base Metal shall be steel plated for fire-rated doors; bronze or stainless steel for exterior outswinging doors; bronze or plated steel elsewhere as scheduled.
- D. Provide hinges with antifriction bearings for doors with closers.

- E. Unless otherwise indicated, size hinges as follows:
 - 1. 1-3/4 inch thick doors to 36 inches width: 4-1/2 inch height; standard weight.
 - 2. 1-3/4 inch thick doors over 36 inches width: 5 inch height; heavy weight.
- F. Provide in minimum width sufficient to clear trim when door swings 180 degrees, whether or not shown on Drawings to swing 180 degrees.
- G. Number of hinges per leaf shall be as follows:
 - 1. Doors to 60 inches in height: 2 hinges.
 - 2. Doors over 60 to 90 inches in height: 3 hinges.
 - 3. Doors over 90 to 120 inches in height: 4 hinges.
 - 4. For doors over 120 inches in height: 4 hinges plus 1 hinge for every 30 inches, or fraction thereof, door height greater than 120 inches.
- H. Screws: Flat head wood screws not less than 1-1/2 inches long for hinges for wood doors; flat head machine screws elsewhere.
- I. Hinges for reverse bevel doors with locks shall have pins that are made non-removable when the door is in the closed position by means of a set screw in the hinge pin barrel.
- J. Electrified Hinges shall be by Marray Enterprises (MRY).
 - 1. Coordinate number and size of wires for electrified hardware served.
 - 2. Provide junction box/ mortar shield for each electrified hinge.

2.5 PIVOT HINGES

- A. Pivot hinges shall meet BHMA A156.4 Grade 1 requirements.
- B. Pivots shall be constructed of steel, cast or forged bronze, or stainless steel as indicated by BHMA finish specified.
- C. Electrified Pivots shall be by same manufacturer as pivots used on Project.
 - 1. Alternatively, subject to compliance with requirements and acceptance by authorities having jurisdiction, provide pivots by same manufacturer as other pivots on Project electrically modified by one of the following: Architectural Control Systems (ACS), Marray Enterprises (MRY).
 - 2. Coordinate number and size of wires for electrified hardware served.

2.6 CYLINDERS, KEYING AND KEY STORAGE

- A. Lock cylinders shall meet BHMA A156.5 requirements.
- B. Masterkeying system shall meet BHMA A156.28 requirements.
- C. Cylinders at exterior doors and at all exit devices shall be interchangeable core type. Provide mortise or rim type cylinders as required by device for all exit devices having key locking function.

- D. Cylinders shall be Schlage Primus cylinders in keyway(s) and configuration required for integration into campus system.
- E. Cylinders for Telecommunications wiring closets and custodial closets shall be keyed separately to Sargeant LL keyway as directed by Owner.
- F. Locks shall be keyed according to approved Keying Schedule.
- G. Locks shall be furnished with a temporary keying system for interim use during construction.
- H. Provide change keys in individual envelopes for each cylinder delivered. Envelopes shall be marked with respective door identification numbers.
- I. Key set symbol, and inscription "Do Not Duplicate" shall be stamped on all keys.
- J. Keys shall be supplied as follows:
 - 1. Locks: 3 change keys each lock.
 - 2. Master keyed sets: 2 keys each set.
 - 3. Grand master keys: 5 total.
 - 4. Great Grand master keys: 5 total.
 - 5. Interchangeable Core control keys: 2 total.
 - 6. Construction keys: 10 total.
- K. Subject to compliance with requirements, provide emergency entrance key vault(s); Knox Company 3200 Series, or equal.
 - 1. Recessed mount with hinged door, with tamper switch; 1/4 inch plate steel housing; 1/2 inch thick steel door with gasket seal.
 - 2. Exterior Dimensions: 7 inches (H) x 7 inches (W) x 3-1/4 inches (D).
 - 3. Finish Color: Match Phase I.
 - 4. Provide recessed mounting kit and all other required mounting accessories.
 - 5. Where indicated provide security key override switches for electrically activated openings.
 - 6. Coordinate and provide keying and type per fire/ police department, and other jurisdictional agency requirements.

2.7 LOCKSETS AND LATCHSETS

- A. Mortise Locks and Latches shall meet BHMA A156.13 Grade 1 requirements.
- B. Electrified Locks shall also meet BHMA A156.25 requirements.
- C. Provide locking or latching functions as indicated in Hardware Sets.
- D. Operating trim shall be lever type as indicated in Hardware Sets.
- E. Lock trim shall be rose or escutcheon type as indicated in Hardware Sets; heavy wrought or cast brass, bronze, or stainless steel; through-bolted through door.

- F. Lock functions which include thumb turn trim shall be provided with thumb turns compliant with accessibility code requirements.
- G. Lock Throw: Comply with requirements for length of latch bolts to comply with labeled fire door requirements.
- H. Lock backset shall be 2-3/4 inches unless otherwise indicated.
- I. Provide curved-lip strike with dust box for each latch or lock bolt, with lip extended to protect frame, finished to match door hardware set, unless otherwise indicated.
- J. Electromechanical locksets shall be by same manufacturer as mechanical type locksets on Project.
 - 1. Alternatively, subject to compliance with requirements and acceptance by authorities having jurisdiction, provide locksets by same manufacturer as other locksets on Project electrically modified by one of the following: Architectural Control Systems (ACS), Marray Enterprises (MRY), Security Door Controls (SDC).
- K. Electromechanical locksets utilized at fire rated openings shall be listed and labeled by a testing agency acceptable to authorities having jurisdiction, and shall maintain door in positive latched position when power is off.
- L. Provide Electromechanical Locks operated by 24VDC power.

2.8 EXIT DEVICES

- A. Exit devices and exit device accessories shall meet BHMA A156.3, Grade 1 requirements.
- B. Electromechanical exit devices shall also meet BHMA A156.25 requirements.
- C. Panic Exit Devices: Listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for panic protection, based on testing according to UL 305. Provide standard hex key dogging for all devices.
- D. Fire Exit Devices: Provide Fire Exit Devices for all fire rated doors that are scheduled to receive exit devices. Comply with NFPA 80, and provide devices listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252.
- E. Touch bars shall be fabricated of stainless steel, brass or bronze depending on finish indicated. All visible parts of exit devices shall be finished compatible with indicated device finish -- black strikes, end caps, or other exposed parts are not acceptable.
- F. Outside Trim: Lever Design, material and finish to match locksets, unless otherwise indicated. Unless otherwise indicated, provide manufacturer's standard outside trim for the function specified for functions not utilizing a lever handle trim.
- G. Adjustable strikes shall be provided for rim type and vertical rod devices.
- H. Fire Exit Removable Mullions: Where indicated, provide removable mullions for use with fire exit devices complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire and panic protection, based on testing according to UL 305 and NFPA 252. Mullions shall be used only with exit devices for which they have been tested.

- I. Electromechanical exit devices shall be by same manufacturer as mechanical type exit devices on Project.
 - 1. Alternatively, subject to compliance with requirements and acceptance by authorities having jurisdiction, provide exit devices by same manufacturer as other exit devices on Project electrically modified by one of the following: Architectural Control Systems (ACS), Marray Enterprises (MRY), Security Door Controls (SDC).
 - J. Electromechanical exit devices utilized at fire rated openings shall be listed and labeled by a testing agency acceptable to authorities having jurisdiction, and shall maintain door(s) in positive latched position when power is off.
- 2.9 ELECTRIC STRIKES
- A. Electric strikes shall meet BHMA A156.31 Grade 1 requirements, and be listed and labeled under UL 1034 Burglary Resistant Electric Locking Equipment.
 - B. Electric strikes for fire rated openings shall be listed and labeled for such use by a testing agency acceptable to authorities having jurisdiction. Fail Secure (fail locked) strikes shall be used at all fire rated openings.
- 2.10 ELECTROMAGNETIC LOCK ASSEMBLIES
- A. Electromagnetic lock assemblies shall meet BHMA A156.23 Grade 1 requirements.
 - B. Locks shall be field-selectable for 12 or 24 VDC operation, and provide 1,500 lbf minimum holding force for direct pull applications and 2,000 lbf holding force for shear type applications.
 - C. Wiring connections shall be via on-board screw terminal connections. Lock shall have built-in circuit/ surge and voltage kickback suppression protection.
 - D. Where indicated, locks shall be equipped with concealed sensors to monitor magnetic bond status and door position status.
 - E. Locks used on fire rated doors shall be listed and labeled for such use by a testing agency acceptable to authorities having jurisdiction.
 - F. Surface mounted assemblies for double door applications shall have full width housing and shall include two magnets and two armatures (one for each of the two doors.)
 - G. Delayed egress electromagnetic lock assemblies shall meet BHMA A156.24 requirements, and shall be provided in configuration acceptable to authorities having jurisdiction.
- 2.11 ELECTRICAL POWER TRANSFERS
- A. Electrical power transfers shall be capable of transferring sufficient electrical current to properly operate electrified hardware in door.
 - B. Electrical power transfers used on fire rated doors shall be listed and labeled by a testing agency acceptable to authorities having jurisdiction.
- 2.12 DOOR POSITION SWITCHES
- A. Door position switches used on fire rated doors shall be listed and labeled by a testing agency acceptable to authorities having jurisdiction.

2.13 POWER SUPPLIES FOR ELECTRIFIED HARDWARE

- A. Power supplies shall be UL listed for applicable use; shall be housed in an approved enclosure; and provide both Class 1 and Class 2 outputs.
- B. Output shall be filtered and regulated. Relay, timer, and logic modules shall be provided as required for interface to indicated security components; and shall be assembled, connected, and fully contained within the power supply enclosure. A fire alarm emergency release input terminal shall be provided for connection to fire / life safety system.
- C. Power supplies shall provide sufficient power capacity for the worst-case condition that could occur in the operating environment without any loss or degradation of operation.

2.14 FLUSH BOLTS

- A. Manual flush bolts shall meet BHMA A156.16 requirements.
- B. Bottom bolt shall have 12 inch long operating rod. Top bolt operating rod shall be determined by door height, assuring the operator is located less than 72 inches above the floor.
- C. Automatic flush bolts shall meet BHMA A156.3
- D. Provide dust proof strikes for bottom bolts. Dust proof strikes shall meet BHMA A156.16.

2.15 DOOR COORDINATORS

- A. Door coordinators shall meet BHMA A156.3 requirements.
- B. Door coordinators shall be flat bar type; stop mounted with all necessary filler bars and mounting brackets to accommodate required hardware.
- C. Provide carry bar at each pair of doors equipped with an overlapping astragal, except when automatic or self-latching bolts are used.

2.16 SURFACE DOOR CLOSERS

- A. Door closing devices shall meet BHMA A156.4, Grade 1 requirements.
- B. Surface closers shall be fully adjustable with sweep speed, latch speed and back check position valves.
- C. Surface closers on exterior doors without building overhang protection shall be primed with rust inhibitive primer before finish application.
- D. Provide closers size adjusted in accordance with BHMA A156.4, Table A1, unless modified by manufacturer's recommendations, and otherwise as required to insure closing and latching of doors.
- E. Arm selection shall follow the requirements of the manufacturer's recommendations with brackets, drop plates and miscellaneous accessories provided as necessary.
- F. Provide closers with arms designed to permit openings of doors as far as job conditions will permit; unless otherwise indicated closers with arms restricting opening of door will not be acceptable.

2.17 OVERHEAD HOLDERS AND STOPS

- A. Overhead holders and stops shall meet BHMA A156.8 requirements.
- B. Overhead door holders and stops shall be adjustable from 90 to 110 degrees dead stop or hold open position, as applicable.
- C. Overhead door stops shall have shock absorbers providing 5 to 7 degrees compression before dead stop.
- D. Overhead stops shall not be provided with hold open function when used at fire rated doors.

2.18 AUTOMATIC AND LOW ENERGY DOOR OPERATORS

- A. Surface Applied Operator: The operator header shall be mounted to the surface of the door frame or wall. Connecting hardware shall be a double arm arrangement that can either push the door or pull the door open to suit the job condition. Provide parallel arm when operator mounting is on the pull side, and adjacent wall is within 4 inches of the door frame. Provide fire labeled unit for use at rated doors.
- B. Overhead Concealed Operator: The operator header shall be mounted directly over the door and serve as the door frame header. The operator output shaft shall connect to an arm that transmits power to the door via a slide block which moves in track that is recess mounted in the top of the door.
- C. Automatic Door Operators shall meet BHMA A156.10 requirements.
 - 1. Provide guard rails and safety sensors as needed to meet A156.10 requirements and all applicable codes.
 - 2. Power operation shall be activated by push plate switch, motion detector, or other actuators as indicated.
- D. Low Energy Door Operators shall meet BHMA A156.19 requirements.
 - 1. Door shall not open to back check faster than 3 seconds, and shall require no more than 15 lbf applied 1 inch from latch edge to stop door movement.
 - 2. Door shall remain in fully open position for no less than 5 seconds.
 - 3. Door shall close from 90 degrees to 10 degrees no faster than 3 seconds, and 10 degrees to fully closed no faster than 1-1/2 seconds.
 - 4. Provide safety sensors as needed to meet requirements all applicable codes.
 - 5. Power operation shall be activated by push plate switch, or other actuators as indicated.

2.19 ARCHITECTURAL DOOR TRIM

- A. Architectural door trim shall meet BHMA A156.6 requirements.
- B. Door Protection Plates: Kick, mop, and armor plates shall be 0.050 inch thick brass, bronze, or stainless steel depending on finish indicated. Plates shall have beveled edges, and shall be provided with countersunk mounting holes and No. 6 oval head screw fasteners. Width of

kick and armor plates shall be 2 inches less than door width for single doors and 1 inch less for pairs of doors. Width of mop plates shall be 1 inch less than door width. Unless otherwise indicated, height shall be 10 inches for kick and mop plates, and 34 inches for armor plates.

- C. Door Edging and Astragals: Fabricated from 18 gauge cold-rolled steel or 304 stainless steel as indicated; factory prepared for all mortise hardware; countersunk screw mounting.
- D. Push and pull plates shall be 0.050 inch thick brass, bronze, or stainless steel depending on finish indicated. Plates shall have beveled edges, and shall be furnished with countersunk mounting holes and No. 6 oval head screw fasteners. Pull plates shall also be furnished with flat-head through bolts for pull grip.
- E. Push and pull bars and grip handles shall be brass, bronze, or stainless steel depending on finish indicated.

2.20 AUXILIARY HARDWARE

- A. Auxiliary hardware shall meet BHMA A156.16 requirements.
- B. Door Stops: Stops shall be of heavy duty construction, provided in finish indicated. Wall bumpers shall have no visible fasteners. Floor stops shall be of height required by floor conditions. Unless otherwise indicated, provide stops at all doors as follows:
 - 1. At exterior, outswinging doors provide heavy duty Surface Mounted Overhead Stop Rixson 9 Series or equal, unless stop function is indicated in door closer. At all other doors provide wall bumper Trimco 1270CV, or equal. Where it is not possible to properly place a wall type stop, provide heavy duty Surface Mounted overhead type stop Rixson 1 Series, or when door closer is indicated, provide heavy-duty dead stop function in closer.
- C. Silencers: Gray rubber, non-marring configured for metal or wood frames as scheduled. Provide 3 per single door and 2 per pair of doors. Silencers shall be tamper resistant once installed in door frame.

2.21 DOOR BOTTOMS

- A. Door bottoms shall be of aluminum or extruded bronze of the type and finish indicated and shall provide proper clearance and an effective seal with specified thresholds.
- B. Door bottom shall have a rubber, vinyl or neoprene seal as indicated.
- C. The door bottom shall exclude light when the door is in the closed position and shall inhibit the flow of air through the unit.

2.22 METAL THRESHOLDS

- A. Thresholds shall meet BHMA A156.21 requirements.
- B. Thresholds shall be heavy-gauge aluminum or bronze of the configuration and finish indicated, and shall provide an effective seal with door bottom.
- C. Where required, thresholds shall be prepared to accommodate floor closers, pivots, and projecting bolts of latching hardware.
- D. Thresholds at floor closers shall have mitered returns and removable access portion for floor closer maintenance.

2.23 METAL HOUSED TYPE WEATHERSTRIP

- A. Metal Housed Type Weatherstrip shall meet BHMA A156.22 requirements.
- B. Metal Housed Type Weatherstrip shall be aluminum or bronze of the type and finish indicated, comprised of metal retainers with vinyl, neoprene, silicone rubber, polyurethane or vinyl brush inserts as indicated.
- C. Seals shall remain functional through all weather and temperature conditions.

2.24 GASKETING

- A. Shall be a compression type product for use with wood or steel doors; labeled for use on fire-rated doors where required.

2.25 FOLDING AND SLIDING DOOR HARDWARE

- A. Folding and Sliding Door Hardware shall meet BHMA A156.14 requirements.
- B. Provide complete sets of type indicated, consisting of overhead track, hangers, supports, track stoppers, floor guides, and other required accessories.

2.26 FINISHES

- A. Provide hardware in finishes as indicated.
- B. Unless otherwise indicated, finishes shall conform to those identified in BHMA A156.18. Comply with base material and finish requirements indicated by the following:
 - 1. BHMA 600: Primed for painting, steel base metal.
 - 2. BHMA 626: Satin chromium plated over nickel, brass or bronze base metal.
 - 3. BHMA 627: Satin aluminum, clear coated, aluminum base metal.
 - 4. BHMA 628: Satin aluminum, clear anodized, aluminum base metal.
 - 5. BHMA 630: Satin stainless steel, stainless-steel base metal.
 - 6. BHMA 652: Satin chromium plated over nickel, steel base metal.
 - 7. BHMA 689: Aluminum painted, any base material.
 - 8. BHMA 719: Mill finish aluminum, uncoated, aluminum base metal.

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Examine doors and frames for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
- B. Examine rough-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Installation shall be in accordance with DHI A115 and/ or DHI A115-W; and DHI A115.IG.

- B. Hardware for fire doors shall be installed conforming with NFPA 80, and all other applicable building codes and regulations.
- C. Install each door hardware item according to manufacturer's written instructions, utilizing proper fasteners provided by manufacturer.
- D. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in other Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.
- E. Set units level, plumb, and true to line and location. Adjust and reinforce attachment substrates as necessary for proper installation and operation.

3.3 DOOR CLOSING DEVICES

- A. Surface closers on doors opening to or from halls and corridors shall be mounted on the room side of the door.
- B. Surface closers on exterior doors shall be mounted on the interior side of building utilizing regular arm, parallel arm, or top jamb mounting as required.
- C. Door closing devices shall be installed in accordance with the templates and printed instructions supplied by the manufacturer of the devices.
- D. Door closing devices with adjustable spring power shall be adjusted for proper door operation, and compliance will all applicable codes and regulations.
- E. The cutting of weatherstripping to accommodate closer installation will not be acceptable.

3.4 PUSH, PULL AND PROTECTIVE PLATES

- A. All plates shall be installed using countersunk No. 6 oval head screw fasteners, unless otherwise indicated.
- B. Pull plate grip handles shall be through bolted through the door. When push plate is indicated on opposite door side, through bolts shall be countersunk with push plate mounted to conceal through bolts.

3.5 THRESHOLDS

- A. Thresholds shall be secured with a minimum of 3 fasteners per single door width and 6 fasteners per double door width with a maximum spacing of 12 inches. Thresholds over 6 inches in width shall be secured with a double row of fasteners.
- B. Exterior thresholds shall be installed in a bed of sealant with combination expansion anchors and stainless steel machine screws, except that bronze or anodized bronze thresholds shall be installed with expansion anchors with brass screws.
- C. Minimum screw size shall be No. 10, length dependent on job conditions, with a minimum of 1 inch thread engagement into the floor or anchoring device used.
- D. Provide thresholds at doors where indicated in Hardware Sets. Refer to Door Schedule and Drawing details for type and configuration required. Additionally, provide fire door thresholds where combustible flooring passes under doors with rating greater than 20 minutes.

3.6 HARDWARE LOCATIONS

A. Unless otherwise indicated install hardware as follows:

1. Bottom Hinge or Pivot: 10 inches from door bottom to bottom of hinge.
2. Top Hinge or Pivot: 5 inches from door top to top of hinge.
3. Center Hinge(s) or Pivot(s): Spaced equidistantly between top and bottom hinges/pivots.
4. Lockset / Latchset/ Exit Device Operating Trim: 38 inches from finished floor to center of lever/ trim.
5. Deadlock: 32 inches from finished floor to center key cylinder / thumb turn.
6. Push Plate: 44 inches from finished floor to center of plate.
7. Pull Plate: 42 inches from finished floor to center of pull.
8. Push-Pull Bars: 42 inches from finished floor to center of bar.
9. Exit Device: 38 inches from finished floor to center of push bar.
10. Wall Bumper: Centered at point on wall where lever, or other operating trim, first makes contact with wall.
11. Floor Stop: Adjacent to wall; not to exceed 4 inches from face of wall; located 3 inches from latch edge of door; in any case never more than 50 percent of door width from latch edge of door.

3.7 ADJUSTING

- A. Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended.
- B. Engage a factory-authorized service representative to adjust door closing devices, compensating for final operation of heating and ventilating equipment, and to comply with referenced accessibility requirements.

3.8 COMPLETION

- A. When complete all hardware shall be properly secured in place and all exposed surfaces shall be clean and free from scratches, paint, and other defects and damages.
- B. Contractor shall demonstrate that all keys properly operate the locks as identified in the approved Keying Schedule.

3.9 DOOR HARDWARE SETS

- A. The following is a general listing of hardware requirements. Provide hardware items required by established standards and practices to meet state and local codes, whether or not specifically indicated in the following sets.

- B. Silencers and gasketing, where listed in Hardware Sets, may be omitted at openings where door frames are provided with integral seals if integral seals satisfy all applicable Codes and Regulations.
- C. Refer to Door Schedule and/ or Drawings for door opening information, hardware set assignment, and related requirements.

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Hardware Sets:HW 101

	Hinges	Per Specification	652	HAG
1 Ea.	Storeroom Lockset	L9080 x 06A	626	SCH
1 Ea.	Closer	4040/4040EDA Series	689	LCN
1 Ea.	Kick Plate	Per Specification	630	TRI
1 Ea.	Door Stop	Per Specification	---	---
1 Set	Gasketing	S88	---	PEM

HW 102

	Hinges	Per Specification	652	HAG
1 Ea.	Exit Device	99NL	626	VON
1 Ea.	Cylinder to Suit Device	Per Specification	626	SCH
1 Ea.	Closer	4040/4040EDA Series	689	LCN
1 Ea.	Door Stop	Per Specification	---	---
1 Set	Gasketing	S88	---	PEM

HW 103 NOT USEDHW 104 NOT USEDHW 105 NOT USEDHW 106

	Hinges	AB750	652	HAG
1 Ea.	Electrified Hinge	TEF2+4C-3K-H	652	MAR
1 Ea.	Electrified Fire Exit Device	RX-E99L-F	626	VON
1 Ea.	Cylinder to Suit Device	Per Specification	626	SCH

1 Ea.	Closer	4040/4040EDA Series	689	LCN
1 Ea.	Door Stop	Per Specification	---	---
1 Set	Gasketing	S88	---	PEM
1 Ea.	Door Position Switch	By Security	630	SEN
1 Ea.	Junction Box for Door Position Switch	430	GAL	HAG
1 Ea.	Junction Box for Electrified Hinge	430	GAL	HAG

Note: Controlled Opening – Wiring, Controls, Power, and other components by Security. Free egress at all times. Coordinate door operation and programming with UNL BSM Access Control requirements.

HW 107 NOT USEDHW 108

	Hinges	AB750	652	HAG
1 Ea.	Electrified Hinge	TEF2+4C-3K-H	652	MAR
1 Ea.	Electrified Lockset	L9080 EU-RX x 06A	626	SCH
1 Ea.	Closer	4040/4040EDA Series	689	LCN
1 Ea.	Door Stop	Per Specification	---	---
1 Set	Gasketing	S88	---	PEM
1 Ea.	Door Position Switch	By Security	630	SEN
1 Ea.	Junction Box for Door Position Switch	430	GAL	HAG
1 Ea.	Junction Box for Electrified Hinge	430	GAL	HAG

Note: Controlled Opening – Wiring, Controls, Power, and other components by Security. Free egress at all times. Auto Operator and Power Supply require P.12091VAC. Coordinate door operation and programming with UNL BSM Access Control requirements.

HW 109 NOT USEDHW 110 NOT USEDHW 111 NOT USEDHW 112 NOT USEDHW 113

	Hinges	AB700	652	HAG
1 Ea.	Storeroom Lockset	L9080 x 06A	626	SCH
1 Ea.	Doorstop	Per Specification	---	---
3 Ea	Silencer	1229	---	TRI

HW 114 NOT USED

HW 115 NOT USED

HW 116 NOT USED

HW 117 NOT USED

HW 118 NOT USED

HW 119

	Hinges	Per Specification	652	HAG
1 Ea.	Classroom Lockset	L9070 x 06A	626	SCH
1 Ea.	Overhead Concealed Door Stop	Per Specification	---	---
1 Set	Gasketing	S88	---	PEM

HW 120

	Hinges	AB850	630	HAG
1 Ea.	Exit Device	99NL	626	VON
1 Ea.	Cylinder to Suit Device	Per Specification	626	SCH
1 Ea.	Closer	4040EDA Series - DEL	689	LCN
1 Ea.	Overhead Concealed Door Stop	Per Specification	---	---
1 Ea.	Threshold	To Suit Sill Condition	719	PEM
1 Ea.	Door Sweep	345ANB	719	PEM
1 Set	Gasketing	S88	---	PEM
1 Ea.	Door Position Switch	By Security	630	SEN

HW 121 NOT USEDHW 122

Note: All hardware by manufacturer.

HW 123

1 Ea.	Padlock	PL4000 Series	606	SCH
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HW 124 NOT USED

HW 125 NOT USEDHW 126 NOT USEDHW 127 NOT USEDHW 128 NOT USEDHW 129 NOT USEDHW 130

	Hinges	Per Specification	630	HAG
1 Ea.	Storeroom Lockset	L9080 x 06A	626	SCH
1 Ea.	Closer	4040/4040EDA Series	689	LCN
1 Ea.	Door Stop	Per Specification	---	---
1 Ea.	Threshold	To Suit Sill Condition	719	PEM
1 Ea.	Door Sweep	345ANB	719	PEM
1 Set	Gasketing	S88	---	PEM
1 Ea.	Rain Drip	346C	719	PEM

HW 131 NOT USEDHW 132 NOT USEDHW 133 NOT USEDHW 134 NOT USEDHW 135

1 Ea.	Armor Plate	Per Specification	630	TRI
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1 Ea.	Closer	4040/4040EDA Series - Delayed Action	689	LCN
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Balance of Hardware Existing

HW 136

2 Ea.	Pivot Set	195 x 180	626	RIX
2 Ea.	Intermediate Pivot	M19	626	RIX
1 Ea.	Exit Device	99EO	626	VON
1 Ea.	Exit Device	99NL	626	VON
1 Ea.	Key Removable Mullion	KR4954	689	VON
1 Ea.	Cylinder to Suit Device	Per Specification	626	SCH
1 Ea.	Cylinder to Suit Mullion	Per Specification	626	SCH
2 Ea.	Closer	4040/4040EDA Series	689	LCN
2 Ea.	Door Stop	Per Specification	---	---
2 Ea.	Door Position Switch	By Security	630	SEN
2 Ea.	Junction Box for Door Position Switch	430	GAL	HAG

Note: Alum/ Glass Doors - Perimeter, meeting stile and door bottom seals by door manufacturer.

HW 137

	Hinges	AB750	652	HAG
1 Ea.	Passage Latchset	L9010 x 06A	626	SCH
1 Ea.	Closer	4040/4040EDA Series	689	LCN
1 Ea.	Door Stop	Per Specification	---	---
1 Set	Gasketing	S88	---	PEM

HW 138

Hinges	AB750	652	HAG	Hinges
1 Ea.	Electrified Hinge	TEF2+4C-3K-H	652	MAR
1 Ea.	Electrified Lockset	L9080 EU-RX x 06A	626	SCH
1 Ea.	Closer	4040/4040EDA Series	689	LCN
1 Ea.	Door Stop	Per Specification	---	---
1 Set	Gasketing	S88	---	PEM
1 Ea.	Door Position Switch	By Security	630	SEN
1 Ea.	Junction Box for Door Position Switch	430	GAL	HAG
1 Ea.	Junction Box for Electrified Hinge	430	GAL	HAG

Note: Controlled Opening - Wiring, Controls, and other components by Security. Free egress at all times. Coordinate door operation and programming with UNL BSM Access Control requirements.

HW 139

	Hinges	AB750	652	HAG
1 Ea.	Electrified Hinge	TEF2+4C-3K-H	652	MAR
1 Ea.	Electrified Lockset	L9080 EU-RX x 06A	626	SCH
1 Ea.	Closer (Active Leaf)	4041 x 18TJ	689	LCN
2 Ea.	Closer (Inactive Leaf)	4041 x 18TJ x ST 2463	690	LCN
1 Set	Automatic Flush Bolt x DP Strike	962 x 82	626	DCI
2 Ea.	Door Stop	Per Specification	---	---
1 Ea.	Coordinator	500 Series	626	DCI
1 Ea.	Astragal	FMA	630	ANE
1 Ea.	Meeting Stile Gasket	S77	---	PEM
1 Set	Gasketing	S88	---	PEM
2 Ea.	Door Position Switch	By Security	630	SEN
2 Ea.	Junction Box for Door Position Switch	430	GAL	HAG
1 Ea.	Junction Box for Electrified Hinge	430	GAL	HAG
Note:	Controlled Opening - Wiring, Controls, and other components by Security. Free egress at all times. Coordinate door operation and programming with UNL BSM Access Control requirements.			

HW 140

	Hinges	Per Specification	652	HAG
1 Ea.	Fire Exit Device	QEL9847WDC-EO-F x LBR	626	VON
1 Ea.	Fire Exit Device	QEL9847WDC-NL-OP-F x LBR	626	VON
1 Ea.	Power Supply	PS873-AO x 871-2Q	---	VON
2 Ea.	Electric Power Transfer	EPT-10 Series	689	VON
2 Ea.	Offset Door Pull	BF159	630	ROC
1 Ea.	Cylinder to Suit Device	Per Specification	626	SCH
2 Ea.	Closer	4040/4040EDA Series	689	LCN
2 Ea.	Door Stop	Per Specification	---	---
1 Set	Split Astragal	29324CNB	628	PEM
1 Ea.	Meeting Stile Gasket	S77	CLR	PEM
1 Set	Gasketing	S88 (Double Row for sound)	---	PEM
2 Ea.	Door Bottom	2170DV	---	PEM
1 Ea.	Threshold	1665A	719	PEM
2 Ea.	Door Position Switch	By Security	630	SEN
2 Ea.	Junction Box for Door Position Switch	430	GAL	HAG

Note: Controlled Opening - Wiring, Controls, and other components by Security. Free egress at all times. Doors normally closed and locked. Presenting proper credential will send a signal, retracting the latchbolts and allowing the doors to be opened. Latchbolts held in retracted condition (Electric dogging) until proper credential is presented again, sending a signal to release the latchbolts. Latchbolts will also release upon a signal from the life safety system, latching the doors. When locked, the active leaf can be opened by use of a key from the lobby side if the proper credential is not available, or if the doors have been locked by the life safety system. Coordinate door operation and programming with UNL BSM Access Control requirements.

HW 141

1 Set	Bypass Sliding Door Hardware	200MD 3 Door		JOH
2 Pair	Multi-Pull Catch	2054 PLBG		JOH
2 Ea.	Flush Pull	S2002B	626	ACC

NOTE: Coordinate installation of Guide Tracks in the floor.

HW 142

	Hinges	AB850	630	HAG
1 Ea.	Exit Device	99EO	626	VON
1 Ea.	Electrified Exit Device	EL99NL	626	VON
1 Ea.	Key Removable Mullion	KR4954	689	VON
1 Ea.	Cylinder to Suit Device	Per Specification	626	SCH
1 Ea.	Cylinder to Suit Mullion	Per Specification	626	SCH
1 Ea.	Electric Power Transfer	EPT Series	689	VON
1 Ea.	Power Supply	PS873-AO	---	VON
1 Ea.	Closer (Inactive Leaf)	4040EDA Series	689	LCN
1 Ea.	Auto Door Operator (Active Leaf)	4640 Series	628	LCN
1 Ea.	Bollard Post	6" x 6" BPS-IG-AL-Clear-Prep for Actuator and Credential Reader	628	WIK
1 Ea.	Push Plate Actuator	59-HSS	630	SED
1 Ea.	Vestibule Push Plate Actuator	59V-HSS	631	SED
2 Ea.	OH Stop	9 Series	689	RIX
1 Ea.	Threshold	To Suit Sill Condition	719	PEM
2 Ea.	Door Position Switch	By Security	630	SEN
2 Ea.	Junction Box for Door Position Switch	430	GAL	HAG

Note: Alum/ Glass Doors - Perimeter, meeting stile and door bottom seals by door manufacturer.

Note: Controlled Opening - Wiring, Controls, and other components by Security. Free egress at all times. Auto Operator and Power Supply require 120VAC. Coordinate door operation and programming with UNL BSM Access Control requirements.

HW 143

	Hinges	AB750	652	HAG
2 Ea.	Push-Pull Bar Set	1747-1	630	TRI
1 Ea.	Closer (Inactive Leaf)	4040EDA Series	689	LCN
1 Ea.	Auto Door Operator (Active Leaf)	4640 Series	628	LCN

1 Ea.	Push Plate Actuator	59-HSS	630	SED
2 Ea.	OH Stop	9 Series	689	RIX

Note: Alum/ Glass Doors - Perimeter and meeting stile seals by door manufacturer.

HW 144

	Hinges	Per Specification	652	HAG
1 Ea.	Classroom Lockset	L9070 x 06A	626	SCH
1 Ea.	Closer	4041DEL SERIES	689	LCN
1 Ea.	Door Stop	Per Specification	---	---
1 Set	Gasketing	S88	---	PEM

HW 145

	Hinges	Per Specification	652	HAG
1 Ea.	Privacy Indicator Lock	L9496 x 06A	626	SCH
1 EA.	Closer	4041 Series	689	LCN
1 Ea.	Door Stop	Per Specification	---	---
1 Ea.	Kick Plate	Per Specification	630	TRI
1 Ea.	Mop Plate	Per Specification	630	TRI
1 Set	Gasketing	S88	---	PEM

HW 146

	Hinges	AB750	652	HAG
1 Ea.	Electrified Hinge	TEF2+4C-3K-H	652	MAR
1 Ea.	Junction Box for Electrified Hinge	430	GAL	HAG
1 Ea.	Electrified Lockset	L9080 EU-RX x 06A	626	SCH
2 Ea.	Closer	4040/4040EDA Series	689	LCN
1 Set	Auto Flush Bolt x DP Strike	842/942 x 82	626	DCI
2 Ea.	Door Stop	Per Specification	---	---
1 Ea.	Astragal (at HM Door)	Overlapping Type By Door Mfr.	600	---
1 Ea.	Coordinator	500	626	DCI
1 Ea.	Meeting Stile Gasket	S77	---	PEM
1 Set	Gasketing	S88	---	PEM
2 Ea.	Door Position Switch	By Security	630	SEN

Note: Controlled Opening - Wiring, Controls, and other components by Security. Free egress at all times. Coordinate door operation and programming with UNL BSM Access Control requirements.

HW 147 NOT USED

HW 148

1 Ea.	Cylinder to Suit Lock	Per Specification	626	SCH
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HW 149

NOTE: Existing, relocated door; re-use all existing hardware.

HW 150

	Hinges	AB750	652	HAG
2 Ea.	Electrified Hinge	TEF2+4C-3K-H	652	MAR
1 Ea.	Electrified Fire Exit Device	RX9927EO-F-LBR	626	VON
1 Ea.	Electrified Fire Exit Device	RX-E9927L-F x 06	626	VON
1 Ea.	Cylinder to Suit Device	Per Specification	626	SCH
2 Ea.	Closer	4040/4040EDA Series	689	LCN
2 Ea.	Door Stop	Per Specification	---	---
1 Set	Split Astragal	29324CNB	628	PEM
1 Ea.	Meeting Stile Gasket	S77	CLR	PEM
1 Set	Gasketing	S88	---	PEM
2 Ea.	Door Position Switch	By Security	630	SEN
2 Ea.	Junction Box for Door Position Switch	430	GAL	HAG
2 Ea.	Junction Box for Electrified Hinge	430	GAL	HAG

NOTE: Controlled Opening - Wiring, Controls, and other components by Security. Free egress at all times. Doors normally closed and locked. Presenting proper credential will send a signal, retracting the latchbolts and allowing the doors to be opened. Latchbolts held in retracted condition (Electric dogging) until proper credential is presented again, sending a

signal to release the latchbolts. Latchbolts will also release upon a signal from the life safety system, latching the doors. When locked, the active leaf can be opened by use of a key from the lobby side if the proper credential is not available, or if the doors have been locked by the life safety system. Coordinate door operation and programming with UNL BSM Access Control requirements.

HW 151

2 Ea.	Pivot Set	195 x 180	626	RIX
2 Ea.	Electric Through Wire Intermediate Pivot	E-M19-8 Conductor	626	RIX
1 Ea.	Electrified Exit Device	RX9927EO-LBR	626	VON
1 Ea.	Electrified Exit Device	RX-E9927L x 06	626	VON
1 Ea.	Cylinder to Suit Device	Per Specification	626	SCH
2 Ea.	Closer	4040/4040EDA Series	689	LCN
2 Ea.	Door Stop	Per Specification	---	---
1 Set	Split Astragal	29324CNB	628	PEM
1 Ea.	Meeting Stile Gasket	S77	CLR	PEM
1 Set	Gasketing	S88	---	PEM
2 Ea.	Door Position Switch	By Security	630	SEN
2 Ea.	Junction Box for Door Position Switch	430	GAL	HAG
2 Ea.	Junction Box for Electrified Pivot	430	GAL	HAG

NOTE: Controlled Opening - Wiring, Controls, and other components by Security. Free egress at all times. Doors normally closed and locked. Presenting proper credential will send a signal, retracting the latchbolts and allowing the doors to be opened. Latchbolts held in retracted condition (Electric dogging) until proper credential is presented again, sending a signal to release the latchbolts. Latchbolts will also release upon a signal from the life safety system, latching the doors. When locked, the active leaf can be opened by use of a key from the lobby side if the proper credential is not available, or if the doors have been locked by the life safety system. Coordinate door operation and programming with UNL BSM Access Control requirements.

HW 152

	Hinges	AB750	652	HAG
2 Ea.	Push Plate	1001-3	630	TRI
2 Ea.	Pull Plate	1018-3	630	TRI
2 Ea.	Kick Plate	Per Specification	630	TRI
2 Ea.	Closer	4040/4040EDA Series	689	LCN
2 Ea.	Electromagnetic Holder	2000 Series	689	ABH
1 Set	Split Astragal	29324CNB	628	PEM

1 Ea.	Meeting Stile Gasket	S77	CLR	PEM
1 Set	Gasketing	S88	---	PEM

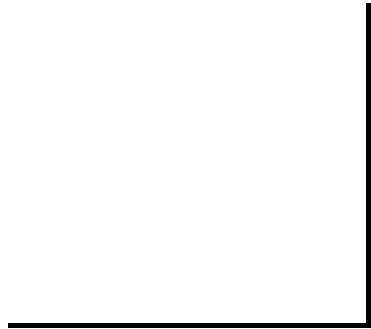
END OF SECTION

SPECIFICATION SECTION	FINISH CODE	COLOR CODE	REMARKS	
SECTION 04 72 00				
CAST STONE MASONRY	STN	ARCHITECTURAL CAST STONE		
SECTION 06 40 00				
ARCHITECTURAL WOODWORK		WALL PANELS		
	WPL-1	NUTMEG	RICHLITE, 1/4" THICK,	
	WPL-2	MAPLE	INTERLAM, ART DIFFUSION COP 001, RAW MDF WITH POLYURETHANE MATT LACQUIER FINISH	
SECTION 09 30 00				
TILING		CERAMIC, GLASS, PORCELAIN AND SLATE TILE		
	CT-1	D335	DAL TILE, 'KEYSTONES', COLOR: ALMOND	WALL TILE
	CT-2	MB-5A	DAL TILE, 'KEYSTONES', COLOR: ALMOND	COVED BASE TILE
	GT-1	CN48	DAL TILE, COLOR: BIANCO	ACCENT TILE
	GT-2	CN49	DAL TILE, COLOR: GIALLO	ACCENT TILE
	GT-3	CN50	DAL TILE, COLOR: NOCE	ACCENT TILE
	GT-4	CN51	DAL TILE, COLOR: ROSSO	ACCENT TILE
	PT-1	CN04	DAL TILE, 'CANALETTO' GIALLO 13x13 BASE TILE	FLOOR TILE (LOBBY TOILETS)
	PT-2	CN04	DAL TILE, 'CANALETTO' GIALLO 6x13x5/16 COVED BASE TILE	BASE TILE
	PT-3	CN04	DAL TILE, 'CANALETTO' GIALLO 13x13	WALL TILE
	PT-4	CD60	DAL TILE, 'PORCEALTO', COLOR: GRIGIO ELBA 12x12x5/16"	FLOOR TILE (LARGE TOILETS)
	PT-5	CN04	DAL TILE, "CANALETTO' GIALLO, BULLNOSE 3x13	
	ST-1	S700	DAL TILE, NATURAL SLATE "CALIFORNIA GOLD" 12x12 x 3/8"	FLOOR TILE
SECTION 09 51 00				
ACOUSTICAL CEILINGS		ARMSTRONG, CLEANROOM MYLAR, MINERAL FIBER, MYLAR FACED, SQUARE EDGE, COLOR: WHITE		
	SAT-1	WH		
	SAT-2	WH	ARMSTRONG, CIRRUS OPEN PLAN, MINERAL FIBER, TEGULAR EDGE, COLOR: WHITE	
	GR-1	WH	ARMSTRONG, PRELUDE XL 15/16 EXPOSED TEE GRID SYSTEM, COLOR: WHITE	
	GR-2	WH	ARMSTRONG, SILHOUETTE XL 1/4" REVEAL 9/16 BOLT SLOT GRID SYSTEM, COLOR: WHITE	

SECTION 09 63 00			RUBBER BASE	
RESILIENT FLOORING	RB-1	P184	4" HIGH, ROPPE, COLOR: ALMOND	
	RB-2	P158	4" HIGH, ROPPE, COLOR: SAND	
	RB-3	P130	4" HIGH, ROPPE, COLOR: BUCKSIN	
	RB-4	P100	4" HIGH, ROPPE, COLOR: BLACK	
	RB-5		4" HIGH, TO MATCH FLOOR STONE	
	RB-6	CLEAR	4" PLAIN SLICED WOOD MAPLE	
			RUBBER TILE	
	RF-1	2946	NORA 'NP ENVIRONCARE', COLOR: MORNING DEW	FIELD TILE
	RF-2	2779	NORA 'NP ENVIRONCARE', COLOR: EVERGREEN PATH	ACCENT TILE
	RF-3	2949	NORA 'NP ENVIRONCARE', COLOR: SAGE	ACCENT TILE
	RF-4	2967	NORA 'NP ENVIRONCARE', COLOR: MOOR GRASS	ACCENT TILE
	RF-5	2787	NORA 'NP ENVIRONCARE', COLOR: DRIFTWOOD	ACCENT TILE
	RF-6	2785	NORA 'NP ENVIRONCARE', COLOR: SATIN WOOD	ACCENT TILE
	RF-7	2958	NORA 'NP ENVIRONCARE', COLOR: FALLEN ACORN	ACCENT TILE
	RF-8	2934	NORA 'NP ENVIRONCARE', COLOR: RAIN CLOUD	FIELD TILE (ELEVATOR)
SECTION 09 68 13			CARPET TILE	
TILE CARPETING	CPT-1	6270	INTERFACE 'PRECAST', COLOR: TRAVERTINE	FIELD CARPET
	CPT-2	6592	INTERFACE 'FLAGSTONE', COLOR: TRAVERTINE	ACCENT TILE, RANDOM
	CPT-3	6580	INTERFACE 'STONELINE', COLOR: TRAVERTINE	(INTERACTION ROOM)
	CPT-4	5847	INTERFACE 'SOLID FOUNDATION', COLOR: KELP	ACCENT TILE, RANDOM
	CPT-5	3536	INTERFACE 'PAINT BOX', COLOR: SHERWOOD	ACCENT TILE, RANDOM
	CPT-6	3580	INTERFACE 'PAINT BOX', COLOR: OCHRE	ACCENT TILE, RANDOM
	CPT-7	3589	INTERFACE 'PAINT BOX', COLOR: SABLE	ACCENT TILE, RANDOM
SECTION 09 91 26			PAINT COLORS	
BUILDING PAINTING	A	953	BENJAMIN MOORE 'CLASSIC COLORS', COLOR: FEATHER DOWN	INTERIOR-GEN. WALL COLOR
	B	1441	BENJAMIN MOORE 'CLASSIC COLORS', COLOR: AMETHYST SHADOW	ACCENT PAINT
	C	HC-8	BENJAMIN MOORE 'CLASSIC COLORS', COLOR: DORSET GOLD	ACCENT PAINT
	D	2136-40	BENJAMIN MOORE 'COLOR PREVIEW', COLOR: AEGEAN TEAL	ACCENT PAINT
	E	2143-30	BENJAMIN MOORE 'COLOR PREVIEW', COLOR: OLIVE BRANCH	ACCENT PAINT
	F	2157-30	BENJAMIN MOORE 'COLOR PREVIEW', COLOR: BUTTERSCOTCH	ACCENT PAINT
	G			OSHA SAFETY YELLOW
			NOTES:	
			1) REFER TO SPECIFICATION SECTION 03310 FOR CONCRETE SEALER AND HARDENER.	
			2) REFER TO SPEC SECTION 09915 - BUILDING PAINTING FOR PAINT SYSTEM. LOCATIONS AS SHOWN ON FINISH SCHEDULE AND DRAWINGS.	
			3) ACCENT COLOR DESIGNATION AS SHOWN ON DRAWINGS	

SECTION 12 48 13.13				
ENTRANCE MAT	EM-1	609023	INTERFACE 'SUPER FLOR', COLOR MID BROWN	

NOT USED



Section 09 06 10 - Room Finish Schedule - Legend

General Notes:

- A. See plans and elevations for finish locations and patterns.
- B. Refer to specifications for description of product types.
- C. See interior elevations (and ceiling plans) for projection screen locations.
- D. Where noted to paint surfaces black (including reveals) Use P-XXX-XX.
- E. Resilient base on gypsum board walls only.
- F. Paint soffits P-64A unless noted otherwise.
- G. See stair details for railing and stringer paint colors and locations.
- H. Not Used
- I. Where multiple finishes are noted on one surface, refer to Drawings for layout of finishes and patterns.
- J. Semi-colons (;) divide multiple finishes for surface in a single direction.
- K. Refer to Drawings for finish substrate material: although paint system may indicate substrate materials refer to Drawings to verify.
- L. All floor finishes extend wall-to-wall underneath casework and equipment.

Keyed Notes:

- 1. Ceiling heights as noted on reflective ceiling plans.
- 2. Paint freestanding columns in open office P-64A
- 3. Maple wood base where gypsum board and WPL-2 occurs.
- 4. Refer to Overall Finish Plan for patterns
- 5. Refer to Interior Elevations for patterns
- 6. Refer to Interior Elevations for additional wall finish materials.
- 7. Future Glass Wash
- 8. Reception, Offices and Work Files shall have 80% CPT-1 & 20% CPT-2, non directional
- 9. Team and Open Offices shall have 70% CPT-1 & 30% CPT-2, non directional
- 11. Refer to Spec Section 09 67 23 for Resinous Coating Flooring types
- 12. Extend floor finish on entire floor including under casework (per NIH)

Abbreviations:

AFF	= Above Access Floor	(E)	= Existing	RF - #	= Resilient Flooring - Type #
AF	= Access Floor	EM	= Entrance Mat	SAT - #	= Suspended Acoustical Tile Ceiling - Type #
AFF	= Above Finish Floor	EXP STR	= Exposed Structure	SCRF - #	= Static Control Resilient Flooring
AT	= Acoustic Tile (surface applied)	EXT	= Exterior	SEAL	= Concrete Sealer
AWT	= Acoustic Wall Treatment	FAC	= Factory Finish	S/H	= Concrete Sealer / Hardner
AL MTL	= Aluminum Metal	FUT	= Future	SS	= Stainless Steel
CAF - #	= Cleanroom Access Floor - Type #	GB	= Gypsum Board	STL	= Steel
CG - #	= Corner Guard - Type #	G	= Glass	STN	= Stone
CLF	= Chain Link Fence	MIR	= Mirror	ST - #	= Stone Tile - Type #
CMU	= Concrete Masonry Unit	MTL	= Metal	UNO	= Unless Noted Otherwise
CONC	= Concrete	OF/CI	= Owner Furnished / Contractor Installed	UNS	= Unsealed Concrete
CP - #	= Broadloom Carpet - Type #	OF/OI	= Owner Furnished / Owner Installed	VDB - #	= Visual Display Board - Type #
CPT - #	= Carpet Tile - Type #	P-XXX-XX	= Paint System No./ Color Letter	WC - #	= Wall Covering - Type #
CR - #	= Chair/Crash Rail - Type #	PL - #	= Plastic Laminate - Type #	WG - #	= Wall Guard - Type #
CRC	= Chemical Resistant Coating - Section 09678	PLYWD	= Plywood	WD	= Wood
CT - #	= Ceramic Tile - Type #	PT - #	= Porcelin Tile - Type #	WPL-#	= Wall Panel
CWS - #	= Cleanroom Wall System - Type #	RB - #	= Resilient Base - Type #		
DGB	= Demountable Gypsum Board Partition	RC - #	= Resinuous Coating - Section 09675		

Section 09 06 10 - Room Finish Schedule					Note: Refer to legend on preceeding pages for abbreviations and notes.					
Pkg. No. or RFI	Interior Finishes									
	Room		Floor	Base	Ceiling	Walls				Remarks
						North	East	South	West	
	No.	Name	Finish	Finish	Finish	Finish	Finish	Finish	Finish	
	BASEMENT LEVEL (LEVEL 0)									
				–	–	–	–	–	–	–
	LOWER LEVEL (LEVEL 1)									
	150	CORRIDOR	RF-1 RF-2	RB-1	SAT-2 GR-2	P-64A	P-64A	P-64A	P-64A	4, 6
	122	DOCK AREA	S/H	–	EXP STR	P-59A	G-7	P-59A	P-59A	
	122A	OFFICE	CPT-1	RB-1	SAT-2 GR-2	P-64A	P-64A	P-64A	P-64A	8
	151	JANITOR	S/H	RB-4	EXP STR	P-65A	P-65A	P-65A	P-65A	
	153	SHARED EQUIPEMENT ROOM	RF-1	RB-1	SAT-1 GR-1	P-67A	P-67A	P-67A	P-67A	12
	154	ELEVATOR MACHINE ROOM	S/H	RB-4	EXP STR	P-65A	P-65A	P-65A	P-65A	–
	156	ELEVATOR	RF-8	RB-4	AL MTL	WPL-1	WPL-1	WPL-1	WPL-1	–
	152	CORRIDOR	RF-1 RF-2	RB-1	P-64A SAT-2 GR-2 EXP. STR.	P-64A	P-64A	P-64A	P-64A	4, 6
	159	GAS	S/H	–	–	–	–	–	–	–
	158	OFFICE	CPT-1 CPT-2	RB-1	SAT-2 GR-2	P-64A	P-64A	P-64A	P-64A	8
	160	OFFICE	CPT-1 CPT-2	RB-1	SAT-2 GR-2	P-64A	P-64A	P-64A	P-64A	8
	162	STORAGE	S/H	RB-1	–	P-64A	P-64A	P-64A	P-64A	–
	163	LAB 1F	RF-2 RF-3 RF-6 BE-7	RB-1	SAT-1 GR-1	P-67A	P-67A	P-67C	P-67A	4,12
	163A	CELL CULTURE	RF-1	RB-1	SAT-1 GR-1	P-67A	P-67A	P-67A	P-67A	12
	164	WOMEN'S RESTROOM	PT-1	PT-2	P-67A	P-67A PT-3 GT (1-4)	P-67A PT-3 GT (1-4)	P-67A PT-3 GT (1-4)	P-67A PT-3 GT (1-4)	5,6

Section 09 06 10 - Room Finish Schedule					Note: Refer to legend on preceeding pages for abbreviations and notes.					
Pkg. No. or RFI	Interior Finishes									
	Room		Floor	Base	Ceiling	Walls				Remarks
						North	East	South	West	
	No.	Name	Finish	Finish	Finish	Finish	Finish	Finish	Finish	
	166	MEN'S RESTROOM	PT-1	PT-2	P-67A	P-67A PT-3 GT (1-4)	P-67A PT-3 GT (1-4)	P-67A PT-3 GT (1-4)	P-67A PT-3 GT (1-4)	5,6
	169	SEMINAR	CPT-3	RB-1	P-64A SAT-2 GR-2	P-64A	P-64A	P-64A	P-64A	4,6
	169A	STORAGE	CPT-3	RB-1	P-64A	P-64A	P-64A	P-64A	P-64A	—
	169B	STORAGE	CPT-3	RB-1	P-64A	P-64A	P-64A	P-64A	P-64A	—
	180	STAIR #4	S/H	—	—	P-65A	P-65A	P-65A	P-65A	—
	170	LOBBY/ INTERACTION	ST-1	RB-1	P-64A SAT-2 GR-2	P-64A	P-64A	STN	P-64A	4,6
	170A	VESTIBULE	EM-1	RB-5	P-64A	G-7	G-7	STN	G-7	
	MIDDLE LEVEL (LEVEL 2)									
	250	CORRIDOR	RF-1 RF-2	RB-1	P-64A SAT-2 GR-2 EXP STR	P-64A	P-64A	P-64A	P-64A	4,6
	250A	CORRIDOR	RF-1 RF-2	RB-1	P-64A SAT-2 GR-2 EXP STR	P-64A	P-64A	P-64A	P-64A	4,6
	251	GLASS WASH	RC-1	RC-1	SAT-1 GR-1	P-67A	P-67A	P-67A	P-67A	7,12
	252	WOMEN'S RESTROOM	PT-4	CT-2	P-67A	P-67A CT-1	P-67A CT-1	P-67A CT-1	P-67A CT-1	—
	253	SHARED EQUIPEMENT ROOM	RF-1	RB-1	SAT-1 GR-1	P-67A	P-67A	P-67A	P-67A	12
	254	MEN'S RESTROOM	PT-4	CT-2	P-67A	P-67A CT-1	P-67A CT-1	P-67A CT-1	P-67A CT-1	—
	256	ELEVATOR	RF-8	RB-4	AL MTL	WPL-1	WPL-1	WPL-1	WPL-1	—
	257	LAB 2F	RF-2 RF-3 RF-6 RF-7	RB-1	SAT-1 GR-1	P-67A	P-67A	P-67D	P-67A	4,12
	258	OPEN OFFICE	CPT-1 CPT-2	RB-1	SAT-2 GR-2	P-64A	P-64A	P-64A	P-64A	9

Section 09 06 10 - Room Finish Schedule					Note: Refer to legend on preceeding pages for abbreviations and notes.					
Pkg. No. or RFI	Interior Finishes									
	Room		Floor	Base	Ceiling	Walls				Remarks
						North	East	South	West	
	No.	Name	Finish	Finish	Finish	Finish	Finish	Finish	Finish	
	259	GAS	S/H	—	—	—	—	—	—	—
	260	OFFICE	CPT-1 CPT-2	RB-1	SAT-2 GR-2	P-64A	P-64A	P-64A	P-64A	8
	262	OFFICE	CPT-1 CPT-2	RB-1	SAT-2 GR-2	P-64A	P-64A	P-64A	P-64A	8
	264	OPEN OFFICE	CPT-1 CPT-2	RB-1	SAT-2 GR-2	P-64A	P-64A	P-64A	P-64A	9
	265	LAB 2F	RF-2 RF-3 RF-6 RE-7	RB-1	SAT-1 GR-1	P-67A	P-67A	P-67D	P-67A	4,12
	265A	CELL CULTURE	RF-1	RB-1	SAT-1 GR-1	P-67A	P-67A	P-67A	P-67A	12
	267	PCR	RF-1	RB-1	SAT-1 GR-1	P-67A	P-67A	P-67A	P-67A	12
	268	OFFICE	CPT-1 CPT-2	RB-1	SAT-2 GR-2	P-64A	P-64A	P-64A	P-64A	8
	269	COLD ROOM	FACT	FACT	FACT	FACT	FACT	FACT	FACT	—
	270	OPEN OFFICE	CPT-1 CPT-2	RB-1	SAT-2 GR-2	P-64A	P-64A	P-64A	P-64A	9
	271	LAB 2F	RF-2 RF-3 RF-6 RE-7	RB-1	SAT-1 GR-1	P-67A	P-67A	P-67D	P-67A	4,12
	271A	CELL CULTURE	RF-1	RB-1	SAT-1 GR-1	P-67A	P-67A	P-67A	P-67A	12
	273	GAS	S/H	—	—	—	—	—	—	—
	280	STAIR #4	S/H	—	—	P-65A	P-65A	P-65A	P-65A	—
		UPPER LEVEL (LEVEL3)								
	350	CORRIDOR	RF-1 RF-2	RB-1	P-64A SAT-2 GR-2 EXP_STR	P-64A	P-64A	P-64A	P-64A	4,6
	350A	CORRIDOR	RF-1 RF-2	RB-1	P-64A SAT-2 GR-2 EXP_STR	P-64A	P-64A	P-64A	P-64A	4,6
	351	STORAGE	RC-1	RC-1	—	P-67A	P-67A	P-67A	P-67A	7,12
	352	WOMEN'S RESTROOM	PT-4	CT-2	P-67A	P-67A CT-1	P-67A CT-1	P-67A CT-1	P-67A CT-1	—
	353	SHARED EQUIPEMENT ROOM	RF-1	RB-1	SAT-1 GR-1	P-67A	P-67A	P-67A	P-67A	12
	354	MEN'S RESTROOM	PT-4	CT-2	P-67A	P-67A CT-1	P-67A CT-1	P-67A CT-1	P-67A CT-1	—

Section 09 06 10 - Room Finish Schedule					Note: Refer to legend on preceeding pages for abbreviations and notes.						
Pkg. No. or RFI	Interior Finishes										
	Room		Floor	Base	Ceiling	Walls				Remarks	
						North	East	South	West		
	No.	Name	Finish	Finish	Finish	Finish	Finish	Finish	Finish		
	356	ELEVATOR	RF-8	RB-4	AL MTL	WPL-1	WPL-1	WPL-1	WPL-1	—	
	357	LAB 2F	RF-2 RF-3 RF-6 RF-7	RB-1	SAT-1 GR-1	P-67A	P-67A	P-67E	P-67A	4,12	
	358	OPEN OFFICE	CPT-1 CPT-2	RB-1	SAT-2 GR-2	P-64A	P-64A	P-64A	P-64A	9	
	359	GAS	S/H	—	—	—	—	—	—	—	
	360	OFFICE	CPT-1 CPT-2	RB-1	SAT-2 GR-2	P-64A	P-64A	P-64A	P-64A	8	
	362	OFFICE	CPT-1 CPT-2	RB-1	SAT-2 GR-2	P-64A	P-64A	P-64A	P-64A	8	
	364	OPEN OFFICE	CPT-1 CPT-2	RB-1	SAT-2 GR-2	P-64A	P-64A	P-64A	P-64A	9	
	365	LAB 2F	RF-2 RF-3 RF-6 RF-7	RB-1	SAT-1 GR-1	P-67A	P-67A	P-67E	P-67A	4,12	
	365A	CELL CULTURE	RF-1	RB-1	SAT-1 GR-1	P-67A	P-67A	P-67A	P-67A	12	
	367	PCR	RF-1	RB-1	SAT-1 GR-1	P-67A	P-67A	P-67A	P-67A	12	
	368	OFFICE	CPT-1 CPT-2	RB-1	SAT-2 GR-2	P-64A	P-64A	P-64A	P-64A	8	
	369	COLD ROOM	FACT	FACT	FACT	FACT	FACT	FACT	FACT	—	
	370	OPEN OFFICE	CPT-1 CPT-2	RB-1	SAT-2 GR-2	P-64A	P-64A	P-64A	P-64A	9	
	371	LAB 2F	RF-2 RF-3 RF-6 RF-7	RB-1	SAT-1 GR-1	P-67A	P-67A	P-67E	P-67A	4,12	
	371A	CELL CULTURE	RF-1	RB-1	SAT-1 GR-1	P-67A	P-67A	P-67A	P-67A	12	
	373	GAS	S/H	—	—	—	—	—	—	—	
	380	STAIR #4	S/H	—	—	P-65A	P-65A	P-65A	P-65A	—	
			PENTHOUSE LEVEL (LEVEL 4)								
	450	CORRIDOR	S/H	RB-4	EXP STR	P-65A	P-65A	P-65A	P-65A	—	
	454	STORAGE	S/H	RB-4	EXP STR	P-65A	P-65A	P-65A	P-65A		
456	ELEVATOR	RF-8	RB-4	AL MTL	—	—	—	—	—		
457	STORAGE	S/H	RB-4	EXP STR	P-65A	P-65A	P-65A	P-65A	—		

Section 09 06 10 - Room Finish Schedule					Note: Refer to legend on preceeding pages for abbreviations and notes.					
Pkg. No. or RFI	Interior Finishes									
	Room		Floor	Base	Ceiling	Walls				Remarks
						North	East	South	West	
	No.	Name	Finish	Finish	Finish	Finish	Finish	Finish	Finish	
	459	MECHANICAL ROOM	S/H	RB-4	EXP STR	P-65A	P-65A	P-65A	P-65A	-

SECTION 09 67 23

RESINOUS COATINGS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. This Section specifies the requirements necessary to furnish and install:

1. Multicomponent trowel-applied epoxy resin with graded aggregates and mineral oxide pigment floor coating.
2. Metal edge strips.
3. Include separate unit bid price for applying specified vapor transmission barrier in case the concrete moisture content values exceed flooring manufacturer's limit for installing resinous flooring.

1.2 RELATED WORK

A. Use this Section in conjunction with the following other specifications and related Contract Documents to establish the total requirements for the referenced resinous coatings:

1. The Contract.
2. Division 01 sections included in the project specifications.
3. Section 03 30 00 - Cast-In-Place Concrete.
4. Section 04 25 00 - Unit Masonry Assemblies.
5. Section 09 06 10 - Room Finish Schedule.
6. Section 09 24 16 - Gypsum Board Assemblies.

B. CAUTION: Use of this Section without including the above-listed items results in omission of basic requirements.

1.3 DESIGN CRITERIA

A. Install floor coating to conform to the following:

Property	Test	Result
Tensile strength	ASTM C307	Minimum 1,750 psi.
Compressive strength	ASTM C579	Minimum 10,000 psi.
Flexural Strength	ASTM C580	4,000 psi.
Hardness	ASTM D2240, Shore D	85 to 90.
Bond Strength	ASTM D4541	Greater than 400 psi.
Water absorption	ASTM C413	Maximum 0.2 percent.
Surface burning	ASTM E84	Class A; flame spread less than 25; Smoke developed

Property	Test	Result
		less than 450.
Flammability	ASTM E648	Class 1.
Impact resistance	ASTM D4226	Greater than 160 inch/pounds.

1.4 WARRANTY

- A. Warranty: Include coverage against flooring delamination from substrate and degradation of surface finish.

1.5 REGULATORY REQUIREMENTS

- A. Conform to applicable code for flooring flame/fuel/smoke ratings in accordance with ASTM E84.

1.6 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain primary resinous flooring materials including primers, resins, hardening agents, finish or sealing coats from a single manufacturer with not less than ten years of successful experience in manufacturing the principal materials described in this Section.
- B. Preinstallation Meeting: participate in meeting that shall be conducted by the Contractor not less than 30 days before start of installation. Meeting shall include Contractor, installer, Architect/Engineer, Owner's representative, and other contractors whose work is affected by work in this Section.

1.7 QUALIFICATIONS

- A. Installer: company specializing in resinous matrix coating applications with 5 years' documented experience.
- B. Supervisor: trained by product manufacturer, under direct full-time supervision of manufacturer's plant-trained foreman.

1.8 ENVIRONMENTAL REQUIREMENTS

- A. Do not install coatings when temperature is below 60 degrees F or above 90 degrees F.
- B. Maintain this temperature range 24 hours before, during, and 72 hours after installation of flooring.
- C. Ventilate area where coatings are being installed. Post and enforce no smoking or open flame signs until flooring has cured.
- D. Provide uniform lighting in accordance with manufacturer's recommendations measured at area of installation.
- E. Restrict traffic from area where coatings are being installed or are curing.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver coating materials to the site and check for completeness of delivery and shipping damage before start of installation.
- B. Coating materials shall be factory preweighed and prepackaged in single batches to eliminate on site mixing errors.
- C. Store resin materials in a dry, enclosed area protected from exposure to moisture. Maintain storage area temperature between 60 and 90 degrees F.
- D. Keep products away from open flame.

1.10 SUBMITTALS

- A. Provide the following:
 - 1. Product Data and MSDS: for each type of coating installed.
 - 2. Samples:
 - a. Coating samples: 6 inches by 6 inches in size, illustrating each color of epoxy coating including finish texture and color.
 - b. Edge strip: 6-inch long samples.

1.11 OPERATION AND MAINTENANCE DATA

- A. Include procedures for stain removal, repairing surface, and cleaning.

PART 2 - PRODUCTS**2.1 MANUFACTURERS**

- A. Dex-O-Tex Division, Crossfield Products Corp.
- B. Dudick, Inc.
- C. General Polymers/Division of Sherwin Williams.
- D. Stonhard.

2.2 MATERIALS

- A. Floor Coating - Provide manufacturer's standard materials for the following:
 - 1. Primer: two-component, 100 percent solids, penetrating epoxy.
 - 2. Mortar: multicomponent troweled mortar consisting of epoxy resin, curing agent and finely graded silica aggregate blended with inorganic pigments.

3. Seal coat: two coats of a two-component, 100 percent solids, epoxy coating. Color: as selected by Architect/Engineer from manufacturer's standard color range. Overall Coating Thickness: 3/16 inch.
4. Floor Base: Self cove base with patching mortar cove behind floor coating.
5. Basis of Design Products: Stonclad GS floor coating system with Stonkote HT4 top coat and Stonset PM5 patching mortar to fill voids and form self cove floor base.

2.3 ACCESSORIES

A. Vapor Transmission Barrier:

1. Basis of Design Products:
 - a. Koster VAP 1 2000 System.
 - b. Sinak VC5.

B. Edge Strips: Stainless steel, with anchoring features; as recommended by the coating manufacturer. Strip height to match flooring thickness.

C. Patching Mortar: manufacturer's standard 100 solids, two-component epoxy patch mortar.

D. Glass Fiber Reinforcing Mat: manufacturer's standard mat.

E. Joint Sealant: manufacturer's recommended sealant material for floor products specified.

PART 3 - EXECUTION

3.1 INSPECTION

A. Verify that surfaces and substrate are ready to receive work and that substrate surfaces are clean, dry, and free of substances which could affect bond before starting coating application.

B. Verify moisture and pH requirements of the flooring manufacturer. At a minimum, the substrate should achieve the following:

1. Concrete Moisture Test: Per ASTM F710, Section 5. Execute a minimum of three tests for the first 1,000 square-feet of floor area. Then execute one test for each additional 1,000 square-feet of floor area.
2. Concrete pH Test: Readings below 7.0 and above 10.0 can adversely affect flooring. If test results exceed flooring manufacturer's limits, do not commence application until results conform to limits.

C. Verify that concrete surfaces shall have cured a minimum of 28 days as specified in Section 03 30 00, Cast-In-Place Concrete.

D. Verify that concrete unit masonry has cured a minimum of 28 days and mortar joints have been tooled flush as specified in Section 04 25 00, Unit Masonry Assemblies.

- E. Verify that gypsum board surfaces shall have been completed to specified level of finish and cured a minimum of 5 days as specified in Section 09 24 16, Gypsum Board Assemblies.

- F. Beginning of installation means acceptance of existing surfaces and substrate.

3.2 PROTECTION

- A. Protect elements surrounding the work of this Section from damage or disfigurement.

3.3 FIELD PREPARATION

- A. Concrete Substrate: Prepare concrete by mechanical means and include use of a scarifier or shot blast machine for removal of bond inhibiting materials such as curing compounds or laitance. Acid etching is not an acceptable form of preparation.
- B. If moisture and pH tests are not within flooring manufacturer's limits install manufacturer's approved vapor transmission barrier, in accordance with manufacturer's instructions.
- C. Concrete Masonry Surfaces: Brush loose masonry and mortar from surfaces and fill voids with patching mortar.
- D. Gypsum Board Surfaces: Allow finished surfaces to cure 5 days before application of coatings.

3.4 INSTALLATION

- A. Accessories: Install edge strips straight and level to locations indicated on Drawings.

- B. Flooring:

1. General:

- a. Mix and apply each component of resinous flooring system in accordance with manufacturer's instructions to produce a uniform monolithic wearing surface of thickness indicated, uninterrupted except at divider strips, sawn joints, or other types of joints (if any), indicated or required.
- b. Apply flooring system to a minimum total thickness of 3/16 inch.
- c. Finish to a smooth level surface.
- d. Verify phasing of epoxy installation with Owner.

- 2. Vapor Transmission Barrier: Apply specified vapor transmission barrier if concrete moisture content values exceed flooring manufacturer's limits for installing resinous flooring.

- 3. Primer: Mix and apply primer over properly prepared substrate with strict adherence to manufacturer's installation procedures and coverage rates. Coordinate timing of primer application with application of troweled mortar to ensure optimum adhesion between resinous flooring materials and substrate.

4. Troweled Mortar: Uniformly spread mortar over substrate using manufacturer's notched tools adjusted to specified height. Hand trowel apply mixed material over freshly primed substrate using steel finishing trowels or power trowel materials.
5. Top Coat: Remove excess unbonded granules by lightly brushing and vacuuming the floor surface. Mix and apply top coat in accordance with manufacturer's installation procedures to achieve a gloss sheen finish.
6. Integral Cove Base: Install edge trim as detailed on Drawings. Trowel integral cove base in areas and to the height indicated in Section 09 06 10, Room Finish Schedule.

3.5 ADJUSTING AND CLEANING

- A. Cure resinous coating materials in compliance with manufacturer's instructions, taking care to prevent contamination during stages of application and before completion of curing process. Close area of application for a minimum of 24 hours.
- B. Protect resinous flooring materials from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application.
- C. Cleaning: Remove temporary covering and clean resinous coatings just before final inspection. Use cleaning materials and procedures recommended by resinous coating manufacturer.

3.6 FIELD QUALITY CONTROL

- A. The Owner reserves the right to execute material testing at any time, and any number of times during period of coating application.
- B. The Owner may engage service of an independent testing laboratory to sample materials being used on the project. Samples of material will be taken, identified, sealed, and certified in presence of Contractor.
- C. Testing laboratory will perform tests specified characteristics, using applicable testing procedures referenced in this Section.
- D. If test results show materials being used do not comply with specified requirements, Contractor may be directed by Owner to stop work; remove noncomplying materials; pay for testing; reapply coating materials to properly prepared surfaces that had previously been coated with unacceptable materials.

END OF SECTION

SECTION 12 35 53

LABORATORY CASEWORK

PART 1 - GENERAL

1.1 WORK INCLUDED

A. This Section specifies the requirements necessary to furnish and install:

1. Wood laboratory casework.
2. Metal laboratory casework.
3. Acid storage cabinets, solvent storage cabinets.
4. Utility-space closure panels between base cabinets and at exposed ends of utility spaces.
5. Custom-fabricated utility column enclosures.
6. Health and Emergency Laboratory Panel ("HELP") station.
7. Laboratory countertops.
8. Stainless steel countertops with integral sinks.
9. Microscope tables.
10. Shelves.
11. Laboratory sinks.
12. Accessories.
13. Water, laboratory gas, and electrical service fittings.

1.2 RELATED WORK

A. Use this Section in conjunction with the following other specifications and related Contract Documents to establish the total requirements for Laboratory Casework:

1. The Contract.
2. Division 01 sections included in the project specifications.
3. Division 06 Section "Wood Blocking and Curbing" for wood blocking for anchoring laboratory casework.
4. Division 09 Section "Gypsum Board Assemblies" for reinforcements in metal-framed gypsum board partitions for anchoring laboratory casework.

5. Division 09 Section "Resilient Flooring" for resilient base applied to wood laboratory casework.
6. Division 11 Section "Laboratory Fume Hoods" for fume hoods, including base cabinets and countertops under fume hoods.
7. Divisions 23 and 26 Sections for installing service fittings specified in this Section.
8. Division 23 and 26 Sections for piping and wiring for service fittings within laboratory casework.
9. Appendix included at the end of this Section.

- B. CAUTION: Use of this Section without including the above-listed items results in omission of basic requirements.

1.3 DEFINITIONS

- A. Exposed Portions of Casework: Surfaces visible when doors and drawers are closed, including bottoms of cabinets more than 48 inches (1200 mm) above floor, and visible surfaces in open cabinets or behind glass doors.
- B. Semiexposed Portions of Casework: Surfaces behind opaque doors, such as interiors of cabinets, shelves, dividers, interiors and sides of drawers, and interior faces of doors. Tops of cases 78 inches (1980 mm) or more above floor are defined as semiexposed.
- C. Concealed portions of casework include sleepers, web frames, dust panels, and other surfaces not usually visible after installation.

1.4 PERFORMANCE REQUIREMENTS

- A. System Structural Performance: Laboratory casework and support framing system shall withstand the effects of the following gravity loads and stresses without permanent deformation, excessive deflection, or binding of drawers and doors:
1. Support Framing System: 600 lb/ft. (900 kg/m).
 2. Suspended Base Cabinets (Internal Load): 160 lb/ft. (240 kg/m).
 3. Work Surfaces (Including Tops of Suspended Base Cabinets): 160 lb/ft. (240 kg/m).
 4. Wall Cabinets (Upper Cabinets): 160 lb/ft. (240 kg/m).
 5. Shelves: 50 lb/sq. ft. (244 kg/sq. m).
- B. Delegated Design: Design laboratory casework, including comprehensive engineering analysis by a qualified professional engineer, using seismic performance requirements and design criteria indicated.
- C. Seismic Performance: Provide laboratory casework systems and components capable of withstanding the effects of earthquake motions determined according to ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 09, "Earthquake Loads."

1. Seismic Design Criteria: Refer to Structural Drawings for design information and Building Code criteria.
- 1.5 SUBMITTALS
- A. Refer to the Submittal Schedule at the end of Part 3 for a list of submittal requirements for this Section.
- 1.6 QUALITY ASSURANCE
- A. Testing Agency Qualifications: An independent agency qualified for testing indicated, as documented according to ASTM E 548.
 - B. Source Limitations: Obtain laboratory casework, including countertops, sinks, service fittings, and accessories, through one source from a single manufacturer.
 1. Obtain through same source from same manufacturer as fume hoods specified in Division 11 Section "Laboratory Fume Hoods."
 - C. Product Standard: Comply with SEFA 8, "Laboratory Furniture--Casework, Shelving and Tables--Recommended Practices."
 - D. Flammable Liquid Storage: Where cabinets are indicated for solvent or flammable liquid storage, provide units that are listed and labeled as complying with requirements of NFPA 30 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 1. Cabinets that are not listed and labeled but are constructed according to NFPA 30, Paragraph 4-3.3(c) may be used if acceptable to authorities having jurisdiction.
 - E. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
 - F. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."
- 1.7 DELIVERY, STORAGE, AND HANDLING
- A. Protect finished surfaces during handling and installation with protective covering of polyethylene film or other suitable material.
- 1.8 PROJECT CONDITIONS
- A. Environmental Limitations: Do not deliver or install wood laboratory casework 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. Field Measurements: Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.
2. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.9 COORDINATION

- A. Coordinate layout and installation of framing and reinforcements for support of wood laboratory casework.
- B. Coordinate installation of wood laboratory casework with installation of fume hoods and other laboratory equipment.
- C. Coordinate installation of acid storage cabinet exhaust with mechanical contractor.

1.10 EXTRA MATERIALS

- A. Furnish complete touchup kit for each type and color of wood laboratory casework provided. Include scratch fillers, stains, finishes, and other materials necessary to perform permanent repairs to damaged laboratory casework finish.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

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

1. Wood and Metal Laboratory Casework and Mobile Instrumentation Carts:

- a. Fisher Hamilton L.L.C.
- b. Kewaunee Scientific Corporation; Laboratory Division.
- c. CIF.
- d. Valley City.
- e. Case Systems, Inc.
- f. Mott Manufacturing, Ltd.

2. Epoxy Tops, Sinks, and Troughs:

- a. Durcon Company, Inc. (The).
- b. Laboratory Tops, Inc.
- c. Epoxyn Products.
- d. Prime Industries, Inc.

3. Stainless Steel Countertops:

- a. Same as casework manufacturer.

4. Service Fittings:

- a. Basis-of-Design Product: The design for accessories is based on products indicated on the Drawings. Subject to compliance with requirements, provide the named products or a comparable product by one of the following:

- (1) Broen.
- (2) Water Saver Faucet Co.

2.2 WOOD CABINET MATERIALS

A. General:

- 1. Certified Wood Materials: Provide cabinets made from wood and wood-based materials that are produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC 1.2, "Principles and Criteria for Forest Stewardship."
- 2. Adhesives: Do not use adhesives that contain urea formaldehyde.
- 3. Maximum Moisture Content for Lumber: 7 percent for hardwood and 12 percent for softwood.
- 4. Hardwood Plywood: HPVA HP-1, either veneer core or particle core, unless otherwise indicated, made without urea formaldehyde.
- 5. Particleboard: ANSI A208.1, Grade M-2, made with binder containing no urea formaldehyde.
- 6. Medium-Density Fiberboard: ANSI A208.2, Grade MD, made with binder containing no urea formaldehyde.
- 7. Straw-Based Particleboard ("Wheatboard"): Exceeding requirements of ANSI A208.1-99, Grade M3, and 208.2-2002 MR30 and MR50 for technical property standards and moisture resistance.
- 8. Edgebanding for Wood-Veneered Construction: Minimum 1/8-inch- (3-mm-) thick, solid wood of same species as face veneer.

B. Exposed Materials:

- 1. General: Provide materials that are selected and arranged for compatible grain and color. Do not use materials adjacent to one another that are noticeably dissimilar in color, grain, figure, or natural character markings.
- 2. Wood Species and Veneer Cut: Maple, Grade A, rotary cut/plain sawn.
- 3. Stain Colors and Finishes: As selected by Architect from manufacturer's full range.
- 4. Solid Wood: Clear hardwood lumber.
- 5. Plywood: Hardwood plywood; Grade A exposed faces at least 1/50 inch (0.5 mm) thick, Grade J crossbands, and backs of same species as faces.

C. Semiexposed Materials:

1. Solid Wood: Sound hardwood lumber, selected to eliminate appearance defects, of same species as exposed solid wood.
2. Plywood: Hardwood plywood of any species similar in color and grain to same species as exposed plywood. Grade B faces, Grade J crossbands, and backs of same species as faces. Semiexposed backs of plywood with exposed faces shall be same species as faces.

D. Concealed Materials:

1. Solid Wood: Any hardwood or softwood species, with no defects affecting strength or utility.
2. Plywood: Hardwood plywood. Concealed backs of plywood with exposed or semiexposed faces shall be same species as faces.
3. Particleboard.
4. Medium-density fiberboard.
5. Hardboard: AHA A135.4, Class 1 tempered.

2.3 METAL CABINET MATERIALS

A. Metal Sheet:

1. Steel for painted finish: Commercial-quality, cold-rolled, carbon-steel sheet, complying with ASTM A1008/A1008M; matte finish; suitable for exposed applications; and stretcher leveled or roller leveled to stretcher-leveled flatness.
2. Stainless steel: Commercial-quality, cold-rolled stainless steel sheet, complying with ASTM A666, Type 304, with No. 4 satin finish.

B. Minimum Metal Thickness: Provide metal laboratory furniture components of the following minimum thicknesses:

1. Sides, ends, fixed backs, bottoms, tops, soffits, and items not otherwise indicated: 0.0478 inch (1.2 mm). Except for flammable liquid storage cabinets, bottoms may be 0.0359 inch (0.9 mm) if reinforced.
2. Back panels, doors, drawer fronts and bodies, and shelves: 0.0359 inch (0.9 mm). For back panels and doors for flammable storage cabinets, use 0.0478-inch (1.2 mm) thick metal. For shelves more than 36 inches (900 mm) long, use 0.0478-inch- (1.2 mm) thick metal or provide suitable reinforcement.
3. Intermediate horizontal rails, table aprons and cross rails, center posts, and top gussets: 0.0598 inch (1.5 mm).
4. Drawer runners, sink supports, and hinge reinforcements: 0.0747 inch (1.9 mm).

5. Leveling and corner gussets: 0.1046 inch (2.7 mm).

C. Metal Pipe:

1. Stainless steel: Commercial-quality, complying with ANSI/ASTM B36.10 and ANSI/ASTM B36.19M, Schedule 10S, Type 304, with No. 4 satin finish.

D. Cold-Rolled Metal Framing System: Equal to "Unistrut" P1000 1-5/8 in. x 1-5/8 in. channel, mill finish for welding.

2.4 AUXILIARY CABINET MATERIALS

A. Acid Storage-Cabinet Lining: Polyethylene or polypropylene, thickness as indicated.

B. Glass for Glazed Doors: Clear tempered glass complying with ASTM C 1048, Kind FT, Condition A, Type I, Class 1, Quality q3; not less than 5.5 mm thick.

C. Filler Strips and Utility-Space Closure Panels: Provide as needed to close spaces between cabinets and walls, ceilings, and indicated equipment. Fabricate from same material and with same finish as cabinet fronts.

2.5 CABINET DESIGN

A. Flush overlay.

B. Wood Grain Direction and Matching: Run and match grain vertically for door fronts, drawer fronts and fixed panels.

2.6 WOOD CABINET FABRICATION

A. Construction: Provide wood-faced laboratory casework of the following minimum construction:

1. Bottoms and Ends of Cabinets, Shelves, and Tops of Wall Cabinets and Tall Cabinets: 3/4-inch- (19-mm-) thick plywood.

2. Base Cabinet Top Frames: 3/4- by 2-inch (19 by 50 mm) solid wood with mortise and tenon or doweled connections, glued and pinned or screwed.

3. Backs of Cabinets: 3/4-inch (19 mm) thick plywood where exposed, 1/4-inch- (6.4-mm-) thick hardboard dadoed into sides, bottoms, and tops where not exposed.

4. Drawer Fronts: 3/4-inch- (19-mm-) thick plywood or solid hardwood.

5. Drawer Sides and Backs: 1/2-inch- (12.7 mm) thick solid wood or 7/16-inch (11.11 mm) thick plywood, with glued dovetail or multiple-dowel joints.

6. Drawer Bottoms: 1/4-inch- (6.4 mm) thick hardboard glued and dadoed into front, back, and sides of drawers. Use 1/2-inch- (12.7 mm) thick material for drawers more than 24 inches (600 mm) wide.

7. Doors 48 Inches (1200 mm) or Less in Height: 3/4 inch (19 mm) thick, with particleboard or medium-density fiberboard cores, solid hardwood stiles and rails, and hardwood face veneers and crossbands.
8. Doors More Than 48 Inches (1200 mm) in Height: 1-1/16 inches (27 mm) thick, with honeycomb cores, solid hardwood stiles and rails, and hardwood face veneers and crossbands.
9. Stiles and Rails of Glazed Doors 48 Inches (1200 mm) or Less in Height: 3/4-inch (19 mm) thick by 2-3/4-inch (69.85 mm) wide solid hardwood with mortise and tendon or doweled connection (glued and screwed).
10. Stiles and Rails of Glazed Doors More Than 48 Inches (1200 mm) in Height: 1-1/16 inches (27 mm) thick by 2-3/4-inch (69.85 mm) wide solid hardwood with mortise and tendon or doweled connection (glued and screwed).

2.7 METAL CABINET FABRICATION

- A. General: Complete assembly and finish work at point of manufacture. Perform assembly on precision jigs to provide units which are square; fully reinforced with angles, gussets, and channels; and integrally framed and welded to form a dirt and vermin-retardant enclosure. Where applicable, reinforce base cabinets for sink support. Maintain uniform clearance around door and drawer fronts of 1/16 to 3/32 inch (1.5 to 2.4 mm).
- B. Fabricate units on precision dies for interchangeability of like-size drawers, doors, and similar parts.
- C. Flush Doors: Outer and inner pans formed and telescoped into box formation, with channel reinforcements full height on center of each pan. Fill doors solid with noncombustible, sound-deadening material.
- D. Glazed Doors: Hollow-metal stiles and rails of similar construction as flush doors, with glass held in resilient channels or gasket material.
- E. Hinged Doors: Mortise at flanges for hinges and reinforce with angles, welded inside inner pans at hinge edge.
- F. Drawers: Assemble fronts from telescoping outer and inner pans, designed to eliminate raw edge of steel at top. Fabricate sides, back, and bottom of one piece with rolled or formed top of sides for stiffening and comfortable grasp for drawer removal. Weld drawer front to sides, back, and bottom to form a single, integral unit. Provide drawers with rubber bumpers, runners, and positive stops to prevent metal-to-metal contact or accidental removal.
- G. Adjustable Shelves: Front, back, and ends formed down with returned lip at front and back.
- H. Toe Space: Provide metal toe space, fully enclosed, 4 inches (100 mm) high by 3 inches (75 mm) deep, with no open gaps or pockets.
- I. Table Legs: Not less than 2 inch- (50 mm) square or 1-5/8 inch- (42 mm-) round electrically welded tubing. Provide leg stretchers where necessary to comply with structural performance requirements. Weld or bolt leg stretchers to legs and cross-stretchers. Securely bolt or weld legs to table aprons. Provide leveling device welded to bottom of each leg.

- J. Utilities: Provide space, cutouts, and holes for pipes, conduits, and fittings in cabinet bodies to accommodate utility services and their support-strut assemblies.
- K. Utility-Space Framing: Manufacturer's standard steel framing units consisting of 2 cold-rolled C-channel uprights, not less than 1-5/8 inches (41 mm) square by 0.10 inch (2.5 mm) thick, connected together at the top and bottom by U-shaped brackets made from 1-1/4-by-1/4-inch (32 by 6 mm) flat bars. Framing units may be made by welding C-channel material specified for uprights into rectangular frames instead of using U-shaped brackets.

2.8 WOOD FINISH

- A. Preparation: Sand lumber and plywood for laboratory casework construction before assembling. Sand edges of doors, drawer fronts, and molded shapes with profile-edge sander. Sand casework after assembling for uniform smoothness at least equivalent to that produced by 220 grit sanding and without machine marks, cross sanding, or other surface blemishes.
- B. Staining: Remove fibers and dust and apply stain to exposed and semiexposed surfaces as necessary to match approved Samples. Apply stain in a manner that will produce a consistent appearance. Apply wash-coat sealer before applying stain to closed-grain wood species.
- C. Chemical-Resistant Finish: Apply laboratory casework manufacturer's standard two-coat, chemical-resistant, transparent finish consisting of sealer and catalyzed topcoat(s). Sand and wipe clean between coats. Topcoat(s) may be omitted on concealed surfaces.
 - 1. Chemical and Physical Resistance of Finish System: Finish complies with acceptance levels of cabinet surface finish tests in SEFA 8. Acceptance level for chemical spot test shall be no more than four Level 3 conditions.

2.9 METAL FINISH

- A. Pretreatment: After assembly, thoroughly clean surfaces of grease, dirt, oil, flux, and other foreign matter by physical and chemical means. Treat entire unit with metallic phosphate process, leaving surfaces with uniform, fine-grained, crystalline phosphate coating to provide bond for finish.
- B. Chemical-Resistant Enamel Finish: Immediately after cleaning and pretreating, apply manufacturer's standard electrostatically-applied powder coat and bake in controlled high-temperature oven to hard, satin finish, with dry film thickness of 1.5 mil average and 1.2 mil minimum.
 - 1. Chemical and Physical Resistance of Finish System: Comply with acceptance levels of cabinets surface finish tests in SEFA 8. Acceptance level for chemical spot test shall be no more than four Level 3 conditions.
- C. Colors: Comply with the following requirements for colors of metal laboratory casework finish:
 - 1. Colors: Match Phase I.

2.10 CABINET HARDWARE

- A. Most laboratory casework manufacturers offer choices for cabinet hardware designs, materials, and finishes, but not all choices are available from all manufacturers. Verify availability with manufacturers selected.
- B. General: Provide laboratory casework manufacturer's standard satin-finish, commercial-quality, heavy-duty hardware complying with requirements indicated for each type.
- C. Hinges: Stainless-steel, 5-knuckle hinges complying with BHMA A156.9, Grade 1, with antifriction bearings and rounded tips. Provide 2 for doors 48 inches (1219 mm) or less in height; 3 for doors more than 48 inches (1219 mm) in height.
- D. Pulls: 4-inch wire pulls, solid aluminum, stainless steel, or chrome-plated brass, satin finish; fastened from back with two screws. Provide 2 pulls for drawers more than 24 inches (600 mm) in width. For sliding doors, provide stainless-steel or chrome-plated recessed flush pulls.
 - 1. Pull Direction: Horizontal on drawers, vertical on doors.
- E. Door Catches: Nylon-roller spring catch or dual, self-aligning, permanent magnet catch. Provide 2 catches on doors more than 48 inches (1200 mm) in height.
- F. Drawer Slides: Powder-coated, full-extension, self-closing, heavy-duty drawer slides; designed to prevent rebound when drawers are closed; with nylon-tired, ball-bearing rollers; and complying with BHMA A156.9, Type B05091, and rated for 100 lbf (440 N).
- G. File Drawer Slides: Powder-coated, full-extension, self-closing, heavy-duty drawer slides; designed to prevent rebound when drawers are closed; with nylon-tired, ball-bearing rollers; and complying with BHMA A156.9, Type B05091, and rated for 150 lbf (667 N).
- H. Label Holders: Stainless steel, aluminum, or chrome plated, satin finish; sized to receive standard label cards approximately 1 by 2 inches (25 by 50 mm), attached with screws or rivets. Provide where indicated:
 - 1. Provide on drawers.
 - 2. Provide on single doors.
 - 3. Provide one holder for paired doors.
- I. Locks: Cam type with 5-pin tumbler, brass with chrome-plated finish; complying with BHMA A156.11, Type E07281.
 - 1. Provide minimum of two keys per lock and six master keys.
 - 2. Provide on 50-percent of all drawers, single doors and paired doors.
- J. Sliding-Door Hardware Sets: Laboratory casework manufacturer's standard, to suit type and size of sliding-door units.
- K. Adjustable Shelf Supports: Mortise-type, powder-coated steel standards and shelf rests complying with BHMA A156.9, Types B04071 and B04091.

2.11 ACID STORAGE CABINETS

- A. Cabinet Materials, Design and Finish: Match Wood Laboratory Casework.
- B. Cabinet Construction: As indicated for other Wood Laboratory Casework, except as follows:
 - 1. Bottom, Top, Back, Sides, and Door(s) of Cabinets: Match Wood Laboratory Casework.
 - 2. Back of Cabinets: Provide removable back panels for access to utility chase from inside of cabinet.
 - 3. Liner Material: Chemical resistant 3/16" thick molded polyethylene or polypropylene tub lining with coved corners and 2" lip at front of cabinet opening. Tub to have a removable back.
 - a. Line cabinet doors with 1/8" thick polyethylene or polypropylene lining.
 - b. Provide polyethylene or polypropylene tray with raised edges for adjustable shelf.
 - 4. Adjustable Shelving: Provide full width and half-depth, 3/4-inch- (19-mm-) thick plywood adjustable shelves and polyethylene or polypropylene trays with raised edges for spill containment.
 - 5. Hardware: Match Wood Laboratory Casework. Provide lock on all doors.
 - 6. Ventilation: Provide two threaded, 2-inch pipe vent outlets and user removable caps at back of cabinet, with 2-inch polyethylene or polypropylene vent piping assembly. Connect vent assembly from back of cabinet through adjacent wall to exhaust duct above ceiling.

2.12 SOLVENT (FLAMMABLE) STORAGE CABINETS

- A. Provide units that are listed and labeled as complying with requirements of NFPA 30 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
- B. Cabinet Materials, Design and Finish: Match Wood Laboratory Casework.
- C. Cabinet Construction:
 - 1. Bottom, Top, Back, Sides and Door(s) of Cabinets: Construct of 1-inch- (25-mm-) thick plywood. Joints shall be rabbetted and fastened in two directions with wood screws.
 - 2. Back of Cabinets: Floor mounted and suspended cabinets shall have removable back panels for access to utility chase from inside of cabinet. For floor mounted cabinets with flush top panel, the top panel shall be removable.
 - 3. Cabinet Doors, Hardware, Shelves and Accessories:
 - a. Provide rabbetted overlap of not less than 5/8-inch at pairs of doors.

- b. Provide minimum 2-inch high sill at cabinet bottom, behind doors, to retain spilled liquids. Provide removable, liquid tight, powder-coated sheet metal pan full width and depth of cabinet, with 2-inch high lip each side.
- c. Hardware: Provide five-knuckle self-closing hinges, three-point latching system and lock.
- d. Adjustable Shelving: Provide full width and full depth, 3/4-inch- (19-mm-) thick plywood adjustable shelves.
- e. Identification: Solvent (flammable) storage cabinets shall be identified with conspicuous, two-inch high lettering to read "FLAMMABLE KEEP FIRE AWAY."

2.13 HELP STATIONS

- A. HELP Stations: Provide HELP Station cabinets as indicated on drawings, using casework manufacturer's typical methods of fabrication for similar types of cabinet assemblies, and as follows:
 - 1. Cabinet Materials, Design and Finish: Match Wood Laboratory Casework.
 - 2. Hardware: As indicated; match Wood Laboratory Casework hardware and finish.
 - 3. Refer to Division 10 Section – "Visual Display Boards" for marker board and fabric wrapped tack board to be incorporated into HELP Station cabinets.

2.14 MICROSCOPE TABLES

- A. Steel tables with epoxy tops, 36 in. W x 24 in. D x 30 in. H (nominal); provide 27 in. accessible clear height space below frame.
 - 1. Frames: Welded tubing legs, not less than 2 inches (50 mm) square with welded tubing stretchers as needed to comply with product standard. Provide leveling device welded to bottom of each leg.
 - a. Leg Shoes: Satin-finished stainless steel, open-bottom, slip-on type.
 - b. Finish: Match metal casework component finish.
 - 2. Tops: Epoxy resin, flat 1 in. thick, beveled edges and corners, with drip groove at perimeter.

2.15 COUNTERTOPS, SHELVES AND SINKS

- A. Countertops, General: Provide units with smooth surfaces in uniform plane free of defects. Make exposed edges and corners straight and uniformly beveled. Provide front and end overhang of 1 inch (25 mm), with continuous drip groove on underside 1/2 inch (13 mm) from edge.
- B. Sinks, General: Provide sizes indicated or laboratory casework manufacturer's closest standard size of equal or greater volume, as approved by Architect.

1. Outlets: Provide with strainers and tailpieces, NPS 1-1/2 (DN 40), unless otherwise indicated.
 2. Overflows: For each sink except cup sinks, provide overflow of standard beehive or open-top design with separate strainer. Height 2 inches (50 mm) less than sink depth. Provide in same material as strainer.
- C. Plastic-Laminate Shelves:
1. Plastic-Laminate Shelves: Plastic-laminate sheet complying with NEMA LD 3, shop bonded with waterproof adhesive to both sides and edges of 3/4-inch- (19 mm) thick particleboard, made with binder containing no urea formaldehyde. Sand surfaces to which plastic laminate is to be bonded.
 2. Plastic-Laminate Type for Shelves: HGL.
 3. Chemical-Resistant Plastic Laminate: Provide product for shelves that complies with grade specified above and has the following ratings when tested with indicated reagents according to NEMA LD 3, Test Procedure 3.4.5:
 - a. Comply with acceptance levels of cabinet surface finish tests in SEFA-8. Acceptance level for chemical spot test shall be no more than four Level 3 conditions.
 4. Adhesive for Bonding Plastic Laminate: Resorcinol.
 5. Colors, Textures, and Patterns: Match Phase I.
- D. Metal Shelves:
1. Adjustable shelves shall be formed down 3/4 inch, returned back 7/8inch and up 1/4 inch into a channel formation front and rear; formed down 3/4 inch at each end. Shelves over 42 inches long shall be further reinforced with a channel formation electro-welded to underside of shelf.
 2. Color: Match color of shelf uprights on Phase 1.
- E. Epoxy Countertops and Sinks: Factory molded of modified epoxy-resin formulation with smooth, nonspecular finish.
1. Physical Properties:
 - a. Flexural Strength: Not less than 15,000 psi (100 MPa).
 - b. Compressive Strength: Not less than 30,000,000 psi (200 MPa).
 - 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 350 deg F (177 deg C).
 - f. Thermal Shock Resistance: Highly resistant.
 2. Chemical Resistance: Epoxy-resin material has the following ratings 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, hydrochloric acid (37 percent), phosphoric acid (85 percent), butyl alcohol, xylene, zinc chloride.
- b. Slight Effect: Chromic acid (60 percent) and sodium hydroxide (50 percent).
- 3. Color: Match Phase I.
- 4. Countertop Fabrication: Fabricate with factory cutouts for sinks and with butt joints assembled with epoxy adhesive and prefitted, concealed metal splines.
 - a. Countertop Configuration: Flat, 1 inch (25 mm) thick, with beveled or rounded edge and corners, and with drip groove and separately-applied backsplash.
 - b. Countertop Construction: Uniform throughout full thickness.
- 5. Sink Fabrication: Molded in 1 piece with smooth surfaces, coved corners, and bottom sloped to outlet; 1/2-inch (13 mm) minimum thickness.
 - a. Provide with polypropylene strainers and tailpieces.
 - b. Undercounter installation, unless noted otherwise noted. Provide manufacturer's recommended adjustable support system for cabinet-type installations.
 - c. For all sinks inside BSL3 suite, provide sinks for drop-in installation with 1/4-inch- (6-mm-) thick lip around perimeter of sink.

F. Stainless Steel Countertops, Sinks, Legs, and Shelving:

- 1. Stainless-Steel Countertops: Made from stainless-steel sheet, not less than 0.062-inch (1.59-mm) nominal thickness, with No. 4 satin finish.
 - a. Extend top down 1 inch (25 mm) at edges with a 1/2-inch (13 mm) return flange under frame. Apply heavy coating of heat-resistant, sound-deadening mastic to undersurface.
 - b. Form backsplash coved to and integral with top surface.
 - c. Provide raised (marine) edge around perimeter of countertops at sinks, where indicated; pitch two ways to sink to provide drainage without channeling or grooving.
 - d. Punch holes for service fittings at factory.
 - e. Reinforce underside of countertop with channels or use thicker metal sheet where necessary to insure rigidity without deflection.
 - f. Weld shop-made joints.

- g. Where field-made joints are required, provide hairline butt-joints mechanically bolted through continuous channels welded to underside at edges of joined ends. Keep field jointing to a minimum.
 - h. After fabricating and welding, 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.
- 2. Stainless Steel Legs: Stainless steel pipe, 1-1/4 in. nominal size. Provide welded bottom plate with threaded insert for with screw-type adjustable glide.
- 3. Stainless-Steel Shelves: Made from stainless-steel sheet, not less than 0.050-inch (1.27-mm) nominal thickness, with No. 4 satin finish. Weld shop-made joints. Fold front edge down 3/4 inch (19 mm); fold back edge up 3 inches (75 mm). Provide integral stiffening brackets, formed by folding up ends 3/4 inch (19 mm) and welding to upturned back edge. After fabricating, grind welds 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.
- 4. Stainless-Steel Sinks: Made from stainless-steel sheet, not less than 0.050-inch (1.27-mm) nominal thickness. Fabricate with corners rounded and coved to at least 5/8-inch (16-mm) radius. Slope sink bottoms to outlet. Provide double-wall construction for sink partitions with top edge rounded to at least 1/2-inch (13-mm) diameter. Provide continuous butt-welded joints. Where indicated to be located in stainless steel countertop, factory-weld into one integral unit with countertop. After fabricating and welding, grind surfaces smooth and polish as needed to produce uniform finish with no evidence of welds and free of cross scratches. Passivate and rinse surfaces; remove embedded foreign matter and leave surfaces clean.
 - a. Punch holes for fittings at factory.
 - b. Provide with stainless-steel strainers and tailpieces.
 - c. Provide with integral rims except where located in stainless-steel countertops.
 - d. Apply 1/8-inch- (3 mm) thick coating of heat-resistant, sound-deadening mastic to undersink surfaces.

2.16 ACCESSORIES

- A. Adjustable Wall Shelf Supports: Surface-type steel standards and steel shelf brackets, with epoxy powder-coated finish, complying with BHMA A156.9, Types B04102 and B04112.
 - 1. Standards: Provide heavy duty slotted steel standards, 12 gage, approximately 7/8-inch wide by 11/16-inch high by required length; 2-inch slot adjustment.
 - a. Basis-of-Design: Knappe & Vogt: No. 87.
 - b. Standard Spacing: 16-inch on center, maximum.

2. Shelf Brackets: Provide heavy duty weight triple-hook steel with single molded nylon cam lock lever.
 - a. Basis-of-Design: Knape & Vogt: No. 186/187.
 - b. Size: As required for shelf depth indicated.
 3. Shelf Clip: Provide one shelf clip at each bracket; attach clip to bottom of shelf.
 - a. Basis-of-Design: Knape & Vogt: No. 210 and 211.
 4. Caps: Provide manufacturer's standard caps at top and bottom of surface-mounted standards that do not abut other surfaces.
- B. Pegboards: Epoxy pegboards with removable polypropylene pegs and stainless-steel drip troughs with drain outlet.
1. Carboy Shelf: Provide stainless steel carboy shelf above pegboard, 16" nominal depth by width of pegboard, where indicated.
 - a. Carboy Shelf: Interdyne Systems, Inc., Utility Shelf.
- C. Custom-Fabricated Utility Chases (Base Bid): Fabricate as shown from painted and stainless steel solid and perforated sheet, with cold-rolled metal framing system piping/conduit supports and framing.
- D. Ceiling-Mounted Utility Service Panel (Alternate Bid): 24 in. x 24 in. steel panel

2.17 WATER AND LABORATORY GAS SERVICE FITTINGS

- A. Service Fittings: Provide units that comply with SEFA 7, "Laboratory and Hospital Fixtures--Recommended Practices." Provide fittings complete with washers, locknuts, nipples, and other installation accessories. Include wall and deck flanges, escutcheons, handle extension rods, and similar items.
1. Provide units that comply with recommendations in SEFA 7, Section 11, "Vandal-Resistant Faucets and Fixtures."
- B. Materials: Fabricated from cast or forged red brass, unless otherwise indicated.
1. Reagent-Grade Water Service Fittings: Polypropylene, PVC, or PVDF for parts in contact with water.
- C. Finish: Acid- and solvent-resistant powder coating complying with requirements in SEFA 7 for corrosion-resistant finishes.
1. Provide chemical-resistant powder coating in laboratory casework manufacturer's standard metallic brown, aluminum, white, or other color as approved by Architect.
- D. Water Valves and Faucets: Provide units complying with ASME A112.18.1, with renewable seats, designed for working pressure up to 125 psig (860 kPa).

1. Vacuum Breakers: Provide ASSE 1035 vacuum breakers on water fittings with serrated outlets.
 2. Aerators: Provide aerators on water fittings that do not have serrated outlets.
 3. Self-Closing Valves: Provide self-closing valves where indicated.
- E. Ball Valves: Chrome-plated ball and PTFE seals. Handle requires no more than 5 lbf (22 N) to operate. Provide units designed for working pressure up to 75 psig (520 kPa), with serrated outlets.
- F. Needle Valves: Provide units with renewable, self-centering, floating cones and renewable seats of stainless steel or Monel metal, with removable serrated outlets.
1. Provide units designed for working pressure up to 60 psig (410 kPa).
- G. Hand of Fittings: Furnish right-hand fittings unless fitting designation is followed by "L."
- H. Remote-Control Valves: Provide needle valves, straight-through or angle type as indicated for fume hoods and where indicated.
- I. Handles: Provide three- or four-arm, forged-brass handles for valves, unless otherwise indicated.
1. Provide wrist-blade handles for water valves, where indicated.
 2. Provide lever-type handles for fume hood water valves at accessible fume hoods.
 3. Provide lever-type handles for ball valves.
 4. Provide knurled nylon handles for needle valves.
- J. Service-Outlet Identification: Provide color-coded plastic discs with embossed identification, secured to each service-fitting handle to be tamper resistant.
- 2.18 ELECTRICAL SERVICE FITTINGS
- A. Service Fittings, General: Provide units complete with metal housings, receptacles, terminals, switches, pilot lights, device plates, accessories, and gaskets required for mounting on laboratory casework.
- B. Receptacles: Provide Hospital Grade, 2-pole, 3-wire grounding devices rated at 20A, 125VAC.
1. GFCI Receptacles: Provide ground-fault circuit interrupter duplex receptacles where indicated and when located in units containing water supplies or sinks.
 2. TVSS Receptacles: Provide duplex, hard-wired, transient voltage surge suppressor receptacles where indicated.
 - a. Identification: Distinctive marking on face of device to denote TVSS-type unit.
- C. Switches: Provide single-pole, double-pole, or 3-way switches as required; rated 120VAC to 277VAC; and in amperage capacities to suit units served.
1. Provide pilot lights adjacent to toggle switches where noted as "PL" next to switch identification.

2. Provide thermal-overload switches, single or double pole, as required, with maximum overcurrent trip setting to suit particular motor controlled.
- D. Recessed-Type Fittings: Provide with galvanized steel boxes.
- E. Finishes for Service-Fitting Components: Provide housings or boxes for pedestal- and line-type fittings with manufacturer's standard baked-on, chemical-resistant enamel in color as selected by Architect from manufacturer's full range.
 1. Color of Receptacles and Switches: Gray, unless otherwise indicated or required by NFPA 70.
 2. Color of TVSS Receptacles: Blue.
- F. Cover Plates: Provide satin finish, Type 304, stainless-steel cover plates with formed, beveled edges.
- G. Cover-Plate Identification: Use 1/4-inch- (6 mm) high letters, unless otherwise indicated. On stainless steel or chrome-plated metal, stamp or etch plate and fill in letters with black enamel. Provide at the following locations:
 1. Receptacles other than standard 125-V duplex, grounding type. Indicate voltage and phase.
 2. Switches and thermal-overload switches. Indicate equipment being controlled.
 3. Pilot lights when located remotely from associated equipment or switch, where function is not obvious. Indicate equipment being controlled.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of reinforcements, and other conditions affecting performance of wood laboratory casework.
 1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF CABINETS

- A. Install level, plumb, and true; shim as required, using concealed shims. Where laboratory casework abuts other finished work, apply filler strips and scribe for accurate fit, with fasteners concealed where practical.
- B. Base Cabinets: Adjust top rails and subtops within 1/16 inch (1.5 mm) of a single plane. Fasten cabinets to partition framing, wood blocking, or reinforcements in partitions with fasteners spaced not more than 24 inches (600 mm) o.c. Fasten adjacent cabinets together with joints flush, tight, and uniform. Align similar adjoining doors and drawers to a tolerance of 1/16 inch (1.5 mm).

1. Where base cabinets are installed away from walls, fasten to floor at toe space at not more than 24 inches (600 mm) o.c. and at sides of cabinets with not less than 2 fasteners per side.
 - C. Wall Cabinets: Adjust fronts and bottoms within 1/16 inch (1.5 mm) of a single plane. Fasten to hanging strips, masonry, partition framing, blocking, or reinforcements in partitions. Fasten each cabinet through back, near top, at not less than 24 inches (600 mm) o.c. Align similar adjoining doors to a tolerance of 1/16 inch (1.5 mm).
 - D. Install hardware uniformly and precisely. Set hinges snug and flat in mortises.
 - E. Adjust laboratory casework and hardware so doors and drawers align and operate smoothly without warp or bind and contact points meet accurately. Lubricate operating hardware as recommended by manufacturer.
- 3.3 INSTALLATION OF COUNTERTOPS
- A. Abut top and edge surfaces in one true plane with flush hairline joints and with internal supports placed to prevent deflection. Locate joints only where shown on Shop Drawings.
 - B. Field Jointing: Where possible, make in the same manner as shop jointing using dowels, splines, adhesives, and fasteners recommended by manufacturer. Prepare edges to be joined in shop.
 - C. Fastening:
 1. Secure countertops, except for epoxy countertops, to cabinets with Z-type fasteners or equivalent, using two or more fasteners at each cabinet front, end, and back.
 2. Secure epoxy countertops to cabinets with epoxy cement, applied at each corner and along perimeter edges at not more than 48 inches (1200 mm) o.c.
 3. Where necessary to penetrate countertops with fasteners, countersink heads approximately 1/8 inch (3 mm) and plug hole flush with material equal to countertop in chemical resistance, hardness, and appearance.
 - D. Set splashes in full bed of chemical-resistant adhesive to provide watertight joint at junction with countertops as recommended by manufacturer.
 - E. Seal joint between tops of splashes and adjoining construction.
 - F. Provide required holes and cutouts for service fittings.
 - G. Provide scribe moldings for closures at junctures of countertop, curb, and splash, with walls as recommended by manufacturer for materials involved. Match materials and finish to adjacent laboratory casework. Use chemical-resistant, permanently elastic sealing compound where recommended by manufacturer.
 - H. Carefully dress joints smooth, remove surface scratches, and clean entire surface.

3.4 INSTALLATION OF SINKS

- A. Underside Installation of Epoxy Sinks: Use laboratory casework manufacturer's recommended adjustable support system for table- and cabinet-type installations. Set top edge of sink unit in sink and countertop manufacturers' recommended chemical-resistant sealing compound or adhesive and firmly secure to produce a tight and fully leakproof joint. Adjust sink and securely support to prevent movement. Remove excess sealant while still wet and finish joint for neat appearance.
- B. Drop-in Installation of Epoxy Sinks: Rout groove in countertop to receive sink rim if not prepared in shop. Set sink in adhesive and fill remainder of groove with sealant or adhesive. Use procedures and products recommended by sink and countertop manufacturers. Remove excess adhesive and sealant while still wet and finish joint for neat appearance.

3.5 INSTALLATION OF ACCESSORIES

- A. Install accessories according to Shop Drawings and manufacturer's written instructions.
- B. Securely fasten adjustable shelving supports, pegboards and carboy shelves to partition framing, wood blocking, or reinforcements in partitions.
- C. Install shelf standards plumb and at heights to align shelf brackets for level shelves. Install shelving level and straight, closely fitted to other work where indicated.

3.6 INSTALLATION OF SERVICE FITTINGS

- A. Comply with requirements in Divisions 23 and 26 Sections for installing water and laboratory gas service fittings, piping, electrical devices, and wiring.
- B. Install fittings according to Shop Drawings and manufacturer's written instructions. Set bases and flanges of sink- and countertop-mounted fittings in sealant recommended by manufacturer of sink or countertop material. Securely anchor fittings, piping, and conduit to laboratory casework, unless otherwise indicated.
- C. Service Fittings Schedule: Refer to Laboratory Furnishing Drawings for Schedule.

3.7 CLEANING AND PROTECTING

- A. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.
- B. Protect countertop surfaces during construction with 6-mil (0.15-mm) plastic or other suitable water-resistant covering. Tape to underside of countertop at minimum of 48 inches (1200 mm) o.c.

- C. Provide the submittals listed in the below Submittal Schedule.

Submittal Schedule

ITEM NO.	SUBMITTAL REQUIREMENT	WITH BID	NO. OF WEEKS AFTER AWARD	AS INDICATED
123553-001	Product Data, for each type of product indicated.			
123553-002	NOT USED			
123553-003	Shop Drawings, for laboratory casework. Include plans, elevations, sections, details, and attachments to other work.			See Note A below.
123553-004	Samples for Initial Selections.			See Note B below.
123553-005	Samples for Verification.			See Note C below.
123553-006	Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating compliance of laboratory casework finishes and countertops with requirements specified for chemical and physical resistance.			

Note A: Shop Drawings shall indicate the following:

1. Locations of blocking and reinforcements required for installing laboratory casework.
2. Locations and types of service fittings, together with associated service supply connection required.
3. Details of utility spaces showing supports for conduits and piping.
4. Details of exposed conduits, if required, for service fittings.
5. Locations of and clearances from adjacent walls, doors, windows, other building components, and other laboratory equipment.
6. Coordinated dimensions for laboratory equipment specified in other Sections.

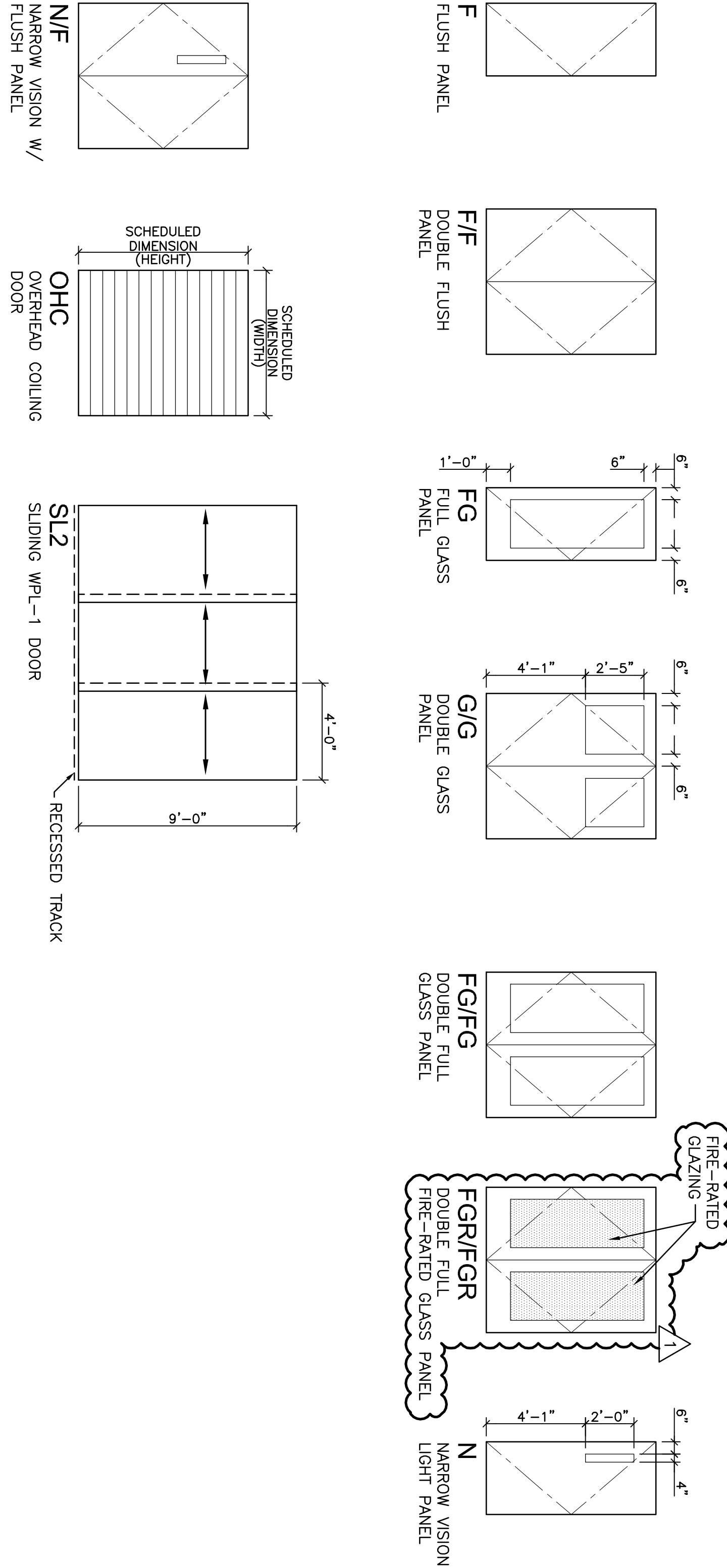
Note B: Samples for Initial Selections shall include manufacturer's color charts consisting of actual units or sections of units for each type of cabinet, adjustable shelf, countertop material, and other materials specified, matching Phase I product colors, textures, and patterns. .

Note C: Maintain Samples for Verification at Project site during construction in an undisturbed condition as a standard for judging the completed Work. Unless otherwise directed, approved Sample units in an undisturbed condition at time of Substantial Completion may become part of the completed Work. Notify Architect of their exact locations. If not incorporated into the Work, retain acceptable Sample units at Project site and remove when directed by Architect. Samples shall include the following:

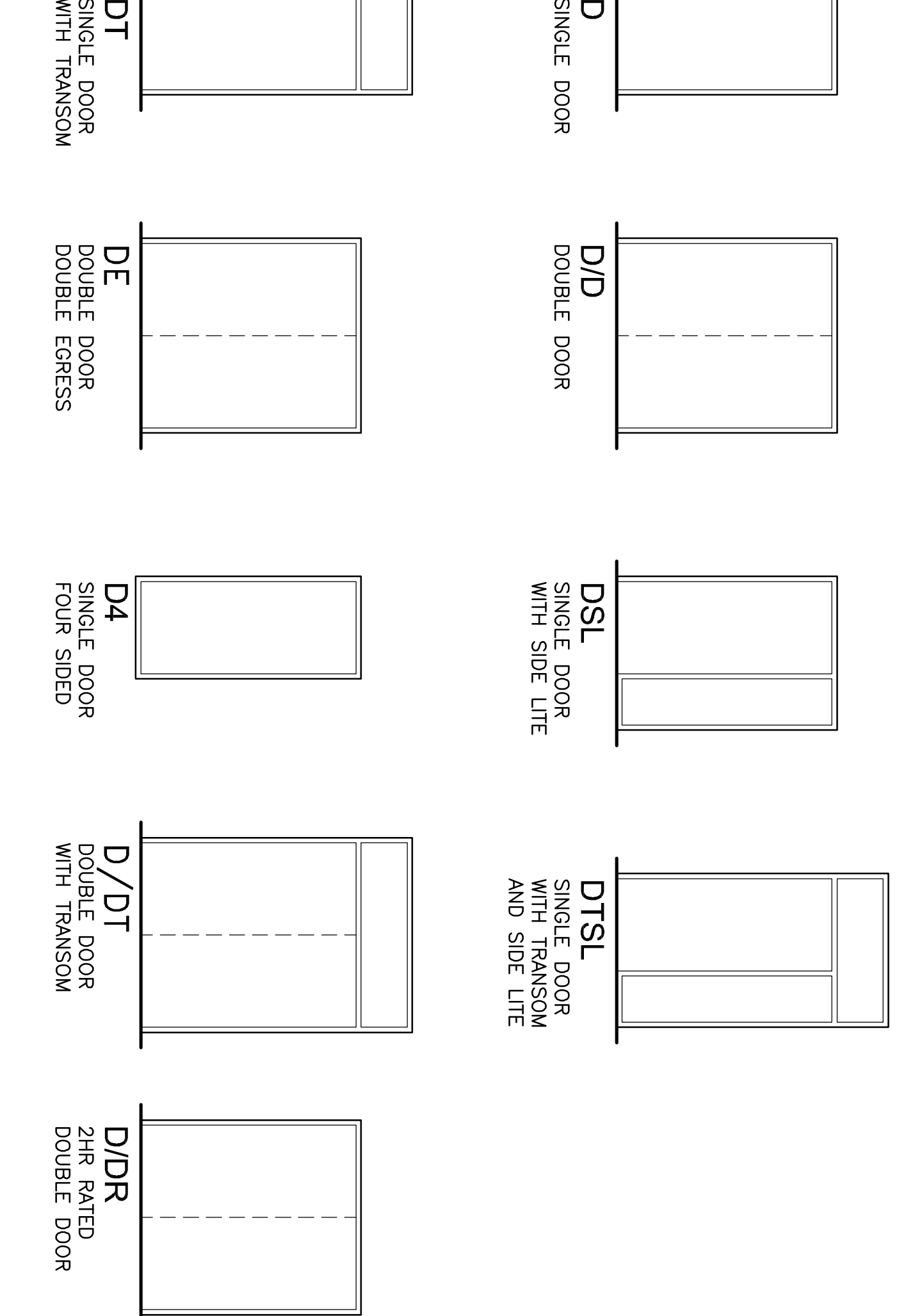
1. 6-inch- (150-mm-) square Samples for each type of countertop material.
2. One full-size, finished base cabinet complete with hardware, doors, and drawers, but without countertop.
3. One full-size, finished wall cabinet complete with hardware, doors, and adjustable shelves.
4. One Sample each of hinged and sliding doors.
5. One of each service fitting specified, complete with accessories and specified finish.
6. One of each type of sink and accessory item specified.
7. One sample of each shelf standard and bracket.

END OF SECTION

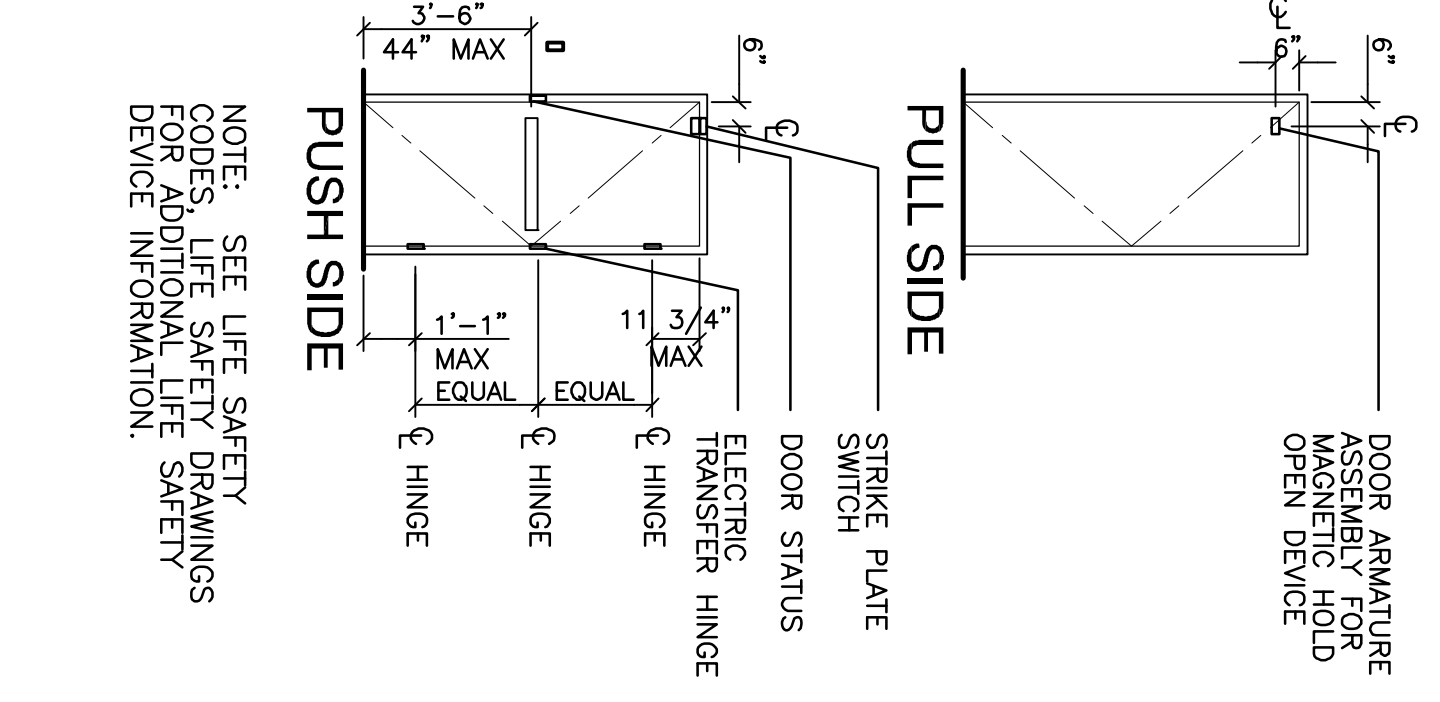
DOOR TYPES



FRAME TYPES



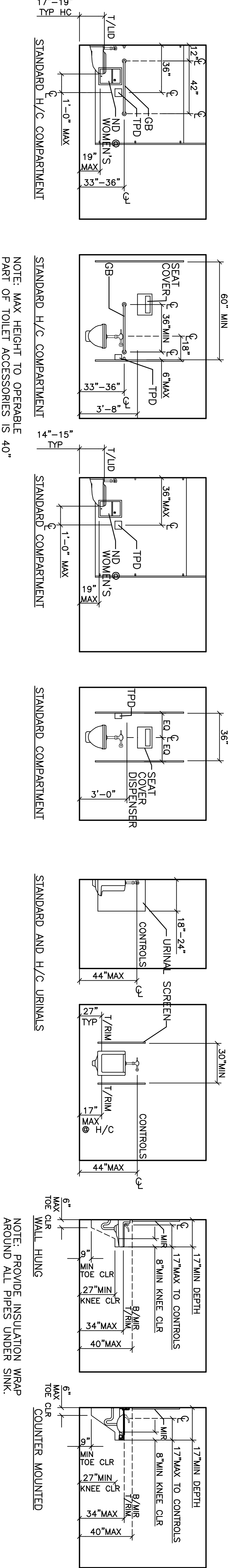
HARDWARE MOUNTING HEIGHTS



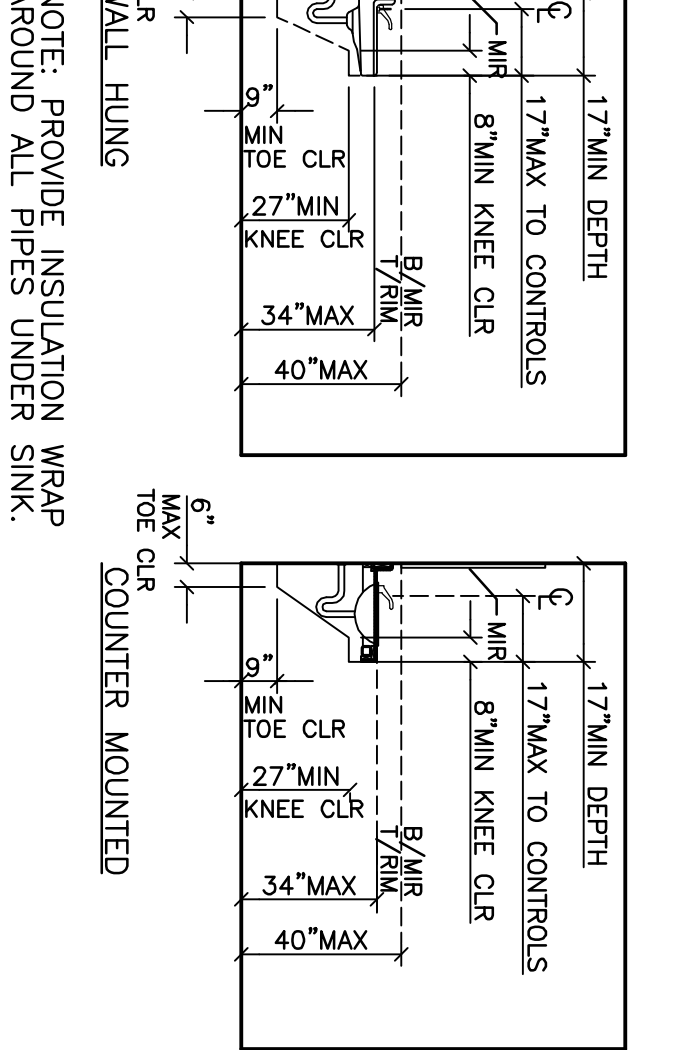
STANDARD MOUNTING HEIGHTS AND ADA REQUIREMENTS

NOTES:
A. VERIFY ACCESSORY SIZE WITH MANUFACTURER TO ENSURE CONFORMANCE WITH ADA MOUNTING HEIGHTS.
B. DIMENSIONS TO TOILET ROOM ACCESSORIES ARE TO THE HIGHEST PORTION OF THE OPENING OR OPERATING DEVICE.
C. PROVIDE DRINKING OR ELECTRIC AND TELEPHONE DEVICES AT 10 INCHES ABOVE COUNTERS AND COUNTERTOPS.

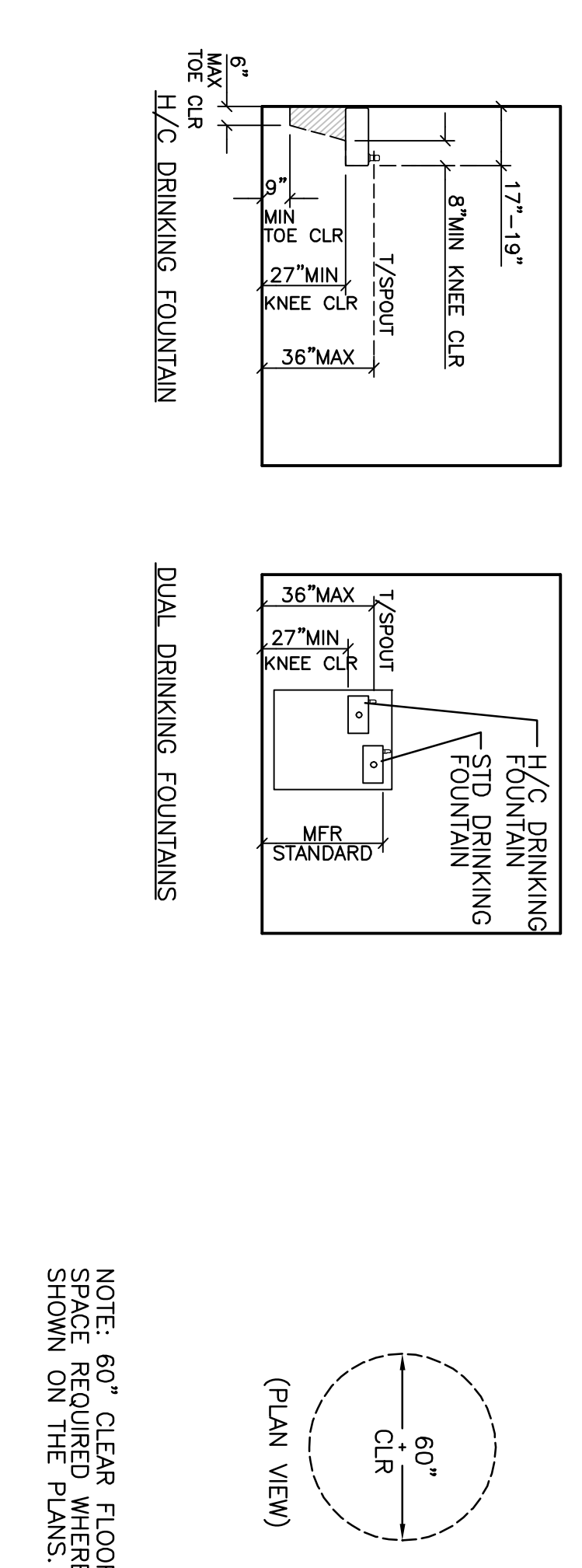
TOILET STALLS AND ACCESSORIES



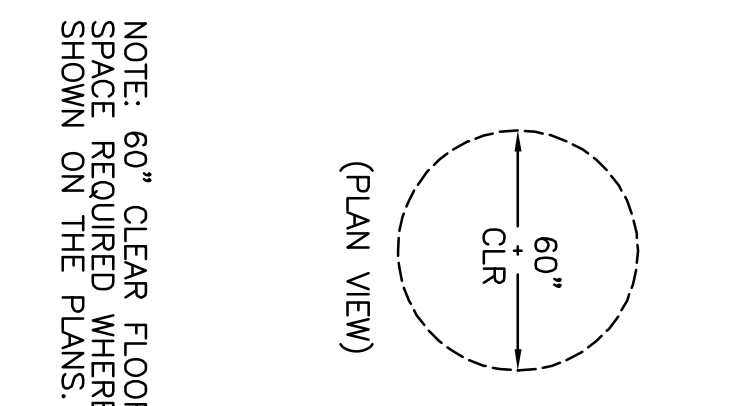
H/C LAVATORY CLEARANCES



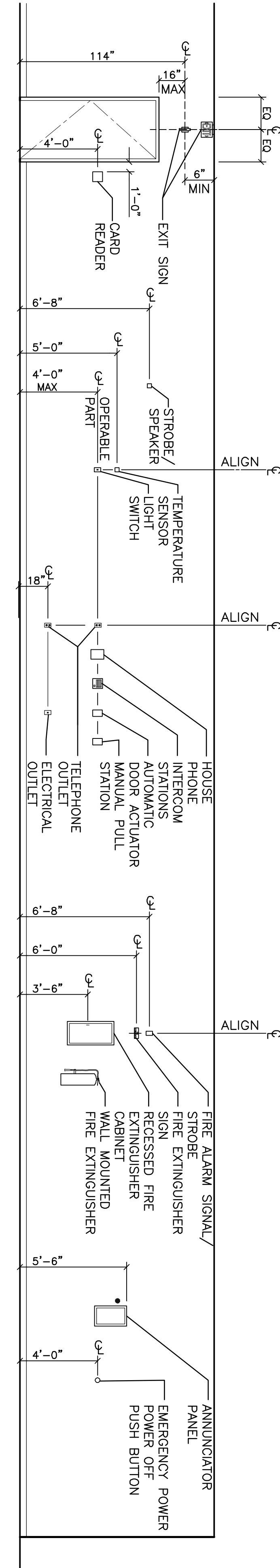
DRINKING FOUNTAINS



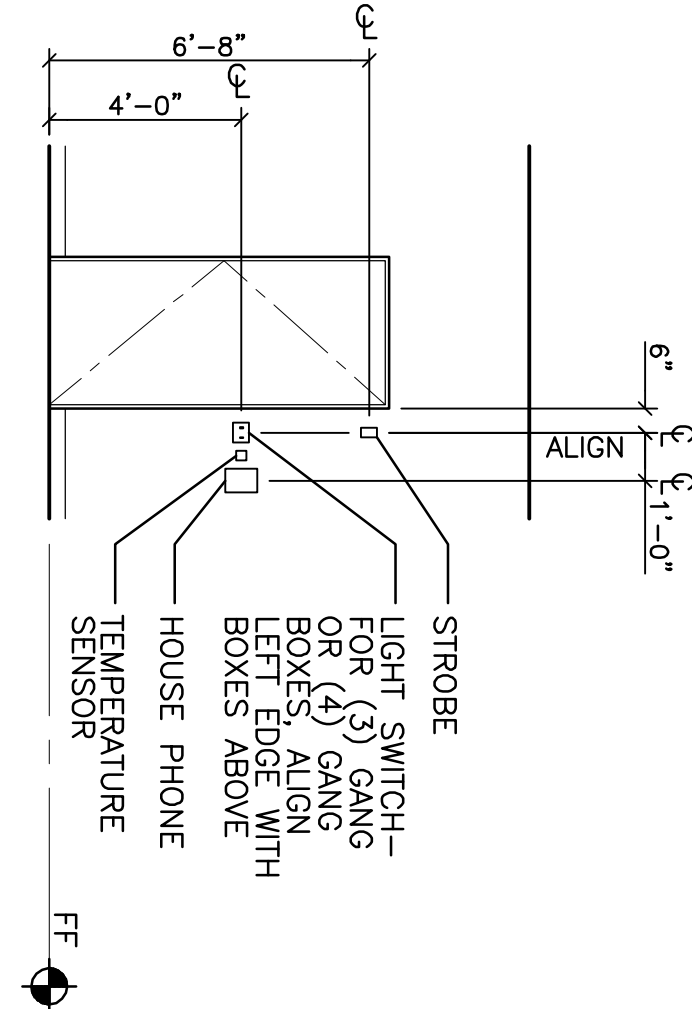
CLEAR FLOOR SPACE



FIXTURES AND DEVICES



TYPICAL AT CORRIDOR/LAISLE



TYPICAL AT ROOM

12 - FURNISHINGS 01 OFFICE FURNITURE (OFO) 13 - SPECIAL CONSTRUCTION 01 PRE-MANUFACTURED INSULATED METAL CLAD 01 HYDRAULIC PASSENGER ELEVATOR 01 MECHANICAL 01 WOP SINK 02 LAVATORY 03 DRINKING FOUNTAIN 04 FLOOR DRAIN 05 OVERFLOW DRAIN: 8" DIA. MAX. SLEEVED PIPE 06 MECHANICAL EQUIPMENT 07 ROOF DRAIN & OVERFLOW, SEE DETAIL 1/NVA--7606 08 VENT STACK, SEE DETAIL 9/NVA--7606 10 EXHAUST CANOPY 11 ROOF DRAIN ONLY @ AIR INTAKE OPENING 16 ELECTRICAL 01 INDIRECT LUMINAIRE	09 - FINISHES (CONT) 12 PROVIDE 24"x24" OPENING IN WALL ABOVE CEILING, FOR RETURN AIR FLOW. COORDINATE FINAL LOCATIONS WITH MECHANICAL 13 PROVIDE 12"x12" OPENING IN WALL ABOVE CEILING, FOR RETURN AIR FLOW. COORDINATE FINAL LOCATIONS WITH MECHANICAL 14 REPAIR WALL AT LOCATION OF DEMOLITION TO MAINTAIN INTEGRITY OF (E) RATED PARTITION 16 2-HOUR HORIZONTAL SEPARATION AT DROPPED SOFFIT FOR MECHANICAL DUCT 17 2-HOUR HORIZONTAL SEPARATION 1'-1" ABOVE FINISHED FLOOR FOR CONTINUITY OF EXIT PASSAGEWAY RATING: UL DESIGN U437 10 - SPECIALTIES 01 FIRE EXTINGUISHER 02 FULLY RECESSED MOTORIZED PROJECTION SCREEN 03 PROTECTOR, OFO 04 ACCESS FLOOR PANELS TO PIPE TRENCH BELOW SPLASH PANEL 05 REINSTALL SALVAGED DOCK LEVELER AND BUMPERS	08 - DOORS AND WINDOWS 01 GLAZING SYSTEM ABOVE 02 48"x48" FLUSH 2HR RATED ACCESS PANEL 03 24"x24" FLUSH 2HR RATED ACCESS PANEL @ 11'-0" A.F.F. 04 FUTURE SUSPENDED OPERABLE PARTITION WALL 05 RECESSED TRACK FOR SLIDING DOORS 06 POCKET PANEL(2) PROVIDED BY MOVEABLE PARTITION MANUFACTURER TO MATCH SLIDING STORAGE DOORS 07 2-HOUR RATED WALL ACCESS PANEL 08 ACCESS PANEL FOR ACCESS TO MECH DAMPERS(S) 09 - FINISHES 01 GWB SOFFIT OR CEILING 02 PAINTED FLOOR STRIPING FOR CLEAR ACCESS PATH 03 GWB ON MTL. STUD FLOORING AT COLUMN 04 OPEN TO STRUCTURE ABOVE 05 SUSPENDED ACOUSTICAL CEILING (SAT-1) 06 SUSPENDED ACOUSTICAL CEILING (SAT-2) 07 CARPET 08 RESILIENT FLOORING 09 ALIGN FACE OF FINISH WITH CMU WALL 10 PROVIDE 2HR SHAFT ENCLOSURE AT FLOOR LEVEL 2 11 PAINT CONC. CURB OR PLATFORM 01 OSHA SAFETY YELLOW	07 - THERMAL AND MOISTURE PROTECTION 01 ROOF TATCH 02 ROOF WALKWAY PADS 03 ROOF WALKWAY ASSEMBLY N1, SEE DETAIL 13/NVA--7600 04 NOT USED 05 PROVIDE 6" THICK ACOUSTICAL INSULATION ABOVE CEILING 06 INSTALL FIRE-RATING (FSM-2) TO EXTEND OUTSIDE WALL 07 TAPERED ROOF INSULATION TO SLOPE 1/4" PER FOOT. VALLEYS TO SLOPE MIN. 1/16" PER FOOT. 08 TAPERED INSULATION TO MEET SLOPE OF ROOF DECK. PROVIDE POSITIVE DRAINAGE 09 TAPER ROOF INSULATION TO SLOPE 1/4" PER FOOT. THIS AREA SEE DETAIL 1/NVA--7601. 10 VALLEYS TO SLOPE MIN. 1/16" PER FOOT. 11 ROOFING ASSEMBLY B; SEE DETAIL 14/NVA--7600 12 ROOFING ASSEMBLY C; SEE DETAIL 15/NVA--7600 13 SHEET WATERPROOFING 14 2" RIGID INSULATION OVER SHEET WATERPROOFING 15 GWB OVER SHEET VAPOR RETARDER OVER METAL Z-FLOORING @ 24" OC W/ 2" RIGID INSULATION 16 3/8" SEALANT JOINT SET BACK 3/8" FROM FACE OF FINISH MATERIAL; RETURN UP VERTICAL FACE	06 LEVEL EXISTING SLAB AT LOCATION OF DEMOLITION FOR SMOOTH FINISH SURFACE. REFER TO LAB DRAWINGS FOR MORE DETAIL. 05 - ALUM. COMPOSITE PANEL (ACP) 01 PAINTED WELOD WOVEN-WIRE SCREEN @ AIR INTAKE OPENINGS 03 STEEL HANDRAIL/GUARDRAIL 04 LOUVER 05 STEEL ACCESS LADDER 06 EXPANSION JOINT COVER 07 METAL GRATING W/ GUARD RAIL PROVIDED FOR ACCESS TO UTILITY DUCT 08 PROFILE METAL PANEL SCREEN AT EXISTING MECHANICAL PENHOUSE 10 REINSTALL SALVAGED PAD AND MODIFIED ACP 11 REINSTALL SALVAGED PAD AND MODIFIED ACP 12 STRUCTURAL SUPPORT FOR PMP LOUVER. SEE DETAIL 12/NVA--7606 FOR PENETRATION FLASHING 13 2 HOUR RATED JOINT IN RATED HORIZONTAL SEPARATION ABOVE: J-11 14 WOOD SHELF 02 CASEWORK	GENERAL NOTES 1. LAB LAYOUTS ARE SHOWN FOR REFERENCE ONLY. REFER TO LAB DRAWINGS FOR MORE DETAIL. 2. SEE SHEET NVA-0001 FOR ADDITIONAL GENERAL NOTES AND LEGEND. 3. SUSPENDED ACOUSTIC TILE TO BE CENTERED IN ROOM UNLESS NOTED OTHERWISE.. KEYED NOTES KEYNOTE TAG KEYNOTE NUMBER SPECIFICATION DIVISION NUMBER SPECIFICATION TAG 03 - CONCRETE 01 CONCRETE CURB 02 HOUSEKEEPING PAD 03 CONCRETE PLATFORM 04 EQUIPMENT PAD 05 CONCRETE COLUMN

SHEET NO.

NVA-1E-

ARCHITECTURAL

LEVEL 1

FLOOR PLAN

SCALE: 1/8" = 1'-0"

DESIGNED BY:

DRAWN BY:

CHECKED BY:

DATE:

MAY 26, 2011

PROJECT NO.:

102002

KEN MORRISON LIFE SCIENCES

RESEARCH CENTER ADDITION

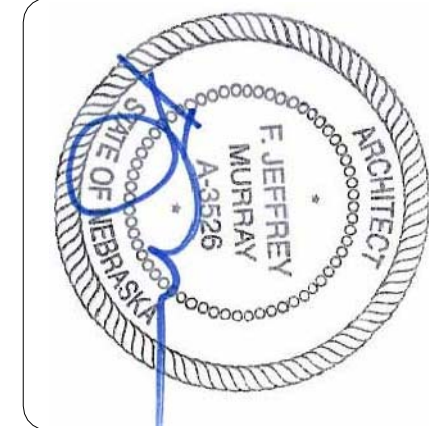
UNIVERSITY OF

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Lincoln

REVISIONS	
ADDM 1	11-21-2011

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IDC ARCHITECTS

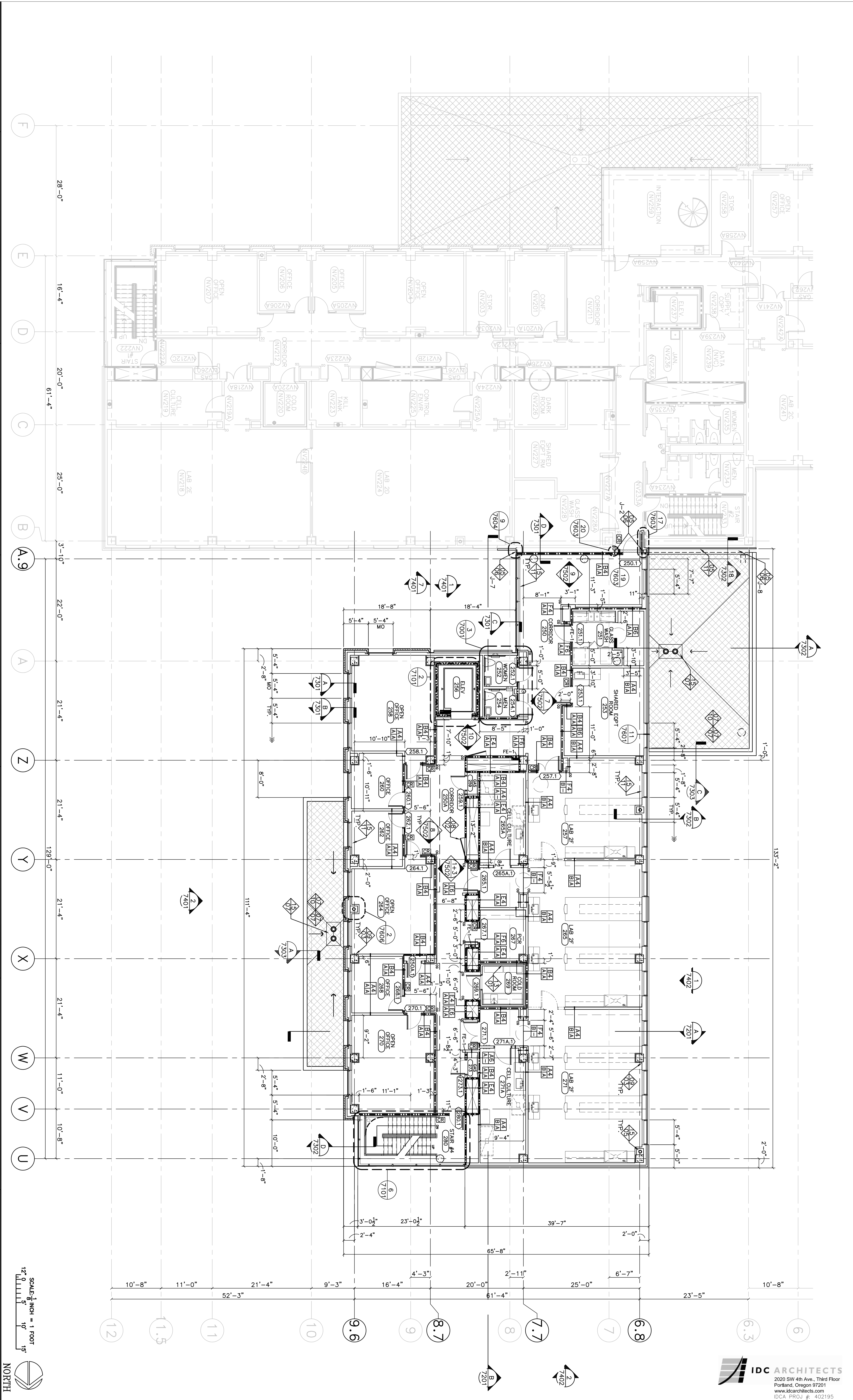
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01/20/2020 NVA-2-E-0001 11/21/2020 10:50 AM

GENERAL NOTES 1. LAB LAYOUTS ARE SHOWN FOR REFERENCE ONLY. REFER TO LAB DRAWINGS FOR MORE DETAIL. 2. SEE SHEET NVA-0001 FOR ADDITIONAL GENERAL NOTES AND LEGEND. 3. SUSPENDED ACOUSTIC TILE TO BE CENTERED IN ROOM UNLESS NOTED OTHERWISE.	KEYED NOTES KEYNOTE TAG KEYNOTE NUMBER SPECIFICATION DIVISION NUMBER SPECIFICATION TAG 02 - CONCRETE 01 CONCRETE CURB 02 HOUSEKEEPING PAD 03 CONCRETE PLATFORM 04 EQUIPMENT PAD 05 CONCRETE COLUMN 02 - STEMWORK 01 GALT. CHAIN LINK FENCING 02 SUBDRAINAGE AT BOTTOM OF WALL 03 - CONCRETE 01 CONCRETE CURB 02 HOUSEKEEPING PAD 03 CONCRETE PLATFORM 04 EQUIPMENT PAD 05 CONCRETE COLUMN	06 LEVEL EXISTING SLAB AT LOCATION OF DEMOLITION FOR SMOOTH FINISH SURFACE. 07 - METAL 01 ALUM. COMPOSITE PANEL (ACP) 02 PAINTED WELDED WOVEN-WIRE SCREEN @ AIR INTAKE OPENINGS 03 STEEL HANDRAIL/GUARDRAIL 04 LOUVER 05 STEEL ACCESS LADDER 06 EXPANSION JOINT COVER 07 METAL GRATING W/ GUARD RAIL PROVIDED FOR ACCESS TO UTILITY DUCT 08 STEEL GATE 09 PROFILE METAL PANEL SCREEN AT EXISTING MECHANICAL PENHOUSE 10 REINFORCED CONCRETE PAD AND MODIFIED ACP 11 STRUCTURAL SUPPORT FOR PMP LOWER. SEE DETAIL 12/NVA-7606 FOR PENETRATION FLASHING 12 2 HOUR RATED JOINT IN RATED HORIZONTAL SEPARATION ABOVE. J-11 13 WOOD SHELF 14 CASEWORK 07 - THERMAL AND MOISTURE PROTECTION 01 ROOF HATCH 02 ROOF FLASHING PADS 03 ROOFING ASSEMBLY A; SEE DETAIL 13/NVA-7600 04 NOT USED 05 PROVIDE 6" THICK ACOUSTICAL INSULATION ABOVE CEILING 06 INSTALL FIRE-RATED ENCLOSURE TO OUTSIDE WALL 07 TAPERED ROOF INSULATION TO SLOPE 1/4" PER FOOT. VALLEYS TO SLOPE MIN. 1/16" PER FOOT. 08 TAPERED INSULATION TO MEET SLOPE OF ROOF DECK. PROVIDE POSITIVE DRAINAGE 09 TAPER ROOF INSULATION TO SLOPE 1/4" PER FOOT. THIS AREA SEE DETAIL 1/NVA-7601. 10 VALLEYS TO SLOPE MIN. 1/16" PER FOOT. 11 ROOFING ASSEMBLY B; SEE DETAIL 14/NVA-7600 12 SHEET WATERPROOFING 13 2" RIGID INSULATION OVER SHEET WATERPROOFING 14 GWB OVER SHEET VAPOR RETARDER OVER METAL Z-FURRING @ 24" OC W/ 2" RIGID INSULATION 15 3/8" SEALANT JOINT SET BACK 3/8" FROM FACE OF FINISH MATERIAL; RETURN UP VERTICAL FACE	08 - DOORS AND WINDOWS 01 GLAZING SYSTEM ABOVE 02 48"x48" FLUSH 2HR RATED ACCESS PANEL 03 24"x24" FLUSH 2HR RATED ACCESS PANEL @ 11'-0" A.T.F. 04 FUTURE SUSPENDED OPERABLE PARTITION WALL 05 RECESSED TRACK FOR SLIDING DOORS 06 POCKET PARTITION (2) PROVIDED BY MOVEABLE PARTITION MANUFACTURER TO MATCH SLIDING STORAGE DOORS 07 2-HOUR RATED WALL ACCESS PANEL 08 ACCESS PANEL FOR ACCESS TO FLOOR DAMPERS(S) 09 11'-0" A.T.F. 01 GWB SOFFIT OR CEILING 02 PAINTED FLOOR STRIPING FOR CLEAR ACCESS PATH 03 GWB ON MTL. STUD FLOORING AT COLUMN 04 OPEN TO STRUCTURE ABOVE 05 SUSPENDED ACOUSTICAL CEILING (SAT-1) 06 SUSPENDED ACOUSTICAL CEILING (SAT-2) 07 CARPET 08 RESILIENT FLOORING 09 ALUM. FACE OF FINISH WITH CMU WALL 10 PAINT CONC. CURB OR PLATFORM 11 OSHA SAFETY YELLOW 09 - FINISHES (CONT.) 12 PROVIDE 24"x24" OPENING IN WALL ABOVE CEILING. FOR RETURN AIR FLOW. COORDINATE FINAL LOCATIONS WITH MECHANICAL 13 PROVIDE 12"x12" OPENING IN WALL ABOVE CEILING. FOR RETURN AIR FLOW. COORDINATE FINAL LOCATIONS WITH MECHANICAL 14 REPAIR WALL AT LOCATION OF DEMOLITION TO MAINTAIN INTEGRITY OF (E) RATED PARTITION 15 2-HOUR HORIZONTAL SEPARATION AT DROPPED SOFFIT FOR MECHANICAL DUCT 16 2-HOUR HORIZONTAL SEPARATION AT DROPPED SOFFIT FOR MECHANICAL DUCT 17 2-HOUR HORIZONTAL SEPARATION 11'-1" ABOVE FINISHED FLOOR FOR CONTINUITY OF EXIT PASSAGEWAY RATING. UL DESIGN U437 10 - SPECIALTIES 01 FIRE EXTINGUISHER 02 FULLY RECESSED MOTORIZED PROJECTION SCREEN 03 PROTECTOR, OTD 04 ACCESS FLOOR PANELS TO PIPE TRENCH BELOW SPACE HEAT 05 REINSTALL SALVAGED DOCK LEVELER AND BUMPERS	12 - FURNISHINGS 01 OFFICE FURNITURE (OTFO) 13 SPECIAL CONSTRUCTION 01 REINFORCED INSULATED METAL CLAD 14 CONCRETE 15 MECHANICAL 16 MECHANICAL 17 MECHANICAL 18 MECHANICAL 19 MECHANICAL 20 MECHANICAL 21 MECHANICAL 22 MECHANICAL 23 MECHANICAL 24 MECHANICAL 25 MECHANICAL 26 MECHANICAL 27 MECHANICAL 28 MECHANICAL 29 MECHANICAL 30 MECHANICAL 31 MECHANICAL 32 MECHANICAL 33 MECHANICAL 34 MECHANICAL 35 MECHANICAL 36 MECHANICAL 37 MECHANICAL 38 MECHANICAL 39 MECHANICAL 40 MECHANICAL 41 MECHANICAL 42 MECHANICAL 43 MECHANICAL 44 MECHANICAL 45 MECHANICAL 46 MECHANICAL 47 MECHANICAL 48 MECHANICAL 49 MECHANICAL 50 MECHANICAL 51 MECHANICAL 52 MECHANICAL 53 MECHANICAL 54 MECHANICAL 55 MECHANICAL 56 MECHANICAL 57 MECHANICAL 58 MECHANICAL 59 MECHANICAL 60 MECHANICAL 61 MECHANICAL 62 MECHANICAL 63 MECHANICAL 64 MECHANICAL 65 MECHANICAL 66 MECHANICAL 67 MECHANICAL 68 MECHANICAL 69 MECHANICAL 70 MECHANICAL 71 MECHANICAL 72 MECHANICAL 73 MECHANICAL 74 MECHANICAL 75 MECHANICAL 76 MECHANICAL 77 MECHANICAL 78 MECHANICAL 79 MECHANICAL 80 MECHANICAL 81 MECHANICAL 82 MECHANICAL 83 MECHANICAL 84 MECHANICAL 85 MECHANICAL 86 MECHANICAL 87 MECHANICAL 88 MECHANICAL 89 MECHANICAL 90 MECHANICAL 91 MECHANICAL 92 MECHANICAL 93 MECHANICAL 94 MECHANICAL 95 MECHANICAL 96 MECHANICAL 97 MECHANICAL 98 MECHANICAL 99 MECHANICAL 100 MECHANICAL



SHEET NO.

NVA-2-E-

ARCHITECTURAL

LEVEL 2

FLOOR PLAN

SCALE: 1/8" = 1'-0"

DESIGNED BY:

CHECKED BY:

DATE:

MAY 26, 2011

PROJECT NO.:

102002

KEN MORRISON LIFE SCIENCES

RESEARCH CENTER ADDITION

UNIVERSITY OF

Nebraska

Lincoln

REVISIONS

ADDM 1 11-21-2011

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REGISTERED PROFESSIONAL ENGINEER

STATE OF NEBRASKA

NO. 0000000000

EXPIRATION DATE 12/31/2020

IDC ARCHITECTS

2020 SW 4th Ave., Third Floor

Portland, Oregon 97201

www.idcarchitects.com

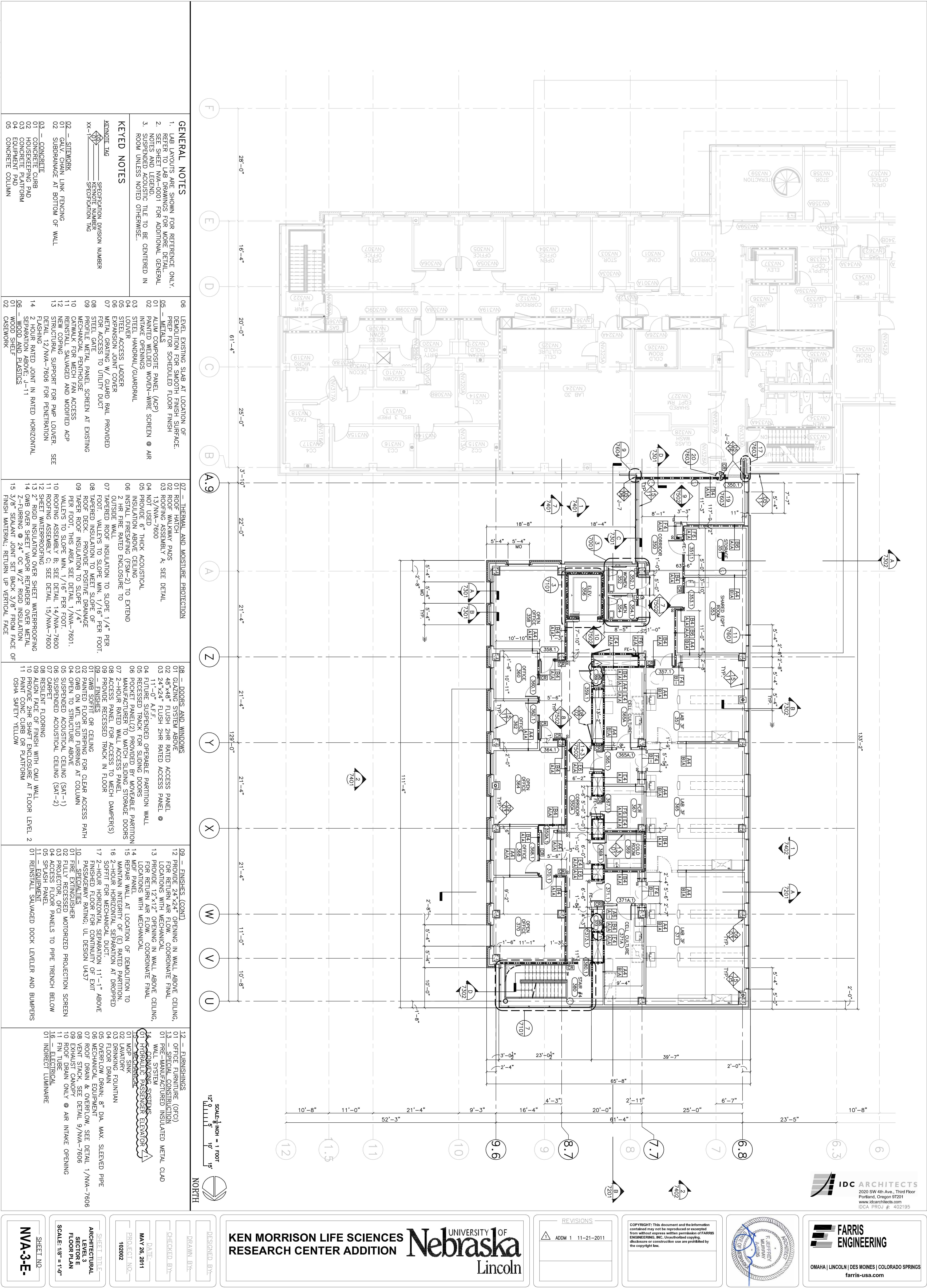
ICDA PROJ # 402195

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SHEET NO.

NVA-3-E-

ARCHITECTURAL

LEVEL 3

SECTOR E

FLOOR PLAN

SCALE: 1/8" = 1'-0"

DESIGNED BY:

DRAWN BY:

CHECKED BY:

DATE: MAY 26, 2011

PROJECT NO.: 102002

KEN MORRISON LIFE SCIENCES

RESEARCH CENTER ADDITION

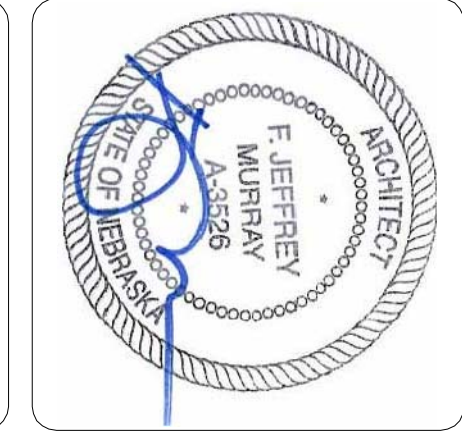
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Lincoln

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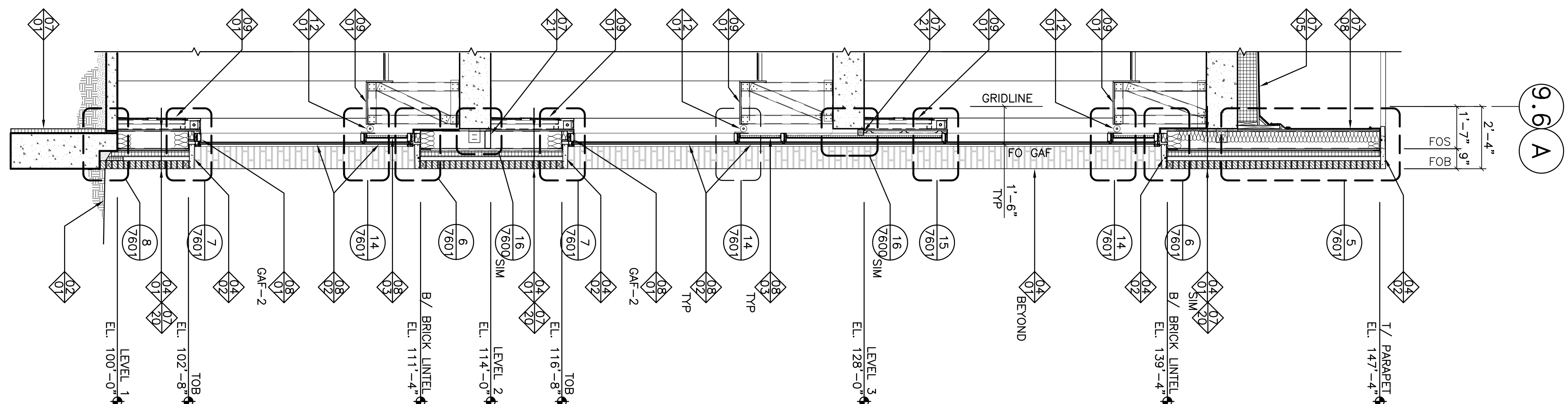
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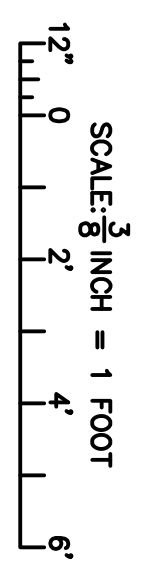
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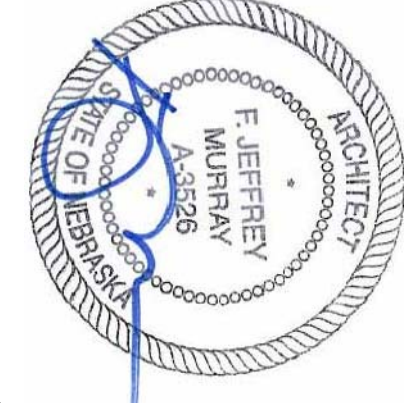
WALL SECTION
A
—
 $3/8'' = 1' - 0''$



13 - MECHANICAL
01 OUTSIDE AIR DUCT AND WALL PENETRATION
SEE MECH

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RESEARCH CENTER ADDITION**

UNIVERSITY OF
Nebraska
Lincoln

**KEN MORRISON LIFE SCIENCES
RESEARCH CENTER ADDITION**

DESIGNED BY:

—DRAWN BY:—

—CHECKED BY:—

DATE: _____

PROJECT NO.: _____

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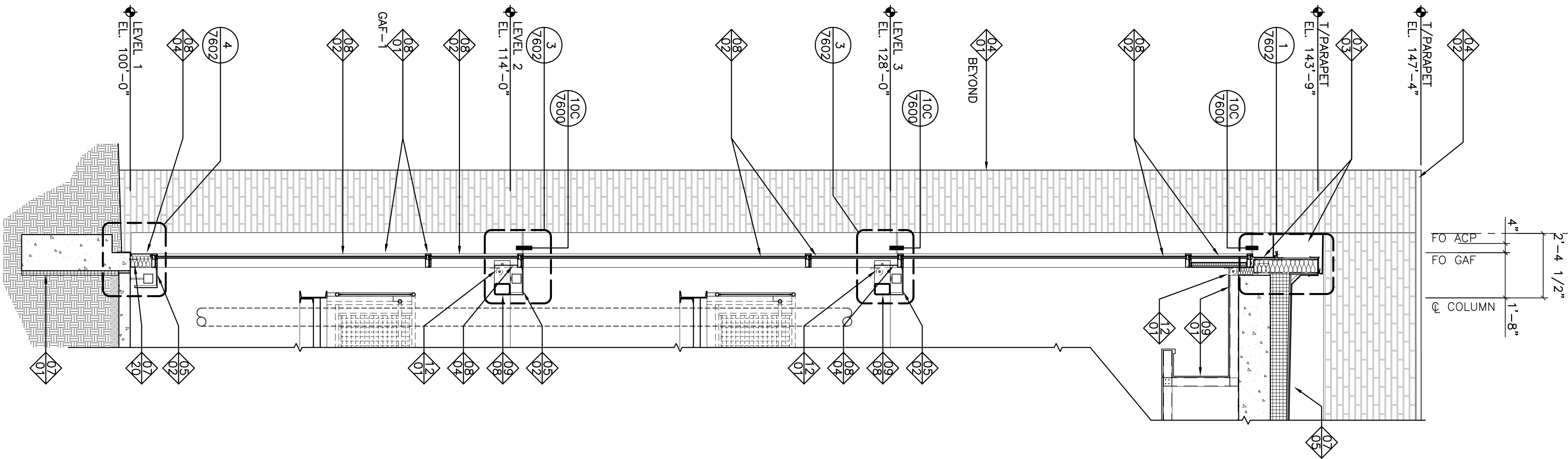
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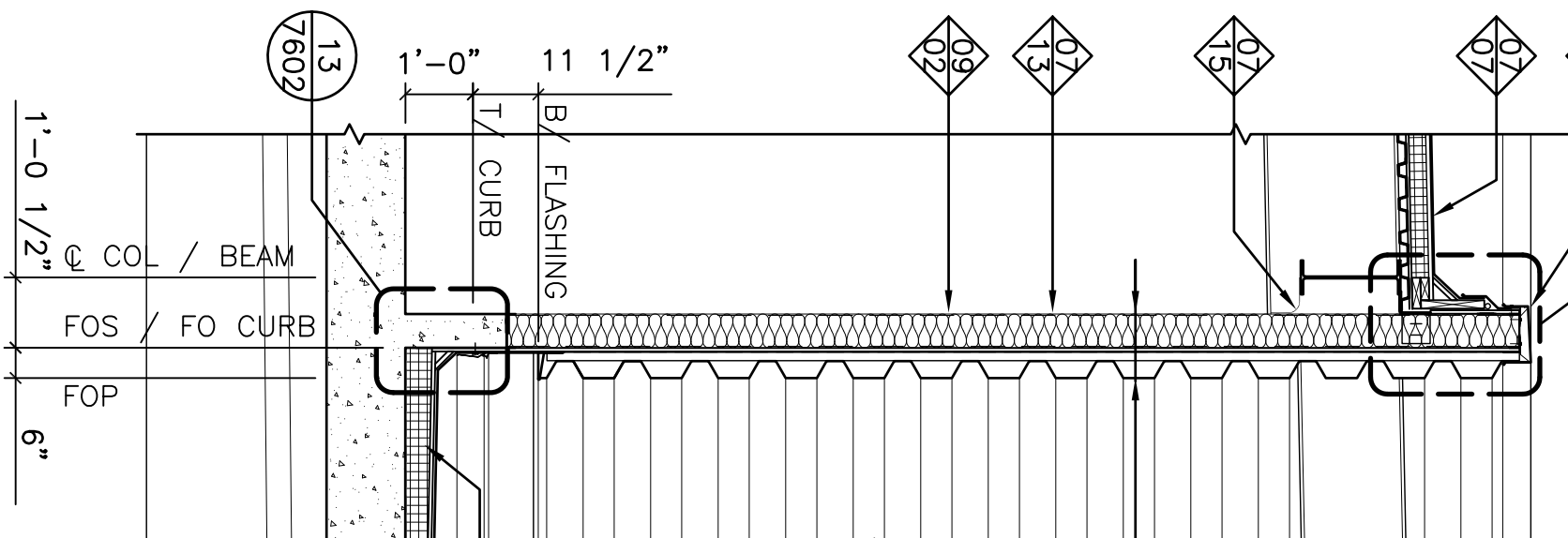
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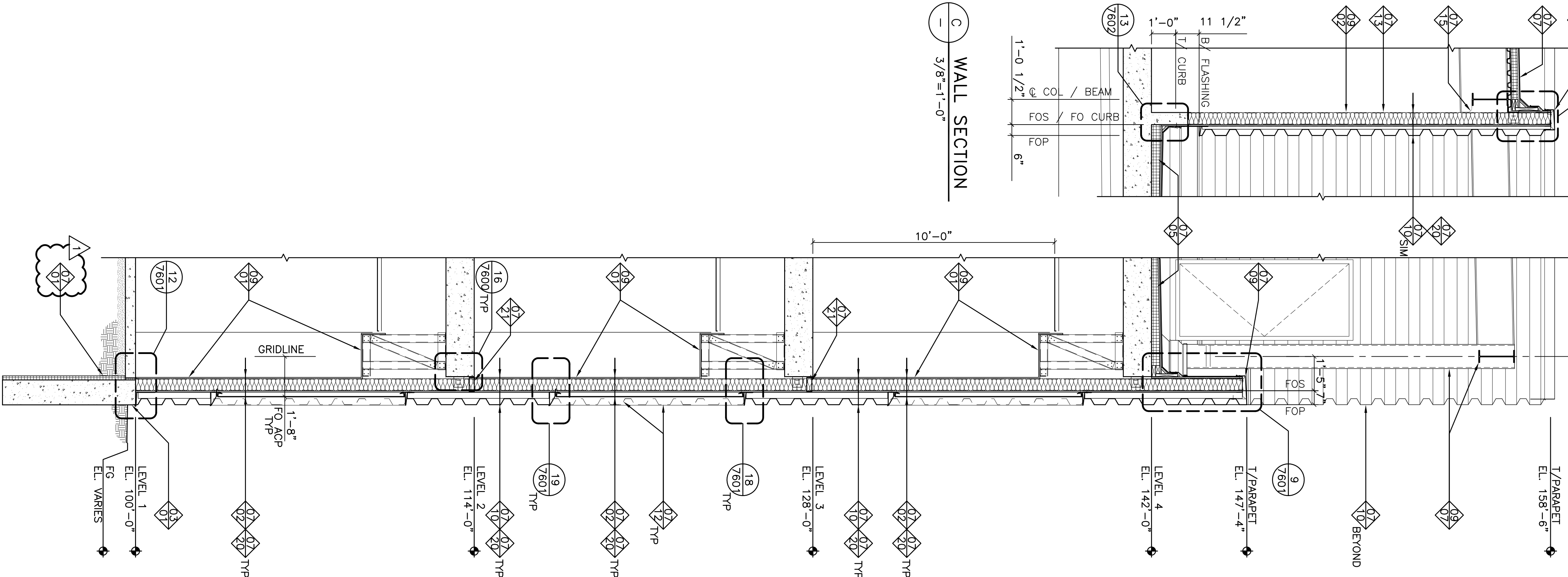
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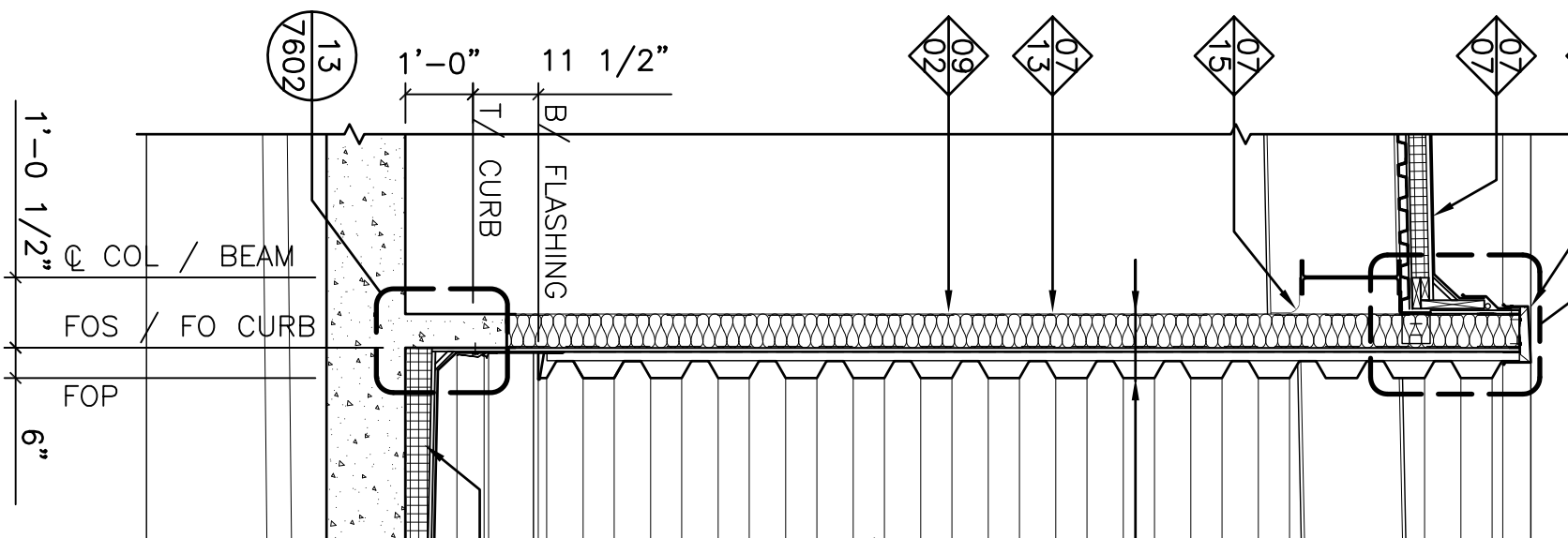
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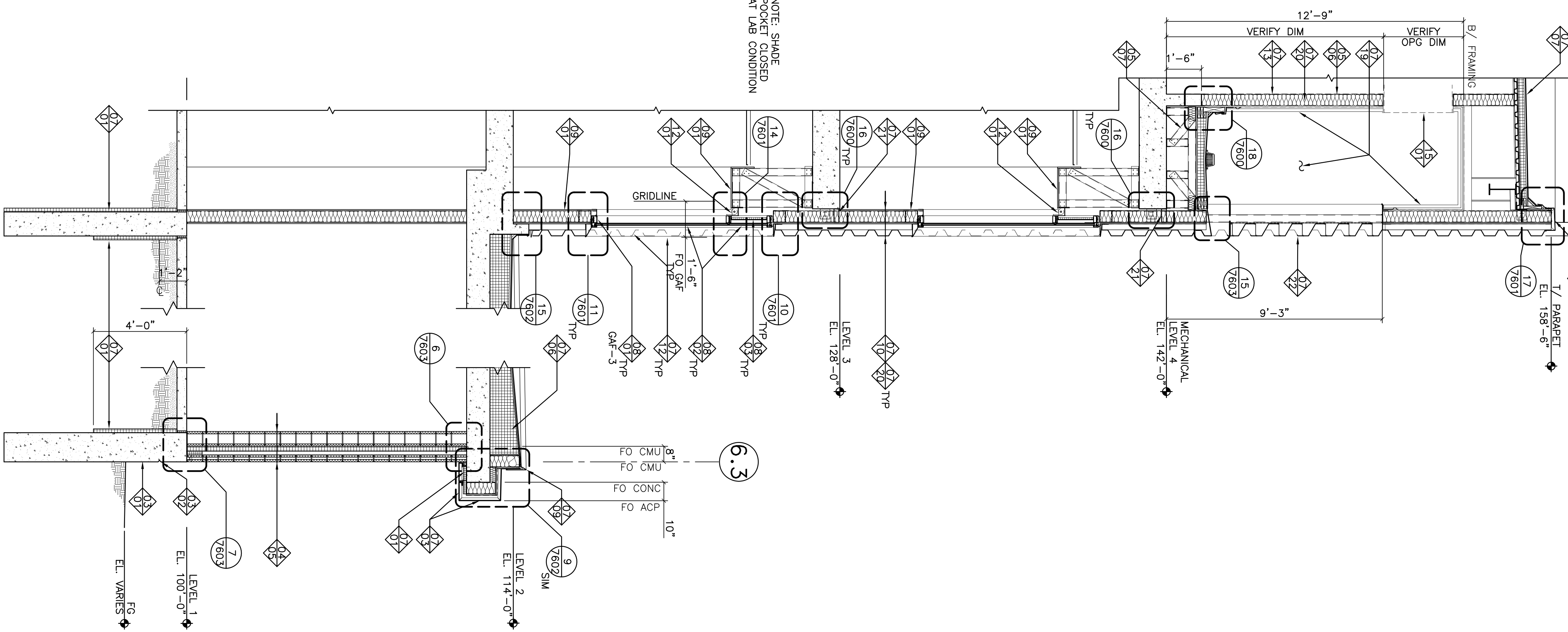
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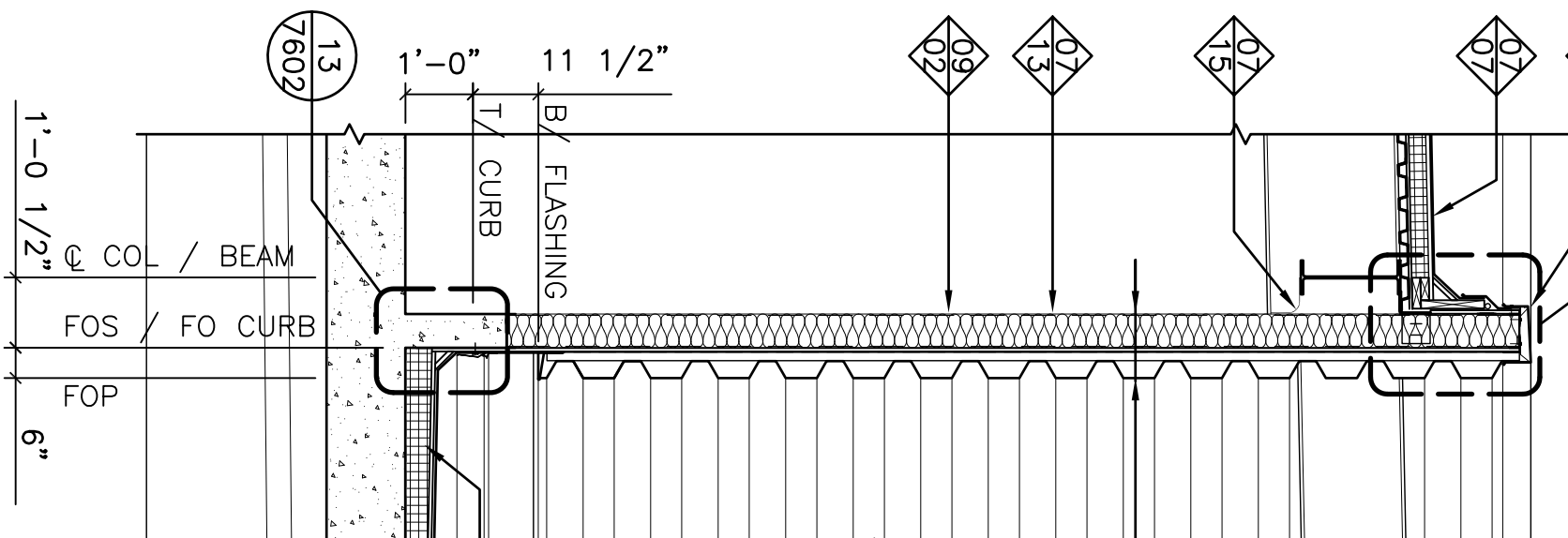
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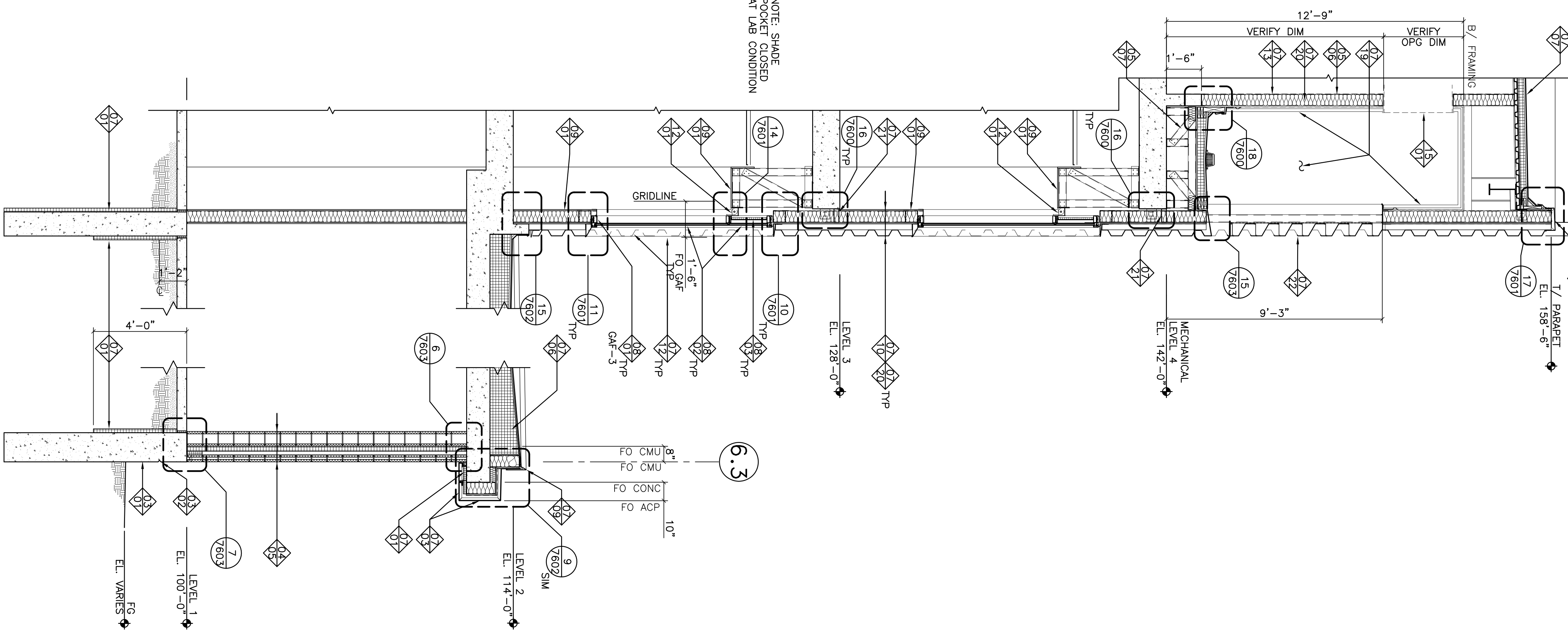
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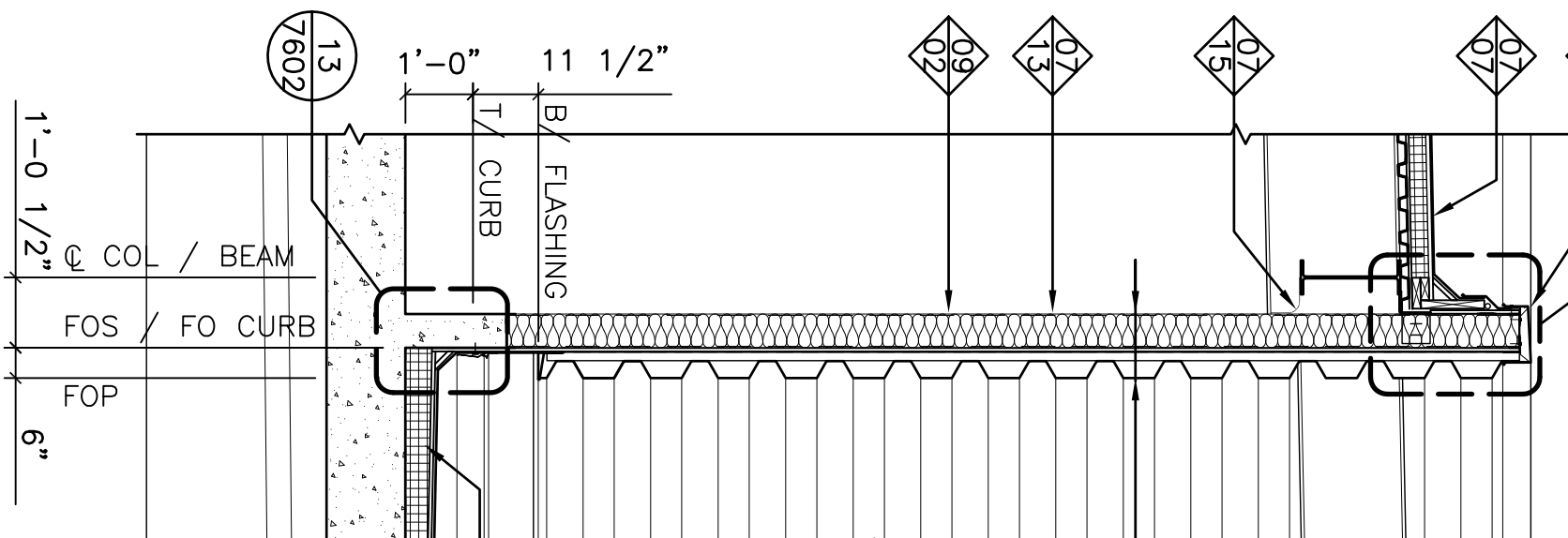
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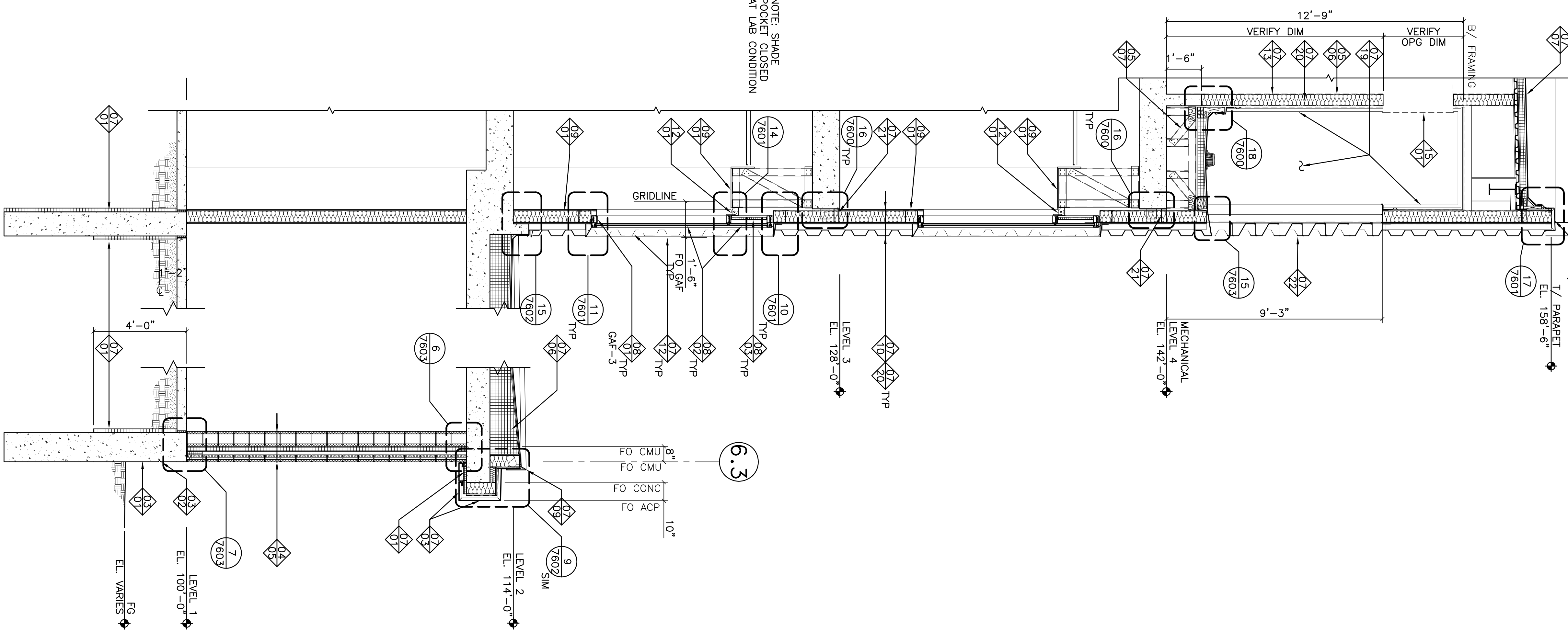
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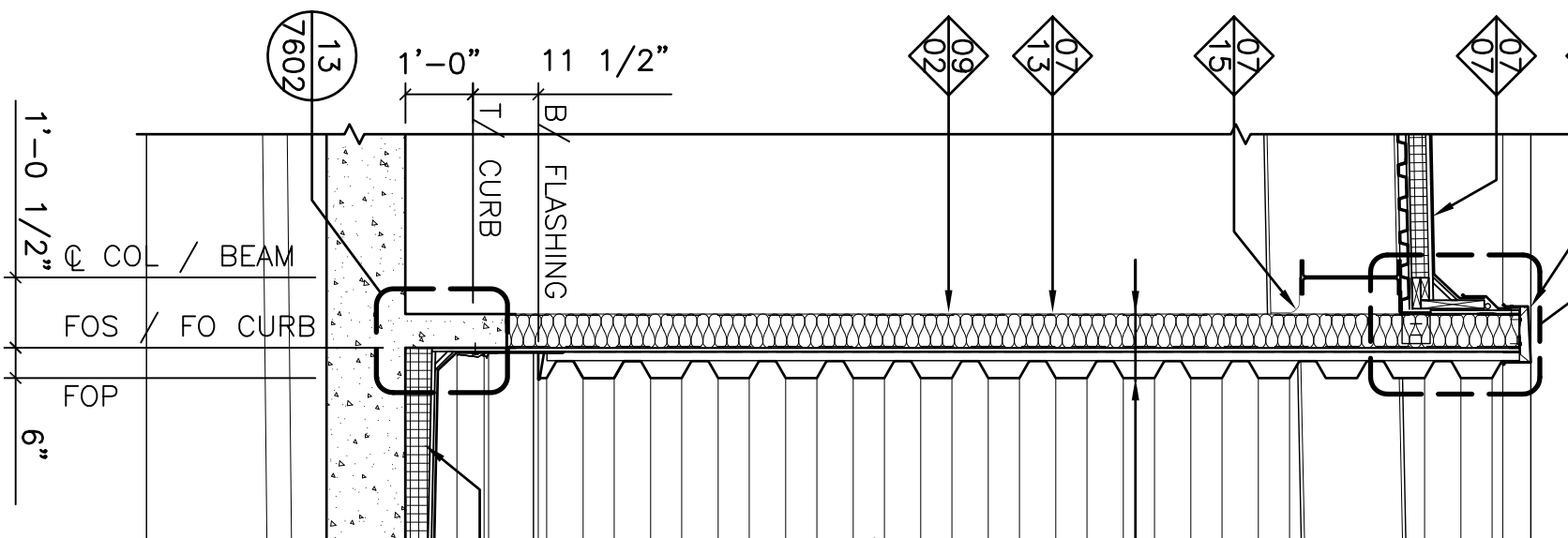
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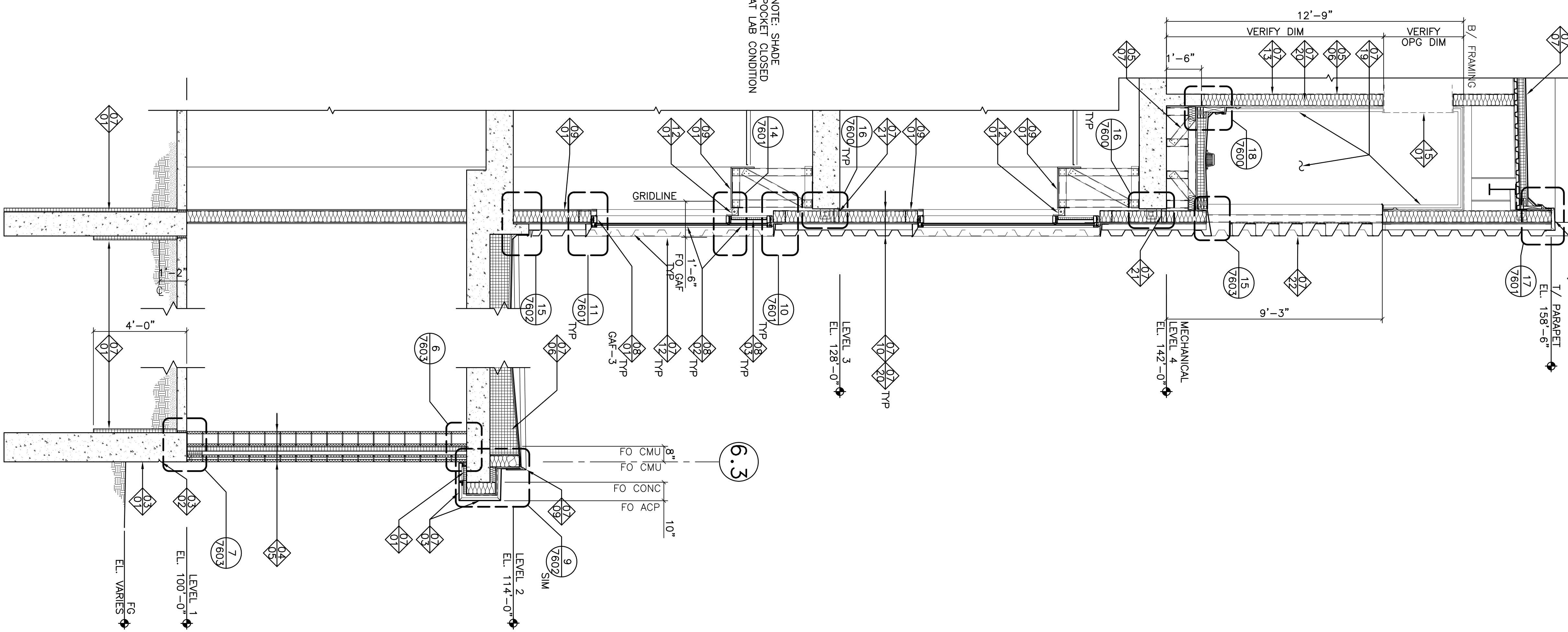
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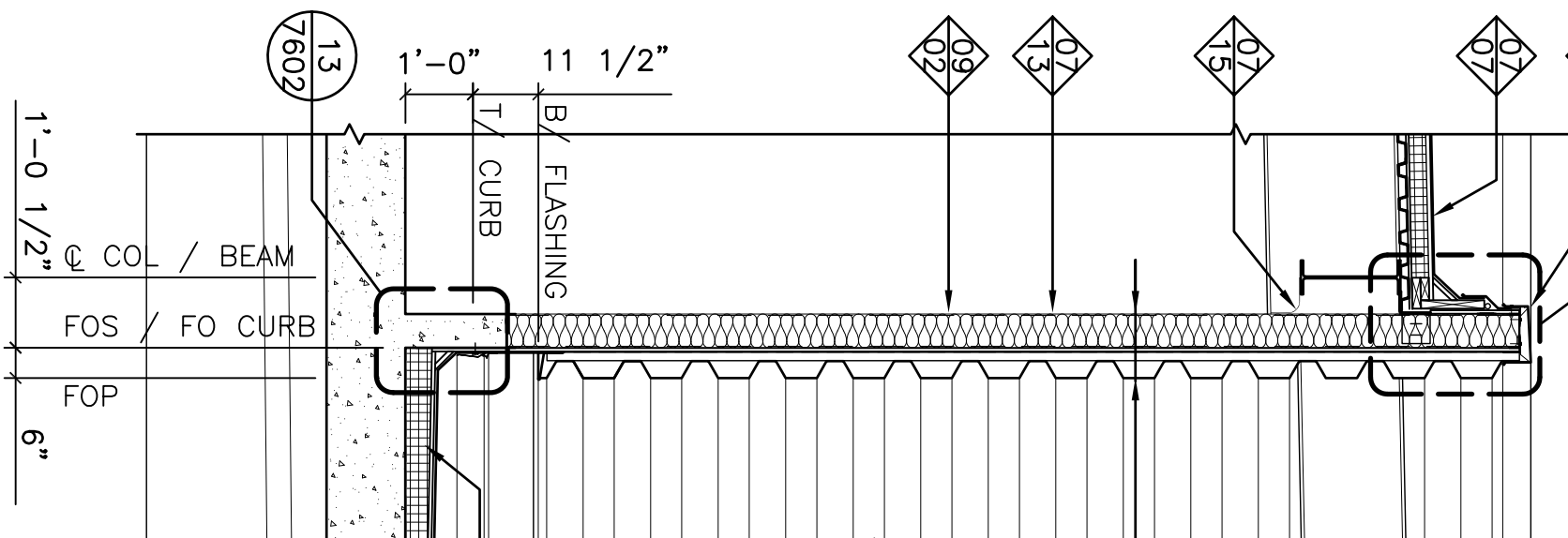
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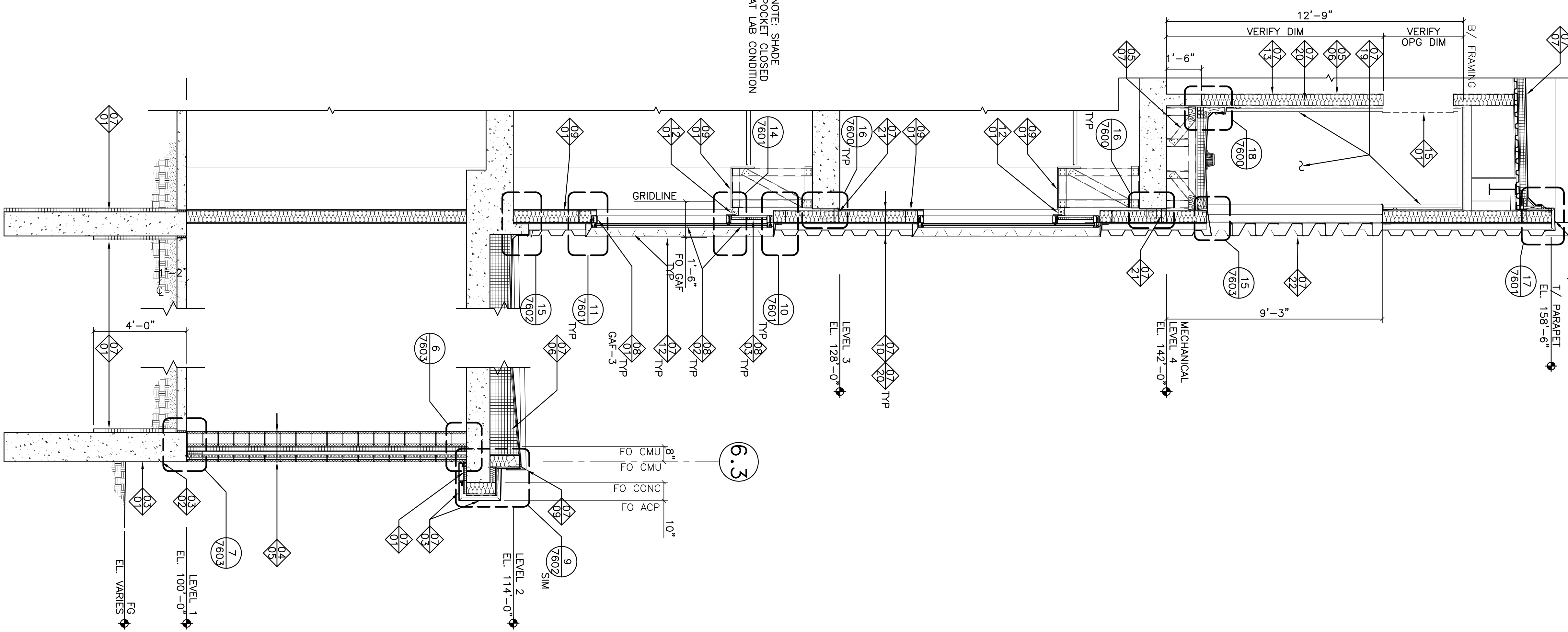
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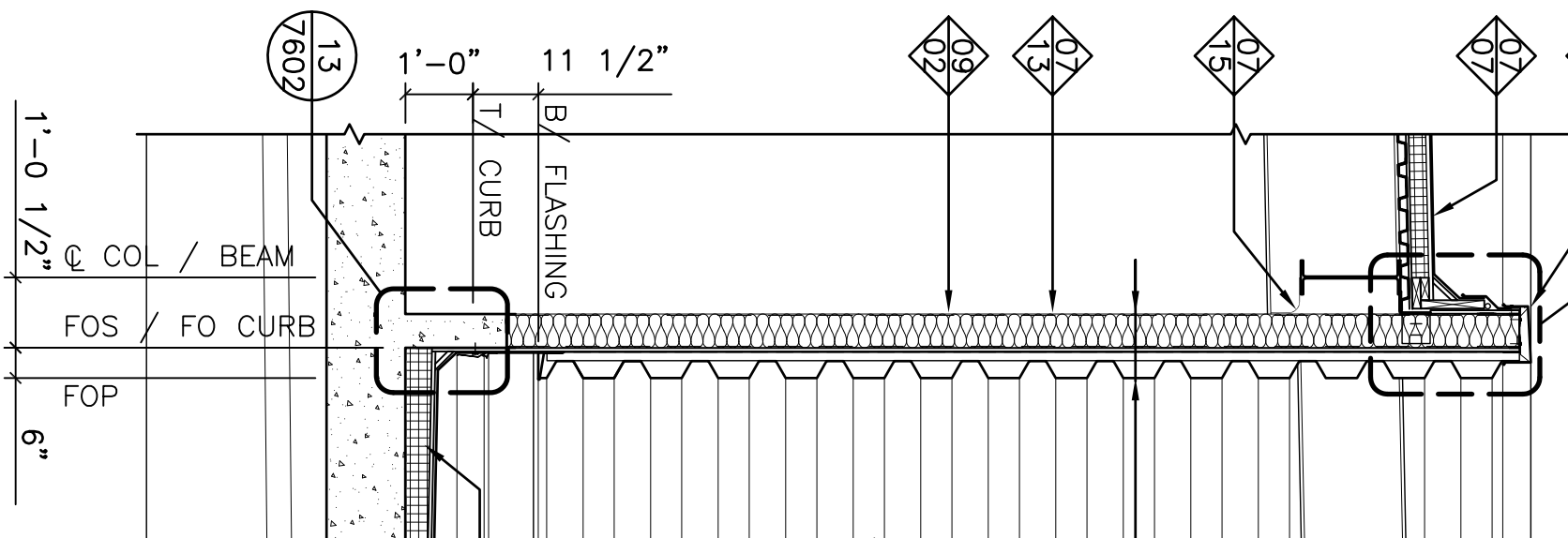
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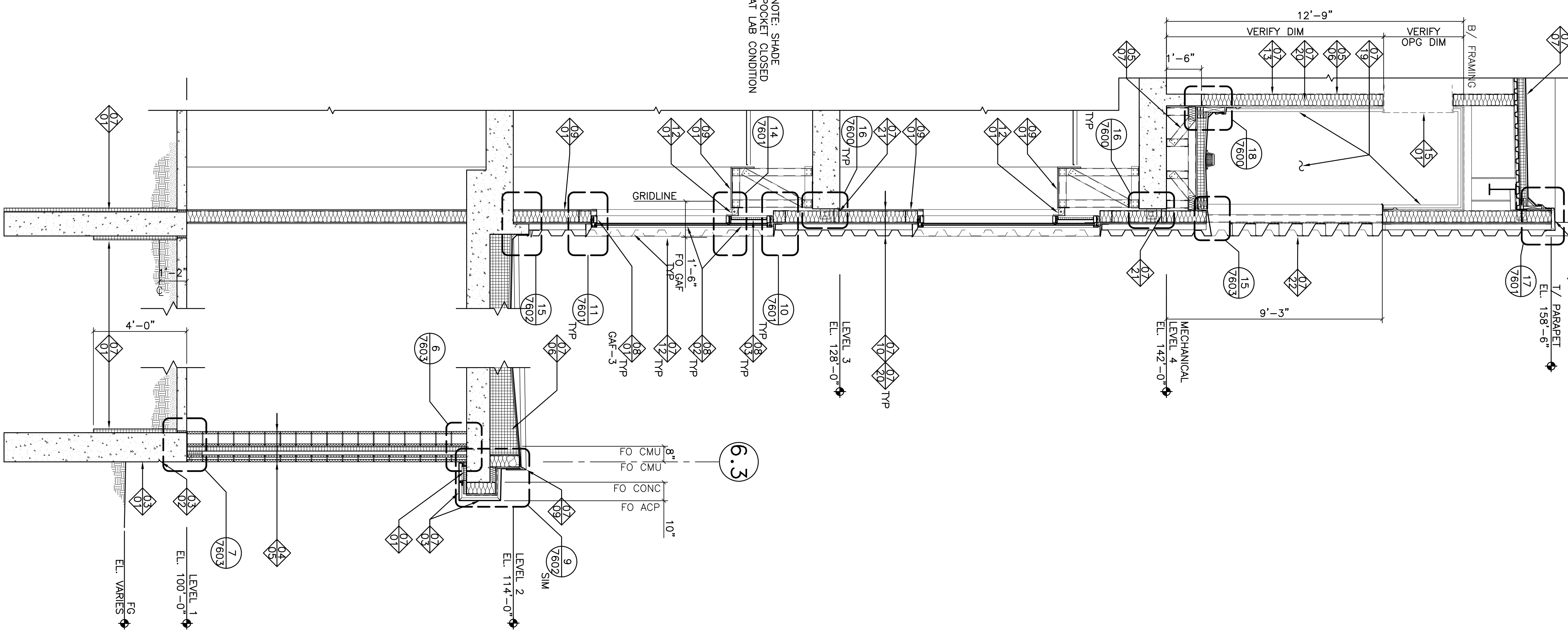
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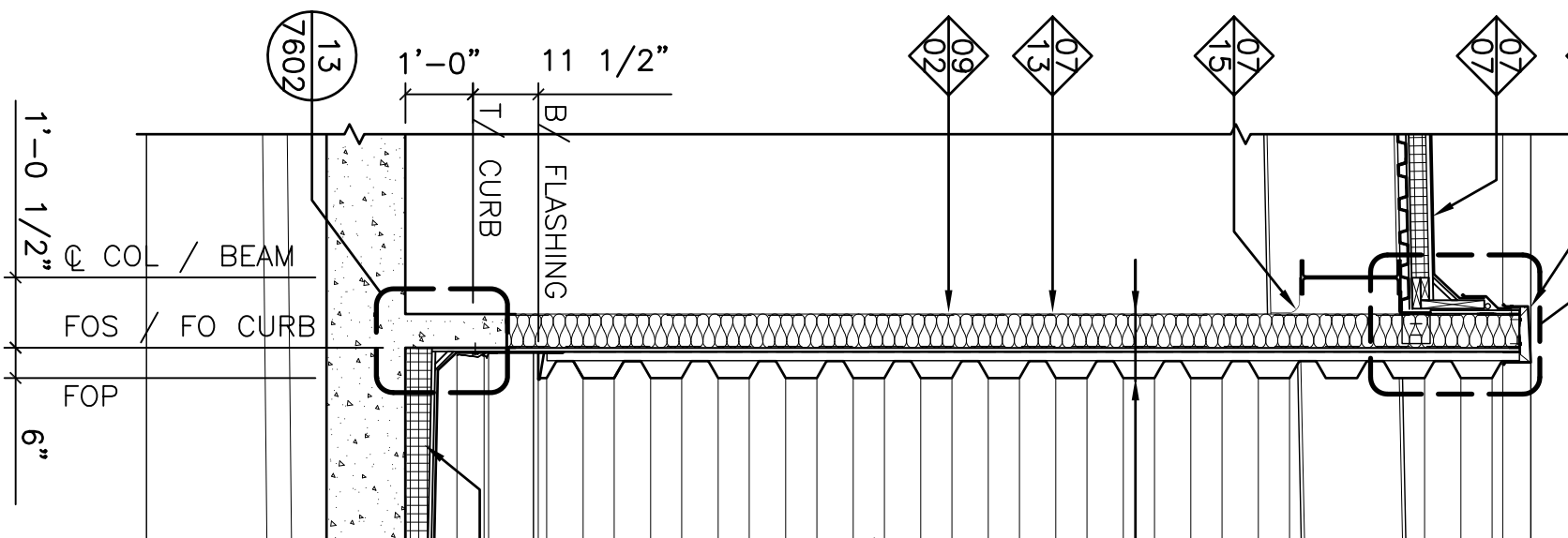
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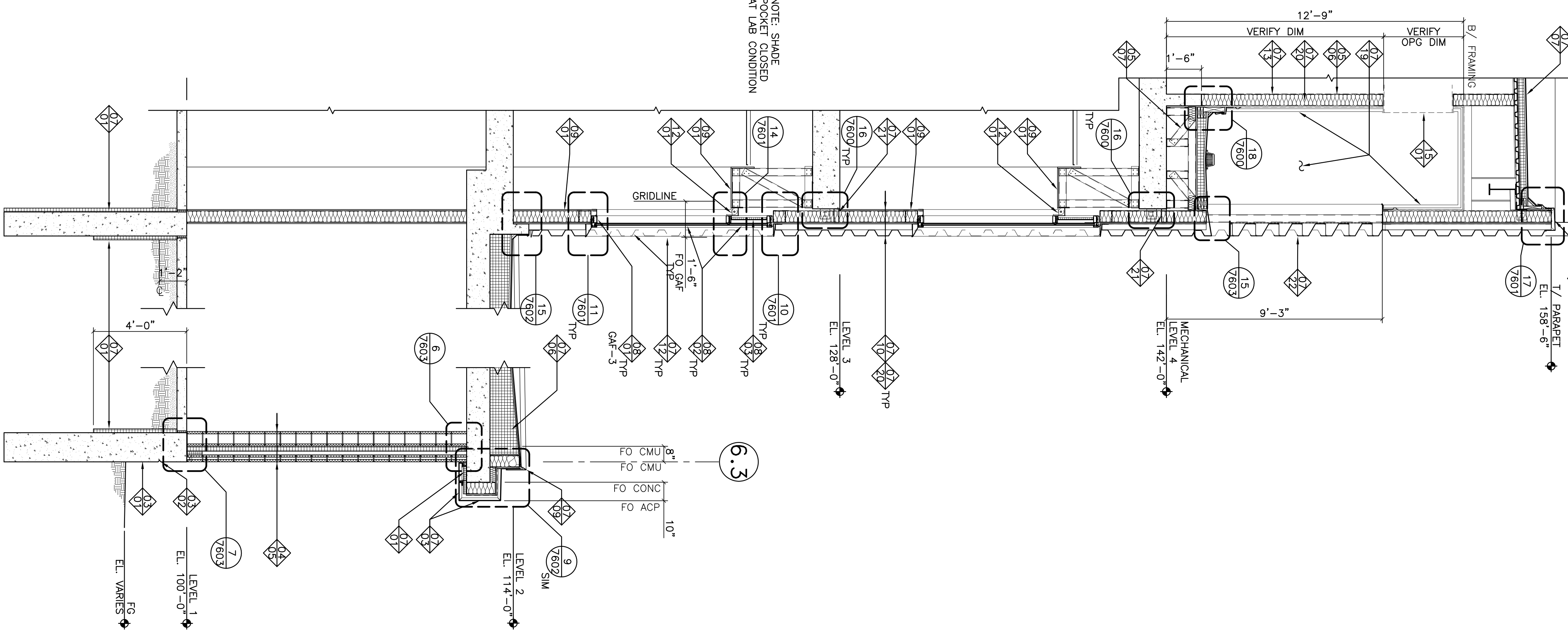
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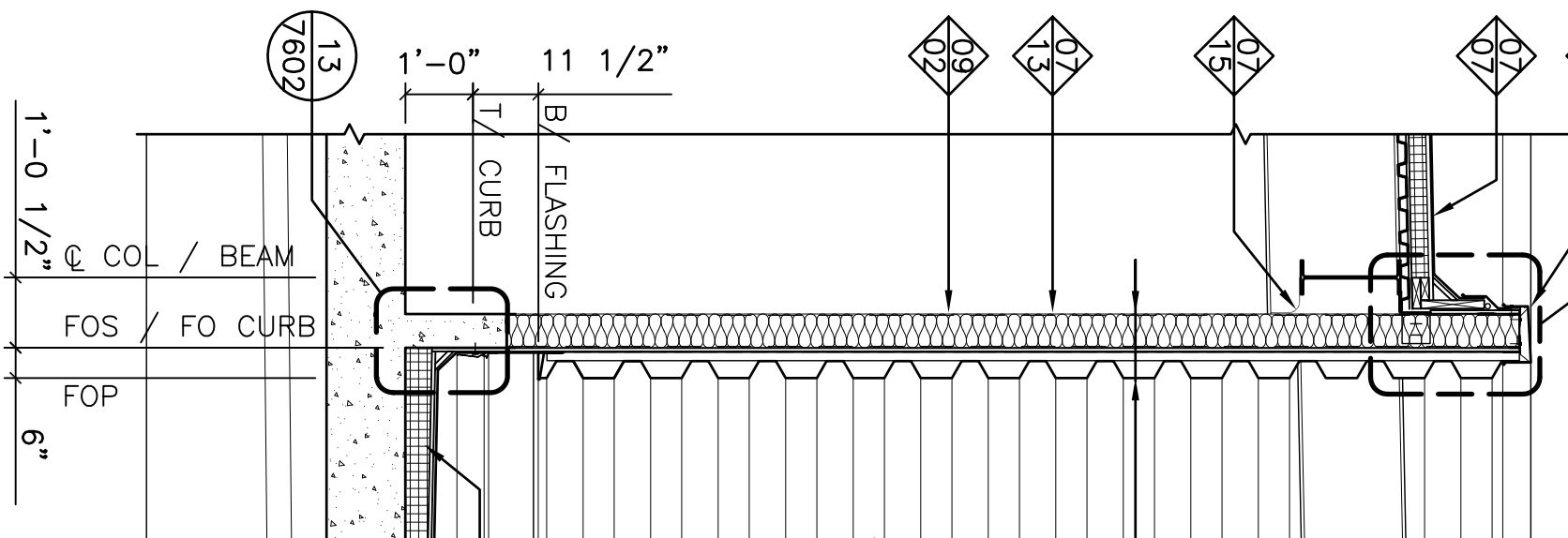
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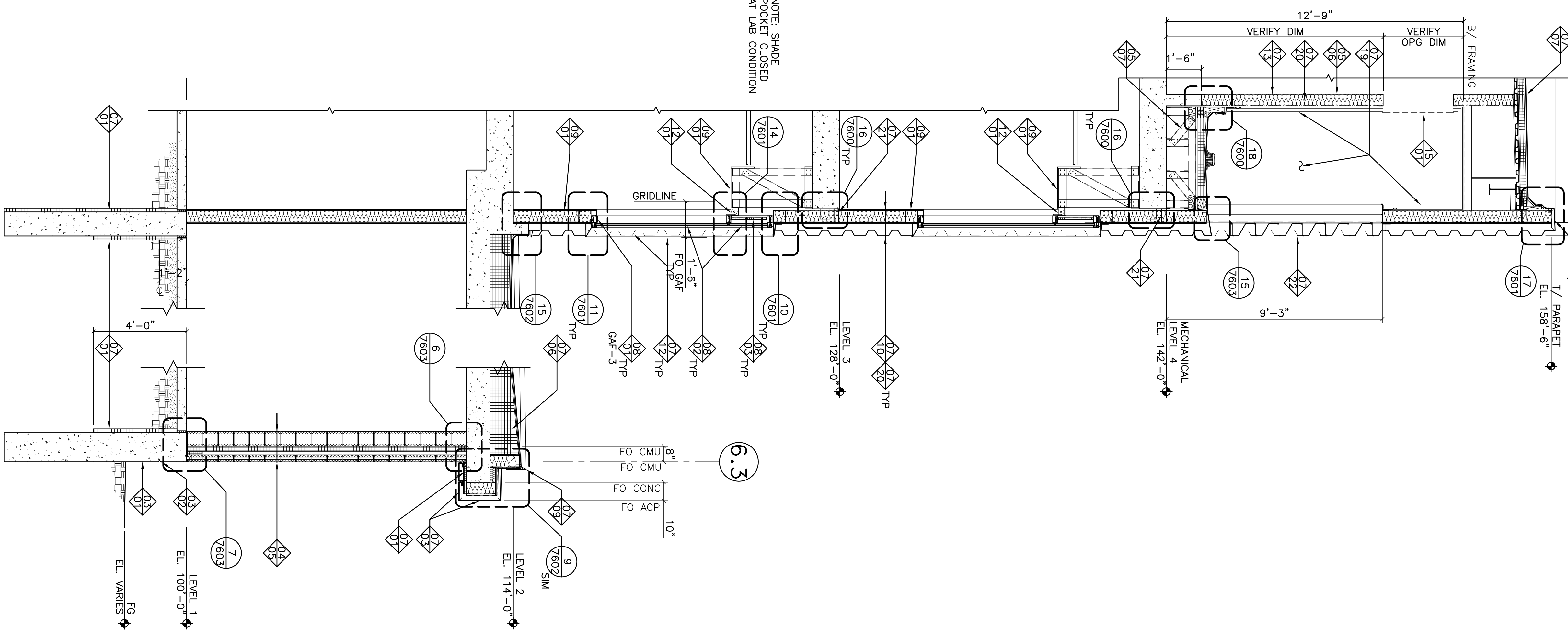
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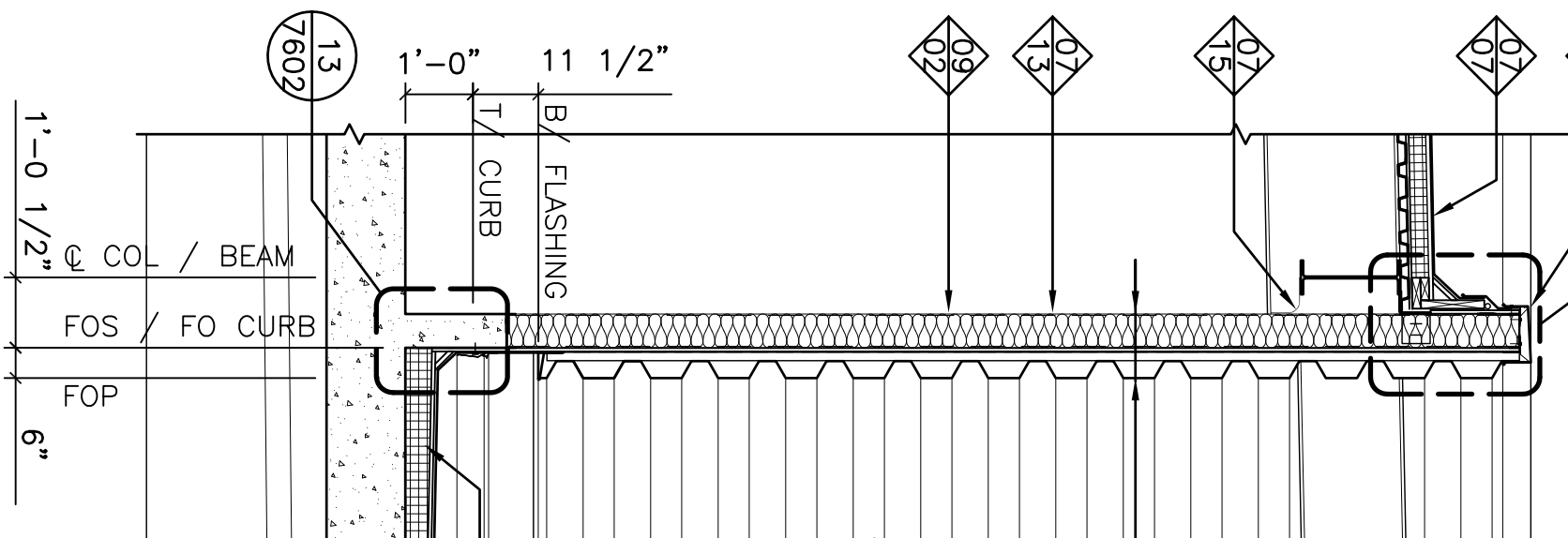
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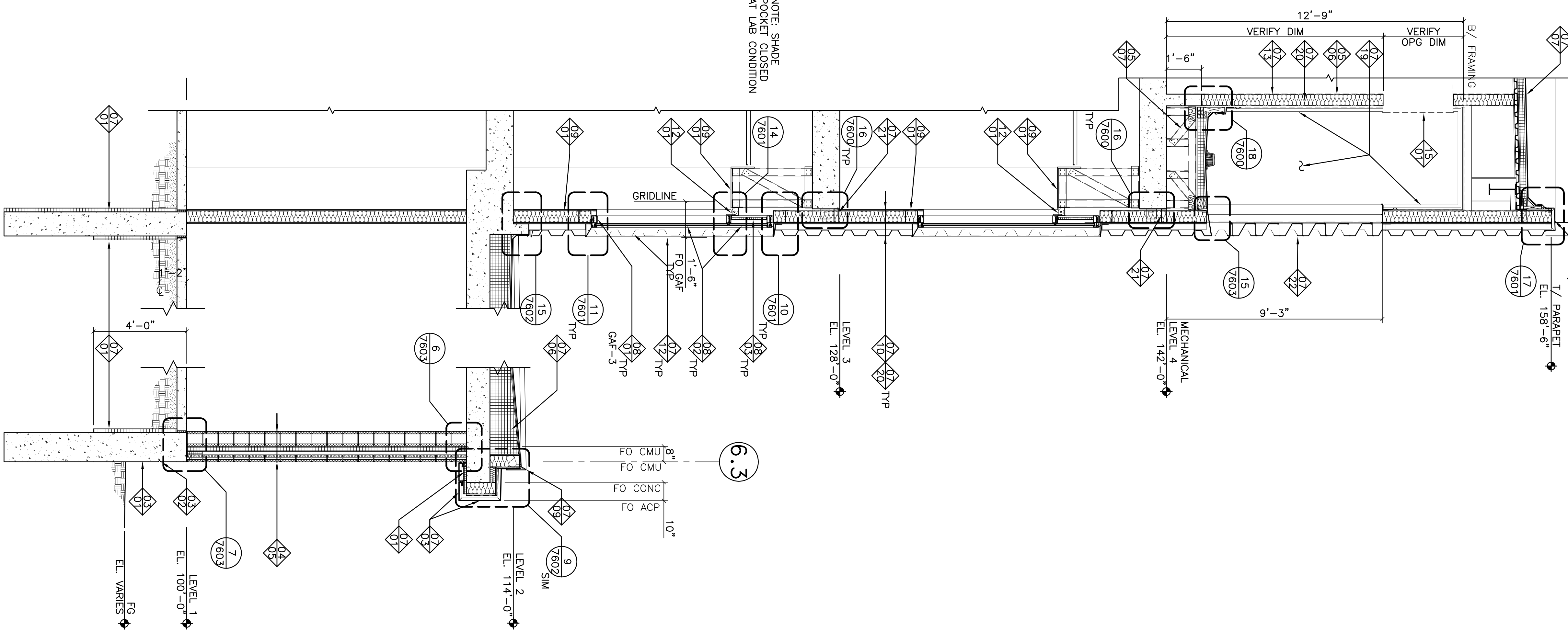
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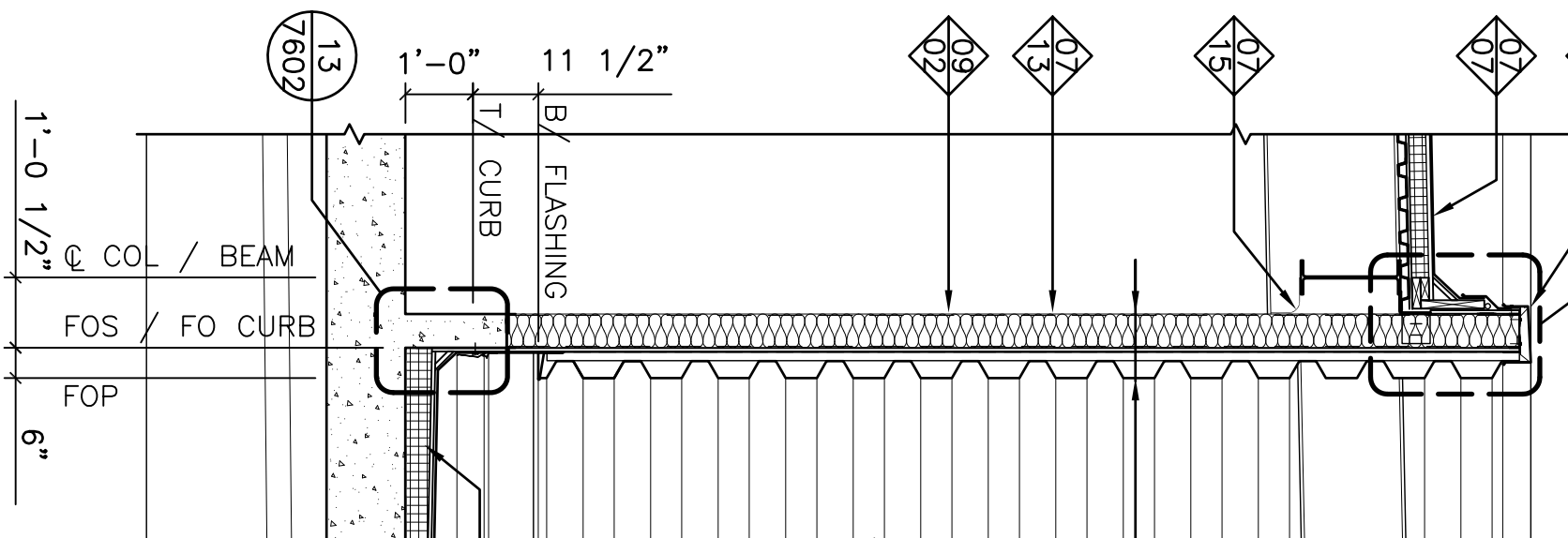
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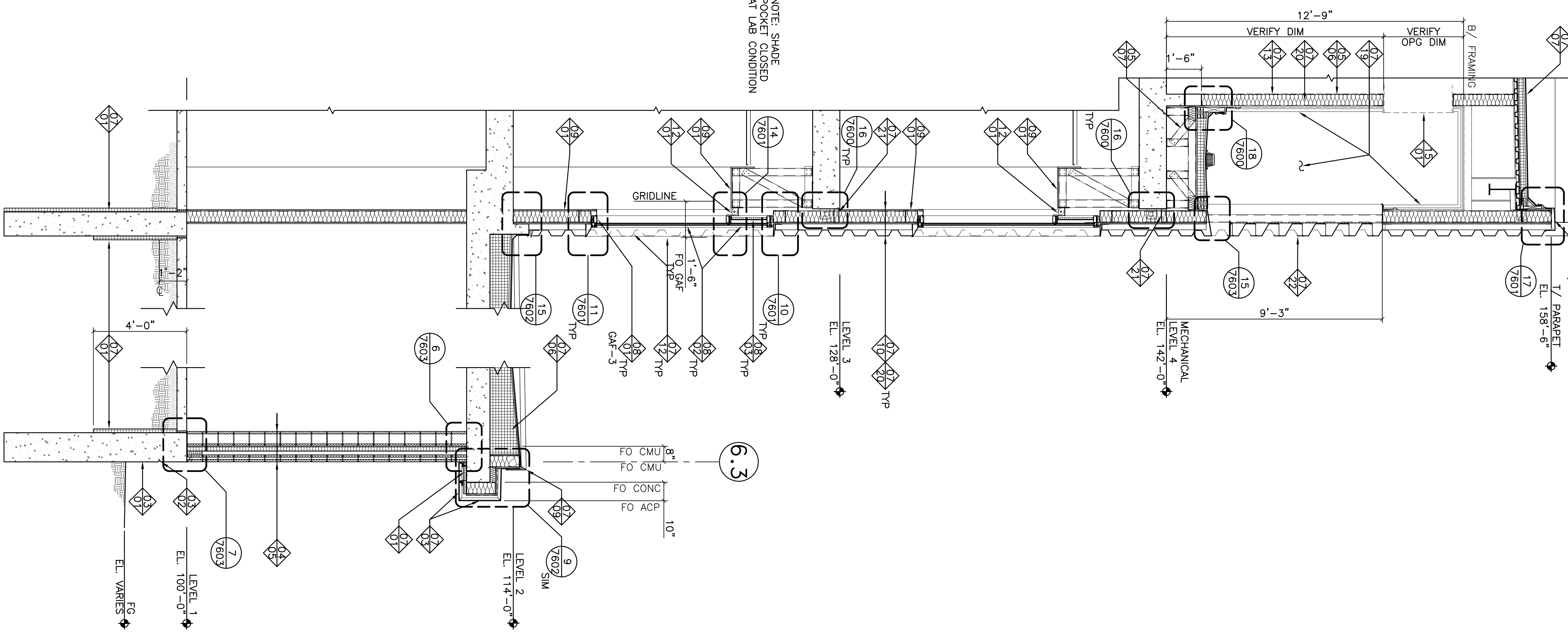
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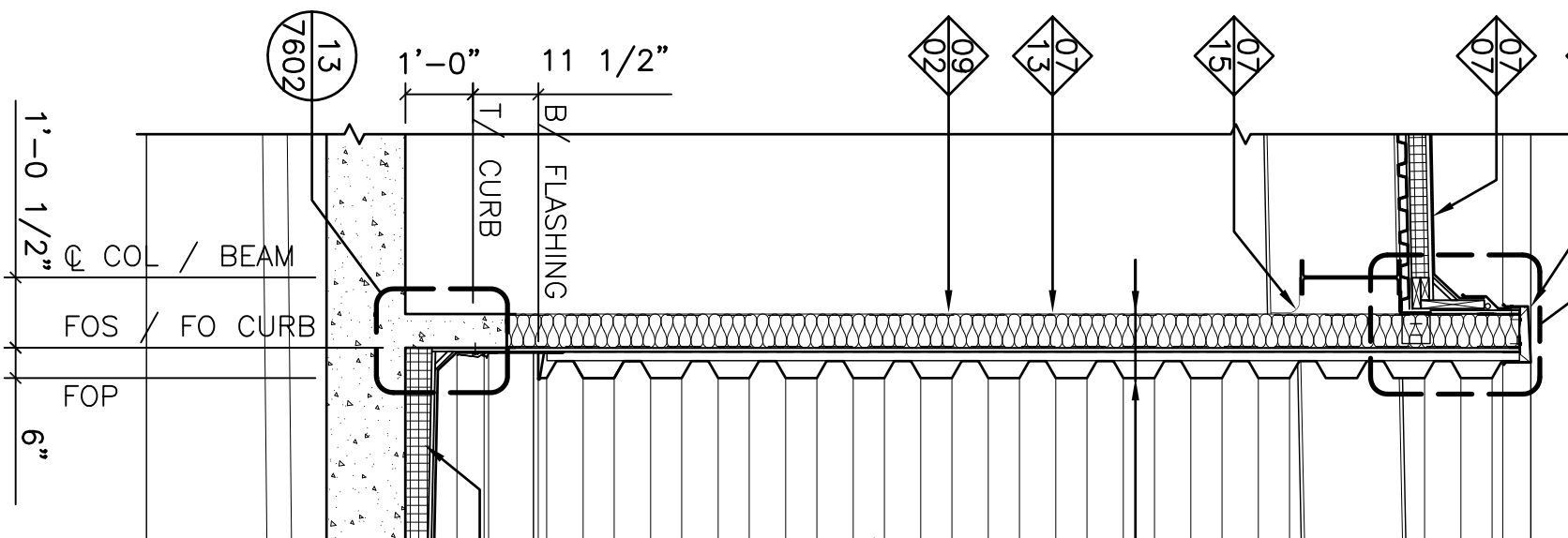
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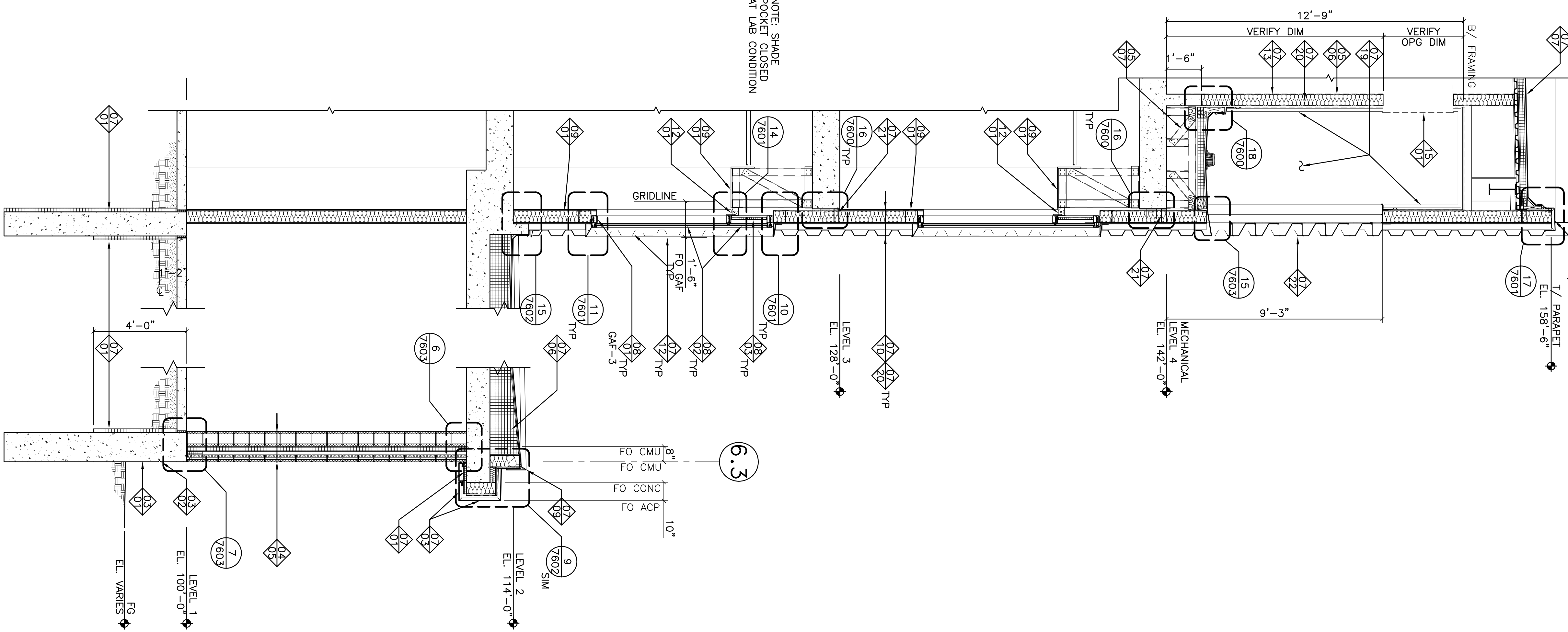
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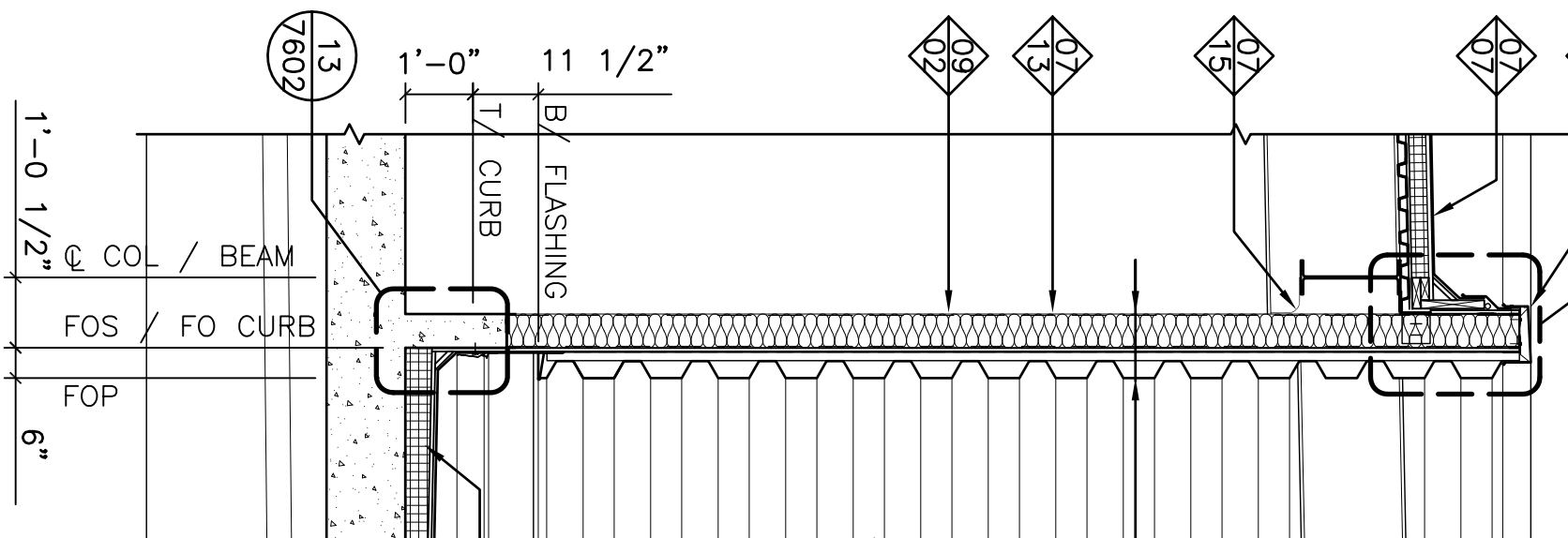
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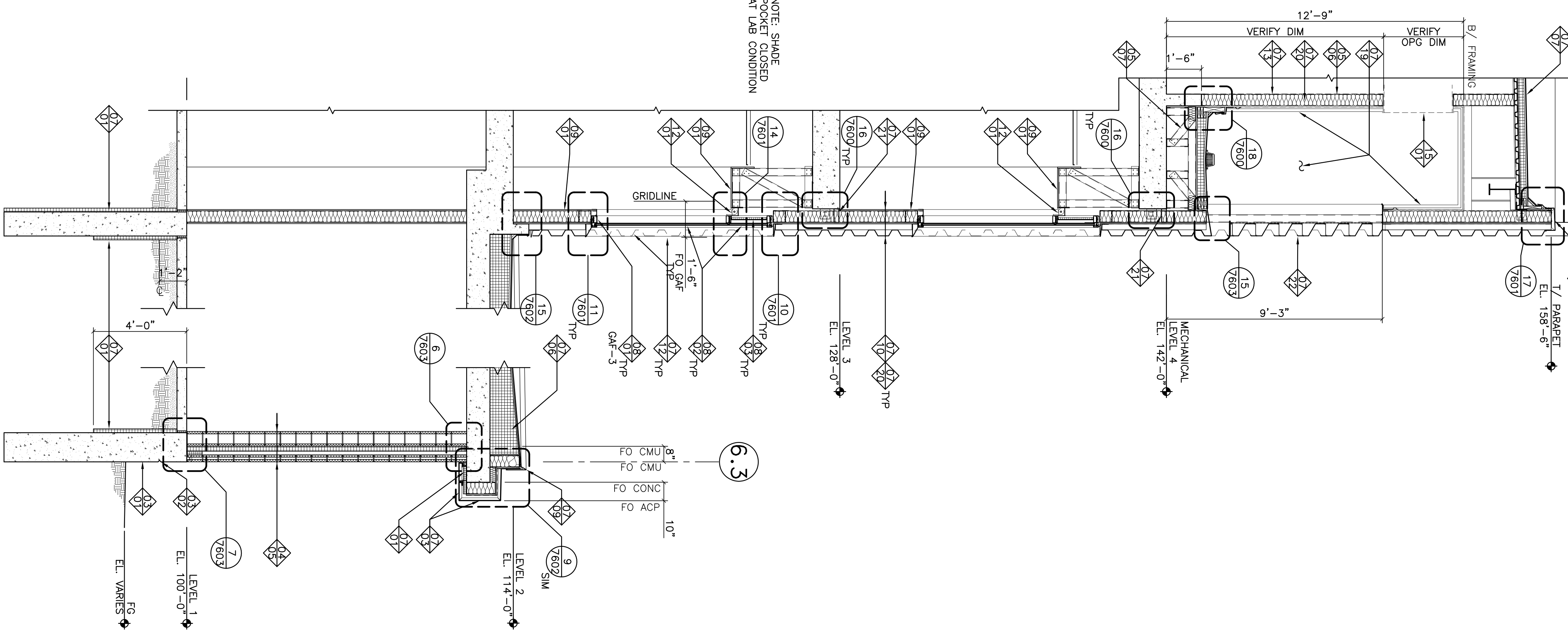
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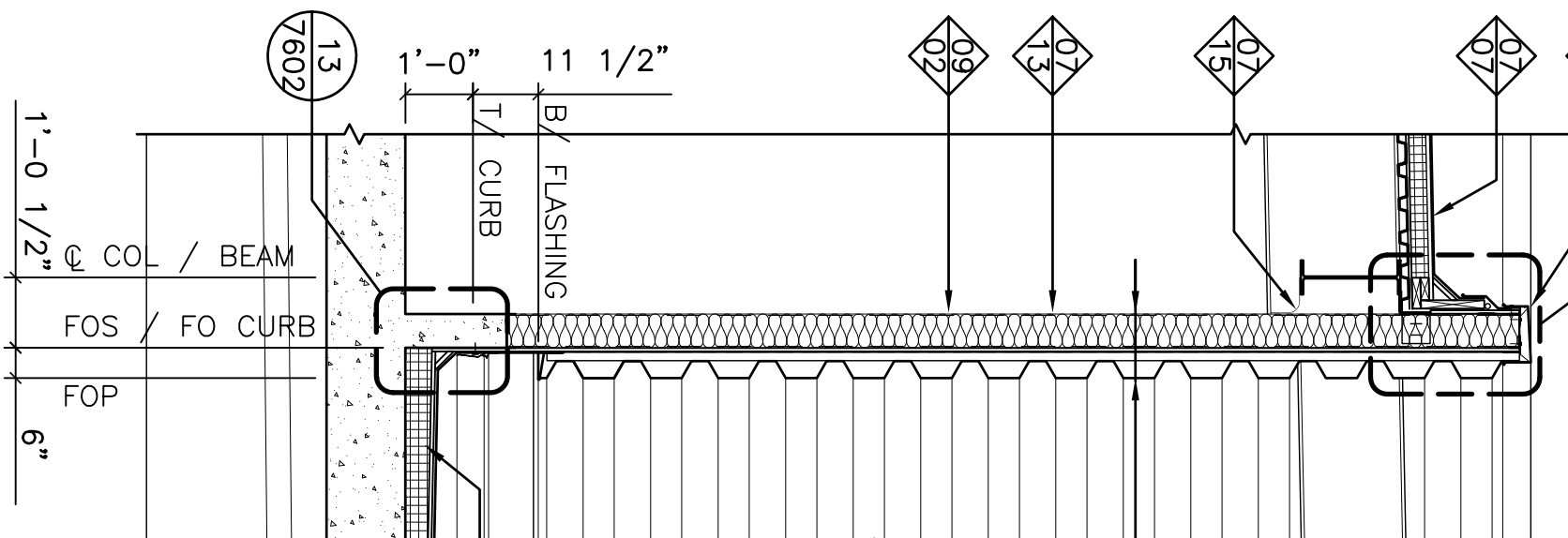
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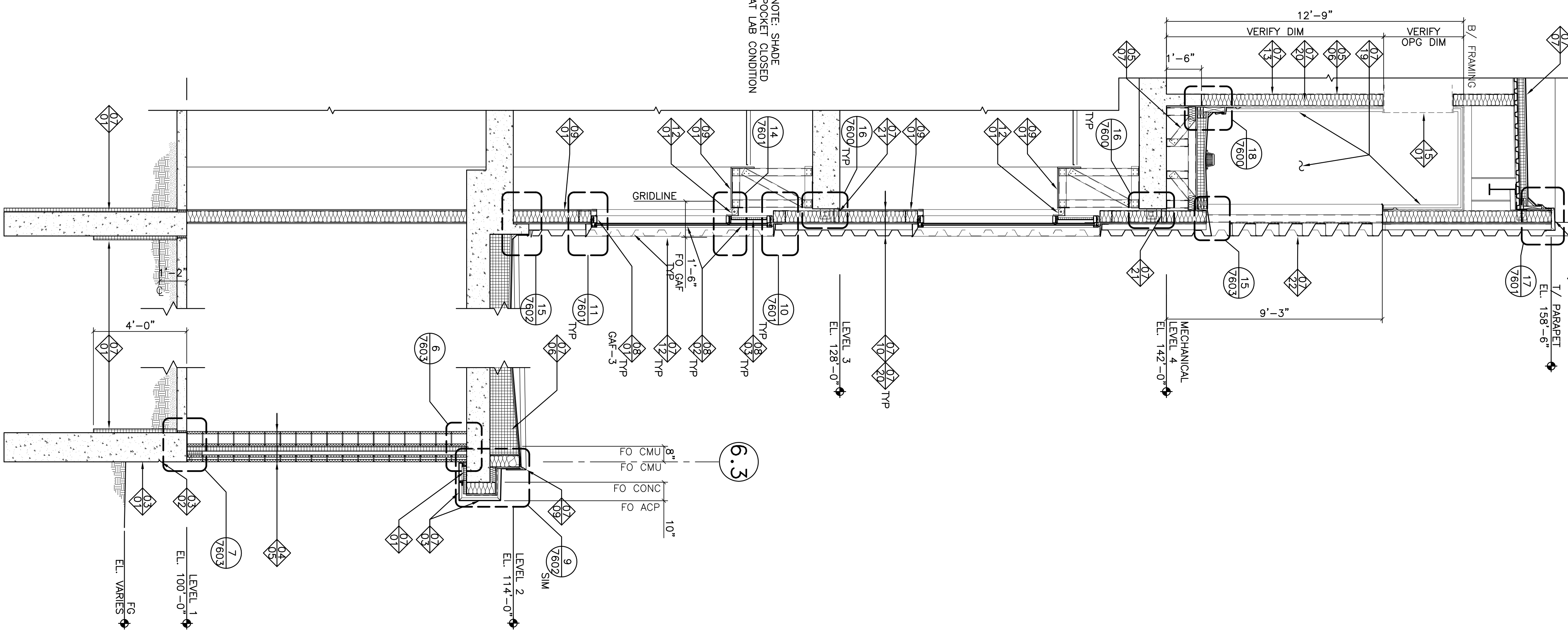
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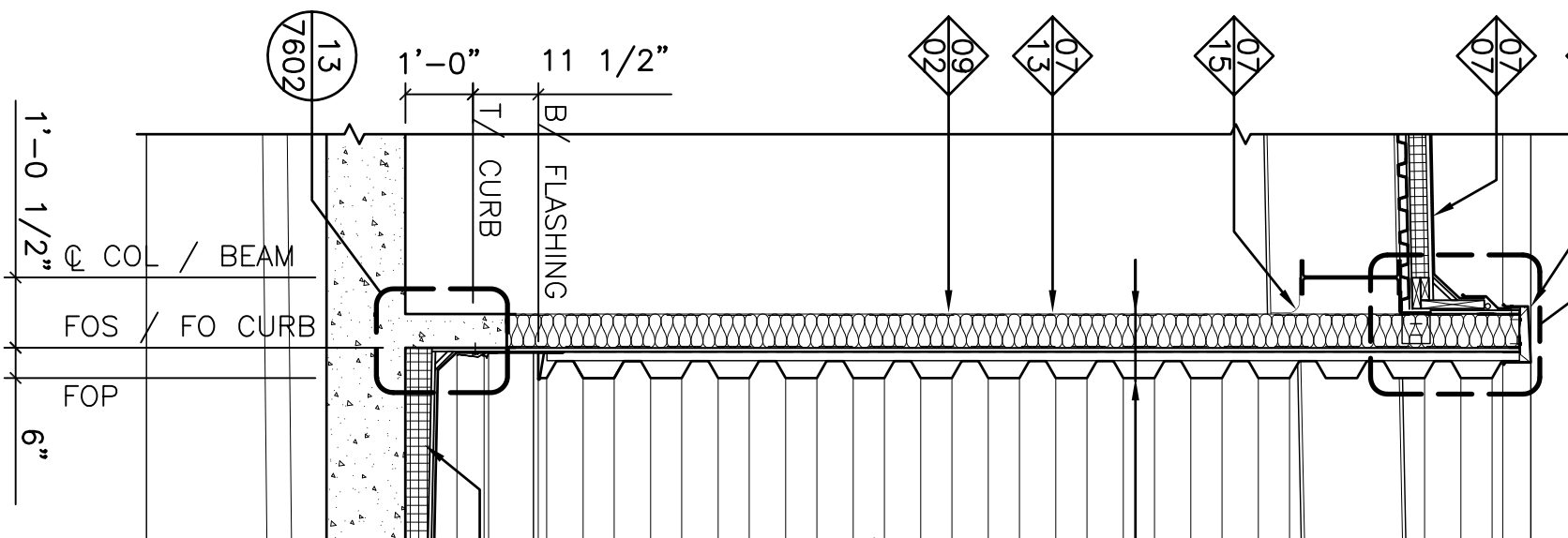
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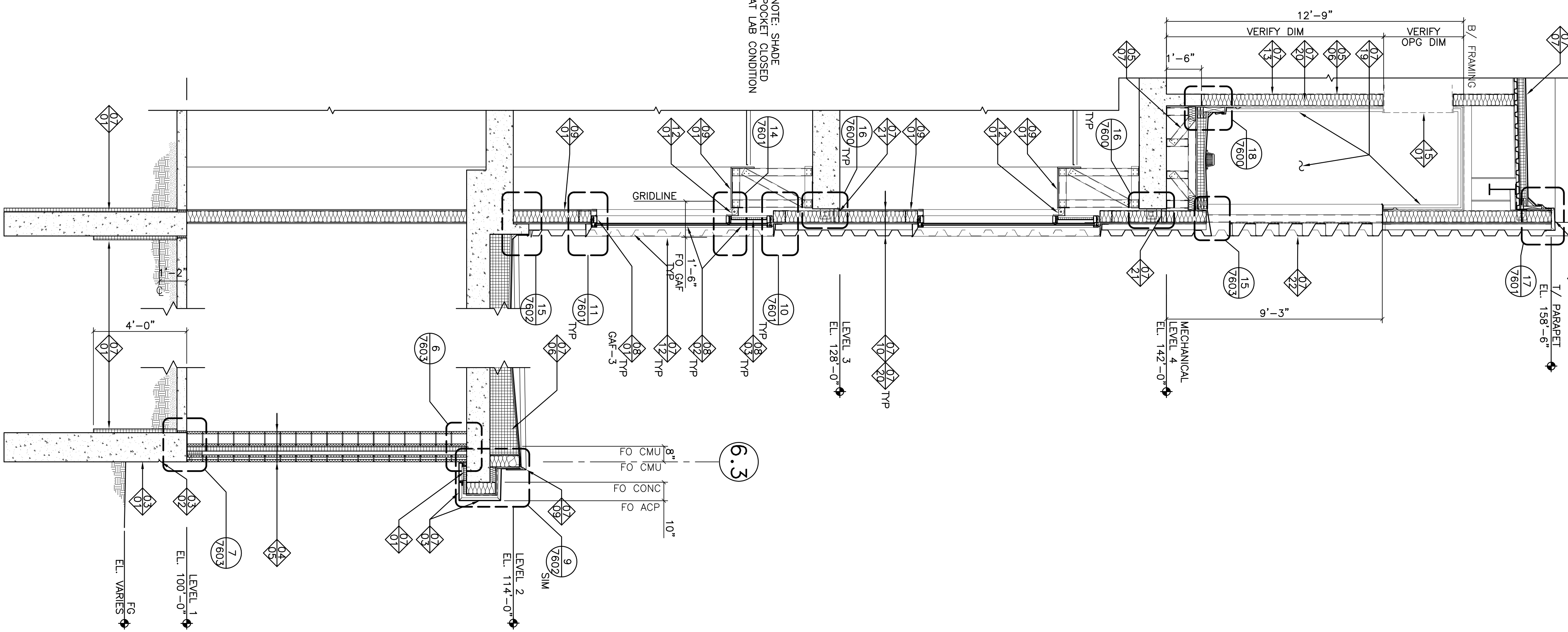
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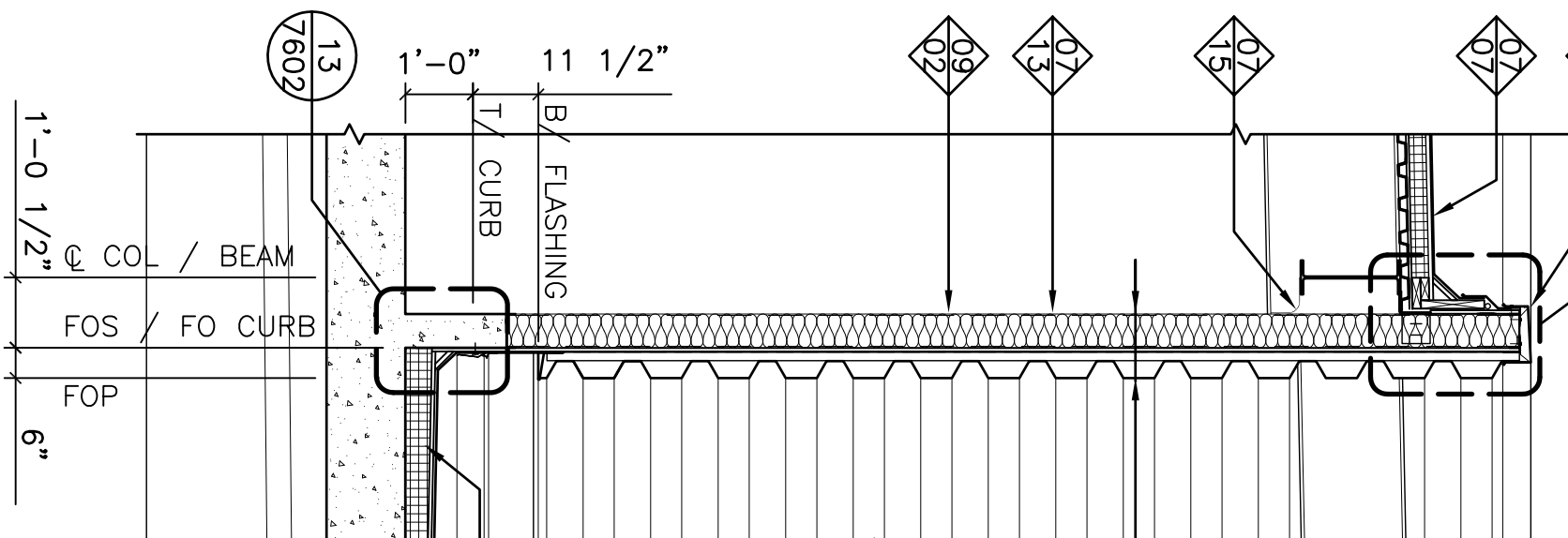
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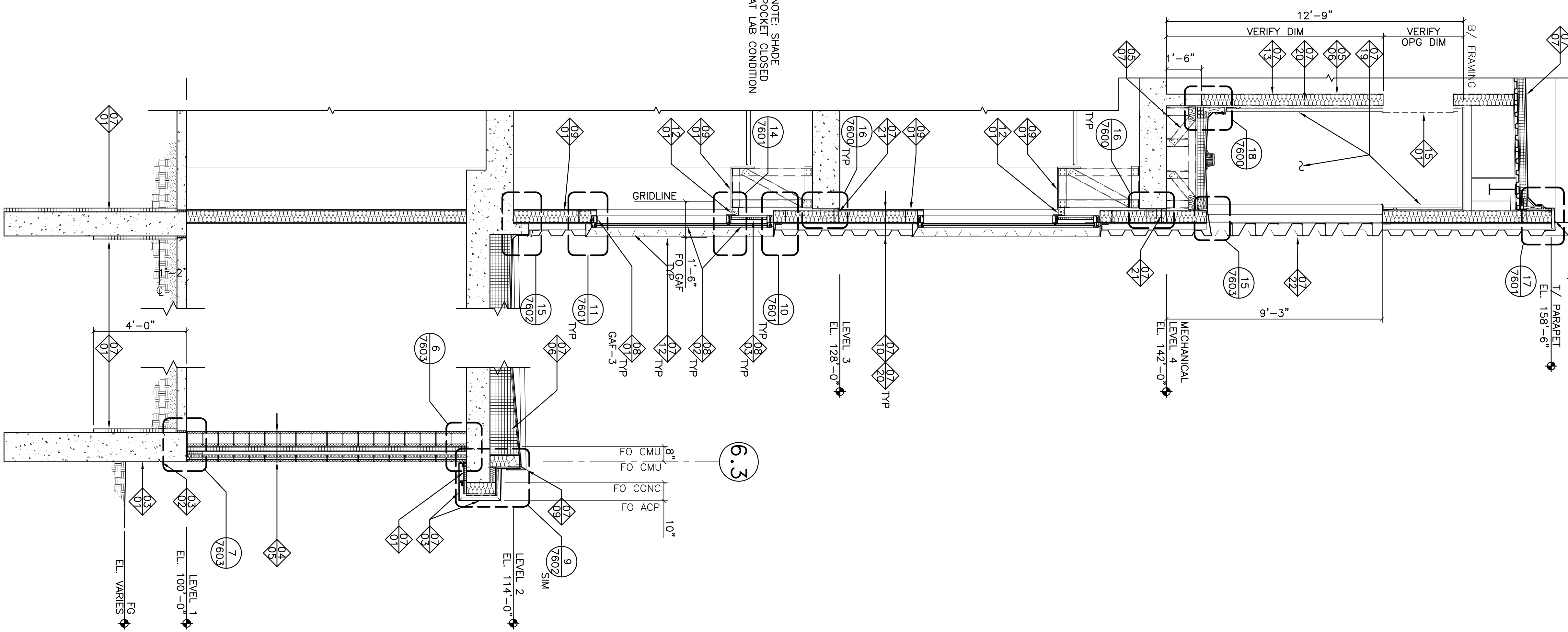
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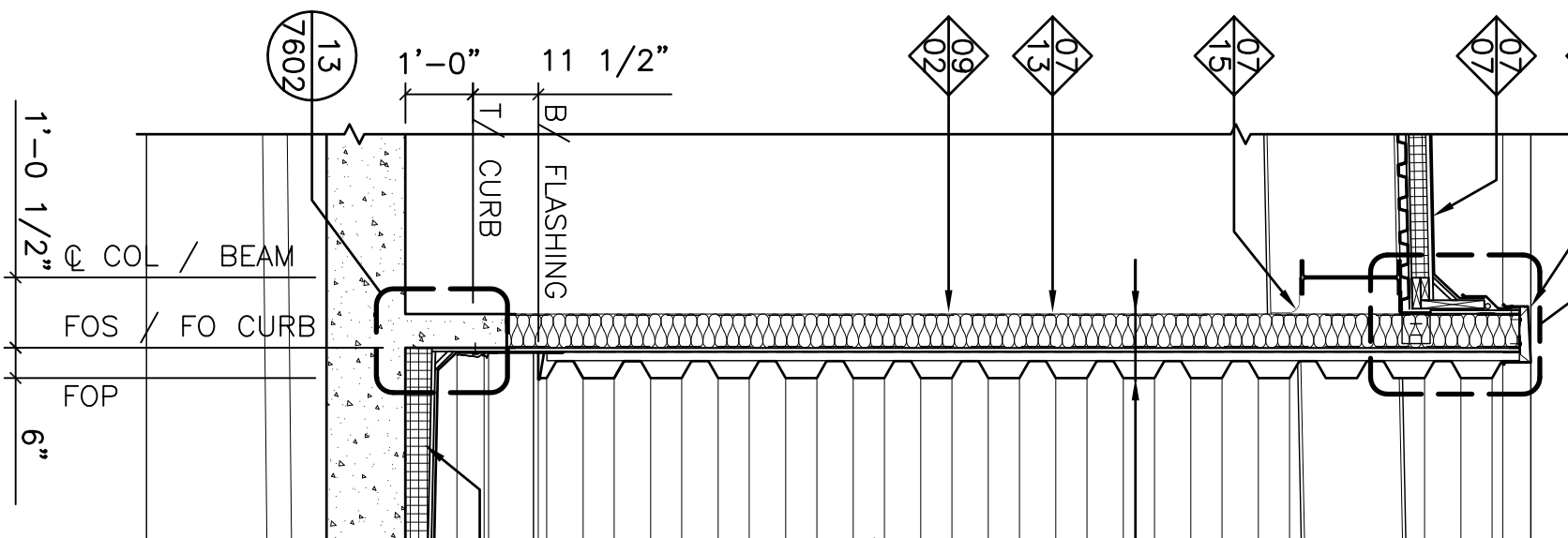
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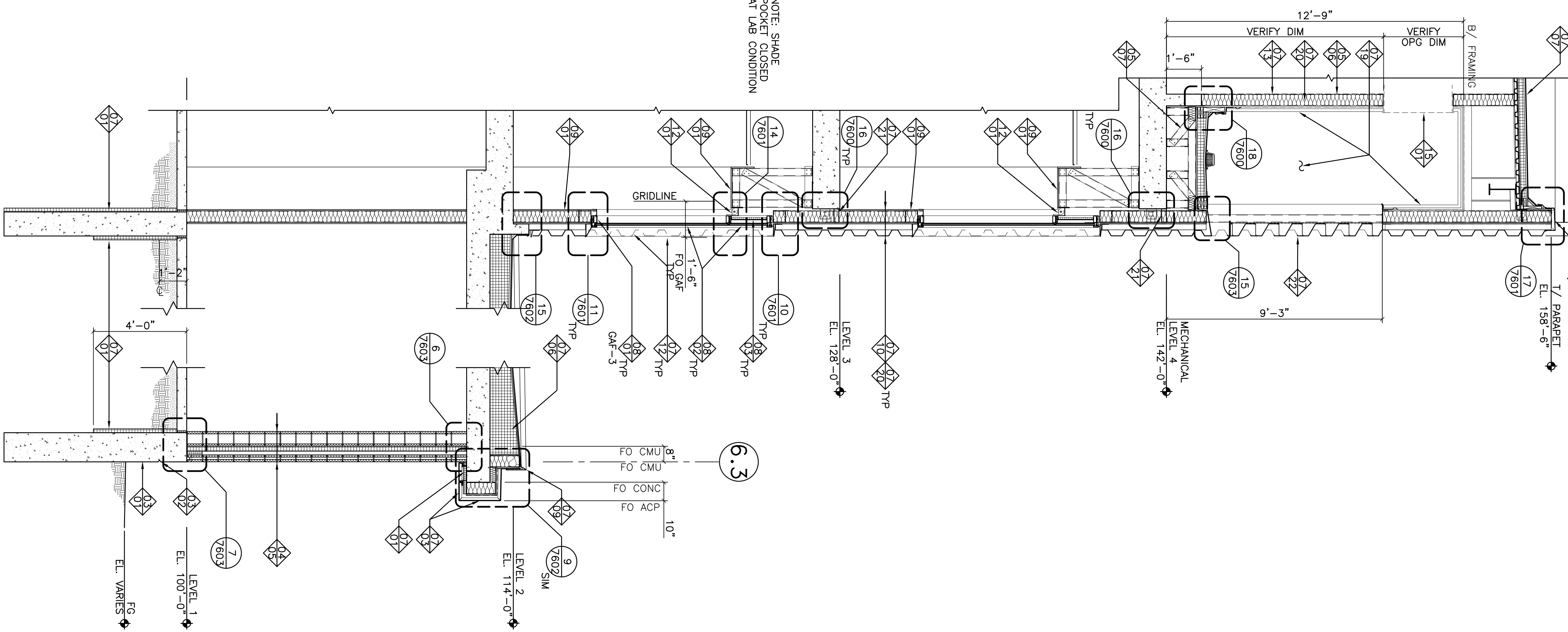
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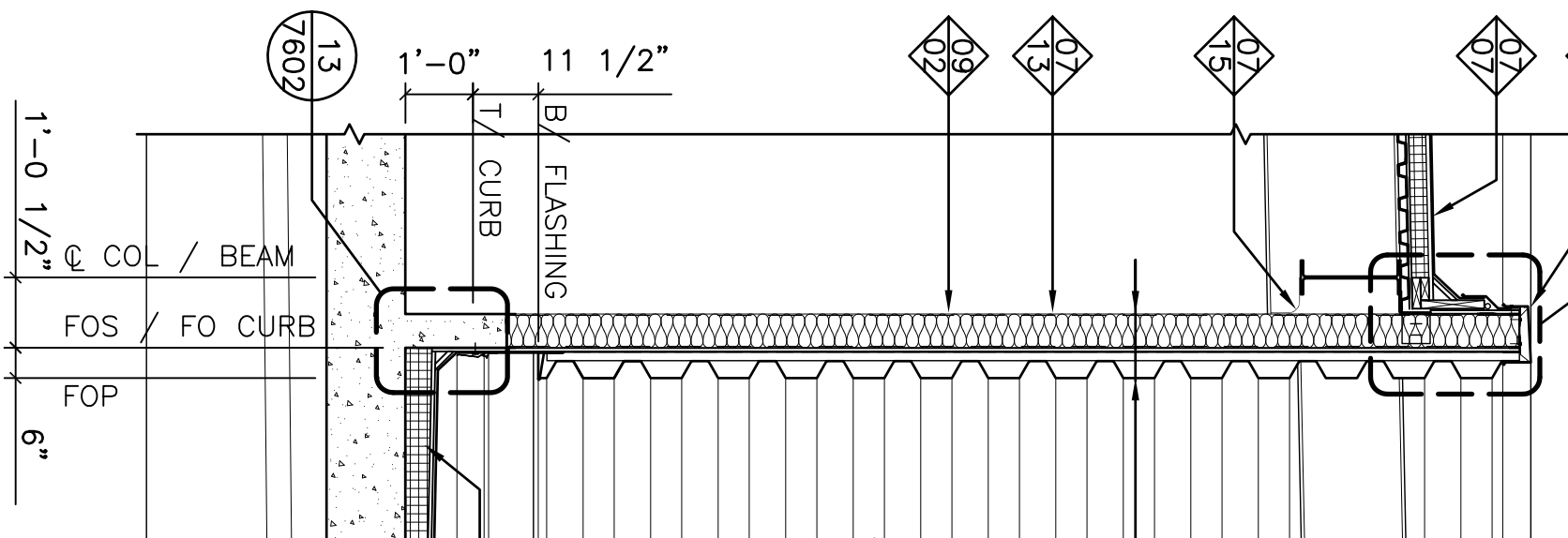
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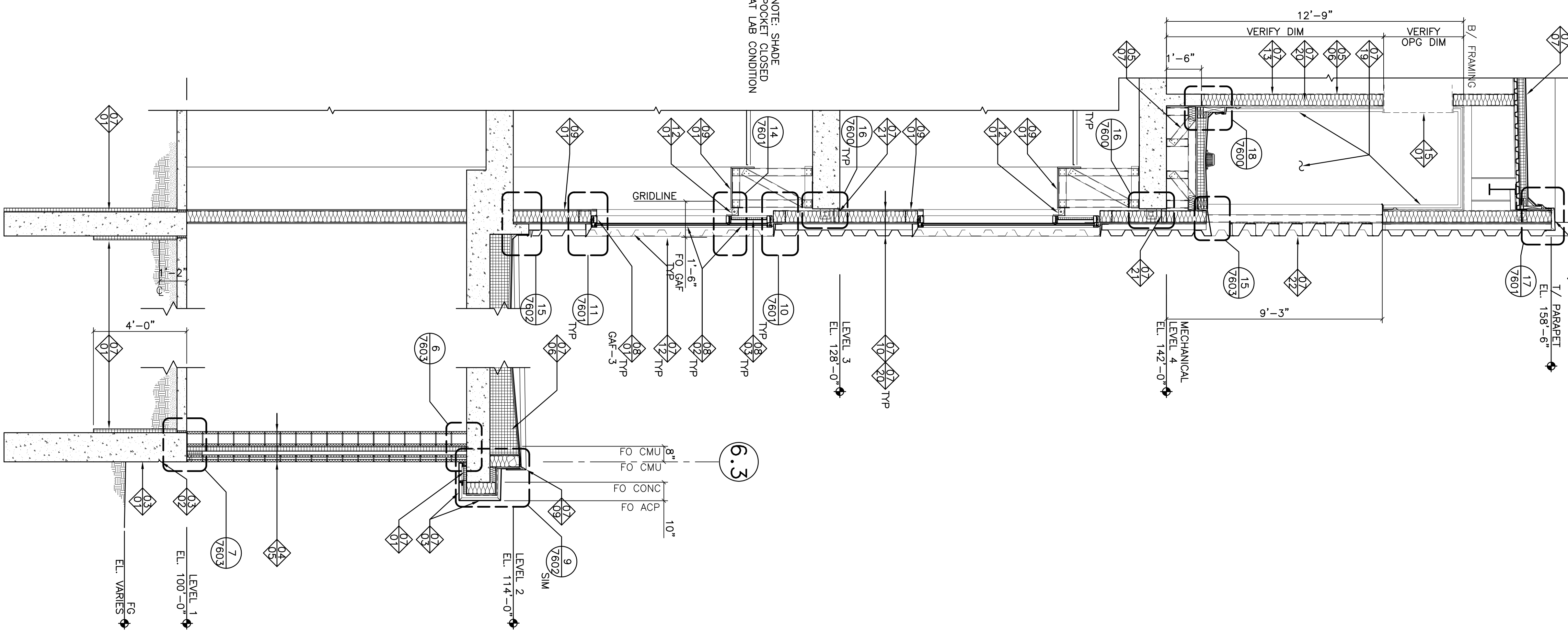
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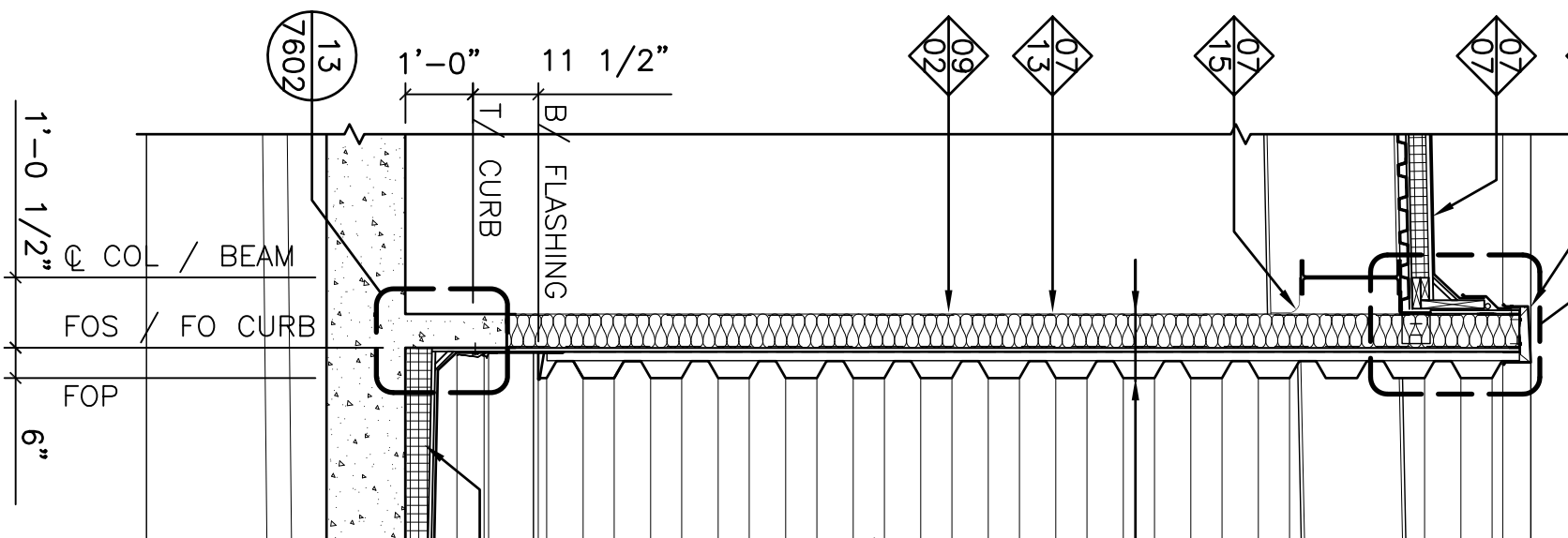
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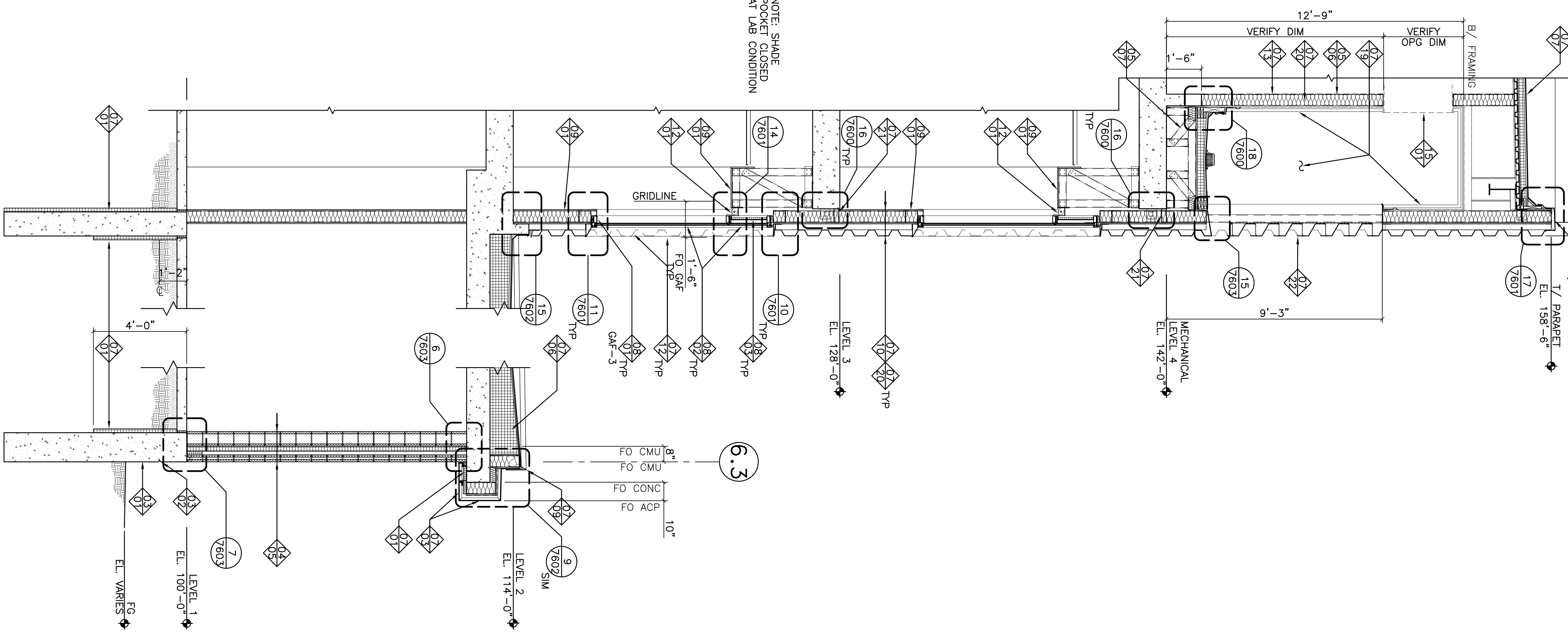
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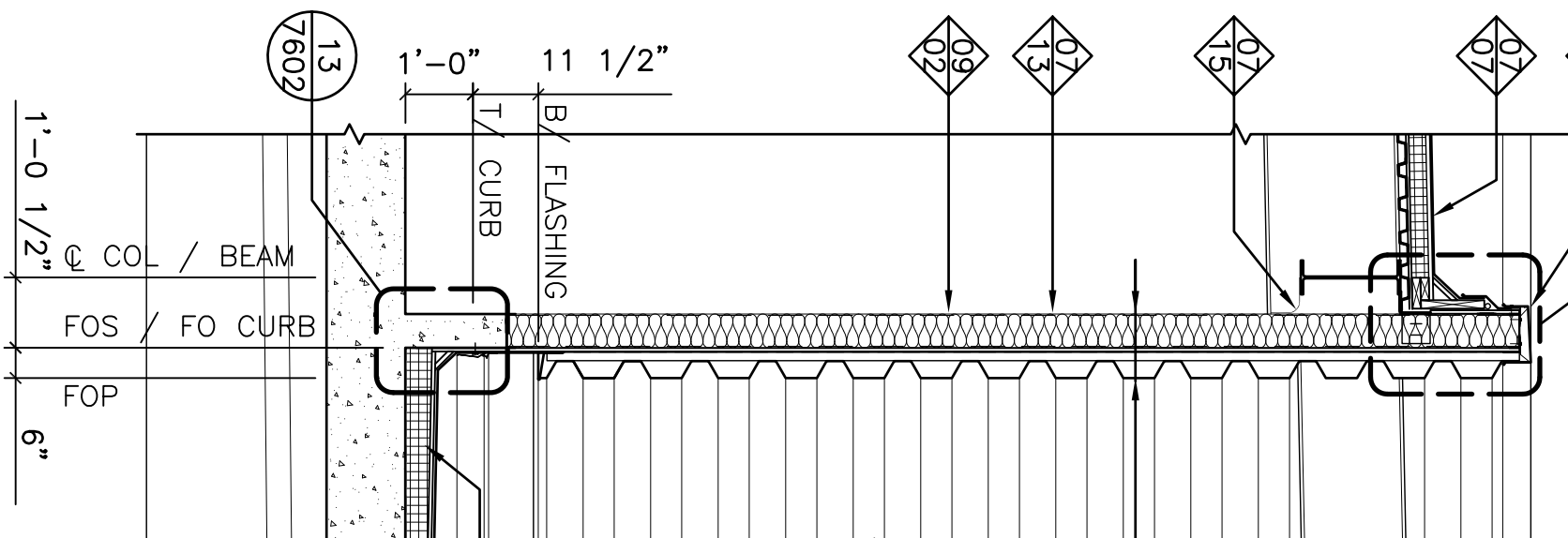
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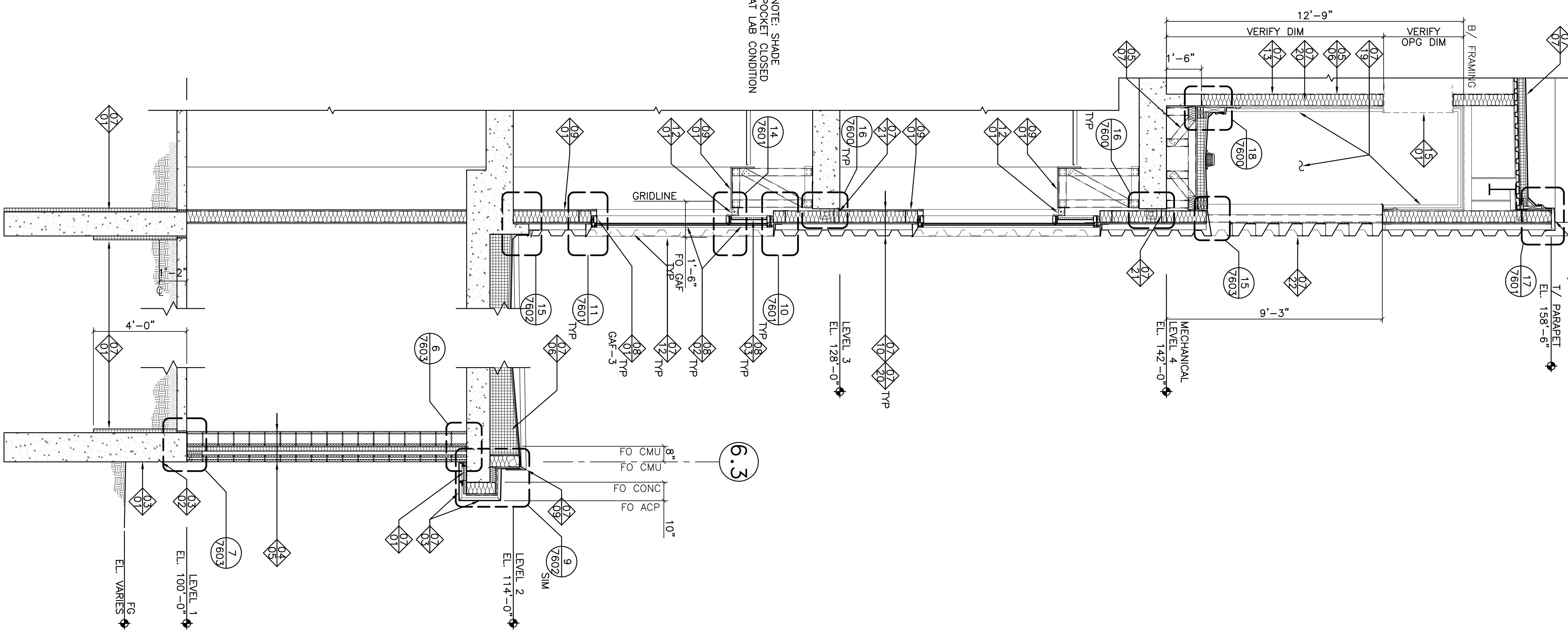
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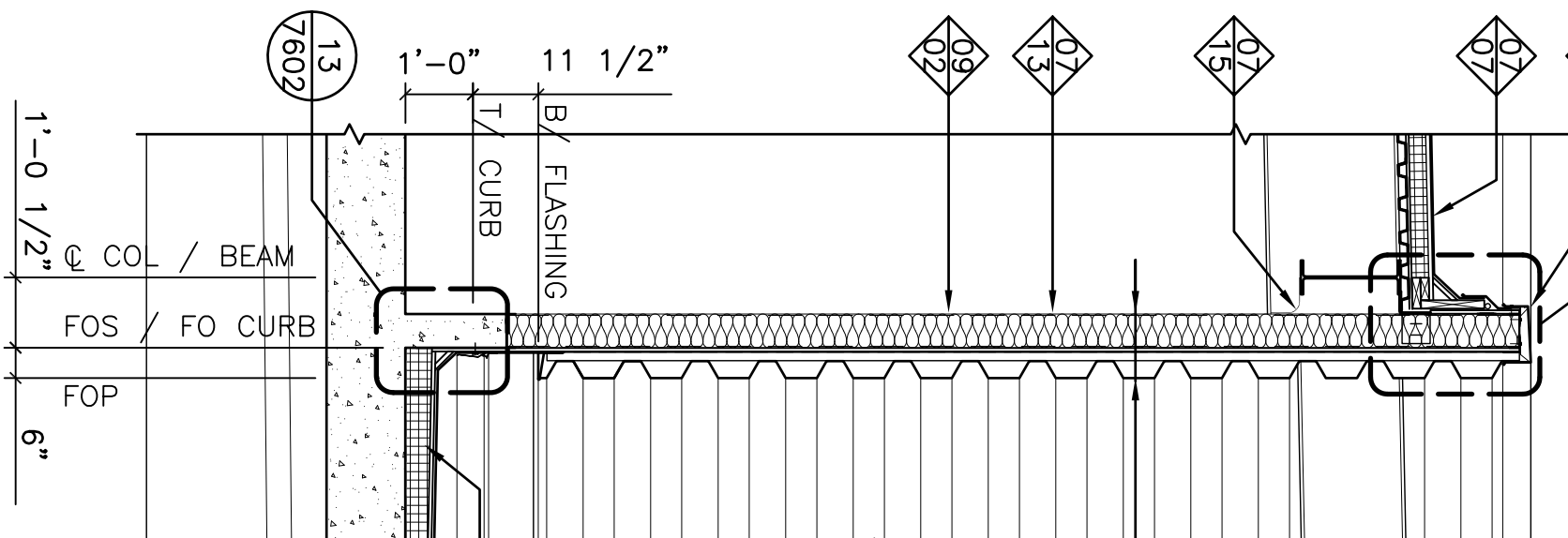
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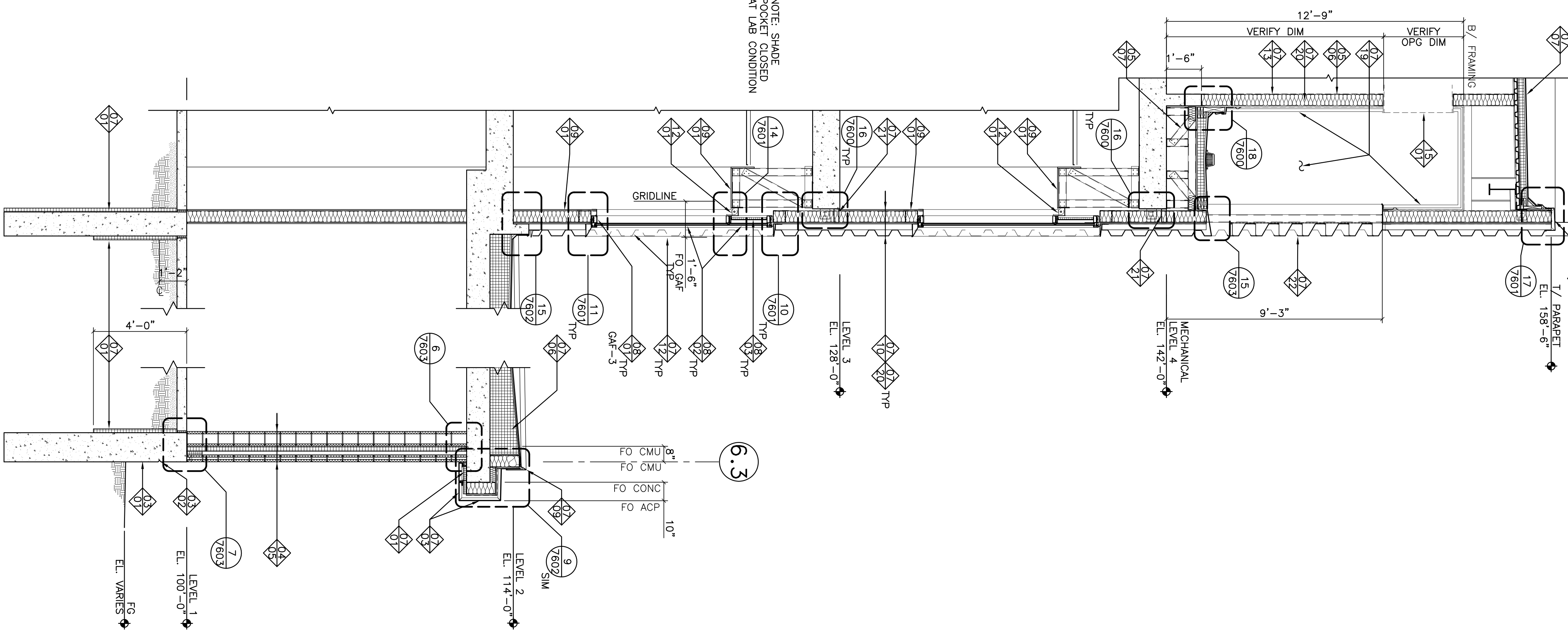
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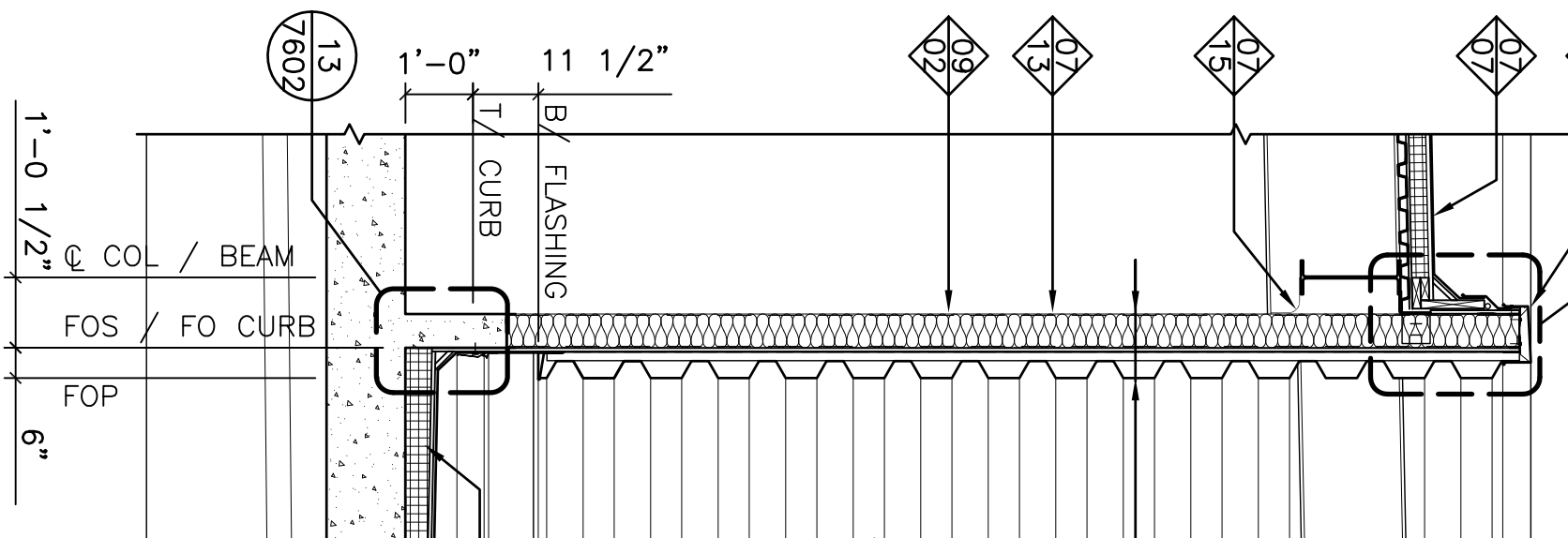
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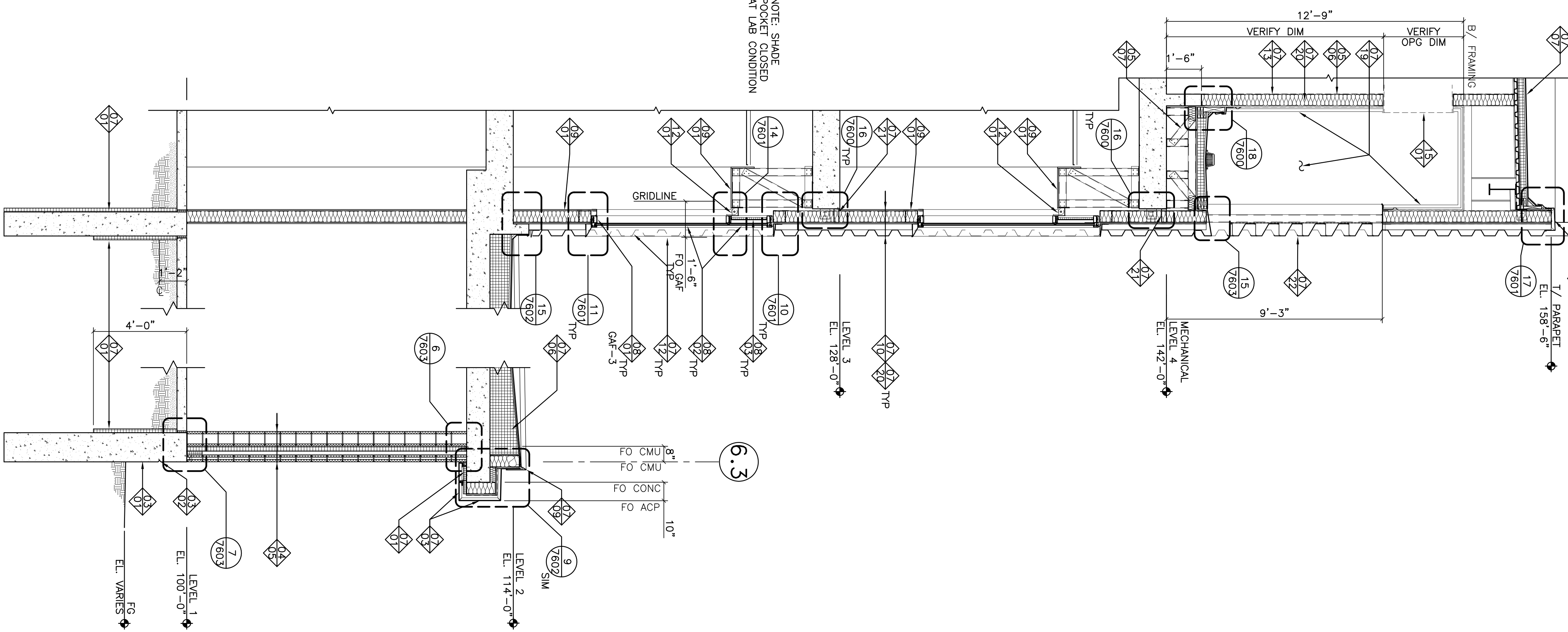
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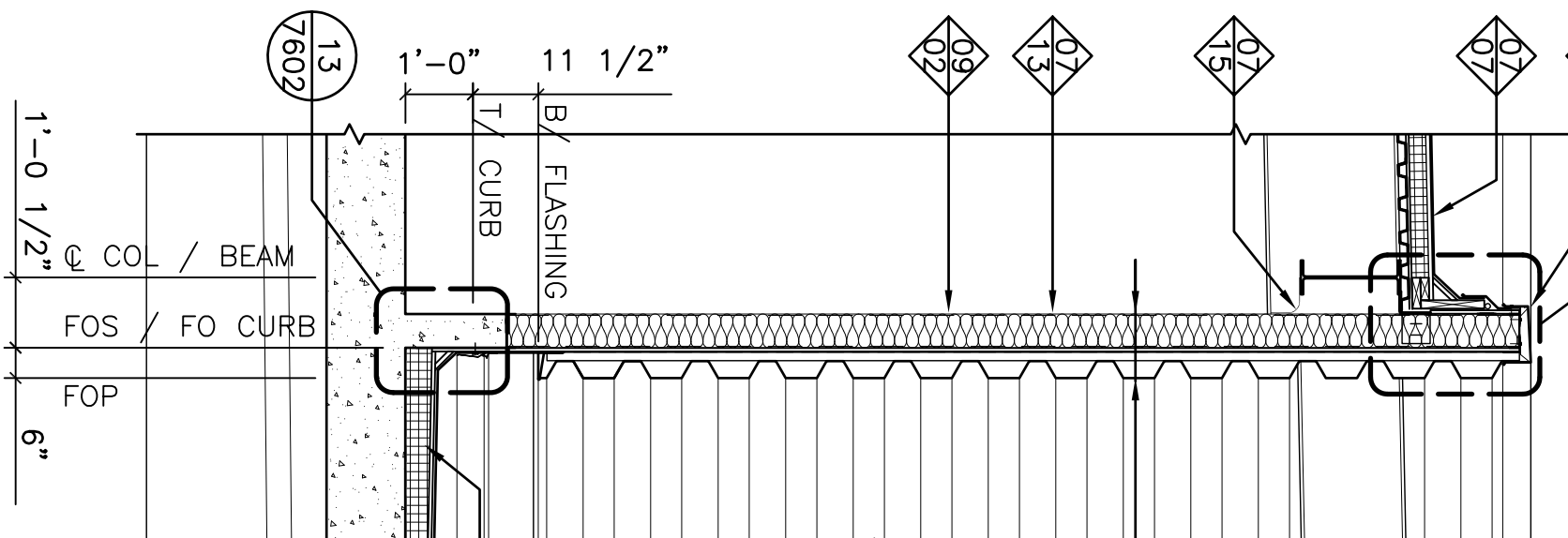
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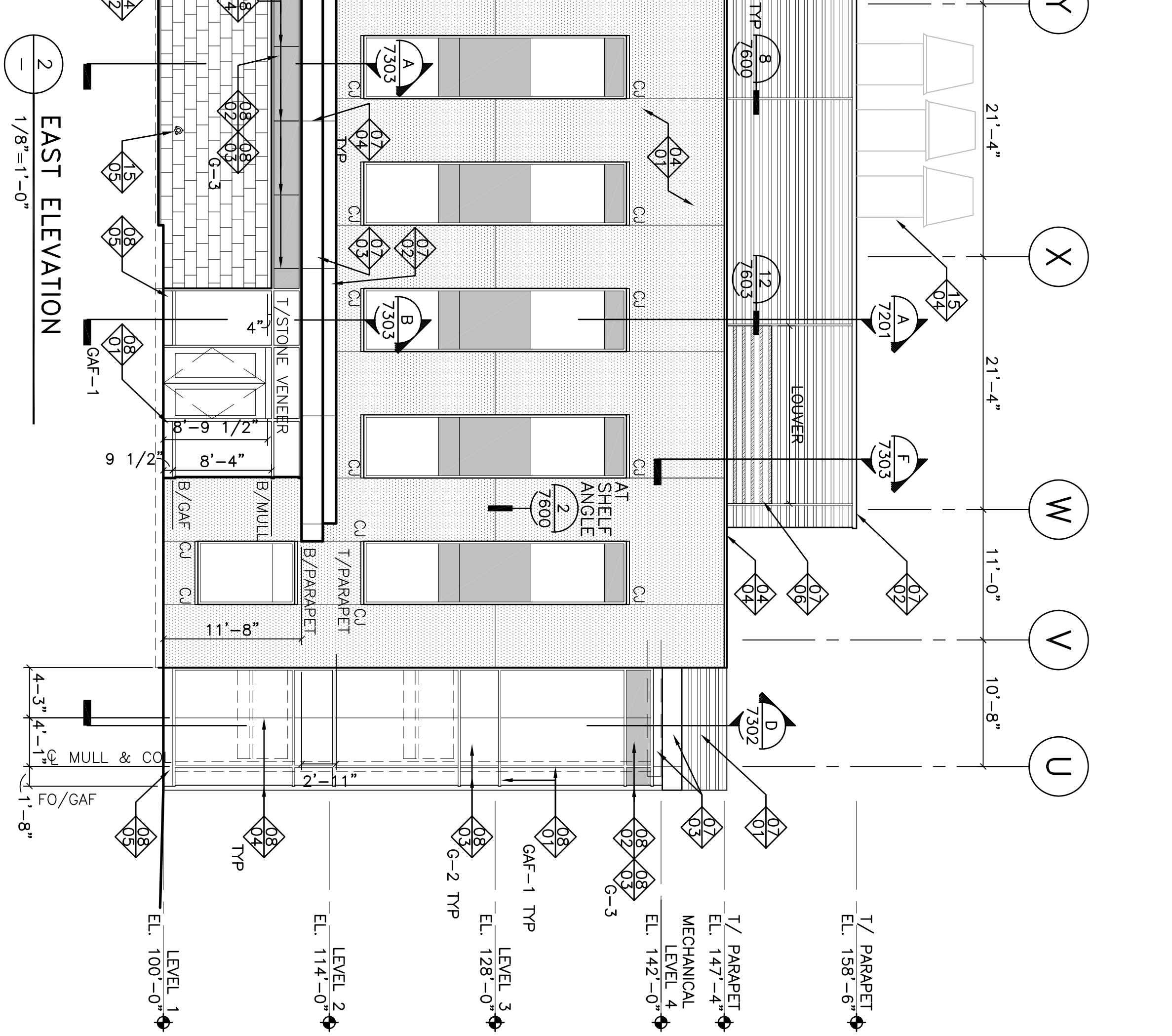
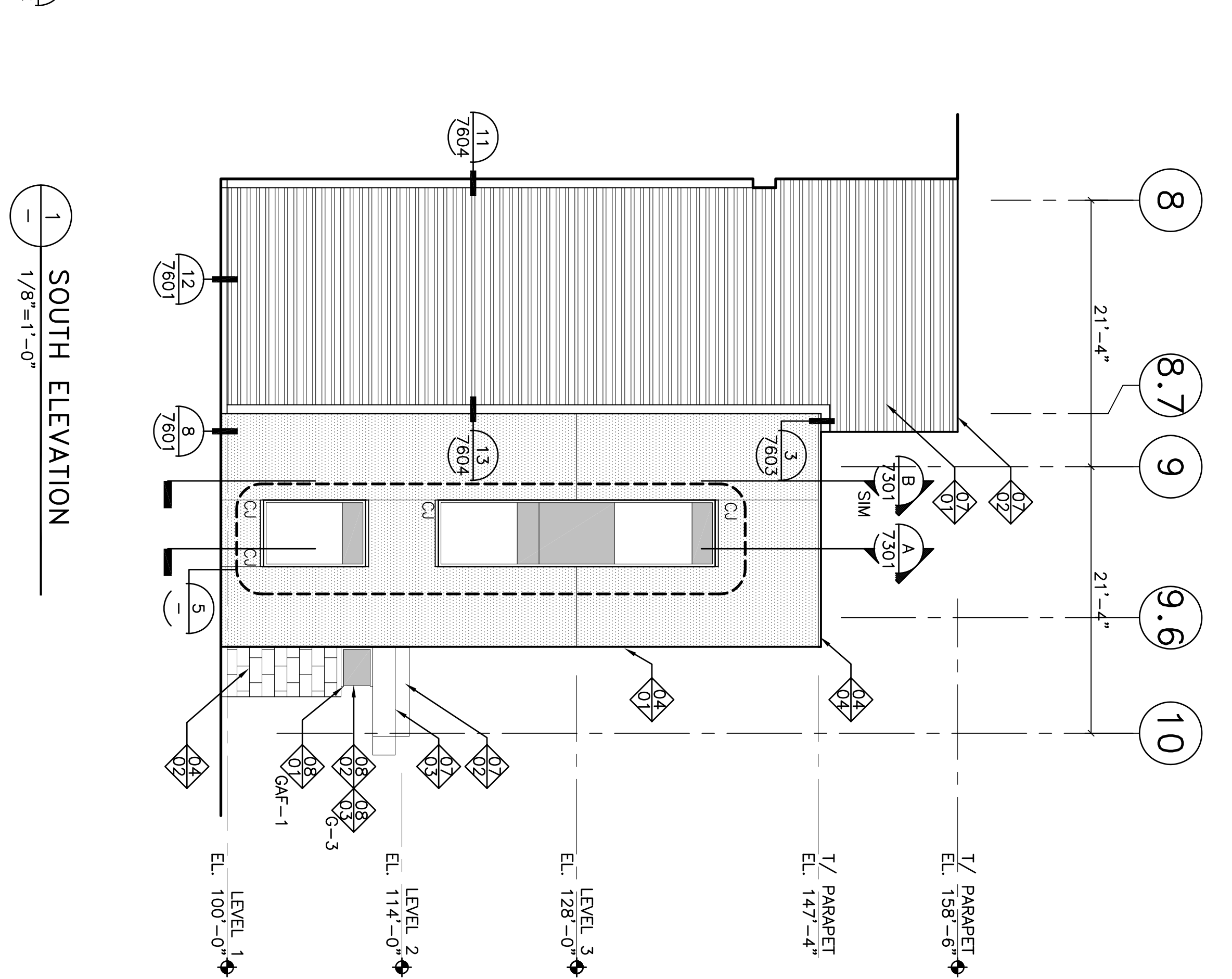


6.3



WALL SECTION
3/8"=1'-0"





2 EAST ELEVATION

11 - EQUIPMENT

- 15 - MECHANICAL
01 BOOE OVERFLOW DRAIN SPOILT TURBOCH WAIL

04 SS EXHAUST STACKS, SEE MECHANICAL

- SCALE: $\frac{1}{8}$ " = 12' 0"

ARCHITECTURAL
EXTERIOR ELEVATIONS

DRAWN BY:

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RESEARCH CENTER ADDITION**



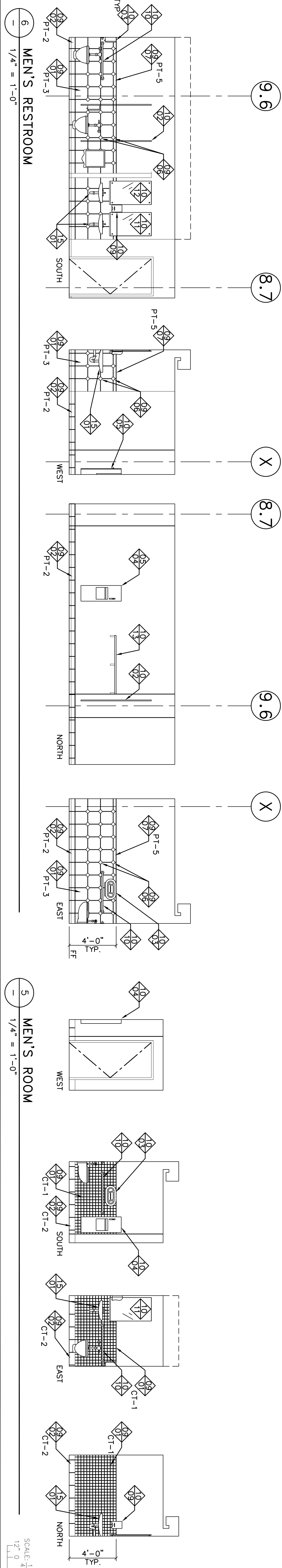
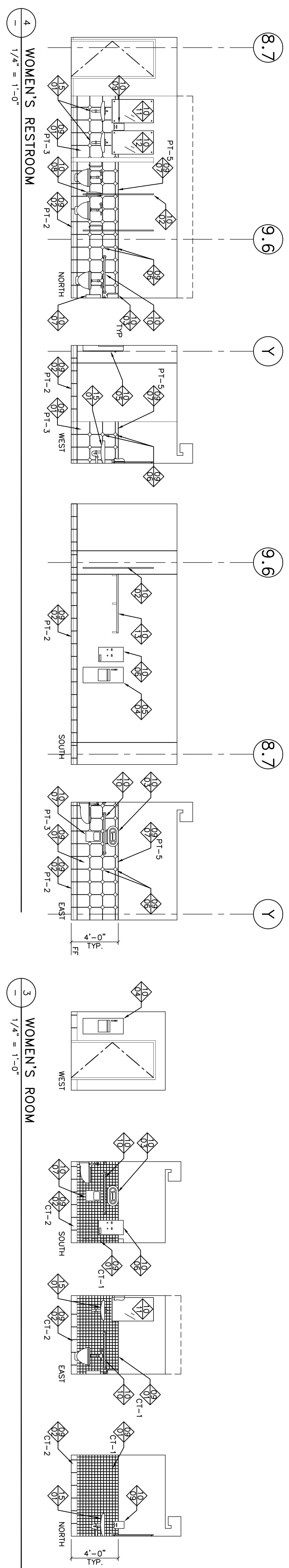
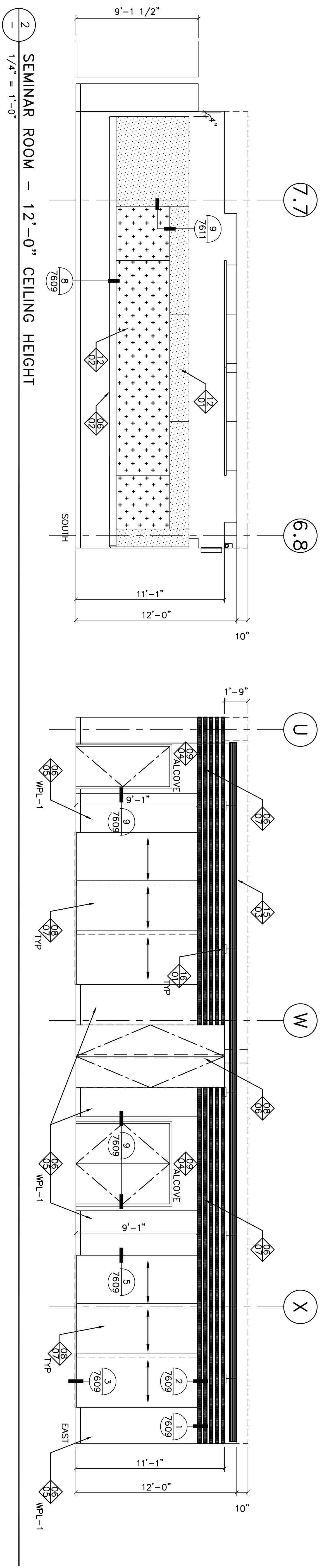
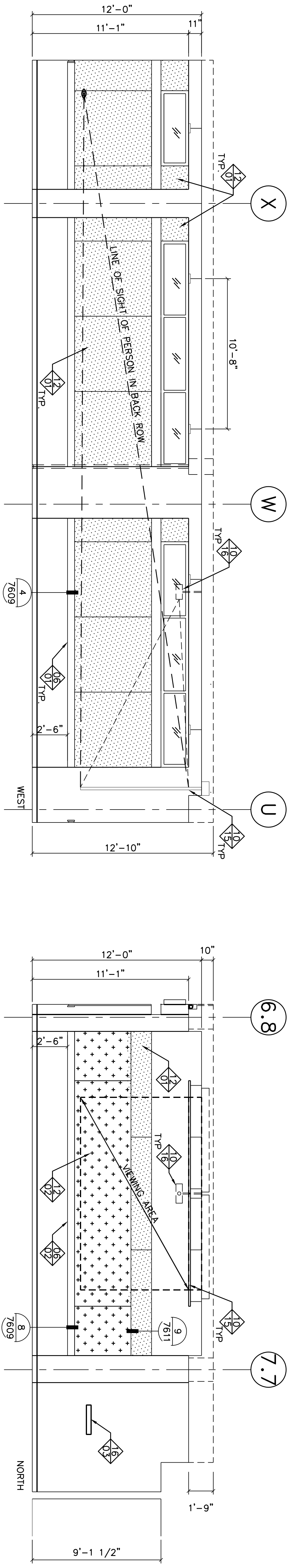
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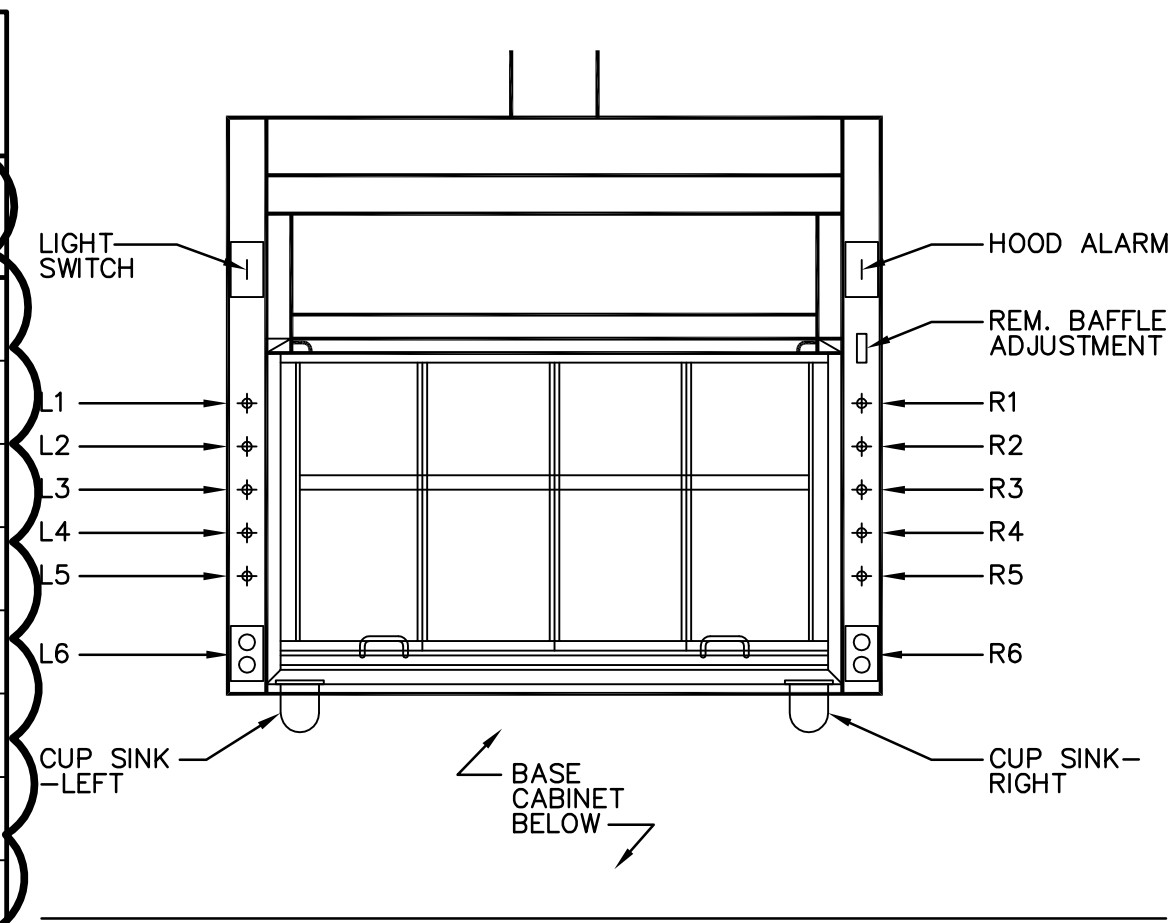
GENERAL NOTES	
1. SEE SHEET NVA-0001 FOR ADDITIONAL GENERAL NOTES AND LEGEND.	
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	KEYNOTE NUMBER
	SPECIFICATION TAG
KEYED NOTES	
03 - CONCRETE	01 CONCRETE W/ SMOOTH-RUBBED FINISH
01 CONCRETE W/ SMOOTH-RUBBED FINISH	
GENERAL NOTES	
01 CAST STONE VENEER: 1/3 RUNNING BOND	04 - MASONRY
02 CAST STONE HEAD SILL	01 GLASS (G-4)
06 - WOOD AND PLASTICS	02 48"x48" FLUSH 2HR RATED ACCESS PANEL CLAD WITH WALL PANEL.
01 WALL GUARD	03 RECESSED 2HR RATED DOOR ON MAGNETIC HOLD OPEN
02 MARKER TRAY	04 TRANSLUCENT GLAZING (G-7)
03 CASEWORK	05 FUTURE 3'-0" x 7'-0" DOOR
04 4" BASEBOARD	06 MOVABLE PARTITION WALL, POCKET DOOR W/WPL-1
05 WALL PANEL	07 CLOSET DOOR PANEL, WPL-1
06 WOOD BENCH	08 ALUMINUM CLOSURE PANEL, MATCH COLOR AND FINISH OF CAF.
07 CONTINUOUS CUSTOM WALL PANEL SCREEN IN FRONT OF MECHANICAL RETURN	
GENERAL NOTES (CONT)	
01 G-4	02 T-1
02 T-1	03 T-2
03 T-2	04 T-3
04 T-3	05 T-4
05 T-4	06 T-5
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MECHANICAL / ELECTRICAL COORDINATION SCHEDULE													
ABBREVIATION:													
E	ELECTRICAL CONTRACTOR	HP	HORSEPOWER	4X	NEMA 4X	V	VOLTAGE						
M	MECHANICAL CONTRACTOR	KW	KILOWATTS	PH	PHASE	VFD	VARIABLE FREQUENCY DRIVE						
I	INTEGRAL WITH EQUIPMENT	MR	PER MANUFACTURER'S	RE	REVERSING								
C	COMBINATION STARTER AND SAFETY SWITCH	NF	NON-FUSED	RV	REDUCED VOLTAGE	2S	TWO SPEED						
CB	CIRCUIT BREAKER	NR	NON-REVERSING	SF	FUSE HOLDER WITH SWITCH	3S	THREE SPEED						
FV	FULL VOLTAGE	N1	NEMA 1	SH	HP RATED SWITCH								
FLA	FULL LOAD AMPS	3R	NEMA 3R	ST	THERMAL ELEM. SWITCH								
REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS													
MARK	DESCRIPTION	RATING			DISCONNECT					MOTOR STARTER			REMARKS
		LOAD	V	PH	FURNISH/INSTALL BY	TYPE	RATING (AMPS)	FUSE SIZE	ENCL.	FURNISH/INSTALL BY	TYPE/ NEMA SIZE	ENCL.	
AHU-5 A	AIR HANDLER 5A	30 HP	460	3	M/E	-	-	-	-	-	-	-	VFD BY UNL
AHU-5 A	AIR HANDLER 5B	30 HP	460	3	M/E	-	-	-	-	-	-	-	VFD BY UNL
AHU-6	AIR HANDLER 6	42 HP	460	3	M/E	-	-	-	-	-	-	-	VFD BY UNL
SG-5	HUMIDIFIER AHU-5	4 A	120	1	M/E	-	-	-	-	-	-	-	VFD BY UNL
SG-6	HUMIDIFIER AHU-6	4 A	120	1	M/E	-	-	-	-	-	-	-	VFD BY UNL
ERP-5	ENERGY RECOVERY LOOP CIRCULATING PUMP	7.5 HP	460	3	M/E	-	-	-	-	-	-	-	VFD BY UNL
CWP-1	CHILLED WATER CIRCULATING PUMP	50 HP	460	3	M/E	-	-	-	-	-	-	-	VFD BY UNL
CWP-2	CHILLED WATER CIRCULATING PUMP	50 HP	460	3	M/E	-	-	-	-	-	-	-	VFD BY UNL
EF-7A	LAB UPBLAST EXHAUST FAN	25 HP	460	3	E/E	SS	60	MR	3R	-	-	-	VFD BY UNL
EF-7B	LAB UPBLAST EXHAUST FAN	25 HP	460	3	E/E	SS	60	MR	3R	-	-	-	VFD BY UNL
EF-7C	LAB UPBLAST EXHAUST FAN	25 HP	460	3	E/E	SS	60	MR	3R	-	-	-	VFD BY UNL
EF-8	GAS STORAGE EXHAUST FAN	1/4 HP	120	1	E/E	SH	20	MR	3R	-	-	-	
EF-9	RESTROOM/JAN. EXHAUST FAN	1/2 HP	120	1	E/E	SH	20	MR	3R	-	-	-	
FCU-11A	SHARED EQUIP 1ST FL FAN COIL	1/3 HP	120	1	E/E	SH	20	MR	N1	-	-	-	
FCU-11B	SHARED EQUIP 1ST FL FAN COIL	1/3 HP	120	1	E/E	SH	20	MR	N1	-	-	-	
FCU-12A	SHARED EQUIP 2ND FL FAN COIL	1/3 HP	120	1	E/E	SH	20	MR	N1	-	-	-	
FCU-12B	SHARED EQUIP 2ND FL FAN COIL	1/3 HP	120	1	E/E	SH	20	MR	N1	-	-	-	
FCU-13A	SHARED EQUIP 3RD FL FAN COIL	1/3 HP	120	1	E/E	SH	20	MR	N1	-	-	-	
FCU-13B	SHARED EQUIP 3RD FL FAN COIL	1/3 HP	120	1	E/E	SH	20	MR	N1	-	-	-	
FCU-15A	SHIPPING FAN COIL	1/2 HP	120	1	E/E	SH	20	MR	N1	-	-	-	
FCU-15B	SHIPPING FAN COIL	1/2 HP	120	1	E/E	SH	20	MR	N1	-	-	-	
FCU-16A	BASEMENT FAN COIL	2/3 HP	120	1	E/E	SH	20	MR	N1	-	-	-	
FCU-16B	BASEMENT FAN COIL	2/3 HP	120	1	E/E	SH	20	MR	N1	-	-	-	
FCU-16C	BASEMENT FAN COIL	2/3 HP	120	1	E/E	SH	20	MR	N1	-	-	-	
FCU-17A	PENTHOUSE FAN COIL	1/3 HP	120	1	E/E	SH	20	MR	N1	-	-	-	
FCU-17B	PENTHOUSE FAN COIL	1/3 HP	120	1	E/E	SH	20	MR	N1	-	-	-	
FCU-18	STAIRS FAN COIL	2/3 HP	120	1	E/E	SH	20	MR	N1	-	-	-	
FCU-19A	CORR 150 FAN COIL	0.7 FLA	120	1	E/E	SH	20	MR	N1	-	-	-	
FCU-19B	CORR 150 FAN COIL	0.7 FLA	120	1	E/E	SH	20	MR	N1	-	-	-	
FCU-20	CORR 450A FAN COIL	0.7 FLA	120	1	E/E	SH	20	MR	N1	-	-	-	
HF-1/ CU-1	ELEVATOR HEAT PUMP	16 A	208	1	E/E	SS	30	MR	N1	-	-	-	
CUH-11	CABINET UNIT HEATERS	1.4 FLA	120	1	E/E	SH	20	MR	N1	-	-	-	
SP-3	SUMP PUMP AND CONTROL SYSTEM	0.4 HP 5 AMPS	120	1	-	-	-	-	-	-	-	-	PLUG AND CORD
SWH-3 SWH-4	STEAM WATER HEATERS	1 AMP	120	1	E/E	SH	20	MR	N1	-	-	-	
TPU-1	TRAP PRIMER UNIT	5 AMPS	120	1	-	-	-	-	-	-	-	-	
VP-3	VACUUM PUMP VP-3	30 HP	460	3	E/E	C	60	MR	N1	E/E	NR/3	N1	4
GENERAL NOTES:													
A. CONTRACTOR SHALL VERIFY/COORDINATE ALL RATINGS FOR EQUIPMENT SUPPLIED BY THE SELECTED MANUFACTURER, WHERE SUCH RATINGS ARE OTHER THAN AS INDICATED ON MECHANICAL/ELECTRICAL COORDINATION SCHEDULE, DISCONNECTS, MOTOR STARTERS, OVERCURRENT DEVICES AND RELATED REVISIONS SHALL BE PROVIDED ACCORDINGLY. THE CONTRACTOR THAT FURNISHES EQUIPMENT WITH RATINGS OTHER THAN AS INDICATED SHALL BE RESPONSIBLE FOR ALL COORDINATION AND COSTS FOR REVISIONS TO ACCOMMODATE SELECTED EQUIPMENT.													
B. ALL FRACTIONAL HORSEPOWER MOTORS SHALL BE PROVIDED WITH INTEGRAL OVERLOAD PROTECTION.													
C. HORSEPOWER RATED SWITCHES (SH): FOR 120 V MOTORS LESS THAN 1/2 HP, PROVIDE FUSEHOLDER WITH SWITCH, FUSED PER MANUFACTURER'S RECOMMENDATION AND NEC REQUIREMENTS. FOR 120 V MOTORS RATED 1/2 HP OR 3/4 HP, PROVIDE HP RATED TOGGLE SWITCH (WHERE BRANCH CIRCUIT OVERCURRENT DEVICE MEETS NEC REQUIREMENTS FOR SHORT-CIRCUIT PROTECTION) OR FUSED SAFETY SWITCH.													
REMARKS:													
1. EXHAUST FAN MOTOR SHALL BE FACTORY WIRED TO WEATHERPROOF JUNCTION BOX INTEGRAL WITH FAN. ELECTRICAL CONTRACTOR TO PROVIDE WEATHERPROOF HORSEPOWER RATED SWITCH (SEE GENERAL NOTES ABOVE).													
2. LOCKABLE DISCONNECT SHALL BE FURNISHED INTEGRAL WITH VFD.													
3. DISCONNECT AND STARTER FURNISHED BY ELECTRICAL INTEGRAL WITH MOTOR CONTROL CENTER.													
4. VACUUM PUMP VP-3 PROVIDED UNDER ADD ALTERNATE NUMBER 4.													

MARK	LOCATION	HOOD SIZE	STATIC PRESSURE (N. W.G.)					ELEC SERVICE	CUP SINKS	MANUFACTURER & MODEL NO.	REMARKS
				CW	N/G	AIR	VAC	DUPLEX OUTLET			
FH101	163 - LAB1F	5'	0.20"	R2	R3	R4	R5	L6, R6	1, RIGHT	LAB CRAFTERS "AIR SENTRY" MODEL HBASCS	1, 2, 3, 4, 5, 6, 7, 8
FH201	257 - LAB2F	5'	0.20"	R2	R3	R4	R5	L6, R6	1, LEFT	LAB CRAFTERS "AIR SENTRY" MODEL HBASCS	1, 2, 3, 4, 5, 6, 7, 8
FH202	265 - LAB2F	5'	0.20"	R2	R3	R4	R5	L6, R6	1, LEFT	LAB CRAFTERS "AIR SENTRY" MODEL HBASCS	1, 2, 3, 4, 5, 6, 7, 8
FH203	271 - LAB2F	5'	0.20"	R2	R3	R4	R5	L6, R6	1, LEFT	LAB CRAFTERS "AIR SENTRY" MODEL HBASCS	1, 2, 3, 4, 5, 6, 7, 8
FH301	357 - LAB3F	5'	0.20"	R2	R3	R4	R5	L6, R6	1, LEFT	LAB CRAFTERS "AIR SENTRY" MODEL HBASCS	1, 2, 3, 4, 5, 6, 7, 8
FH302	365 - LAB3F	5'	0.20"	R2	R3	R4	R5	L6, R6	1, LEFT	LAB CRAFTERS "AIR SENTRY" MODEL HBASCS	1, 2, 3, 4, 5, 6, 7, 8
FH303	371 - LAB3F	5'	0.20"	R2	R3	R4	R5	L6, R6	1, LEFT	LAB CRAFTERS "AIR SENTRY" MODEL HBASCS	1, 2, 3, 4, 5, 6, 7, 8

REMARKS:

- FURNISH WITH LIGHT SWITCH AND HOOD ALARM.
- VERIFY CURP SINK LOCATION AND QUANTITY ON PLANS.
- FURNISH WITH COMBO SASH: 1 VERTICAL AND 4 HORIZONTAL SLIDING DOORS.
- HOODS 32" NOMINAL DEPTH.
- FURNISH WITH (2) 120V 20 AMP GFI DUPLEX ELECTRICAL OUTLETS.
- FURNISH WITH GOOSENECK COLD WATER OUTLET INSIDE OF HOOD.
- FURNISH WITH EXTERNAL MOUNTED ASSE 1001 ATMOSPHERIC VACUUM BREAKER.
- FURNISH WITHOUT AIRFLOW INDICATOR, UNL BSM WILL PROVIDE INDICATOR.



VAV - NON-LAB TERMINAL UNIT SCHEDULE

MARK	SELECTION (COIL ΔP INCLUDED)		USABLE (COIL ΔP INCLUDED)		MANUFACTURER & MODEL NUMBER	INLET SIZE	OUTLET SIZE (WxH)	REHEAT COIL	REMARKS
	RANGE (CFM)	ΔP (IN WC)	RANGE (CFM)	ΔP (IN WC)					
VAV-XXX-5	0-200	0.1	65-350	0.2	TITUS MODEL ESV SINGLE DUCT BOX	5 INCH	12 x 8 INCH	2 - ROW	1, 2, 3, 4, 5, 6
VAV-XXX-6	201-400	0.4	80-450	0.5	TITUS MODEL ESV SINGLE DUCT BOX	6 INCH	12 x 8 INCH	2 - ROW	1, 2, 3, 4, 5, 6
VAV-XXX-8	401-650	0.3	145-750	0.5	TITUS MODEL ESV SINGLE DUCT BOX	8 INCH	12 x 10 INCH	2 - ROW	1, 2, 3, 4, 5, 6
VAV-XXX-10	651-900	0.3	230-1100	0.4	TITUS MODEL ESV SINGLE DUCT BOX	10 INCH	14 x 12 INCH	2 - ROW	1, 2, 3, 4, 5, 6
VAV-XXX-12	901-1250	0.3	325-1600	0.3	TITUS MODEL ESV SINGLE DUCT BOX	12 INCH	16 x 16 INCH	2 - ROW	1, 2, 3, 4, 5, 6
VAV-XXX-12R	420-2000	0.3	420-2100	0.4	PRICE MODEL SDE SINGLE DUCT BOX	16 x 15 INCH	16 x 15 INCH	NA	1, 2, 3, 6
VAV-XXX-14	1251-1550	0.2	450-2200	0.5	TITUS MODEL ESV SINGLE DUCT BOX	14 INCH	20 x 18 INCH	2 - ROW	1, 2, 3, 4, 5, 6
VAV-XXX-14R	2001-2600	0.2	540-2600	0.3	PRICE MODEL SDE SINGLE DUCT BOX	20 x 17.5 INCH	20 x 17.5 INCH	NA	1, 2, 3, 6
VAV-XXX-16	1551-2300	0.3	580-2750	0.3	TITUS MODEL ESV SINGLE DUCT BOX	16 INCH	24 x 18 INCH	2 - ROW	1, 2, 3, 4, 5, 6, 7

REMARKS:

1. TERMINAL UNITS TO BE FURNISHED WITH FIBRE FREE DUCT LINER.
2. TERMINAL UNITS TO BE FURNISHED LESS CONTROLS, AND ACTUATORS.
3. FLOW SENSOR TO BE FACTORY MOUNTED, AND READY FOR CONNECTION TO FIELD INSTALLED CONTROL SYSTEM AND ACTUATORS.
4. HOT WATER REHEAT COIL TO BE SHIPPED SEPARATE. PROVIDE ACCESS DOOR IN DUCT BETWEEN REHEAT COIL AND UNIT.
5. 190 DEG F ENTERING WATER TEMPERATURE, 170 DEG F LEAVING WATER TEMPERATURE.
6. SUPPLY DUCT CONNECTIONS.
7. SUPPLY SILENCER SHALL BE VIBRO-ACOUSTICS RECTANGULAR FILM-LINED, MEDIUM VELOCITY, LOWEST F-NUMBER AVAILABLE. SUPPLY SILENCER - 24" X 18" CONN./OVERALL SIZE, 3' LONG



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Project:

Ken Morrison Life Sciences Research Center Addition

Sheet Title:

MECHANICAL SCHEDULES

Project No:

102002

Addenda No:

1

Dwg Ref No: **NVM-0101**

Addenda Sht: **7 of 9**

Date:

11-21-2011

Checked By:

PAM

Drawn By:

MDB

1ST FLOOR, AHU-6 - VAV TERMINAL UNIT & ROOM BALANCE SCHEDULE

ROOM	SUPPLY UNIT	SUPPLY					NON-LAB RETURN (CFM)		EXHAUST											AIR BALANCE ROOM OFFSET (CFM)	OCCUPANCY SWITCH/ SENSOR	ROOM PURGE SWITCH	SUPPLEMENTAL HEAT
		REHEAT CAP. (BTUH)	COOLING (CFM)		HEATING (CFM)	REHEAT GPM	MIN.	MAX.	LAB EXHAUST UNIT	EXHAUST (CFM)		HOOD EXHAUST UNIT	EXHAUST (CFM)		GAS/CC EXHAUST UNIT	EXHAUST (CFM)		NON-LAB CONST. EXHAUST (CFM)					
			MIN.	MAX.						MIN.	MAX.		MIN.	MAX.		MIN.	MAX.						
122A - OFFICE (DOCK)	VAV-122A-5	6,500	65	150	90	0.50	65	150												SENSOR			
158 - OPEN OFFICE	VAV-158-10	30,000	230	700	420	2.00	180	650										50	SENSOR		FINNED TUBE		
160 - OFFICE	VAV-160-5	8,600	65	200	120	0.50	15	150										50	SENSOR		FINNED TUBE		
162 - STORAGE	VAV-162-5	8,600	65	200	120	0.50	15	150										50					
170/170A - LOBBY/INTER.	VAV-170-10	37,800	880	880	880	4.00	550	550										330			FINNED TUBE		
164, 165 - WOMEN, MEN	VAV-164-6	17,200	400	400	400	2.00											625	-225	SENSOR				
169A - SEMINAR	VAV-169A-16	85,800	700	2,000	1,200	5.50	580	2,000	VAV-100A-14R										SENSOR				
169B - SEMINAR	VAV-169B-16	85,800	700	2,000	1,200	5.50	580	2,000	VAV-100B-14R										SENSOR				
TOTAL		194,500	3,105	6,530	4,430	15.00	1,985	5,650	VAV-100C-12R								625	105					
TOTAL 1ST FLOOR AHU-5 & AHU-6		355,500	4,815	10,280	7,025	27.00	1,985	5,650		950	3,475		1,000	1,415		65	65	625	380				

REMARKS:

- VAV-100A-24 (SEMINAR) SHALL BE MAX. 4,000 CFM, MIN. 1400 CFM
- VAV-100B-16 (LOBBY/OFFICES) SHALL BE MAX. 1,650 CFM, MIN. 580 CFM

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Project:

Ken Morrison Life Sciences Research Center Addition

Sheet Title:

MECHANICAL SCHEDULES

Project No:

102002

Date:

11-21-2011

Addenda No:

1

Checked By:

PAM

Dwg Ref No: **NVM-0102**

Addenda Sht: **8 of 9**

Drawn By:

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VAV TERMINAL UNIT & ROOM BALANCE SCHEDULE

ROOM	SUPPLY								NON-LAB RETURN (CFM)		EXHAUST												AIR BALANCE ROOM OFFSET (CFM)	OCCUPANCY SWITCH/ SENSOR	ROOM PURGE SWITCH	SUPPLEMENTAL HEAT
	SUPPLY UNIT	SUPPLY AHU	REHEAT CAP. (BTUH)	COOLING (CFM)		HEATING (CFM)	REHEAT GPM	WINDOW FINNED TUBE			LAB EXHAUST UNIT	EXHAUST (CFM)		HOOD EXHAUST UNIT	EXHAUST (CFM)		GAS/CC EXHAUST UNIT	EXHAUST (CFM)		NON-LAB CONST. EXHAUST (CFM)						
				MIN.	MAX.				MIN.	MAX.		MIN.	MAX.		MIN.	MAX.										
122A - OFFICE (DOCK)	VAV-122A-5	AHU-6	6,500	65	150	90	0.50		65	150													SENSOR			
153 - SHARED EQUIP	LSVAV-153-8	AHU-5	14,000	100	325	195	1.00				LEVAV-153-8	150	375									-50				
151 - JANITOR	LSVAV-151-8	AHU-5	7,800	180	180	180	1.00				LEVAV-151-8	230	230									-50				
152 - CORR	LSVAV-152-10	AHU-5	29,000	675	675	675	3.00															675				
159 - GAS																	GSVAV-259-4	50	50			-50				
158 - OPEN OFFICE	VAV-158-10	AHU-6	30,000	230	700	420	2.00		180	650												50	SENSOR		FINNED TUBE	
160 - OFFICE	VAV-160-5	AHU-6	8,600	65	200	120	0.50		15	150												50	SENSOR		FINNED TUBE	
162 - STORAGE	VAV-162-5	AHU-6	8,600	65	200	120	0.50		15	150												50				
170/170A - LOBBY/INTER.	VAV-170-10	AHU-6	37,800	880	880	880	4.00		550	550												330			FINNED TUBE	
163 - LAB 1F	LSVAV-163-14	AHU-5	79,300	535	1,850	1,110	5.00				LEVAV-163-14	250	2,050	FHVAV-163-8	225	640	CCVAV-257-4	15	15			-200	SWITCH	YES	FINNED TUBE	
163A - CELL CULTURE	LSVAV-163A-10	AHU-5	30,900	220	720	435	2.00				LEVAV-163A-10	320	820	FHVAV-163B6-10 (FUTURE)	775	775						-100	SWITCH	YES		
164, 165 - WOMEN, MEN	VAV-164-6	AHU-6	17,200	400	400	400	2.00					625								625		-225	SENSOR			
169A - SEMINAR	VAV-169A-16	AHU-6	85,800	700	2,000	1,200	5.50	1	580	2,000													SENSOR			
169B - SEMINAR	VAV-169B-16	AHU-6	85,800	700	2,000	1,200	5.50		580	2,000														SENSOR		
250 - CORR	LSVAV-250-8	AHU-5	25,800	600	600	600	2.75															600			FINNED TUBE	
250A - CORR	LSVAV-250A-8	AHU-5	25,800	600	600	600	2.75															600				
251 - GLASS WASH	LSVAV-251-12	AHU-5	47,200	180	1,100	660	3.00				LEVAV-251-12	230	1,200									-100		YES		
253 - SHARED EQUIP	LSVAV-253-8	AHU-5	14,000	100	325	195	1.00				LEVAV-253-8	150	375									-50				
257 - LAB 2F	LSVAV-257-12	AHU-5	51,500	310	1,200	720	3.25				LEVAV-257-12	180	1,300	FHVAV-257-8	225	640	CCVAV-257-4	15	15			-100	SWITCH	YES	FINNED TUBE	
265 - LAB 2F	LSVAV-265-14	AHU-5	79,300	525	1,850	1,110	5.00				LEVAV-265-14	250	2,050	FHVAV-265-8	225	640	CCVAV-257-4	15	15			-200	SWITCH	YES	FINNED TUBE	
271 - LAB 2F	LSVAV-271-14	AHU-5	81,500	545	1,900	1,140	5.25				LEVAV-271-14	250	2,100	FHVAV-271-8	225	640	CCVAV-257-4	15	15			-200	SWITCH	YES	FINNED TUBE	
265A - CELL CULTURE	LSVAV-265A-10	AHU-5	30,900	145	720	435	2.00				LEVAV-265A-10	245	820	FHVAV-265B4-8 (FUTURE)	550	550						-100	SWITCH	YES		
														FHVAV-265B6-10 (FUTURE)	775	775										
271A - CELL CULTURE	LSVAV-271A-10	AHU-5	30,900	120	720	435	2.00				LEVAV-271A-10	220	820	FHVAV-271B4-8 (FUTURE)	550	550						-100	SWITCH	YES		
														FHVAV-271B6-10 (FUTURE)	775	775										
252 - WOMEN																				150		-150			FINNED TUBE	
254 - MEN																				150		-150				

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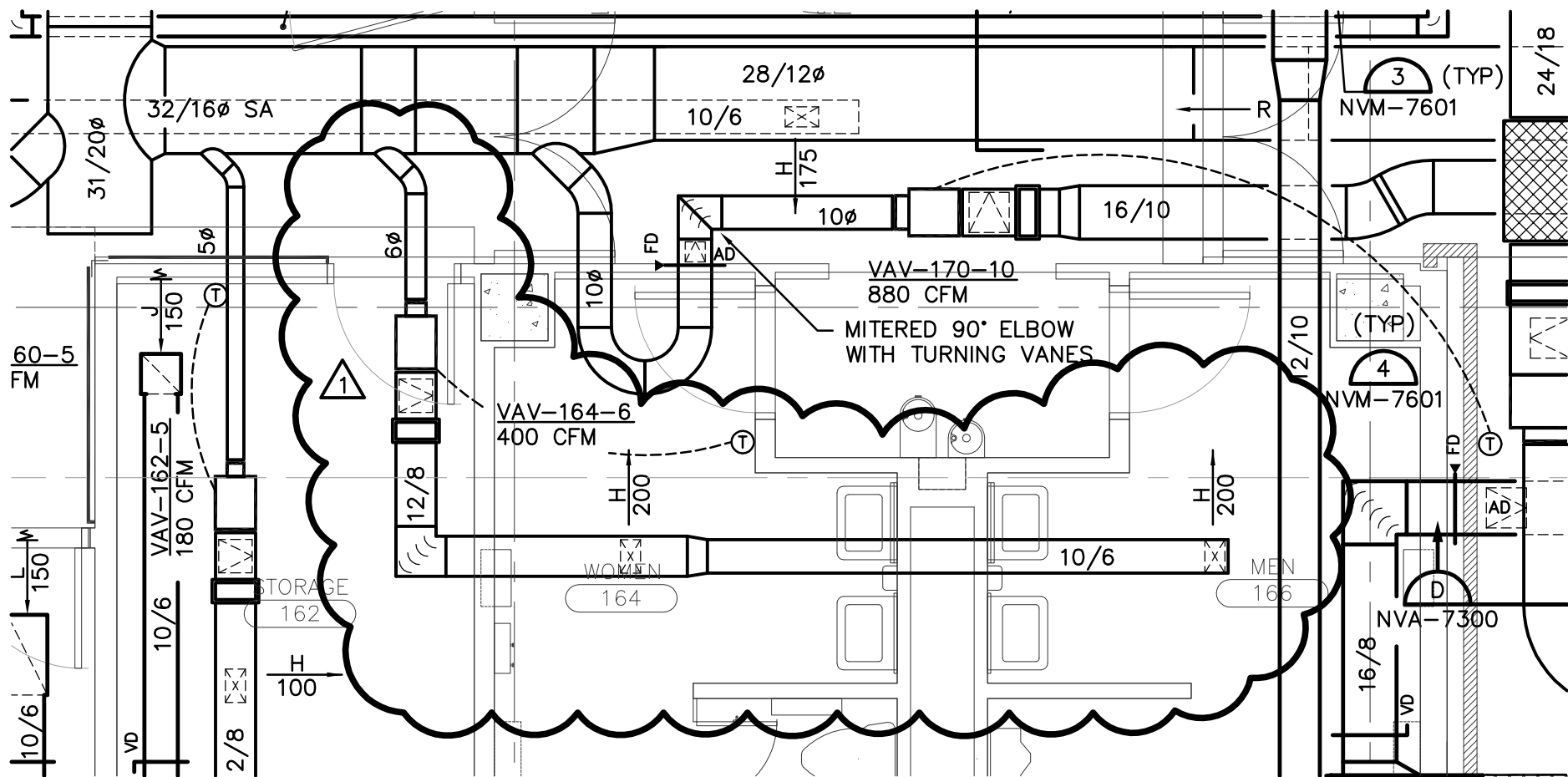
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Project: Ken Morrison Life Sciences Research Center Addition

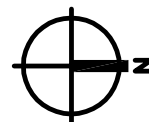
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Project No: 102002	Addenda No: 1	Dwg Ref No: NVM-0103
Date: 11-21-2011	Checked By: PAM	Addenda Sht: 9 of 9
		Drawn By: MDB



MECHANICAL – HVAC SECTOR E FIRST LEVEL FLOOR PLAN

SCALE: $\frac{1}{4}$ INCH = 1 FOOT
 12" 0 5'



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Project:

Ken Morrison Life Sciences Research Center Addition

Sheet Title:

MECHANICAL - HVAC SECTOR E FIRST LEVEL FLOOR PLAN

Project No:

102002

Date:

11-21-2011

Addenda No:

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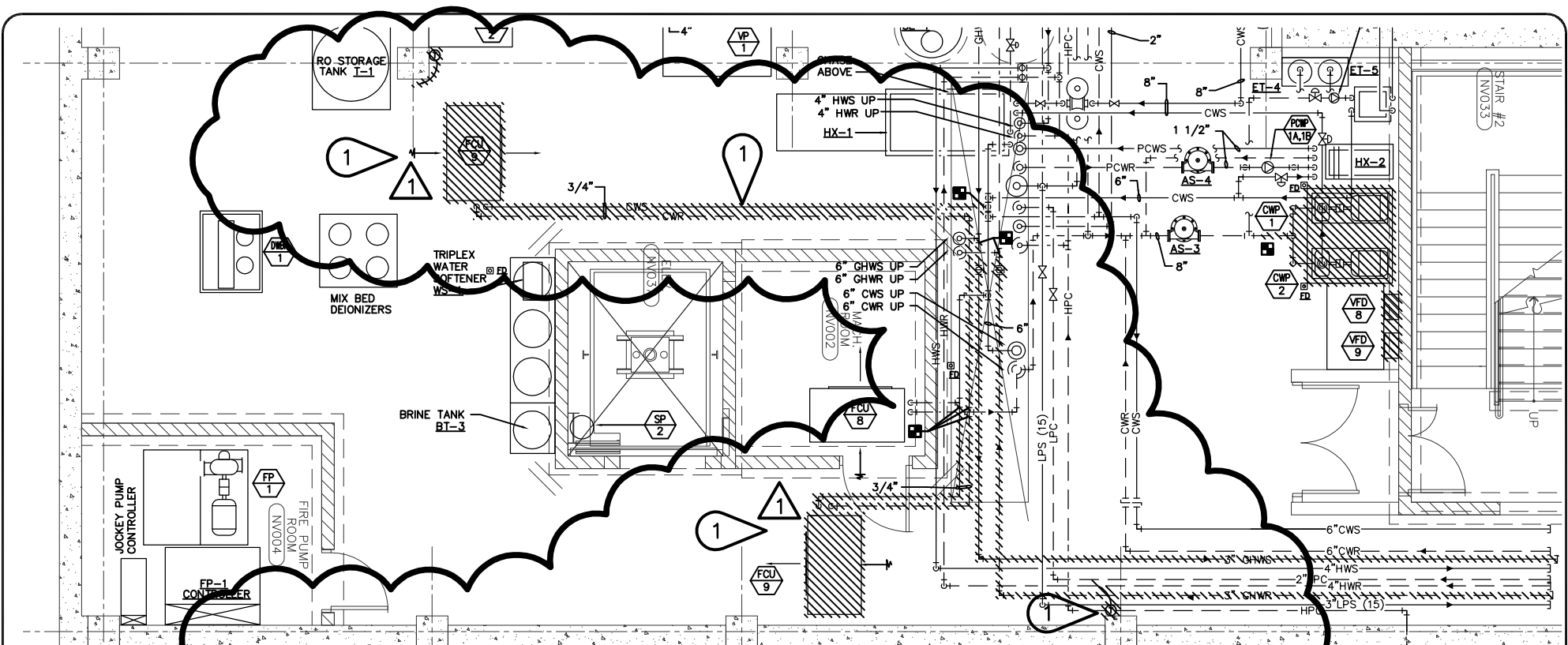
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Dwg Ref No: **NVMH1-E-**

Addenda Sht: **1 of 9**

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MDB

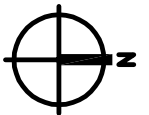


MECHANICAL KEYNOTES:

- △ 1 REMOVE EXISTING FAN COIL UNIT AND ASSOCIATED PIPING AND CONTROLS. CONTRACTOR TO TURN FCU REMOVED OVER TO UNL-BSM.

MECHANICAL – PIPING BASEMENT FLOOR PLAN – DEMOLITION

SCALE: $\frac{1}{8}$ INCH = 1 FOOT
 12" 0 5' 10' 15'



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Project:

Ken Morrison Life Sciences Research Center Addition

Sheet Title:

MECHANICAL PIPING - BASEMENT FLOOR PLAN - DEMOLITION

Project No:

102002

Date:

11-21-2011

Addenda No:

1

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Dwg Ref No:

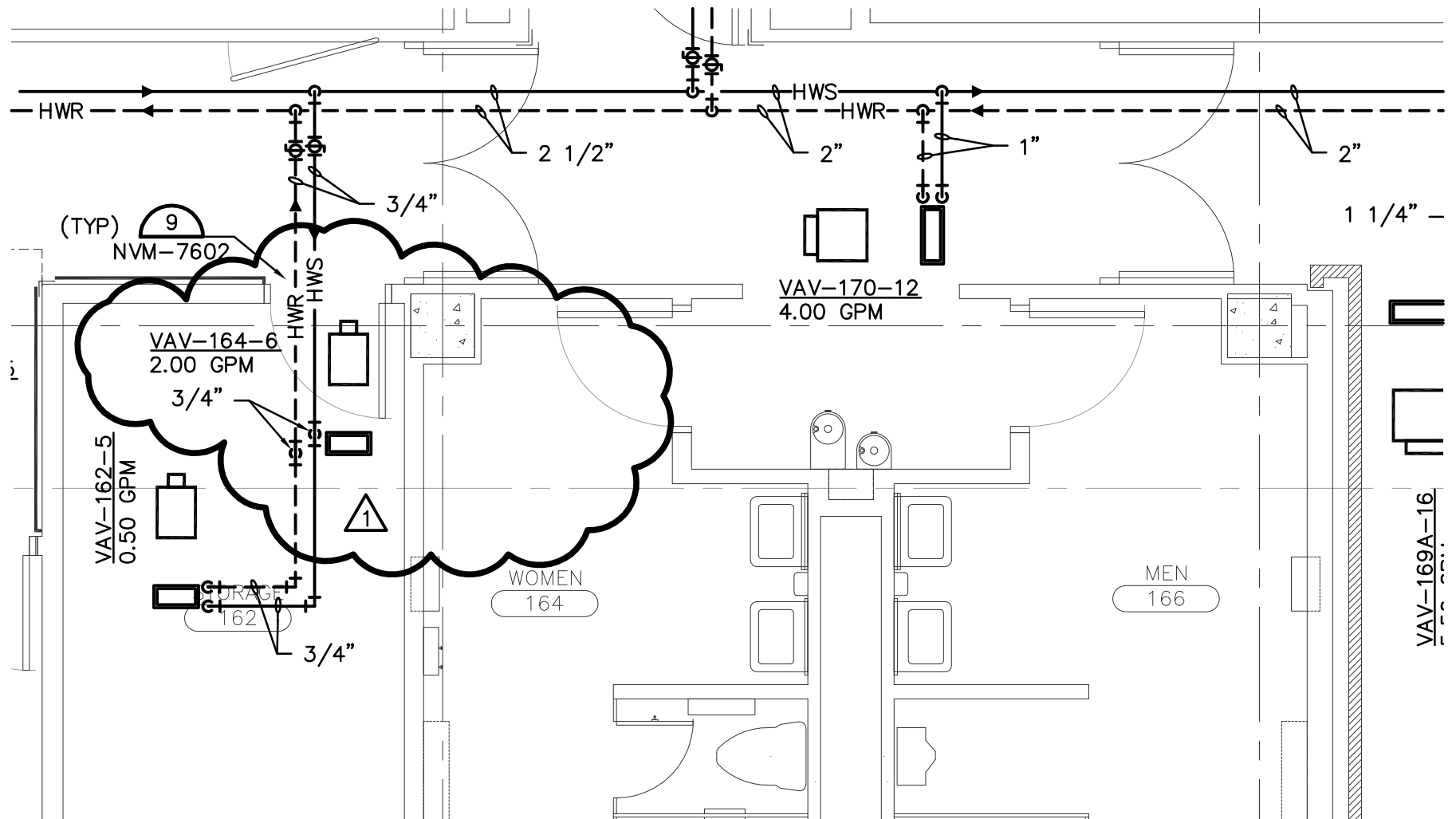
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Addenda Sht:

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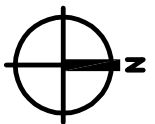
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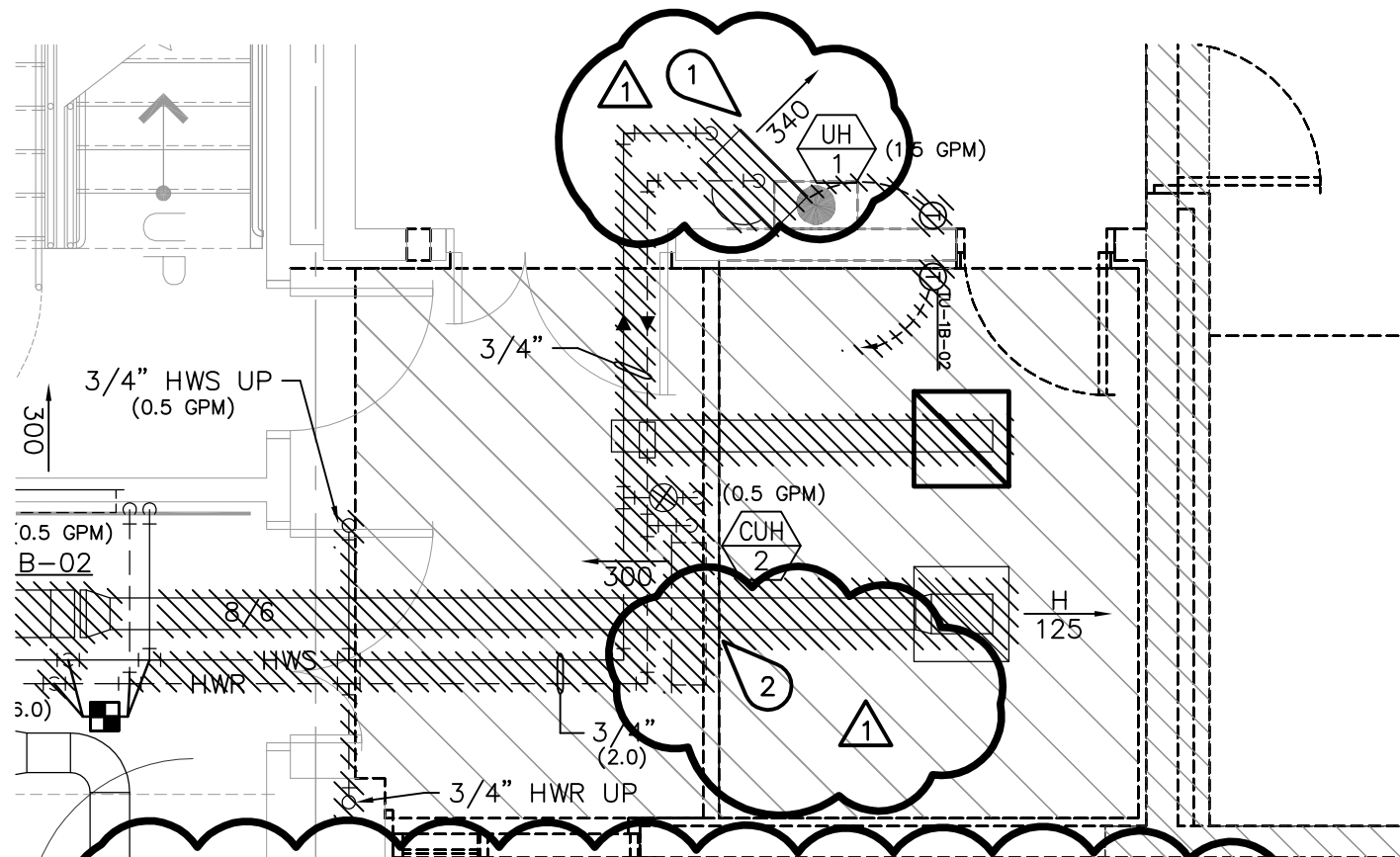
MECHANICAL – PIPING SECTOR E FIRST LEVEL FLOOR PLAN

SCALE: $\frac{1}{4}$ INCH = 1 FOOT
 12" 0 5'



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	Project: Ken Morrison Life Sciences Research Center Addition		
	Sheet Title: MECHANICAL PIPING - SECTOR E FIRST LEVEL FLOOR PLAN		
	Project No: 102002	Addenda No: 1	Dwg Ref No: NVMP1-E-
	Date: 11-21-2011	Checked By: PAM	Addenda Sht: 2 of 9 Drawn By: MDB



MECHANICAL PIPING KEYNOTES: ()

1

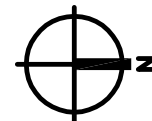
REMOVE EXISTING UNIT HEATER AND ASSOCIATED PIPING AND CONTROLS. CONTRACTOR TO TURN UNIT HEATER REMOVED OVER TO UNL-BSM.

2

REMOVE EXISTING CABINET UNIT HEATER AND ASSOCIATED PIPING AND CONTROLS. CONTRACTOR TO TURN UNIT HEATER REMOVED OVER TO UNL-BSM.

SCALE: $\frac{1}{4}$ INCH = 1 FOOT
12" 0 5'

MECHANICAL - HVAC & PIPING PARTIAL FIRST LEVEL FLOOR PLAN - DEMOLITION



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Project:

Ken Morrison Life Sciences Research Center Addition

Sheet Title:

MECHANICAL - FIRST LEVEL FLOOR PLAN - DEMOLITION

Project No:

102002

Addenda No:

1

Dwg Ref No: **NVMP1DM**

Addenda Sht: **4 of 9**

Date:

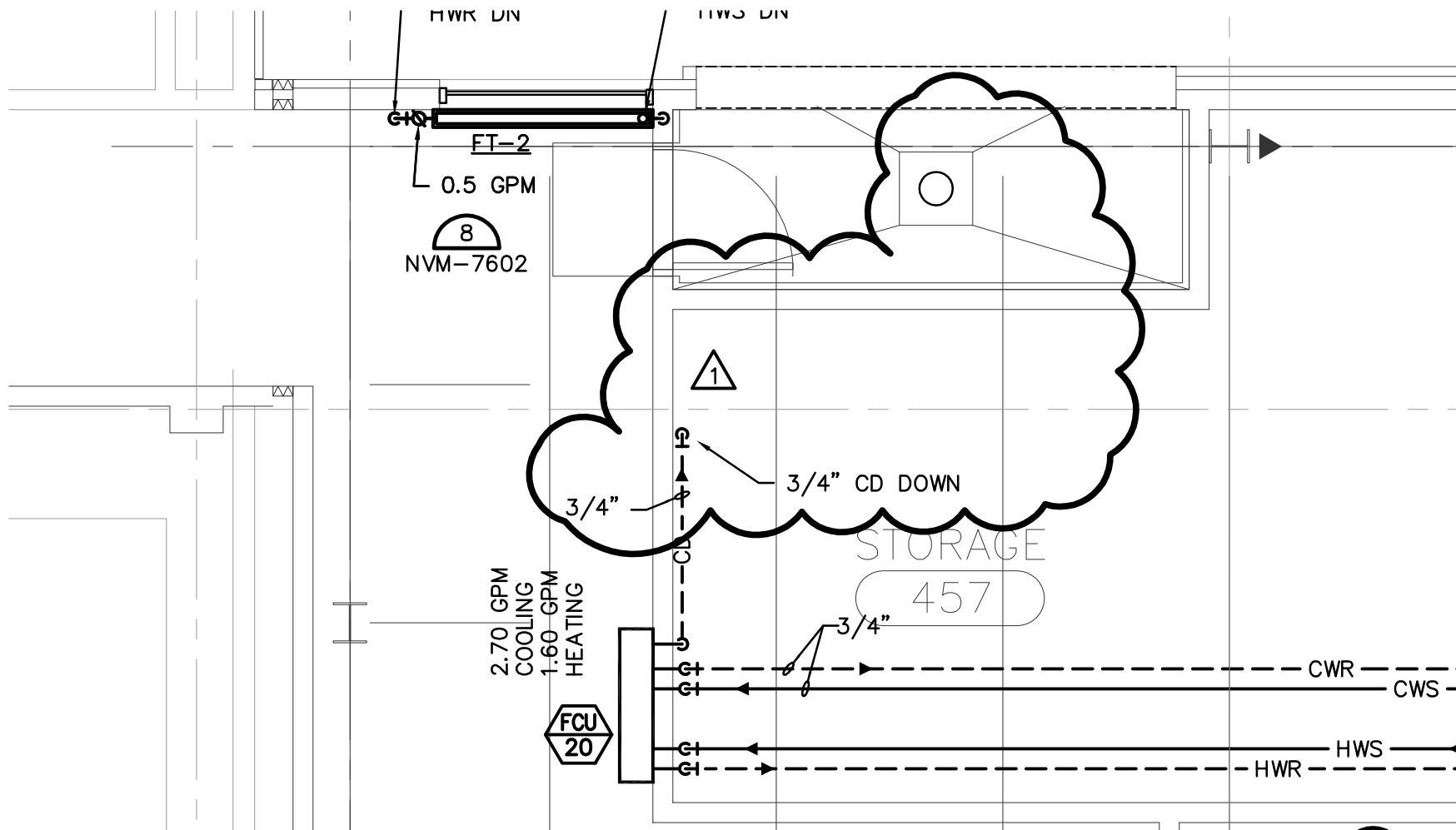
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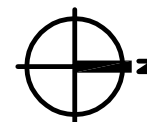
Drawn By:

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MECHANICAL – PIPING SECTOR E FOURTH LEVEL FLOOR PLAN

SCALE: $\frac{1}{4}$ INCH = 1 FOOT
 12" 0 5'



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Project:

Ken Morrison Life Sciences Research Center Addition

Sheet Title:

MECHANICAL - PIPING SECTOR E FOURTH LEVEL FLOOR PLAN

Project No:

102002

Date:

11-21-2011

Addenda No:

1

Checked By:

PAM

Dwg Ref No: **NVMP4-E-**

Addenda Sht: **6 of 9**

Drawn By:

MDB

PRE-BID MEETING AGENDA

Morrison Center Addition Project

- WELCOME
- SIGN- IN/ATTENDANCE SHEET
- INTRODUCTIONS

UNL Representatives:

Chad A. Lea – Project Manager, UNL FM&P
Warren Lauritzen – UNL BSM
Charlie Griesen – UNL Utilities
Mike Huerta – UNL FPC Project Inspector
Emily Casper – UNL Landscape Services
Dan Carpenter – UNL Parking & Transit Services

Project Architects/Engineers

J. Matt Morrissey - Farris Engineering.
Ernie Staley – IDC Architects
Angie Schmidt – E&A Consulting Group
Pat Moran – Farris Engineering

- PROJECT DESCRIPTION

The project will construct a new addition to the Ken Morrison Life Sciences Research Center building on the University of Nebraska- Lincoln East Campus. The project will consist of a four story structure containing approximately 29,000 gross square feet of finished laboratory & office space, as well as related site and utility construction.

This project is for Prime General Construction Services.

- PROJECT SCHEDULE

Bid Date – Dec 7, 2011
Anticipated Notice to Proceed Date – Jan 10, 2012
Project Substantial Competition Date – Mar. 1, 2013

- GENERAL INFORMATION FOR BIDDERS:

Plans and Specifications – Available at A&D Technical Supply Co.
Omaha and Lincoln
Project information & list of plan holders may be viewed on A&D Technical Supply web
site: <http://www.adtechplans.com/>

PRE-BID MEETING AGENDA

Morrison Center Addition Project

- GENERAL INFORMATION FOR BIDDERS: (cont')

Bid Submittal - 2:00 PM CDT, Wednesday December 7th, 2011.

Submit to: University of Nebraska – Lincoln
Business Services – Purchasing Dept.
1700 Y St.
Lincoln, NE 68588

Addenda - No addenda have been issued to date.

Last Date for Addendum to be issued – Nov. 30th, 2011

Addenda No. #001 – To be issues following Pre-Bid Mtg

Included Items: - Pre-Bid Mtg Agenda
Responses to Questions
Spec Section Updates
Spec. Substitutions Request Responses

Contractor Questions - All questions issued in writing, and answered by addendum; otherwise the work shall be installed as per Contract Documents.

Last day for submittal of questions – 5:00 PM on Nov 28th, 2011

- SPECIAL CONDITIONS (items that may affect the Contractor's bid.)

ARRA Project - Contractors Recognize University Procedures. **(Refer to Spec Sect. 01 10 00- Summary of Work)**

Davis Bacon Requirements – Wages, Reporting, & Monitoring/Interviews

ARRA - Buy America Provision – DOES NOT APPLY

ARRA – Reporting and Documentation

Job Site Parking - Parking available through UNL PT&S - Permits Req'd - \$50/mo/per vehicle.

Parking will be in Area C - On & in lot west of East Campus Loop.

Construction of new parking stalls & walks West of existing Morr Ctr, and relocation of UNL Landscape Services gate & pasture fence to be complete at earliest opportunity available.

Morrison Center Restrooms are not available for contractor use.

Occupancy and service to adjacent building (VBS & VDC) & dock apron to be maintained during construction.

Access to VDC dock will be maintained during construction via access road north the Morrison Ctr Bldg. Coordinate with UNL.

Staging Area – To be within job site. Protection required for existing landscaping, except those to be removed, per UNL LS direction. NO CRUSHED ROCK allowed.

- Design Team Review of Project
- QUESTIONS/ANSWERS

Meeting Attendance

Purpose:

PRE-BID MTG.

Project Name:

MARRIOTT AND FEN.

UNL Project No.

A126303

Date of mtg:

11/10

Time:

130

Location:

MRK. RM 145

Name	Organization	Phone	Fax	E-Mail
~~CLAUDE A. LEA~~	~~LNL HZ~~	~~472-4883~~		~~cllea@unl.edu~~
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Scott Johnson	Capital City Elect	420-7435	420-7436	CIEKRE@CC.com
REGAN ZENGER	Lund-Ross	402-342-2810	402-342-8775	reganz@lundross.com
Matt Miller	Hausmann Const	402-438-3230	402-438-3235	mattm@hausmannconstruction.com
Mike Callaway	Kiewit	402-977-4517	402-435-1080	mike.callaway@kiewit.com
JUSTIN KURTZER	CHEEVER CONST	402-472-6745	402-472-2063	jkurtzer@cheeverconstruction.com
Chad Francisco	Vision Mechanical Corp	402-466-0087	402-466-7593	chad@vmach.net
J DAVID BEALL	CENTRAL CONTRACTING	308-2342421	308-2374767	SLNTEL@CENTRAL CONTRACTING.NET
Kori Aker	Farris Inc.	402-330-5900		Kaaky@farris-usa.com
Sean Akers	Conference Technologies	402-593-6750	402-593-6901	Sakers@conference-tech.com
Nick Collen	IES	402-890-4763		jon@ies-electricinc.com
Anne DeVries	UNL BSM	472-4862		adevries2@unl.edu
Gene Benes	Benes HVAC	783-2046	783-3263	marybenes@beneshvac.com
Richard Fink	UNL FP&C	402-472-3652		rfink@unl.edu

Name	Organization	Phone	Fax	E-Mail
STEVE GRESS	IHS	408-944-2232		
Dean Curtis	ILS	402-944-2752	402-944-2414	Dean@willmar-electric.com
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Steve Gardner	Willmar Electric	320-295-9059	320-235-0322	sgardner@willmar-electric.com
Dale Miller	SHAWHAN ME	402-784-1887	402-784-7788	dgmiller@shawhanme.com
Mike Huerta	UNL FP&C	5608387		mhuerta2@unl.edu
VICTOR BAEZ	WEITZ	402 5024003		VICTOR.BAEZ@WEITZ.COM
Charles Wood	NEV	402 472 4570		
Damon Magnuson	NCU	472-4530		

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Mtg Date

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Page 2

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Subject: **Bidder Questions**
 Project Name: UNL CV2

Date: November 16, 2011
 Project Number: 402195

To: UNL

From: E. Staley

Item No.	Needed By	Question	Design Disc	Response
S-1	American Dywall	What is the gauge of exterior studs?	S	Per the sheet NVS-0002, General Structural Notes, Section R, the cold formed steel is a deferred submittal performance spec item. Specification section 05 40 00 provides performance criteria. Per section 05 40 00.2.3.A the minimum thickness is 16 gauge.
S-2	American Dywall	What is the gauge of the interior studs?	S	As required to meet design criteria per Specification section 09 21 16. Para 2.2.A.1.c the minimum thickness is 18 gauge.
S-3	Kiewit	<i>Plan sheet NVS-0001 includes notes under Structural Steel, 0.1.1.2 and 0.1.1.3 that would appear to be from another project. Are we really supposed to get steel from Los Angeles, California or Clark County Nevada?</i>	S	<i>Section O.1 requires that the structural steel fabricator be registered and approved to perform fabrication on their premises without special inspection per the exception in IBC section 1704.2.1. The list provided is recognized certification programs that would satisfy the requirements of IBC section 1704.2.2.</i>
A-1	Kiewit	<i>In spec section 096723, para. 1.1.A.3 describes an "Alternate #6". There are no alternates on the bid form. Does this note belong to another project?</i>	A	<i>There are no alternates on the project. We are requiring the bidder to include a separate unit price for applying specified vapor transmission barrier in case the concrete moisture content values exceed flooring</i>

INFORMATION NEEDS

Item No.	Needed By	Question	Design Disc	Response
				<i>manufacturer's limits for installing resinous flooring. Revised spec issued in Addendum 01.</i>
A-2	WRC	<i>Architectural General Note 03-01 and 04-03 details water repellant coatings. There isn't a specification for water-repellants, could we get the material specified for this application.</i>	A	<i>There are no water repellants to be used on the concrete or CMU as stated in the notes. Revised drawings issued in Addendum 01.</i>
A-3	Kiewit	<i>Plan sheet NVA-0-E includes a note "02/02" at the Utility Trench that calls for "sub-drainage at bottom of wall". There is no specification for this work, and there does not appear to be any architectural wall sections showing the extent of this work. Please clarify.</i>	A	<i>Sub-drainage to match existing sub-drainage on Phase 1. Field verify existing conditions.</i>
A-4	Kiewit	<i>The Room Finish Schedule includes a General Note H which refers to spec section 09678 for Chemical Resistant Coatings. The Project Manual does not contain this section, and there is no indication of any CRC's on the schedule. Is this an item that is not being used for this project?</i>	A	<i>There are no Chemical Resistant Coatings in Phase 2. Revised spec issued in Addendum 01.</i>
A-5	Kiewit	<i>The Room Finish Schedule shows several rooms with a Concrete Sealer/Hardener as the floor finish. There does not appear to be a specification for this product in the concrete section 033000. Please clarify.</i>	A	<i>Revised spec issued in Addendum 01.</i>
A-6	Kiewit	<i>Most of the spec sections where some sort of on-site testing would be required call for the Owner to pay for such testing costs, including 033000, 042000, 051200, 053100, 054000, 312000, and 316316. Section 321313 does not call for the Owner to pay for these costs. Will the Owner include testing for the concrete paving?</i>	C	<i>The Contractor will be responsible for testing costs for the concrete paving. Specification 01 40 00 states that the contractor is responsible for testing costs unless explicitly assigned to the owner.</i>
A-7	Kiewit	<i>In the Door Schedule, doors 180.1, 280.1, and 380.1 all have a note referring to "Alt.-13". There are no alternates on the Bid Form. Please clarify this item.</i>	A	<i>There is no Alt-13. Revised spec issued in Addendum 01.</i>
A-8	Kiewit	<i>In the Door Schedule, door 50.1 is noted as being a 90 min. rated access door. On plan sheet NVA-0-E, it is called out as a 2 hr. rated access door. Please clarify.</i>	A	<i>The access panel needs to be a 2-hour rated access door to match adjacent wall construction. Revised</i>

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Item No.	Needed By	Question	Design Disc	Response
				<i>spec issued in Addendum 01.</i>
A-9	Kiewit	<i>In the Door Schedule, door 152.1 calls for a door type FGR/FGR. Plan sheet NVA-0002 does not include an elevation of this door type. Please clarify.</i>	A	<i>The elevation of FGR/FGR is the same as FG/FG on sheet NVA-0002 with fire-rated glazing. Revised drawing issued in Addendum 01.</i>
A-10	Kiewit	<i>In the Door Schedule, doors 160.1, 250A.1, 259.1, 273.1, 350A.1, 359.1, and 373.1 all call for hardware set 113. Spec section 087100 says that hardware set 113 id "not used". Please clarify.</i>	A	<i>Hardware set 113: Hinges: AB700, 652 HAG 1 Ea, Storeroom Lockset, L9080x06A, 626 SCH 1 Ea, Doorstop per Specification, --- --- 3 Ea, Silencer, 1229, --- TRI Revised spec issued in Addendum 01.</i>
A-11	Kiewit	<i>In the Door Schedule, door 162.1 is described as a "pair" of doors. On plan sheet NVA-1-E, it is clearly a single leaf door. Please clarify.</i>		<i>It is a single-leaf door. Revised spec issued in Addendum 01.</i>
A-12	Kiewit	<i>In the Door Schedule, doors 169A.1 and 169B.1 are described as 4'-6" x 7'-0" panels. Plan sheet NVA-0002 gives panel dimensions of 4'-0" x 9'-0". On plan sheet NVA-7503, elevation 2 includes a note "08-07" that gives panel dimensions as 5'-0" x 10'-6". Please clarify.</i>	A	<i>Sheet NVA-0002 is correct. The panels are 4'-0" x 9'-0". Revised spec and drawing issued in Addendum 01.</i>
A-13	Kiewit	<i>The specs include section 083323 Overhead Coiling Doors. Door 122.3 is the only overhead coiling door in the project, and is an existing door to be relocated and repainted. Why do we need spec section 083323?</i>	A	<i>The existing overhead coiling door shall be utilized. Spec section removed in Addendum 01.</i>
A-14	Kiewit	<i>The specs include section 111300 Loading Dock Equipment. The dock leveler and dock bumpers on this project are existing products to be relocated. Why do we need spec section 111300?</i>	A	<i>The existing loading dock equipment shall be utilized. Spec section removed in Addendum 01.</i>
A-15	ILS	<i>On project drawings NVAL-2-E & NVAL-3-E the cold rooms appear to be designated as part of Alt. 2. When I visit the bid documents and bid form I can find no listing for alternates. Are there any project alternates?</i>	A	<i>There are no project alternates. The cold rooms shall be included as part of the base bid.</i>
A-16	ILS	<i>On sheet NVAL-2-E in rooms 265A and 271A there are boxes with a keyed note 5 indicating microscope tables. Similar dimensioned boxes occur on sheet NVAL-3-E in rooms 365A and</i>	A	<i>Correct. Revised drawing issued in Addendum 01.</i>

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Item No.	Needed By	Question	Design Disc	Response
		371A but lack a keyed note. Are these units to be microscope tables?		
A-17	ILS	Are there any alternates on the project?	A	No.
A-18	ILS	Chad a review of the current project documents shows that Help Stations Section 123553 2.13 on page 12 specifies that the help stations are to be metal. Original project documents required the Help Stations to be wood. Which is correct?	A	The HELP Stations shall be wood to match the wood lab casework. In addition, HELP Station hardware shall match the wood lab casework hardware. Revised spec issued in Addendum 01.
A-19	ILS	I am unable to find project description for FXF-1 as shown on the attached drawings. I need confirmation that the unit is a Troemner Labjaws product	A	FXF is a Flexiframe as indicated on NVA-0001. This is the Frame Rod Support System (Troemner Labjaws) described in spec section 13 21 21 Laboratory Environmental Rooms
A-20	Lund-Ross	The general notes on the architectural sheets (NVA-1-E) category 14 – conveying systems notes the elevator to be an additive alternate but the bid form does not indicate any alternates. Please clarify.	A	There are no alternates. The elevator shall be included in the base bid. Revised drawings issued in Addendum 01.
A-21	ILS	Current specifications for gas cylinder restraints occur in two places—115300 page 9 2.7 and 115300 page 10 2.9. 2.7 deals with general cylinder storage and appears to occur in 5 places on the drawings. 2.9 deals with cylinder storage in traffic areas. Cannot find such an application. Are there one or more of such applications?	A	There are no cylinder storage areas in traffic areas.
A-22	ILS	Current specifications also detail Local Exhaust Vent (Snorkel) Systems—115300 page 9 2.8. Are there any such creatures on the project?	A	There are no snorkels in Phase 2.

CC:

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INFORMATION NEEDS