

LOS RIOS COMMUNITY COLLEGE DISTRICT

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Purchasing Department

Sacramento City College American River College Cosumnes River College Folsom Lake College

ADDENDUM NO. 4

ISSUE DATE: May 21, 2018

American River College Liberal Arts Building Modernization STEM

LRCCD BID NO. 18027

Issued By:

LOS RIOS COMMUNITY COLLEGE DISTRICT
1919 Spanos Court, Sacramento, CA 95825
Phone (916) 568-3071 Fax (916) 568-3145

This addendum forms a part to the Contract Documents. The addendum items supersede and supplement all portions of the bidding documents with which it conflicts. All workmanship, materials, appliances and equipment which may be included in the following addendum items shall be of the same relative quality as described for similar work set forth in the general or main specifications of which these addendum items shall be considered a part.

This Addendum has been acknowledged in the space provided on the Bid Form and is considered part of the bid documents.

This Addendum consists of 42 pages

ADDENDUM NO. 4

LRCCD Bid #18027

American River College

Liberal Arts Modernization STEM Building

DSA Application No.: 02-116042

Date: 21 May 2018

2 pages plus attachments

NOTICE TO ALL BIDDERS

The following described changes, corrections, clarifications, deletions, additions, and approvals for the Contract Bid and Contract Documents dated 19 March 2018, which comprise Addendum No. 4, are hereby made a part of the Contract Bid and Contract Documents and shall govern in the performance of the Work. Bidder shall acknowledge receipt of this Addendum on the Bid Form.

CLARIFICATION

Item 1: Provide battery powered clocks in the following rooms:
Level 01 rooms: 100, 101, 102, 104, 105, 106, 107, 108, 113, 114, 115, 122, 134, 136
Level 02 rooms: 200, 201, 203, 206, 207, 208, 211, 215, 216, 217, 218, 226, 230, 235, 237, 239
Level 03 rooms: 300, 301, 302, 304, 305, 306, 310, 311, 312, 313, 321, 326, 332, 334.

SPECIFICATIONS

Section: 03 3000 – “CAST-IN-PLACE CONCRETE”

Part 2, paragraph 2.7, sub paragraph A removed. Part 3, paragraph 3.5, sub paragraph A and B removed.

Section: 07 2616 – “BELOW-GRADE VAPOR RETARDERS”

See attached updated section.

ARCHITECTURAL

Drawings

Item A-1: (Refer to DOOR SCHEDULE A512)
Door 113B changed from HM to Aluminum frame.

ELECTRICAL

Drawings

Item E-1: (Refer to PANEL SCHEDULES AND PROJECT NOTES E001)
Branch Panels have been revised.

Item E-2: (Refer to LIGHTING PLAN – LEVEL 01 A/E201)

Elevator Control Room has been moved to the first floor and plan updated to reflect this.

- Item E-3:** (Refer to POWER & TELECOMMUNICATIONS PLAN – LEVEL 01 A/E301)
Elevator Control Room has been moved to the first floor and plan updated to reflect this.
- Item E-4:** (Refer to FIRE ALARM RISER DIAGRAM A/E500B)
Fire Alarm Riser Diagram has been updated.
- Item E-5:** (Refer to FIRE ALARM PLAN – LEVEL 01 A/E501)
Updated Fire Alarm plan for Level 01 has been updated.
- Item E-6:** (Refer to FIRE ALARM PLAN – LEVEL 02 A/E502)
Updated Fire Alarm plan for Level 02 has been updated.
- Item E-7:** (Refer to FIRE ALARM PLAN – LEVEL 03 A/E503)
Updated Fire Alarm plan for Level 03 has been updated.
- Item E-8:** (Refer to ENLARGED ROOM PLANS E601)
Key notes #17 and 18 have been updated.

END OF ADDENDUM NO. 4

SECTION 03 3000

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. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.
- B. Related Requirements:
 - 1. Section 03 3500 "Concrete Finishing" for general building applications of specially finished formed concrete.
 - 2. Section 32 1316 "Site Concrete " for concrete pavement and walks.
 - 3. Section 07 2626 "Below-grade Vapor Retarders" for vapor retarders below grade.
 - 4. Section 09 6123 "Concrete Vapor Emission Treatment" for building application of vapor emission on concrete.

1.3 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, other pozzolans, and silica fume; materials subject to compliance with requirements.
- B. W/C Ratio: The ratio by weight of water to cementitious materials.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at the project site.
 - 1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.
 - c. Ready-mix concrete manufacturer.
 - d. Concrete Subcontractor.
 - e. Special concrete finish Subcontractor.
 - 2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, shoring and reshoring procedures, vapor-retarder installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, methods for achieving specified floor and slab flatness and levelness floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
 - 1. Indicate amounts of mixing water to be withheld for later addition at Project site.
- C. Steel Reinforcement Shop Drawings: Placing Drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.
- D. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
 - 1. Location of construction joints is subject to approval of the Architect.
- E. Samples: For waterstops, vapor retarder.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer, manufacturer, testing agency.
- B. Welding certificates.
- C. Material Certificates: For each of the following, signed by manufacturers:
 - 1. Cementitious materials.
 - 2. Admixtures.
 - 3. Form materials and form-release agents.
 - 4. Steel reinforcement and accessories.
 - 5. Fiber reinforcement.
 - 6. Waterstops.
 - 7. Curing compounds.
 - 8. Floor and slab treatments.
 - 9. Bonding agents.
 - 10. Adhesives.
 - 11. Vapor retarders.
 - 12. Semirigid joint filler.
 - 13. Joint-filler strips.
 - 14. Repair materials.
- D. Material Test Reports: For the following, from a qualified testing agency:
 - 1. Aggregates: Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.
- E. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer, detailing fabrication, assembly, and support of formwork.
 - 1. Shoring and Reshoring: Indicate proposed schedule and sequence of stripping formwork, shoring removal, and reshoring installation and removal.

- F. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.
 - G. Field quality-control reports.
 - H. Minutes of preinstallation conference.
- 1.7 QUALITY ASSURANCE
- A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
 - B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
 - 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
 - C. Testing Agency Qualifications: An independent agency, acceptable to the authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
 - 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician, Grade I. Testing agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician, Grade II.
 - D. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M.
 - E. Mockups: Cast concrete slab-on-grade, suspended slabs, walls and columns to demonstrate typical joints, surface finish, texture, tolerances, floor treatments, and standard of workmanship.
 - 1. Build panel approximately 200 sq. ft. for slab-on-grade and 100 sq. ft. for formed surfaces in the location indicated or, if not indicated, as directed by Architect.
 - 2. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- 1.8 PRECONSTRUCTION TESTING
- A. Preconstruction Testing Service: Engage a qualified testing agency to perform preconstruction testing on concrete mixtures.
- 1.9 DELIVERY, STORAGE, AND HANDLING
- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
 - B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

1.10 FIELD CONDITIONS

- A. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
1. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.
- B. Hot-Weather Placement: Comply with ACI 301 and as follows:
1. 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. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

- A. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
1. ACI 301.
 2. ACI 117.

2.2 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
1. Plywood, metal, or other approved panel materials.
 2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - a. High-density overlay, Class 1 or better.
 - b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.
 - c. Structural 1, B-B or better; mill oiled and edge sealed.
 - d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.
 3. Overlaid Finnish birch plywood.
- 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 produce surfaces with gradual or abrupt irregularities not

exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.

- D. Pan-Type Forms: Glass-fiber-reinforced plastic or formed steel, stiffened to resist plastic concrete loads without detrimental deformation.
- E. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.
- F. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch, minimum.
- G. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.
- H. Form-Release Agent: Commercially formulated form-release agent that does not bond with, stain, or adversely affect concrete surfaces and does not impair subsequent treatments of concrete surfaces.
 - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- I. Form Ties: Factory-fabricated, removable or snap-off glass-fiber-reinforced plastic or metal form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 - 1. Furnish units that leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.
 - 2. Furnish ties that, when removed, leave holes no 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.

2.3 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615, Grade 60 or Grade 80, deformed.
- B. Low-Alloy-Steel Reinforcing Bars: ASTM A 706, Grade 60 or Grade 80, deformed.
- C. Steel Bar Mats: ASTM A 184, fabricated from ASTM A 615, Grade 60 or Grade 80 deformed bars, assembled with clips.
- D. Plain-Steel Wire: ASTM A 1064.
- E. Deformed-Steel Wire: ASTM A 1064.
- F. Plain-Steel Welded-Wire Reinforcement: ASTM A 1064, plain, fabricated from as-drawn steel wire into flat sheets.

2.4 REINFORCEMENT ACCESSORIES

- A. Joint Dowel Bars: ASTM A 615, Grade 60 or Grade 80, plain-steel bars, cut true to length with ends square and free of burrs.
- B. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating; compatible with epoxy coating on reinforcement and complying with ASTM A 775.
- C. Zinc Repair Material: ASTM A 780.

- D. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:
1. For concrete surfaces exposed to view, where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
 2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.
 3. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.

2.5 CONCRETE MATERIALS

- A. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
- B. Cementitious Materials:
1. Portland Cement: ASTM C 150, Type I or Type II. Use Type II for mat slabs with sulfate environment. Use Type III for when high early strength or Type IV for when lower heat of hydration is required.
 2. Retain supplementary cementing materials in "Fly Ash" and "Slag Cement" subparagraphs below if permitted. Ready-mix-concrete manufacturer blends these materials with portland cement. Fly ash, slag cement, or pozzolanic materials may slow rate of concrete strengthening and affect color uniformity. Class F fly ash is more readily available than Class C fly ash.
 3. Fly Ash: ASTM C 618, Class F.
 4. Slag Cement: ASTM C 989, Grade 100 or 120.
 5. Blended Hydraulic Cement: ASTM C 595, Type IS, portland blast-furnace slag cement.
 6. Silica Fume: ASTM C 1240, amorphous silica.
- C. Normal-Weight Aggregates: ASTM C 33, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
1. Maximum Coarse-Aggregate Size: 1 inch nominal.
 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- D. Lightweight Aggregate: ASTM C 330, 1-inch or 3/8-inch nominal maximum aggregate size.
- E. Air-Entraining Admixture: ASTM C 260.
- F. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.
1. Water-Reducing Admixture: ASTM C 494, Type A.
 2. Retarding Admixture: ASTM C 494, Type B.
 3. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
 4. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
 5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494, Type G.

6. Plasticizing and Retarding Admixture: ASTM C 1017, Type II.
- G. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C 494, Type C.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Corporation-Construction Systems.
 - b. Grace Construction Products; W.R. Grace & Co. -- Conn.
 - c. Sika Corporation.
- H. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Corporation-Construction Systems.
 - b. Grace Construction Products; W.R. Grace & Co. -- Conn.
 - c. Sika Corporation.
- I. Color Pigment: ASTM C 979/C 979M, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.
 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. BASF Corporation-Construction Systems.
 2. Color: As indicated by manufacturer's designation, as selected by Architect from manufacturer's full range.
- J. Water: ASTM C 94/C 94M and potable.

2.6 WATERSTOPS

- A. Flexible Rubber Waterstops: CE CRD-C 513, with factory-installed metal eyelets, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.
 1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Williams Products, Inc.
 2. Profile: Flat dumbbell without center bulb.
 3. Dimensions:.
- B. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Carlisle Coatings & Waterproofing Inc.
 - b. Sika Greenstreak.

~~2.7 VAPOR RETARDERS~~

- ~~A. Sheet Vapor Retarder: ASTM E 1745, Class A, except with maximum minimum 15 mils thickness. Include manufacturer's recommended adhesive or pressure sensitive tape.~~
- ~~1. Manufacturers: Subject to compliance with requirements, provide products meeting the following performance criteria:~~
- ~~a. Puncture Resistance, ASTM D1709, Method B: 3,000 grams.~~
 - ~~b. Tensile Strength, ASTM E154, Section 9: 67 lbf/in.~~
 - ~~c. Water Vapor Permeance, ASTM F1249: 0.0067 perms.~~

2.8 FLOOR AND SLAB TREATMENTS

- A. Slip-Resistive Emery Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive, crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials with 100 percent passing No. 4 sieve.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- a. Dayton Superior.
 - b. L&M Construction Chemicals, Inc.
 - c. Lambert Corporation.
- B. Emery Dry-Shake Floor Hardener: Factory-packaged, dry combination of portland cement, graded emery aggregate, and plasticizing admixture; with emery aggregate consisting of no less than 60 percent of total aggregate content.
1. Color: As selected by Architect from manufacturer's full range.
- C. Metallic Dry-Shake Floor Hardener: Factory-packaged, dry combination of portland cement, graded metallic aggregate, rust inhibitors, and plasticizing admixture; with metallic aggregate consisting of no less than 65 percent of total aggregate content.
1. Color: As selected by Architect from manufacturer's full range.
- D. Unpigmented Mineral Dry-Shake Floor Hardener: Factory-packaged dry combination of portland cement, graded quartz aggregate, and plasticizing admixture.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- a. BASF Corporation-Construction Systems.
 - b. Dayton Superior.
 - c. SpecChem, LLC.
- E. Pigmented Mineral Dry-Shake Floor Hardener: Factory-packaged, dry combination of portland cement, graded quartz aggregate, color pigments, and plasticizing admixture. Use color pigments that are finely ground, nonfading mineral oxides interground with cement.
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- a. BASF Corporation-Construction Systems.
 - b. Dayton Superior.
 - c. SpecChem, LLC.
2. Color: As selected by Architect from manufacturer's full range.

2.9 LIQUID FLOOR TREATMENTS

- A. Penetrating Liquid Floor Treatment: Clear, chemically reactive, waterborne solution of inorganic silicate or silicate materials and proprietary components; odorless; that penetrates, hardens, and densifies concrete surfaces.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Dayton Superior.
 - b. PROSOCO, Inc.
 - c. SpecChem, LLC.

2.10 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Corporation-Construction Systems.
 - b. Sika Corporation.
 - c. W.R. Meadows, Inc.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- D. Water: Potable.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Corporation-Construction Systems.
 - b. W.R. Meadows, Inc.
- F. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, nondissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Corporation-Construction Systems.
 - b. Dayton Superior.
 - c. W.R. Meadows, Inc.
- G. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, 18 to 25 percent solids, nondissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BASF Corporation-Construction Systems.

b. W.R. Meadows, Inc.

H. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. BASF Corporation-Construction Systems.
- b. Dayton Superior.
- c. SpecChem, LLC.
- d. W.R. Meadows, Inc.

I. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. BASF Corporation-Construction Systems.
- b. Dayton Superior.
- c. SpecChem, LLC.
- d. W.R. Meadows, Inc.

2.11 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752, cork or self-expanding cork.

B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 according to ASTM D 2240.

C. Bonding Agent: ASTM C 1059/C 1059M, Type II, nonredispersible, acrylic emulsion or styrene butadiene.

D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:

1. Types I and II, nonload bearing, Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

E. Reglets: Fabricate reglets of not less than 0.022-inch-thick, galvanized-steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.

F. Dovetail Anchor Slots: Hot-dip galvanized-steel sheet, not less than 0.034 inch thick, with bent tab anchors. Temporarily fill or cover face opening of slots 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 5000 psi at 28 days when tested according to ASTM C 109.
- B. Repair Overlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface 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 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 5000 psi at 28 days when tested according to ASTM C 109.

2.13 CONCRETE MIXTURES, GENERAL

- A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.
1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials: Use fly ash, pozzolan, slag cement, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent. Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
1. Fly Ash: 25 percent.
 2. Combined Fly Ash or Pozzolan and Slag Cement: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.06 percent by weight of cement.
- D. Admixtures: Use admixtures according to manufacturer's written instructions.
1. Use water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
 2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a w/c ratio below 0.50.
 4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
- E. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

2.14 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 ASTM C 1116, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

- B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd..
3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 FORMWORK INSTALLATION

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

- C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:

1. Class A, 1/8 inch for smooth-formed finished surfaces.
2. Class B, 1/4 inch for rough-formed finished surfaces.

- D. Construct forms tight enough to prevent loss of concrete mortar.

- E. Construct forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast-concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

1. Install keyways, reglets, recesses, and the like, for easy removal.
2. Do not use rust-stained steel form-facing material.

- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEM INSTALLATION

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC 303.
 - 2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
 - 3. Install dovetail anchor slots in concrete structures as indicated.

3.3 REMOVING AND REUSING FORMS

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

3.4 SHORING AND RESHORING INSTALLATION

- A. Comply with ACI 318 and ACI 301 for design, installation, and removal of shoring and reshoring.
 - 1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.
- 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 RETARDER INSTALLATION~~

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

3.6 STEEL REINFORCEMENT INSTALLATION

- A. General: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
 - 1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded-wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.
- F. Epoxy-Coated Reinforcement: Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M. Use epoxy-coated steel wire ties to fasten epoxy-coated steel reinforcement.
- G. Zinc-Coated Reinforcement: Repair cut and damaged zinc coatings with zinc repair material according to ASTM A 780/A 780M. Use galvanized-steel wire ties to fasten zinc-coated steel reinforcement.

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.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - 2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches 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 at maximum 40 ft. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
 - 6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
 - 7. 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 does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 - 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
 - 2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Section 07 9200 "Joint Sealants," are indicated.
 - 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.8 WATERSTOP INSTALLATION

- A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed

waterstops during progress of the 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, adhesive bonding, 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 are completed.
- B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Architect.
- C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

- 1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

- D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

- 1. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
 - 2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
 - 3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

- E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

- 1. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Maintain reinforcement in position on chairs during concrete placement.
 - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 4. Slope surfaces uniformly to drains where required.
 - 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

3.10 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

- 1. Apply to concrete surfaces not exposed to view.

- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
 - 1. Apply to concrete surfaces exposed to view.
 - 2. If retaining "Rubbed Finish" Paragraph below, retain "Smooth-Formed Finish" Paragraph above.
- C. Rubbed Finish: Apply the following to smooth-formed-finished as-cast concrete where indicated:
 - 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.
 - 2. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix 1 part portland cement to 1-1/2 parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches, so color of dry grout matches adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
 - 3. Cork-Floated Finish: Wet concrete surfaces and apply a stiff grout. Mix 1 part portland cement and 1 part fine sand with a 1:1 mixture of bonding agent and water. Add white portland cement in amounts determined by trial patches, so color of dry grout matches adjacent surfaces. Compress grout into voids by grinding surface. In a swirling motion, finish surface with a cork float.
- 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 ACI 302.1R recommendations 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 to produce a profile amplitude of 1/4 inch in one direction.
 - 1. Apply scratch finish to surfaces to receive concrete floor toppings or to receive mortar setting beds for 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 to receive trowel finish and 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 troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is

free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
 2. Finish surfaces to the following tolerances, according to ASTM E 1155, for a randomly trafficked floor surface:
 - a. Specified overall values of flatness, F(F) 25; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 17; and of levelness, F(L) 15.
 - b. Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade.
 - c. Specified overall values of flatness, F(F) 30; and of levelness, F(L) 20; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 15; for suspended slabs.
 - d. Specified overall values of flatness, F(F) 45; and of levelness, F(L) 35; with minimum local values of flatness, F(F) 30; and of levelness, F(L) 24.
 3. Finish and measure surface, so gap at any point between concrete surface and an unlevelled, freestanding, 10-ft.- long straightedge resting on two high spots and placed anywhere on the surface does not exceed 1/8 inch.
- E. Trowel and Fine-Broom Finish: Apply a first trowel finish to surfaces where ceramic or quarry tile is to be installed by either thickset or thinset method. While concrete is still plastic, slightly scarify surface with a fine broom.
1. Comply with flatness and levelness tolerances for trowel-finished floor surfaces.
- F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.
1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.
- G. Slip-Resistive Finish: Before final floating, apply slip-resistive aggregate or aluminum granule finish where indicated and to concrete stair treads, platforms, and ramps. Apply according to manufacturer's written instructions and as follows:
1. Uniformly spread 25 lb/100 sq. ft. of dampened slip-resistive aggregate or aluminum granules over surface in one or two applications. Tamp aggregate flush with surface, but do not force below surface.
 2. After broadcasting and tamping, apply float finish.
 3. After curing, lightly work surface with a steel wire brush or an abrasive stone and water to expose slip-resistive aggregate or aluminum granules.
- H. Dry-Shake Floor Hardener Finish: After initial floating, apply dry-shake floor hardener to surfaces according to manufacturer's written instructions and as follows:
1. Uniformly apply dry-shake floor hardener at a rate of 100 lb/100 sq. ft. unless greater amount is recommended by manufacturer.
 2. Uniformly distribute approximately two-thirds of dry-shake floor hardener over surface by hand or with mechanical spreader, and embed by power floating. Follow power floating with a second dry-shake floor hardener application, uniformly distributing remainder of material, and embed by power floating.

3. After final floating, apply a trowel finish. Cure concrete with curing compound recommended by dry-shake floor hardener manufacturer and apply immediately after final finishing.

3.12 MISCELLANEOUS CONCRETE ITEM INSTALLATION

- A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.
- B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations:
 1. Coordinate sizes and locations of concrete bases with actual equipment provided.
 2. Construct concrete bases 6 inches high unless otherwise indicated, and extend base not less than 6 inches in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated or unless required for seismic anchor support.
 3. Minimum Compressive Strength: 4000 psi at 28 days.
 4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.
 5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete substrate.
 6. Prior to pouring concrete, place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 7. Cast anchor-bolt insert into bases. Install anchor bolts to elevations required for proper attachment to supported 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 PROTECTING AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for remainder of curing period.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

- E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:
1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period, using cover material and waterproof tape.
 - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
 - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
 - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies does not interfere with bonding of floor covering used on Project.
 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound does not interfere with bonding of floor covering used on Project.
 4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.14 LIQUID FLOOR TREATMENT APPLICATION

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

3.15 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 one month. Do not fill joints until construction traffic has permanently ceased.

- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joints clean and dry.
- C. Install semirigid 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. Remove and replace concrete that cannot be repaired and patched to Architect's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of 1 part portland cement to 2-1/2 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 to solid concrete. Limit cut depth to 3/4 inch. 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 matches 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.
- 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 a 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 mixture as original concrete, except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

7. Repair random cracks and single holes 1 inch 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's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect's approval.

3.17 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a special inspector and a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

C. Inspections:

1. Steel reinforcement placement.
2. Steel reinforcement welding.
3. Headed bolts and studs.
4. Verification of use of required design mixture.
5. Concrete placement, including conveying and depositing.
6. Curing procedures and maintenance of curing temperature.
7. Verification of concrete strength before removal of shores and forms from beams and slabs.

D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172/C 172M shall be performed according to the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.
2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day.
 - a. When frequency of testing provides fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
3. Slump: ASTM C 143/C 143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
4. Air Content: ASTM C 231/C 231M, pressure method, for normal-weight concrete; ASTM C 173/C 173M, 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 mixture.

5. Concrete Temperature: ASTM C 1064/C 1064M; one test hourly when air temperature is 40 deg F and below or 80 deg F and above, and one test for each composite sample.
 6. Unit Weight: ASTM C 567/C 567M, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
 7. Compression Test Specimens: ASTM C 31/C 31M.
 - a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.
 - b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.
 8. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.
 - a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.
 - b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.
 9. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
 10. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
 11. Test results shall be reported in writing to Architect, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
 12. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect but will not be used as sole basis for approval or rejection of concrete.
 13. 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. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Architect.
 14. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
 15. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.
- E. Measure floor and slab flatness and levelness according to ASTM E 1155 within 48 hours of finishing.
- 3.18 PROTECTION OF LIQUID FLOOR TREATMENTS
- A. Protect liquid floor treatment from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by liquid floor treatments installer.

LRCCD – American River College
STEM Building
Sacramento, CA

IDA Structural Engineers, Inc.
Addendum 4
May 21, 2018

END OF SECTION 03 3000

SECTION 07 2616 – BELOW-GRADE VAPOR RETARDERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SECTION INCLUDES

- A. Heavy-duty under-slab plastic vapor retarder.

1.3 RELATED SECTIONS

- A. Section 07 1326 - Self-Adhering Sheet Waterproofing.
- B. Section 07 1329 – Pre-Applied Sheet Membrane Waterproofing.
- B-C. Section 03 3000 – Cast-in-Place Concrete

1.4 SUSTAINABILITY REQUIREMENTS

- A. Refer to Section 01 8113 for sustainability requirements related to this Section.

1.5 DEFINITIONS

- A. Vapor Retarder Assembly: The collection of vapor retarder materials and auxiliary materials applied over free draining gravel, including the sealing of sheet laps, joints, and penetrations, forming an impermeable membrane to control movement of moisture up through slabs-on-grade.

1.6 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM E1745-17: Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
 - 2. ASTM E1643-18a: Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
- B. Technical Reference – American Concrete Institute (ACI):
 - 1. ACI 302.2R-06: Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials.
 - 2. ACI 302.1R-15: Guide for Concrete Floor and Slab Construction.

~~4.6~~1.7 ACTION SUBMITTALS

- A. Product Data: Provide data indicating material characteristics, performance criteria, and limitations.

4.71.8 INFORMATIONAL SUBMITTALS

- A. Manufacturer's Installation Instructions for placement, seaming, penetration prevention and repair, and perimeter seal per ASTM E1643. ~~Indicate preparation and installation requirements, techniques.~~
- B. Certificates of Compliance: Include the name, description of the product. Provide third party independent testing reports to verify compliance with referenced standards.
 - 1. When Certificates of Compliance cannot be provided, the Contractor shall hire a professional testing laboratory to verify compliance. Contractor shall pay for the cost of testing.
- C. Summary of test results per paragraph 9.3 of ASTM E1745.
- D. Manufacturer's samples and literature
- E. All mandatory ASTM E1745 testing must be performed on a single production roll per ASTM E1745 Section 8.1.
- G-F. Contact vapor barrier manufacturer to coordinate a review of the vapor barrier installation either by digital review or in person.

4.81.9 CLOSEOUT SUBMITTALS

- A. Warranty: Sample of special warranty.

4.91.10 QUALITY ASSURANCE

- A. Perform Work in accordance with ASTM E1643 and manufacturers recommend methods.
- B. Single-Source Responsibility: Obtain vapor retarder material and installation accessories from single source providing consistent quality in performance and appearance without delaying progress of the Work.

4.101.11 DELIVERY, STORAGE, AND HANDLING

- A. Protect vapor retarder materials from puncture damage prior to use.
- B. Comply with manufacturer's written recommendations for handling and storage, and protection during installation.

4.141.12 WARRANTY

- A. Special Manufacturer's Warranty: Manufacturer's standard form in which manufacturer agrees to replace vapor retarder material that does not comply with requirements or that fails achieve a watertight seal, or exhibits loss of adhesion or cohesion within specified warranty period.
 - 1. Warranty Period: Three years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Provide continuous vapor retarder under floor slab throughout the building, unless indicated otherwise on Drawings and ASTM E1643.

2.2 MATERIALS

- A. Plastic Vapor Retarder Sheeting: ASTM E1745, Class A, 15.0 mil total thickness, 14'-0" wide sheets. Maintain permeance of less than 0.01 Perms [grains/(ft² · hr · inHg)] as tested in accordance with mandatory conditioning tests per ASTM E1745 Section 7.1 (7.1.1-7.1.5).
 - 1. Basis-of-Design: Stego Industries, StegoWrap
 - 2. Puncture Resistance, ASTM D1709, Method B: 3,000 grams
 - 3. Tensile Strength, ASTM E154, Section 9: 67 lbf / in.
 - 4. Water Vapor Permeance, ASTM F1249: 0.0067 perms.
 - 4-5. Provide third party documentation that all testing was performed on a single production roll per ASTM E1745 Section 8.1.

2.3 ACCESSORIES

- A. Tape: Polyethylene pressure sensitive, self-adhering type, mesh reinforced, 4-inch wide, compatible with vapor retarder material.
 - 1. Water Vapor Transmission Rate: ASTM E96/E96M; 0.3 perms or lower.
- B. Adhesive: Compatible with vapor retarder and substrate, permanently non-curing; as manufactured by vapor retarder manufacturer, with demonstrated capability to bond vapor retarders securely to substrates indicated.
 - 1. Water Vapor Transmission Rate: ASTM E96/E96M; 0.3 perms or lower
- C. Pipe Boots: Solid 10 mill pre-manufactured peel and stick patching product with aggressive all weather adhesive for direct adhesion to vapor retarder surface, pipes and penetrations.
 - 1. Water Vapor Transmission Rate: ASTM E96/E96M; 0.0016 perms or lower
- D. Cleaner for Vapor Retarder: As recommended by vapor retarder manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify required condition of substrate and adjacent construction with installer present. Make any corrections before proceeding with vapor retarder installation.
- B. Do not proceed with installation of retarder until unsatisfactory conditions have been corrected. Proceeding with installation indicates acceptance of substrate.

3.2 PREPARATION

- A. Remove loose or foreign matter that might impair adhesion.
- B. Level and tamp or roll aggregate, sand or tamped earth base. Ensure that subsoil is approved by Architect.

- C. Clean and prime substrate surfaces to receive adhesive in accordance with manufacturers' instructions.

3.3 INSTALLATION

A. Install vapor retarder materials in accordance with manufacturer's instructions and ASTM E1643 requirements.

B. Extend vapor barrier to the perimeter of the slab. If practicable, terminate it at the top of the slab, otherwise (a) at a point acceptable to the structural engineer or (b) where obstructed by impediments, such as dowels, waterstops, or any other site condition requiring early termination of the vapor barrier. At all points of termination (block-outs, interior grade beams, perimeter edge, etc.), mechanically seal vapor barrier to the slab itself per manufacturer's instructions.

1. Seal vapor barrier to the entire slab perimeter per manufacturer's instructions.

2. OR

4-3. Seal vapor barrier to the entire perimeter wall or footing/grade beam with double sided Tape per manufacturer's instructions. Ensure the concrete is clean and dry prior to adhering tape.

~~B.C.~~ Lay vapor retarder over base rock with width of sheet running parallel with the direction of concrete pour.

~~C.D.~~ Lap vapor retarder 6 inches minimum and seal with 4-inch wide adhesive tape. Position lap seals over firm bearing. Tape joints.

~~D.E.~~ Lap vapor retarder 3 inches over footings and grade beams. Seal membrane to concrete with adhesive or concrete nail every 5 foot on footing surface.

~~E.F.~~ Offset intermediate end joints in adjacent sheets no less than 4 feet.

~~F.G.~~ Cut sheeting to fit closely and neatly around penetrations of pipe and conduit. Seal tears and punctures.

~~G.H.~~ Slip sheeting over penetrations where possible, otherwise slit from penetration hole to nearest edge.

~~H.I.~~ Slip pipe boots fabricated from sheeting material over penetration holes and tape in place completely.

1. Single pipe penetrations may be sealed using pipe boot constructed from the product. Cut a piece of plastic 12-inches wide x 1-1/2 times the circumference of the pipe. With scissors, cut slits half the width of the film Wrap boot around pipe; tape onto pipe and completely tape the base to the vapor barrier.

2. Multiple pipe penetrations in close proximity and very small pipes shall be sealed using mastic. Cut out a small area around pipes. Cut a patch of vapor barrier extending at least 6-inches past the cut out in all directions. Cut X's or small circles in the patch and install over pipes. Overlap at least 6-inches and tape. Build up 40- to 60-mils of mastic or as required to completely fill voids between the pipe and the vapor barrier.

~~I.J.~~ Seal penetrations of pipe and conduit with tape to ensure an airtight seal. Seal tears and punctures with tape immediately before proceeding with covering the vapor retarder. Use a second layer of vapor retarder material where damage to vapor retarder is extensive and would require excessive use of tape to repair.

1. No penetration of the vapor retarder is allowed except for reinforcing steel and permanent utilities.
2. Repair damaged areas by cutting patches of vapor retarder, overlapping damaged area 6 inches and taping all four sides with tape.

K. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

~~J.L.~~ For interior forming applications, avoid the use of non-permanent stakes driven through the vapor barrier. Use female-threaded screed pad posts with nail holes and insert them into a forming system that will not puncture the vapor barrier. Ensure forming system is fully adhered to the vapor barrier.

3.4 CLEANING

- A. Construction Waste Management: Manage construction waste in accordance with provisions of Section 01 7419 Construction Waste Management and Disposal. Submit documentation for Credit MR 2 to satisfy the requirements of that Section.

3.5 PROTECTION

- A. Protect installed vapor retarders from damage by harmful weather exposure, and other construction activities.
- B. Repair any punctures to vapor retarder before pouring concrete slab over retarder.
- C. Do not permit adjacent Work to damage Work of this Section.

END OF SECTION 07 2616

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DOOR SCHEDULE - LEVEL 01

Table with columns: MARK, FUNCTION, NUMBER OF LEAVES, DIMENSIONS (TYPE, LEAF 1, LEAF 2, WIDTH, HEIGHT, THICKNESS), FINISHES (FINISH 1, FINISH 2 (GLASS)), FRAME TYPE, FRAMES (HEAD, JAMB, SILL), FINISHES (FINISH 1, FINISH 2), HARDWARE SET, FIRE RATINGS, REMARKS, REVISION, MARK. Rows 100A-136B.

DOOR SCHEDULE REMARKS:

- 1. CARD READER
2. ADA PUSH BUTTON ON WALL
3. ADA PUSH BUTTON ON REVLARD
4. OR 1376 FOLDING METAL WALL
5. OR 3213 ALUMINUM FRAMED GLASS DOORS
6. NOMINAL SIZES LISTED IN SCHEDULE, VERIFY HEIGHT AND WIDTH IN SHOP DRAWINGS
7. SWING DOOR, REFER TO CASWORK SHEETS
8. MEN'S RESTROOM, SEE SHEET A1000, DETAIL ST-C2
9. WOMEN'S RESTROOM, SEE SHEET A1000, DETAIL ST-C2
10. REFER TO SPEC SECTION 08 1116 FOR RATED FRAMES AND SECTION 08 8100 FOR RATED GLAZING.
11. FIRE DOOR LABELING REQUIREMENTS SHALL CONFORM WITH IBC 716.5.7.1
12. REFER TO SPEC SECTION 08 1116 FOR RATED FRAMES AND SECTION 08 8100 FOR RATED GLAZING.
13. MAGNETIC HOLD OPEN
14. PROVIDE 180 DEGREE HINGE FOR MAGNETIC HOLD OPEN.

DOOR SCHEDULE ABBREVIATIONS:

- AL-1 ANODIZED CLEAR ALUMINUM
AL-2 DARK BRONZE ALUMINUM
WD WOOD
HM HOLLOW METAL
NF NO FRAME (CASEWORK SWING DOOR)
GL-1 INSULATING GLASS WITH FRIT
GL-2 INSULATING GLASS WITH LEAD
GL-3 INTERIOR 3/8" LAMINATED GLASS
GL-4 INTERIOR 1/4" HEAT TREATED GLASS
GL-5 INTERIOR 3/8" HEAT TREATED GLASS
GL-6 INTERIOR 1-1/8" FIRE-RATED GLASS
PT-1 INTERIOR PAINT, REFER TO FINISH LEGEND
PT-3 INTERIOR PAINT, REFER TO FINISH LEGEND
PT-7 REFER TO FINISH LEGEND

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LRCCD - AMERICAN RIVER COLLEGE - LIBERAL ARTS MODERNIZATION STEM BUILDING
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www.goulddevans.com
structural engineer: DA Structural Engineers
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510.854.1629
mechanical/plumbing engineer: Capital Engineering Consultants, Inc.
11020 Sun Center Dr, Suite 100 Rancho Cordova, CA 95670
916.851.5500
electrical engineer: The Engineering Enterprise
1125 High Street Auburn, CA 96803
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civil engineer: BKF Engineers
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916.556.5900
landscape architect: Meyer & Silberg Land Architects
1101 8th Street, Suite 202 Berkeley, CA 94710
510.559.2973
acoustics: Charles M. Salter Associates Inc.
130 Sutter Street, Floor 5 San Francisco, CA 94104
415.387.0442

DOOR SCHEDULE - LEVEL 02

Table with columns: MARK, FUNCTION, NUMBER OF LEAVES, DIMENSIONS (TYPE, LEAF 1, LEAF 2, WIDTH, HEIGHT, THICKNESS), FINISHES (FINISH 1, FINISH 2 (GLASS)), FRAME TYPE, FRAMES (HEAD, JAMB, SILL), FINISHES (FINISH 1, FINISH 2), HARDWARE SET, FIRE RATINGS, REMARKS, REVISION, MARK. Rows 202A-239.

- IDENTIFICATION STAMP
DK OF THE STATE ARCHITECT/ OFFICE OF REGULATION SERVICES
APPL: 02-116042
AC FLS SS DATE

AL-1 ANODIZED CLEAR ALUMINUM
AL-2 DARK BRONZE ALUMINUM
WD WOOD
HM HOLLOW METAL
NF NO FRAME (CASEWORK SWING DOOR)
GL-1 INSULATING GLASS WITH FRIT
GL-2 INSULATING GLASS WITH LEAD
GL-3 INTERIOR 3/8" LAMINATED GLASS
GL-4 INTERIOR 1/4" HEAT TREATED GLASS
GL-5 INTERIOR 3/8" HEAT TREATED GLASS
GL-6 INTERIOR 1-1/8" FIRE-RATED GLASS
PT-1 INTERIOR PAINT, REFER TO FINISH LEGEND
PT-3 INTERIOR PAINT, REFER TO FINISH LEGEND
PT-7 REFER TO FINISH LEGEND

DOOR SCHEDULE - LEVEL 03

Table with columns: MARK, FUNCTION, NUMBER OF LEAVES, DIMENSIONS (TYPE, LEAF 1, LEAF 2, WIDTH, HEIGHT, THICKNESS), FINISHES (FINISH 1, FINISH 2 (GLASS)), FRAME TYPE, FRAMES (HEAD, JAMB, SILL), FINISHES (FINISH 1, FINISH 2), HARDWARE SET, FIRE RATINGS, REMARKS, REVISION, MARK. Rows 301A-334.

Table with columns: No., Description, Date. Rows 1-4.

No. Description Date
1 DSA PERMIT SET 19 MAR 2018
2 ADDENDUM 1 30 APRIL 2018
3 ADDENDUM 3 15 MAY 2018
4 ADDENDUM 4 21 MAY 2018
Project No 1115-0180
Date: MARCH 19, 2018
Sheet:

REFER TO REVISION COLUMN FOR ANY CHANGES IN THE DOOR SCHEDULE

DOOR SCHEDULE
A512
ISSUED FOR DSA PERMIT

Branch Panel: H3, Branch Panel: H2, Branch Panel: H1. Location: ELECTRICAL 320, 225, 121. Served From: H1, MSB. Phases 3 A.I.C. Rating: 14KAIC, 25KAIC. Bus Rating: 100A, 225A. Main Rating: 60A, 150A. Tables with columns for Amp, P, #, A, B, C, #, P, Amp, LOAD SERVED, and Panel Totals.

Branch Panel: L3, Branch Panel: L2, Branch Panel: L1. Location: ELECTRICAL 320, 225, 121. Served From: MSB. Phases 3 A.I.C. Rating: 10KAIC. Bus Rating: 250A, 400A. Main Rating: 250A, 400A. Tables with columns for Amp, P, #, A, B, C, #, P, Amp, LOAD SERVED, and Panel Totals.

Branch Panel: L3A, Branch Panel: L2A, Branch Panel: L1A. Location: ELECTRICAL 320, 225, 121. Served From: L3, L2, L1. Phases 3 A.I.C. Rating: 10KAIC. Bus Rating: 400A, 250A, 400A. Main Rating: 400A, 250A, 400A. Tables with columns for Amp, P, #, A, B, C, #, P, Amp, LOAD SERVED, and Panel Totals.

Branch Panel: L3B. Location: IT 314. Served From: L3A. Phases 3 A.I.C. Rating: 10KAIC. Bus Rating: 100A. Main Rating: 60A. Table with columns for Amp, P, #, A, B, C, #, P, Amp, LOAD SERVED, and Panel Totals.

Branch Panel: L3C. Location: ELECTRICAL 320. Served From: L3. Phases 3 A.I.C. Rating: 10KAIC. Bus Rating: 400A. Main Rating: 400A. Table with columns for Amp, P, #, A, B, C, #, P, Amp, LOAD SERVED, and Panel Totals.

Switchboard: MSB. Location: ELECTRICAL RM. 110B. Served From: NOTE 1. Phases 3. A.I.C. Rating: 65KAIC. Bus Rating: 277/480V. Main Rating: 1600A. Table with columns for Amp, P, #, A, B, C, #, P, Amp, LOAD SERVED, and Panel Totals.

Branch Panel: L1B, Branch Panel: L2B. Location: IT 116, IT 219. Served From: L1A, L2A. Phases 3 A.I.C. Rating: 10KAIC. Bus Rating: 100A, 250A. Main Rating: 60A, 250A. Tables with columns for Amp, P, #, A, B, C, #, P, Amp, LOAD SERVED, and Panel Totals.

Branch Panel: L3C. Location: IT 314. Served From: L3A. Phases 3 A.I.C. Rating: 10KAIC. Bus Rating: 100A. Main Rating: 60A. Table with columns for Amp, P, #, A, B, C, #, P, Amp, LOAD SERVED, and Panel Totals.

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LRCCD-AMERICAN RIVER COLLEGE STEM BUILDING. 4700 COLLEGE OAK DRIVE SACRAMENTO, CA 95841. owner: Los Rios Community College District.

The Engineering Enterprise logo and contact information: 1125 HIGH STREET ALBANY, CA 95003 (530) 886-8556.

GENERAL SHEET NOTES. A BREAKER FOR FIRE ALARM CONTROL PANEL AND OTHER FIRE ALARM DEVICES SHALL COMPLY WITH NFPA 72 SECTION 10.5.5. A. PROVIDE DEDICATED CIRCUIT...

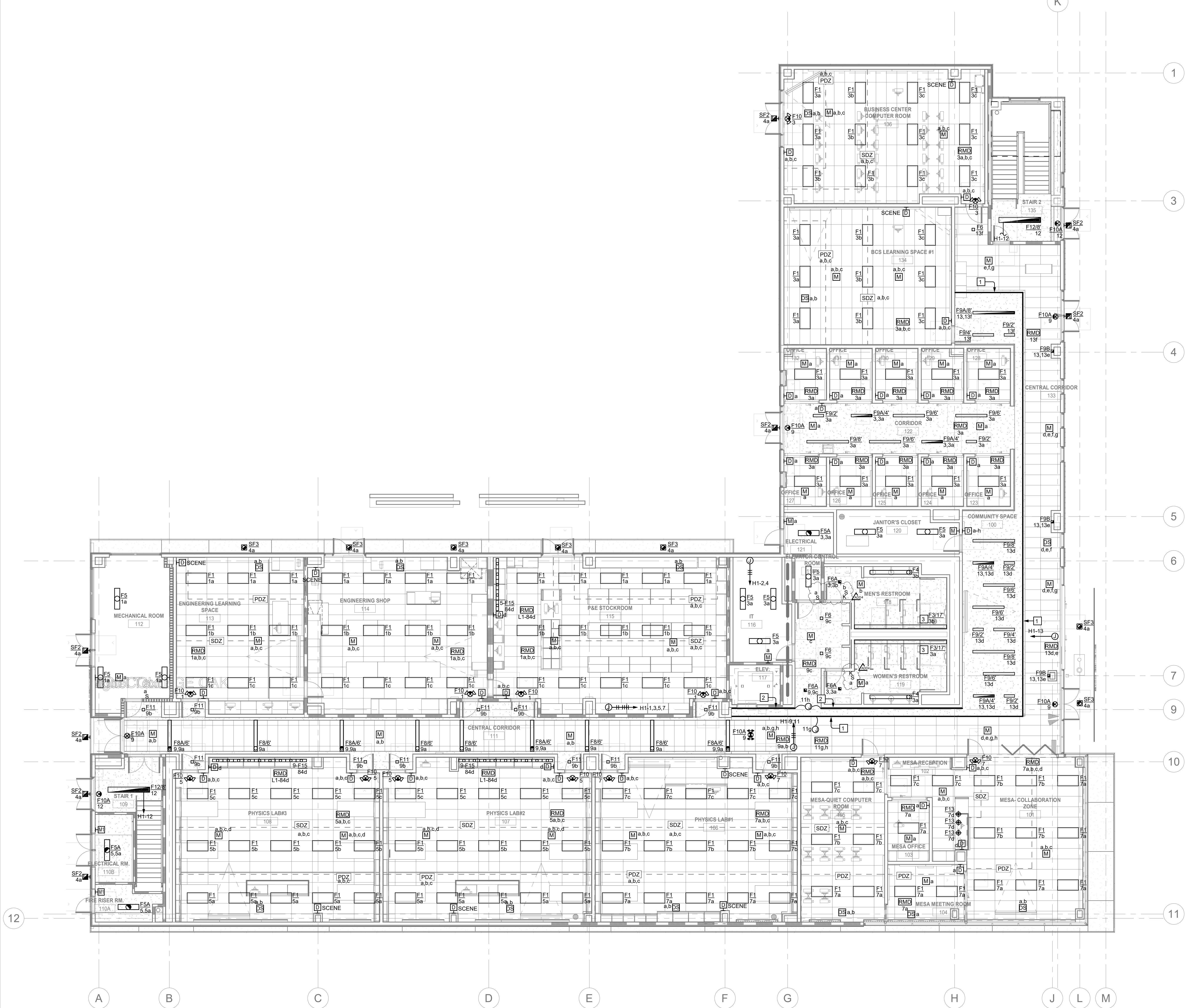
PROJECT NO: 1115-0180. DATE: MARCH 19, 2018. SHEET: E001. ISSUED FOR DSA PERMIT.

GENERAL SHEET NOTES

- A ALL CONDUIT AND RACEWAY PENETRATIONS THROUGH FIRE RATED WALLS AND FIXTURES/DEVICES INSTALLED IN RATED ASSEMBLIES SHALL MAINTAIN THE RATING OF THE ASSEMBLY PER SECTION 712 OF THE CBC. REFER TO DETAILS J.1 & K&E02 FOR RATED PENETRATION DETAILS. REFER TO ARCHITECTURAL PLANS FOR IDENTIFICATION OF FIRE RATED CONDITIONS.
- B REFER TO SHEET E803 FOR LIGHT FIXTURE INSTALLATION DETAILS.
- C REFER TO PROJECT GENERAL NOTES AND SPECIFICATION SECTION 260519 FOR ADDITIONAL LINE VOLTAGE WIRING REQUIREMENTS, INCLUDING LIMITATIONS FOR USE OF MC CABLE.
- D REFER TO TYPICAL WIRING DIAGRAMS ON SHEET E703, AND SPECIFICATION SECTION 260506 FOR LIGHTING CONTROL REQUIREMENTS. 0-10V WIRING, LOW VOLTAGE CABLE AND SOME COMPONENTS OF THE LIGHTING CONTROL SYSTEM ARE NECESSARILY SHOWN ON THE PLANS. PROVIDE A COMPLETE WORKING SYSTEM.
- E REFER TO THE FIXTURE SCHEDULE ON SHEET E602 FOR ADDITIONAL INSTALLATION REQUIREMENTS, INCLUDING MOUNTING HEIGHT OF WALL MOUNTED AND SUSPENDED FIXTURES. VERIFY MOUNTING HEIGHTS OF FIXTURES WITH ARCHITECTURAL ELEVATIONS.
- F SHADING AT LIGHT FIXTURES INDICATES BATTERY BACK-UP. WIRE FOR SWITCHED CONTROL DURING NORMAL OPERATING CONDITIONS. PROVIDE UNSWITCHED HOT FROM SAME CIRCUIT FOR VOLTAGE SENSING. LIGHT FIXTURES ARE NOT TO BE WIRED AS NIGHT LIGHTS U.O.M. WITH THE EXCEPTION OF EXIT SIGNS.
- G COORDINATE ALL FIXTURE LOCATIONS WITH THE ARCHITECTURAL REFLECTED CEILING PLANS. REPORT ANY DISCREPANCIES TO THE ARCHITECT IMMEDIATELY.

NUMBERED SHEET NOTES

- 1 PROVIDE CEILING COVE LIGHT, FIXTURE TYPE F14, LENGTH AS INDICATED. REFER TO ARCHITECTURAL CEILING DETAILS ON SHEET AS74 AND AS77.
- 2 PROVIDE WALL COVE LIGHT, FIXTURE TYPE F14A, LENGTH AS INDICATED. REFER TO ARCHITECTURAL CEILING DETAILS ON SHEET AS74 AND AS77.
- 3 FIXTURE SHALL BE INSTALLED PRIOR TO INSTALLATION OF THE CEILING. REFER TO ARCHITECTURAL DETAILS AND COORDINATE WITH CEILING INSTALLATION.



A LEVEL 01-LIGHTING PLAN
 SCALE: 1/8" = 1'-0"

LRCCD-AMERICAN RIVER COLLEGE STEM BUILDING

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structural engineer:
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Oakland, CA 94612
510.534.1629

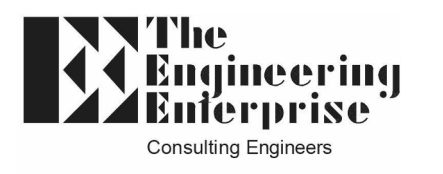
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landscape architect:
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acoustics:
Charles M. Salter Associates Inc.
130 Sutter Street, Floor 5
San Francisco, CA 94104
415.387.0442



1125 HIGH STREET
AUBURN, CA 95603
(530) 886-8556

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No.	Description	Date
1	100% DSA SUBMITTAL	09 JUNE 2017
3	ADDENDUM 4	18 MAY 2018

Project No 1115-0180
 Date: MARCH 19, 2018
 Sheet:

LIGHTING PLAN - LEVEL 01

E201

ISSUED FOR DSA PERMIT

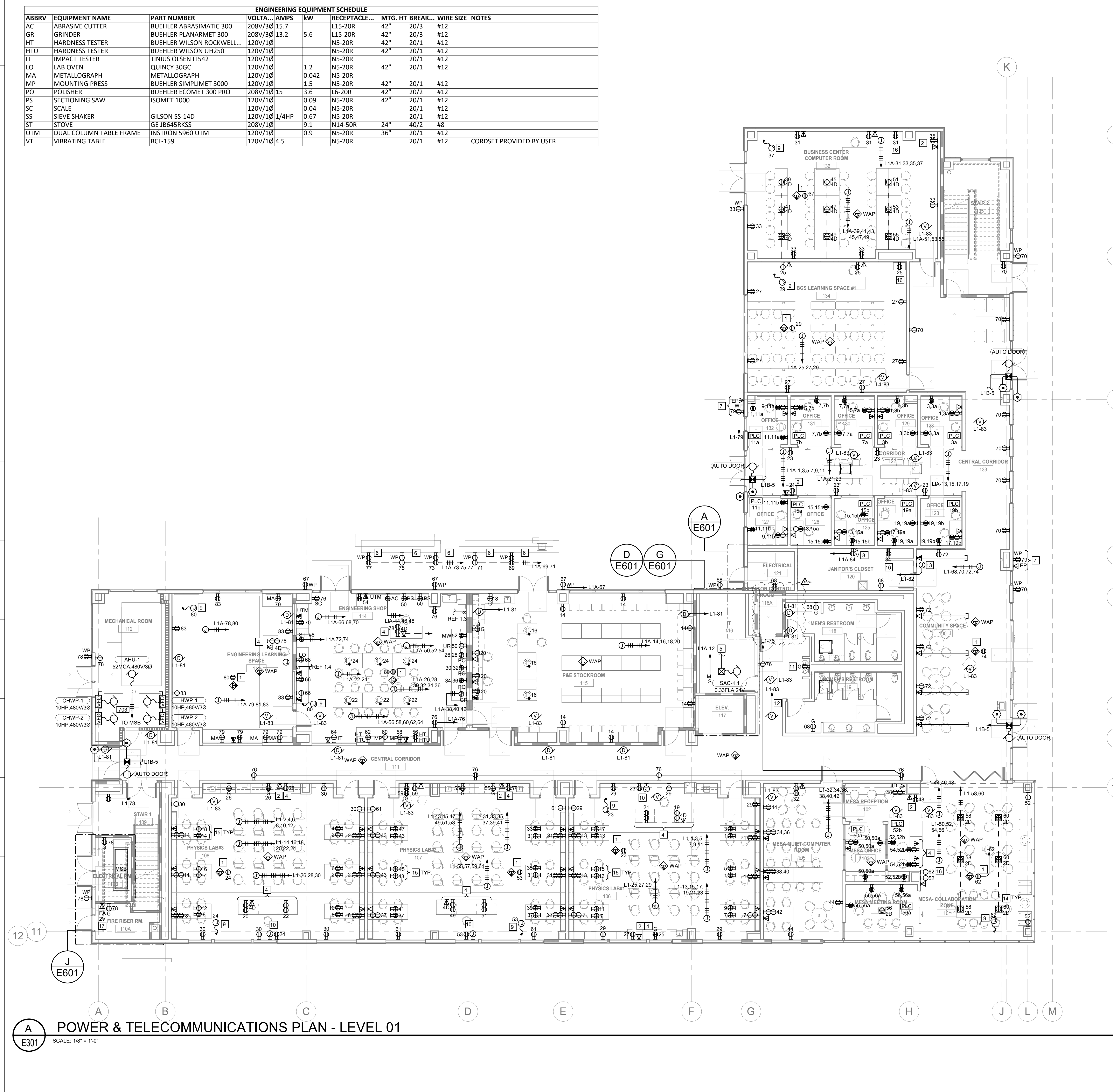
ABBREV	EQUIPMENT NAME	PART NUMBER	VOLTA... AMPS	KW	RECEPTACLE...	MTG. HT	BREAK...	WIRE SIZE	NOTES
AC	ABRASIVE CUTTER	BUHLER ABRASIMATIC 300	208V/3Ø 15.7		L15-20R	42"	20/3	#12	
GR	GRINDER	BUHLER PLANARMET 300	208V/3Ø 13.2	5.6	L15-20R	42"	20/3	#12	
HT	HARDNESS TESTER	BUHLER WILSON ROCKWELL...	120V/1Ø		N5-20R	42"	20/1	#12	
HTU	HARDNESS TESTER	BUHLER WILSON UH250	120V/1Ø		N5-20R	42"	20/1	#12	
IT	IMPACT TESTER	TINIUS OLSEN ITS42	120V/1Ø		N5-20R	42"	20/1	#12	
LO	LAB OVEN	QUINCY 30GC	120V/1Ø	1.2	N5-20R	42"	20/1	#12	
MA	METALLOGRAPH	METALLOGRAPH	120V/1Ø	0.042	N5-20R				
MP	MOUNTING PRESS	BUHLER SIMPLIMET 3000	120V/1Ø	1.5	N5-20R	42"	20/1	#12	
PO	POLISHER	BUHLER ECOMET 300 PRO	208V/1Ø 15	3.6	L6-20R	42"	20/2	#12	
PS	SECTIONING SAW	ISOMET 1000	120V/1Ø	0.09	N5-20R	42"	20/1	#12	
SC	SCALE		120V/1Ø	0.04	N5-20R	42"	20/1	#12	
SS	SIEVE SHAKER	GILSON SS-14D	120V/1Ø 1/4HP	0.67	N5-20R	42"	20/1	#12	
ST	STOVE	GE JB645RKSS	208V/1Ø	9.1	N14-50R	24"	40/2	#8	
UTM	DUAL COLUMN TABLE FRAME	INSTRON 5960 UTM	120V/1Ø	0.9	N5-20R	36"	20/1	#12	
VT	VIBRATING TABLE	BCL-159	120V/1Ø 4.5		N5-20R	20/1	#12		CORDSET PROVIDED BY USER

GENERAL SHEET NOTES

- A ALL CONDUIT AND RACEWAY PENETRATIONS THROUGH FIRE RATED WALLS AND FIXTURES/DEVICES INSTALLED IN RATED ASSEMBLIES SHALL MAINTAIN THE RATING OF THE ASSEMBLY PER SECTION 712 OF THE CBC. REFER TO DETAILS J & K E802 FOR RATED PENETRATION DETAILS. REFER TO ARCHITECTURAL PLANS FOR IDENTIFICATION OF FIRE RATED CONDITIONS.
- B AT TYPICAL WORKSTATIONS, DATA OUTLET AND POWER RECEPTACLE SHALL BE INSTALLED WITHIN 6" AND AT THE SAME ELEVATION.
- C REFER TO PROJECT GENERAL NOTES AND SPECIFICATION SECTION 260519 FOR ADDITIONAL LINE VOLTAGE WIRING REQUIREMENTS, INCLUDING LIMITATIONS FOR USE OF IFC CABLE.
- D REFER TO FINAL OWNER APPROVED FURNITURE PLANS TO VERIFY DIMENSIONS FOR WORKSTATION OUTLETS, FLOORBOXES, ELECTRIFIED FURNITURE POWER CONNECTIONS, ETC. PRIOR TO ROUGH-IN.
- E REFER TO MECHANICAL AND PLUMBING PLANS FOR EQUIPMENT ELECTRICAL REQUIREMENTS. REFER TO FINAL APPROVED MECHANICAL AND PLUMBING SHOP DRAWINGS TO VERIFY CONNECTION REQUIREMENTS PRIOR ROUGH-IN.
- F REFER TO THE LIGHTING CONTROL WIRING DIAGRAMS ON SHEET E703 FOR RECEPTACLE CONTROL REQUIREMENTS.
- G EXTERIOR WP RECEPTACLES SHALL BE PROVIDED WITH FLUSH, LOCKABLE WHILE IN USE COVERS. RECEPTACLES IN MULTI-USER RESTROOMS SHALL BE GFCI AND PROVIDED WITH A CAST, LOW-PROFILE WEATHERPROOF COVER.
- H WIRELESS ACCESS POINT (WAP) SHALL CONSIST OF DATA OUTLET INSTALLED ABOVE THE ACCESSIBLE CEILING U.O.N. REFER TO THE PROJECT SPECIFICATIONS FOR CABLING REQUIREMENTS. WIRELESS EQUIPMENT PROVIDED BY OWNER AND INSTALLED BY CONTRACTOR. VERIFY EXACT LOCATION WITH THE OWNER AND PROVIDE PATCH CORD. LENGTHS AS REQUIRED.
- I ALL DATA OUTLETS SHALL BE INSTALLED PER C/E802 U.O.N. WHERE DATA OUTLET IS INSTALLED IN AREA WITHOUT ACCESSIBLE CEILING, ROUTE CONDUIT TO IDF ROOM, OR TO NEAREST ACCESSIBLE CEILING SPACE.
- J ROUTE ALL CABLE IN CONDUIT AND/OR J-HOOKS WHEN NOT IN CABLE TRAY. INSTALL PER H/E802.
- K TELECOM CONTRACTOR SHALL PROVIDE DATA CABLE REQUIREMENTS FOR AV AND SECURITY CAMERAS. REFER TO E4 SERIES FLOOR PLANS AND E704.
- L ALL SLEEVES AND CONDUITS ABOVE CEILING SHALL BE SOUND PROOFED AT BOTH ENDS WITH SOUND PROOF INSULATION AFTER THE INSTALLATION OF CABLE.
- M REFER TO ENGINEERING EQUIPMENT SCHEDULE ON THIS SHEET FOR CLARIFICATION OF ABBREVIATIONS USED, AND FOR ADDITIONAL ELECTRICAL REQUIREMENTS FOR EQUIPMENT LOCATE IN THE ENGINEERING LAB AND LEARNING SPACE.

NUMBERED SHEET NOTES

- 1 LOCATE DEVICES IN CEILING FOR PROJECTOR. REFER TO AV PLANS.
- 2 LOCATE DEVICES FOR OWNER FURNISHED COPIER/PRINTER.
- 3 LOCATE DEVICES FOR OWNER FURNISHED FLAT PANEL DISPLAY. REFER TO AV PLANS.
- 4 INSTALL DEVICES IN FIXED CASEWORK. COORDINATE WITH ARCHITECTURAL PLANS.
- 5 INDOOR UNIT FED FROM OUTDOOR UNIT (SCU). PROVIDE LOW VOLTAGE WIRING IN 0.75" C. TO OUTDOOR UNIT. REFER TO MECHANICAL PLANS AND MANUFACTURER'S INSTALLATION INSTRUCTIONS. PROVIDE 120V CIRCUIT FOR CONDENSATE PUMP.
- 6 LOCATE DEVICES IN EXTERIOR CONCRETE WORK BENCH. REFER TO ARCHITECTURAL PLANS.
- 7 EMERGENCY WALL PHONE WITH BLUE LIGHT. MOUNT POWER AND DATA AT WALL BELOW TELEPHONE ASSEMBLY AND CONNECT TO PHONE HOUSING WITH CONDUIT.
- 8 LOCATE RECEPTACLE FOR TANKLESS WATER HEATER TWH-1 AND CIRCULATION PUMP CP-1.
- 9 PROVIDE 120V CONNECTION AT MOTORIZED PROJECTION SCREEN. REFER TO SIGNAL PLANS FOR LOCATION OF LOW VOLTAGE CONTROL STATION.
- 10 LOCATE DEVICES ABOVE WHITEBOARDS FOR FUTURE SMART BOARD. VERIFY DEVICE MOUNTING HEIGHT WITH THE OWNER PRIOR TO ROUGH-IN. PROVIDE 1/2" STUB FROM EMPTY JUNCTION BOX WITH BLACK COVER TO ACCESSIBLE CEILING SPACE.
- 11 PROVIDE 120V CONNECTION AT DRINKING FOUNTAIN. COORDINATE ROUGH-IN REQUIREMENTS WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- 12 PROVIDE 120V CONNECTION TO ALL VAVS ON THIS FLOOR. CIRCUITING TO EACH VAV NOT SHOWN. COORDINATE EXACT LOCATIONS AND FINAL COUNT WITH MECHANICAL PLANS.
- 13 LOCATE POWER AND DATA FOR LOCK BOX. VERIFY MOUNTING HEIGHT WITH OWNER.
- 14 PROVIDE MULTI-SERVICE FLUSH FLOORBOX WITH RECESSED DEVICES. WITH TWO DUPLEX RECEPTACLES AND 2-GANGS FOR DATA, LEGRAND EVOLUTION SERIES OR EQUAL. VERIFY EXACT LOCATION WITH THE APPROVED FURNITURE PLANS.
- 15 TYPICAL PROVIDE POWER AND DATA @18" FOR OWNER PROVIDED PC. PROVIDE TWO DUPLEX RECEPTACLES ABOVE COUNTER. ONE ON PC CIRCUIT FOR MONITORS. AND ONE DEDICATED CIRCUIT FOR LAB EQUIPMENT. LABEL THE DEDICATED EQUIPMENT CIRCUIT "DEDICATED" WITH TYPE-ON-TAPE.
- 16 LOCATE RECEPTACLE FOR AV EQUIPMENT CABINET. REFER TO SIGNAL PLANS.
- 17 ROUTE VOICE CABLE FROM THE MISCELLANEOUS 110 BLOCK IN TC.1.1 TERMINATE CABLES INSIDE THE FIRE ALARM CONTROL PANEL IN A SURFACE MOUNT BOX.



A POWER & TELECOMMUNICATIONS PLAN - LEVEL 01
 SCALE: 1/8" = 1'-0"

LRCCD-AMERICAN RIVER COLLEGE STEM BUILDING

4700 COLLEGE OAK DRIVE
 SACRAMENTO, CA 95841

owner:
Los Rios Community College District
 3753 Broadway Drive
 Sacramento, CA 95827
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 415.503.1411
 www.gould-evans.com

structural engineer:
DA Structural Engineers
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 510.534.1629

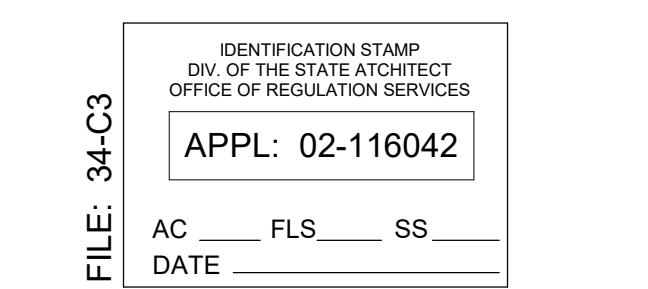
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 510.559.2973

acoustics:
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1	100% DSA SUBMITTAL	09 JUNE 2017
3	ADDENDUM 4	18 MAY 2018

Project No 1115-0180
 Date: MARCH 19, 2018
 Sheet:

POWER & TELECOMMUNICATIONS
 PLAN - LEVEL 01

E301

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STEM BUILDING**

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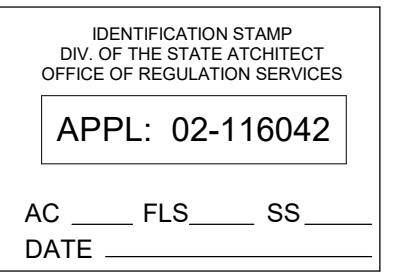
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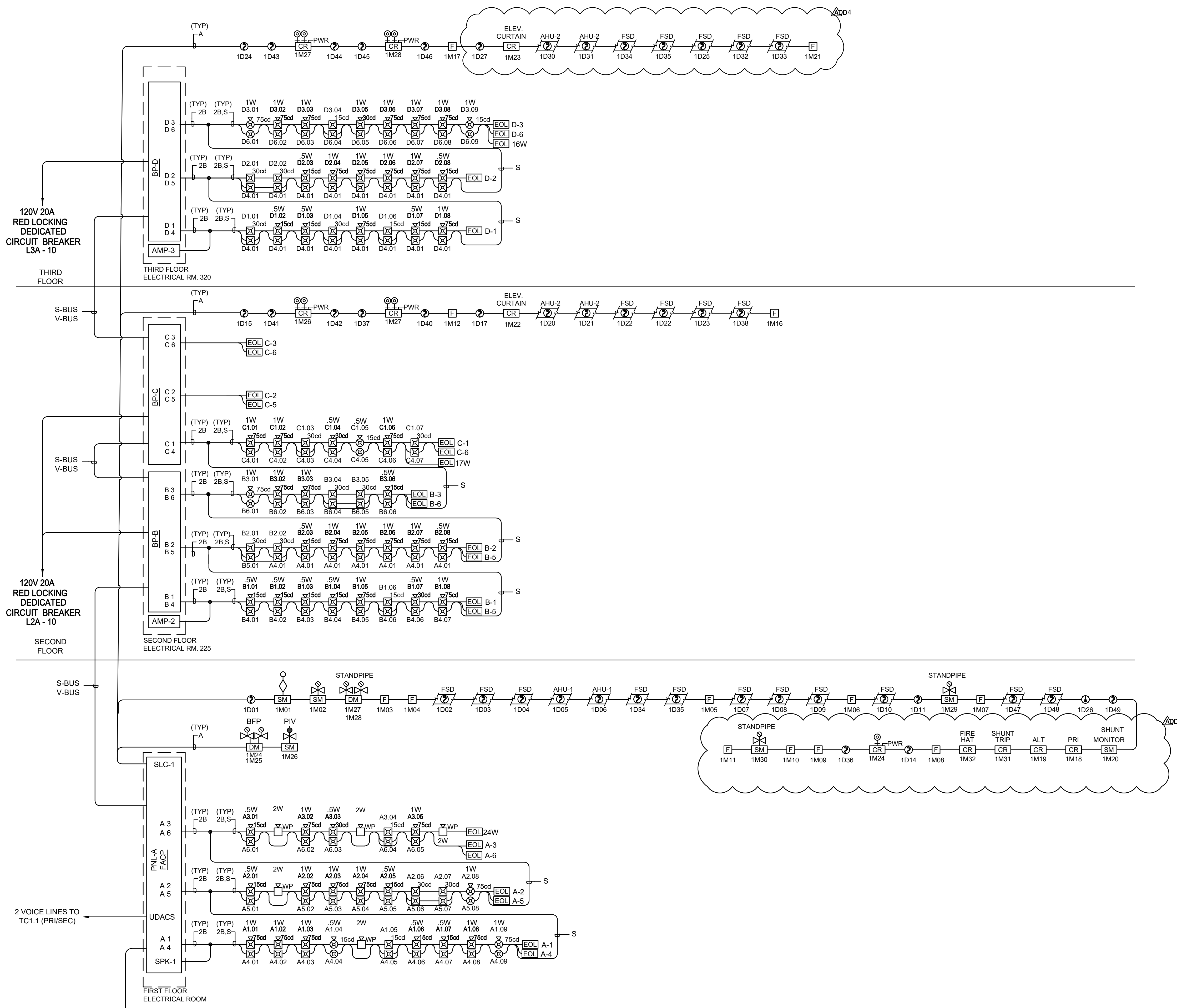
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3	100% DSA SUBMITTAL ADDENDUM 4	09 JUNE 2017 18 MAY 2018

Project No 1115-0180
Date: MARCH 19, 2018
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**FIRE ALARM RISER
DIAGRAM**

E500B

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A FIRE ALARM RISER DIAGRAM
NOT TO SCALE

5.00P

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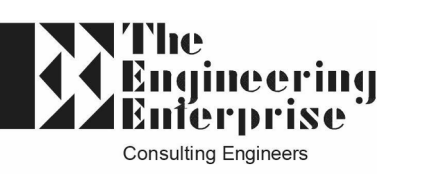
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Date: MARCH 19, 2018
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FIRE ALARM PLAN - LEVEL 01

E501

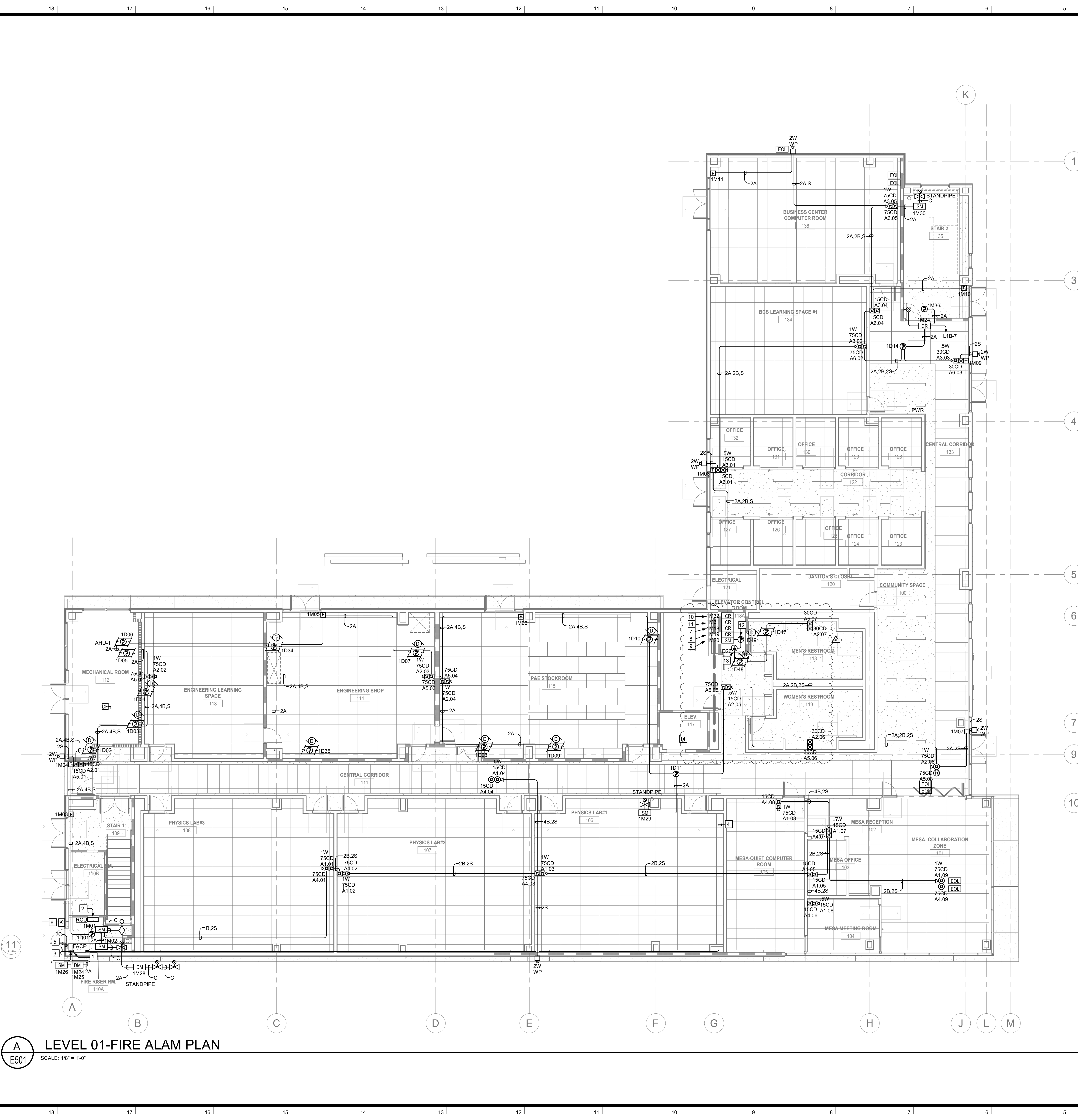
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GENERAL SHEET NOTES

- A FIRE ALARM SYSTEM INSTALLATION SHALL COMPLY WITH ALL REQUIREMENTS OF APPLICABLE CODES, STANDARDS AND STATE REGULATIONS.
- B FIRE ALARM CIRCUITS AND CIRCUIT ROUTING ARE SHOWN SCHEMATICALLY FOR CLARITY ILLUSTRATING THE WIRING CONFIGURATION NECESSARY FOR PROPER CIRCUIT SUPERVISION.
- C COORDINATE CEILING MOUNTED FIRE ALARM DEVICE LOCATIONS WITH NEW LIGHT FIXTURES TO AVOID CONFLICTS.
- D DO NOT INSTALL FIRE ALARM DEVICES BACK TO BACK IN STUD WALLS.
- E INSTALL FIRE ALARM CONDUCTORS IN CONDUIT OR METAL SURFACE RACEWAY WHEN IN EXPOSED SPACES. MINIMUM SIZE OF CONDUIT SHALL BE 0.75" UTILIZE WIREMOLD 700 SERIES SURFACE RACEWAY (IN LIEU OF CONDUIT) FOR AREA WHERE CONDUIT CANNOT BE INSTALLED CONCEALED. CABLE ABOVE ACCESSIBLE CEILING CAN BE INSTALLED FREE AIR WHEN USING APPLICABLE CABLE. SUPPORT ALL FREE AIR CABLE EVERY 48" WITH J-HOOKS.
- F ALL SPEAKER, SPEAKER / STROBES SHALL HAVE MINIMUM 0.75" CONDUIT PATHWAYS. USE OF EXISTING 0.5" CONDUIT PATHWAY IS NOT ACCEPTABLE.
- G ENSURE THAT SPEAKER / STROBES ARE MOUNTED IN 5" SQ. X 2 7/8" DEEP BOX. FOR SURFACE MOUNTED DEVICES. FLUSH MOUNTED DEVICES SHALL BE MOUNTED IN THE MANUFACTURES DESIGNATED BACK BOXES. COLOR TO MATCH DEVICE.
- H REFER TO E101 FOR SITE PATHWAY AND ADDITIONAL INFORMATION. REFER TO E500B FOR RISER DIAGRAM.
- I ENSURE STROBE FLASH IS SYNCHRONIZED PER NFPA 72 18.5.5.5.7

NUMBERED SHEET NOTES

- 1 CONTRACTOR SHALL PROVIDE A NEW FIRE ALARM CONTROL PANEL (FACP), CONNECT WITH EXISTING MAIN CAMPUS FIRE ALARM CONTROL PANEL. REFER TO E500B FIRE RISER DIAGRAM.
- 2 PROVIDE A NEW REMOTE COMMAND UNIT (RCU) CONNECT TO NEW FACP LOCATED IN THE FIRE RISER ROOM.
- 3 CONNECT TO EXISTING MAIN CAMPUS FIRE ALARM CONTROL PANEL.
- 4 PROVIDE (1) 1/2" CONDUIT FROM NEW FIRE ALARM CONTROL PANEL IN THE FIRE RISER ROOM, TO FIRE ALARM BOOSTER PANEL LOCATED IN ELECTRICAL ROOM 225. FOR FIRE ALARM PATHWAY.
- 5 PROVIDE 1" UNDERGROUND PATHWAY. REFER TO E101 FOR ADDITIONAL PATHWAY INFORMATION.
- 6 PROVIDE KEY LOCK BOX, KNOX OR EQUAL.
- 7 CONTROL RELAY FOR PRIMARY ELEVATOR RECALL.
- 8 CONTROL RELAY FOR ALTERNATE ELEVATOR RECALL.
- 9 MONITOR MODULE FOR SUPERVISORY OF SHUNT TRIP POWER.
- 10 CONTROL RELAY TO TRIP ELEVATOR SHUNT TRIP BREAKER.
- 11 CONTROL RELAY TO ACTIVATE FIRE HAT.
- 12 ELEVATOR ROOM SMOKE DETECTOR SHALL INITIATE ELEVATOR RECALL.
- 13 ELEVATOR ROOM HEAT DETECTOR SHALL INITIATE ELEVATOR SHUNT TRIP. SHUNT TRIP SHALL BE DELAYED FOR THE DURATION OF TIME IT TAKES THE ELEVATOR CAB TO TRAVEL FROM THE HIGHEST LEVEL OF DISCHARGE TO THE LOWEST LEVEL OF DISCHARGE.
- 14 UPON THE PRESENCE OF FIRE SPRINKLERS IN THE ELEVATOR SHAFT (INCLUDING ELEVATOR PIT) THEY SHALL BE ACCOMPANIED BY HEAT DETECTORS TO INITIATE ELEVATOR RECALL, ELEVATOR SHUNT TRIP, AND THE FIRE HAT.



A LEVEL 01-FIRE ALAM PLAN
E501 SCALE: 1/8" = 1'-0"

GENERAL SHEET NOTES

- A FIRE ALARM SYSTEM INSTALLATION SHALL COMPLY WITH ALL REQUIREMENTS OF APPLICABLE CODES, STANDARDS AND STATE REGULATIONS.
- B FIRE ALARM CIRCUITS AND CIRCUIT ROUTING ARE SHOWN SCHEMATICALLY FOR CLARITY ILLUSTRATING THE WIRING CONFIGURATION NECESSARY FOR PROPER CIRCUIT SUPERVISION.
- C COORDINATE CEILING MOUNTED FIRE ALARM DEVICE LOCATIONS WITH NEW LIGHT FIXTURES TO AVOID CONFLICTS.
- D DO NOT INSTALL FIRE ALARM DEVICES BACK TO BACK IN STUD WALLS.
- E INSTALL FIRE ALARM CONDUCTORS IN CONDUIT OR METAL SURFACE RACEWAY WHEN IN EXPOSED SPACES. MINIMUM SIZE OF CONDUIT SHALL BE 0.75". UTILIZE WIREMOLD 700 SERIES SURFACE RACEWAY (IN LIEU OF CONDUIT) FOR AREA WHERE CONDUIT CANNOT BE INSTALLED CONCEALED. CABLE ABOVE ACCESSIBLE CEILING CAN BE INSTALLED FREE AIR WHEN USING APPLICABLE CABLE. SUPPORT ALL FREE AIR CABLE EVERY 48" WITH J-HOOKS.
- F ALL SPEAKER, SPEAKER / STROBES SHALL HAVE MINIMUM 0.75" CONDUIT PATHWAYS. USE OF EXISTING 0.5" CONDUIT PATHWAY IS NOT ACCEPTABLE.
- G ENSURE THAT SPEAKER / STROBES ARE MOUNTED IN 5" SQ. X 2 7/8" DEEP BOX. FOR SURFACE MOUNTED DEVICES. FLUSH MOUNTED DEVICES SHALL BE MOUNTED IN THE MANUFACTURERS DESIGNATED BACK BOXES. COLOR TO MATCH DEVICE.
- H REFER TO E101 FOR SITE PATHWAY AND ADDITIONAL INFORMATION. REFER TO E500B FOR RISER DIAGRAM.
- I ENSURE STROBE FLASH IS SYNCHRONIZED PER NFPA 72 18.5.5.7

NUMBERED SHEET NOTES

- 1 PROVIDE A NEW FIRE ALARM BOOSTER PANEL (BP-2).
- 2 PROVIDE NEW VOICE AMPLIFIER (AMP-2).
- 3 FROM FACP LOCATED IN FIRE RISER ROOM. REFER TO E101 FOR SITE PATHWAY AND ADDITIONAL INFORMATION.
- 4 PROVIDE A 1.5" PATHWAY TO BP-3 LOCATED IN THIRD FLOOR ELECTRICAL ROOM 320.
- 5 TO BP-2 LOCATED IN ELECTRICAL ROOM 225.
- 6 PROVIDE A CONTROL RELAY TO CLOSE ELEVATOR CURTAIN WHEN FIRE ALARM SYSTEM GOES INTO ALARM.

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**LRCCD-
AMERICAN RIVER
COLLEGE
STEM BUILDING**

**4700 COLLEGE OAK DRIVE
SACRAMENTO, CA 95841**

owner:
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415.503.1411
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structural engineer:
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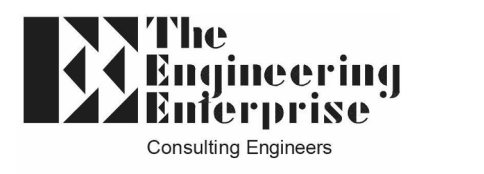
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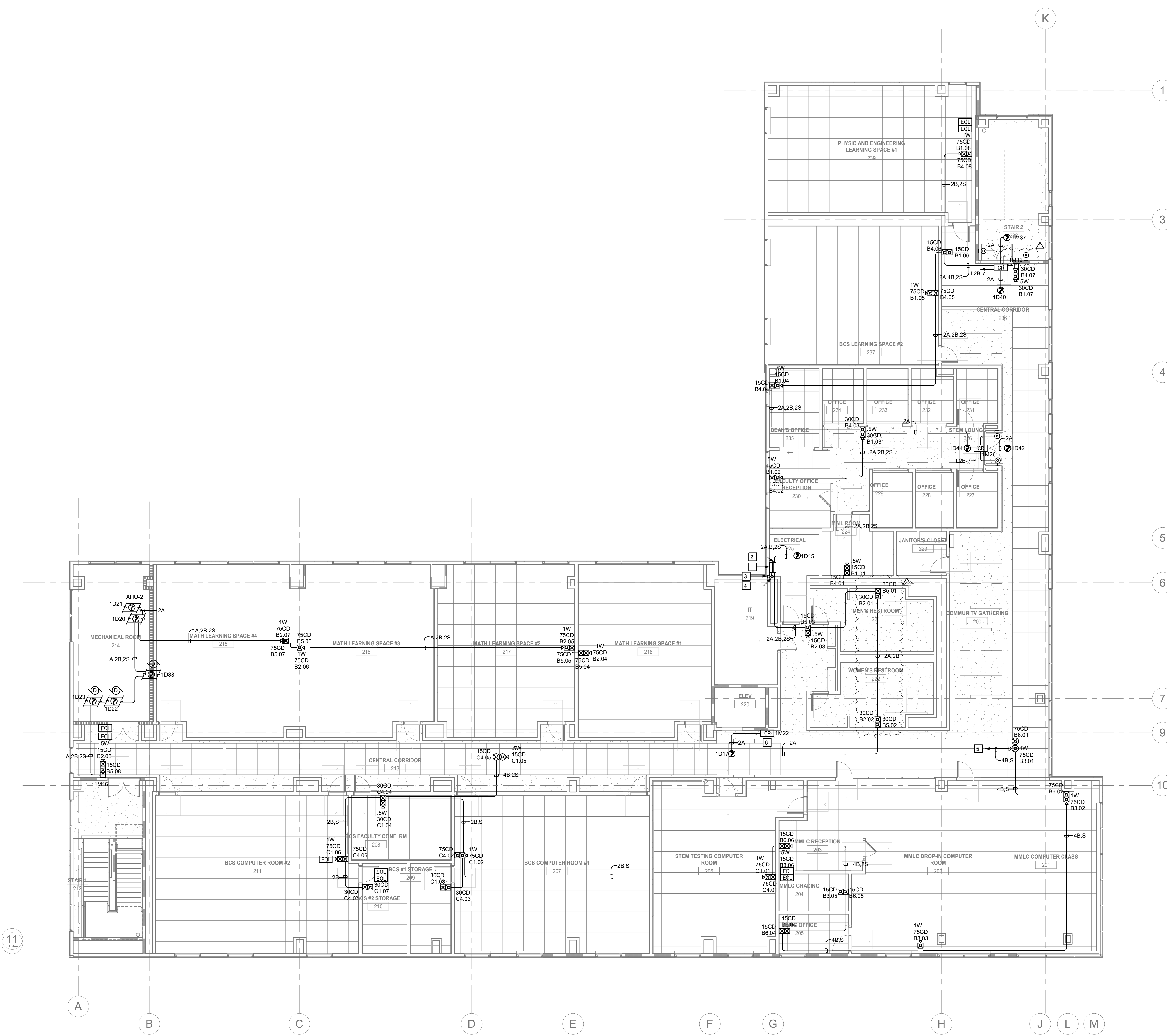
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2	100% DSA SUBMITTAL	09 JUNE 2017
3	ADDENDUM 4	18 MAY 2018

Project No 1115-0180
Date: MARCH 19, 2018
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FIRE ALARM PLAN - LEVEL 02

E502

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A LEVEL 02-FIRE ALAM PLAN
SCALE: 1/8" = 1'-0"

E502

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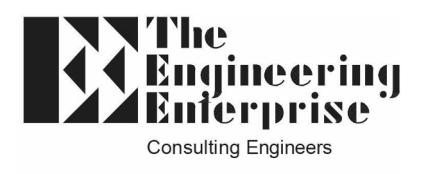
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FIRE ALARM PLAN - LEVEL 03

E503

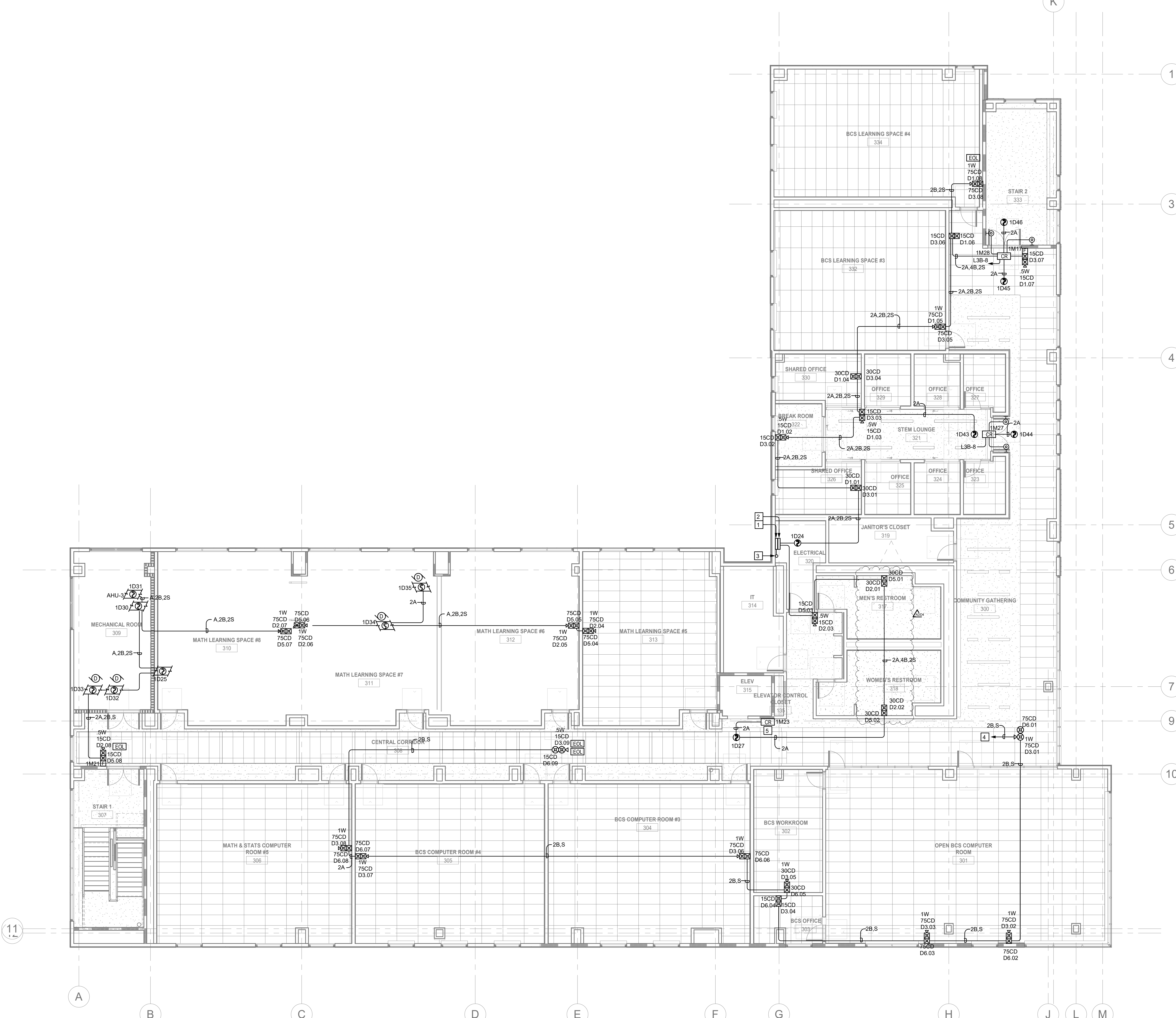
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GENERAL SHEET NOTES

- A FIRE ALARM SYSTEM INSTALLATION SHALL COMPLY WITH ALL REQUIREMENTS OF APPLICABLE CODES, STANDARDS AND STATE REGULATIONS.
- B FIRE ALARM CIRCUITS AND CIRCUIT ROUTING ARE SHOWN SCHEMATICALLY FOR CLARITY ILLUSTRATING THE WIRING CONFIGURATION NECESSARY FOR PROPER CIRCUIT SUPERVISION.
- C COORDINATE CEILING MOUNTED FIRE ALARM DEVICE LOCATIONS WITH NEW LIGHT FIXTURES TO AVOID CONFLICTS.
- D DO NOT INSTALL FIRE ALARM DEVICES BACK TO BACK IN STUD WALLS.
- E INSTALL FIRE ALARM CONDUCTORS IN CONDUIT OR METAL SURFACE RACEWAY WHEN IN EXPOSED SPACES. MINIMUM SIZE OF CONDUIT SHALL BE 0.75" UTILIZE WIREMOLD 700 SERIES SURFACE RACEWAY (IN LIEU OF CONDUIT) FOR AREA WHERE CONDUIT CANNOT BE INSTALLED CONCEALED. CABLE ABOVE ACCESSIBLE CEILING CAN BE INSTALLED FREE AIR WHEN USING APPLICABLE CABLE. SUPPORT ALL FREE AIR CABLE EVERY 48" WITH J-HOOKS.
- F ALL SPEAKER, SPEAKER / STROBES SHALL HAVE MINIMUM 0.75" CONDUIT PATHWAYS. USE OF EXISTING 0.5" CONDUIT PATHWAY IS NOT ACCEPTABLE.
- G ENSURE THAT SPEAKER / STROBES ARE MOUNTED IN 6" SQ. X 2 7/8" DEEP BOX, FOR SURFACE MOUNTED DEVICES. FLUSH MOUNTED DEVICES SHALL BE MOUNTED IN THE MANUFACTURERS DESIGNATED BACK BOXES. COLOR TO MATCH DEVICE.
- H REFER TO E101 FOR SITE PATHWAY AND ADDITIONAL INFORMATION. REFER TO E500B FOR RISER DIAGRAM.
- I ENSURE STROBE FLASH IS SYNCHRONIZED PER NFPA 72 18.5.5.7

NUMBERED SHEET NOTES

- 1 PROVIDE A NEW FIRE ALARM BOOSTER PANEL (BP-3).
- 2 PROVIDE A NEW VOICE AMPLIFIER (AMP-3).
- 3 TO BP-2 LOCATED IN THE SECOND FLOOR ELECTRICAL ROOM 225.
- 4 TO BP-3 LOCATED IN ELECTRICAL ROOM 320.
- 5 PROVIDE A CONTROL RELAY TO CLOSE ELEVATOR CURTAIN WHEN FIRE ALARM SYSTEM GOES INTO ALARM.



A LEVEL 03-FIRE ALARM PLAN
SCALE: 1/8" = 1'-0"

E503

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REGISTERED PROFESSIONAL ENGINEER
No. E01549
Exp. 06/30/19
C. M. Salter
ELECTRICAL ENGINEER
STATE OF CALIFORNIA

No. Description Date
100% DSA SUBMITTAL 09 JUNE 2017
ADDENDUM 4 18 MAY 2018

Project No 1115-0180
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ENLARGED ROOM PLANS

E601

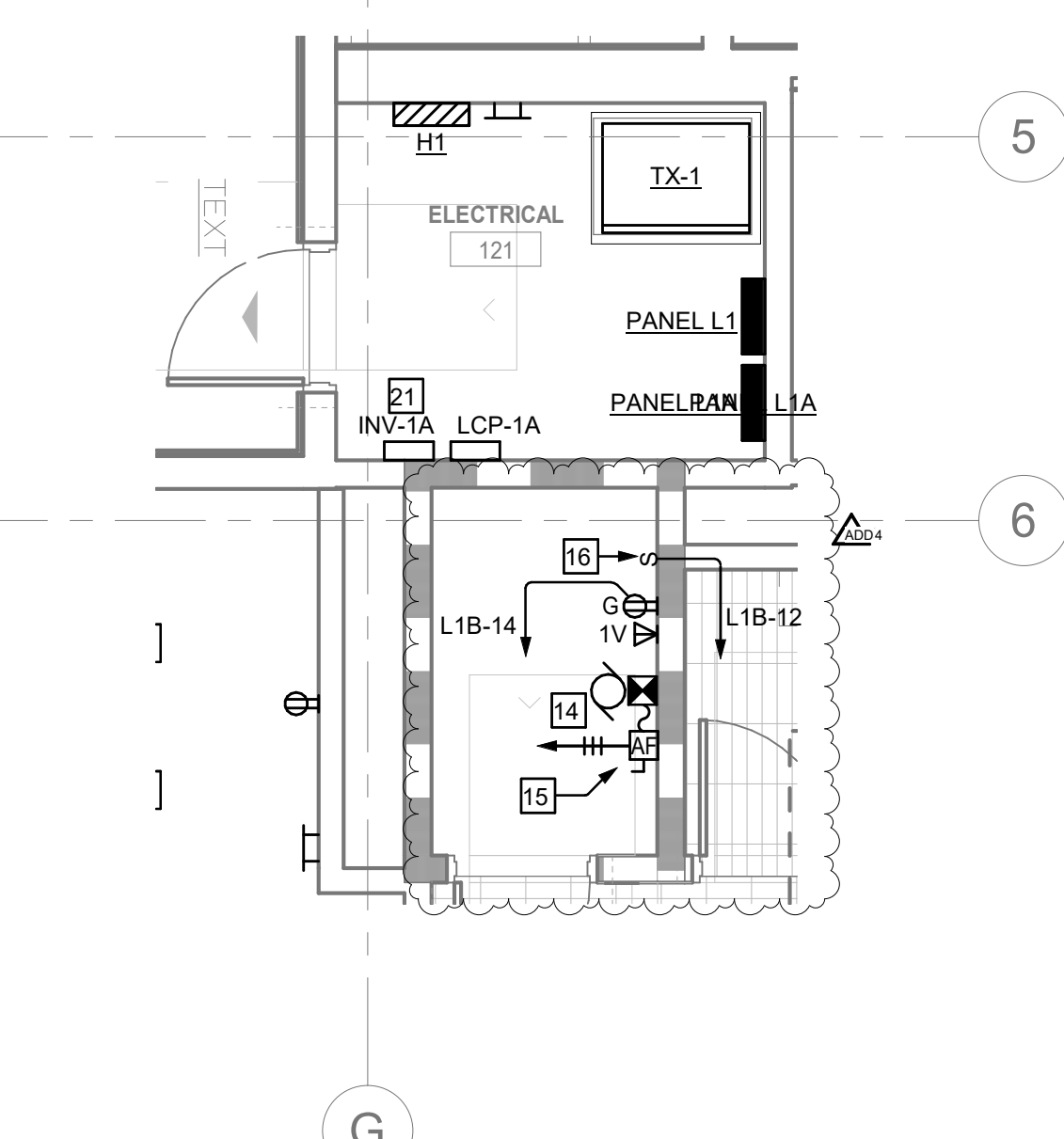
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GENERAL SHEET NOTES

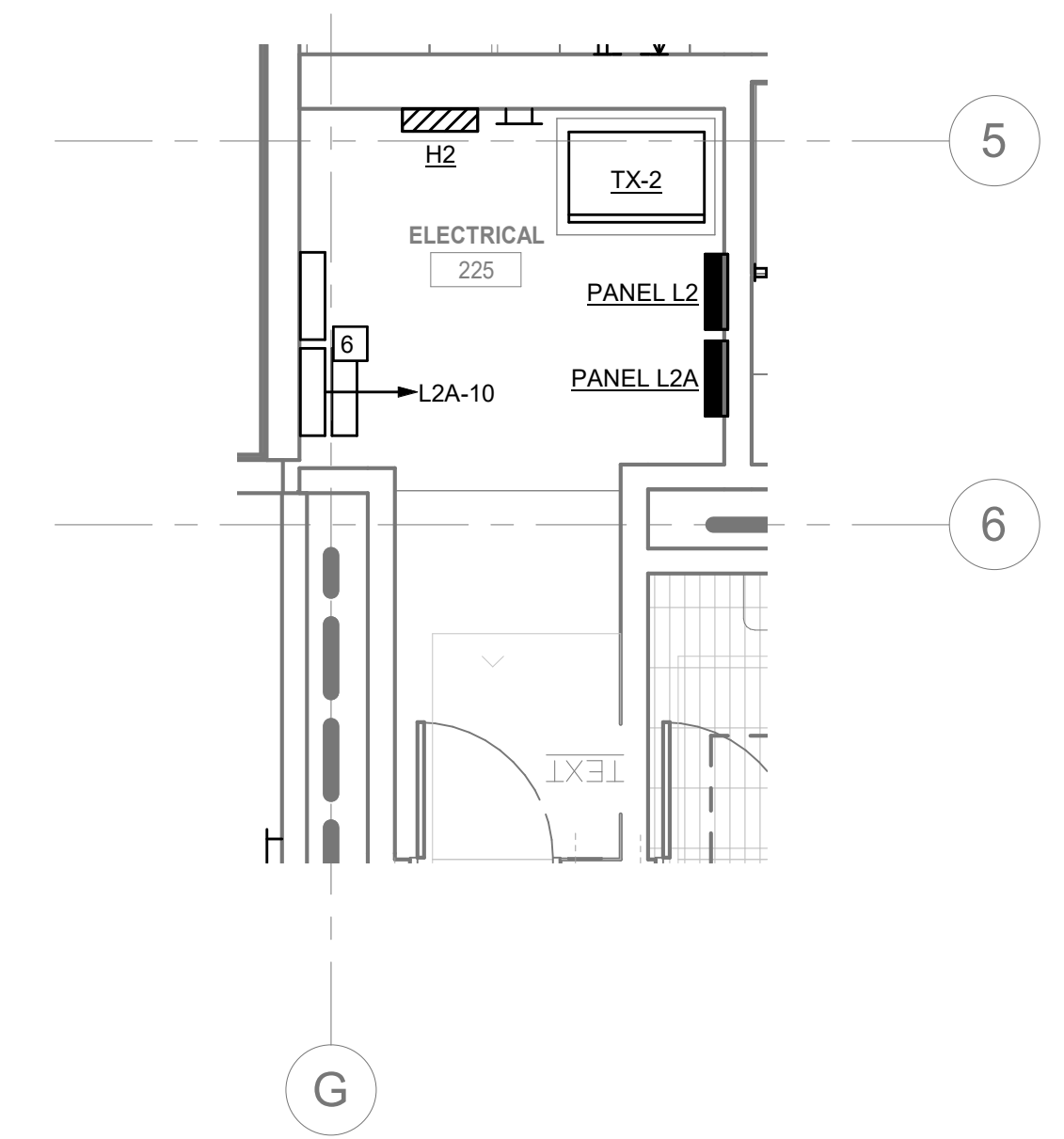
- A INSTALL PANELBOARDS AND SURFACE MOUNTED EQUIPMENT CABINETS PER A/E802.
- B INSTALL HOUSEKEEPING PAD AND INSTALL ALL TRANSFORMERS PER B/E802.

NUMBERED SHEET NOTES

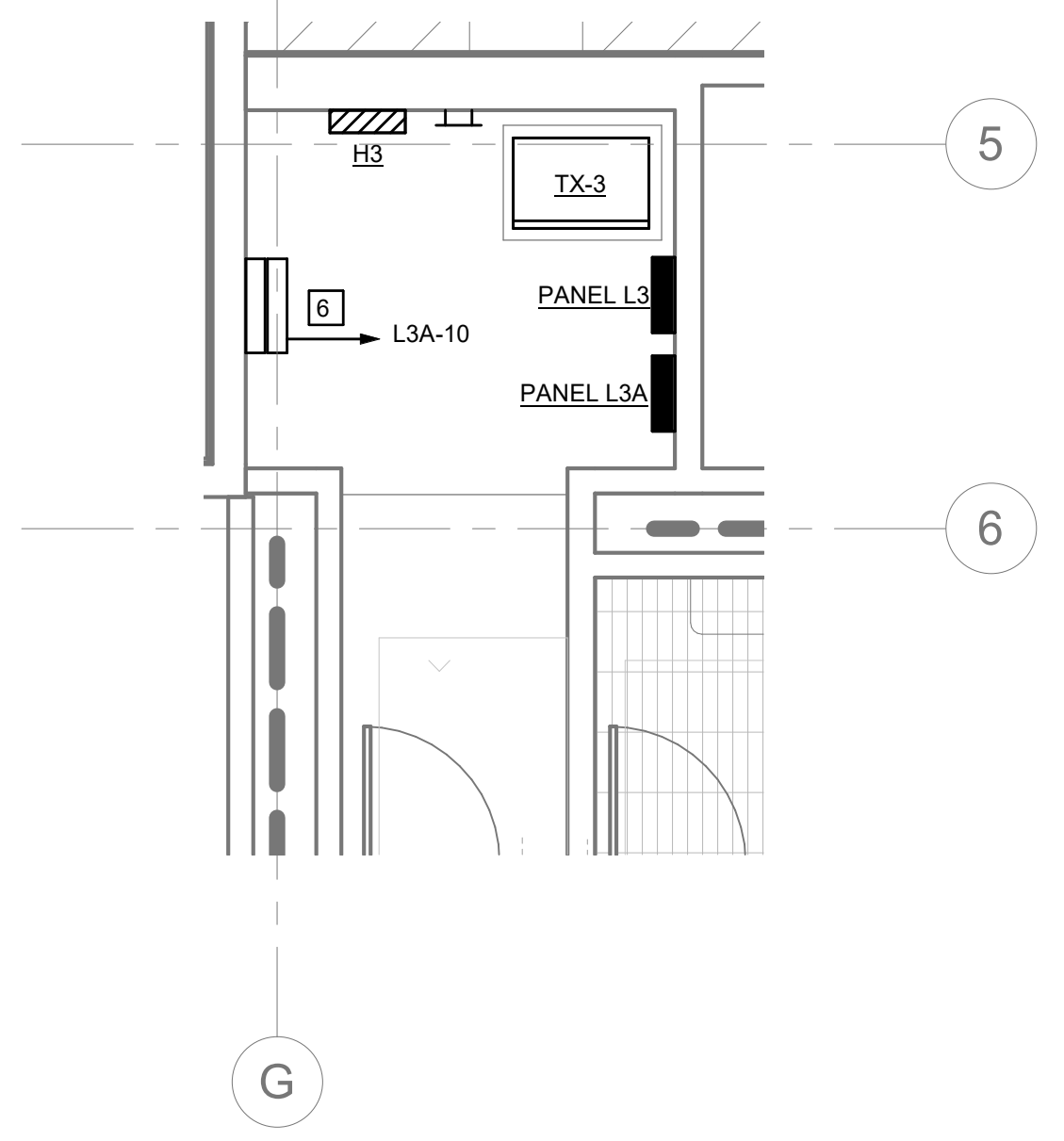
- 1 12" OVERHEAD CABLE RUNWAY AT 90° A.F.F. SUPPORT RUNWAY TO WALL STUDS EVERY 48" AND AT ENDS WITH ANGLE BRACKETS AND END SUPPORTS. SUPPORT TO THE TOP OF EACH RACK WITH 6" STANDOFF BRACKETS.
- 2 PROVIDE PLYWOOD BACKBOARD, 4"WX8"HX0.75" COMMUNICATIONS GRADE AROUND PERIMETER OF THE IDF ROOM AT 3" A.F.F. A MINIMUM OF TWO COATS OF FIRE RETARDANT PAINT. COLOR TO MATCH WALL FINISH. SHALL BE APPLIED TO ALL SURFACES OF THE BOARD PRIOR TO INSTALLATION.
- 3 PROVIDE 19"X84" FLOOR MOUNTED, 2-POST IDF EQUIPMENT RACKS WITH 10"WX17"D X84"H VERTICAL WIRE MANAGERS ON EACH SIDE OF EACH RACK. REFER TO A/E804.
- 4 PROVIDE A 19"X30"D X84"H 4-POST IDF EQUIPMENT RACK WITH 10"WX17"D X84"H VERTICAL WIRE MANAGERS ON EACH SIDE OF RACK. REFER TO A/E804.
- 5 ACCESS CONTROL, INTRUSION AND BATTERY CABINETS. REFER TO S/E702.
- 6 FIRE ALARM BOOSTER PANEL AND AUDIO AMP.
- 7 4.4" UNDERGROUND CONDUIT FROM SITE. REFER TO E101. TERMINATE CONDUIT 4" A.F.F AND PROVIDE BUSHING.
- 8 100 PAIR BUILDING ENTRANCE PROTECTOR WITH FUSES. MOUNT AT 60" A.F.F.
- 9 TWO 100 PAIR CATEGORY 5E AND ONE CATEGORY 6 110 TERMINATION BLOCKS FOR THE TERMINATION OF RISER CAT 5E CABLES BETWEEN FLOORS. CAT 5E VOICE TIE CABLE TO VOICE CAT 5E PATCH PANEL AT EQUIPMENT RACK AND A MISCELLANEOUS BLOCK FOR SPECIALTY CAT 6 CABLES SUCH AS ELEVATOR PHONE, FIRE ALARM, SECURITY ALARM, BMS, AND EMERGENCY PHONES. REFER TO C/E702.
- 10 20"X4" COPPER GROUND BUS BAR WITH ISOLATION MOUNTING HARDWARE.
- 11 12"X4" COPPER GROUND BUS BAR WITH ISOLATION MOUNTING HARDWARE.
- 12 4.4" CONDUIT SLEEVES BETWEEN FLOORS. TERMINATE AT 4" A.F.F. AND PROVIDE BUSHINGS ON BOTH ENDS.
- 13 FIRE ALARM CONTROL PANEL AND ANNUNCIATOR. REFER TO FIRE ALARM PLANS. PROVIDE TWO PHONE LINES FOR DIALER.
- 14 ELEVATOR FEEDER FROM MAIN SWITCHBOARD. REFER TO POWER ONE-LINE DIAGRAM A/E701.
- 15 ELEVATOR MOTOR DISCONNECTING MEANS, FUSED PER ELEVATOR SHOP DRAWINGS. PROVIDE WITH AUXILIARY CONTACTS AND CONTROL WIRING BACK TO ELEVATOR CONTROLLER TO SHUT DOWN ELEVATOR BATTERY POWER SUPPLY UPON MANUAL SHUT-OFF OF THE DISCONNECT PER CEC-620.91(C).
- 16 ELEVATOR CAB LIGHT AND VENTILATION DISCONNECTING MEANS CAPABLE OF BEING LOCKED IN THE OPEN POSITION.
- 17 LOCATE ELEVATOR PIT LIGHT SWITCH NEAR ACCESS DOOR PER ELEVATOR SHOP DRAWINGS. RECEPTACLE AND SWITCH SHALL BE LOCATED IN A NEMA 4X ENCLOSURE IF PIT IS SPRINKLED.
- 18 ELEVATOR PIT LIGHT, LITHONIA VW150IM12 OR EQUAL. PROVIDE WITH HIGH OUTPUT LED BULB. MIN. 1500 LUMEN OUTPUT, RATED FOR ENCLOSURED FIXTURE. ASSEMBLY SHALL BE NEMA 4X RATED.
- 19 ALLOW 30" OF CLEAR SPACE FOR FUTURE RACK AND WIRE MANAGERS.
- 20 TYPICAL VERTICAL WIRE MANAGERS PER SPECIFICATIONS.
- 21 WALL MOUNT MINI-INVERTER SIMILAR TO A/E802. WIRE PER F/E703.
- 22 MAIN SWITCHBOARD 'MSB'. REFER TO POWER ONE-LINE DIAGRAM A/E701, AND SPECIFICATION SECTION 262413. PROVIDE HOUSEKEEPING PAD PER B/E802.
- 23 PROVIDE LIGHTING AND SERVICE RECEPTACLE AT TOP OF ELEVATOR SHAFT. LOCATE SWITCH AND RECEPTACLE ADJACENT TO SHAFT ACCESS. REFER TO ELEVATOR SHOP DRAWINGS. SEE NOTE 18 FOR FIXTURE PART NO.
- 24 ROUTE VOICE CABLE FROM THE MISCELLANEOUS 110 BLOCK IN TC1.1. TERMINATE CABLES INSIDE THE ELEVATOR CONTROL PANEL IN A SURFACE MOUNT BOX. COORDINATE WITH THE ELEVATOR CONTRACTOR.



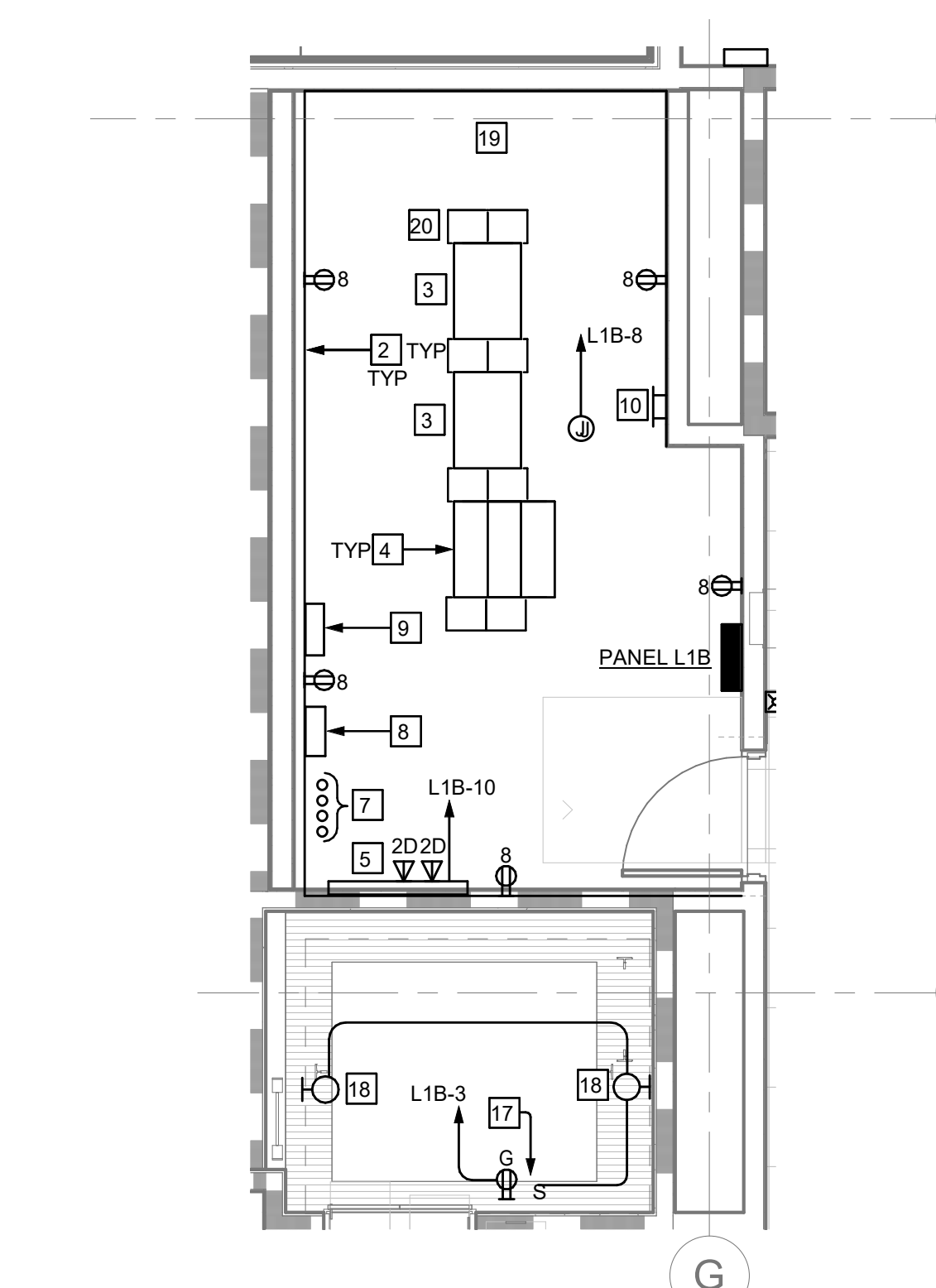
A FIRST FLOOR MAIN ELECTRICAL ROOM
E601 SCALE: 1/4" = 1'-0"



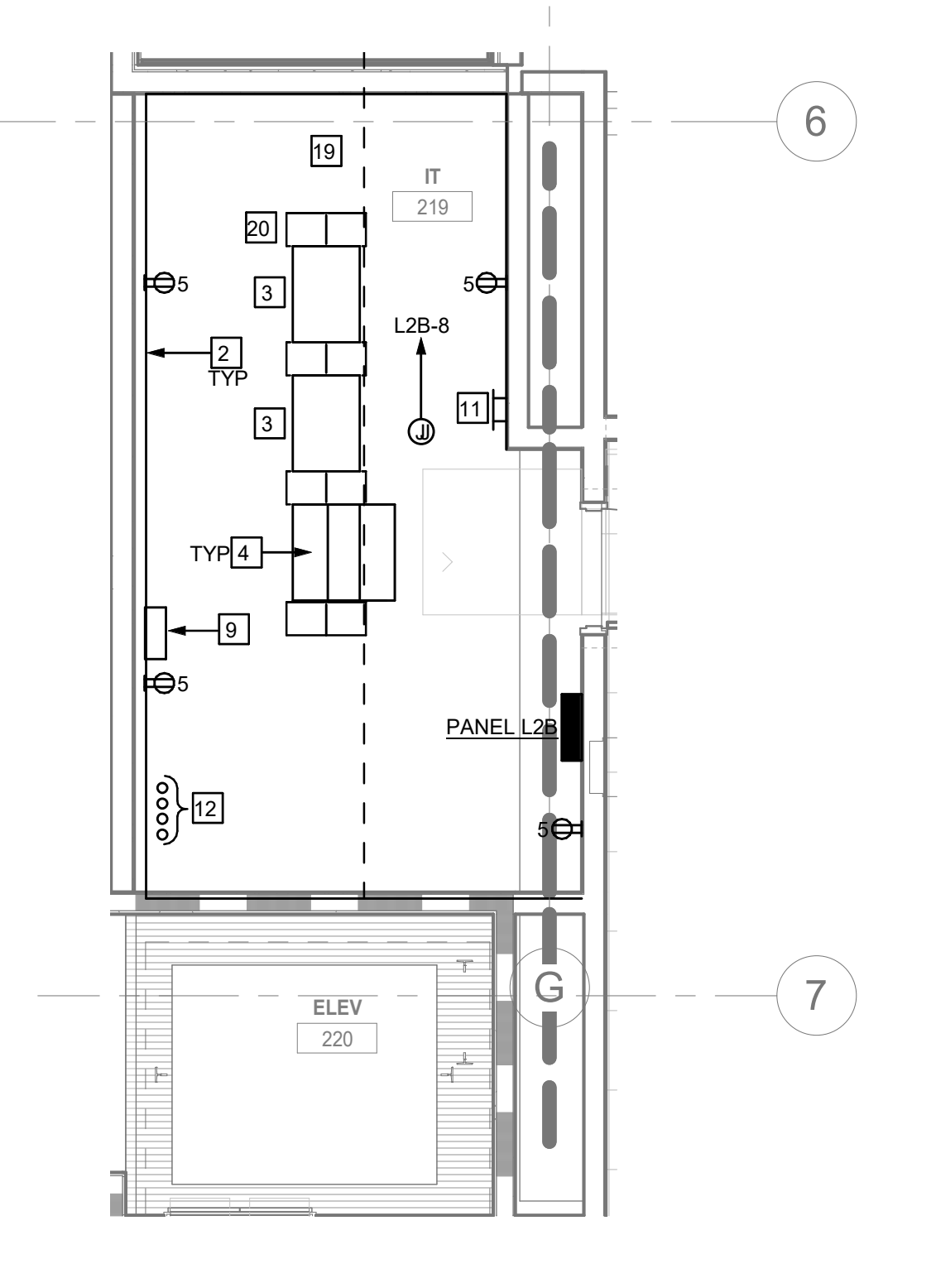
B SECOND FLOOR ELECTRICAL ROOM
E601 SCALE: 1/4" = 1'-0"



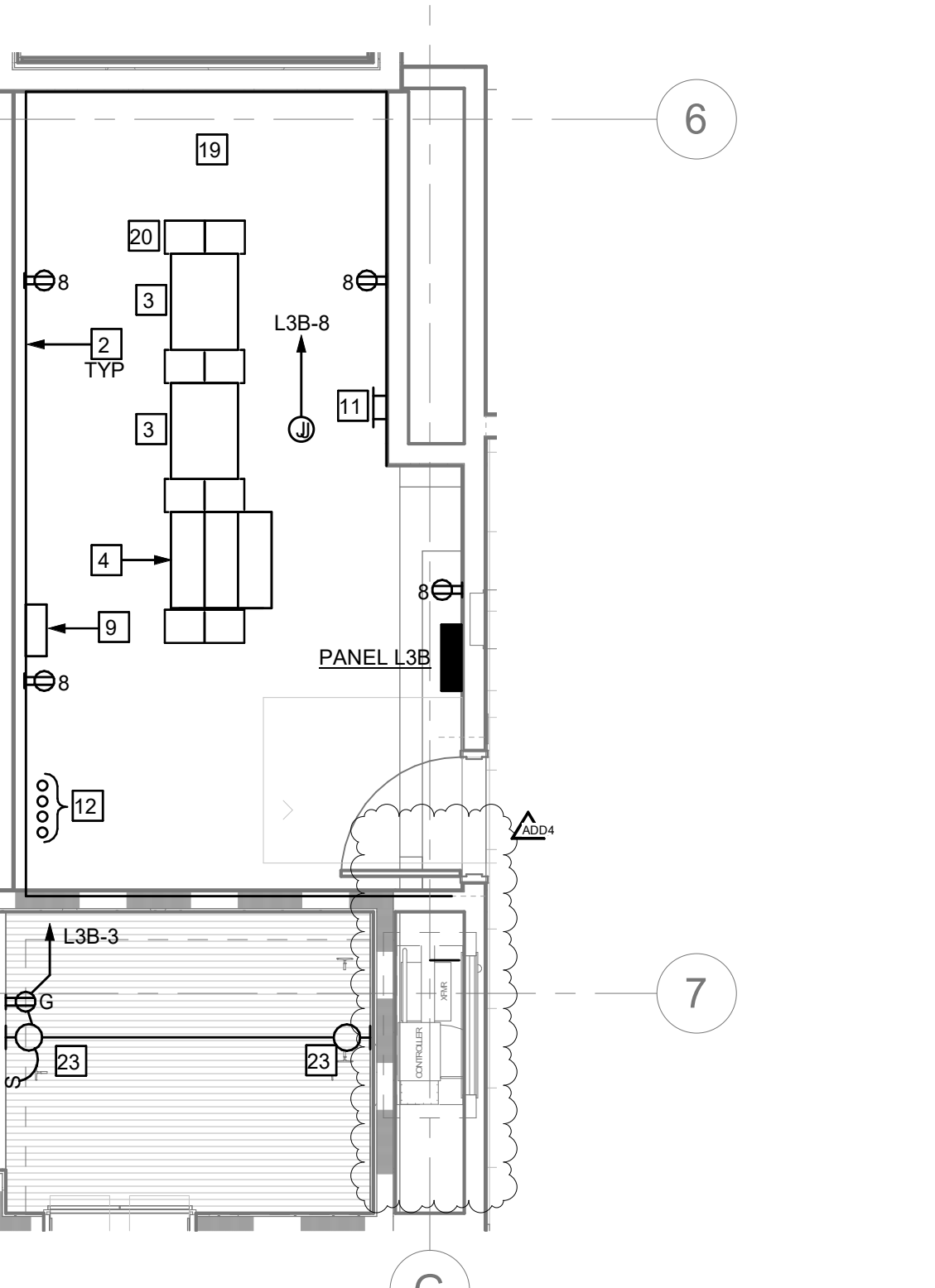
C THIRD FLOOR ELECTRICAL ROOM
E601 SCALE: 1/4" = 1'-0"



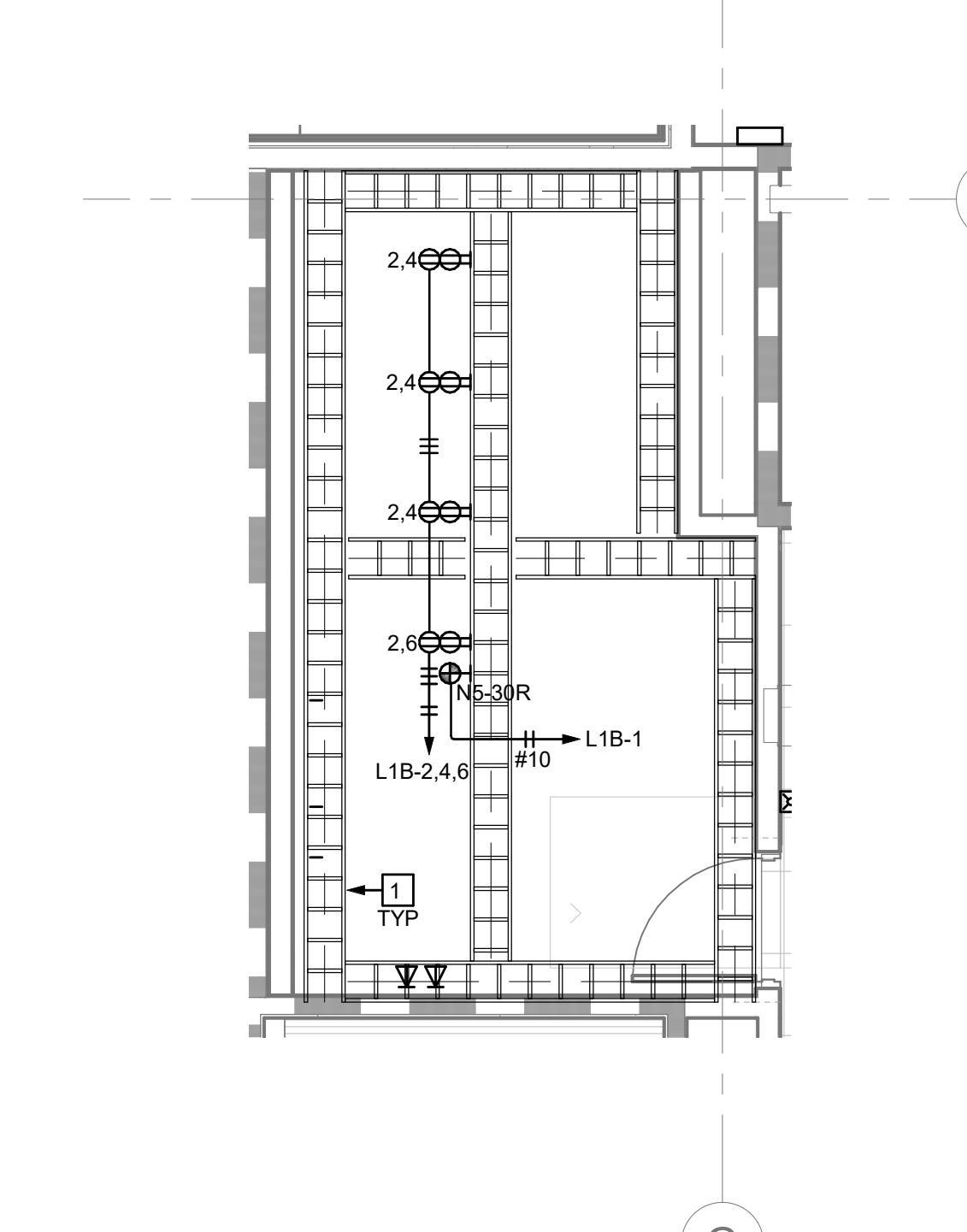
D FIRST FLOOR TELECOM ROOM
E601 SCALE: 1/4" = 1'-0"



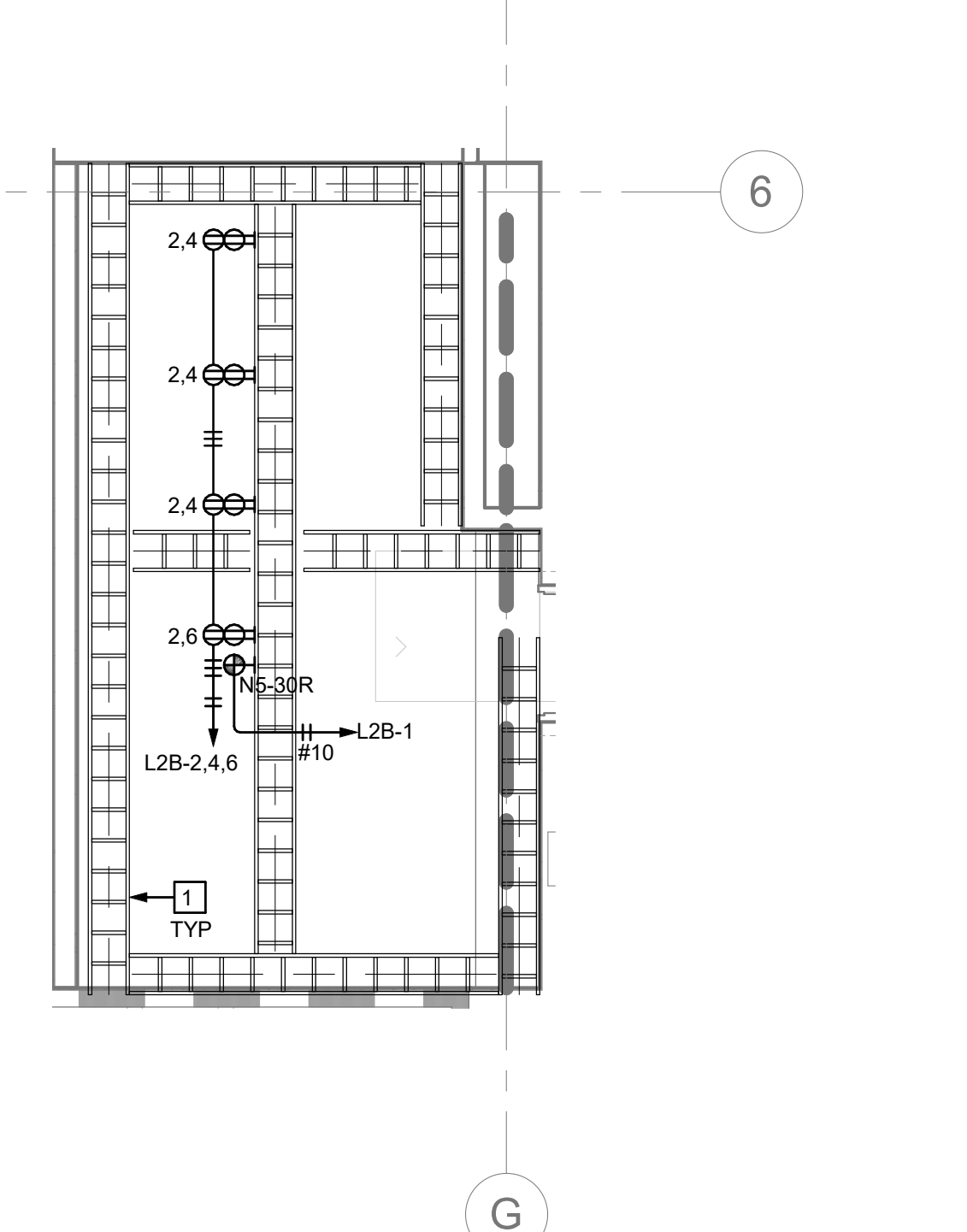
E SECOND FLOOR TELECOM ROOM
E601 SCALE: 1/4" = 1'-0"



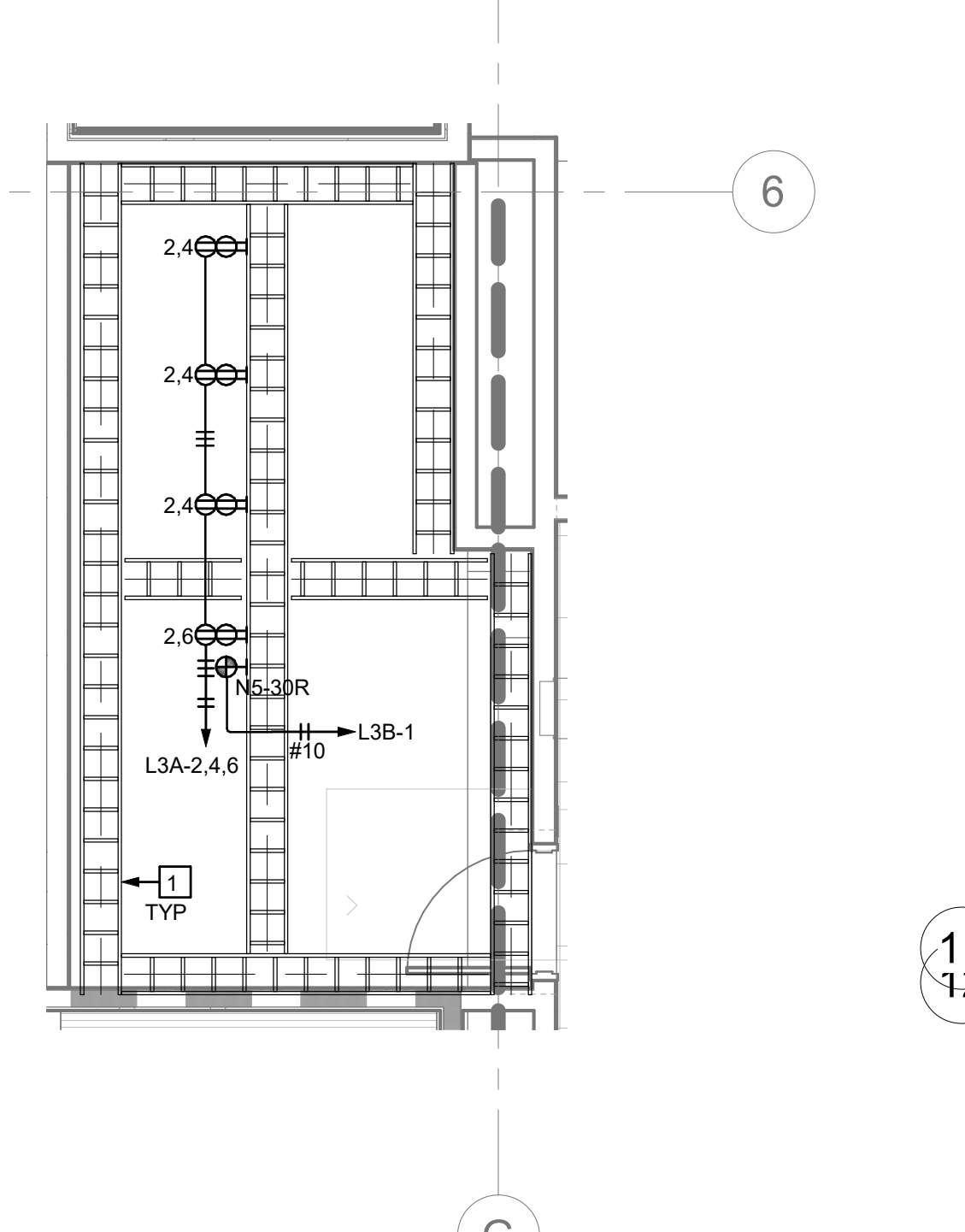
F THIRD FLOOR TELECOM ROOM
E601 SCALE: 1/4" = 1'-0"



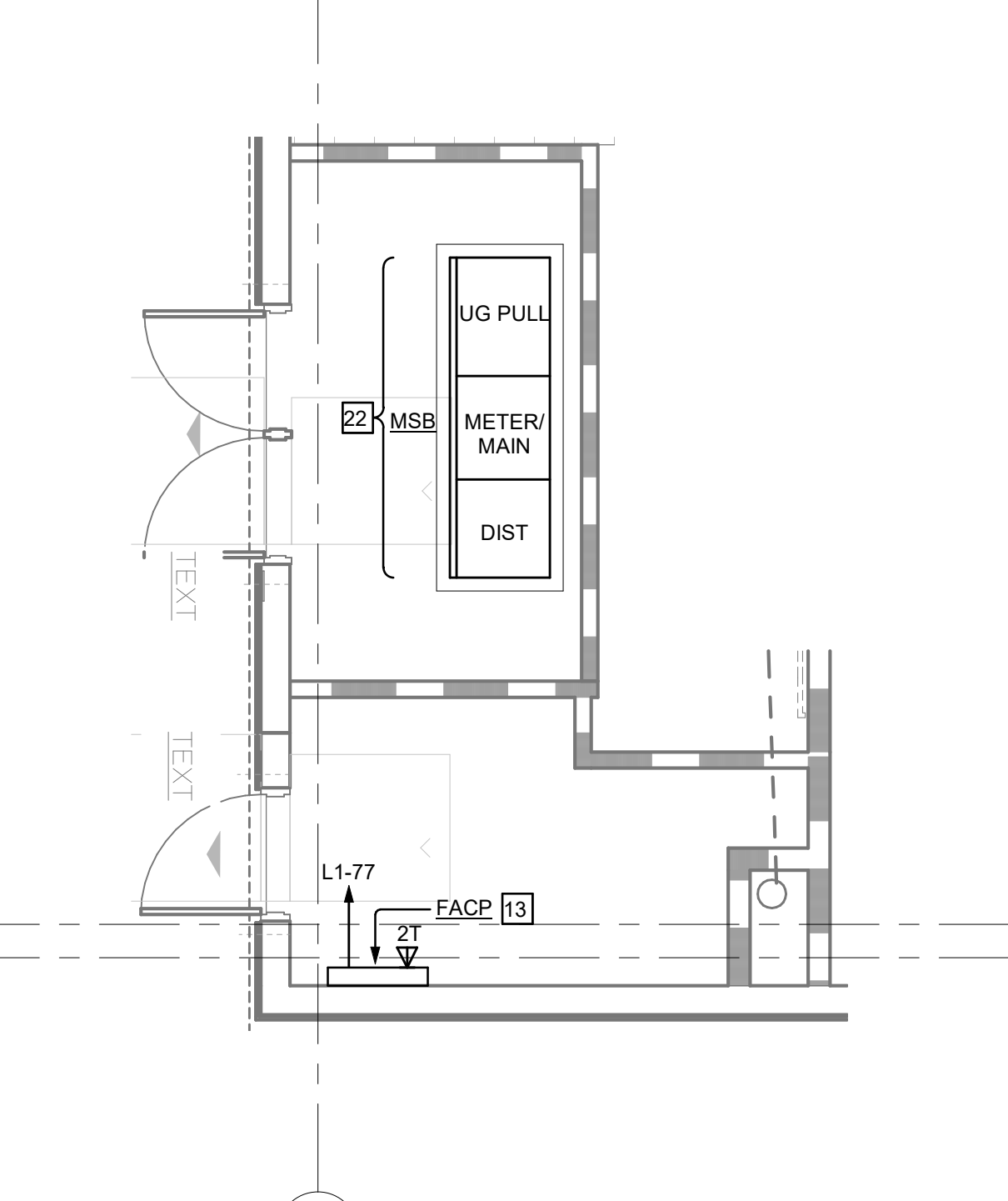
G LEVEL 01-RACK LAYOUT
E601 SCALE: 1/4" = 1'-0"



H LEVEL 02-RACK LAYOUT
E601 SCALE: 1/4" = 1'-0"



I LEVEL 03 RACK LAYOUT
E601 SCALE: 1/4" = 1'-0"



J FIRST FLOOR ELECTRICAL ROOM & FIRE RISER ROOM
E601 SCALE: 1/4" = 1'-0"