

ADDENDUM NO. 2

Issued: August 22, 2016

Project Number: CD16-00003

Project: City of Edmond, Oklahoma
CCWRRF Administration/Laboratory Building
1600 N. Midwest Blvd.
Edmond, OK 73034

Architect: BBN Architects, Inc.
411 Nichols Rd, Suite 246
Kansas City, MO 64112

This Addendum forms part of the Contract Documents and modifies the original Bidding Documents as noted below. Acknowledge receipt of this Addendum when submitting bid.

REVISIONS TO PROJECT MANUAL

Item No. 1.01 Section 07 52 16 – SBS Modified Bituminous Membrane Roofing

- a. Add the following Subparagraphs to Paragraph 2.1 A.:
 - 5. Soprema, Inc.
 - 6. Malarkey Roofing Products

Item No. 1.02 Section 07 71 00 – Roof Specialties

- a. In Subparagraph 2.4 B.2 change the word “Ogee” to “Rectangular Style B or H”.
- b. In Paragraph 2.4 C. change the word “rectangular” to “3 inch round”.

Item No. 1.03 Section 08 41 13 – Aluminum-Framed Entrances and Storefronts

- a. In Paragraph 2.2 A., change “Trifab VG 451T” to “IR 501T” and change “AA 425 Thermal Entrances” to “350/500 Heavy Wall Entrances”
- b. In Subparagraph 2.3 A.5., change “stick system” to “shear block/screw spline”
- c. In Subparagraph 2.4 A.1., change “0.125” to “0.1875”.
- d. Delete Clause 2.4. A.1.a.

Item No. 1.04 Section 09 21 26 – Gypsum Board Assemblies

- e. In Clause 2.6 A.2.a. add “Basis-of Design Fry Reglet DMCT-375. Corner guards to extend full height of wall to opening or to finished ceiling.”

Item No. 1.05 Section 10 26 00 – Wall and Door Protection

- a. Change Paragraph 2.3 A. to the following:

- A. Refer to 09 21 26 Gypsum Board Assemblies for Corner Guards specified under Trim Accessories.
 - b. Delete Subparagraphs 2.3 A. 1. through 5.
- Item No. 1.06 Section 10 71 13 – Exterior Sun Control Devices
- a. Add the following Clause to Subparagraph 2.2 A.:
 - c. ASCA, Inc.
- Item No. 1.07 Section 31 23 16.16 – Rock Removal
- a. Delete Section 31 23 16 in its entirety and substitute the revised Section attached hereto.
- Item No. 1.08 Section 32 84 00 – Planting Irrigation
- a. Delete pages 6 and 7 from Section 32 84 00 and substitute the revised pages attached hereto.

REVISIONS TO DRAWINGS

- Item No. 2.01 Sheet No. L102
- a. Delete Sheet No. L102 in its entirety and substitute the revised sheet attached hereto.
- Item No. 2.02 Sheet No. S201
- a. Delete Sheet No. S201 in its entirety and substitute the revised sheet attached hereto.
- Item No. 2.03 Sheet No. A501
- b. Delete Sheet No. A501 in its entirety and substitute the revised sheet attached hereto.
- Item No. 2.04 Sheet No. A601
- a. Delete Sheet No. A601 in its entirety and substitute the revised sheet attached hereto.
- Item No. 2.05 Sheet No. LF201
- a. Delete Sheet No. LF201 in its entirety and substitute the revised sheet attached hereto.
- Item No. 2.06 Sheet No. LF204
- a. Delete Sheet No. LF204 in its entirety and substitute the revised sheet attached hereto.

END OF ADDENDUM NO. 2

SECTION 312316.16 - ROCK REMOVAL

PART 1 - GENERAL

1.01 SUMMARY

- A. Section includes: Removal of rock during excavation and trenching by mechanical methods or by blasting.
- B. Related sections:
 - 1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
 - 2. It is the Contractor's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of Contractor's Work.
 - 3. The following Sections are related to the Work described in this Section. This list of Related Sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the Contractor to see that the completed Work complies accurately with the Contract Documents.
 - a. Section 312000 Earth Moving.
 - b. Section 312333 Trenching and Backfilling for Utilities.

1.02 REFERENCES

- A. Associated General Contractors (AGS):
 - 1. Manual of Accident Prevention for Construction.
- B. Institute of Makers of Explosives (IME):
 - 1. Safety Library Publications.
- C. National Fire Protection Association (NFPA)
 - 1. NFPA 495 – Code for the Manufacture, Transportation, Storage, and Use of Explosive Materials.
- D. Occupational Safety and Health Administration (OSHA).

1.03 SUBMITTALS

- A. Rock removal by mechanical methods:
 - 1. Removal plan including:
 - a. Equipment and/or products to be used for splitting rock.
- B. Rock removal by explosive methods:
 - 1. Blasting plan, including but not limited to the following information:
 - a. Sketches showing blast locations.

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- b. Proximity to and provisions for protecting existing structures, utilities and improvements.
 - c. Type of explosives and detonators.
 - d. Information on location and energy of charges, including powder factor per cubic yard, drill patterns, hole size, sub-drill, and stemming depth.
 - e. Description of trenching, pre-splitting and production shots.
 - f. Types of detonators with firing sequences and delay patterns.
 - g. Calculations of ground accelerations, velocities, and displacements.
 - h. Field monitoring methods and techniques.
 - i. Safety precautions, including details of audible advance signals to be used as alert that blast is about to occur.
 - j. Type of blasting mats or covers.
 - k. Rock recovery method.
 - l. Instruments proposed for use in monitoring vibrations, noise, and air blast over-pressure levels. Include manufacturer's catalog data and performance specifications.
 - 2. During production blasting, submit changes to plan
 - 3. Blasting permit(s): Submit 3 copies of permits required by and obtained from local authorities having jurisdiction.
- C. Qualifications.
- 1. **Provide the following information for the qualified person responsible for preparing and directing the blasting operations:**
 - a. Name, professional registration, qualifications, and experience.
 - b. List of not less than 5 projects, similar in size, complexity, and geological condition completed during the 5 years preceding the bid date for this Work. Include reference contact information.
 - 2. Blasting contractor:
 - a. Name(s), qualifications, and experience record of firm and of individuals conducting blasting operations.
 - b. Copy of blasting contractor's license, issued by local authorities having jurisdiction.
 - c. List of not less than 5 projects, similar in size, complexity, and geological condition completed during the 5 years preceding the bid date for this Work. Include reference contact information.
 - d. Proof of blasting contractor's insurance coverage for this project.
 - 3. Seismic survey/monitoring contractor.
 - a. Name, professional registrations, qualifications, and experience.
 - b. List of not less than 5 projects, similar in size, complexity, and geological condition completed during the 5 years preceding the bid date for this Work. Include reference contact information.
- D. Pre-blasting preparation documents: Submit 3 copies.
- 1. Pre-blast survey of conditions and structures near blasting.
- E. Blasting records:

1. Seismographic monitoring.
 - a. Calibration records for the blast monitoring instrumentation.
 - b. Seismograph and sound level monitoring records.

1.04 QUALITY ASSURANCE

- A. Rock removal by blasting.
 1. Licensed professional engineer or geologist preparing and directing blasting operations:
 - a. Licensed in the state where the blasting will be performed.
 - b. Demonstrating not less than 5 years post-licensure professional experience in blasting operations and controlling blast vibrations.
 - c. Having successfully completed not less than 5 projects with similar rock conditions and blasting techniques as those proposed during the 5 years preceding the bid date of this Work.
 2. Blasting contractor:
 - a. Licensed in the state (and jurisdiction if applicable) where the blasting will be performed.
 - b. Company specializing in explosives for disintegration of subsurface rock, that has completed not less than 5 projects with similar blasting and excavation in similar rock during the 5 years preceding the bid date of this Work.
 3. Seismic survey /blast monitoring contractor:
 - a. Company specializing in seismic surveys and blast monitoring.
 - b. Individuals who will be performing the work trained in the operation of and interpretation of data from blast monitoring equipment of the type proposed for this Work.

1.05 REGULATORY REQUIREMENTS

- A. Conform to applicable codes for explosive disintegration of rock.
 1. Where conflicts exist between local codes, ordinances, regulations, and the requirements of this Section, the more restrictive provisions shall apply.
- B. Obtain permits from authorities having jurisdiction before explosives are brought to site or drilling is started.

1.06 SYSTEM DESCRIPTION

- A. Rock removal by mechanical methods.
 1. Drill holes and use expansive tools, wedges, and mechanical disintegration compound to fracture rock.
- B. Rock removal by blasting.
 1. Where blasting is proposed for removal of rock, provide a controlled blasting system.

2. Conduct blasting and rock removal activity without damage to existing or new structures, utilities, or improvements surrounding the Work.
3. Design blasting procedures to provide faces of final slopes and rock surfaces as indicated on the Drawings and specified herein. Minimize over-break and fracturing of rock shown to remain in place.
4. Monitor blasting operations to confirm compliance with limits specified herein and designated in the Contractor's blasting plan.
5. Blasting criteria limits.
 - a. Peak particle velocity (PPV) limit:
 - 1) In no case shall the maximum peak particle velocity at any new or existing structure surrounding the work exceed the limits in Table A.

Table A: Limits on peak particle velocity from blasting	
Distance from blast to structure	Maximum peak particle velocity (inches per second)
Less than 150 feet	2.0
150 feet to 300 feet	1.0
Greater than 300 feet	0.5
Buried, below grade structure	3.0

- b. Air blast over-pressure limit:
 - 1) Air blast over-pressure measured at the location of an above-ground, occupied structure nearest the blast (considering wind direction) shall not exceed 0.014 pounds per square inch.
- c. Adjacent work limits:
 - 1) Concrete placement limit:
 - a) Do not blast within 500 feet of locations where concrete has been placed during the 24-hour period immediately preceding the blast.
 - b) Do not blast within 100 feet of concrete structures until the concrete has reached its minimum specified 28-day compressive strength and is braced by temporary supports or permanent construction.
 - 2) Rock anchor limit: Do not blast within 100 feet of permanently installed rock anchors.

1.07 PROJECT/SITE REQUIREMENTS

- A. Blasting is limited to times between the hours of 9:00 am and 4:30 pm, Monday through Friday, with local government holidays excepted.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Explosives: Type recommended by explosives firm following seismic survey and required by authorities having jurisdiction.
- B. Delay devices: Type recommended by explosives firm.
- C. Blasting mat materials: Type recommended by explosives firm.
- D. Blasting monitoring equipment:
 - 1. Calibrated over the required frequency ranges using standards traceable to the National Bureau of Standards within the 6-month period immediately preceding blasting.

PART 3 EXECUTION

3.01 GENERAL

- A. Remove rock to limits of under-grading indicated on the Drawings.
 - 1. Cut rock at bottom of removal to form a level bearing surface for overlying structures and fills.
 - 2. As far as practical, leave no un-drained depressions in the rock cut.
- B. Rock removal may be accomplished by hydraulic breakers, expansion products placed in holes drilled into rock, or blasting.
 - 1. Determine best method of rock removal based on rock conditions and likely impacts to surrounding properties, structures, utilities, and people.
 - 2. Consider effects of removal method both above and below ground.
- C. Design and provide rock support and reinforcement required to maintain safety of persons and equipment within the excavation at all times.
- D. Dispose of material removed as specified and as indicated on the Drawings.
- E. In utility trenches, excavate to 6 inches below invert elevation of pipe and 24 inches wider than pipe diameter. At dedicated easements or rights of way, excavate 18 inches wider than pipe diameter.
- F. Where bottom of rock excavation exposes shale layers that will not be removed and replaced with fill materials, cover with concrete seal slabs as specified in Section 02300 within 4 hours after initial exposure.

3.02 ROCK REMOVAL BY MECHANICAL METHODS

- A. Excavate for and remove rock by mechanical methods.

3.03 ROCK REMOVAL BY BLASTING METHODS

- A. Blasting and use of explosives shall conform to the requirements of this Section.
- B. Contractor's responsibilities:
 - 1. Determine type of material that may be encountered and whether blasting will be necessary.
 - 2. Exercise utmost care not to endanger life or damage property.
 - a. Enlist services of experienced explosive engineer for advice on blasting methods and for protection of existing structures or facilities, and for preparation of blasting plan.
 - 3. Exercise care to minimize over-break of rock below the foundation bearing elevation indicated on the Drawings.
 - 4. Control grades resulting from blasting so that, at the bottom of the excavation, no under-break remains above a line 6 inches below the bottom of the structure as indicated on the Drawings.
- C. Preparation:
 - 1. Seismic survey.
 - a. Obtain and pay for the services of a seismic survey company to determine charges to be used at different locations in areas of rock excavation.
 - 2. Blasting plan.
 - a. Not less than 45 days before blasting operations will begin, submit blasting plan for the Work.
 - b. Blasting plan shall be prepared by a professional engineer or geologist, licensed in the state where the work is located, and having not less than 5 years of professional experience in the preparation and execution of blasting operations.
 - c. Submittal of Contractor's blasting plan will be for information only. Contractor remains fully responsible for adequacy and safety of proposed means and methods.
 - d. If required, obtain review and approval of blasting plan by authorities having jurisdiction over the work before commencing blasting operations.
 - e. Maintain at least 2 copies of blasting plan on site and available until rock excavation is complete.
 - f. If revisions to plan are made during production blasting, submit updates.
 - g. Retain blasting plan for a period of not less than 3 years following final completion of the Work.
 - 3. Blasting permits.

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- a. Obtain and pay for required blasting permits. Display original permits prominently before commencing blasting operations. Submit copies for information.
 4. Notifications.
 - a. Identify utilities, properties, structures, and persons that may be affected by blasting.
 - b. Provide written notification of upcoming blasting operations to each public utility. Give advance notice sufficient to for that utility to advise Contractor of precautions that should be taken to protect the utility's improvements from damage.
 - c. 14 calendar days before blasting commences:
 - 1) Provide written notification to advise affected entities of upcoming blasting operations. Describe blasting and seismic operations, and provide Contractor's contact information for questions or concerns during blasting.
 - d. 5 working days before blasting commences:
 - 1) Provide second notification to affected properties and persons. Complete notification before setting up seismographic stations for monitoring blasting activities.
 - 2) Furnish and erect signs to warn public of blasting operations. Locate and maintain signs to be clearly evident to public during critical periods of blasting operations.
 - e. 72 hours before blasting:
 - 1) Notify authorized representatives of utilities of blasting work and schedule.
 - 2) Notify Engineer of blasting work and schedule.
 5. Seismic survey.
 - a. Obtain seismic survey prior to rock excavation to determine maximum charges that can be used at different locations in area of excavation without damaging adjacent properties.
 6. Pre-blast survey.
 - a. Not less than 7, nor more than 14 days before blasting operations will begin, submit pre-blast survey of structures, improvements, and adjacent properties within the influence range of blasting operations, or within 500 feet of blasting operations, whichever is greater.
 - b. Coordinate activities, issue notices, obtain access to affected properties, and provide clerical services to accomplish the survey and prepare report for submittal.
 - c. Include as part of survey:
 - 1) Close-up, visual observation, of surrounding structures and improvements. Support observations with still photographs and annotated drawings and maps. Locate and clearly label pre-blasting cracks and damage.
 - 2) List of owners of adjacent properties or utilities notified of upcoming blasting work with contact information.

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- 3) List of property owners who refused to cooperate or to permit entry and inspection.
 - d. Perform survey:
 - 1) Under the supervision of a licensed professional engineer or geologist experienced in preparation and post-blasting use of such surveys.
 - 2) With Contractor's and blasting subcontractor's insurance underwriter(s) in attendance. **If underwriter determines that their presence is not required as part of the insurance policy, provide written statement from underwriter attesting to such.**
 7. Retain records of pre-blast survey for at least 3 years following final completion of the Work.
- D. Blasting procedures.
1. Perform work under the direct supervision of an professional engineer or geologist, licensed in the state where the work is performed and experienced in the blasting under conditions anticipated for this Work.
 2. Conduct blasting operations in full compliance with local codes and ordinances; with OSHA requirements; and in accordance with recommendations of Section 9 of AGC Manual of Accident Prevention for Construction, IME Safety Library, and NFPA 495.
 3. Perform work so that:
 - a. No damage occurs to any building, structure, pipeline, or facility on or off site of the work, above or below ground.
 - b. Earth below footings or foundations of any existing or proposed structure is not loosened or disturbed.
 4. Transport, store, handle, and use explosives in accordance with provisions and requirements of applicable laws, ordinances, and regulations.
 5. Blasting limits:
 - a. Limit any one blast to not more than 2,000 square feet of surface area, unless a smaller area is required by applicable laws, ordinances, or regulations.
 6. Hole depth and spacing:
 - a. Depth: Limited to 8 feet, **or alternative depth as reviewed and approved by the Engineer.**
 - b. Spacing: Not exceed hole depth.
 7. Multiple holes:
 - a. Shot using millisecond delay.
 8. Test shots:
 - a. Determine shock wave, best depth, number of holes, and pounds of explosive to be shot at one time.
 9. Stemming of each hole or cover over explosives:
 - a. Provide stemming sufficient to prevent surface blast wave, but in no case less than 3 feet 6 inches.
 10. Blasting below any lift of material is not permitted until all interior excavation to that depth is completed.

E. Protection – People and property.

1. Contain fly rock and debris within the project site. Prevent hazards to persons, existing improvements, vehicles, and vegetation.
2. Devise and put in place an audible warning system to be sounded before each blast. Familiarize all personnel on the project, Engineer, Owner, and surrounding property owners with the system.
3. Patrol danger areas before each blast to be certain that they are completely cleared of people and equipment.
4. At time of firing, station personnel along road at sufficient distance from blasting operations to warn or stop vehicles, pedestrians, and construction personnel from entering the area. Keep personnel in place until the area has received an “all clear” signal from the blast supervisor.
 - a. Use blasting mats. Do not use steel mats within 2,000 feet of power lines.
5. Devise and implement other safety requirements unique to blasting operations for this Work so that life, property, utilities, and new and existing construction are protected.

F. Protection – Rock surfaces:

1. **At locations where structures are shown to be cast against rock faces, employ measures to minimize over-break and to preserve the rock faces.**
2. **Preserve lines and faces of final slopes and surfaces using precautions including, but not limited to those in the following paragraphs.**
 - a. **Line drilling. Do not permit drill holes to deviate from their planned plane more than 3 inches over the entire length of the hole.**
 - b. **Pre-splitting. Load and fire pre-splitting holes before production holes to create a fracture plane along the perimeter of the excavation.**
 - 1) **Perform using practices that produce a clean face on the excavated cut.**
 - 2) **Drill holes for pre-splitting to full depth of cut, or to a preselected bench elevation as indicated on the Drawings or accepted in advance by the Engineer.**
 - 3) **Do not permit pre-splitting holes to deviate from their planned alignment more than 6 inches over the full vertical lift height. If particle velocity and air blast over-pressure limits permit, fire pre-splitting holes simultaneously. If particle velocity and air blast over-pressures do not permit, fire pre-split holes in segments along the pre-split line using a sequential timer to delay firing intervals.**
 - 4) **Do not drill production holes closer to the presplit line more than 12 times the diameter of the production hole.**

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- c. **Differing charges:** Load outside rows of blast holes with lesser charges to reduce vibration, fragmentation, and damage.
 - d. **Cushion blasting:** Cushion berms adjacent to final rock surfaces for later removal by trim and/or cushion blasting.
 - 1) If used, load and fire cushion blast holes after the main round to ensure a free face and equal burden.
 - 2) Do not permit cushion blast holes to deviate more than 6 inches from the planned alignment.
 - e. **Delay patterns.** Arrange delay patterns to progress parallel to the final rock line in order to avoid excessive back-pressure at the rock surface.
 - 3. **If, in the judgment of the Engineer, blasting procedures being used are not providing adequate preservation of rock surfaces, adjust the diameter, spacing, stemming, and loading of perimeter and production holes until acceptable results are obtained. If adjustments do not achieve the required results, revise blasting techniques. Make adjustments and/or revisions at no additional cost to the Owner.**
- F. Observations, monitoring and reporting.
- 1. Maintain accurate records of each blast showing its location; depth and number of drill holes; type and quantity of explosive used; ground acceleration, velocity, and displacement; and other pertinent data.
 - 2. Establish signaling system that will allow the precise time of firing to be communicated to the monitor, so that monitoring equipment can be started before firing.
 - 3. Monitor peak particle velocity and air blast over-pressure resulting from each blast at not less than 2 locations.
 - a. One location shall be at the existing structure nearest the blast.
 - b. The second location shall be at a location mutually agreed upon by the Engineer and Contractor.
 - 4. Monitor and record, at a minimum, the following blast characteristics:
 - a. Three mutually perpendicular components of particle velocity in directions vertical, radial, and perpendicular to the vibration source.
 - b. Peak particle velocity component and frequency, and air blast over-pressure. Provide equipment capable of displaying these values for field readings immediately after each blast.
 - c. Permanent time history of particle velocity and air blast over-pressure wave forms so the frequency and time of maximum velocity and pressure may be determined.
 - 5. Within 24 hours after each blast, submit blast monitoring report in format similar to the sample report attached at the end of this Section.
 - a. Include copy of seismographic strip chart or other record of velocity/time waveform, marked with date, time, and location of the blast and with the number of the accompanying blast monitoring report.

6. Retain records of blasting and blast monitoring records for a period of not less than 3 years following final completion of the Work.
 7. Based on measurements obtained during monitoring or special site conditions, the Engineer may direct that additional blast monitoring be performed. When previous reports of particle velocities or over-pressure have exceeded the limits specified, provide such additional monitoring, if so directed, at no additional cost to the Owner.
 8. Report to the Engineer in writing all blasting complaints within 24 hours after they are received. Include in the report: name and address of the party filing the complaint; time received; date and time of blast that led to the complaint; and description of circumstances forming the basis for the complaint.
- G. Blasting follow-up.
1. Post-blast survey.
 - a. Upon completion of blasting and rock excavation, make observations at properties previously observed where complaints of damage have been received.
 - b. Retain records of post-blast survey for a period of not less than 3 years following final completion of the Work

3.04 EXCAVATION AND REMOVAL OF LOOSENED MATERIAL

- A. Excavate and remove rock loosened by mechanical or explosive methods using equipment and procedures that prevent damage to rock surfaces, earth slopes, and surrounding structures.
- B. Cut rock at bottom of excavation to form level bearing surface for structures and fills. Form surface with sharp steps between levels.
- C. Remove loose and partially detached rock fragments as part of routine excavation.
 1. Remove boulders and fragments that may slide or roll into excavated areas.
 2. Remove loose and shaled layers to provide sound and un-shattered base for foundations.

3.05 REMOVAL OF DISPOSAL OF EXCAVATED ROCK

- A. Rock may be crushed and screened for reuse in the Work, provided that the resulting materials meet the requirements for gravel or crushed limestone as specified in Sections 02300 and 02318.
 1. Where reuse is proposed, obtain tests and submit test data demonstrating that the processed materials comply with these Specifications.

- B. Remove unused rock from the site for disposal. Comply with all local regulations for disposal of waste and surplus materials. Provide removal and disposal at no additional cost to the Owner.

3.06 FIELD QUALITY CONTROL

- A. Provide quality control over the Work of this Section as specified in Section 01450.
- B. Cooperate to allow Engineer's observation of drilling and loading procedures. Provide Engineer with detailed information on blasting operations upon request.
- C. Engineer shall observe prepared rock surfaces and subgrades before placement of any fill or structures thereon.
 - 1. Footing or slab bearing surfaces inclined at a slope of more than 1 vertical to 8 horizontal shall be leveled by additional rock removal.
 - 2. Rock located outside the limits of rock excavation indicated on the Drawings, but that, in the opinion of the Engineer, is loose, fractured, weathered, or otherwise unsuitable, will be identified for removal and replacement. Excavate designated rock materials and replace with Class "C" concrete as specified in Section 03300.
- D. Visually inspect bearing surfaces for soundness and for cavities formed by removed rock before placing seal slabs, fills, or foundations.
- E. At exposed rock surfaces directly below structures, provide probe borings for evaluation of the presence of cavities or seams of clay or shale materials within the rock matrix.
 - 1. Provide probe borings below the following structures:
 - a. Administration Building: 5 probe borings with one under each corner at perimeter walls and one in the middle.
 - 2. Boring details: Provide 2-inch diameter hole drilled not less than 3 feet below top surface of rock.
 - 3. Owner's geotechnical engineer shall observe and probe borings for the presence of cavities, seams of clay or shale, or other discontinuities in the rock mass, and will assess the impacts of such discontinuities (if any) on the foundations for the structures.
 - 4. Where voids are observed, Engineer will issue instructions for additional measures to be undertaken before seal slabs, fills, or foundations are placed over the rock.
 - 5. **Alternative methods for confirming that there are no solution cavities or "sinkholes" below the structures may be proposed for review and evaluation by Engineer prior to execution.**

3.07 ADJUSTING

- A. In the event that blasting results in air blast over-pressures or in ground vibrations that exceed the limits specified herein, immediately revise the blasting plan and the design of individual rounds of blasting. Make revisions at no additional cost to the Owner.
- B. Repair of damage resulting from blasting:
 - 1. Damage noted after completion of blasting operations, and not identifiable in the pre-blast survey as a pre-existing condition will be presumed to have been caused by blasting.
 - 2. Repair or replace any damage, as nearly as possible to its condition prior to blasting and to the satisfaction of the property owner, in manner acceptable to the Engineer.
 - 3. Replace loosened material below footings or foundations with Class "C" concrete as specified in Section 03300.
- C. Correct unauthorized rock removal by replacing rock with Class "C" concrete as specified in Section 03300, Controlled Low Strength Material as specified in Section 02312, or other material acceptable to the Engineer.

END OF SECTION

Report of Blast Monitoring		
Project:	City of Edmond, OK	Report No.:
General Contractor:		Date:
Blasting Subcontractor:		Time:
Observers:		

Blast data:			
Project work area:			
Blast location (attach plan):		Bottom of lift elev:	
Maximum charge weight per delay:		Pounds on delay:	
Total charge weight per blast:			

Vibration and air blast over-pressure data:	
Weather conditions	
Wind direction:	
Monitoring location(s):	1)
(attach plan)	2)
Monitoring instrument:	
(make, model & serial)	
	Amplifier gain:
	Chart feed rate:
Particle velocity sensor location (attach plan)	
Over-pressure sensor location: (attach plan)	
Distance of sensors from blast:	

Blast monitoring results:	
Particle velocity components:	Transverse (in/sec):
	Longitudinal (in/sec):
	Vertical (in/sec):
Peak particle velocity (in/sec):	
Peak air blast over-pressure (psi):	

Comments:

1. Provide only new materials, without flaws or defects and of highest quality of their specified class and kind.
 2. Use lavender colored materials as required for irrigation systems with non-potable water sources.
- B. Plastic Pipe and Fittings
1. Provide pipe continuously and permanently marked with manufacturer's name or trademark, size, schedule and type of pipe, working pressure at 73 degrees F, and National Sanitation Foundation (NSF) approval.
 2. Pressure Supply Lines (downstream of backflow prevention units) - Class 200 BE (1" - 21/2") and Class 160 PVC gasketed end (3" & larger).
 3. Non-Pressure Lines - Class 200 BE.
 4. Drip Tubing – Rainbird Drip System XFD
 5. Emitter Tubing - By emitter manufacturer.
 6. All pipe to be identified with following indelible markings
 - a. Manufacturer's name.
 - b. Nominal pipe size.
 - c. Schedule of class.
 - d. Pressure rating
 - e. NSF (National Sanitation Foundation) seal of approval.
 - f. Date of extrusion.
- C. Solvent Weld Pipe
1. Manufactured from virgin polyvinyl chloride (PVC) compound in accordance with ASTM D2241 and ASTM D1784; cell classification 12454-B, Type 1, Grade 1.
 2. Fittings
 - a. Standard weight, Schedule 40, injection molded PVC; complying with ASTM D1784 and D2466, cell classification 12454-B.
 - b. Threads - Injection molded type (where required).
 - c. Tees and ells - Side gated.
 3. Threaded nipples - ASTM D2464, Schedule 80 with molded threads
 4. Joint Cement and Primer - Type as recommended by manufacturer of pipe and fittings.
- D. Gasketed End Pipe
1. Manufactured from virgin polyvinyl chloride compound in accordance with ASTM D2241 and ASTM D1784; cell classification 1254B, Type 1, Grade 1.
 2. Fittings - Epoxy coated steel or ductile iron with push-on joints or mechanical joint.
 3. Gaskets - Factory installed in pipe and fittings, having a metal or plastic support within gasket or a plastic retainer ring for gasket.
 4. Lubricant - As recommended by manufacturer of pipe fittings
- E. Low Pressure/Volume Systems:
1. Drip Tubing - Manufactured of flexible vinyl chloride compound conforming to ASTM D1248, Type 1, Class C, Category 4, P14 and ASTM D3350 for PE 1221110.
 2. Fittings - As recommended by tubing manufacturer
 3. Drip Valve Assembly - As recommended by tubing manufacturer. **To be sized according to zone requirements.**
 - a. ~~Wye Strainer - Plastic construction with 150 mesh nylon screen and 1/2" blow out assembly, manufactured by Agricultural Products, Inc.~~

- ~~b. Control Valve - 2 way, solenoid pilot operated type made of synthetic, non-corrosive material; diaphragm activated and slow closing. Include freely pivoted seat seal; retained (mounted) without attachment to diaphragm. 700 series manufactured by Hardie.~~
- ~~c. Pressure Reducing Valve - Plastic construction with manual adjusting nut.~~
- d. Pressure regulating basket filter component specifications include: Standard 200 mesh (75 micron) filter screen constructed of stainless steel. Normally-open in-line pressure regulating device. Operating flow rate of 3 to 20 gpm. Operating pressure range of 15 to 150 psi. Regulated pressure of 40 psi. Temperature rating to 150° F. Manufactured by Rain Bird Corporation. Shall include a 3 -year trade warranty.
- e. Drip Zone Control Kit (medium flow): XCZ-100-PRB-COM (1" PVC ball valve, 1" PESB CV and 1" PRBF filter). Medium flow control zone kit assembly for drip zones with flows from 3 to 20 gpm, including PVC ball valve, PESB control valve (CV), and quick check pressure-regulating basket filter (PRBF) which combines filtration and pressure regulation in one integrated unit for protection of downstream components of drip irrigation system.
- f. Or Approved Equal

F. Copper Pipe and Fittings

1. Copper pipe - Type 'K' hard tempered.
2. Fittings - Wrought copper, solder joint type.
3. Joints - Soldered with solder, 45% silver, 15% copper, 16% zinc, and 24% cadmium and solids at 1125° F and liquids at 1145° F.

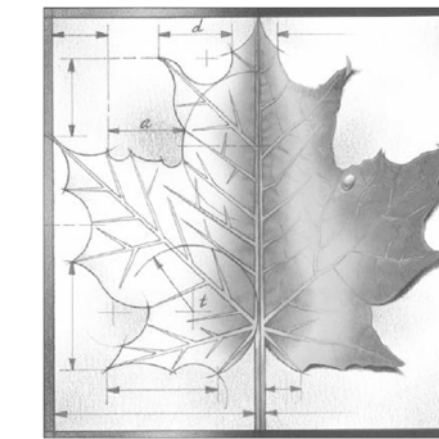
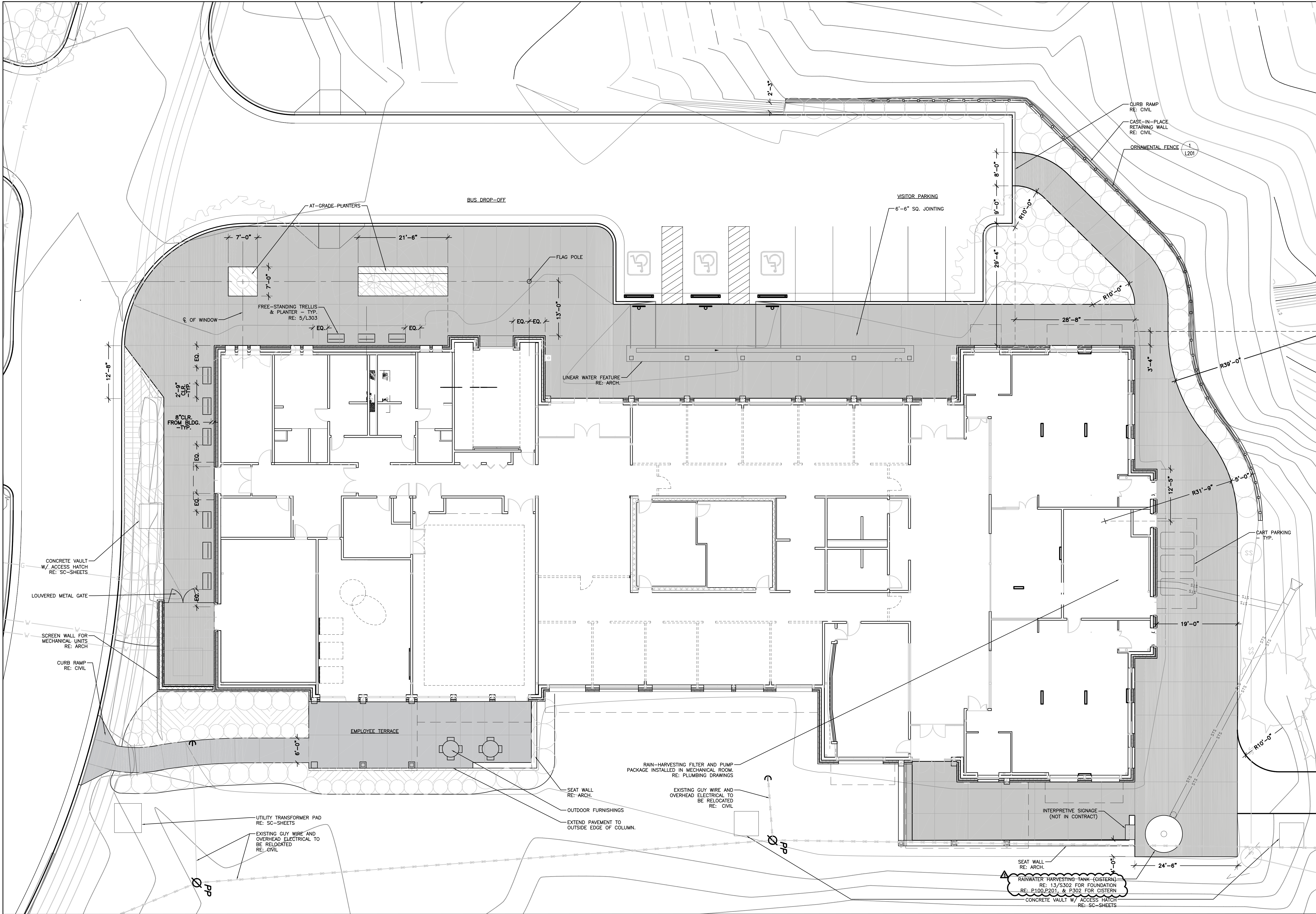
G. Brass Pipe and Fittings

1. Brass Pipe - 85% red brass, AMSI Schedule 40 screwed pipe
2. Fittings - Medium brass, screwed 125 pound class.

H. Sprinklers, pumps, valves, and associated equipment

1. TORO
 - a. 570Z Series bodies with 570 series nozzles.
 - b. ~~Super 600, 700, or V1550 sprinklers~~ T5 Gear Drive Rotor.
 - c. P-220 Series valves.
 - d. ~~Custom Command Series controllers.~~
 - e. Quick couplers 473-00
 - f. Or approved equals of above.
2. RAINBIRD
 - a. 1800 Series bodies with 1800 series nozzles.
 - b. ~~T-Bird~~ 5000+ series or Falcon Rotary sprinklers.
 - c. PGA Series valves.
 - d. ~~ESP LXME Plus Series Controllers.~~
 - e. 33RC/33K Quick Coupler combination.
 - f. Or approved equal of above.

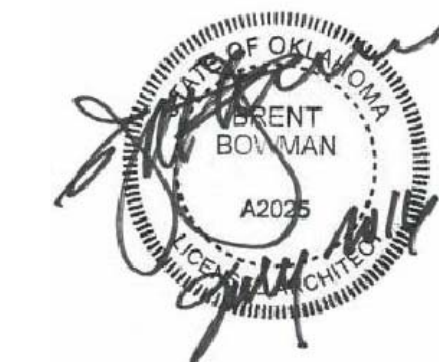
I. Controller



BBN

BBN ARCHITECTS, INC.
411 NICHOLS ROAD, SUITE 246
KANSAS CITY, MO 64112
PH: 816-753-2550
WWW.BBNARCHITECTS.COM

Information provided on the drawings regarding existing conditions has been obtained from the best sources available, but cannot be guaranteed in all respects. Contractor shall verify all such information prior to proceeding with any new work that may be affected. Include as part of the contract all work required to produce the indicated result. All drawings and written material appearing herein constitute the original and unpublished work of the Architect, and same may not be duplicated, used or disclosed without the written consent of the Architect.
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REVISIONS:	
1	8-22-16 ADDENDUM #2
2	
3	
4	
5	
6	
Project Number: CD16-00003	
Date: 07-06-16	
Project Name: CCWRRF ADMIN/LAB BUILDING	
Project Address: 1600 N. Midwest Blvd Edmond, Oklahoma 73034	
Sheet Title: BUILDING ENLARGED PLAN	
Sheet: L102	
Of:	

GENERAL STRUCTURAL NOTES

General Contractor shall review and stamp all the shop drawings before submitting for review.

Verify all dimensions and elevations with the Architectural Drawings.

See the Architectural Drawings for the exact dimensions for openings in the walls,

roof, and floor systems.

Verify all mechanical opening sizes and locations with the mechanical contractor.

Verify all electrical opening sizes and locations with the electrical contractor.

No pipes, sleeves, or etc. shall pass through the beams or columns unless indicated on the plan.

Do not hang or attach any architectural, mechanical, or electrical elements or systems from the metal roof deck or any joist bridging unless specifically approved otherwise. The contractor shall design, provide, and maintain temporary bracing, shoring, guying, etc. and other methods as required to prevent any excessive loading and to stabilize the structural elements during construction. These methods shall remain in place until all members and final connections have been completed. The foundation is designed for an allowable bearing pressure of 2000 psf as recommended in the Geotechnical Investigation Report prepared by Geotechnology, Inc., Project No. J024271.02.

The building structural system is designed per the International Building Code - 2015 Edition.

Steel joist, structural steel, and metal deck erection shall comply with OSHA Standard 29 CFR Part 1926, Subpart R and all other governing regulations. Steel joist and structural steel suppliers and fabricators shall incorporate the requirements of this standard into the materials fabricated and supplied on this project.

DESIGN LOADS

Building structure is designed for the following loads and criteria:

Risk Category:	III at Main Building IV at Safe Room
Dead:	Weight of materials and construction plus weight of fixed service equipment

Live Load:	
Floor Live Load:	
First floor general areas:	100 psf
Exit facilities:	100 psf
Roof live load:	25 psf (non-reducible)

Snow:	
Ground snow load:	Pg = 10 psf
Flat-roof snow load:	PF = 11 psf
Drifting snow load:	ASCE 7-10
Snow exposure factor:	Ce = 1.0
Snow load importance factor:	I = 1
Thermal factor:	CT = 1.2 At Canopies

Wind:	
Basic wind speed (3-second gust):	Vult = 135 MPH Ultimate Vassd = 105 MPH Nominal
Wind exposure category:	C
Internal pressure coefficient:	+0.18

Extreme wind safe room design data:	
Analysis procedure:	FEMA 361 (Third Edition) and ASCE/SEI 7-10
Minimum extreme wind safe room roof live load:	150 psf (non-reducible)
Basic wind speed (3-second gust):	250 MPH
Wind importance factor:	I = 1.00
Wind exposure category:	C
Internal pressure coefficient:	+0.55
Topographic factor:	Kzt = 1.00
Directionality factor:	Kd = 1.00

Seismic:	
Seismic Importance factor:	I = 1.25 at Main Building I = 1.50 at Safe Room
Mapped spectral response accelerations:	Ss = 0.25 S1 = 0.08
Site class:	C
Spectral response coefficients:	Sds = 0.20 Sd1 = 0.041
Seismic Design Category:	B at Main Building C at Safe Room
Analysis procedure:	Equivalent lateral force
Basic seismic-force resisting system:	Steel frame not specifically detailed for seismic resistance at Main Building
Response modification factor:	R = 3
Seismic response coefficient:	Cs = 0.083
Design base shear:	V = 0.069 x W
Basic seismic-force resisting system:	Ordinary Reinforced Masonry Shear Walls at Safe Room
Response modification factor:	R = 2
Seismic response coefficient:	Cs = 0.15
Design base shear:	V = 0.15 x W

STRUCTURAL SPECIAL INSPECTIONS

The contractor shall engage one or more qualified independent testing and inspecting agencies to perform the material testing and inspection requirements as outlined in the project specifications and this section. The contractor shall review the specifications and coordinate with the Architect to determine which party, the owner or contractor, is responsible for retaining an agency for each of the testing and inspection services.

Testing and inspection reports shall be furnished to the Building Official, the Architect, and the Structural Engineer. Reports shall indicate that the materials tested and the work inspected are in conformance with the Contract Documents. Discrepancies shall be brought to the attention of the Contractor for correction. If the discrepancies are not corrected, the discrepancies shall be reported to the Building Official, the Architect, and the Structural Engineer.

The testing and inspecting agencies shall submit a final report for each type of work stating that any discrepancies noted in the testing and inspections have been corrected and that the structural work was, to the best of their knowledge, performed in conformance with the Contract Documents.

The testing and inspection program does not relieve the Contractor of any responsibility for constructing the project in accordance with the Contract Documents and for controlling the quality of construction. The Contractor shall be responsible for the scheduling and the timely notification of the testing and inspection agencies of the need for material testing or inspections.

All work which requires testing or inspection shall be ready for testing or inspection at the time of the testing and inspecting agency's visit. No work shall be performed which would conceal items to be tested or inspected until the work has been reviewed and accepted.

The following types of work require special inspection (IBC references refer to the International Building Code edition referenced above).

1. Inspection of fabrications shall comply with IBC Section 1704.2.5.
2. Testing and inspection of steel construction shall comply with IBC Section 1705.2, IBC Table 1705.2.3, and American Institute of Steel Construction (AISC) Specification for Structural Steel Buildings 360.
 - a. Submit material test reports, manufacturer's certifications, product data sheets, welding procedure specifications, welding personnel performance qualification records, fabricator/erector quality control manual, fabricator/erector inspector qualifications as specified. Contractor shall maintain same for review by Architect/Engineer as indicated in AISC 360 Chapter N.
 - b. Submit AWS performance qualification records for personnel performing shop fabrication or field erection welding.
 - c. Perform visual inspection of the fabricated or erected steel framing to verify compliance with the construction drawings, including member location, bracing, stiffeners, and connection types.
 - d. Perform Visual Inspection of all shop fabrication and field erection welds.

- e. Perform ultrasonic inspection of all partial or complete joint penetration welds during the shop fabrication and field erection.
 - f. Perform continuous inspection of all fillet welds greater than 5/16" during the shop fabrication and field erection.
 - g. Perform visual inspection of all snug-tightened (Type 5T) bolted connections.
 - h. Observe the verification testing required for pretensioned bolted connections defined in the Research Council on Structural Connections (RCSC) Specification for Structural Joints Using High Strength Bolts, Section T.
 - i. Perform visual inspection of all bolted connections using tension control bolts at slip-critical (Type 5C) bolted connections and pretensioned (Type PT) bolted connections.
 - j. Perform visual inspection of the placement of anchor rods and embed plates in concrete. Verify diameter, grade, type, length, and embedment of anchors prior to placing concrete.
 - k. Perform visual inspection and bend testing of headed stud shear connectors in compliance with AWS D11, Section 7.
 - l. Perform visual inspection of the metal roof deck fastener installation.
 - m. Perform visual inspection of all extreme wind and impact-resistant safe room metal door frame connections to the masonry walls.
3. Testing and inspection of concrete construction shall comply with IBC Section 1705.3 and IBC Table 1705.3.
 - a. Perform sampling and testing of cast-in-place concrete as specified.
 - b. Perform periodic observation of reinforcing for steel size, cover, spacing, positioning, lap lengths and locations at slabs on grade.
 - c. Perform inspection of the reinforcing for steel size, cover, spacing, positioning, lap lengths and locations at slabs on grade.
 - d. Perform inspection of concrete placement for proper procedures for transporting, placing, consolidating, and finishing of concrete.
 - e. Perform periodic inspection of concrete curing and protection procedures, including compliance with the hot and cold weather requirements defined in the specifications.
 - f. Contractor shall maintain records of all batch reports and delivery tickets on each load of concrete delivered to the project site for periodic review by the Architect/Engineer.
 - g. Perform inspection of the reinforcing steel placement at the extreme wind safe room elevated slab.
 4. Testing and inspection of masonry construction shall comply with the quality assurance requirements of Section 119.1 Level C and Table 119.3 of the TMS 402/ACI 530/ASCE 5 and Section 1.6 Level C and Table 5.3 of the TMS 602/ACI 530/ASCE 6.
 - a. Periodically verify the proportions of site prepared mortar and grout.
 - b. Perform continuous inspection of the mortar placement with the site tolerances defined in TMS 602/ACI 530/ASCE 6 Section 3.8F.
 - c. Perform periodic inspection of the placement of masonry units and the mortar joint construction.
 - d. Perform continuous inspection of the reinforcing steel grade, type, size, placement and positioning and the block core cleaning and preparation.
 - e. Perform continuous inspection of the grout placement for proper consolidation, reconsolidation, and placement of the grout lift heights.
 - f. Continuously verify the type, size, and location of anchors and embeds for anchorage of masonry to other construction.
 - g. Continuously observe the preparation of the mortar specimens per ASTM C780 and grout specimens per ASTM C1019 for testing and as specified.
 5. Testing and inspection of the soils shall comply with IBC Section 1705.6 and IBC Table 1705.6.
 - a. Perform sampling, testing, and inspection of the soil type, exposed subgrade, moisture content, lift thickness, and compaction as specified.
 - b. Perform periodic testing and inspection of the soils at the foundation system bearing elevation to verify the required soil bearing capacities.

6. Testing and inspection of the wood construction shall comply with IBC Section 1705.5.
 - a. Contractor shall maintain records of all material and product certificates delivered to the project site for periodic review by the Architect/Engineer.
 - b. All pre-engineered products shall be designed by a professional engineer licensed to practice in the State of Oklahoma.
7. Testing and inspection of post-installed anchors and post-installed reinforcing bars shall comply with IBC Section 1705.11.
 - a. Perform an initial post-installed anchor and reinforcing bar installation inspection for each type and size of post-installed anchor and reinforcing bar. Any change in the personnel performing the post-installed anchor or reinforcing bar installation shall require an initial installation inspection.
 - b. Perform periodic post-installed anchor and post-installed reinforcing bar installation inspections during the project to verify that the anchor and reinforcing bar installations continue to be properly performed.
 - c. Post-installed anchor and reinforcing bar installation inspections shall verify anchor/reinforcing bar type, diameter, embedment depth, spacing, adhesive type, hole dimensions, base material, hole cleaning procedures, and adherence to the manufacturer's installation instructions.
 - d. Perform visual observation of all completed post-installed anchor and post-installed reinforcing bar installations.
 - e. All post-installed adhesive anchor installations shall be tested to a torque equal to a minimum of 75 percent of the anchor manufacturer's defined installation tightening torque.
 - f. Perform continuous anchor installation inspections for all post-installed anchors and reinforcing bars that are installed overhead with the anchor/reinforcing bar in a vertical position.

SPECIAL REQUIREMENTS FOR EXTREME WIND SAFE ROOM

The extreme wind safe room is defined on the Architectural Drawings as Small Conference Room 106 and Server Room 107.

The extreme wind safe room's lateral and vertical load resisting structural systems are designed to meet extreme wind loading requirements in accordance with FEMA 361, Third Edition. The fabrication and erection of the extreme wind safe room's lateral and vertical load resisting structural elements and systems must comply with the manufacturer's structural steel construction requirements defined in the International Building Code - 2015 Edition (IBC), the preceding structural special inspection section, and the project specifications.

The Contractor shall submit a written Contractor Statement of Responsibility from each Contractor responsible for the construction or erection of the extreme wind safe room structural elements and systems to the Building Official and the Architect prior to the commencement of the work. The Contractor Statement of Responsibility is to be in accordance with Section 1704.4 of the IBC.

The Contractor shall engage a registered design professional, as defined in Chapter 2 of the IBC, to perform periodic structural observations of the extreme wind safe room to comply with the requirements of Section 1704.6 of the IBC.

Periodic structural observation by the registered design professional does not include or relieve the responsibility for the inspection required by Section 110, 1704 or other sections of the IBC. Periodic structural observations are to be performed at significant construction stages and at the completion of the extreme wind safe room's structural system.

A structural observation is required after the placement of the reinforcing steel in the extreme wind safe room foundation system. Formed foundation systems shall have a structural observation after the placement of the footing reinforcing and the foundation wall reinforcing.

A structural observation of the extreme wind safe room masonry wall construction is required prior to beginning grouting procedures for the first lift of masonry and periodically during the remainder of the masonry wall construction.

A structural observation is required after the placement of the reinforcing steel in the extreme wind safe room cast-in-place concrete slab and prior to placement of cast-in-place concrete slab.

The registered design professional's periodic structural observation reports of the extreme wind safe room shall be furnished to the Architect, the Structural Engineer, and the Contractor by the next business day after the structural observations are completed. Structural observation reports are to identify any general conformance discrepancies brought to the attention of the Contractor for correction.

The registered design professional's final structural observation report of the extreme wind safe room shall be furnished to the Building Official, the Architect, the Structural Engineer, and the Contractor. The final structural observation report is to state that the structural observations have been performed and identify any general conformance discrepancies that to the best of their knowledge have not been resolved.

The Contractor shall be responsible for the scheduling and the timely notification of the registered design professional of the need for periodic structural observations. All work that requires structural observation shall be ready for observation at the time of the registered design professional's visit. No work shall be performed which would conceal items to be observed.

CAST-IN-PLACE CONCRETE

All concrete shall have the following minimum compressive strengths at 28-days.

Footings and Foundation Walls:	3000 psi
Interior Floor Slabs:	3000 psi
Interior Elevated Slabs:	4000 psi

All aggregate for normal weight concrete shall meet ASTM C33. Aggregates shall be proportioned such that mix design shall contain a minimum of 50% coarse aggregates by gradation requirements set forth in ASTM C33. Coarse aggregate shall meet No. 67 grading requirements.

Exterior exposed concrete shall have from 4 to 7% entrained air. Concrete shall be in strict conformance with the current "ACI Manual of Concrete Practice".

No aluminum shall be placed in the concrete.

Chamber all exposed edges of the concrete 3/4"

Slabs on earth shall be 5 inches thick with #4 at 15" o.c. each way unless otherwise noted.

Contraction joints or construction joints in slabs on grade shall be spaced as indicated on the drawings.

All saw-cut joints in slab on grade floors shall use an early entry dry-cutting sawing system.

Do not install saw-cut joints elevated structural slabs on formwork.

Provide 3-inch edge losses for the mechanical equipment. All shall be 4 inches thick on top of floor slabs on grade with 6x6-H2.9XN2.9 welded wire reinforcement, unless otherwise noted.

REINFORCING STEEL

All welded wire reinforcement (WWR) shall meet ASTM A1064. Lap splice all welded wire reinforcement the cross wire spacing plus 2 inches. Furnish all welded wire reinforcement in flat sheets.

All reinforcing steel shall meet ASTM A615 - 60,000.

All reinforcing steel shall have adequate coverage as indicated in ACI 318 for the given exposure.

Reinforcing steel shall be continuous and lapped a minimum of 24 inches or 36 bar diameters whichever is greater, unless otherwise noted.

Reinforcing shall be detailed according to the ACI Detailing Manual.

Provide corner lap bars to match in size and spacing of all wall, trench footing, and grade beam horizontal bars. Corner bars are not required in the wall footings, unless specifically indicated.

Formwork reinforcing and openings in the structural members. Do not field cut bars unless the Architect's approval is obtained.

Provide 2-#5, 4'-0" longer than opening dimension, on all sides of the openings in the slabs and walls.

Provide 500 pounds of extra bars of various sizes to be used as directed. Include labor for placing same.

Reinforcing shall be continuous with continuous bottom plate at 4'-0" maximum centers for positioning all grade beam bottom bars and all footing bottom bars.

Mark each bundle of the reinforcing with weatherproof tags.

Welding of all reinforcing bars shall conform to AWS D1.4, "Structural Welding Code - Reinforcing Steel".

CONCRETE MASONRY

All concrete masonry units (CMU) shall be made of lightweight concrete aggregate and shall have a minimum compressive strength of 1900 psi on net area at 28-days.

All mortar for use in concrete masonry shall conform to ASTM C 270, Type S.

Provide vertical CMU reinforcement as indicated on the plan and sections. Bars for typical lift shall be shop cut for 4'-0" lifts plus a minimum 48 bar diameters lap. Field cut bars for top lift and non-typical lengths.

Provide dowels from the foundation to match in size and spacing of all vertical CMU reinforcement.

Provide at least one vertical rebar at each end, side of control joints, jamps, corner, and intersection of all load bearing and exterior CMU walls. Size of rebar is to match the size of typical vertical reinforcing. If the wall does not contain any vertical CMU reinforcing, provide 1-#5 vertical at the described locations.

Grout all reinforced vertical block cores and bond beams with minimum 2500 psi grout. Grout shall conform to ASTM C 476.

Provide 2-#5's continuous for all bond beams unless otherwise indicated on the plan. Furnish in shop lengths and field cut. See the plans (including architectural), sections and notes for the locations.

Provide one corner bar to match each horizontal bond beam.

Provide an 8-inch deep bond beam at 4'-0" o.c. vertically in all 8-inch CMU walls.

Provide horizontal joint reinforcing in all concrete masonry unit walls at 16 inches o.c. unless noted otherwise.

Provide vertical masonry reinforcing galvanized bar positioners at 48 inches o.c. at each vertical reinforcing bar. Provide bar positioners to match the wall thickness, bar size, and bar position as required.

Provide masonry control joints at a maximum spacing of 24'-0" o.c. unless noted or shown otherwise.

Coordinate all control joint locations with the Architect/Engineer.

SUBGRADE PREPARATION AND EARTHWORK NOTES

All subgrade preparation and earthwork shall be performed under the direction of the Geotechnical Engineer.

The Geotechnical Engineer shall approve all soil materials, monitor all earthwork operations, and perform the appropriate testing during the earthwork process. Subgrade preparation shall include the removal of all existing soils, foundations, pavement, and stripping the exposed native soils and bedrock to a minimum 3'-0" depth below the foundation bearing level.

After the site preparation work has been completed, proof roll the exposed subgrade in the presence of the Geotechnical Engineer to identify any areas of soft or unstable material. Remove any unsatisfactory material and replace with suitable material as directed by the Geotechnical Engineer.

Scarify, moisture condition, and compact the top 12" of the exposed native soils subgrade prior to starting the engineered fill placement operations. Moisture condition the scarified soils to at least 3 percentage points above the soils optimum moisture content and compact to a minimum of 95% of the maximum dry density as determined by the Standard Proctor, ASTM D-698.

The clean granular drainage base material shall be a well-graded aggregate meeting the ASTM D448 No. 571 material.

The low volume change (LVC) zone material shall be an approved soil, free of organic material and deleterious material. LVC shall consist of lean, fine grained soil with a liquid limit less than 45. Well graded crushed rock such as ODOT Type A, B, or C aggregate would be an acceptable LVC material.

All general engineered fill material required shall be an approved soil, free of organic material and deleterious material with a liquid limit less than 45 and a plasticity index less than 20.

All fill material shall be placed in maximum 8" thick loose horizontal lifts and shall be compacted to at least 95% of Standard Proctor maximum dry density, ASTM D-698. Cohesive soils shall be placed at a moisture content between optimum and 3 percent above their optimum moisture content. The specified moisture content shall be maintained in the soils until the floor slab has been placed.

STRUCTURAL STEEL

Structural steel shall meet the latest AISC "Specification for Structural Steel Buildings."

The steel fabricator and detailer shall be responsible for the design and detailing of all steel framing connections which are not explicitly detailed on the contract documents. The submitted shop drawings shall clearly show and note all shop and field bolting and welding requirements.

All member loads, reactions, and moments defined on the drawings are ASD,

service-load level, unless noted otherwise.

Steel framing members shall only be spliced at locations shown on the design drawings or as shown on and approved on the shop drawings.

Structural steel shop drawings shall be prepared under the supervision of a professional engineer licensed to practice in the State of Oklahoma.

All steel plates and shapes shall meet ASTM A36 except wide flange sections shall meet ASTM A992, Fy = 50 ksi. Structural steel tubing shall meet ASTM A500, Grade B, Fy = 46 ksi and structural piping shall meet ASTM A53, Grade B, Fy = 35 ksi.

All beam and column connections shall be made with A325 (Type I) bolts and accessories. Connections shall be designed as snug-tightened (Type 5T) bolted connections, unless noted otherwise.

Provide ASTM A325 (Type I) tension control bolts meeting ASTM F1852 at all slip critical (Type 5C) and at all pretensioned (Type PT) bolted connections.

All headed studs and shear connectors shall meet ASTM A108, Grade 1015-1020, and AWS D11, Type B.

Do not shop paint the top surface of beam top flanges to receive field installed

headed stud shear connectors.

All unheaded anchor rods shall be ASTM F1554, Grade 36.

All threaded steel rods shall meet ASTM A307, Grade B, ASTM F1554, Grade 36; or an approved equal or greater strength threaded rod. All threaded rods cast in concrete or post-installed in concrete or masonry shall be thoroughly cleaned of all surface oils.

Provide 3/8" plate washers above all oversized holes (hole diameters greater than 1/16" larger than anchor diameter) in the column base plates. Provide standard hole size in plate washers.

All anchor rods set in concrete shall be furnished with double nuts and shall be set with a template.

Provide standard size holes for all bolts and anchors in steel framing members unless noted otherwise (1/16" larger hole than diameter of bolt or anchor).

Where oversized holes are required or desired in steel framing members to accommodate the drill bit size on post-installed anchors, provide a 3/16" thick plate washer at each post-installed anchor location with a standard hole or 1/16" larger hole than the anchor diameter in the center of the plate washer. After the anchors and the steel framing members have been installed, add the plate washer on each anchor prior to installing the anchor. After the anchor has been properly tightened, weld the plate washer to the steel framing member with a 3/16" fillet weld along each vertical edge of the plate washer.

Provide an angle frame to support the metal deck at all openings greater than 4" x 4".

Provide an angle frame below the perimeter curb of all mechanical roof top units and around the curb openings below the mechanical equipment.

Where the unit is perpendicular to the roof joists, provide L4x4x3/8 between the joists and below the curb. Where the perimeter curb of the unit is parallel to the roof joists, provide L4x4x3/8 between the joists at a maximum spacing of 6'-0" o.c. and provide L4x4x3/8 between the angles and below the curb. The contractor shall coordinate all mechanical unit sizes and locations.

Welding shall conform to AWS D11, "Structural Welding Code - Steel". All welds shall be AWS prequalified welded joints. No unauthorized welds will be accepted.

ET0xx electrodes shall be used for all welding, U.N.O..

Use E80xx electrodes for the welding of all ASTM A706-60,000 weldable reinforcing bars or as required to comply with AWS D1.4.

See Intel Schedule for Intel requirements indicated on the drawings.

Not all masonry openings that require lintels are shown on the structural drawings. Refer to the architectural and mechanical drawings for the size and location of additional openings in the masonry walls.

Galvanize all steel lintels, sills, and jamb columns in exterior walls.

Galvanize all exterior steel columns.

Loose angle lintels shall bear a minimum of 8" onto adjacent masonry U.N.O.

All field completed welding and bolted connections shall be reviewed and accepted by the field inspection and testing agency prior to the installation of subsequent work. Galvanized structural steel shall conform to ASTM A123 for members and ASTM A153 for connection elements.

Hot-dip galvanize steel framing members as specified where specifically noted on the drawings. Provide venting relief holes as required, but locate on the bottom side or at other non-visible locations where the members are exposed on the exterior of the building. Show or note the locations of venting holes on the shop drawing submitted.

Hot-dip galvanize steel framing members as specified where specifically noted on the drawings. Provide venting relief holes as required, but locate on the bottom side or at other non-visible locations where the members are exposed on the exterior of the building. Show or note the locations of venting holes on the shop drawing submitted.

STEEL JOISTS

Open web joists shall meet the latest specifications of the Steel Joist Institute (SJI), and shall be fabricated by a member of the SJI.

Steel joist spacing shall be as shown on the plans.

Weld all joists to steel bearing, where such bearing occurs, except where bolted connections are required to comply with the governing standards or regulations.

Where joist bearing conditions require nonstandard bearing ends, joist fabricator shall provide special bearing ends as required to accommodate such conditions and the provided bearing length.

Provide specially fabricated sloped end bearing on all roof joists with a roof slope greater than 1/4" per foot.

Provide erection bolts at locations per SJI specifications.

Suspension of any miscellaneous items from joists shall be only at top or bottom chord panel points unless otherwise indicated.

Joist fabricator shall provide joist bridging per SJI recommendations. See the plans and details for the special bridging and bracing requirements.

Joists shall be designed by the manufacturer for uniform loads as defined in the SJI load tables. The SJI defined uniform load also applies at top chord extensions and extended ends. In addition to the uniform loads, all joists shall be designed to support a 200 pound concentrated load applied to any single top or bottom chord panel point along the length of the joist. Where noted on the plans or details, joists shall be designed for additional special loads as indicated. Any 1/3 stress increase for short-term loadings shall not be applied to the design of the joists.

Do not shop paint the top surface of joist top chords to receive field installed headed stud shear connectors.

Design all roof joists for the net uplift pressure indicated on the wind uplift diagram.

Design K-Series roof joists for a rollover force across the joist bearing seat of 1500 lbs.

METAL ROOF DECK

Metal deck shall be Type 15B 1-1/2", 20 gage, galvanized, wide rib deck, continuous over three spans.

Deck shall have a minimum flexural modulus of 0.254 in³/ft and a minimum moment of inertia of 0.201 in⁴/ft; Deck shall be galvanized and shall conform to ASTM A424 and/or A653 with a minimum G60 coating. End lap joints shall be staggered a minimum of one joist spacing. Metal roof deck is designed to resist a diaphragm force of 400 plf, and shall be connected using size 12 screw fasteners to all supports as follows:

End laps shall be fastened through both pieces in a 36/7 pattern.

Intermediate supports shall be fastened in a 36/7 pattern in the field of the roof.

Intermediate supports that occur within the roof corners and perimeter edge strips shall be fastened with two fasteners at each side lap and all flutes between (36/4 pattern). The perimeter edge strip/corner distance extends 8 feet from the perimeter of each individual roof plane.

Side laps shall have 5 size 10 screw fasteners between supports.

Deck shall be fastened to all perimeter boundary members parallel with deck flutes with size 12 screws at 6 inches o.c., where such members occur. Deck shall be fastened to all perimeter boundary members perpendicular with deck flutes with two size 12 crews at each flute, where such members occur. Partial deck sheets used to complete deck layout shall be fastened to the supporting members at all flutes.

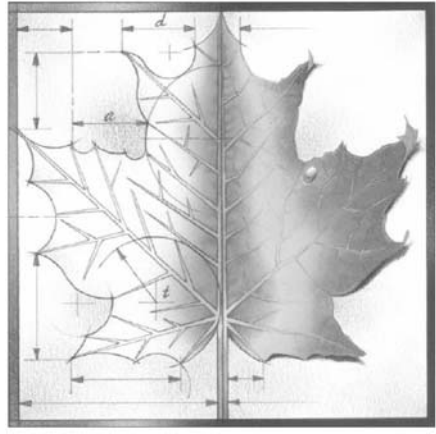
Deck shall be fastened to all perimeter boundary members parallel with deck flutes with size 12 screws at 6 inches o.c., where such members occur. Deck shall be fastened to all perimeter boundary members perpendicular with deck flutes with two size 12 crews at each flute, where such members occur. Partial deck sheets used to complete deck layout shall be fastened to the supporting members at all flutes.

Deck shall be fastened to all perimeter boundary members parallel with deck flutes with size 12 screws at 6 inches o.c., where such members occur. Deck shall be fastened to all perimeter boundary members perpendicular with deck flutes with two size 12 crews at each flute, where such members occur. Partial deck sheets used to complete deck layout shall be fastened to the supporting members at all flutes.

Deck shall be fastened to all perimeter boundary members parallel with deck flutes with size 12 screws at 6 inches o.c., where such members occur. Deck shall be fastened to all perimeter boundary members perpendicular with deck flutes with two size 12 crews at each flute, where such members occur. Partial deck sheets used to complete deck layout shall be fastened to the supporting members at all flutes.

Deck shall be fastened to all perimeter boundary members parallel with deck flutes with size 12 screws at 6 inches o.c., where such members occur. Deck shall be fastened to all perimeter boundary members perpendicular with deck flutes with two size 12 crews at each flute, where such members occur. Partial deck sheets used to complete deck layout shall be fastened to the supporting members at all flutes.

Deck shall be fastened to all perimeter boundary members parallel with deck flutes with size 12 screws at 6 inches o.c., where such



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REVISIONS:

1 08-22-16 ADDENDUM #2

2

3

4

5

6

Project Number: CD16-00003

Date: 07-06-16

Project Name:
**CCWRRF
ADMIN/LAB
BUILDING**

Project Address:
**1600 N. Midwest Blvd
Edmond, Oklahoma 73034**

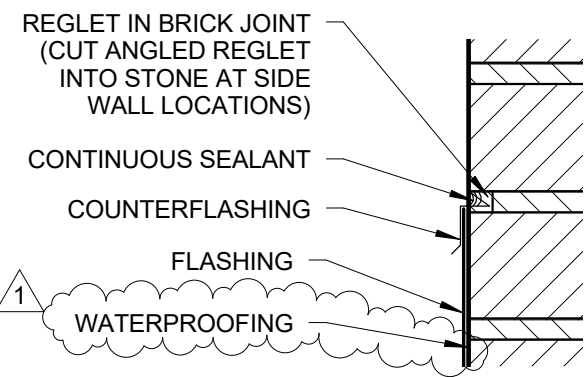
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DETAILS

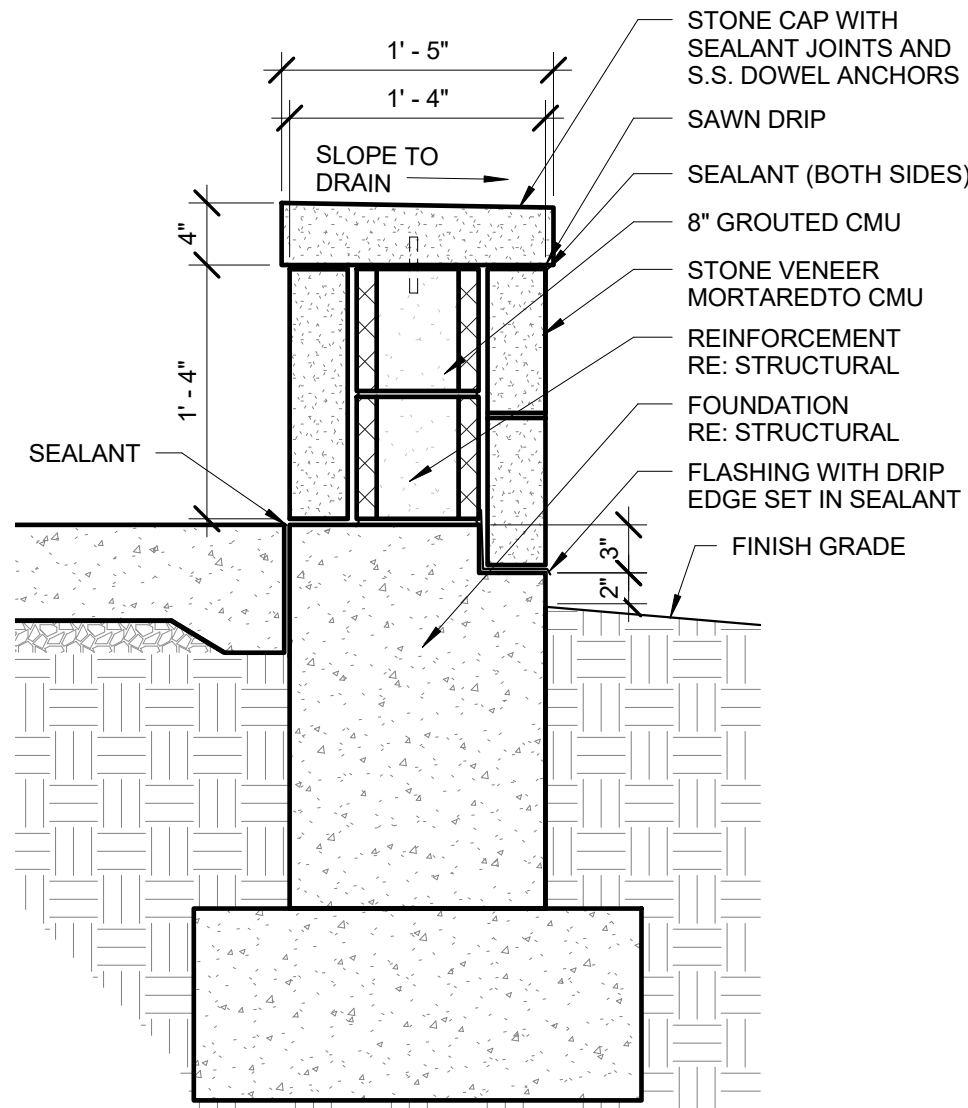
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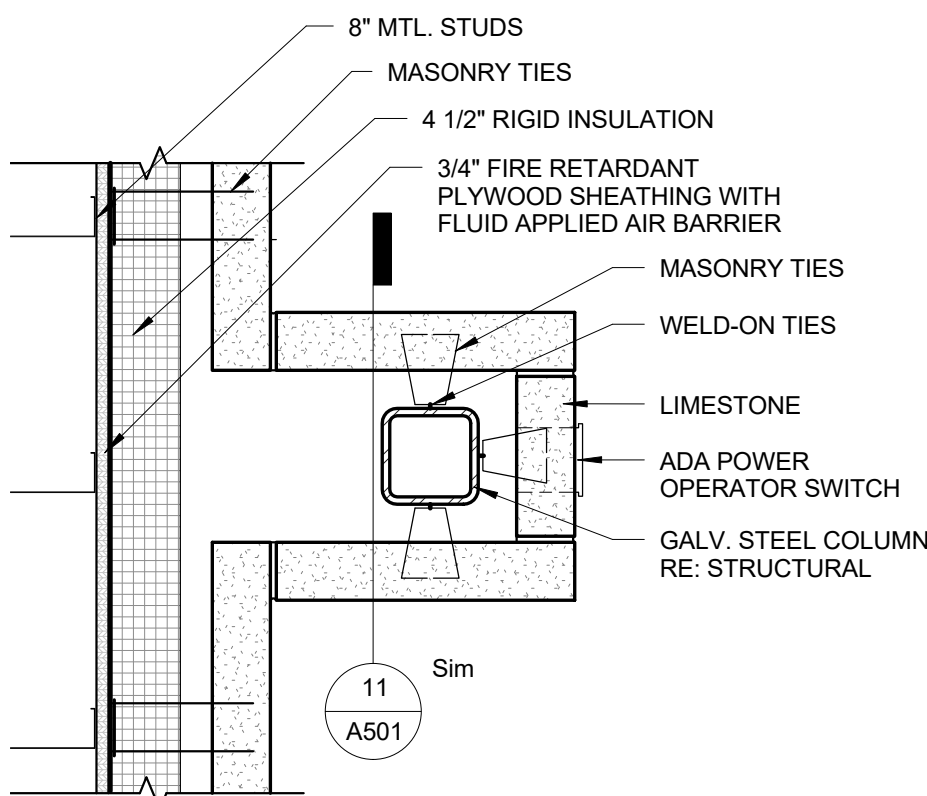
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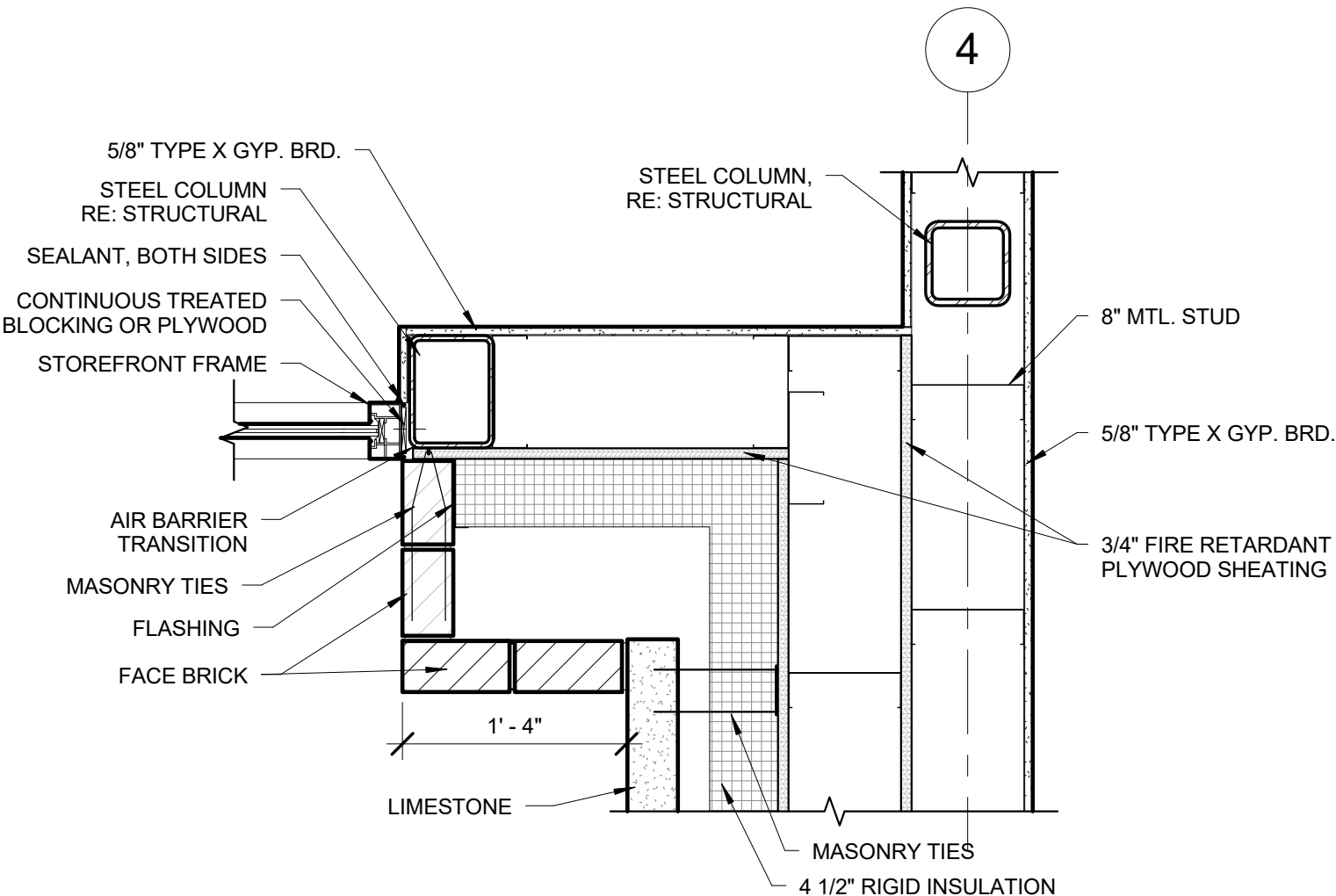
10 FLASHING DETAIL
3" = 1'-0"



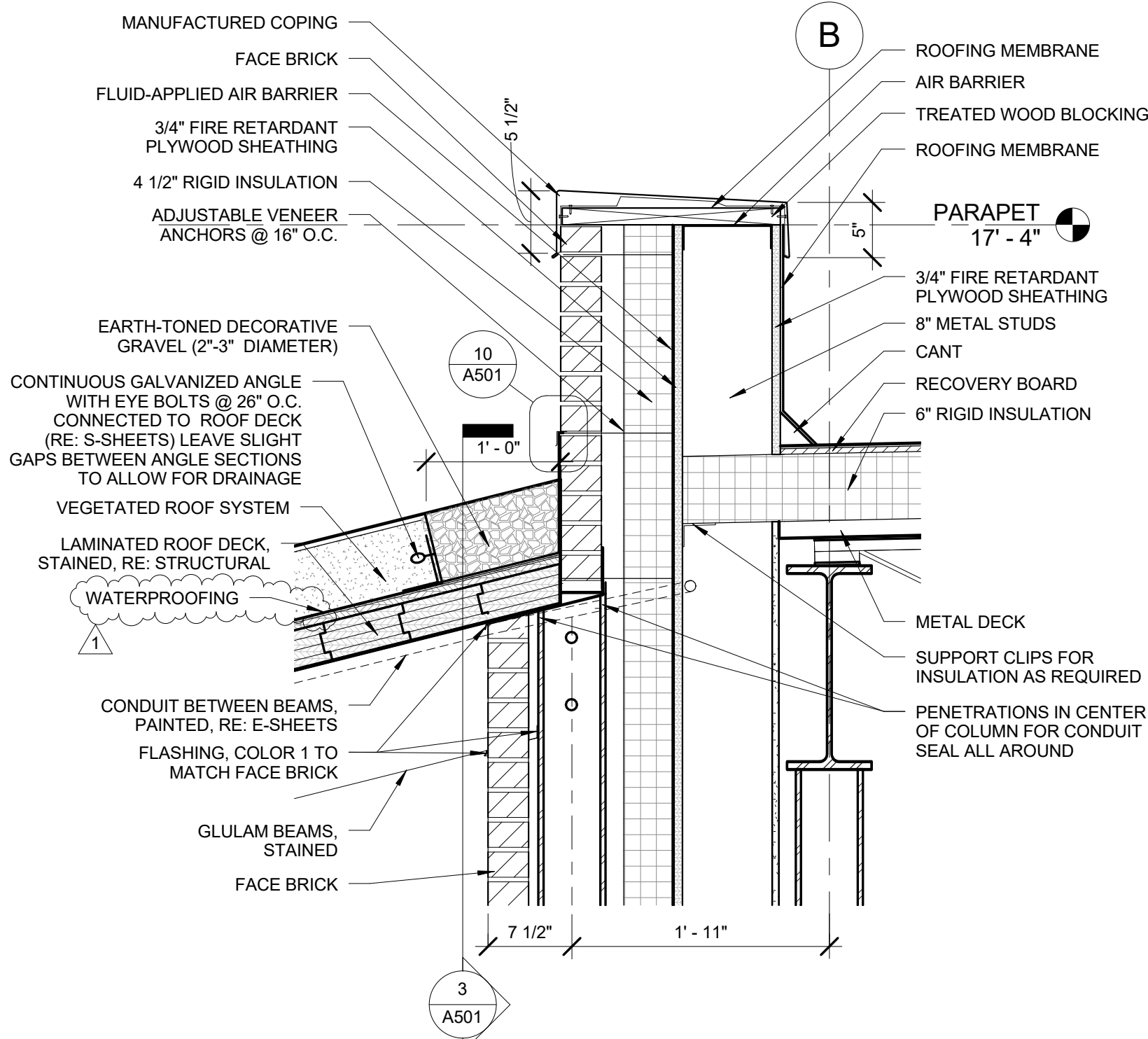
9 SEAT WALL DETAIL
1" = 1'-0"



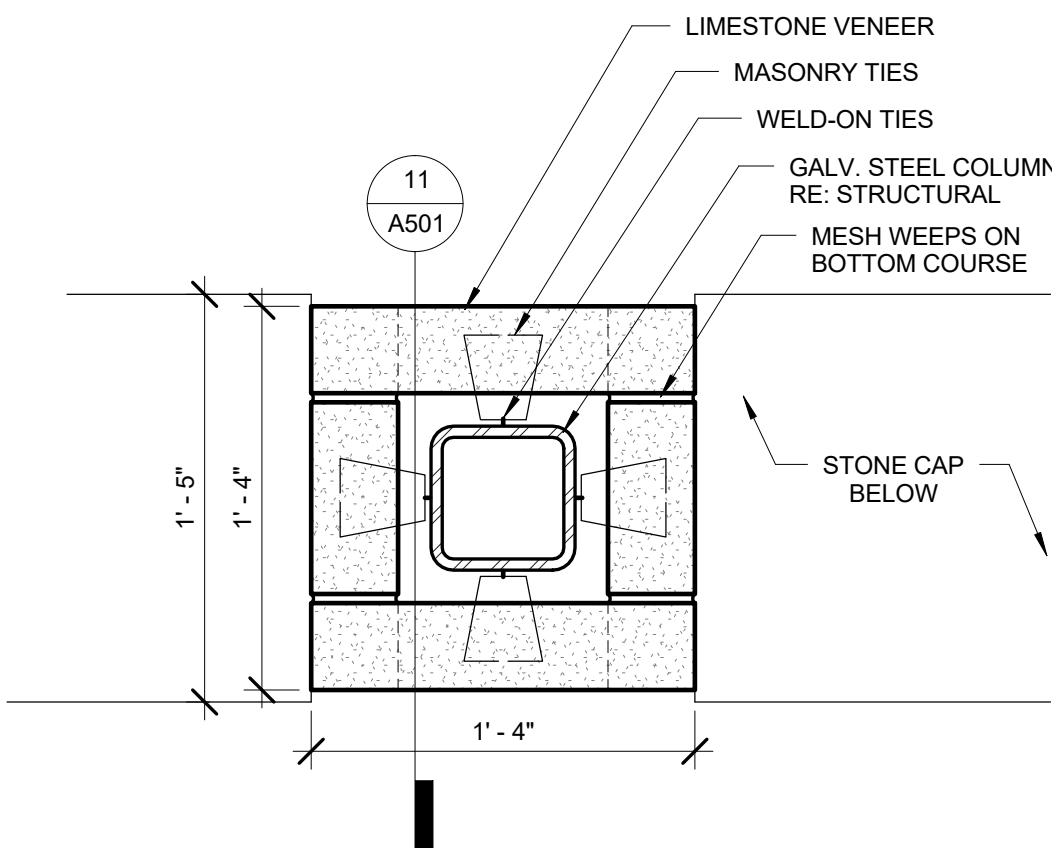
8 PILASTER DETAIL
1" = 1'-0"



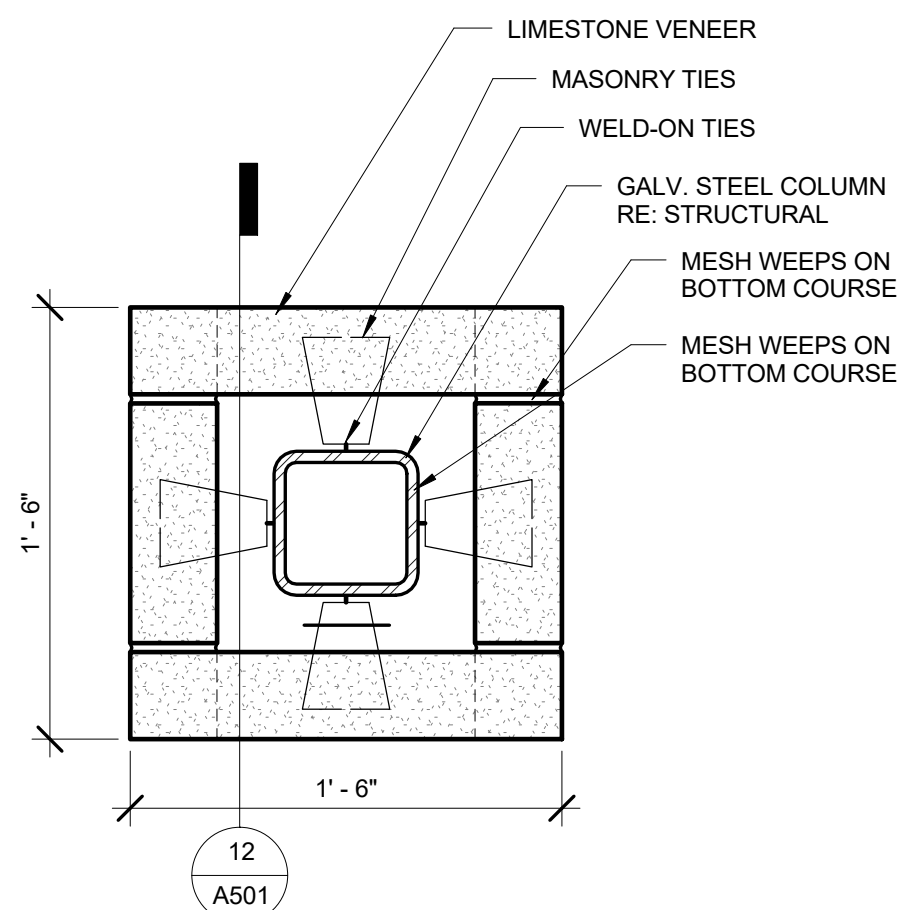
7 CORNER PILASTER DETAIL
1" = 1'-0"



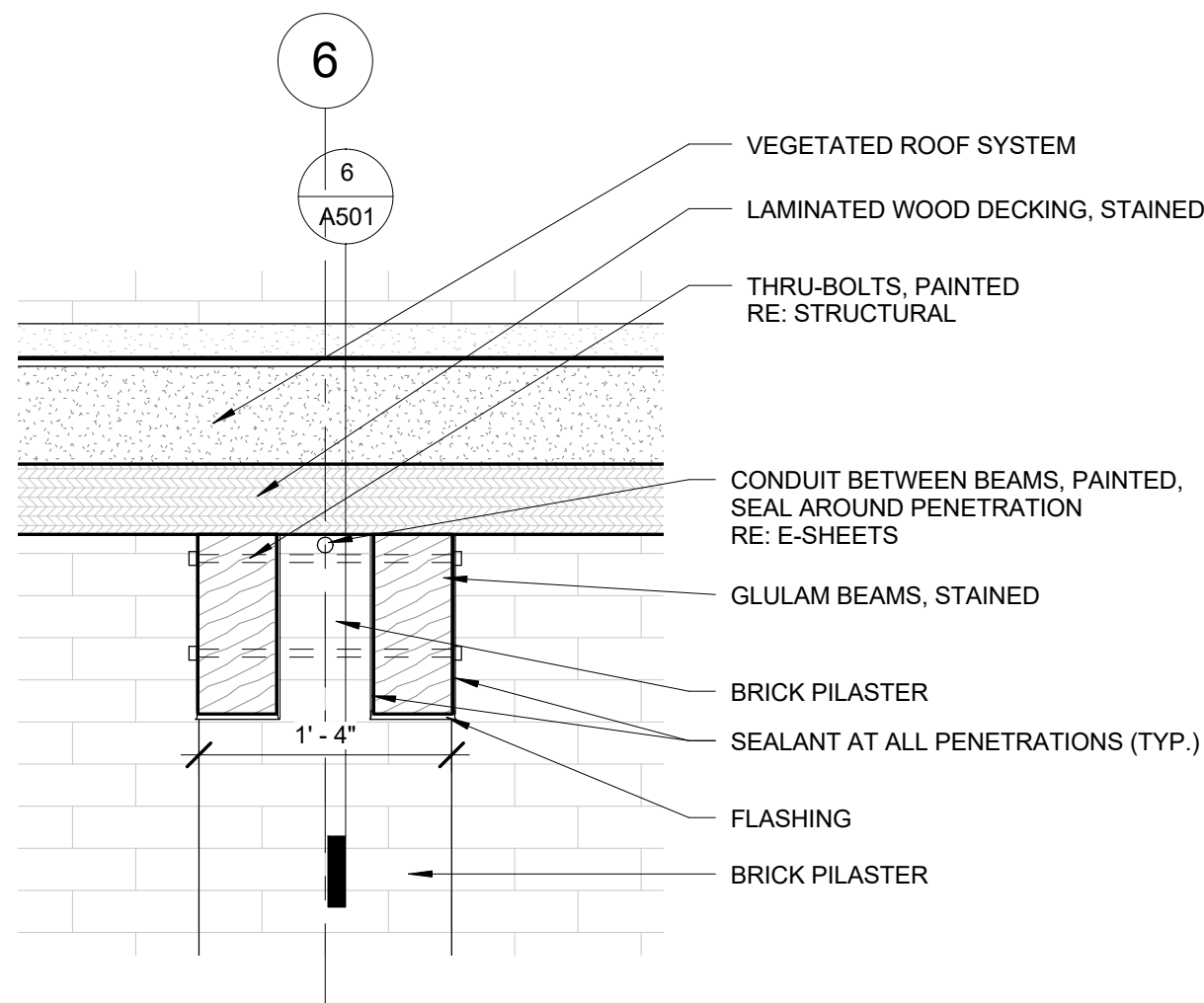
6 ROOF SECTION
1" = 1'-0"



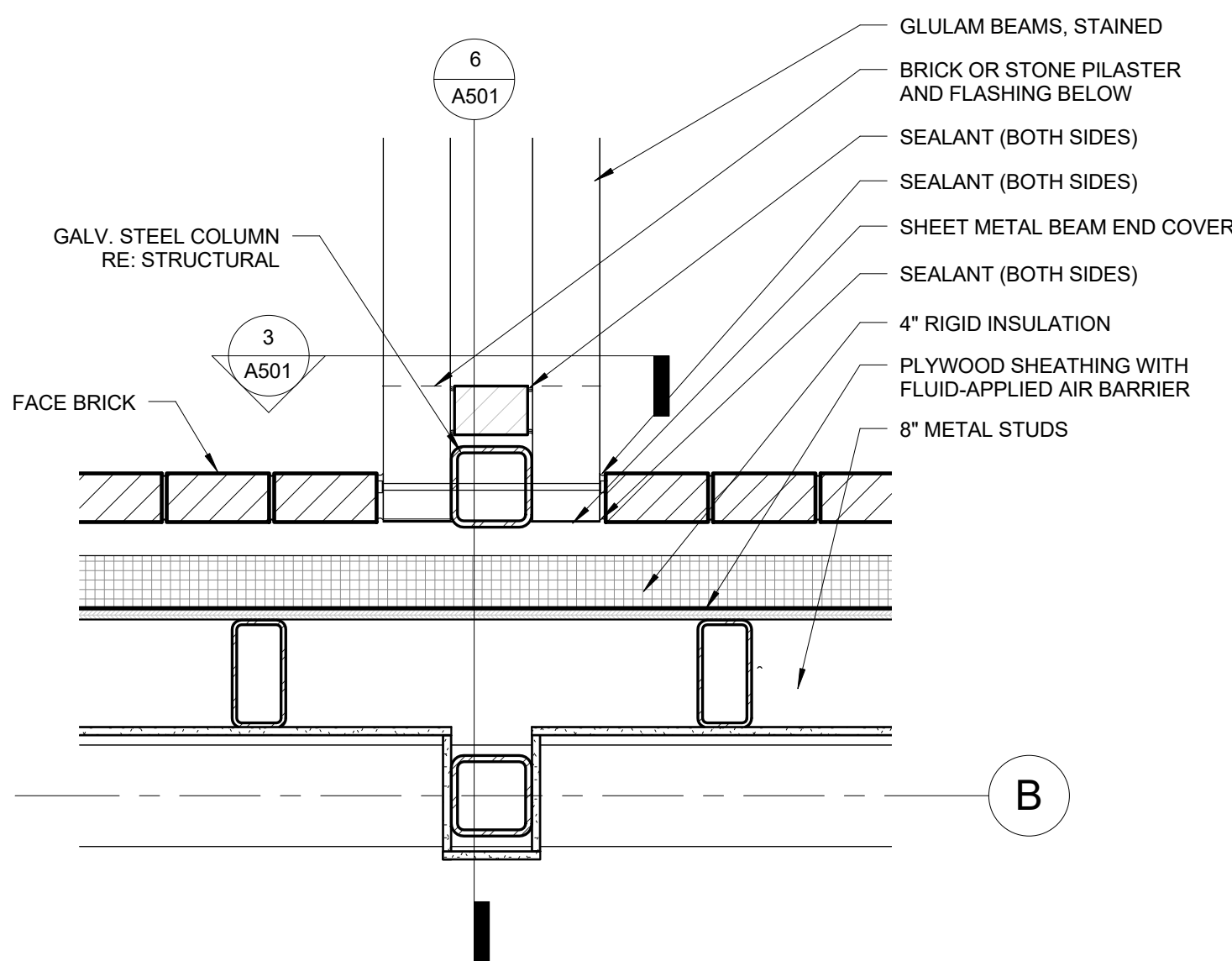
5 COLUMN DETAIL
1 1/2" = 1'-0"



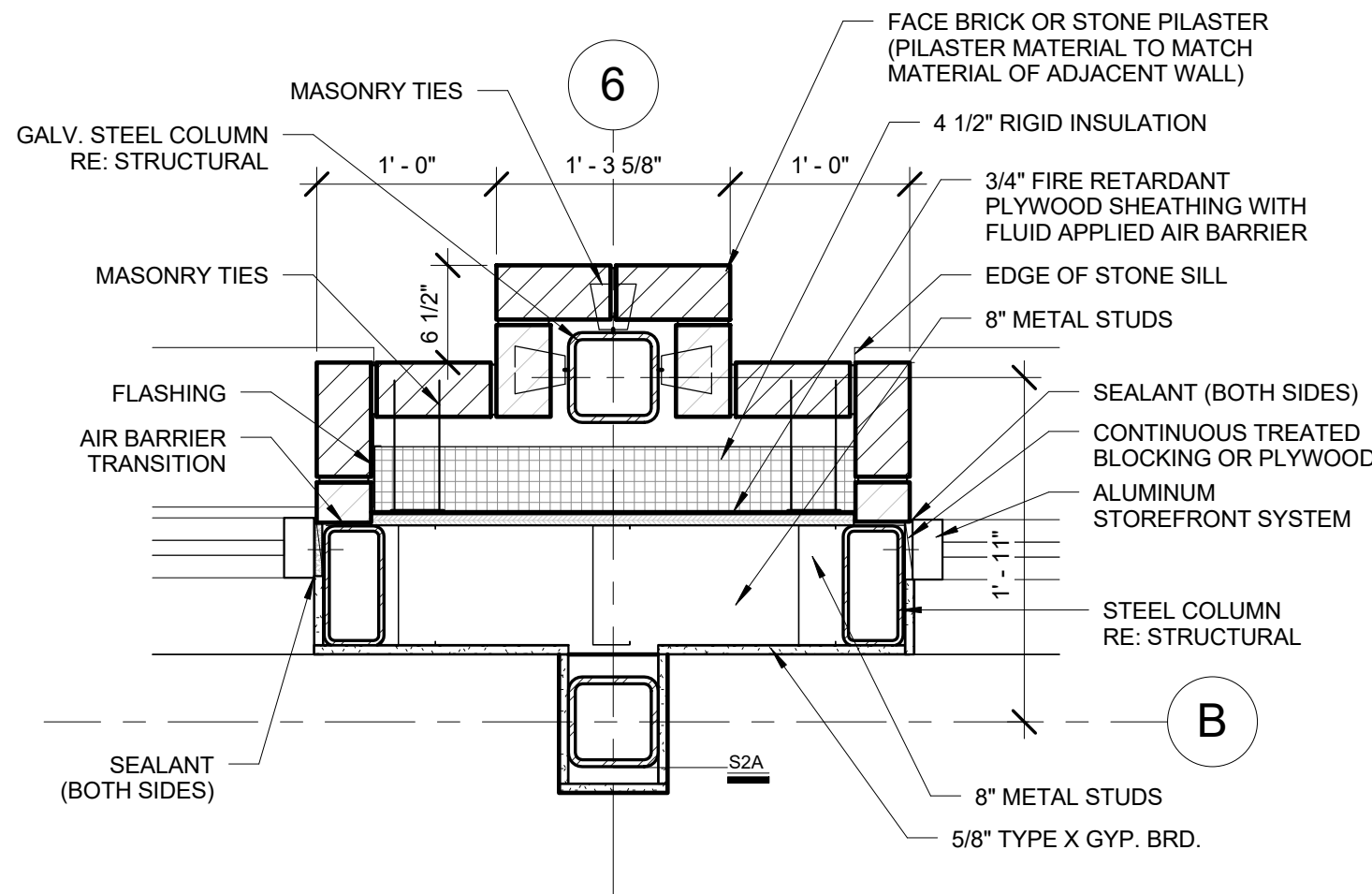
4 COLUMN DETAIL
1 1/2" = 1'-0"



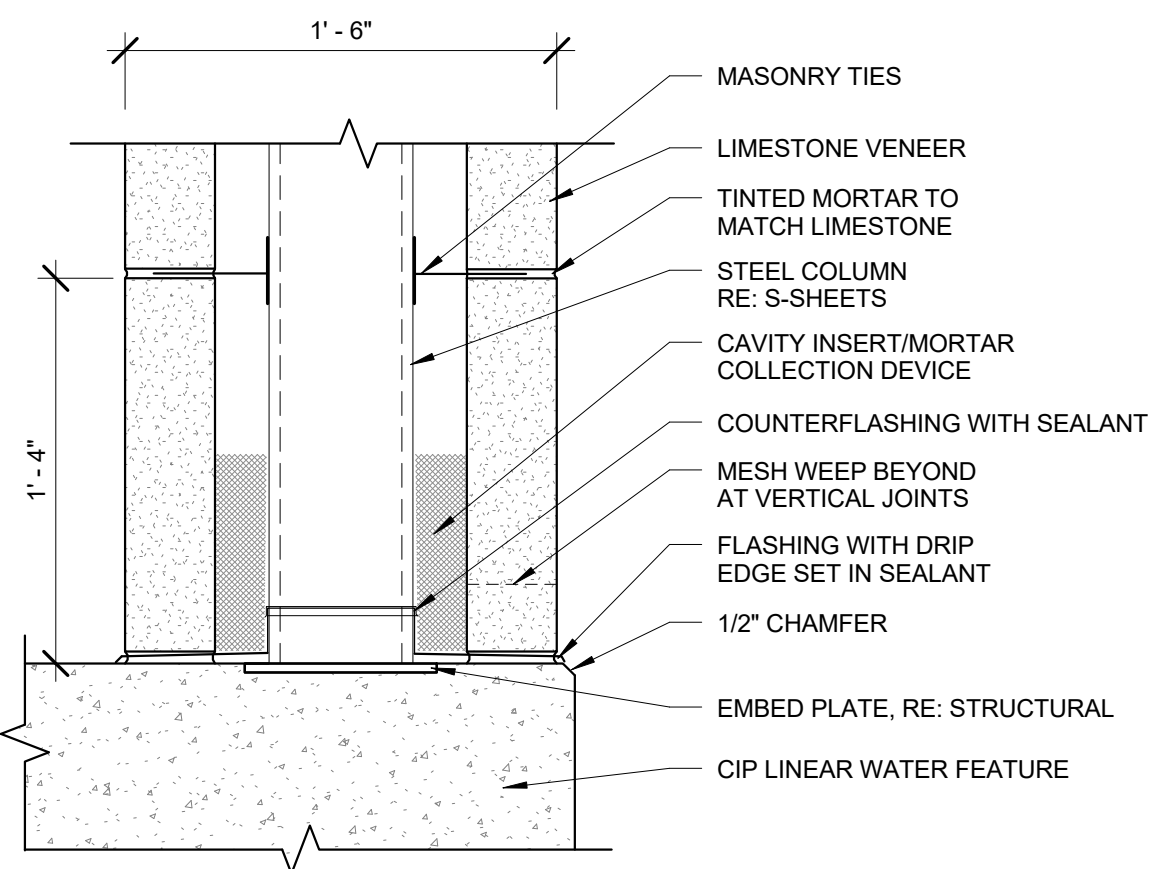
3 PILASTER ELEVATION
1" = 1'-0"



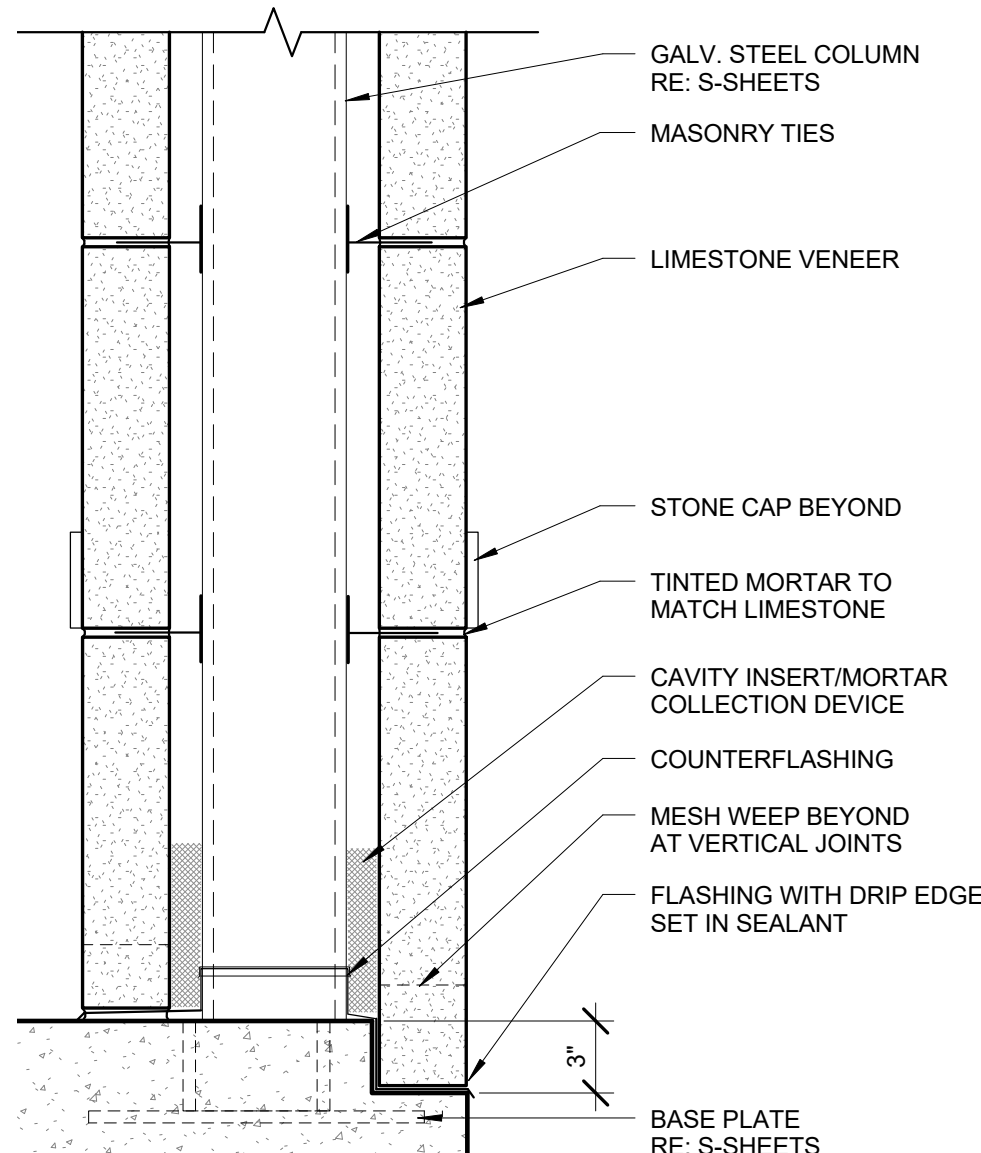
2 PILASTER DETAIL - CEILING PLAN
1" = 1'-0"



1 PILASTER DETAIL
1" = 1'-0"



12 COLUMN SECTION
1 1/2" = 1'-0"



11 COLUMN SECTION
1 1/2" = 1'-0"

ROOM FINISH SCHEDULE						
Number	Name	Floor Finish	Base Finish	Wall Finish	Ceiling Finish	Comments
101	VESTIBULE	CPT1	ALUM	GYP/P	GYP/P	
102	LOBBY	FT1/CPT2	ALUM	GYP/P	WDD	
103	CORRIDOR	CPT2	R	GYP/P	ACT2	
104	OFFICE SUITE 2	CPT2	R	GYP/P	ACT2	
105	VESTIBULE	CPT1	R	GYP/P	GYP/P	
106	SMALL CONFERENCE	CPT2	R	GYP/P	ACT1	
107	SERVER	SC	R	CMU/P	ES	
108	WORKROOM	CPT2	R	GYP/P	ACT2	
109	FILE STORAGE	CPT2	R	GYP/P	ACT2	
110	WOMEN	FT2	WT2/WT4/ACT2	WT2/WT4/ACT2	GYP/P	
111	MEN	FT2	WT2/WT4/ACT1	WT2/WT4/ACT1	GYP/P	
112	OBSERVATION AREA	CPT2	R	GYP/P	WDD	SEAL CONC. FLOOR (SEE NOTES)
113	WATER LAB	SC	CTB2	GYP/P	GYP/P	PAINT EXPOSED STEEL COLUMNS
113A	OFFICE	SC	CTB2	GYP/P	GYP/P	
114	VESTIBULE	CPT1	R	GYP/P	GYP/P	PAINT EXPOSED STEEL COLUMNS
115	STORAGE	SC	R	GYP/P	GYP/P	
116	MECHANICAL	SC	--	GYP/P	ES	
117	MICROBIOLOGY	SC	CTB2	GYP/P	GYP/P	
118	VESTIBULE	CPT1	R	GYP/P	GYP/P	PAINT EXPOSED STEEL COLUMNS
119	WASTEWATER LAB	SC	CT2	GYP/P	GYP/P	PAINT EXPOSED STEEL COLUMNS
119A	OFFICE	SC	CT2	GYP/P	GYP/P	
120	VESTIBULE	CPT1	R	GYP/P	GYP/P	
121	CONTROL ROOM	CPT2	R	GYP/P	ACT4	BLACK SUSPENDED ACOUSTIC CEILING SYSTEM

ROOM FINISH SCHEDULE						
Number	Name	Floor Finish	Base Finish	Wall Finish	Ceiling Finish	Comments
122	OFFICE SUITE 1	CPT2	R	GYP/P	ACT2	
123	CORRIDOR	CPT2	R	GYP/P	ACT2	
124	TRAINING ROOM	CPT2	R	GYP/WD	ACT1/WCS2	SEAL CONC. FLOOR (SEE NOTES)
125	AV	CPT2	R	GYP/P	GYP/P	
126	JANITOR	SC	R	GYP	GYP/P	
127	STORAGE	SC	R	GYP	GYP/P	
128	BREAK ROOM	FT1/CPT2	ALUM	GYP/P	ACS	
129	MECHANICAL	SC	--	GYP/P	ES	
130	UNIFORMS	SC	R	GYP/P	ACT3	
131	VESTIBULE	CPT1	ALUM	GYP/P	GYP/P	
132	CORRIDOR	FT1	ALUM	GYP/P	ACT2	
133	STORAGE	SC	R	GYP/P	GYP/P	
134	LOCKERS	FT2	CTB1/WT2/WT4 /ACT1	WT2/WT4/ACT1	GYP/P	
135	SHOWER	CT2	WT2/WT4	WT2/WT4	GYP/P	
136	SHOWER	CT2	WT2/WT4	WT2/WT4	GYP/P	
137	MEN	CT2	WT1/WT3/ACT1	WT1/WT3/ACT1	GYP/P	
138	WOMEN	CT2	WT1/WT3/ACT2	WT1/WT3/ACT2	GYP/P	
139	LOCKERS	CT2	CTB1/WT2/WT4 /ACT2	WT2/WT4/ACT2	GYP/P	
140	SHOWER	CT2	WT2/WT4	WT2/WT4	GYP/P	
141	CORRIDOR	CT2	ALUM	GYP/P	ACT2	
142	CLOSET	CT1	R	GYP/P	GYP/P	
143	LARGE CONFERENCE	CPT2	R	GYP/WP	ACT1/WCS1	

ROOM FINISH SCHEDULE LEGEND

FLOOR MATERIALS

CPT1	CARPET TILE 1 (WALK-OFF)
CPT2	CARPET TILE 2
FT1	FLOOR TILE 1
FT2	FLOOR TILE 2
SC	SEALED CONCRETE

BASE MATERIALS

---	NO FINISH
R	RUBBER BASE
CTB1	CERAMIC TILE BASE 1
CTB2	CERAMIC TILE BASE 2
ALUM	ALUMINUM BASE MOLDING

WALL FINISH

GYP/P	GYPSUM BOARD - PAINTED
CMU/P	CMU - PAINTED
WT1	WALL TILE 1
WT2	WALL TILE 2
WT3	WALL TILE 3
WT4	WALL TILE 4
ACT1	ACCENT TILE 1
ACT2	ACCENT TILE 2
ACT3	ACCENT TILE 3
WP	ACOUSTIC WOOD PANELING

CEILING FINISH

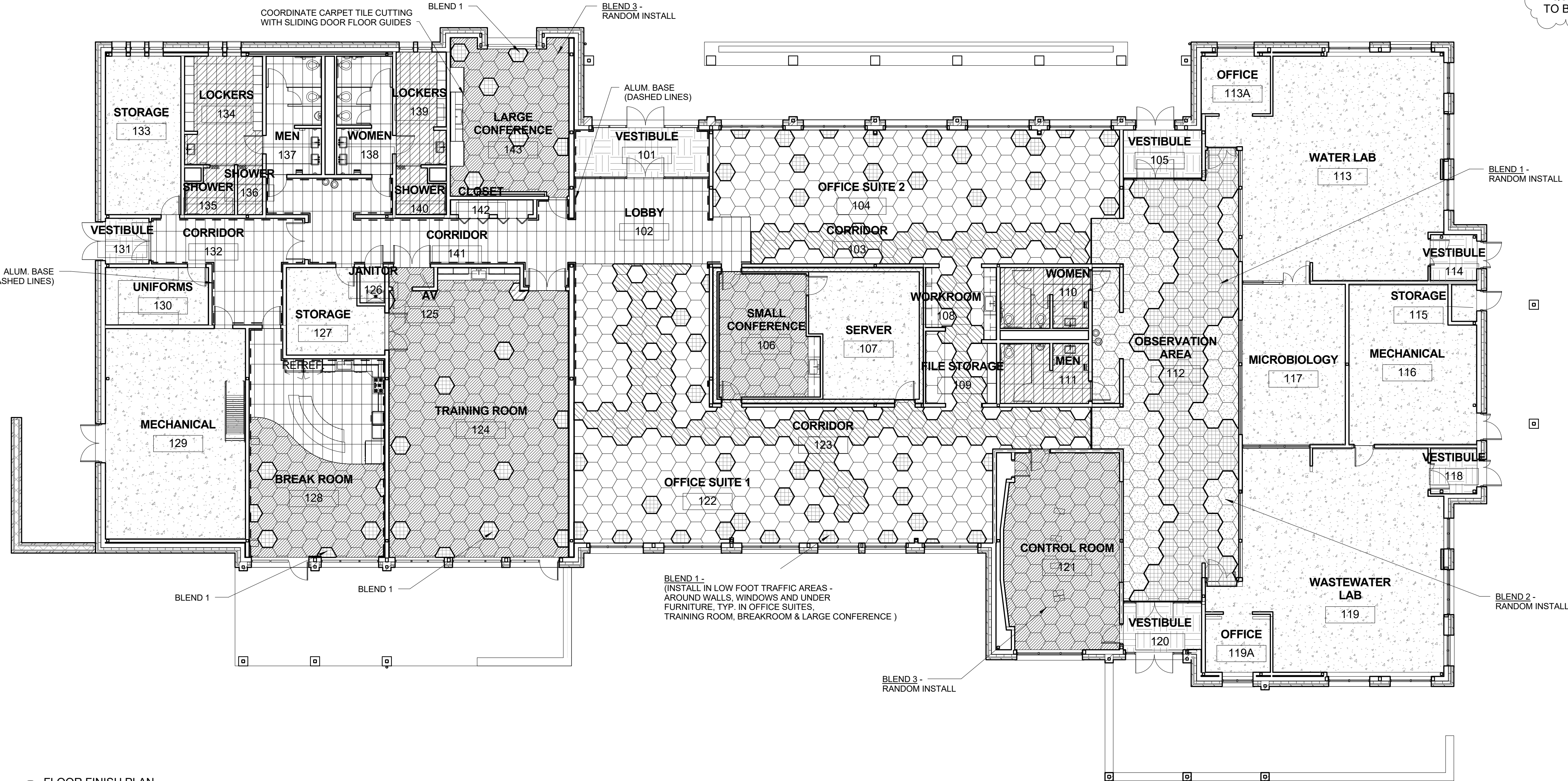
ES	EXPOSED STRUCTURE, PAINTED
GYP/P	GYPSUM BOARD - PAINTED
ACT 1	ACOUSTIC CEILING TILE 1
ACT 2	ACOUSTIC CEILING TILE 2
ACT 3	ACOUSTIC CEILING TILE 3
ACT 4	ACOUSTIC CEILING TILE 4
WDD	WOOD DECKING - STAINED
WCS1	WOOD CEILING SYSTEM 1
WCS2	WOOD CEILING SYSTEM 2

NOTES:

ARCHITECT WILL SELECT UP TO 12 UNIQUE PAINT COLORS, INCLUDING 6 DARK TINTED COLORS, FOR ROOMS AND ITEMS SCHEDULED TO BE PAINTED. SCHEDULE WILL BE ISSUED PRIOR TO COMMENCEMENT OF THAT SCOPE OF WORK.

FIRE SPRINKLER PIPING, EXPOSED CONDUIT, JUNCTION BOXES, BRACING, AND OTHER PIPING SHALL BE PAINTED IN EXPOSED ROOMS AND EXTERIOR AREAS SCHEDULED TO HAVE PAINTED OR STAINED WOOD CEILINGS.

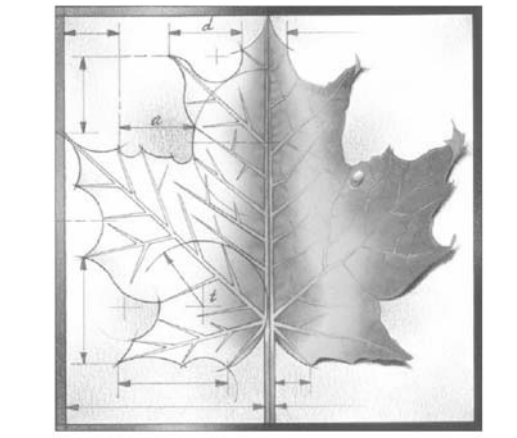
SEAL CONCRETE FLOORS IN OBSERVATION AREA 112 AND TRAINING ROOM 124 WITH GLIDDEN GRIPPER PRIMER/SEALER OR EQUIVALENT TO ACCOMMODATE HEARING LOOP. HEARING LOOP TO BE PROVIDED AND INSTALLED IN SEPARATE PACKAGE (N.I.C.).



FLOORING LEGEND

	BLEND 1 - 33.3% HEXAGON PLANE - ROYAL 33.3% HEXAGON PLANE - CYAN 33.3% HEXAGON PLANE - WAVE
	BLEND 2 - 25% HEXAGON LINEAR - TWEED 25% HEXAGON LINEAR SHIFT - PEWTER TWEED 50% HEXAGON PLANE - TWEED
	BLEND 3 - 25% HEXAGON LINEAR - TWEED 25% HEXAGON LINEAR SHIFT - PEWTER TWEED 25% HEXAGON PLANE - TWEED 25% HEXAGON LINEAR - PEWTER
	BLEND 4 - 100% HEXAGON PLANE - TWEED
	BLEND 5 - 33.3% HEXAGON LINEAR - TWEED 33.3% HEXAGON LINEAR SHIFT - PEWTER TWEED 33.3% HEXAGON LINEAR - PEWTER
	SEALED CONCRETE
	CARPET 1
	CARPET 2
	FLOOR TILE 1
	FLOOR TILE 2

1 FLOOR FINISH PLAN
3/32" = 1'-0"



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REVISIONS:

1 08-22-16 ADDENDUM #2

2	
3	
4	
5	
6	

Project Number: CD16-00003

Date: 07-06-16

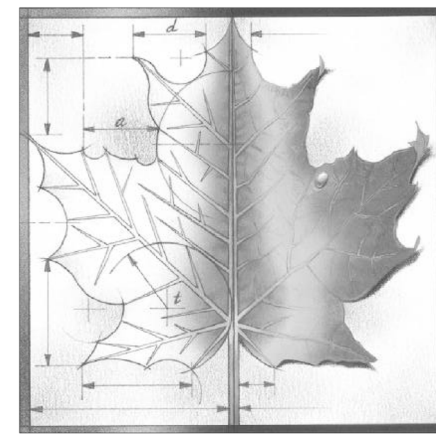
Project Name:
**CCWRRF
ADMIN/LAB
BUILDING**

Project Address:
**1600 N. Midwest Blvd
Edmond, Oklahoma 73034**

Sheet Title:
**ROOM FINISH
SCHEDULE &
PLAN**

Sheet:
A601

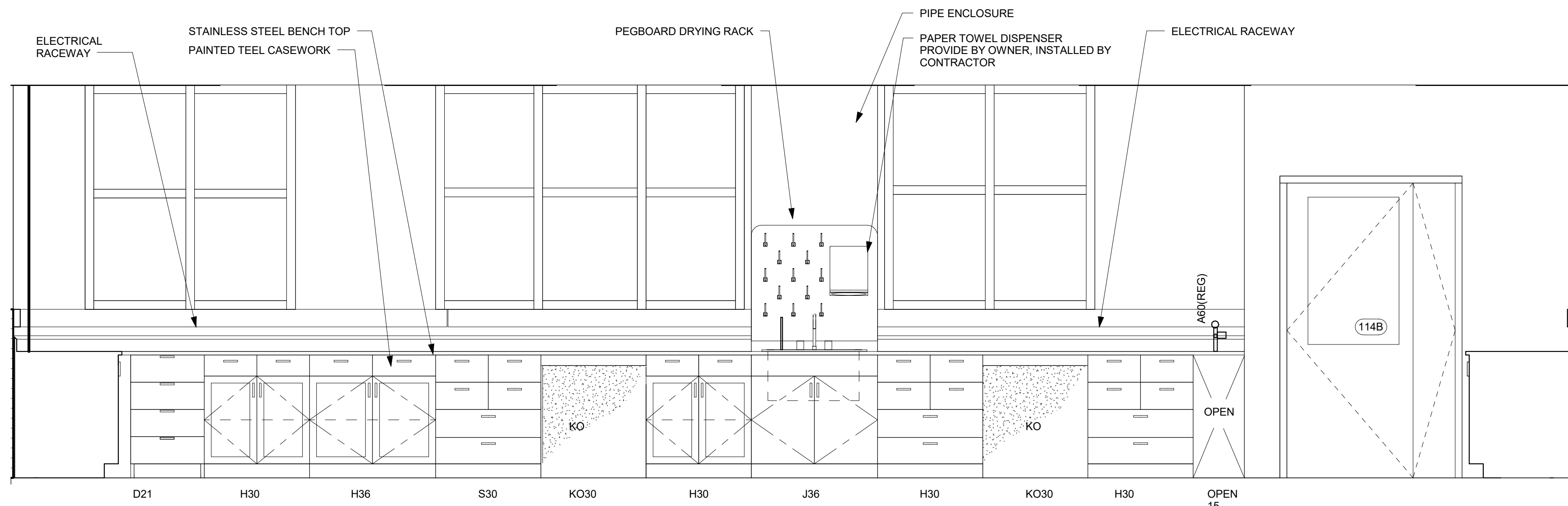
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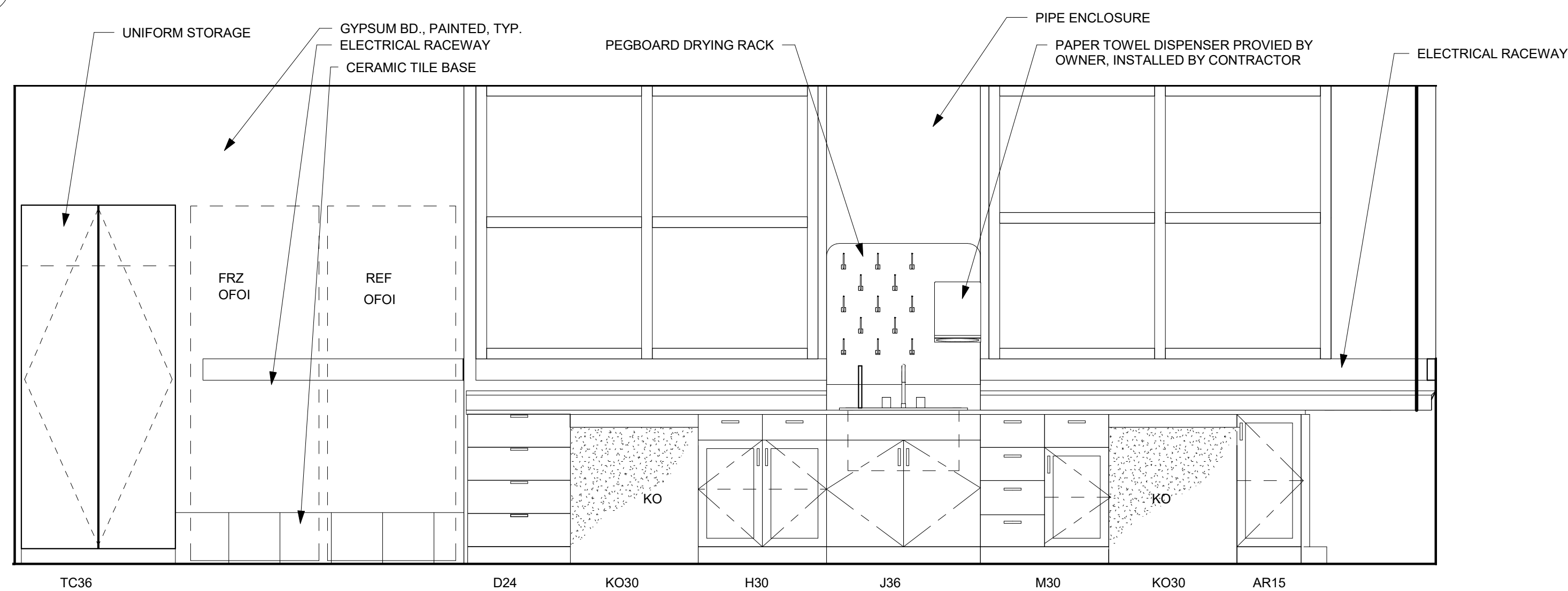
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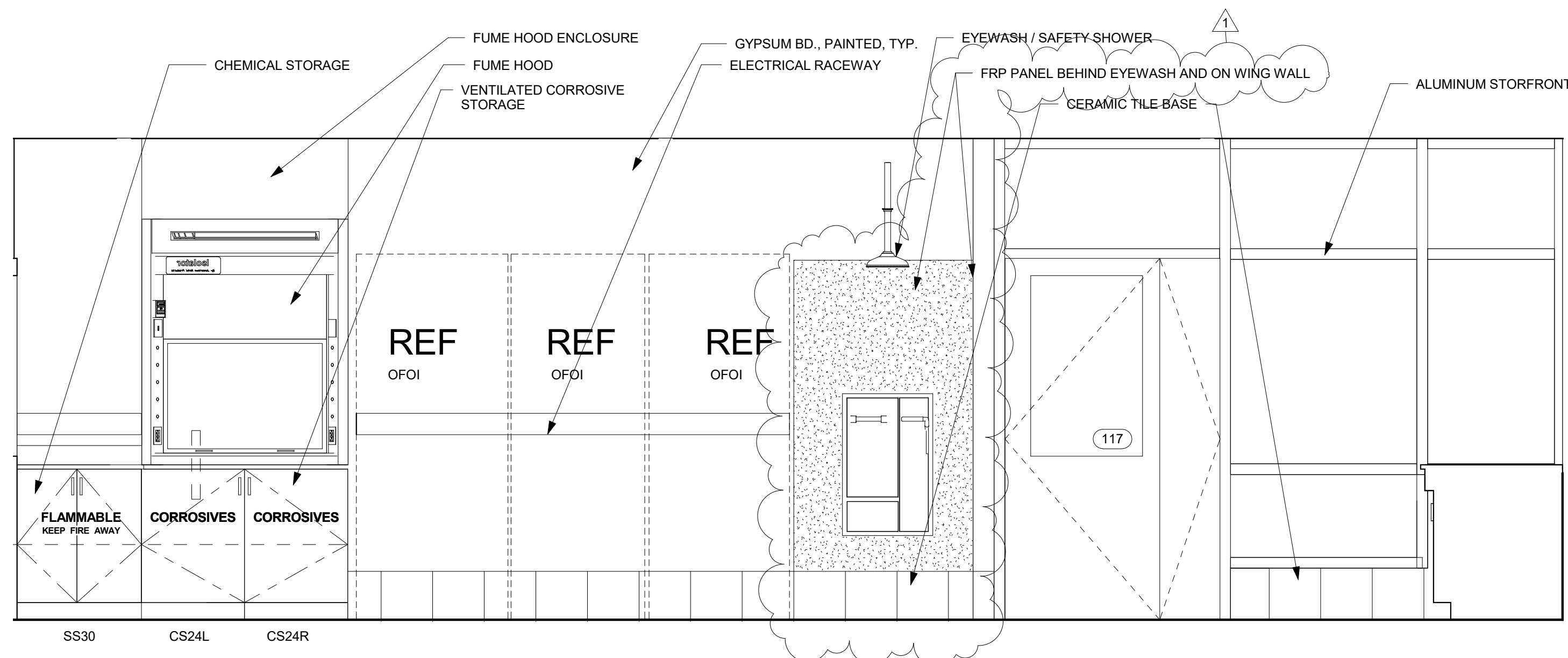
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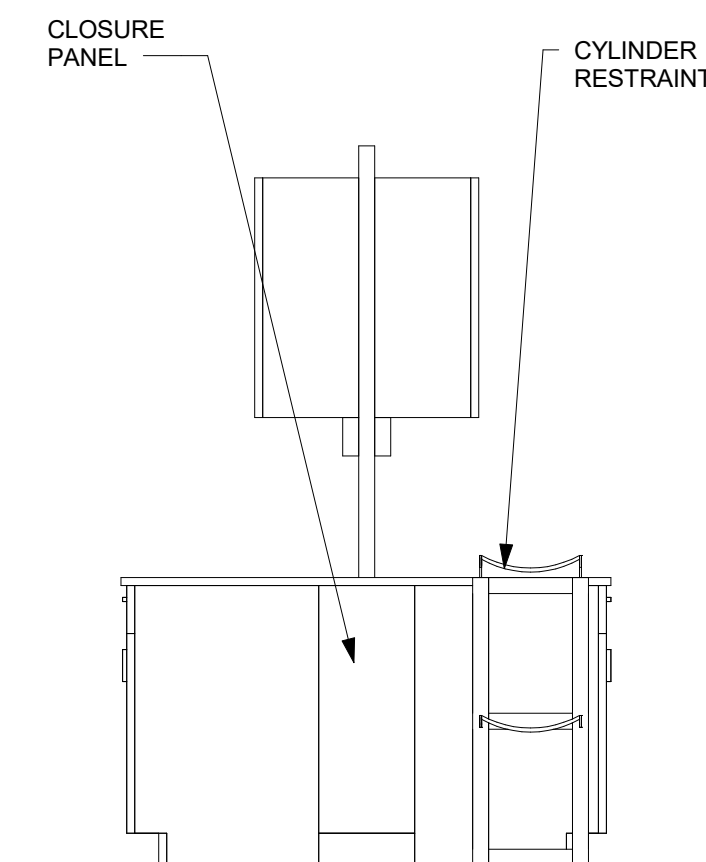
1 WATER LAB NORTH WALL
1/2" = 1'-0"



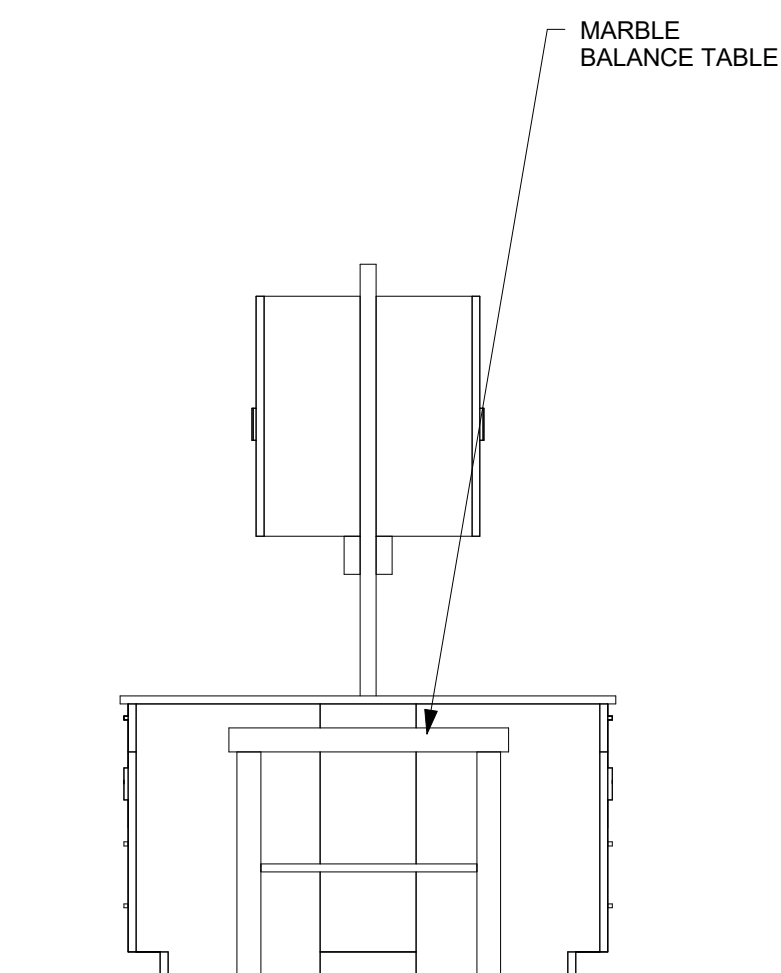
2 WATER LAB - WEST WALL
1/2" = 1'-0"



3 WATER LAB - EAST WALL
1/2" = 1'-0"



4 WATER LAB - WEST FACE-NORTH ISLAND
1/2" = 1'-0"



5 WATER LAB -EAST FACE-CENTER ISLAND
1/2" = 1'-0"

REVISIONS:

1 08-22-16 ADDENDUM #2

2

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4

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6

Project Number: **CD16-00003**

Date: **07-06-16**

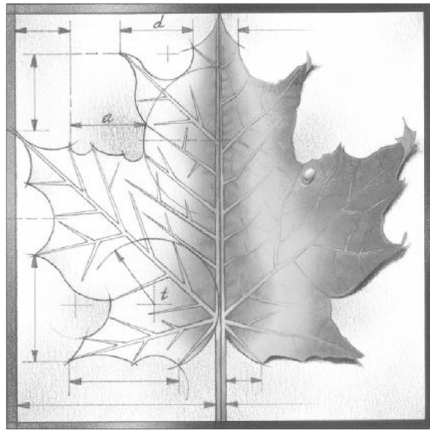
Project Name:
**CCWRRF
ADMIN/LAB
BUILDING**

Project Address:
**1600 N. Midwest Blvd
Edmond, Oklahoma 73034**

Sheet Title:
**LAB
CASEWORK
ELEVATIONS**

Sheet:
LF201

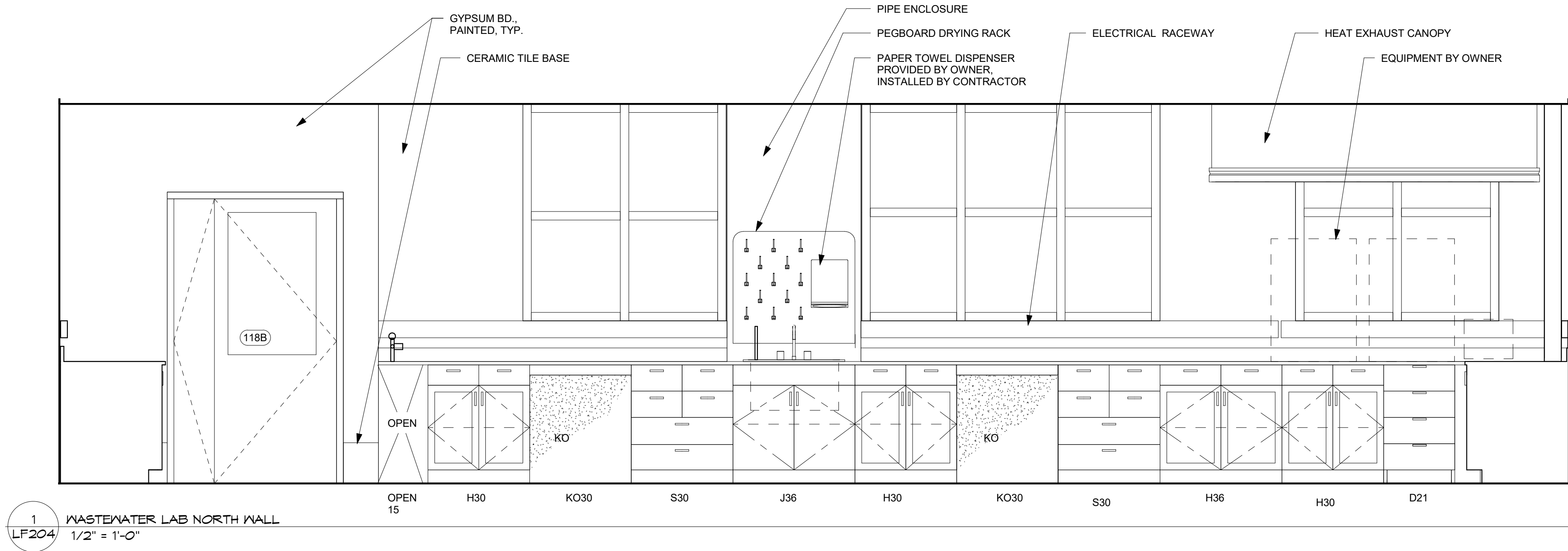
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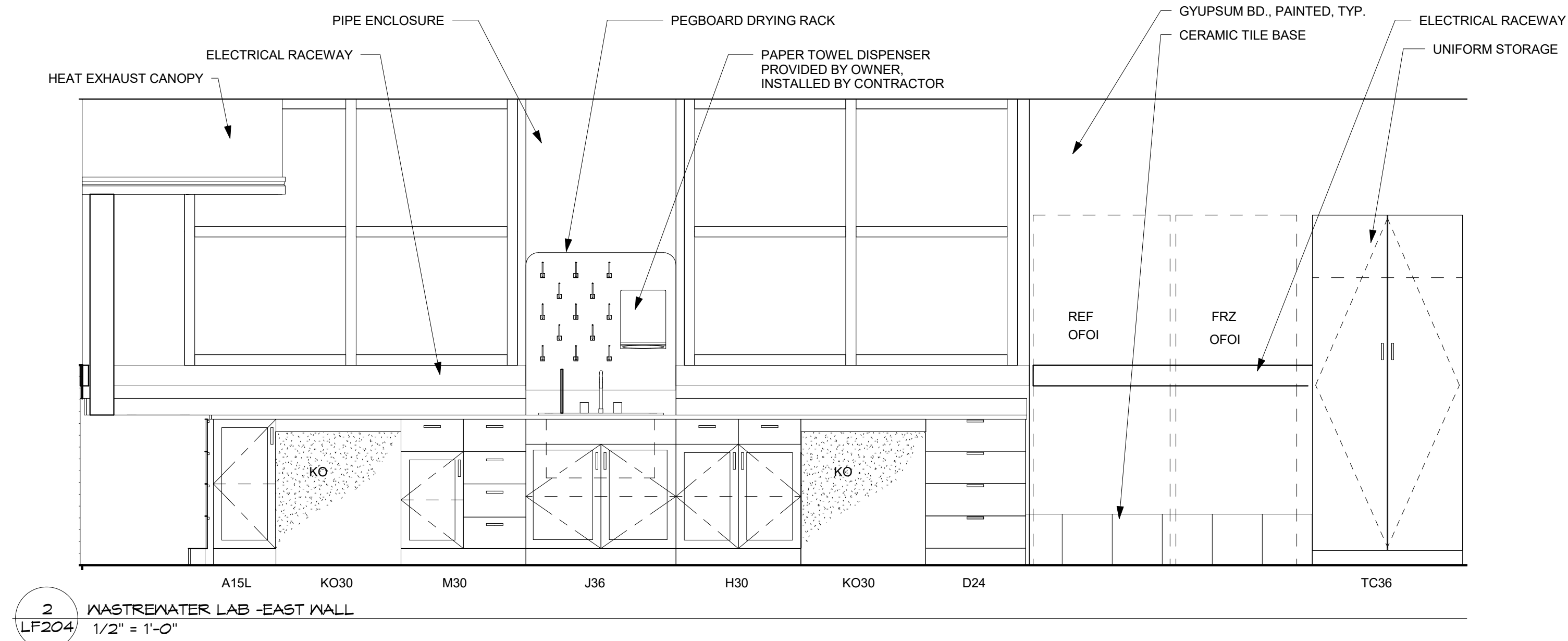
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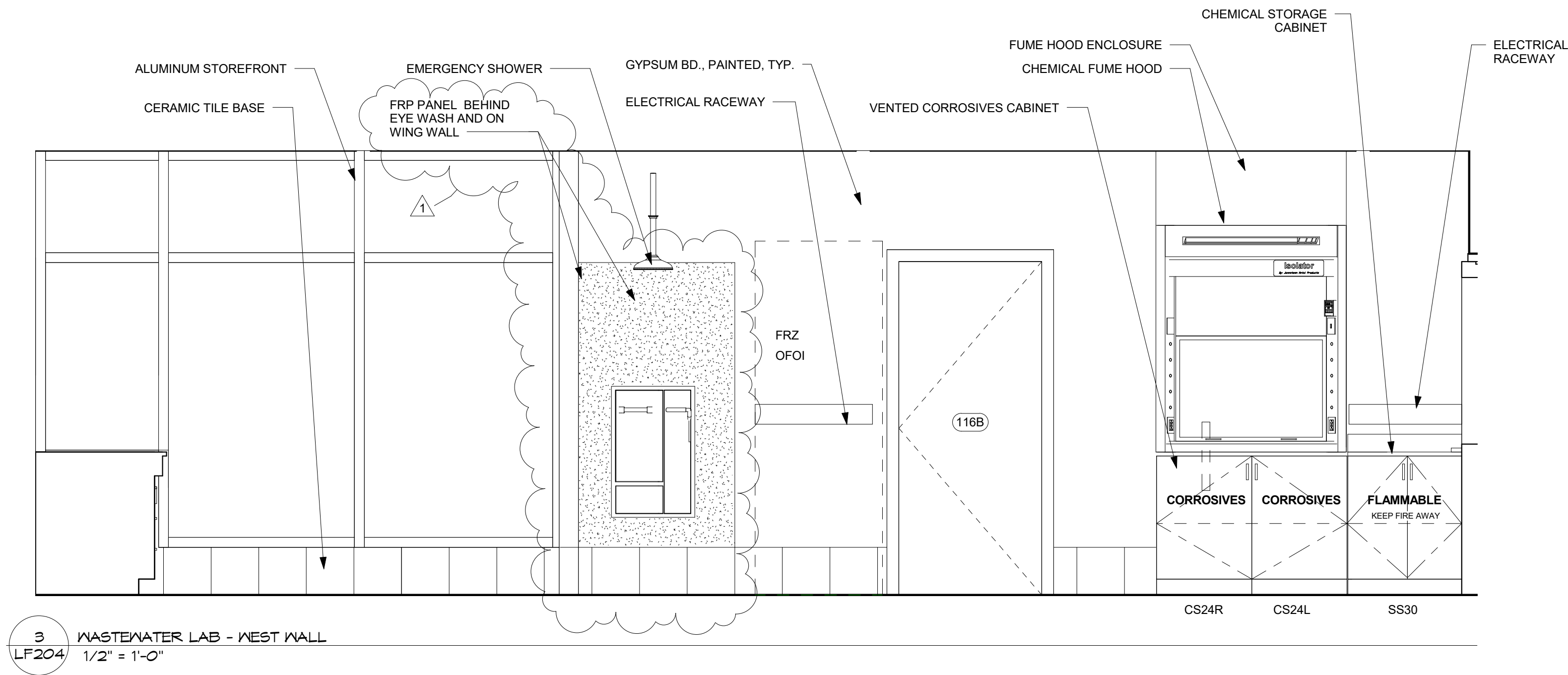
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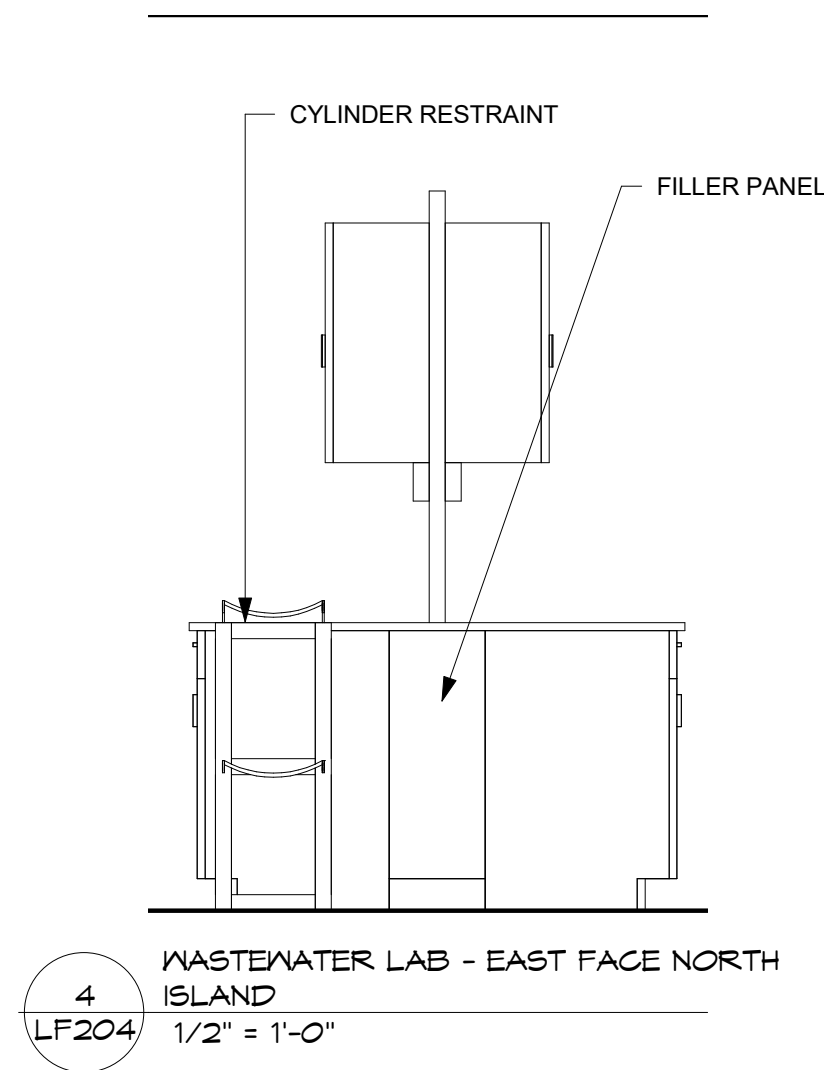
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LF204
WASTEWATER LAB NORTH WALL
1/2" = 1'-0"



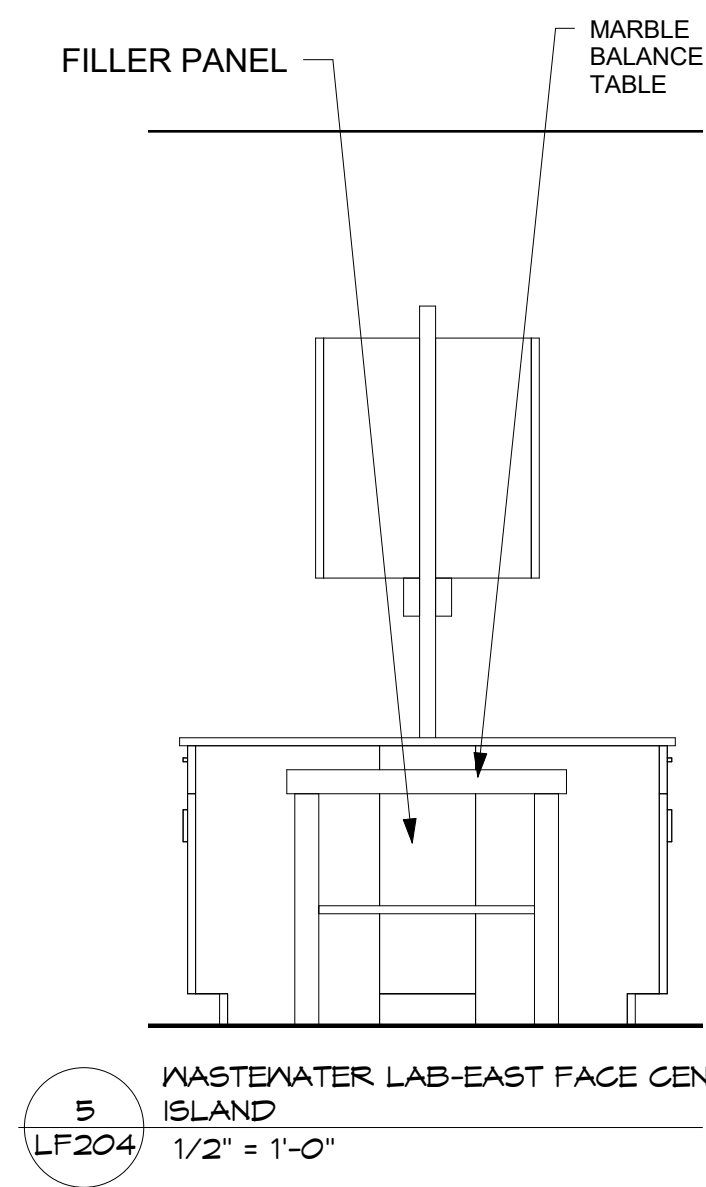
2
LF204
WASTEWATER LAB -EAST WALL
1/2" = 1'-0"



3
LF204
WASTEWATER LAB - WEST WALL
1/2" = 1'-0"



4
LF204
WASTEWATER LAB - EAST FACE NORTH ISLAND
1/2" = 1'-0"



5
LF204
WASTEWATER LAB -EAST FACE CENTER ISLAND
1/2" = 1'-0"

REVISIONS:

1	08-22-16	ADDENDUM #2
2		
3		
4		
5		
6		

Project Number: **CD16-00003**

Date: **07-06-16**

Project Name:
**CCWRRF
ADMIN/LAB
BUILDING**

Project Address:
**1600 N. Midwest Blvd
Edmond, Oklahoma 73034**

Sheet Title:
**LAB
CASEWORK
ELEVATIONS**

Sheet:

LF204

Of: