

# University of Oregon Classroom Expansion

Straub and Earl Halls



## Project Manual Vol. 1 - Div 1-14

100% Construction Documents  
7 October 2013

Rowell Brokaw  
Architects



(Blank Page)

**SECTION 09 2116**  
**GYP SUM BOARD ASSEMBLIES**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Performance criteria for gypsum board assemblies.
- B. Metal stud wall framing.
- C. Ceiling and soffit suspension system for support of gypsum board finishes.
- D. Acoustic insulation.
- E. Gypsum sheathing.
- F. Exterior sheathing.
- G. Gypsum wallboard.
- H. Joint treatment and accessories.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 3300 - Delegated Design Requirements: Suspension systems engineering.
- B. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.
- C. Section 05 4000 - Cold-Formed Metal Framing: Exterior wind-load-bearing metal stud framing.
- D. Section 07 2100 - Thermal Insulation: Rigid Insulation.
- E. Section 07 2500 - Weather Barriers: Water-resistive barrier over sheathing.
- F. Section 07 8400 - Firestopping: Top-of-wall assemblies at fire rated walls.
- G. Section 07 9005 - Joint Sealers: Acoustic sealant.

**1.03 REFERENCE STANDARDS**

- A. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
- B. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement. (replaced SG-971)
- C. ANSI A108.11 - American National Standard for Interior Installation of Cementitious Backer Units; 2012.1.
- D. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2012.1.
- E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2011.
- F. ASTM C635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2004.
- G. ASTM C636 - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels; 2004.
- H. ASTM C645 - Standard Specification for Nonstructural Steel Framing Members; 2011a.
- I. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2012.
- J. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2011.
- K. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2011.
- L. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2011.

- M. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2007.
- N. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2010a.
- O. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2008.
- P. ASTM C1288 - Standard Specification for Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets; 1999 (Reapproved 2010).
- Q. ASTM C1325 - Standard Specification for Non-Asbestos Fiber-Mat Reinforced Cement Substrate Sheets; 2008b.
- R. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2011.
- S. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.
- T. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009.
- U. ASTM E413 - Classification for Rating Sound Insulation; 2010.
- V. ASTM E580 - Standard Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint; 2002.
- W. CISCA - Acoustical Ceilings: Use and Practice.
- X. GA-226 - Application of Gypsum Board to Form Curved Surfaces; Gypsum Association; 2008.
- Y. GA-600 - Fire Resistance Design Manual; Gypsum Association; 2012.
- Z. ICC (IBC) - International Building Code; 2012.
- AA. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

#### **1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate special details associated with fireproofing, acoustic seals, and general suspension system design, control joint locations and details..
- C. Delegated Design: As required by AHJ.
  - 1. Delegated Design Submittal: Comply with Section 01 3300 - Delegated Design.
  - 2. Regulatory Submittal: Submit seismic design and details sealed by a Professional Structural Engineer, licensed in the state of the project, to code agency for review and approval.
- D. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.
- E. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.
- F. Test Reports: For all stud framing products that do not comply with ASTM C645 or C 754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.
- G. Samples: Submit two samples of gypsum board finished with proposed texture application, 12 by 12 inches in size, illustrating finish color and texture.
- H. LEED Submittals:
  - 1. For gypsum wallboard, submit documentation of recycled content and location of manufacture.
  - 2. For steel products, submit documentation of steel mill process, location of mill, and location of manufacture.

3. For recycled plastic furring strips, submit documentation of recycled content and location of manufacture.

### **1.05 QUALITY ASSURANCE**

- A. Installer Qualifications: Company specializing in performing gypsum board application and finishing, with minimum 5 years of documented experience.
- B. Copies of Documents at Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.
- C. Comply with details indicate and with gypsum board manufacturer's written recommendations or, if none available, with the United States Gypsum's "Gypsum Construction Handbook."

### **1.06 PERFORMANCE REQUIREMENTS**

- A. Suspension System: Rigidly secure ceiling and soffit suspension system including integral mechanical and electrical components with a maximum deflection of 1:360.
- B. Seismic Requirements:
  1. Comply with ASTM E-580.
  2. Comply with Oregon Structural Specialty Code.
  3. Comply with ASCE-7 Seismic Design Category D.
  4. Comply with CISC's "Guidelines for Seismic Restraint of Direct-Hung Suspended Ceiling Assemblies - Seismic Zone 3 & 4.

## **PART 2 PRODUCTS**

### **2.01 GYPSUM BOARD ASSEMBLIES**

- A. Provide completed assemblies complying with ASTM C840 and GA-216.
- B. Interior Partitions: Provide completed assemblies with the following characteristics:
  1. Acoustic partitions: As indicated.
- C. Shaft Walls at HVAC Shafts: Provide completed assemblies with the following characteristics:
  1. Air Pressure Within Shaft: Sustained loads of 5 lbf/sq ft with maximum mid-span deflection of L/240.
  2. Acoustic Attenuation: STC of 35-39 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
- D. Shaft Walls at Elevator Shafts: Provide completed assemblies with the following characteristics:
  1. Air Pressure Within Shaft: Intermittent loads of 5 lbf/sq ft with maximum mid-span deflection of L/240.
  2. Acoustic Attenuation: STC of 35-39 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.
- E. Fire Rated Assemblies: Provide completed assemblies complying with applicable code.
  1. ICC IBC Item Numbers: Comply with applicable requirements of ICC IBC for the particular assembly.
  2. Gypsum Association File Numbers: Comply with requirements of GA-600 for the particular assembly.
  3. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL Fire Resistance Directory.

### **2.02 METAL FRAMING MATERIALS**

- A. Manufacturers - Metal Framing, Connectors, and Accessories. Manufacturer's approval is subject to compliance with the specified requirements listed below.
  1. Allied Studco.
  2. AllSteel & Gypsum Products, Inc.
  3. California Expanded Metal Products Company.
  4. Clark Dietrich Building Systems LLC.
  5. Consolidated Fabricators Corp.
  6. Craco Metals Manufacturing, LLC.

7. Custom Stud, Inc.
  8. Dale/Incor.
  9. Design Shapes in Steel.
  10. Formetal Co. Inc.
  11. Innovative Steel Systems.
  12. Marino /Ware.
  13. Quail Run Building Materials, Inc.
  14. SCAFCO Corporation.
  15. Southeastern Stud & Components, Inc.
  16. Steel Construction Systems.
  17. Steeler, Inc.
  18. Super Stud Building Products, Inc.
  19. United Metal Products, Inc.
  20. Phillips Manufacturing Company.
  21. The Steel Network, Inc.
  22. Substitutions: See Section 01 6000 - Product Requirements.
- B. Non-Loadbearing Framing System Components: ASTM C645;galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflectio of wall framing of L/240 at 5 psf..
1. Studs: "C" shaped with flat or formed webs with knurled faces.
  2. Runners: U shaped, sized to match studs.
  3. Ceiling Channels: C shaped.
  4. Furring: Hat-shaped sections, minimum depth of 7/8 inch.
  5. Furring: "Z" shaped, depth to match insulation board thickness.
  6. Sheet Metal Backing: .036 inch galvanized steel as backing for attachments and supporting wall mounted items.
- C. Loadbearing Studs for Application of Gypsum Board: As specified in Section 05 4000.
- D. Shaft Wall Studs and Accessories: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 and specified performance requirements.
- E. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
- F. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
  2. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot dipped galvanized coating.
  3. Provide components UL-listed for use in UL-listed fire-rated head of partition joint systems indicated on drawings.
  4. Deflection and Firestop Track:
    - a. Provide mechanical anchorage devices as described above that accommodate deflection while maintaining the fire-rating of the wall assembly.
    - b. Acceptable Products:
      - 1) "Posi Clip" by Fire Trak Corporation.
      - 2) "The System" by Metal-Lite, Inc.
  5. Provide top track preassembled with connection devices spaced to fit stud spacing indicated on drawings; minimum track length of 12 feet.
  6. Clips for attachment to fireproof-sprayed structural steel:
    - a. "Z" or "L" shaped clips as shown on Drawings; 20 gage.
    - b. Install at 16 inches on center, minimum.

### 2.03 CEILING AND SOFFIT SUSPENSION SYSTEM

- A. Suspension Systems - General: ASTM C635, die-cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings as required.
- B. Concealed Steel Suspension System: Formed steel, commercial quality cold rolled; heavy-duty; galvanized.
  - 1. Profile: Tee; 1-1/2 inch face width.
  - 2. Construction Double web.
  - 3. Molding: Angle and channel molding standard with system.
  - 4. Finish: Galvanize to G40.
  - 5. Products:
    - a. Drywall Grid by Armstrong World Industries.
    - b. Rigid X System by United States Gypsum Co.
    - c. Substitutions: See Section 01 6000 - Product Requirements.
- C. Suspension Accessories
  - 1. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.
  - 2. Perimeter Moldings: Same material and finish as grid.
    - a. At Concealed Grid: Provide exposed L-shaped molding.

### 2.04 BOARD MATERIALS

- A. Manufacturers - Gypsum-Based Board:
  - 1. American Gypsum: [www.americangypsum.com](http://www.americangypsum.com).
  - 2. CertainTeed Corporation: [www.certainteed.com](http://www.certainteed.com).
  - 3. Georgia-Pacific Gypsum: [www.gpgypsum.com](http://www.gpgypsum.com).
  - 4. Lafarge North America Inc: [www.lafargenorthamerica.com](http://www.lafargenorthamerica.com).
  - 5. National Gypsum Company: [www.nationalgypsum.com](http://www.nationalgypsum.com).
  - 6. PABCO Gypsum: [www.pabco gypsum.com](http://www.pabco gypsum.com).
  - 7. Temple-Inland Building Product by Georgia-Pacific, LLC: [www.temple.com](http://www.temple.com).
  - 8. USG Corporation: [www.usg.com](http://www.usg.com).
  - 9. Substitutions: See Section 01 6000 - Product Requirements.
- B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
  - 1. Application: Use for vertical surfaces, unless otherwise indicated.
  - 2. ~~Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.~~
  - 3. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
  - 4. Thickness:
    - a. Vertical Surfaces: 5/8 inch.
  - 5. ~~Mold Resistant Paper Faced Products:~~
    - a. ~~American Gypsum; M-Bloc.~~
    - b. ~~American Gypsum; M-Bloc AR Type X.~~
    - c. ~~American Gypsum; M-Bloc IR Type X.~~
    - d. ~~CertainTeed Corporation; ProRoc Brand Moisture & Mold Resistant Gypsum Board.~~
    - e. ~~Georgia Pacific Gypsum; ToughRock Mold Guard and ToughRock Mold Guard Type X Gypsum Wallboard.~~
    - f. ~~Lafarge North America Inc; Mold Defense Drywall.~~
    - g. ~~Lafarge North America Inc; Protecta AR-100 Type X with Mold Defense.~~
    - h. ~~National Gypsum Company; Gold Bond Brand XP Gypsum Board.~~
    - i. ~~National Gypsum Company; Gold Bond Hi-Abuse Brand XP Wallboard.~~
    - j. ~~Pacific Coast Building Products, Inc; PABCO Mold Curb Gypsum Wallboard.~~
    - k. ~~Temple-Inland Building Product by Georgia-Pacific, LLC; ComfortGuard Mold Resistant Gypsum Board.~~

- l. ~~Temple-Inland Building Product by Georgia-Pacific, LLC; ComfortGuard AR Abuse Resistant.~~
  - m. ~~USG Corporation; Sheetrock Brand Mold Tough Gypsum Panels.~~
  - n. ~~USG Corporation; Sheetrock Brand Mold Tough Gypsum Panels AR.~~
  - o. \_\_\_\_\_
  - p. ~~Substitutions: See Section 01 6000 - Product Requirements.~~
- C. Backing Board For Wet Areas: One of the following products:
- 1. Application: Surfaces behind tile in wet areas including restrooms.
  - 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
  - 3. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
    - a. Thickness: 1/2 inch.
    - b. Products:
      - 1) Custom Building Products; Wonderboard.
      - 2) National Gypsum Company; PermaBase Brand Cement Board.
      - 3) USG Corporation; Durock Brand Cement Board.
      - 4) Substitutions: See Section 01 6000 - Product Requirements.
  - 4. ASTM Cement-Based Board: Non-gypsum-based, cementitious board complying with ASTM C1288.
    - a. Thickness: 1/2 inch.
    - b. Products:
      - 1) James Hardie Building Products, Inc; Hardibacker Cement Board.
      - 2) Substitutions: See Section 01 6000 - Product Requirements.
- D. Backing Board For Moisture Sensitive Areas: Water-resistant gypsum backing board as defined in ASTM C1396/C1396M; sizes to minimum joints in place; ends square cut.
- 1. Application: at all vertical surfaces in restrooms, at all vertical surfaces in janitor's closets, at all vertical surfaces behind sinks, non-tiled. Extend at least one foot beyond sink horizontally.
  - 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
  - 3. Type: Type X, in locations indicated.
  - 4. Type X Thickness: 5/8 inch.
  - 5. Edges: Tapered.
  - 6. Products:
    - a. American Gypsum; M-Bloc.
    - b. CertainTeed Corporation; ProRoc Brand Moisture & Mold Resistant Gypsum Board.
    - c. Georgia-Pacific Gypsum; DensShield Tile Backer.
    - d. Lafarge North America Inc; Mold Defense Drywall.
    - e. National Gypsum Company; Gold Bond Brand XP Gypsum Board.
    - f. Pacific Coast Building Products, Inc; PABCO Mold Curb Gypsum Wallboard.
    - g. Temple-Inland Building Product by Georgia-Pacific, LLC; ComfortGuard WR.
    - h. USG Corporation; Sheetrock Brand Mold Tough Gypsum Panels.
    - i. Substitutions: See Section 01 6000 - Product Requirements.
- E. Ceiling Board: Special sag-resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
- 1. Application: Ceilings, unless otherwise indicated.
  - 2. Thickness: 1/2 inch.
  - 3. Edges: Tapered.
  - 4. Products:
    - a. American Gypsum; Interior Ceiling Board.
    - b. CertainTeed Corporation; ProRoc Interior Ceiling.
    - c. Georgia-Pacific Gypsum; ToughRock CD Ceiling Board.
    - d. Lafarge North America Inc; Sagcheck.



- e. National Gypsum Company; High Strength Brand Ceiling Board.
  - f. Pacific Coast Building Products, Inc; PABCO Ceiling Board.
  - g. Temple-Inland Building Products by Georgia-Pacific, LLC; Span24 Ceiling Board.
  - h. USG Corporation; Sheetrock Brand Sag-Resistant Interior Gypsum Ceiling Board.
  - i. Substitutions: See Section 01 6000 - Product Requirements.
- F. Exterior Sheathing Board: Sizes to minimize joints in place; ends square cut.
- 1. Application: Exterior sheathing, unless otherwise indicated.
  - 2. ~~Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.~~
  - 3. Glass-Mat-Faced Sheathing: Glass mat faced gypsum substrate as defined in ASTM C1177/C1177M.
  - 4. Core Type: Regular and Type X, as indicated.
  - 5. Type X Thickness: 5/8 inch.
  - 6. Regular Board Thickness: 1/2 inch.
  - 7. Eave and Soffit Board Thickness: 5/8 inch.
  - 8. Edges: Square, for vertical application. V-shaped tongue and groove for horizontal application.
  - 9. Glass-Mat-Faced Products:
    - a. CertainTeed Corporation; GlasRoc Brand.
    - b. Georgia-Pacific Gypsum; DensGlass Sheathing.
    - c. National Gypsum Company; Gold Bond Brand eXP Extended Exposure Sheathing.
    - d. USG; Securock Glass Mat Sheathing
    - e. Temple-Inland Building Products by Georgia-Pacific, LLC; GreenGlass Exterior Sheathing.
    - f. Substitutions: See Section 01 6000 - Product Requirements.
- G. Shaftwall and Coreboard: Type X; 1 inch thick by 24 inches wide, beveled long edges, ends square cut.
- 1. Paper Faced Type: Gypsum shaftliner board or gypsum coreboard as defined ASTM C1396/C1396M; water-resistant faces.
  - 2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
  - 3. Products:
    - a. American Gypsum; M-Bloc Shaft Liner.
    - b. Georgia-Pacific Gypsum; DensGlass Shaftliner (mold-resistant).
    - c. National Gypsum Company; Gold Bond Brand 1" Fire-Shield Shaftliner XP (mold-resistant).
    - d. National Gypsum Company; Gold Bond Brand eXP Extended Exposure Shaftliner.
    - e. Temple-Inland Building Products by Georgia-Pacific, LLC; GreenGlass Liner Panel.
    - f. USG Corporation; Sheetrock Gypsum Liner Panels--Enhanced (mold-resistant).
    - g. Substitutions: See Section 01 6000 - Product Requirements.

## 2.05 ACCESSORIES

- A. Acoustic Insulation: ASTM C665; preformed glass fiber, friction fit type, unfaced. Full cavity thickness
- B. Acoustic Sealant: As specified in Section 07 9005.
- C. Water-Resistive Barrier: As specified in Section 07 2500.
- D. Finishing Accessories: ASTM C1047, galvanized steel or rolled zinc, unless otherwise indicated.
  - 1. Types: As detailed or required for finished appearance.
  - 2. Special Shapes: In addition to conventional cornerbead and control joints, provide U-bead at exposed panel edges.
- E. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
  - 1. Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.

2. Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.
  3. Ready-mixed vinyl-based joint compound.
  4. Chemical hardening type compound.
- F. High Build Drywall Surfer: Vinyl acrylic latex-based coating for spray application, designed to take the place of skim coating and separate paint primer in achieving Level 5 finish.
  - G. Screws for Attachment to Steel Members Less Than 0.03 inch In Thickness, to Wood Members, and to Gypsum Board: ASTM C1002; self-piercing tapping type; cadmium-plated for exterior locations.
  - H. Screws for Attachment to Steel Members From 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws for application of gypsum board to loadbearing steel studs.
  - I. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.
  - J. Exterior Soffit Vents: One piece, perforated, ASTM B 221 6063 T5 alloy aluminum, with plaster or EIFS edge and manufactured especially for soffit application. Provide continuous vent.

### **PART 3 EXECUTION**

#### **3.01 EXAMINATION**

- A. Verify that project conditions are appropriate for work of this section to commence.
- B. Verify prior to beginning installation that hangers, suspension system, and framing will not interfere with other Work.
- C. Verify prior to beginning installation that other Work is coordinated with suspension system.

#### **3.02 SHAFT WALL INSTALLATION**

- A. Shaft Wall Framing: Install in accordance with manufacturer's installation instructions.
  1. Fasten runners to structure with short leg to finished side, using appropriate power-driven fasteners at not more than 24 inches on center.
  2. Install studs at spacing required to meet performance requirements.
- B. Shaft Wall Liner: Cut panels to accurate dimension and install sequentially between special friction studs.
  1. On walls over sixteen feet high, screw-attach studs to runners top and bottom.
  2. Seal perimeter of shaft wall and penetrations with acoustical sealant.

#### **3.03 FRAMING INSTALLATION**

- A. Metal Framing: Install in accordance with ASTM C754 and manufacturer's instructions.
- B. Suspended Ceilings and Soffits: Space framing and furring members as permitted by standard.
  1. Level ceiling system to a tolerance of 1/1200.
  2. Laterally brace entire suspension system.
  3. Install bracing as required at exterior locations to resist wind uplift.
- C. Studs: Space studs as permitted by standard, but no greater than 16 inches on center..
  1. Extend partition framing to structure where indicated and to ceiling in other locations.
  2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
  3. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.
- D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.
- E. Standard Wall Furring: Install at concrete and masonry walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.

1. Orientation: Horizontal.
  2. Spacing: As indicated.
- F. Furring for Fire Ratings: Install as required for fire resistance ratings indicated and to GA-600 requirements.
- G. Blocking and Backing: Install metal, wood, or other backing as indicated or required for support of:
1. Framed openings.
  2. Wall mounted cabinets.
  3. Plumbing fixtures.
  4. Toilet partitions.
  5. Toilet accessories.
  6. Wall mounted door hardware.
  7. Wall paneling and trim.
  8. Joints of rigid wall coverings that occur between studs.
  9. Markerboards
  10. Other wall or ceiling mounted items indicated.

### **3.04 ACOUSTIC ACCESSORIES INSTALLATION**

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
1. Place one bead continuously on substrate before installation of perimeter framing members.
  2. Place continuous bead at perimeter of each layer of gypsum board.
  3. In non-fire-rated construction, seal around all penetrations by conduit, pipe, ducts, and rough-in boxes.

### **3.05 CEILING AND SOFFIT SUSPENSION SYSTEM INSTALLATION**

- A. Install suspension system in accordance with manufacturer's recommendations and as specified in this section.
- B. Install after above ceiling work is complete. Coordinate location of hangers with other Work. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where ducts or other obstructions prevent regular spacing of hangers, reinforce nearest affected hangers and related carrying channels to span extra distance.
- C. Install system in accordance with ASTM E580, Oregon Structural Specialty Code for seismic restraint, and CISCA's "Guidelines for Seismic Restraint of Direct-Hung Suspended Ceiling Assemblies - Seismic Zones 3 & 4.
- D. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1"360.
- E. Do not support components on main runners or cross runners when weight causes total dead load to exceed deflection capability. Support fixture loads with supplementary hangers. Do not eccentrically load system, or produce rotation of runners.

### **3.06 BOARD INSTALLATION**

- A. Comply with ASTM C 840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- B. Single-Layer Non-Rated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
1. Exception: Tapered edges to receive joint treatment at right angles to framing.
- C. Double-Layer Non-Rated: Use gypsum board for first layer, placed parallel to framing or furring members, with ends and edges occurring over firm bearing. Use glass mat faced gypsum board at exterior walls and at other locations as indicated. Place second layer perpendicular to framing or furring members. Offset joints of second layer from joints of first layer.

- D. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
- E. Exterior Sheathing: Comply with ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.
  - 1. Paper-Faced Sheathing: Immediately after installation, protect from weather by application of water-resistive barrier.
- F. Exterior Soffits: Install exterior soffit board perpendicular to framing, with staggered end joints over framing members or other solid backing.
- G. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.
- H. Installation on Metal Framing: Use screws for attachment of all gypsum board except face layer of non-rated double-layer assemblies, which may be installed by means of adhesive lamination.
- I. Moisture Protection: Treat cut edges and holes in moisture resistant gypsum board with sealant.

### **3.07 INSTALLATION OF TRIM AND ACCESSORIES**

- A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
  - 1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.
- D. Exterior Soffit Vents: Install according to manufacturer's written instructions and in locations shown on the drawings. Provide vent area specified.

### **3.08 JOINT TREATMENT**

- A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, bedded and finished with chemical hardening type joint compound.
- B. Paper Faced Gypsum Board: Use paper joint tape, bedded with ready-mixed vinyl-based joint compound and finished with ready-mixed vinyl-based joint compound.
- C. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
  - 1. Level 5: Walls and Ceilings.
  - 2. Level 3: Walls to receive textured wall finish.
  - 3. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
  - 4. Level 1: Wall areas above finished ceilings, whether or not accessible in the completed construction.
  - 5. Level 0: Temporary partitions and surfaces indicated to be finished in later stage of project.
- D. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
  - 1. Feather coats of joint compound so that camber is maximum 1/32 inch.
  - 2. Taping, filling, and sanding is not required at surfaces behind adhesive applied ceramic tile and fixed cabinetry.
  - 3. Taping, filling and sanding is not required at base layer of double layer applications.
- E. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

### **3.09 TOLERANCES**

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

**END OF SECTION**

**SECTION 09 9600**  
**HIGH-PERFORMANCE COATINGS**

**PART 1 GENERAL****1.01 SECTION INCLUDES**

- A. Special preparation of surfaces.
- B. Intumescent Coating.

**1.02 RELATED REQUIREMENTS**

- A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

**1.03 REFERENCE STANDARDS**

- A. SSPC-SP 3 - Power Tool Cleaning; Society for Protective Coatings; 1982 (Ed. 2004).

**1.04 SUBMITTALS**

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data indicating coating materials .
  - 1. Provide schedule of steel members, section type, thickness required, coats required to meet requirements for fire rating.
- C. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Maintenance Data: Include cleaning procedures and repair and patching techniques.

**1.05 FIELD CONDITIONS**

- A. Do not install materials when temperature is below 55 degrees F or above 90 degrees F.
- B. Maintain this temperature range, 24 hours before, during, and 72 hours after installation of coating.
- C. Provide lighting level of 80 ft candles measured mid-height at substrate surface.
- D. Restrict traffic from area where coating is being applied or is curing.

**PART 2 PRODUCTS****2.01 MANUFACTURERS**

- A. Intumescent Mastic Coating for Structural Steel:
  - 1. Manufacturer: Hilti
  - 2. Product: Fire Protection Steel Spray CFP-S WB

**PART 3 EXECUTION****3.01 EXAMINATION**

- A. Verify existing conditions before starting work.
- B. Verify that substrate surfaces are ready to receive work as instructed by the coating manufacturer. Obtain and follow manufacturer's instructions for examination and testing of substrates.

**3.02 PREPARATION**

- A. Clean surfaces of loose foreign matter.
- B. Remove substances that would bleed through finished coatings. If unremovable, seal surface with shellac.
- C. Remove finish hardware, fixture covers, and accessories and store.
- D. Ferrous Metal:
  - 1. Solvent clean.

- 2. Remove loose rust, loose mill scale, and other foreign substances using power tools according to SSPC-SP 3.
- E. Protect adjacent surfaces and materials not receiving coating from spatter and overspray; mask if necessary to provide adequate protection. Repair damage.

**3.03 PRIMING**

- A. Apply primer to all surfaces, unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.

**3.04 COATING APPLICATION**

- A. Apply coatings in accordance with manufacturer's instructions, to thicknesses specified.
  - 1. Coating thickness: per manufacturer to meet Fire Rating.
- B. Apply in uniform thickness coats, without runs, drips, pinholes, brush marks, or variations in color, texture, or finish. Finish edges, crevices, corners, and other changes in dimension with full coating thickness.

**3.05 CLEANING**

- A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.
- B. Clean surfaces immediately of overspray, splatter, and excess material.
- C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.

**3.06 PROTECTION**

- A. Protect finished work from damage.

**END OF SECTION**

# University of Oregon Classroom Expansion

Straub and Earl Halls



# Project Manual Vol. 2 - Div 21-33

100% Construction Documents  
7 October 2013

Rowell Brokaw  
Architects



(Blank Page)



**SECTION 28 2000  
ELECTRONIC SURVEILLANCE**

**PART 1 GENERAL****1.01 SURVEILLANCE AND INTRUSION SYSTEMS**

- A. All labor, equipment, materials, documentation and services necessary for a complete and operational Closed Circuit TV (CCTV) monitoring system. Work will include the installation of wiring, cabling, cameras, power supplies, digital video controllers, flat panel displays, and other components necessary to provide a fully operational CCTV monitoring.
- B. Installed system shall be a turnkey package including design review, construction supervision, coordination, and commissioning services.
- C. OFOI and/or OFCI hardware will be determined by each project with the FS Lock & Door Shop.
- D. The system wiring, equipment, and installation shall comply with all listed requirements as well as any and all applicable national, state and local codes and standards.
- E. System Description:
  - 1. The CCTV monitoring system installed shall provide for real-time monitoring of multiple cameras at multiple viewing locations simultaneously, as well as, recording for later review of video.
  - 2. The CCTV system shall be equipped with a video recorder (DVR or NVR where applicable NVR equipment is specified) that shall have the following characteristics:
    - a. Equipped with a 16 port PoE (Power over Ethernet) switch or 16 camera ports.
    - b. Equipped to serve remote display of live and recorded video over client LAN. Client software shall be provided with DVR / NVR.
    - c. Record at a minimum of 12 frames per second with DVR system and 5-7 frames per second with NVR system for each camera location simultaneously.
    - d. Feature that it records only when motion is detected. Motion is defined to be changes in pixels on a camera allowing the user to specify the percent pixel change that defines motion.
    - e. DVR / NVR shall be a 16 camera unit with 500 GB storage capacity.
    - f. Stored video shall be retrievable from the DVR / NVR indexed by time and have fast-forward and rewind functions.
    - g. DVR shall be equipped with a keyboard, mouse, and 17" color LCD display.
    - h. DVR / NVR shall allow live monitoring and continuous recording while viewing stored video.
  - 3. Cameras shall:
    - a. Be 1/3 inch color cameras having minimum of 480 TV lines of resolution. IP cameras capable of low-light recording (IR if needed) and high resolution (720 lines of resolution or greater). All camera models must be approved by FS Lock & Door Shop.
    - b. Have vari-focal lenses and auto-iris to allow for field-of-view optimization and ability to automatically adjust to changing lighting conditions. Lenses shall be those recommended by camera manufacturer.
    - c. Be powered over limited energy conductors from a central power supply mounted in the communications closets of Point of Entry.
    - d. Mini-dome cameras are to be used at elevator cab ceilings. Elevator Subcontractor will install coax cable in elevator traveling cable. CCTV Contractor shall run cable from elevator machine rooms to DVR / NVR and monitor. Coordinate camera installation in elevators with elevator installer.
    - e. Inventory of cameras may include: areas with cash handling equipment; bike storage; primary
    - f. entries; stairwells; etc. Camera inventory and locations will be determined by each project and require FS Lock & Door Shop review and approval.

4. The CCTV system shall be equipped with FS Lock & Door Shop specified number of cameras.
5. Surveillance Products: The appropriate product models are to be approved by designated FS Lock & Door Shop during project design and specification.

**PART 2 PRODUCTS**

<b>Surveillance Product:</b>	<b>Manufacturer:</b>	<b>Model:</b>	<b>Note(s):</b>
Network Video Recorder	AMAG stand alone NVR or DELL server		Where applicable NVR system and equipment are requested and specified
Digital Video Recorder	Pelco	To be approved	Required to integrate into existing DPS remote view software. See also, previous system description within
Standard Color Camera	Panasonic or Sony	To be approved	Or approved equal.
Minidome Color Camera	Bosch FlexiDome, Sony	To be approved	Vandal resistant 24 VAC, with variable focal lens and auto iris. Or approved equal.
Exterior Color Camera	Panasonic or Sony	To be approved	Weatherproof. Or approved equal.
Exterior Color Camera	Panasonic or Sony	To be approved	Weatherproof. Or approved equal.
IP Cameras	AXIS or approved		IP cameras must be compatible with AMAG NVR Solutions
Cameras	ALL	ALL	At least 720 lines of TV resolution during normal lighting conditions. Low-light cameras may switch to black & white in low lux conditions. See also, previous system
Camera Power Supply	Altronix		16 fused output and 24 VAC. Or approved equal.
Camera Mounts & Adapters	-		ALL cameras to include necessary mounts and adapters recommended by manufacturer for
Camera Cable	-		Cat5e or Siamese type depending on
Security/Burglar Alarm	Radionics, Bosch, or Detection System Control Units	-	Programmable by Bosch RPS software, version 3.7 or later.

**PART 3 EXECUTION**

**3.01 GENERAL INSTALLATION**

- A. Quality Assurance: All workers involved with this installation must have completed manufacturer training and have a minimum of 2 years experience installing like equipment or have a minimum of 5 years of installation experience with specified equipment.
- B. Install all equipment and cabling in a manner consistent with manufacturer recommendations and instructions.

- C. Install all devices and components shown on drawings required for proper operation of the system.
- D. Mount devices level and in a uniform fashion.
- E. Camera power supplies are to mount in the Point of Entry rooms.
- F. Wiring to cameras shall be CAT 5e twisted pair and shall include any necessary components to transmit video and power across CAT 5e cabling.
- G. Contractor shall furnish and install all cabling associated with the operation of CCTV system.
- H. Contractor shall **not** pull any CCTV cables in conduits containing or intended to contain voice and data wiring.

**3.02 SURVEILLANCE AND INTRUSION SYSTEMS AND EQUIPMENT**

- A. Coordinate with FS Lock & Door Shop setup of Ethernet network and IP address assignment; camera setup to ensure proper focus and view to satisfaction.
- B. When the installation of all system components and cabling is complete, initial testing shall consist of local walk-through, and working demonstration of all features.
- C. All passwords or access codes for the system shall remain at factory default unless the factory default poses a security risk, in which case all passwords shall be communicated in writing and give written FS
- D. Lock & Door Shop approval of such change. Any costs associated with password recovery shall be borne
- E. by the Contractor.
- F. The Owner shall be provided with a minimum of 2hrs training of the installed system after all startup and testing procedures have been completed and as-built documentation delivered.
  - 1. Minimum hours of required training may increase based upon the system size and complexity.
  - 2. Training will include both an overview for building occupants and an in-depth session for Facilities maintenance to a service level.
- G. Prior to FS Lock & Door Shop final acceptance of the system all zones must be tested in the presence of designated representative(s) from the FS Lock & Door Shop.

**3.03 SURVEILLANCE AND INTRUSION SYSTEMS CLOSEOUT, WARRANTY, AND SUPPORT**

- A. With as-builts, record drawings, O&M manuals, etc. deliverables a complete list is required of all system devices, power packs, etc. noting their installed locations.
- B. Guarantee all work against faulty and improper material and workmanship for a minimum of 1 year from the date of final written acceptance by FS Lock & Door Shop, except where guarantee or warranties for longer terms are clearly requested and specified.
- C. During the entire warranty period the Contractor must provide all related software upgrades to the installed system(s).
- D. Upon notification of a problem, the warranty provider shall furnish within 48 hours at no cost to the Owner such labor and materials as are needed to restore the system to proper operation.
- E. During the entire warranty period the Contractor must guarantee a 4 hour response time for problem resolution.
- F. Prior to the end of the warranty period, with FS Lock & Door Shop present, the Contractor is to conduct a 1 year inspection and provide a report of system equipment and system operational functions.

**END OF SECTION**

(Blank Page)