

**UCLA Michigan Operations Center
Tenant Improvements
Project Number: 20100728-74-90**

ADDENDUM #5

ADDENDUM NUMBER 5
to the
CONSTRUCTION DOCUMENTS

The following changes, additions, or deletions shall be made to the following documents as indicated; and all other conditions shall remain the same:

General:

1) Low Voltage Work – Allowance to be included and required Vendor

The Bidders shall include an Allowance of Two Hundred Ten Thousand Three Hundred and Eighty Three Dollars (\$210,383) for structured cabling within their Bid Sum. Awarded Contractor shall retain the firm NET CONNECT for all related work as outlined in their fee proposal attached within Addendum 5. All work outside of the NET CONNECT scope is the responsibility of the Contractor.

2) Building Access – Security Passes

Bidders shall include Two Thousand Dollars (\$2,000) within their Bid Sum for the deposit of 40 electronic security passes that shall enable access into the facility. At the time the Contractor commences Work on site, there shall be a perimeter security system. At the Completion of the Project, the Contractor shall be refunded on a pro-rata basis for the return of the electronic security passes. Additional passes can be purchased with a \$50 deposit per pass.

3) Phasing

There shall be no phasing of the Contractors work. There shall only be one phase of Work by the Contractor although other work shall be carried by University vendors prior to the Contractor commencing the Project. As discussed at the Job Walk, the facility shall be partially occupied during the Contractors Work and the facility must remain secure.

4) Plan Check Corrections

See attached plan check correction memorandum from Gene Fong Associates (3 pages) that clarifies the corrections that have been made.

5) Fire Sprinklers

Cosco Fire Protection is the sprinkler subcontractor working on the “rack” area for the University. For Information Only. Cosco are relocating the 6” overhead line around the new chairlift.

Bid Date:

- 1) Bid date shall be extended to Tuesday September 14, 2010 3pm.

RFI's

- 1) See answers to the attached RFI's 2,3 and 6,7,8,9 and one non-numbered RFI

Bid Documents

- 1) See attached re-issued page 1 through 30 from the Construction Document package. The Bid Form has been re-issued as well as the Agreement has been re-issued. Bidders shall use this Bid Form package with "Addendum 5 written in the footer.

Specifications

- 1) See attached Concrete Specification Sections 03100 – Concrete Formwork, 03200 – Concrete Reinforcement and 03300 – Cast In Place Concrete
- 2) See attached revised Specification sections 15300 - Fire Protection and 15430 – Plumbing Specialties.

END OF ADDENDUM NUMBER 5



16130 Sherman Way, Van Nuys, CA 91406
Phone 818.535.3405 Fax 818.221.0329

Cabling Estimate

UCLA MITS

**Project: Structured Cabling MOC (Quad drops)
2211 Michigan
Santa Monica, CA**

Document Date: August 25, 2010

Attn: Arlen Amundson

Objective

The objective of this project is to provide structured wiring system for voice and data applications.

Scope (Quad outlets)

- **MDF Build-out**
 - Provide and install (2) Ortronics racks and wire management per plans provided\
 - Ground and bond racks
- **IDF Build-out**
 - Provide and install (6) Ortronics racks, ladder rack hardware, and wire management per plans provided
 - Ground and bond racks
- **Backbone Cabling**
 - Provide and install (4) CAT6 cable runs from MPOE to MDF
 - Provide and install 12 strand SM armored fiber cable from MDF to MPOE
 - Provide and install 24 strand laser optimized MM/24 strand SM armored fiber cable from MDF to IDF.
 - Terminate all fiber cables with LC connectors on LC coupler panels in fiber distribution cabinets
 - Test and label fibers cabinets
 - Provide and install 100 pair plenum cable from MPOE to MDF
 - Provide and install 100 pair plenum cable from MPOE to IDF
 - Provide and install 100 pair plenum cable from MDF to IDF
 - Provide and install 48 port patch panel and 100 pair cable to telco backboard in MDF
 - Provide and install 48 port patch panel and 100 pair cable to telco backboard in IDF
 - 100 pair cables shall terminate on 110 blocks on telco backboards
- **Voice and data cabling -176 Quad/30 dual AP drops (764 CAT6 Plenum Cables)***
 - Provide labor and materials for the installation of 764 CAT6 plenum cables to new suite for voice/data applications per plans provided.
 - (176) Quad CAT6 outlets for workstations
 - (30) Duplex CAT6 outlets for AP's
- **Deliverables**
 - As-built floor plans in electronic and hard copy
 - Cable test results in electronic and hard copy

*Approved electrical floor plan indicating number of drops/location to be provided by customer prior to commencement of rough cabling.

Costs

Labor				
QTY	Description		Cost	Ext. Cost
1	Installation		\$ 71,240.00	\$ 71,240.00
1	Project management		\$ 4,000.00	\$ 4,000.00
1	Documentation		\$ 2,500.00	\$ 2,500.00
		Total labor		\$ 77,740.00
Expenses				
QTY	Description		Cost	Ext. Cost
1	Scissor lift rental		\$ 1,200.00	\$ 1,200.00
		Total		\$ 1,200.00
Materials				
QTY	Description		Cost	Ext. Cost
16	48 port CAT6 angled patch panel		\$ 475.00	\$ 7,600.00
145,000	CAT6 plenum cable		\$ 0.48	\$ 69,600.00
764	CAT6 jacks		\$ 8.50	\$ 6,494.00
8	Horizontal wire mangers (OR-MM6HMF2RU)		\$ 80.00	\$ 640.00
8	Vertical wire mangers (OR-MM10VMD710)		\$ 650.00	\$ 5,200.00
16	Vertical wire mangers (OR-MM10VMD706)		\$ 545.00	\$ 8,720.00
206	Modular faceplates (OR-40300546)		\$ 4.00	\$ 824.00
2	2RU Fiber Distribution Cabinets		\$ 375.00	\$ 750.00
1	24 MM 50 micron laser optimized LC-LC armored		\$ 900.00	\$ 900.00
1	24 SM LC-LC armored		\$ 850.00	\$ 850.00
1	12 Strand SM LC-LC armored cable		\$ 1,200.00	\$ 1,200.00
4	Coupler panels 24 LC		\$ 145.00	\$ 580.00
2	12 Strand SM coupler panels		\$ 95.00	\$ 190.00
280	J-hook ceiling assemblies		\$ 5.00	\$ 1,400.00
8	Ortronics rack (OR-MM6716)		\$ 945.00	\$ 7,560.00
4	Ortronics end panel (OR-MM6EP716)		\$ 320.00	\$ 1,280.00
100	Blank inserts (OR-42100002)		\$ 0.35	\$ 35.00
550	100 Pair plenum cable		\$ 3.75	\$ 2,062.50
2	48 Port Patch panels		\$ 250.00	\$ 500.00
3	300 Pair 110 blocks with C5 clips		\$ 120.00	\$ 360.00
4	Wall angle bracket		\$ 45.00	\$ 180.00
6	Rack to runway mounting kits		\$ 65.00	\$ 390.00
10	Ladder rack		\$ 125.00	\$ 1,250.00
1	Misc. fastening hardware, labels, etc		\$ 1,200.00	\$ 1,200.00
		Sub-total materials:		\$ 119,765.50
		Tax (9.75%)		\$ 11,677.14
		Total Materials		\$ 131,442.64
Grand Total				\$ 210,382.64

Terms

- Net Connect shall provide a project manager as a single point of contact for the duration of the project
- UCLA to provide signed electrical plan with approved drops prior to rough cabling
- 4" Pathways from IDF to 1st floor by others
- Electrical boxes for communication boxes provided by others
- Additional drops shall incur additional costs

SECTION 03100
CONCRETE FORMWORK

1. GENERAL

1.1 DESCRIPTION OF WORK

- A. Furnish and place all concrete formwork as shown on the Drawings and as specified, complete.
- B. The engineering and construction of the formwork shall be the responsibility of Contractor.

1.2 QUALITY ASSURANCE

- A. Where methods, procedures and standards are not specifically covered in this Specification, conform to "Recommended Practice for Concrete Formwork," ACI 347, 301-72 and "Specification for the Design of Cold Formed Steel Structural Members," AISI.

1.3 SUBMITTALS

- A. Refer to Section 01340, SHOP DRAWINGS, PRODUCT DATA & SAMPLES, for procedures.
- B. Samples:
 - 1. Form Coatings. Treat a sample vertical form consisting of 100 square feet (10 square meters) with the form coating. Cast concrete against the form, cure, and dry, for approval by University's Representative prior to concreting.
- C. Shop Drawings and Product Data: The following list includes the required shop drawings that shall be submitted.
 - 1. Detailed treatment of form materials.
 - 2. Liners.
 - 3. Form tie systems.
 - 4. Jointry details.

2. PRODUCTS

2.1 MATERIALS

- A. Wall Form Ties: Use a working strength of not less than 3,000 lbs. (13.3 KN), and a type that will, upon removal, leave no metal closer than 1-1/2" (40 mm) to the exposed surface. Provide external holding devices to support form loads.
- B. Form Coating: The coating shall be a chemical type, non-staining releasing agent which will not affect the bonding of plaster, paint, waterproofing, or other materials to the concrete. Apply in accordance with the manufacturer's printed recommendations.
- C. Exposed Cast-In-Place Concrete:
 - 1. Form Material.
 - a. Sheathing. Use new 3/4 inch (20 mm) 5-ply plywood of exterior type, Grade B-B (concrete form) Class I, conforming to U.S. Product Standard PS-1. The plywood may be reused only when approved by University's Representative.
- D. Concrete Not Exposed to View:

1. Form Material. Use wood or metal sufficiently tight to prevent leakage. Conform to shape, lines, and dimensions of the members shown or called for on the Drawings. Brace and tie so as to maintain position and shape.
- E. Retained-in-Place Corrugated Metal Forms (Centering):
 1. Forms shall conform to the AISI "Specification for the Design of Cold-Formed Steel Structural Members."
 2. Form type, depth, and gauge shall be as shown on the Drawings. Where this information is not given, the deck shall be sized such that the deflection under load of wet concrete and placement procedures shall not exceed 1/240 of the clear span.
 3. Use steel sheets conforming to ASTM A611, uncoated, with a minimum yield point of 80 kips per square inch (KSI).

3. EXECUTION

3.1 INSTALLATION

- A. Form Work: Construct form work to comply with ACI 347, to sizes, shapes, lines, dimensions shown on the Drawings and to obtain accurate alignment, location, grades, level and plumb work in finished structures. Provide for rustication, V-grooves and other recesses. Solidly butt joints and fill joint with water putty or equal material to make watertight.
- B. Form Removal: Where the concrete as a whole is supported on shores, the forms of vertical surfaces such as column, beam sides and walls may be removed after six (6) hours, provided the concrete is sufficiently hard not to be injured. When forms are removed prior to the curing period, continue to cure concrete in accordance with Section 03300, CAST-IN-PLACE CONCRETE.

END OF SECTION

SECTION 03200
CONCRETE REINFORCEMENT

1. GENERAL

1.1 DESCRIPTION OF WORK

- A. Furnish and place all reinforcing steel and accessories as shown on the Drawings and as specified, complete.

1.2 QUALITY ASSURANCE

- A. Where methods and procedures are not specifically covered in this specification, conform to "Details and Detailing of Concrete Reinforcement," ACI 315 and 613A.
- B. Allowable Tolerances: Accurately place all reinforcing and secure it against displacement within the tolerances permitted by "Specifications for Structural Concrete for Building," ACI 301.

1.3 SUBMITTALS

- A. Refer to Section 01340, SHOP DRAWINGS, PRODUCT DATA & SAMPLES, for procedures.
- B. Shop Drawings and Product Data: Submit shop drawings for fabrication, bending and placement of concrete reinforcement. Comply with the ACI 315 "Details and Detailing of Concrete Reinforcement." Submittals shall include bar schedules, bar bending diagrams, number and location of bars and splice location and method of splicing.
- C. Mill Reports: Furnish two (2) certified copies of all mill reports covering the chemical and physical properties of the reinforcing steel.

2. PRODUCTS

2.1 MATERIALS

- A. Reinforcing Bars: Except for column spirals, use deformed bars of the grade indicated on the Drawings, conforming to "Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement." ASTM A615, supplemented by bend test requirements of "Building Code Requirements for Reinforced Concrete," ACI 318.
- B. Column Spirals: Use plain bars of the grades indicated on the Drawings conforming to ASTM A615.
- C. Welded Wire Fabric: Conform to the requirements of the "Standard Specifications for Welded Steel Wire Fabric for Concrete Reinforcement" ASTM A185, or "Standard Specifications for Welded Steel Wire Fabric for Concrete Reinforcement" ASTM A497.
- D. Welded Reinforcing Bars: Welding of reinforcing bars will not be allowed except where specifically shown on the Drawings. For reinforcing bars which are to be welded, conform with "Structural Welding Code - Reinforcing Steel," AWS D1.4. Use bars conforming to "Standard Specification for Low-Alloy Steel Deformed Bars for Concrete Reinforcement" ASTM A706.
- E. Bar Supports: Provide in accordance with "Details and Detailing of Concrete Reinforcement," ACI 315. Use galvanized, stainless steel or plastic coated supports to prevent surface staining where supports are in contact with an exposed concrete surface.

2.2 FABRICATION AND MANUFACTURE

- A. Bar Bends: Conform with ACI 315.
- B. Continuous Bars: Furnish in the longest lengths practical and splice in conformance with ACI 318. Make all splices at points of minimum stress. Show all splices on shop drawings.

3. **EXECUTION**

3.1 **PREPARATION**

- A. Cleaning: Insure that all reinforcing, at the time concrete is placed, is free from dirt, scale, rust, paint, oil, or other foreign material that will destroy or reduce the bond.

3.2 **INSTALLATION**

- A. Install bar support in accordance with ACI 315.
- B. Concrete Protection for Reinforcement: Conform with ACI 318 unless otherwise noted on the Drawings.
- C. Welded Wire Fabric: Lap at least 1-1/2 meshes plus end extension of the wires, but not less than 12 inches (300 mm) in structural slabs. Lap at least 1/2 mesh plus end extension of the wires, but not less than 6 inches (150 mm) in slabs-on-grade.
- D. Projecting reinforcement shall not be bent in the field. Prevent projecting rebars from causing rust stains on exposed concrete. Before subsequent concreting, rebars shall be cleaned.

END OF SECTION

SECTION 03300
CAST IN PLACE CONCRETE

1.0 GENERAL

1.01 SUMMARY

A. Section includes:

1. Cast-in place concrete, including formwork, reinforcement, concrete materials, accessories mix design, placement procedures, and finishes.

B. Related Sections:

1. Section 03 54 13 (03500) - Gypsum Cement Underlayment
2. Section 05 50 00 (05500) - Metal Fabrications
3. Section 07 10 00 (07100) – Dampproofing and Waterproofing
4. Section 07 92 00 (07920) - Joint Sealants
5. Section 13 11 00.01 (13151) - Swimming Pools - Exterior
6. Section 32 13 00 (0271) - Concrete Paving

1.02 REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO) Publications:

1. M 182: Standard Specification for Burlap Cloth Made from Jute or Kenaf and Cotton Mats

B. American Concrete Institute (ACI) Publications:

1. 301 "Specification for Structural Concrete."
2. 117 "Standard Specifications for Tolerances for Concrete Construction and Materials."
3. 211.1 "Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete".
4. 211.2 "Standard Practice for Selecting Proportions for Structural Lightweight Concrete".
5. 212 "Chemical Admixtures for Concrete"
6. 214R "Evaluation of Strength Test Results of Concrete"
7. 301 "Standard Specification for Structural Concrete"
8. 302 "Guide for Concrete Floor and Slab Construction"
9. 304R "Guide for Measuring, Mixing, Transporting and Placing Concrete".
10. 305R "Hot Weather Concreting".
11. 306R "Cold Weather Concreting".
12. 308 "Standard Practice for Curing Concrete"
13. 309R "Guide for Consolidation of Concrete".
14. 311.4R "Guide for Concrete Inspection".
15. 318 "Building Code Requirements for Structural Concrete".
16. 347R "Guide to Formwork for Concrete".
17. 544 "Fibers Reinforced Concrete"
18. SP-66 "ACI Detailing Manual".

C. ASTM International (ASTM) Publications:

1. A82 "Standard Specification for Steel Wire, Plain, for Concrete Reinforcement"
2. A184 "Standard Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement"
3. A185 "Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete"
4. A496 "Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement"
5. A497 "Standard Specification for Steel Welded Wire Reinforcement, Deformed, for Concrete"
6. A615 "Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement"
7. A706 "Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement"
8. A775 "Standard Specification for Epoxy-Coated Steel Reinforcing Bars"
9. A884 "Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement"
10. A934 "Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars"
11. C31 "Standard Practice for Making and Curing Concrete Test Specimens in the Field"
12. C33 "Standard Specification for Concrete Aggregates"
13. C39 "Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens"
14. C42 "Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete"
15. C94 "Standard Specification for Ready-Mixed Concrete"
16. C109 "Standard Test Method for Compressive Strength of Hydraulic Cement Mortars"
17. C143 "Standard Test Method for Slump of Hydraulic Cement Concrete"
18. C150 "Standard Specification for Portland Cement"
19. C171 "Standard Specification for Sheet Materials for Curing Concrete"
20. C172 "Standard Practice for Sampling Freshly Mixed Concrete"
21. C173 "Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method"
22. C219 "Standard Terminology Relating to Hydraulic Cement"
23. C231 "Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method"
24. C260 "Standard Specification for Air-Entraining Admixtures for Concrete"
25. C309 "Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete"
26. C330 "Standard Specification for Lightweight Aggregates for Structural Concrete"
27. C494 "Standard Specification for Chemical Admixtures for Concrete"
28. C567 "Standard Test Method for Determining Density of Structural Lightweight Concrete"
29. C618 "Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete"
30. C881 "Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete"
31. C989 "Standard Specification for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars"

32. C1059 "Standard Specification for Latex Agents for Bonding Fresh To Hardened Concrete"
33. C1064 "Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete"
34. C1077 "Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation"
35. C1116 "Standard Specification for Fiber-Reinforced Concrete and Shotcrete"
36. C1315 "Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete"
37. D1751 "Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)"
38. D1752 "Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction"
39. D2240 "Standard Test Method for Rubber Property—Durometer Hardness"
40. D3963 "Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars"
41. E329 "Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction"
42. E548 "Guide for General Criteria Used for Evaluating Laboratory Competence"
43. E1643 "Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs"

D. American Welding Society (AWS) Publications:

1. D1.4 "Structural Welding Code - Reinforcing Steel"

E. Concrete Reinforcing Steel Institute (CRSI) Publications:

1. CRSI
2. "Manual of Standard Practice"
3. CRSI-WCRSI "Placing Reinforcing Bars"

F. National Ready Mixed Concrete Association's (NRMCA) Publications:

1. "Certification of Ready Mixed Concrete Production Facilities"

G. U.S. Department of Commerce (DOC), National Institute of Standards and Technology (NIST) Publications:

1. PS 1 "Construction and Industrial Plywood"

1.03 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume.

1.04 SUBMITTALS

A. Product Data:

1. Submit "Letter of Conformance" in accordance with Section 01 33 00 (01330) indicating specified items selected for use in project.

B. Design Mixes: For each concrete mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

1. Indicate amounts of mix water to be withheld for later addition at Project site.

- C. Steel Reinforcement Shop Drawings: Details of fabrication, bending, and placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement." Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement. Include special reinforcement required for openings through concrete structures. Coordinate built-in items including anchor bolts, plates and clips.
- D. Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional engineer detailing fabrication, assembly, and support of formwork. Design and engineering of formwork are Contractor's responsibility.
 - 1. Indicate proposed schedule and sequence of stripping formwork.
- E. Welding Certificates: Copies of certificates for welding procedures and personnel.
- F. Material Test Reports: From a qualified testing agency indicating and interpreting test results for compliance of the following with requirements indicated, based on comprehensive testing of current materials:
- G. Material Certificates: Submit "Letter of Conformance" in accordance with Section 01 33 00 (01300) indicating specified items selected for use in project.
 - 1. Cementitious materials and aggregates.
 - 2. Form materials and form-release agents.
 - 3. Steel reinforcement and reinforcement accessories.
 - 4. Fiber reinforcement.
 - 5. Admixtures.
 - 6. Waterstops.
 - 7. Curing materials.
 - 8. Floor and slab treatments.
 - 9. Bonding agents.
 - 10. Adhesives.
 - 11. Vapor retarders.
 - 12. Epoxy joint filler.
 - 13. Joint-filler strips.
 - 14. Repair materials.
- H. Minutes of preinstallation conference.

1.05 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer with a minimum of five years experience, who has completed concrete Work similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.
- B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for formwork and shoring and reshoring installations that are similar to those indicated for this Project in material, design, and extent.
- C. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C94 requirements for production facilities and equipment.
 - 1. Manufacturer must be certified according to the National Ready Mixed Concrete Association's (NRMCA) "Certification of Ready Mixed Concrete Production Facilities."

- D. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C1077 and ASTM E329 to conduct the testing indicated, as documented according to ASTM E548.
1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
- E. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.
- F. Welding: Qualify procedures and personnel according to AWS D1.4, "Structural Welding Code--Reinforcing Steel."
- G. ACI Publications: Comply with the following, unless more stringent provisions are indicated:
1. ACI 301, "Specification for Structural Concrete."
 2. ACI 117, "Standard Specifications for Tolerances for Concrete Construction and Materials."
 3. ACI 211.1 "Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete".
 4. ACI 211.2 "Standard Practice for Selecting Proportions for Structural Lightweight Concrete".
 5. ACI 212 "Chemical Admixtures for Concrete"
 6. ACI 214R "Evaluation of Strength Test Results of Concrete"
 7. ACI 301 "Standard Specification for Structural Concrete"
 8. ACI 302 "Guide for Concrete Floor and Slab Construction"
 9. ACI 304R "Guide for Measuring, Mixing, Transporting and Placing Concrete".
 10. ACI 305R "Hot Weather Concreting".
 11. ACI 306R "Cold Weather Concreting".
 12. ACI 308 "Standard Practice for Curing Concrete"
 13. ACI 309R "Guide for Consolidation of Concrete".
 14. ACI 311.4R "Guide for Concrete Inspection".
 15. ACI 318 "Building Code Requirements for Structural Concrete".
 16. ACI 347R "Guide to Formwork for Concrete".
 17. ACI 544 "Fibers Reinforced Concrete"
 18. ACI SP-66 "ACI Detailing Manual".
- H. Other Publications. Comply with the following, unless more stringent provisions are indicated:
1. Concrete Reinforcing Steel Institute (CRSI): CRSI-WCRSI "Placing Reinforcing Bars"
 2. American Welding Society (AWS) D1.4 "Structural Welding Code - Reinforcing Steel".
- I. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section - "Administrative and Coordination."
1. Before submitting design mixes, review concrete mix design and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixes.

- c. Ready-mix concrete producer.
- d. Concrete subcontractor.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle steel reinforcement to prevent bending and damage.
 - 1. Avoid damaging coatings on steel reinforcement.
 - 2. Repair damaged epoxy coatings on steel reinforcement according to ASTM D3963.

PART 2 PRODUCTS

2.01 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
 - 1. Plywood, metal, or other approved panel materials.
 - 2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:
 - a. High-density overlay, Class 1, or better.
 - b. Medium-density overlay, Class 1, or better, mill-release agent treated and edge sealed.
 - c. Structural 1, B-B, or better, mill oiled and edge sealed.
 - d. B-B (Concrete Form), Class 1, or better, mill oiled and edge sealed.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.
- C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.
- D. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.
- E. Form-Release Agent: Commercially formulated colorless biobased oil, form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.
 - 1. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- F. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 - 1. Furnish units that will leave no corrodible metal closer than 1 inch (25 mm) to the plane of the exposed concrete surface.
 - 2. Furnish ties that, when removed, will leave holes not larger than 1 inch (25 mm) in diameter in concrete surface.
 - 3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.02 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A615, Grade 60, deformed.
- B. Low-Alloy-Steel Reinforcing Bars: ASTM A706, deformed.
- C. Plain-Steel Welded Wire Fabric: ASTM A185, fabricated from as-drawn steel wire into flat sheets.

2.03 REINFORCEMENT ACCESSORIES

- A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete, and as follows:
 - 1. For concrete surfaces exposed to view or weather where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected or CRSI Class 2 stainless-steel bar supports.
- B. Joint Dowel Bars: Plain-steel bars, ASTM A615, Grade 60. Cut bars true to length with ends square and free of burrs.
- C. Tie Wire: Minimum 16 gage annealed type.

2.04 CONCRETE MATERIALS

- A. Portland Cement: ASTM C150, Type I.
- B. Portland Cement: ASTM C150, Type II.
- C. Portland Cement: ASTM C150, Type III. Permitted only for concrete exposed to weather.
- D. Portland Cement: ASTM C150, Type V.
 - 1. Fly Ash: ASTM C618, Class C or F.
 - a. Report the chemical analysis of the fly ash in accordance with ASTM C311. Evaluate and classify fly ash in accordance with ASTM D5759.
 - 2. Ground Granulated Blast-Furnace Slag: ASTM C989, Grade 100 or 120.
- E. Normal-Weight Aggregate: ASTM C33, uniformly graded, and as follows:
 - 1. Class: Negligible weathering region, but not less than 1N.
 - 2. Nominal Maximum Aggregate Size: 1 inch.
- F. Lightweight Aggregate: ASTM C330.
- G. Water: Potable and complying with ASTM C94.

2.05 ADMIXTURES

- A. General: Admixtures certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material and to be compatible with other admixtures and cementitious materials. Do not use admixtures containing calcium chloride.
- B. Air-Entraining Admixture: ASTM C260.
- C. Water-Reducing Admixture: ASTM C494, Type A.
- D. High-Range, Water-Reducing Admixture: ASTM C494, Type F.
- E. Water-Reducing and Accelerating Admixture: ASTM C494, Type E.
- F. Water-Reducing and Retarding Admixture: ASTM C494, Type D.

2.06 WATERSTOPS

- A. Flexible PVC Waterstops: CE CRD-C 572, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.
 - 1. Profile: Ribbed with center bulb.
- B. Avendra, LLC Preferred Manufacturers:
 - 1. None
- C. Approved Manufacturers:

1. PVC Waterstops:
 - a. "PVC Waterstop"; Greenstreak, Inc.; (800-325-9504)
 - b. "Sealtight PVC Waterstops"; W. R. Meadows, Inc.; (800-342-5976)
 - c. Westec Barrier Technologies; Div. of Western Textile Products, Inc., (800-793-7832)
- D. Self-Expanding Strip Waterstops: Manufactured rectangular or trapezoidal strip, sodium bentonite or other hydrophylic material for adhesive bonding to concrete.
 1. Avendra, LLC Preferred Manufacturers:
 - a. None
 2. Approved Manufacturers:
 - a. "Volclay Waterstop-RX"; CETCO, Subsidiary of AMCOL International Corp; (800-527-9948)
 - b. "Hydrotite"; Greenstreak, Inc.; (800-325-9504)
 - c. "Adeka Ultra Seal"; OCM, Inc. (800-999-3959)

2.07 VAPOR RETARDERS

- A. Refer to Section 07 10 00 for vapor barrier or vapor retarder materials.
- B. Granular Fill: Clean mixture of crushed stone or crushed or uncrushed gravel; ASTM D448, Size 57, with 100 percent passing a 1-1/2-inch (38-mm) sieve and 0 to 5 percent passing a No. 4 (4.75-mm) sieve.

2.08 CURING MATERIALS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
 1. Material shall become an integral part of concrete surface and leave floor free of residue or film.
 2. Avendra, LLC Preferred Manufacturers:
 - a. None
 3. Approved Manufacturers:
 - a. "Eucobar"; Euclid Chemical Co, An RPM Company; (800-321-7628)
 - b. "Confilm"; BASF Building Systems (800-433-9517)
 - c. "SikaFilm"; Sika Construction Products Division, Sika Corporation (800-933-7452)
 - d. "Cimfilm"; Axim Italcementi Group, Inc. (800-899-8795)
 4. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) dry.
- B. Moisture-Retaining Cover: ASTM C171, .006 inch (6 mil) thick, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.
- D. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C309, Type 1, Class B.
 1. Avendra, LLC Preferred Manufacturers:
 - a. None
 2. Approved Manufacturers:

- a. "High Seal"; Conspec Marketing & Manufacturing Co., Inc., A Dayton Superior Brand; (800-348-7351)
 - b. "Aqua Cure VOX"; Euclid Chemical Co, An RPM Company; (800-321-7628)
 - c. "Glazecote 20"; Lambert Corp (800-432-4746)
 - d. "Kure-N-Seal WB"; BASF Building Systems (800-433-9517)
 - e. "Clearseal WB 150"; Euclid Chemical Co, An RPM Company; (800-321-7628)
 - f. "Masterkure 200W", BASF Building Systems (800-433-9517)
 - g. "Kure 200W"; Sonneborn Brand of BASF Building Systems (800-433-9517)
- E. Clear, Waterborne, Curing and Sealing Compound: ASTM C1315, 25% solids minimum.
1. Approved Manufacturers:
 - a. "Conspec #1-30"; Conspec Marketing & Manufacturing Co., Inc., A Dayton Superior Brand; (800-348-7351)
 - b. "Super Aqua Cure VOX"; Euclid Chemical Co, An RPM Company; (800-321-7628)
 - c. "Glazecoat 30"; Lambert Corp (800-432-4746)
 - d. "Clearseal WB 300"; Euclid Chemical Co, An RPM Company; (800-321-7628)
 - e. "Kure 1315"; Sonneborn Brand of BASF Building Systems (800-433-9517)

2.09 RELATED MATERIALS

- A. Joint-Filler Strips: ASTM D1751, asphalt-saturated cellulosic fiber, or ASTM D1752, cork or self-expanding cork.
- B. Epoxy Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Shore A hardness of 80 per ASTM D2240.
- C. Polyurea Joint Filler: Two-component, 100 percent solids, with a Shore A hardness of 80 per ASTM D2240.
- D. Bonding Agent: ASTM C1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- E. Epoxy-Bonding Adhesive: ASTM C881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class and grade to suit requirements, and as follows:
 1. Type II, non-load bearing, for bonding freshly mixed concrete to hardened concrete.
 2. Types I and II, non-load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
 3. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- F. Reglets: Fabricate reglets of not less than 0.0217-inch- (0.55-mm-) thick galvanized steel sheet. Temporarily fill or cover face opening of reglet to prevent intrusion of concrete or debris.
- G. Dovetail Anchor Slots: Hot-dip galvanized steel sheet, not less than 0.0336 inch (0.85 mm) thick, with bent tab anchors. Temporarily fill or cover face opening of slots to prevent intrusion of concrete or debris.

2.10 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.
 1. Cement Binder: ASTM C150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C219.

2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3 to 6 mm) or coarse sand as recommended by underlayment manufacturer.
 4. Compressive Strength: Not less than 4100 psi (29 MPa) at 28 days when tested according to ASTM C109/C109M.
- B. Repair Topping: Traffic-bearing, cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch (6 mm).
1. Cement Binder: ASTM C150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C219.
 2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3 to 6 mm) or coarse sand as recommended by topping manufacturer.
 4. Compressive Strength: Not less than 5700 psi (39 MPa) at 28 days when tested according to ASTM C109/C109M.

2.11 CONCRETE MIXES

- A. Prepare design mixes for each type and strength of concrete determined by either laboratory trial mix or field test data bases, as follows:
1. Proportion normal-weight concrete according to ACI 211.1 and ACI 301.
 2. Proportion lightweight structural concrete according to ACI 211.2 and ACI 301.
- B. Use a qualified independent testing agency for preparing and reporting proposed mix designs for the laboratory trial mix basis.
- C. Proportion concrete mix for each class of concrete to achieve the strengths (28 days) and slumps noted on the drawings.
- D. Cementitious Materials:
1. For concrete exposed to deicers, limit percentage, by weight, of cementitious materials other than portland cement according to ACI 301 requirements.
 2. Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
 - a. Fly Ash: 25 percent.
 - b. Combined Fly Ash and Pozzolan: 25 percent.
- E. Maximum Water-Cementitious Materials Ratio:
1. 0.50 for concrete required to have low water permeability.
 2. 0.50 for concrete subject to moderate sulfate exposure.
- F. Air Content: Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content as follows within a tolerance of plus 1 or minus 1.5 percent, unless otherwise indicated:
1. Air Content: 5.5 percent for 1-1/2-inch- (38-mm-) nominal maximum aggregate size.
 2. Air Content: 6 percent for 1-inch- (25-mm-) nominal maximum aggregate size.
 3. Air Content: 6 percent for 3/4-inch- (19-mm-) nominal maximum aggregate size.
- G. Do not air entrain concrete to trowel-finished interior floors and suspended slabs. Do not allow entrapped air content to exceed 3 percent.

- H. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
- I. Micro-Synthetic Fiber: Uniformly disperse in concrete mix at manufacturer's recommended rate, but not less than 1 lb/cu. yd.
- J. Admixtures: Use admixtures according to manufacturer's written instructions.
 - 1. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.
 - 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 - 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
 - 4. Use corrosion-inhibiting admixture in concrete mixes where indicated.

2.12 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.13 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C94 and ASTM C1116, and furnish batch ticket information.
 - 1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 EXECUTION

3.01 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until concrete structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
 - 1. Class A, 1/8 inch (3 mm).
 - 2. Class B, 1/4 inch (6 mm).
- D. Construct forms tight enough to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal.
 - 1. Do not use rust-stained steel form-facing material.
- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

- H. Chamfer exterior corners and edges of permanently exposed concrete unless otherwise noted or detailed on drawings.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.02 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use Setting Drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 1. Install anchor bolts, accurately located, to elevations required.
 - 2. Install reglets to receive top edge of foundation sheet waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
 - 3. Install dovetail anchor slots in concrete structures as indicated.
- B. Embedded items shall be located so as not to reduce the strength of the construction. They shall be thoroughly clean and free from coating, rust, scale, oil and other foreign material. No wood shall be permanently embedded in concrete.
- C. Embedments shall be maintained in position and protected until the concreting is complete.

3.03 REMOVING AND REUSING FORMS

- A. General: Formwork, for sides of beams, walls, columns, and similar parts of the Work, that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete provided concrete is hard enough to not be damaged by form-removal operations and provided curing and protection operations are maintained.
- B. Leave formwork, for beam soffits, joists, slabs, and other structural elements, that supports weight of concrete in place until concrete has achieved the following:
 - 1. At least 70 percent of 28-day design compressive strength.
 - 2. Determine compressive strength of in-place concrete by testing representative field- or laboratory-cured test specimens according to ACI 301.
 - 3. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.
- C. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- D. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by [Owner's Representative] [Architect].

3.04 SHORES AND RESHORES

- A. Comply with ACI 318 (ACI 318M), ACI 301, and recommendations in ACI 347R for design, installation, and removal of shoring and reshoring.

- B. In multistory construction, extend shoring or reshoring over a sufficient number of stories to distribute loads in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.
- C. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.05 VAPOR RETARDERS

- A. General: Extend vapor retarder to extremities of areas to be protected from vapor transmission. Place, protect, and repair vapor-retarder sheets according to ASTM E1643 and manufacturer's written instructions.
- B. Refer to Section 07 10 00 for vapor barrier for additional specifications.

3.06 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
 - 1. Shop- or field-weld reinforcement according to AWS D1.4, where indicated.
- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.
- E. Install welded wire fabric in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.
- F. Epoxy-Coated Reinforcement: Use epoxy-coated steel wire ties to fasten epoxy-coated reinforcement. Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D3963/D3963M.
- G. Zinc-Coated Reinforcement: Use galvanized steel wire ties to fasten zinc-coated reinforcement. Repair cut and damaged zinc coatings with zinc repair material.

3.07 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Owner's Representative.
 - 1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 - 2. Form from preformed galvanized steel, plastic keyway-section forms, or bulkhead forms with keys, unless otherwise indicated. Embed keys at least 1-1/2 inches (38 mm) into concrete.
 - 3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.
 - 4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
 - 5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.

6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness, as follows:
 1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch (3 mm). Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
 2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- (3-mm-) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
 2. Terminate full-width joint-filler strips not less than 1/2 inch (12 mm) or more than 1 inch (25 mm) below finished concrete surface where joint sealants, specified in Division 07 Section "Joint Sealants," are indicated.
 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Dowel Joints: Install dowel sleeves and dowels or dowel bar and support assemblies at joints where indicated.
 1. Use dowel sleeves or lubricate or asphalt-coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.08 WATERSTOPS

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

3.09 CONCRETE PLACEMENT

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

- E. Deposit concrete in forms in horizontal layers no deeper than 24 inches (600 mm) and in a manner to avoid inclined construction joints. Place each layer while preceding layer is still plastic, to avoid cold joints.
 - 1. Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.
 - 2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the vibrator. Place vibrators to rapidly penetrate placed layer and at least 6 inches (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix constituents to segregate.
- F. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 - 1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Maintain reinforcement in position on chairs during concrete placement.
 - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 4. Slope surfaces uniformly to drains where required.
 - 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, free of humps or hollows, before excess moisture or bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- G. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
 - 1. When air temperature has fallen to or is expected to fall below 40 deg F (4.4 deg C), uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50 deg F (10 deg C) and not more than 80 deg F (27 deg C) at point of placement.
 - 2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
 - 3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators, unless otherwise specified and approved in mix designs.
- H. Hot-Weather Placement: Place concrete according to recommendations in ACI 305R and as follows, when hot-weather conditions exist:
 - 1. Cool ingredients before mixing to maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
 - 2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
 - 3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.10 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched. Remove fins and other projections exceeding ACI 347R limits for class of surface specified.

- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8 inch (3 mm) in height.
 - 1. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting.
 - 2. Do not apply rubbed finish to smooth-formed finish.
- C. Rubbed Finish: Apply the following to smooth-formed finished concrete:
 - 1. Grout-Cleaned Finish: Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes. Mix one part portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.
- D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.11 FINISHING FLOORS AND SLABS

- A. General: Comply with recommendations in ACI 302.1R for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes.
 - 1. Apply scratch finish to surfaces indicated and to surfaces to receive concrete floor topping or mortar setting beds for ceramic or quarry tile, portland cement terrazzo, and other bonded cementitious floor finishes.
- C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill low spots. Repeat float passes and restraighening until surface is left with a uniform, smooth, granular texture.
 - 1. Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.
- D. Trowel Finish: After applying float finish, apply first trowel finish and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
 - 1. Apply a trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system.
 - 2. Finish and measure surface so gap at any point between concrete surface and an unlevelled freestanding 10-foot- (3.05-m-) long straightedge, resting on two high spots and placed anywhere on the surface, does not exceed 3/16 inch (4.8 mm).
- E. Trowel and Fine-Broom Finish: Apply a partial trowel finish, stopping after second troweling, to surfaces indicated and to surfaces where ceramic or quarry tile is to be installed by either thickset or thin-set method. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with a fine broom.

- F. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, and ramps, and elsewhere as indicated.
 - 1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Owner's Representative before application.
- G. Slip-Resistive Aggregate Finish (where required by local codes): Before final floating, apply slip-resistive aggregate finish where indicated and to concrete stair treads, platforms, and ramps. Apply according to manufacturer's written instructions and as follows:
 - 1. Uniformly spread 25 lb/100 sq. ft. (12 kg/10 sq. m) of dampened slip-resistive aggregate over surface in one or two applications. Tamp aggregate flush with surface, but do not force below surface.
 - 2. After broadcasting and tamping, apply float finish.
 - 3. After curing, lightly work surface with a steel wire brush or an abrasive stone, and water to expose slip-resistive aggregate.

3.12 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete Work.
- B. Curbs: Other than specified in Section 32 13 13 (02751) Cement Concrete Pavement, provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on Drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates of manufacturer furnishing machines and equipment.
- D. Steel Pan Stairs: Provide concrete fill for steel pan stair treads, landings, and associated items. Cast-in inserts and accessories as shown on Drawings. Screed, tamp, and trowel-finish concrete surfaces.

3.13 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with recommendations in ACI 305R for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing by one or a combination of the following methods:
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces, by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.

- c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch (300-mm) lap over adjacent absorptive covers.
 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
 - b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
 - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer recommends for use with floor coverings.
 3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - a. Restrictions on use: Do not use curing compound on surfaces over which homogeneous sheet material will be applied. For surfaces to receive other finishes, submit well in advance of time for curing application, written acceptance of curing compound by both the manufacturer and the installer of the finish material, relative to compatibility therewith of finish material, including primers, adhesives, and similar materials. If manufacturer of finish material has not been determined, Contractor shall be responsible for coordinating such acceptance.
 4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.14 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions.
 1. Defer joint filling until concrete has aged at least six months. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.
- C. Install semirigid epoxy joint filler full depth in saw-cut joints and at least 2 inches (50 mm) deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.15 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas when approved by Owner's Representative. Remove and replace concrete that cannot be repaired and patched to Owner's Representative approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 (1.2-mm) sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension in solid concrete but not less than 1 inch (25 mm) in depth. Make

- edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Owner's Representative.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 2. After concrete has cured at least 14 days, correct high areas by grinding.
 3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
 4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
 5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch (6 mm) to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 6. Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least 3/4 inch (19 mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mix as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 7. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.
- E. Perform structural repairs of concrete, subject to Owner's Representative's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to Owner's Representative's approval.

3.16 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement. Sampling and testing for quality control may include those specified in this Article.

- B. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C172 shall be performed according to the following requirements:
1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mix exceeding 5 cu. yd. (4 cu. m), but less than 25 cu. yd. (19 cu. m), plus one set for each additional 50 cu. yd. (38 cu. m) or fraction thereof.
 2. Slump: ASTM C143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
 3. Air Content: ASTM C231, pressure method, for normal-weight concrete; ASTM C173, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
 4. Concrete Temperature: ASTM C1064; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.
 5. Unit Weight: ASTM C567, fresh unit weight of structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
 6. When frequency of testing will provide fewer than five compressive-strength tests Compression Test Specimens: ASTM C31/C31M; cast and laboratory cure one set of four standard cylinder specimens for each composite sample.
 - a. Cast and field cure one set of four standard cylinder specimens for each composite sample.
 7. Compressive-Strength Tests: ASTM C39; test two laboratory-cured specimens at 7 days and two at 28 days.
 - a. Test two field-cured specimens at 7 days and two at 28 days.
 - b. A compressive-strength test shall be the average compressive strength from two specimens obtained from same composite sample and tested at age indicated.
- C. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
- D. Strength of each concrete mix will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
- E. Test results shall be reported in writing to [Owner's Representative,] [Architect,] concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mix proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
- F. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by [Owner's Representative] [Architect] but will not be used as sole basis for approval or rejection of concrete.
- G. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by [Owner's Representative] [Architect]. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42 or by other methods as directed by [Owner's Representative] [Architect].

END OF SECTION

SECTION 15300
FIRE PROTECTION SYSTEM (DEFERRED APPROVAL)

1. GENERAL

1.1 DESCRIPTION OF WORK

- A. Work under this section shall include the following:
1. Provide all materials and equipment and perform all labor required to install a complete hydraulically-calculated double interlock pre-action sprinkler system from the point of connection at the base of the existing automatic wet sprinkler riser to the MDF and IDF rooms.
 2. Provide pre-action valves, control valves, check valves, flow switches, tamper devices, local water-flow alarms, inspector's test valves and air maintenance pump.
 3. Provide personnel and materials to perform all acceptance tests and to assist with all required inspections.
- B. This is a design build system. It is the Contractor's responsibility to design and select proper equipment, piping and devices for a complete approved operating system. Plumbing drawings show general layout of fire protection system only for coordination purposes with the other design disciplines. Final design is the responsibility of the Contractor.

1.2 CLARIFICATION

- A. Where this section references UCLA Fire Marshal involvement, the Contractor's contact with the UCLA Fire Marshal shall be via the University's Representative. All documents and other materials shall be submitted to the University's Representative.
- B. Whenever the term "system" is used herein without additional modification, it shall be taken to mean the fire protection system.

1.3 GENERAL REQUIREMENTS

- A. Conform to the requirements specified under Section 15050, Basic Mechanical Materials and Methods.
- B. Conform to all applicable electrical requirements specified in Division 16.
- C. Conform to all Applicable Code Requirements including:
1. California Fire Code.
 2. California Building Code.
 3. California Plumbing Code.

4. UCLA Fire Marshal requirements

1.4 DESIGN CRITERIA

- A. Systems shall be designed in accordance with NFPA 13 classification criteria, as approved by the UCLA Fire Marshal, with a minimum design for Ordinary Hazard (Group 1). The system hydraulic design point shall fall not less than 10 percent below the available supply curve. Design areas shall be a minimum of 1500 square feet. The protection area per sprinkler shall not exceed 130 square feet.
- B. During system design, the contractor shall ensure that the system designer determines if hazard classifications greater than ordinary hazard (group 1) are required per applicable codes and standards.
- C. All core drilling, cutting and patching for the installation of work under this Section shall be performed under this Section of the Specifications. No holes will be allowed in any structural members without the written approval of the University's Representative.

1.5 SYSTEM CONTRACTOR QUALIFICATION

- A. The Contractor shall ensure that the work described in this section, including but not limited to materials, design, installation and testing, shall be performed by a single contractor, identified hereafter as the "system contractor," qualified as described below. There shall be no further subdivision of this work.
- B. The system contractor shall hold a current California C-16 specialty contractor's license, and shall have held this license, under the currently-licensed business name, for a period of not less than five years as of the date of bidding the job.
- C. The system contractor shall demonstrate satisfactory installations of comparable systems over a period of not less than five years immediately preceding the date of bidding this job, including references.
- D. The system contractor shall be capable of furnishing drawings in AutoCAD, Release 14 (or higher), format.

1.6 RELATED WORK

- A. Firestopping: Section 07840
- B. Painting: Section 09900
- C. Fire Alarm System: Section 16720

1.7 REFERENCED STANDARDS

- A. The system shall be designed and installed in accordance with the following standards:
 - B. National Fire Protection Association (NFPA)
 - 1. NFPA 13 – 2002, Installation of Sprinkler Systems.

2. NFPA 25 – 2002, Inspection, Testing and Maintenance of Fire Protection Systems.
3. NFPA 72 – 2002, National Fire Alarm Code.
- C. Underwriters Laboratories, Inc. (UL)
- D. American National Standards Institute
 1. ANSI B16.22, Wrought Copper and Bronze Solder Joint Pressure Fittings
- E. American Society for Testing and Materials
 1. ASTM A 795, Specification for Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use
 2. ASTM B 88, Specification for Seamless Copper Water Tube
- F. Factory Mutual Engineering Corporation (FM)

1.8 SHOP DRAWINGS AND MATERIALS LIST

- A. Refer to Section 01340, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, for procedures.
- B. Prior to any fabrication or installation, submit ten copies of drawings to the Office of UCLA Fire Marshal and the University insurance agency and obtain approval stamps on the Drawings. The Contractor shall assume responsibility for design and plan check approval.
- C. Approval from the University's Representative and UCLA Fire Marshal must be obtained for all components of the system submittal including system contractor qualifications, material data sheets, shop drawings, and hydraulic calculations within 35 days of the Notice to Proceed. Submittals having any content, which is incomplete or unclear, will be returned without review or approval. If all components of the system submittal have not been approved due to Contractor's incompleteness or errors, the University shall have the right to require the Contractor to cancel the system contractor's contract and to engage the services of a substitute system contractor at Contractor's expense
- D. UCLA Fire Marshal approval of submittals is for permission to proceed and does not authorize design, products, or installation not conforming to referenced codes and standards and this specification. Alternates require specific approval by the UCLA Fire Marshal.
- E. Submit evidence of valid system contractor's current California C-16 specialty contractor's license, the original date of said license, and a list of comparable installations, as specified in Paragraph 1.5.
- F. Submit multiple copies of catalog data sheets for all materials. Submittals shall include the following:
 1. Sprinklers and accessories

2. Double interlock valves with complete trims
 3. Pipe and fittings
 4. Floor Control Valves
 5. Gauges
 6. Alarm flow switches
 7. Hangers and supports
 8. Valve supervisory switches
 9. Identification signs
 10. Sprinkler cabinets
 11. California State Fire Marshal listing numbers (alarm and supervisory devices)
 12. Through-penetration firestop systems
- G. Submit shop drawings. Prior to any fabrication or installation submit copies of working plans to UCLA Fire Marshal and obtain approval stamps on the drawings. Working drawings shall be prepared using AutoCAD, Release 14 (or higher) format, and submitted in complete sets (partial submissions will not be accepted) and shall bear the system contractor's license stamp, identity of the system designer and computer program used in the calculation of hydraulic information. Discharge patterns and application data shall be included in submittals for sidewall, water curtain, and similar special purpose sprinklers. Working drawings shall be per Section 6-1, NFPA 13, including, at a minimum:
1. A title sheet, which includes a sheet index; a site plan; the construction type, occupancy classification, and gross area of the building(s); the sprinkler system classification; and the water flow test data used.
 2. Full-height building cross-sections that show sprinkler piping.
 3. Complete sprinkler riser diagrams and sections.
 4. Separate piping plans and reflected ceiling plans for every floor, each of which shows the location of all partitions, with specific identification of all fire walls, the name and occupancy classification of each area or room, and the height and construction of all ceilings.
- H. Hydraulic Calculations: Calculations shall be per NFPA 13, Section 6.4 and shall be accomplished using an approved computer program based on the Hazen-Williams formula.
- I. Drawings and calculations shall be submitted to the UCLA Fire Marshal; for review and approval within 124 days following notice to proceed.
- J. Record Drawings: Submit a total of four (4) sets of final as-built drawings, which shall be sufficiently complete as to facilitate trouble shooting and repair of the

system, as follows: one (1) set shall be diazo black-line Mylar reproducibles, two (2) sets shall be blue-line (or equal) reproduction copies, and one (1) set shall be on one or more CD-ROM in AutoCAD, Release 14 (or higher) format. Final approvals are subject to receipt of acceptable as-built drawings. Submittal of a single blueline (or equal) reproduction draft copy for review prior to the final submission is encouraged.

- K. Operation and Maintenance Instructions: Submit written operating instructions, charts, and diagrams describing the operation and proper maintenance of all system equipment.

1.9 COORDINATION

- A. The Contractor shall coordinate all other Sections to avoid any interference with the effectiveness of the system (refer to Section 01041, Project Coordination). Shop drawings shall include elevations of equipment and piping for Work of other Sections to assure coordination. The system shall be coordinated to assure that conflicts will not arise with structural, mechanical, electrical or architectural features of the building.
- B. The Contractor shall be specifically responsible for ensuring that coordination between the system Work and the fire detection and alarm system Work takes place to ensure full awareness of the location of all system components including control valves, flow switches and tamper switches requiring connection to the fire detection and alarm system.
- C. Locate and pipe the sprinkler heads in center of ceiling tiles symmetrically and fully coordinate with the ceiling layout. Locate sprinkler heads as shown on the architectural reflecting ceiling plan. It is the responsibility of the Contractor to install the required number of heads. If additional heads are required approval for location shall be obtained from the University's Representative.
- D. Submit samples of fire sprinkler heads.

1.10 DELIVERY AND STORAGE

- A. Protect items from damage during shipping, handling and storage on the site. Work showing dents, creases, deformations, weathering, or other defects shall not be acceptable. Deliver materials to site at such interval to insure uninterrupted progress work.
- B. Storage of pipes, fittings, valves and accessories at the site shall be responsibility of the Contractor. Store material to permit easy access for inspection and identification. Keep materials off ground, using pallets, platforms or other supports.
- C. Do not store materials on structure in the manner that might cause distortion or damage to member of supporting or surrounding structures. Repair or replace damaged materials or structures as approved by University's Representative.
- D. The University's Representative reserves the right to reject any material that has become damaged because of improper storage.

2. PRODUCTS

2.1 PIPE AND FITTING MATERIALS

A. Piping

1. Flanged fittings shall be welded or cast.
2. Riser and cross - mains shall be ASTM A-53 Schedule 40 black steel pipe, tubing shall not be used.
3. All other sprinkler piping shall be either ASTM A-53 Schedule 40 black steel pipe or ASTM B 88 Type K copper tube installed in an approved manner.
4. Connections and fittings shall be threaded, flanged, grooved, or welded. Grooveless clamp or saddle fittings are not acceptable. Grooved flange fittings are not acceptable. Threaded fittings and couplings shall be Class 125 (standard) weight minimum, malleable or ductile, with no cast threaded fittings. Grooved fittings and couplings shall be standard weight (e.g., Victaulic Styles 07/77, Grinnell-Gruvlok Figures 7001/7401, Sprink Inc. SPRINK-KUPL Figure 707, or equal).
5. Reducing fittings shall be tapered, concentric cast metal products. Where grooved couplings are used, there shall be a separate coupling for each connection to the reducing fitting.

2.2 VALVES

A. Manufacturer Stockham, Lunkehemer Crane, or equal.

B. Gate Valves:

1. Four inch pipe size and larger: Outside screw and yoke (OS&Y) type, iron body, bronze/brass seat ring, bronze disc ring, bronze stem, 250 psi, cast or welded flange-mounted.
2. Three-inch pipe size and smaller: OS&Y type, 250 psi, iron or brass body, bronze internal working parts, cast or welded flange-mounted.

C. Angle Valves: 250 psi bronze angle valve with screw in bonnet, integral seat, and renewable disc.

D. Globe Valves: 250 psi bronze globe valve.

E. Check Valves: 250 psi iron or brass body, bronze disc and seat, horizontal swing check valve with bolted bonnet. Check valves shall be designed for replacement of internal parts without removal of valve body from piping. Bosses on each side of clapper shall be drilled and tapped for gauge installation.

F. Exception: Wafer or swing check valves listed for vertical installation may be used at fire department connections.

G. Butterfly Valves: 250 psi bronze body, threaded ends, stainless steel disc and stem, not to exceed 2-inch maximum pipe size, with integral tamper switch and geared

slow-close mechanism (Milwaukee Valve Company Model Number BB-SCS02 or equal).

- H. Floor control valves: Butterfly type (2 1/2 - to 4-inch diameter), 300 psi, body: ductile iron conforming to ASTM A 395 with epoxy coating; Disc: brass conforming to ASTM B 124 with EPDM encapsulation; upper and lower stems: stainless steel conforming to ASTM A 582 Type 420; upper and lower bushings: PTFE bronze sintered on steel; "O" ring: EPDM; grooved mounting mechanical type. Integral tamper switch: UL-listed and FM-approved Nibco, Inc., Part Number GD4765-8N or equal.
- I. Ball valves shall not be used.

2.3 SPRINKLER HEADS

- A. Sprinklers: UL-listed and FM-approved, 1/2-inch orifice, standard response. Use of any other sprinklers, including extended coverage, large orifice, and quick response, shall be approved by the UCLA Fire Marshal. Sprinklers shall be 155-165 degrees F for all ordinary temperature classified areas;
 - 1. NOTE: during system design, the contractor shall ensure that the system designer selects and specifies finishes and mountings.
- B. Sprinkler head arrangement on ceilings of finished spaces is of prime aesthetic importance. Such arrangement symmetrically laid out, with full allowance for all obstructions, including partitions, columns, beams, light fixtures, diffusers, registers and grilles and shall be approved by the University's Representative. Provide swing arm arrangement at all areas with ceiling to accommodate ceiling layout alignment.
- C. Sprinklers installed in all finished ceiling areas shall be concealed type, adjustable, UL listed with cover plate painted to match ceiling as selected by the University's Representative. Sprinkler shall be quick response type as manufactured by Reliable, Viking or equal. Submit shop drawings for approval.
- D. Install wire guards where required for protection.

2.4 GAUGES

- A. Pressure gauges shall be UL-listed and labeled for fire protection sprinkler service, minimum 3 1/2-inch dial, moisture proof and weather resistant, 0-300 psi scale, 5-psi increments. Ashcroft (Dresser Industries) Model 1005P, Breco Model W101, Marsh Instruments Model W0410, Marshalltown Instruments Model G32171, US Gauge (Ametek Corporation) Model P-1590, or equal.
- B. Each pressure gauge shall be fitted with an approved three-way valve and a 1/4-inch threaded test gauge connection. Central; Sprink; United; Grinnell; or equal.

2.5 SLEEVES AND ESCUTCHEONS

- A. Sleeves: Provide sleeves for all pipes passing through slabs, concrete walls, lath and plaster ceilings (except drop nipples for sprinklers) and partitions. Sleeves shall extend 3 inches above floors and be flush with walls, ceilings, and partitions. In concrete construction, sleeves shall be set in forms prior to pour. Clearance between sleeves and pipes shall be 1 inch for pipes through 3 1/2 inches, 2 inches for pipe sizes 4 inches and greater, and 3 inches for seismic joints.

B. Sleeve Material

1. In concrete slabs and walls: Schedule 40 black steel pipe.
2. Sleeves through waterproof membranes: Sleeves set in walls and slabs may be either cast iron or steel and shall be provided with a flashing clamp device and corrosion resistant clamping bolts.

C. Mechanical Seals: Calpico Model CSL Pipe Linx, Thunderline Link-Seal, or equal.

D. Escutcheons: Primer-coated steel set-screw type.

2.6 FLOW SWITCHES

- A. Flow switches shall be California State Fire Marshal-listed paddle-type with automatic recycle retard and DPDT contacts. All flow switches shall be provided with the "tampered-cover" option (i.e., provide a tamper indication if the cover is removed).

2.7 TAMPER SWITCHES

- A. All tamper switches shall be California State Fire Marshal-listed. Switches for PIVs or wall indicating valves shall be weather-resistant and shall monitor target position. Switches for OS&Y valves shall monitor stem movement and shall be complete with mounting J-bolts. Switches for valves located on branch lines serving sprinkler protection in elevator spaces shall be integral to the valve.
- B. All tamper switches shall be provided with the "tampered-cover" option (i.e., provide a tamper indication if the cover is removed).
- C. Plug and loop type tamper switches shall not be used.

2.8 PIPE HANGERS AND SUPPORTS

- A. Provide in accordance with referenced standards. Do not mix piping material and hanger material of dissimilar metals. All beam clamps shall be fitted with steel retainer straps. Hanger rods of less than 1/8-inch diameter are not permitted. Provide inserts installed before concrete pour for all mains. Expansion anchors may be used for branches. No shot pins. Provide safety straps at I-beam connections.

2.9 IDENTIFICATION SIGNS

- A. Signs shall be permanent, constructed of 18 gauge steel or aluminum, with a porcelain enamel or printed Mylar facing, respectively. Color shall be red-on-white, white-on-red, or as otherwise approved by the UCLA Fire Marshal. Lettering shall be of sufficient size as to be legible at normally-expected viewing distances. Each sign shall have corner holes or slots to facilitate field attachment.

2.10 SPARE SPRINKLER CABINET

- A. Supply cabinet with a minimum of 6 spare sprinklers, including at least three of each type and rating. Include a sprinkler wrench for each type of sprinkler.

2.11 ANCHORS, GUIDES AND SEISMIC RESTRAINT

- A. General: All sprinkler systems shall be protected to minimize or prevent pipe breakage when subject to earthquakes in accordance with requirements of NFPA #13, 3-5.3. Where applicable.

2.12 HANGERS AND SUPPORTS

- A. General: Type of hangers and installation methods shall be in accordance with the requirements of NFPA #13 Section 3-10.
- B. Ends of all branches 2-1/2 inches and larger shall be sway braced.
- C. Ends of all branches less than 2-1/2 inches shall utilize a splayed seismic brace wire.

2.13 INSPECTOR'S TEST VALVE

- A. Install valve in conveniently accessible location. Discharge shall be outside the building. If discharge inside building is elected coordinate with the Contractor and provide at no additional cost to the University.

2.14 PRE-ACTION SPRINKLER SYSTEM

- A. Provide all materials and equipment and perform all labor required to install a complete hydraulically-calculated pre-action fire sprinkler system for MDF Room 132 and IDF Room, including connection of the agent release control panel to the building fire alarm control panel. This system shall connect to, and take the place of in this rooms only.
- B. Fire sprinkler system shall be of the cycling double interlocked pre-action design. The system shall be designed to limit damage, which may be caused by excessive water flow. The system shall be completely automatic and be designed for on/off operation. The method of detection shall be approved fixed temperature, self-restoring heat detectors with a drop-off tab indicating the detector has been exposed to temperature in excess of 800°F, and will require replacement. On/off operation shall cycle when heat detector senses heat regeneration. When detector cools and restores, the system operation shall cease. Water flow shall be controlled through a 90° pattern, spring aided flow control valve. Once system has operated, a strobe and alarm shall be activated at the control panel. Strobe and alarm will not deactivate until system is manually reset to normal operation. The system release control panel shall be equipped with the capability for a discharge time from 30 seconds to 15 minutes after the detector circuit has returned to "no fire" or "no heat" present condition.
- C. System shall operate as a double interlocked pre-action system as outlined in NFPA 13, Standard for Installation of Sprinkler Systems. Flow control valve trim shall be equipped with a hydraulically latching pressure operated relief valve (PORV) to ensure system will fail open or "fail safe" if system were to lose power during operation.
- D. The system shall incorporate a restricted regulated air supply to supervise the integrity of system piping network. Supervisory air shall be maintained at 30 psi. A

pneumatic actuator between the air supply and the system piping shall be utilized in the release system.

- E. System riser shall be equipped with a rubber seated check valve with gauge connections and a system main drain connection. Check valve shall have a removable access plate for periodic inspection as per NFPA 25.
- F. Cycling double interlocked pre-action system shall be UL listed system with all system components listed for use in the system. System shall be installed according to the manufacturer's installation guidelines.
- G. Cycling double interlocked system riser components shall be installed in a 14 gauge steel cabinet as built per NEMA-12. Cabinet shall house a factory assembled and tested cycling double interlocked valve riser assembly. Cycling double interlocked pre-action system riser shall be equipped with a water supply manifold, system drain manifold, grooved end system discharge outlet, grooved by grooved system control valve, and all trim listed as part of the cycling double interlocked pre-action riser valve assembly. Cycling double interlocked pre-action system water flow pressure switch and solenoid valves shall be supplied as part of the assembly. Cycling double interlocked pre-action system control panel shall be equipped with cabinet, and shall have electrical connections to riser solenoid valves and pressure switches terminated by cabinet manufacturer. Cabinet shall be painted fire red with oven baked coat finish polyester powder on phosphate base. Cabinet finish shall be rustproof. Cabinet shall be equipped with a door that has gauge-viewing ports for supply water pressure and flow control valve priming water pressure as well as a window to monitor panel activity. Pre-action piping shall be galvanized. All piping shall slope to accessible drain valves. Cabinet door shall be equipped with separate access doors for the system emergency release, and system release control panel. All devices shall be substantially secured to the panel. Cabinet door shall be equipped with a neoprene gasket to eliminate vibration. Integrated cycling double interlocked pre-action system shall be a Viking - Double Interlocked Pre-action System Total Pac or equal.
- H. System Devices
 - 1. Release Control Panel: Control panel shall incorporate the necessary relays, timer, and alarm and trouble connections essential to the operation of the system. Release control panel shall be housed in a UL listed and Factory Mutual approved enclosure. Release control panel shall be equipped with 2 detection circuits; 1 detection circuit for normally open detectors, and 1 detection circuit for normally close detectors. Release control panel shall accommodate a back-up power supply. Release control panel shall be a Viking Model E-1 Release Control Panel or equal.
 - 2. Pre-action System Trim: Valve trim shall be UL listed for service in the cycling pre-action system. Cycling pre-action system trim shall incorporate the following: normally open electric solenoid, normally closed solenoid, water flow alarm pressure switch, pressure operated relief valve, pneumatic actuator, supervisory air pressure switch, alarm shut-off valve, alarm test valve, priming connection, ported riser check valve, flow test valve, manual emergency release, priming chamber water pressure gauge and three-way valve, and water supply pressure gauge and three-way valve.

3. Detector: Normally closed detectors utilized in the detection system of the cycling pre-action system shall be fixed temperature, rate compensating detectors listed for use on the pre-action cycling system. The heat probe utilized in the heat detector shall be constructed of stainless steel. Detector shall withstand 1500°F temperatures for short periods of time without damage. Detector utilized in cycling pre-action system shall utilize Viking Model B or equal.
4. Detector cable shall have an outer covering consisting of an aluminum sheath having a minimum thickness of 0.035". The outside diameter of detector cable shall be 0.330". Detector cable shall not emit toxic fumes during a fire. Detector cable shall not propagate a fire. Detector cable shall have the ability to be cut to length in the field and spliced. Cable splicing must be made in a conduit box.
5. Detection System: Electrical devices utilized in the supplemental detection system shall be compatible with the water control valve release control panel. Installation of electrical supplemental detection system shall be in accordance with NFPA. 70, NFPA. 72 and local installation requirements. An accessible detector shall be placed for annual testing of deluge system.
6. Discharge Devices (to be installed according to NFPA 13 Section 3-3.2.4)
 - a. Dry Pendent Sprinklers. Sprinklers shall be of all brass frame construction with a coated metal to metal seating mechanism. Sprinklers utilizing non-metal parts in the sealing portion of the sprinkler are strictly prohibited. Dry pendant barrel shall be of steel construction with an electro-deposited epoxy base coating. Dry pendent sprinklers shall have a 5mm frangible bulb type fusible element. Dry pendants shall have a nominal orifice of 1/2" with a K factor of 5.5. The installation of dry pendant sprinklers shall be in conformance with the manufacturer's installation guidelines. Dry pendent sprinklers shall be UL listed and Factory Mutual approved. Dry Pendent Sprinklers to be Viking Model M.Q.R. Reliable Star or equal. Only dry pendent shall be used with double interlock pre-action system.
7. Flow Control Valve: Sprinkler systems requiring a means of automatic or remote manual opening or closing of the water supply shall utilize a flow control valve with a spring aided clapper. Flow control valve shall be so constructed that the force of the spring and the differential of the valve clapper to water seat will close valve if detection or release system is reset. Valve trim shall be compatible and listed for valve. Flow control valve shall be UL listed and Factory Mutual approved. Flow Control Valve to be Viking Corporation Model H or equal.
8. System Control Valve: Pre-action system control valve shall be a listed indicating type valve. Control valve shall be UL listed and Factory Mutual approved for fire protection installations. System control valve shall be rated for normal system pressure, but in no case less than 175 psi.
9. System Check Valve: Check valves utilized in the sprinkler system riser shall be UL listed and Factory Mutual approved for use on fire protection systems. Sprinkler riser check valves shall be manufactured with supply side and system side gauge connections and a main drain outlet in conformance with NFPA 13, Standard for Installation of Sprinkler Systems. Check valves shall be constructed of a ductile iron body with a brass seat and a rubber faced clapper assembly hinged to a removable access cover. Check valves shall be equipped with a removable access cover for periodic inspection as required in NFPA 25. Check

valves shall have a working water pressure of 250 PSI. Check Valve manufacturer to be Viking Corporation, Valve Model to be F-1 Easy Riser Check Valve, or equal.

10. Compressed Air Supply: An air supply capable of restoring system pressure within 30 minutes shall be provided. An acceptable air supply arrangement shall be a tank mounted air compressor with an air maintenance device between the air compressor and the air supply inlet on the system riser.

3. EXECUTION

3.1 EXAMINATION

- A. Examine plaster, gypsum board and other wall assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements have been clearly marked for installer. Locate reinforcements and mark location if not already done.
- B. If any unusual conditions are encountered, the nature and location of conditions shall be shown on Shop drawings submitted to University's Representative for determination and approval prior fabrication.

3.2 TESTS

- A. The following tests shall be made in the presence of the enforcing agency and the University's Representative. Forty-eight hours notification shall be made prior to tests.
 1. All fire sprinkler piping shall be tested to 200-psi pressure for four hours using a Bristol recording device. After tests, water pressure shall be left under supply main pressure for the balance of the construction period.
 2. Upon completion of work of this Section and prior to acceptance, subject system to tests required by the UCLA Fire Marshal. Furnish the University's Representative with copies of certificates required by testing agencies.
 3. Test blanks shall have red painted lugs protruding beyond flange to clearly indicate their presence and be numbered to assure their removal when testing is completed.
 4. Refer to Section 15411 for sterilization procedures for underground sprinkler lines.
- B. Prior Tests: Concealed work shall remain uncovered until required tests have been completed.
- C. Signed and approved written reports shall be submitted to the University's Representative to demonstrate compliance for all testing. Final pay request will not be released without submission of this report. No exceptions shall be made.

3.3 OPERATING AND MAINTENANCE DATA

- A. Refer to Section 01700, Closeout.

- B. Data: Submit to the University's Representative for approval six months prior to acceptance of the installation, complete and at one time. Partial or separate data shall not be accepted. Data shall consist of the following:
- C. Valve Directory: Indicating valve location and function, for each numbered valve. Four (4) copies submitted.
- D. Manufacturer's Literature: Six copies of manufacturer's instructions for operation and maintenance of all mechanical equipment, valves and controls, including REPLACEMENT PARTS LIST.
- E. Written Instruction: shall be in accordance with NFPA-25. Typewritten instruction for operation and maintenance of the system composed of Operation Instructions and Maintenance Instruction. Six copies submitted to the University's Representative for approval.
 - 1. Operating instructions shall contain a brief description of the system. Adjustments requiring the technical knowledge of the service agency personnel shall not be included in the operating instructions.
 - 2. Maintenance instructions shall list each item on controls and mechanical equipment requiring inspection, lubrication of service and describe the performance of such maintenance.
- F. Verbal Instructions: Operating personnel shall be instructed in the operation of the system in accordance with typewritten, approved instructions. No other verbal instructions shall be given.
- G. Mounting Frame: Wood frame and glass cover sized to mount directories and typewritten instructions, installed as directed by the University's Representative.
- H. Binders: Six complete sets of the above data in loose leaf, ring type binders with permanent covers, with identification on back. This service manual shall be submitted for approval at least 30-days before final inspection. Failure to submit the diagram and service manual will delay final inspection and acceptance of the Work by the University's Representative.
- I. Cleaning Systems
 - 1. Equipment and piping thoroughly cleaned of iron cuttings and other foreign substances.
 - 2. After all equipment and piping is installed complete, the piping systems shall be cleaned.
 - 3. A solution of 1 lb. of trisodium phosphate per 50 gallons of water in the system. A pre-start-up cleaning agent supplied by water treatment company may be used in lieu of T.S.P.
 - 4. Drain and thoroughly flush system with water.
 - 5. Repeat flushing until clean water appears during draining.

3.4 PROTECTION

- A. Protect finishes of work installed in this section from damage during construction period. Remove temporary protective coverings at time of substantial completion.
- B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

3.5 SPECIAL REQUIREMENTS

- A. Damage by Leaks: The Contractor shall be responsible for all damage to equipment and premises caused by leaks or breaks in piping or equipment for a period of one year after date of acceptance of the project.
- B. Unless otherwise approved, and/or specified, and/or indicated, all materials, and equipment, shall be installed in accordance with manufacturer's recommendations and instructions.
- C. Mechanical equipment shall bear the manufacturer's label or nameplate showing performance characteristics. Identifying size or model number shall be given only when not practicable or customary to show otherwise. All valves, pipe, and fittings, shall bear the manufacturer's trademark or identifying markings.
- D. All materials of similar class or service shall be of one manufacturer.

3.6 COMPLETION

- A. The work hereunder shall not be inspected for final acceptance until Operating and Maintenance Data, Manufacturer's Literature and nameplates specified in this Section have been approved and properly posted in the building.

3.7 EXECUTION

- A. Conformation to requirements of NFPA #13 and 20, Standard for Installation of Sprinkler Systems, local and State codes and Ordinances, including the Uniform Building Codes, Uniform Fire Code, State County and County Health Department Ordinances, State of California Industrial Accident Commission Safety Orders.

END OF SECTION

SECTION 15430
PLUMBING SPECIALTIES

1. GENERAL

1.1 SUMMARY

A. This section includes specifications for floor drains, roof drains, cleanouts, backflow preventers, water hammer arrestors and other miscellaneous plumbing specialties. Included are the following topics:

1. Floor Sinks
2. Trench Drains
3. Cleanouts
4. Water Hammer Arrestors
5. Valves
6. Thermostatic Mixing Valves
7. Water Filters
8. Hose Bibs
9. Trap Primer Valves
10. Safings
11. Vent Flashings

1.2 REFERENCES

- A. ANSI A112.14.1 Backwater Valves.
- B. ANSI A112.21.1 Floor Drains.
- C. ANSI A112.26.1/PDI WH-201 Water Hammer Arrestors.
- D. ASSE 1001 Pipe Applied Atmospheric Type Vacuum Breakers.
- E. ASSE 1010 Water Hammer Arrestors.
- F. ASSE 1011 Hose Connection Vacuum Breakers.
- G. ASSE 1012 Backflow Preventers with Intermediate Atmospheric Vent.
- H. ASSE 1013 Reduced Pressure Principle Backflow Preventers.
- I. ASSE 1018 Trap Seal Primer Valves.

1.3 SYSTEM PERFORMANCE REQUIREMENTS

- A. Provide components and installation capable of producing piping systems with following minimum working pressure ratings, except where otherwise indicated:
 - 1. Water Distribution Systems, Below Ground: 150 psig.
 - 2. Water Distribution Systems, Above Ground: 125 psig.
 - 3. Soil, Waste, and Vent Systems: 10-foot head of water.
 - 4. Storm Drainage Systems: 10-foot head of water.
 - 5. Sanitary Sewage, Pumped Piping Systems: 75 psig.
 - 6. Storm Sewage, Pumped Piping Systems: 75 psig.

1.4 QUALITY ASSURANCE

- A. Design Concept: The Drawings indicate capacities, sizes, and dimensional requirements of system components. Components having equal performance characteristics that deviate from the indicated size and dimensions may be considered provided deviations do not change the design concept or intended performance. The burden of proof for equality of products is on the Contractor. Refer to Section 01630 Product Options & Substitutions.

1.5 SUBMITTALS

- A. General: Submit the following in accordance with Section 01340 Shop Drawings, Product Data & Samples.
- B. Product Data: Include data concerning dimensions, capacities, materials of construction, ratings, certifications, weights, manufacturer's installation requirements, manufacturer's performance limitations, and appropriate identification.

1.6 EXTRA MATERIALS

- A. Deliver extra materials to the University. Furnish extra materials matching products installed as described below. Package them with protective covering for storage and identify with labels clearly describing contents.
- B. Operating Keys (Handles): Furnish 1 extra key for each key-operated hose bibb and hydrant installed.

2. PRODUCTS

2.1 FLOOR, AREA DRAINS AND FLOOR SINKS

- A. Manufacturers: Zurn, Ancon, Josam, Smith, Wade or equal. Zurn products are specified below for the purpose of establishing minimum design standards.
- B. General: Size outlets as indicated on drawings.

- C. Traps: Cast iron or bronze, with inlet and outlet matching connected piping, cleanout where indicated:
 - 1. 2-Inch Size: 2-inch-minimum water seal.
 - 2. 2-1/2 Inches and Larger: 3-inch-minimum water seal.
- D. Inlet Fittings: Cast iron, with threaded inlet and threaded or spigot outlet, and trap seal primer valve connection.
- E. FS-1: Floor receptor 12"x12"x10", cast iron body, acid resisting porcelain enamel interior complete with anti-splash bottom strainer. Zurn Z-1902-2-33.

2.2 TRENCH DRAINS

- A. Manufacturers: Zurn, Ancorn, Alhambra Foundry or equal. Zurn products are specified below for the purpose of establishing minimum design standards.
- B. General: Size outlets as indicated on drawings.
- C. Grate: Reinforced Perforated Stainless Steel Grate.
- D. TD-1: 12"Wx8'-0"L", High Density Polyethylene (HDPE), acid resisting plastic interior. Zurn Z882-RPS

2.3 CLEANOUTS

- A. Manufacturers: Zurn, Ancon, Josam, Smith, Wade or equal. Zurn products are specified below for the purpose of establishing minimum design standards.
- B. Interior Concrete Floor Areas: Lacquered cast iron body with round adjustable scoriated polished nickel bronze cover, tapered threaded bronze closure plug. Zurn ZN-1400-BP/ZN-1400-BP-T.
- C. Interior Ceramic Tile Floor Areas: Lacquered cast iron body with square adjustable scoriated nickel bronze cover, tapered threaded bronze closure plug. Zurn 1400-BP-T.
- D. Interior Vinyl Tile Floor Areas: Lacquered cast iron body with round adjustable scoriated nickel bronze cover, tapered threaded bronze closure plug. Zurn 1400-BP.
- E. Interior Carpeted Floor Areas: Lacquered cast iron body with round adjustable scoriated nickel bronze cover and adjustable carpet flange, tapered threaded bronze closure plug. Zurn 1400-BP-CM.
- F. Interior Finished Wall Areas: Line type cleanout tee with tapered threaded bronze cleanout plug, round polished stainless steel access cover secured with machine screw. Zurn Z-1446-BP.
- G. Interior Exposed Vertical Stacks: Line type cleanout tee with tapered threaded bronze closure plug. Zurn Z-1445-BP.
- H. Interior Horizontal Lines: Cast iron hub or plug with tapered threaded bronze plug.

- I. Exterior Paved Areas: Cast iron hub or plug with tapered threaded bronze plug, cast iron frost sleeve and cover set in 24" square by 4" thick reinforced concrete pad top crowned for drainage. Neenah R-1976 with non-ferrous securing screw.
- J. Exterior Unpaved Areas: Cast iron hub or plug with tapered threaded bronze plug, cast iron or PVC frost sleeve and cast iron cover. Neenah R-1916, Alhambra A-1240 or equal with non-ferrous securing screw.

2.4 WATER HAMMER ARRESTERS

- A. Manufacturers: Watts, Ancon, PPP Industries or equal.
- B. ANSI A112.26.1, ASSE 1010; sized in accordance with PDI WH- 201, precharged piston type constructed hard drawn Type K copper, threaded brass adaptor, brass piston with o-ring seals, FDA approved silicone lubricant, suitable for operation in temperature range 35 to 150 degrees F, maximum 250 psig working pressure, 1500 psig surge pressure.
- C. Base sizes on water-supply fixture units.

2.5 VALVES

- A. General
 - 1. Provide all valves of first quality of approved manufacture, have proper clearances, and be tight at the specified test pressure. All pressure ratings are in psi steam working pressure, unless otherwise indicated.
 - 2. Mark on each valve provided with the maker's name or brand, the figure or list number, and the guaranteed working pressure cast on the body and cast or stamped on the bonnet.
 - 3. All gate and globe valves suitable for repacking under pressure. Regardless of service, valves not acceptable when designed for less than 125 pounds per square inch steam working pressure.
 - 4. All valves must be of the product of one manufacturer, except for special application.
 - 5. Figure numbers of manufacturers are listed to indicate the types selected for design, performance and standard of quality.
 - 6. Construct valves to meet Federal Specifications and Manufacturers Standardization Society of the Valve and Fitting Industry.
 - 7. Butterfly valves shall be installed in non-potable piping systems only.
- B. Manufacturer
 - 1. Gate, Globe, Stop Check, and Swing Check Valves: Nibco, Walworth, Hammond, Stockham, Jenkins or equal.
 - 2. Spring Loaded Check Valves: Nibco, Hammond, Miller Silent, Mueller or equal.

3. Butterfly Valves: Nibco, Demco, Hammond, Mueller, Keystone, Stockham or equal.
 4. Ball Valves: Ball valves: Nibco, Walworth, Hammond, Jenkins, Dynaquip or equal.
 5. Plug Valves: Keystone/Drum-Owen, Kennedy or equal.
 6. Gas Cocks: Walworth, Homestead, Stockham or equal.
- C. Gate Valve - Water Service up to 140°F. Nibco products are specified below for the purpose of establishing minimum standards.
1. 2" and Smaller: Class 150, 150 PSI SWP, bronze, threaded rising stem, inside screw, union bonnet, solid wedge bronze disc. Nibco T-134.
 2. 2-1/2" and Larger: Class 150, 150 PSI SWP, ductile iron body, flanged, outside screw and yoke, bolted bonnet, bronze trim. Nibco F-637-31.
- D. Gate Valve - Water Service over 140°F. Nibco products are specified below for the purpose of establishing minimum standards.
1. 2" and Smaller: Class 300, 300 psi SWP, bronze, rising stem, inside screw, union bonnet, threaded end, solid bronze disc, stainless steel seats. Nibco T-174-SS, Milwaukee Valves or equal.
 2. 2-1/2" and Larger: Class 250, 250 PSI SWP, iron body, flanged, outside screw and yoke, bolted bonnet, bronze mounted. Nibco F-667-0, Milwaukee Valves or equal.
- E. Globe Valves: Nibco products are specified below for the purpose of establishing minimum standards.
1. 2" and Smaller: Class 300, 300 PSI SWP, bronze, threaded, renewable Teflon disc, union bonnet. Nibco T-275, Milwaukee Valves or equal.
 2. 2-1/2" and Larger: Class 250, 250 PSI SWP, iron body, flanged, renewable seat and disc, bolted bonnet, bronze mounted. Nibco F-768-B.
- F. Stop Check Valve: Class 250, 250 PSI SWP, cast iron body, flanged, bolted bonnet, renewable seat and disc, bronze mounted. Nibco F-869-B.
- G. Swing Check Valve - Water Service up to 140°F (for Horizontal Installation Only): Nibco products are specified below for the purpose of establishing minimum standards.
1. 2" and Smaller: Class 150, 150 PSI SWP, bronze, threaded, horizontal swing, Y-pattern, renewable Teflon disc, regrinding type, screw-in cap. Nibco T-433, Milwaukee Valve or equal.
 2. 2-1/2" and Larger: Class 125, 125 PSI SWP, iron body, flanged, horizontal swing, renewable bronze disc and seat ring, regrinding type, bolted bonnet, bronze trim., Nibco F-918, Milwaukee Valve or equal.

-
- H. Swing Check Valve – Water Service over 140°F (for Horizontal Installation Only): Nibco products are specified below for the purpose of establishing minimum standards.
1. 2" and Smaller: Class 300, 300 PSI SWP, bronze, threaded, horizontal swing, Y-pattern, renewable Teflon disc, regrinding type, screw-in cap. Nibco T-473, Milwaukee or equal.
 2. 2-1/2" and Larger: Class 250, 250 PSI SWP, iron body, flanged, horizontal swing, renewable bronze disc and seat ring, regrinding type, bolted bonnet, bronze trim. Nibco F-968-B, Milwaukee or equal.
- I. Spring Loaded Check Valves - (For vertical installation only. Not to be installed on sewage ejector or sump pump discharge). Nibco products are specified below for the purpose of establishing minimum standards.
1. 2" and Smaller: Class 125, 125 PSI SWP, bronze body, threaded, center guided stainless steel disc, Teflon seat, stainless steel spring and trim. Nibco T-480.
 2. 2-1/2" and Larger: Cast iron, globe type body, flanged, 250 lb. WOG, center guided bronze disc, Buna-N seat, stainless steel spring and trim. Nibco F960.
- J. Ball Valves 2" and Smaller: Full port, three-piece, threaded bronze body, Type 316 stainless steel stem and ball, reinforced TFE seat ring, extended blowout stem with vapor seal and protective sleeve for insulated piping, lever or tee handle, 150 lb. SWP. Nibco T-595-Y-66, Milwaukee or equal.
- K. Ball Valves 2-1/2" and Larger: Full port, two-piece, flanged stainless steel body, Type 316 stainless steel stem and ball, reinforced RTFE seat and liner, extended blowout stem for insulated piping, lever handle with position indicator for sizes 3" and smaller and gear operator with position indicator for sizes larger than 3", 150 lb. SWP. Nibco F515, Milwaukee or equal.
- L. Plug Valves: Nibco products are specified below for the purpose of establishing minimum standards.
1. 2" and Smaller: Cast iron body, screwed, EPDM coated eccentric plug, pet cocks, memory stop, non-lubricated, 175 lbs. WOG. Nibco, Keystone/Drum-Owen 1512 or equal.
 2. 2-1/2" and Larger: Flanged, non-lubricated, cast iron body and EPDM coated eccentric plug, pet cocks, memory stop, non-lubricated, 175 lbs. WOG. Keystone/Drum-Owen 1522, Nibco or equal.
- M. Gas Cocks: Walworth products are specified below for the purpose of establishing minimum standards.
1. Cocks 2" and Smaller: Class 175 lb. WOG, all bronze, square head, screwed, position indicator with wrench. Walworth 1796, Kennedy, Milwaukee or equal.
 2. Cocks 2-1/2" to 6": Class 175 lb. WOG, flanged, lubricated, iron body and plug, position indicator with wrench. Walworth 1797F, Kennedy, Milwaukee or equal.
 3. Provide one lubricant gun. Walworth 1699, Kennedy, Milwaukee or equal.

- 4. Cocks on insulated piping to be provided with a neck extension 2" above outside diameter of valve body or flanges to accommodate full thickness of insulation.
- N. Niddle Valve: Nibco products are specified below for the purpose of establishing minimum standards. Stainless steel body, Type 316 stainless steel, pressure rate to 150 psi, removable serrated nozzle outlet. Nibco 937 WH, Water Saver, Orion or equal.
- O. Chain Operators: Provide on all valves installed 8' or higher from floor or platform, except where valves are installed above ceilings outside of mechanical rooms.
- P. Water Pressure Reducing Valve: Bronze body, spring/diaphragm operated with integral stainless steel strainer, stainless steel trim, suitable for deadend service, 300 lb. WOG screwed. Watts, Wilkins or equal.
- Q. Air Pressure Reducing Valve: ASTM B-61 bronze body, self-operated balanced single seat with by-pass function, integral stainless steel strainer, stainless steel trim, suitable for deadend service. 2" and smaller, 300 lb. WOG screwed. 2" and larger, 300 lb. WOG flanged. Braukman, Clayton, Wilkins, Watts or equal.
- R. Sanitary Sewer Diverting Valve: Open frame pinch valve, steel body, flanged to suit ANSI 150#, full port Buna-N sleeve, with positive opening tables and full face flanges, to be supplied with alumina actuators thrust base. Completed with torque and limit switches, manual override handwheel, remote selector switch open/close position to be monitored at BMS (wiring by Division 17). Cla-Val Model S-1000-ELO or equal (no known equal).

2.6 STRAINERS

- A. Description: Y-type with strainer baskets of material and perforations suitable for steam or water service, as required. Figure numbers of manufacturers are listed to indicate the types selected for design, performance and standard of quality.
- B. Manufacturer: Spirax Sarco, Mueller, Hoffman or equal.

2.7 THERMOSTATIC WATER-MIXING VALVES

- A. TMV-1 / TMV-2: The supply unit for tempered water control system shall have one mixer of the thermostatic type with bronze body construction and non-corrosive parts. Unit shall come complete with cabinet contained piping components finished in rough chrome plate, and shall include a dial thermometer and outlet volume and shutoff control valve in mixer outlet line and integral check-stops. Capable of flow rated to 25 GPM at 10 psi pressure drop. Cash Acme Heat Guard 110-D Series, "Leonard" Lawler or equal.

2.8 TRAP PRIMER VALVES

- A. Manufacturers: PPP Industries, Ancon, Smith, Watts or equal.
- B. Bronze body, O-ring seals, integral threaded outlet vacuum breaker, in conformance with ANSI/ASSE 1018. PPP Model P-1/P-2.

2.9 SAFINGS

- A. Manufacturers: Noble, Oatey or equal.
- B. Chlorinated polyethylene sheeting, 40 mils thick, ASTM D4068, with CPE solvent; or 3 lb./sq.ft. sheet lead.

2.10 VENT FLASHINGS

- A. Manufacturers: Semco, Oatey or equal.
- B. Formed 3 lb./sq.ft. lead flashing with minimum base size of 15"x17".

2.11 MISCELLANEOUS PIPING SPECIALTIES

- A. Piping specialties such as escutcheons, dielectric fittings, sleeves, and sleeve seals are specified in Section 15050 Basic Mechanical Materials and Methods.
- B. Strainers: Y pattern, except where otherwise indicated, full size of connecting piping. Include Type 304 stainless steel screens with 3/64-inch perforations except where other screens are indicated.
- C. Underground valve boxes with extensions to grade as required with hinged deep galvanized pedestrian traffic cover with drainage port to be provided at the bottom. Openings shall be coordinated on site. Jensen Precast, Utility Vault Co., Associated Concrete Products or equal.

3. EXECUTION

3.1 GENERAL

- A. Coordinate location and setting of plumbing specialties with adjacent construction. Install in accordance with manufacturer's recommendations.

3.2 CLEANOUTS

- A. Set level and plumb adjusted to be flush with finished floor elevation, or finished wall location.
- B. Allow minimum of 18" clearance around cleanouts for rodding. Lubricate threaded cleanout plugs with graphite and oil or waterproof grease.
- C. Install cleanouts in above-ground piping and building drain piping according to the following:
 - 1. Size same as drainage piping up to 6-inch size. Use 6-inch size for larger drainage piping except where larger size cleanout is indicated.
 - 2. Locate at each change in direction of piping greater than 45 degrees.
 - 3. Locate at minimum intervals of 75 feet for sanitary waste and storm piping.
 - 4. Locate at base of each vertical soil or waste stack.

- 5. Locate at minimum intervals of 50 feet for grease waste piping.
- D. Install flashing flange and clamping device with each stack and cleanout passing through floors having waterproof membrane.

3.3 WATER HAMMER ARRESTORS

- A. Install where indicated and at quick closing valves.

3.4 VALVE BOXES

- A. Set level and plumb centered over valve. Set bottom flange on undisturbed soil or compacted granular backfill. Where plastic piping is used, provide cast iron or concrete bearing pad below valve. Adjust top section to finished grade level.

3.5 SAFING

- A. Install safing at floor drains above grade. Extend 12" beyond drains in all directions.
- B. Cover entire floor in showers and extend 6" up walls above curb and to a height of 6' (3" wide each direction) in corners.
- C. Install on concrete floor that is smooth and free of debris.
- D. Seal all joints and connect to drain body clamp. Safing is subject to standing water leak test.

3.6 VENT PENETRATIONS

- A. Flash vent penetrations through roof. Turn down top of lead flashings into vent pipe. Tighten drawband of membrane boot to vent pipe. Adhere base flashing to deck or membrane.
- B. Provide waterproof patch around penetration on existing roofs.

3.7 CONNECTIONS

- A. Supply Runouts to Fixtures: Install hot- and cold-water supply piping runouts to fixtures of sizes indicated.
- B. Drainage Runouts to Fixtures: Provide drainage and vent piping runouts to plumbing fixtures and drains, with approved trap, of sizes indicated.
- C. Locate drainage piping runouts as close as possible to bottom of floor slab supporting fixtures or drains.

3.8 COMMISSIONING

- A. Preparation: Perform the following before start-up:
 - 1. Systems tests are complete.

2. Damaged and defective specialties and accessories have been replaced or repaired.

3. There is clear space for servicing of specialties.

B. Before operating systems, perform these steps:

1. Close drain valves, hydrants, and hose bibbs.

2. Open valves to full open position.

3. Remove and clean strainers.

4. Verify drainage and vent piping are clear of obstructions. Flush with water until clear.

3.9 ADJUSTING

A. Adjust operation and correct deficiencies discovered during commissioning.

3.10 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

B. Place plugs in ends of uncompleted piping at end of day or when work stops.

END OF SECTION



GENE FONG
ASSOCIATES

ARCHITECTURE
PLANNING
INTERIORS

Date: 08/27/10

Memorandum No. 1

To: Amy Kraft

From: Dan Puengprechawat

Re: Revisions to the drawings and Specifications to be issued as part of an addendum

GFA Project Number: 1015

cc: Danny Kaye

The following are revisions to the drawings and Specifications to be issued to bidders as part of an addendum:

Architectural:

Sheet A1.0:

- Relocated new roof top mechanical units (AC-11, CRAC-1 and CRAC-2) to match locations shown on Mechanical drawings.
- Added ADA truncated domes (note #10) at front of existing exterior ADA path of travel and accessible entry doors.
- Added ADA off street parking signage (note #11).

Sheet A4.1:

- Added note # 13 "(N)Soap Dispenser, To Match (E)Adj. Bathrm., Typ." to detail 10B/A4.1.

Sheet A5.1:

- Detail 1 : Added notes: "2) For clg. areas exceeding 1,000sf, horizontal restraints of the clg to the structural system shall be provided", "3) For clg. areas exceeding 2,500 sf, a seismic separation joint or full ht. partitions that break the clg. up in the areas not exceeding 2,500 sf shall be provided".
- Detail 2 : Added notes "Heavy Duty T-Bar", "ACT Panel –See 5A5.1 for Gyp.bd. –See 9/A5.1", "Pop Revit @ Ea.Tee or Runner. (For Gyp.bd. provide additional type-S self tapping screws @ 12" o.c.)".
- Detail 5 : Added notes "5) The ACT suspended clg system to meet ICC approval number 1308.", "6) See details 1,2,6/A5.1 for more info."
- Detail 6 : Added notes "5) The ACT suspended clg. system to meet ICC Approval number ESR-1308", "6) The gyp.bd. suspended clg system to meet ICC approval number ESR-1289", "7) Use only heavy T-bar grid system", "8) Periodic special inspection is required".

- Revised detail 9 Typical Suspended Gyp.bd. Ceiling Bracing and Support to meet ICC Approval Number 1289.

Structural:

Sheet S.4:

- Relocated new roof top mechanical units (AC-11, CRAC-1 and CRAC-2) to match locations shown on Mechanical drawings.

Sheet S-6:

- Revised detail 1 Typical Non-Bearing Steel Stud Schedule.

MEP:

Specification Section 15300, item 2.17:

- To clarify the pre-action fire sprinkler system for the MDF and IDF rooms.

Specification Section 15430, item 2.2:

- To specify Trench drain correctly.

Sheet M-0.2:

- Additional notes to clarify wiring diagrams and package roof top equipment, controls shall be factory mounted.

Sheet M-3.1:

- To clarify and accurately depict Mechanical equipment and systems on the plan.

Sheet M-5.1:

- To clarify mechanical equipment included.

Sheet M-6.1:

- To clarify and coordinate with Electrical plans.

Sheet M6.2 Controls Details:

- Additional sheet to accommodate Trane Control Diagram.

Sheet E-2.1.3:

- To clarify Electrical fixture locations in designated P&O area.

Sheet E-3.1:

- To depict the change of locations from the MDF room and the IDF room.

Sheet E-3.2:

- To depict the change of locations from the MDF room and the IDF room.

Sheet P-2.2.3:

- To depict and define new compressed air piping.



1975 NO. BATAVIA STREET
ORANGE, CA 92865
Phone: (714) 998-3790
Fax (714) 282-0835

Request for Information

RFI #: 3
Date: 8/27/2010
To: TOTUM CONSULTING
Attn: DANNY KAYE

Job: UCLA - MICHIGAN OPERATIONS CENTER
Address: 2211 MICHIGAN AVE., SANTA MONICA, CA 90401
Fax: 818-610-1547

Information requested:

1. DWG. S-6, DETAIL #1 INDICATE THE TYPE OF METAL STUDS TO BE USED FOR NEW WALLS. SOME OF THE WALLS WILL BE 19' HIGH AND THE SCHEDULE DO NOT INCLUDE THE STUDS FOR THESE WALLS. PLEASE, ADVISE.
2. PER SECTION 10160, THE NEW TOILET PARTITION WILL BE OVEN-BAKED METAL PARTITIONS. PER PLANS WE HAVE TO MATCH EXISTING PARTITIONS FROM ADJACENT RESTROOM - THESE ARE STAINLESS STEEL. PLEASE, ADVISE WHAT TO FOLLOW, THE SPECIFICATIONS OR THE PLANS.
3. DWG. A-2.2, NOTE #2 INDICATE TO INSTALL R-19 BATT INSULATION BELOW ROOF SHEETING. DWG. A-7.1, C-5 INDICATE TO INSTALL R-30 ROOF INSULATION AT (E) VOLUME CEILING. PLEASE, ADVISE WHICH TYPE OF INSULATION TO USE.
4. DID THE WAREHOUSE AREAS WILL RECEIVE NEW INSULATION?
5. IT IS ACCEPTABLE TO INSTALL BATT INSULATION IF THE CEILING REMAIN OPEN. IF NOT, PLEASE, SPECIFY THE TYPE.

Date Needed by: A.S.A.P.

Submitted by: Doina Leonte
Estimator

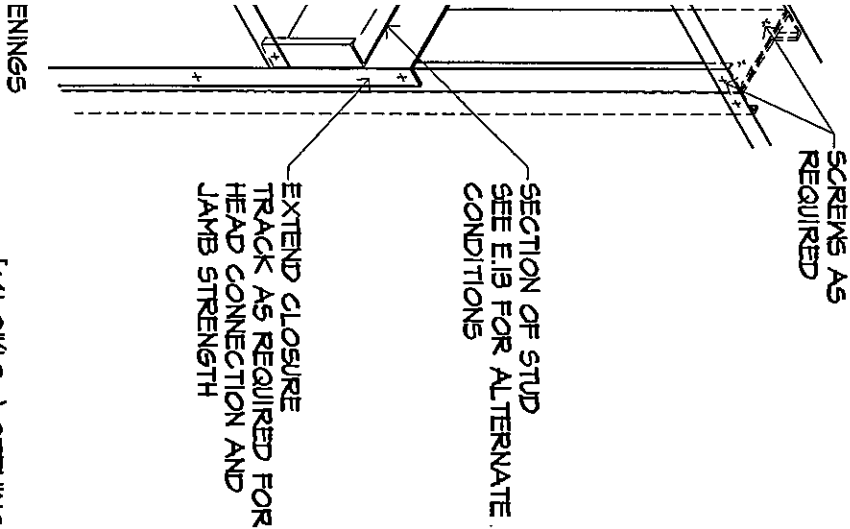
CC: _____

Response:	1. See attached revised detail 1/S-6.
	2. Please provide new toilet partitions as shown on the Drawings (to match adjacent existing bathrms).
	3. See previous RFI.
	4. Insulation at the back warehouse to remain.
	5. New roof insulation type to match existing insulation at the back warehouse area.

Response Date: _____

Response By: _____

CC: _____



STUD *	HEIGHT	SPACING	LAT. LOAD	COVERING	LOCATION
3625/25-33	UP TO 20'-8"	16"	5 PSF	DRYWALL	INTERIOR
3625/25-33	UP TO 22'-6"	12"	5 PSF	DRYWALL	INTERIOR

*ALL STUDS BY STEEL STUD MANUFACTURER ASSOCIATION (ICC ER4943P)

MEMBER DEPTH:
 (EXAMPLE: 6" = 600X/1000 INCHES)
 ALL MEMBER DEPTHS ARE TAKEN IN 1/1000 INCHES. FOR ALL "T" SECTIONS MEMBER DEPTH IS THE INSIDE TO INSIDE DIMENSION



FLANGE WIDTH:
 (EXAMPLE: 1 5/8" = 1.625" ≈ 162X/1000 INCHES)
 ALL FLANGE WIDTHS ARE TAKEN IN 1/1000 INCHES.

20 GAUGE = 33 MILS
 18 GAUGE = 43 MILS
 16 GAUGE = 54 MILS
 14 GAUGE = 68 MILS

STYLE:
 (EXAMPLE: STUD OR JOIST SECTION = S)
 THE FOUR ALPHA CHARACTERS UTILIZED BY THE DESIGNATOR SYSTEM ARE:
 S = STUD OR JOIST SECTIONS
 T = TRACK SECTIONS
 U = CHANNEL SECTIONS
 F = FURRING CHANNEL SECTIONS

MATERIAL THICKNESS:
 (EXAMPLE: 0.054 IN. = 54 MILS;
 1 MIL = 1/1000 IN.)
 MAT. THICKNESS IS THE MIN. BASE METAL THICKNESS IN MILS. MINIMUM BASE METAL THICKNESS REPRESENTS 95% OF THE DESIGN THICKNESS.

BEARING JAMB & HEAD 5

TYP. NON-BEARING STEEL STUD SCHEDULE 1

8/30/10

5-63



1975 NO. BATAVIA STREET
ORANGE, CA 92865
Phone: (714) 998-3790
Fax (714) 282-0835

Request for Information

RFI #: 2
Date: 8/26/2010
To: TOTUM CONSULTING
Attn: DANNY KAYE

Job: UCLA - MICHIGAN OPERATIONS CENTER
Address: 2211 MICHIGAN AVE., SANTA MONICA, CA 90401
Fax: 818-610-1547

Information requested:

1. PLEASE, SPECIFY THE MANUFACTURER AND MODEL NO. FOR ALL DOOR HARDWARE.
2. PER ADDENDUM #2, THE GENERAL CONTRACTOR WILL FURNISH AND INSTALL THE NEW ELECTRICAL CHAIN HOIST. PLEASE, SPECIFY THE MODEL NO.
3. DETAIL #9/S-6, INDICATE TO INSTALL NEW CANTILEVER HOIST BEAM. PLEASE, SPECIFY THE DIMENSION "L" AND THE HEIGHT INSTALLATION.
4. EXISTING WAREHOUSE HAVE A METAL WALLCOVERING, 8' HIGH. PLEASE, SPECIFY IF THE WALLCOVERING WILL BE REMOVED OR REMAIN AS IS.
5. PLEASE, CONFIRM THAT THE CARD READERS ARE NOT PART OF THIS PROJECT, WE WILL INSTALL ALL SPECIFIED DOOR HARDWARE AND PROVIDE CONDUIT BUT THE CARD READERS WILL BE INSTALLED BY OTHERS.
6. STRUCTURAL PLANS S-2 & S-5 INDICATE TO CUT PORTION OF EXISTING SLOPED SLAB ON GRADE TO INSTALL NEW CONCRETE WALLS. ON SITE THIS AREA IS NOT SLOPED. PLEASE, CLARIFY IS WE HAVE TO CUT ALL CONCRETE IN ORDER TO PROVIDE THE SLOPE PER DETAILS.
7. THE WAREHOUSE HAVE CERAMIC TILE THROUGHOUT. IN ORDER TO CONNECT NEW TRENCH DRAIN AT LOADING DOCK TO THE EXISTING STORM DRAIN SYSTEM, WE HAVE TO DEMO PORTION OF THE CERAMIC TILE FLOOR. PLEASE, CLARIFY IF WE HAVE TO INCLUDE THE CERAMIC TILE PATCH OR A CONCRETE PATCH WILL BE ACCEPTABLE.

Date Needed by: A.S.A.P.

Submitted by: Doina Leonte
Estimator

CC: _____

Response:

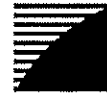
- #1: See Dr. Hardware Note #1 sheet A7.1.
#2: See note #13 sheet A2.1.
#3: "L" 6ft, "H" 10ft.
#4: Wall covering in warehouse to remain.
#5: Confirmed.
#6: Cut existing top slab per D1.1 and A2.1. Existing sloped concrete dock at lowered elevation to be verified in field.
#7: No ceramic tile patch required at portion demo.

Response Date: _____

Response By: _____

CC: _____

DATE: 8/27/2010
RFI NO.: 6
REPLY NEEDED BY: 8/31/2010
REPLY ATTENTION: maryann@spcinc.com



SIERRA PACIFIC CONSTRUCTORS

REQUEST FOR INFORMATION/CLARIFICATION

PROJECT: UCLA Michigan Operations Center
2211 Michigan Avenue
Santa Monica, CA

TO: TOTUM CONSULTING

Project Number:

SPC Job No.

ATTN: Danny Kaye

Specification Section:

Paragraph:

Drawing:

A-2.2 and A-7.1

Detail:

REQUEST / RECOMMENDATION:

Attachments:



Keynote 2 on sheet A-2.2 requests R-19 roof insulation. But in Finish Keynotes on Sheet A7.1, Ceiling finish C5 indicates new R-30 roof insulation. Please clarify work required.

Roof insulation to be R-19 to match (E) roof insulation @ brick stage area.

REPLY:

DATE: 8/30/10

CC:

Attachments:



DATE: 8/27/2010
RFI NO.: 7
REPLY NEEDED BY: 8/31/2010
REPLY ATTENTION: maryann@spcinc.com



SIERRA PACIFIC CONSTRUCTORS

REQUEST FOR INFORMATION/CLARIFICATION

PROJECT:	TO:
UCLA Michigan Operations Center	TOTUM CONSULTING
2211 Michigan Avenue	
Santa Monica, CA	
Project Number:	
SPC Job No.	ATTN: Danny Kaye
Specification Section:	Paragraph:
Drawing: S-4	Detail:

REQUEST / RECOMMENDATION:

Attachments:

☐

Please provide connection details and hardware specifications for new PSL's noted on sheet S-4.

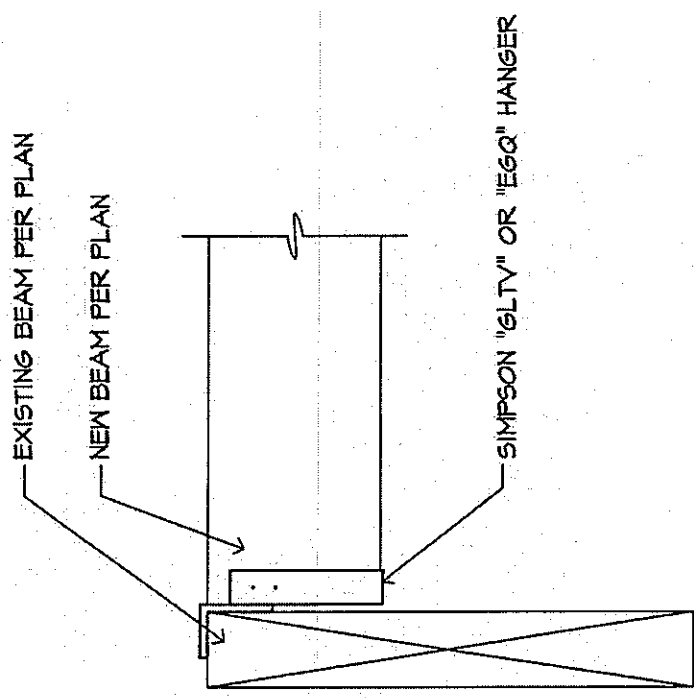
Please see attached detail SK-1.

REPLY:	DATE: 8/30/10
--------	---------------

CC:

Attachments:

☐



FC010-01

TYPICAL NEW BEAM TO EXISTING BEAM

2006-11-6

SK-1

8/10/10

DATE: 8/27/2010
RFI NO.: 8
REPLY NEEDED BY: 8/31/2010
REPLY ATTENTION: maryann@spcinc.com



SIERRA PACIFIC CONSTRUCTORS

REQUEST FOR INFORMATION/CLARIFICATION

PROJECT:	TO:
UCLA Michigan Operations Center	TOTUM CONSULTING
2211 Michigan Avenue	
Santa Monica, CA	
Project Number:	
SPC Job No.	ATTN: Danny Kaye
Specification Section:	Paragraph:
Drawing: A-2.3 & S-4	Detail:

REQUEST / RECOMMENDATION:

Attachments:

☐

Existing finishes on second floor mezzanine are indicated as existing to remain. Is installation of the new PSLs and framing acceptable through the roof deck, to avoid destruction and required patching and repair back of finishes.

Acceptable (Means & Method of construction to be determined by G.C.).

REPLY:

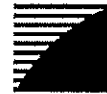
DATE: 8/30/10

CC:

Attachments:

☐

DATE: 8/27/2010
RFI NO.: 9
REPLY NEEDED BY: 8/31/2010
REPLY ATTENTION: maryann@spcinc.com



SIERRA PACIFIC CONSTRUCTORS

REQUEST FOR INFORMATION/CLARIFICATION

PROJECT:	TO:
UCLA Michigan Operations Center	TOTUM CONSULTING
2211 Michigan Avenue	
Santa Monica, CA	
Project Number:	
SPC Job No.	ATTN: Danny Kaye
Specification Section:	Paragraph:
Drawing: D-1-1	Detail:

REQUEST / RECOMMENDATION:

Attachments:

☐

Please provide recommendation for ceramic tile patch back method at loading dock, portion of demolished compressor room, trench drain tie into storm drain, and tie into new stair at loading dock. It should be assumed that new ceramic tile and trim will not match the existing.

No replacement of ceramic tile is req'd. Demo (E) ceramic tile in straight lines fashion to minimize damage to (E) adj. tiles. New conc. to match (E) ceramic tile elevation.

REPLY:

DATE:

CC:

Attachments:

☐

RFI

To: Danny Kaye, Totum

From: Maria Antonicelli

E-Mail: danny@totumconsulting.com

Pages: 2

Phone: 310-351-0138

Date: August 25, 2010

Re: UCLA Michigan Operations

Proposal #: 19668

☐ Urgent ☐ For Review ☐ Please Comment ☐ Please Reply ☐ Please Recycle

● Comments:

Please respond to the following questions:

1. Sheet A-1.0 – There is no explanation for keynotes at parking lot. Please confirm that there is no exterior work as part of our scope.
 2. Note #11/D-1.0 – Note #11 indicates that there is existing chain link fencing and gates to remain in the warehouse area. This is not correct. There is none existing. Will new fencing be required and will this be added to our scope of work.
 3. Please confirm that security devices are NIC and that GC is to provide conduit and boxes only.
 4. Sheet M-0.2 – Unit Schedule includes unit CRAC-03 for future. Should the cost of this unit be included in our cost at this time? If yes, will unit be placed on the roof top to be connected electrical and new duct work at a later date?
 5. Responsibility Matrix – Please specify shelving; make, model #, manufacturer and quantity that GC is to furnish and install.
 6. Note #18/A-2.1 – Please specify model # and quantity of horizontal wall track system by Chief Manufacturing.
 7. Spec Section #15300, Item 2.17 calls for Pre-Action fire sprinkler system in RMS 2532, 2530, 2528A. These rooms do not exist on the plans. Please advise if this is required and which rooms a Pre-Action system is required for and the size of the rooms if not noted on the plans.
-

August 25, 2010

8. Spec Section 15300, Item 1.1 B calls out for "complete OSHPD approved operating system". Is this correct? Is this project to be considered an "OSHPD" project? Please advise.
9. Spec Section #16720, Item 1, 1.1 D calls for a "complete and fully functional manual and automatic, addressable fire detection and audible/visual annunciation alarm system" and "full smoke coverage in all rooms of the project". 2007 CFC does not require audible/visual notification throughout, nor does it require full area smoke detector coverage in the size and type of occupancy. Will "full smoke [detector] coverage" and "audible/visual annunciation" still be required? Please advise.

If there is a possibility to extend the schedule due to these additional questions the additional time would be greatly appreciated.

Please let me know if you need any further clarification of the above questions.

Please feel free to contact me if you have any questions. I can be reached at 818-906-6200, ext. 222.

Thank you,

Maria

- #1: No work on the existing parking lot.
- #2: See previous response to RFI.
- #3: Confirmed by the University.
- #4: Provide roof structural requirements for CRAC-03 only - no allowance for future unit in this project.
- #5: Pending.
- #6: Chief Manufacturing model "KSA-1022" or equal. Quantity to be confirm by the University.
- #7: Rooms requiring pre-action shall be the IDF and the MDF rooms
- #8: This project is not OSHPD
- #9: The specification section 16720, item 1, 1.1 D will be changed to read "complete and fully functional manual and automatic fire sprinkler monitoring system with addressable fire detection and audible/visual annunciation alarm system, per code"

