

UNIVERSITY OF CALIFORNIA, SANTA BARBARA

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SANTA BARBARA • SANTA CRUZ

OFFICE OF DESIGN & CONSTRUCTION SERVICES and PHYSICAL FACILITIES

CONTRACTING SERVICES  
Building 439  
Santa Barbara, California 93106-1030  
Telephone (805) 893-3356  
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**SENT VIA:**  FAX ON THIS DATE  
 HAND DELIVERY ON THIS DATE  
 FEDERAL EXPRESS ON THIS DATE  
 UNITED PARCEL SERVICE ON THIS DATE

HOLDERS OF PLANS AND SPECIFICATIONS:

MRL Lab Remodel, Room 1056  
Project No. FM070242S/987656

**Addendum No. 1**

March 27, 2007

Enclosed is **ADDENDUM NO. 1** to the Construction Documents on the above-captioned project.

Bid date is **Wednesday, April 4, 2007 at 2:30 P.M.** to be held at:

CONTRACTING SERVICES  
Facilities Management, Bldg. 439,  
Door #E, Reception Counter  
University of California, Santa Barbara  
Santa Barbara, CA 93106-1030.

Late arrivals shall be disqualified. Please allow time for unforeseen traffic delays, securing a parking permit and potential parking problems.



Anna Galanis  
Director, Contracting Services

ADDENDUM NUMBER 1

to the

CONSTRUCTION DOCUMENTS

MARCH 27, 2007

**GENERAL**

The following changes, additions or deletions shall be made to the following document(s) as Indicated; all other conditions shall remain the same.

**I. SPECIFICATIONS**

Item No.

1. Section 09980 – “Polymer Flooring” Part 2 Products, 2.01,  
“MANUFACTURERS”; **Add** “D, Floor Finish” to read in it’s entirety “The polymer floor finish shall be: **Color Flake with Clear Coat.**”
2. Specification Section 15410- "Plumbing Piping" pages 1 thru 7; **Add**  
Specification Section 15410, Plumbing Piping, in it’s entirety.

**II. DRAWINGS**

Item No.

1. DRAWING NO. A2.1 (PARTIAL FLOOR PLAN-FIRST FLOOR); **Add** the following  
keynote:  
"7. Patch and Paint ceiling where disturbed by work associated with  
demolition and subsequent build-out."
2. DRAWING NO. P 2.1 (PARTIAL PLUMBING DEMO FLOOR PLAN); **Replace**  
existing Drawing P 2.1 with attached Drawing P 2.1 , dated 3/23/2007,in its entirety:

END OF ADDENDUM NO. 1

SECTION 15410

PLUMBING PIPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SECTION INCLUDES

- A. Pipe, pipe fittings, valves, and connections for piping systems.
  - 1. Industrial and Domestic water.
  - 2. Deionized water.
  - 3. Acid waste and vent.
  - 4. Compressed air, oxygen, argon and nitrogen.

1.03 RELATED SECTIONS

- A. Division 7 - Firestopping.
- B. Division 9 - Painting.
- C. Section 15000 - Mechanical Requirements.
- D. Section 15140 - Supports and Anchors.
- E. Section 15190 - Mechanical Identification.
- F. Section 15260 - Piping Insulation.
- G. Division 16 - Electrical.

1.04 REFERENCES

- A. AGA Z21.22 - Relief Valves and Automatic Gas Shutoff Devices for Hot Water Supply Systems.
- B. ASME B16.3 - Malleable Iron Threaded Fittings.
- C. ASME B16.4 - Cast Iron Threaded Fittings Class 125 and 250.
- D. ASME B16.18 - Cast Copper Alloy Solder Joint Pressure Fittings.
- E. ASME B16.22 - Wrought Copper and Bronze Solder Joint Pressure Fittings.
- F. ASME B16.23 - Cast Copper Alloy Solder Joint Drainage Fittings - DWV.
- G. ASME B16.26 - Cast Bronze Fittings for Flared Copper Tubes.
- H. ASME B16.29 - Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings - DWV.
- I. ASME B31.9 - Building Service Piping.
- J. ASME B31.2 - Fuel Gas Piping. ASME SEC IX - Welding and Brazing Qualifications.
- K. ASTM A53 - Pipe, Steel, Black and Hot-Dipped Zinc Coated, Welded and Seamless.
- L. ASTM A74 - Cast Iron Soil Pipe and Fittings.
- M. ASTM A234/A234M - Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.
- N. ASTM B32 - Solder Metal.
- O. ASTM B42 - Seamless Copper Pipe.
- P. ASTM B43 - Seamless Red Brass Pipe.
- Q. ASTM B68 - Seamless Copper Tube
- R. ASTM B75 - Seamless Copper Tube ASTM B88 - Seamless Copper Water Tube
- S. ASTM B251 - Wrought Seamless Copper and Copper-Alloy Tube

- T. AB. ASTM B280 - Seamless Copper Tube for Air Conditioning and Refrigeration Field Service.
- U. ASTM B302 - Threadless Copper Pipe (TP).
- V. ASTM B306 - Copper Drainage Tube (DWV).
- W. ASTM C4 - Clay Drain Tile.
- X. ASTM C564 - Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
- Y. ASTM E814 - Fire Tests of Through-Penetration Fire Stops.
- Z. ASTM F708 - Design and Installation of Rigid Pipe Hangers.
- AA. ASTM D2239 - Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter.
- BB. ASTM D2241 - Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).
- CC. ASTM D2447 - Polyethylene (PE) Plastic Pipe Schedules 40 and 80, Based on Outside Diameter.
- DD. ASTM D2466 - Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
- EE. ASTM D2513 - Thermoplastic Gas Pressure Pipe, Tubing and Fittings.
- FF. ASTM D2564 - Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
- GG. ASTM D2609 - Plastic Insert Fittings for Polyethylene (PE) Plastic Pipe.
- HH. ASTM D2665 - Poly(Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings.
- II. ASTM D2729 - Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- JJ. ASTM D2855 - Making Solvent-Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings.
- KK. ASTM D3034 - Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
- LL. ASTM F679 - Poly(Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings.
- MM. AWWA C651 - Disinfecting Water Mains.
- NN. AWWA C900 - Polyvinyl Chloride (PVC) Pressure Pipe, 4 in. Through 12 in. for Water Distribution.
- OO. AWS A5.8 - Brazing Filler Metal.
- PP. CISPI 301 - Cast Iron Soil Pipe and Fittings for Hubless Cast Iron Sanitary Systems.
- QQ. CISPI 310 - Joints for Hubless Cast Iron Sanitary Systems.
- RR. MSS SP89 - Pipe Hangers and Supports - Fabrication and Installation Practices.
- SS. MSS SP-110 - Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends.
- TT. NCPWB - Procedure Specifications for Pipe Welding.
- UU. NFPA 54 - National Fuel Gas Code.
- VV. UL 1479 - Fire Tests of Through-Penetration Firestops.

#### 1.05 SUBMITTALS

- A. Submit under provisions of Section 15000 and Division 1 - "Submittals" Section.
- B. Product Data: Provide data on pipe materials, pipe fittings, valves, and accessories. Provide manufacturers catalog information. Indicate valve data and ratings.
- C. Project Record Documents: Record actual locations of valves.

#### 1.06 QUALITY ASSURANCE

- A. Perform Work per Applicable Code Requirements.
- B. Valves: Manufacturer's name and pressure rating marked on valve body.
- C. Identify pipe with marking including size, ASTM material classification, ASTM specification, potable water certification, water pressure rating.

#### 1.07 REGULATORY REQUIREMENTS

- A. Install backflow prevention devices per Applicable Code Requirements.

- B. Provide certificate of compliance per Applicable Code Requirements indicating approval of installation of backflow prevention devices.

#### 1.08 DELIVERY, STORAGE, AND PROTECTION

- A. Comply with Division 1 - "Materials and Equipment": Transport, handle, store, and protect products.
- B. Accept valves on site in shipping containers with labeling in place. Inspect for damage.
- C. Provide temporary protective coating on cast iron and steel valves.
- D. Provide temporary end caps and closures on piping and fittings. Maintain in place until installation.
- E. Protect piping systems from entry of foreign materials by temporary covers, completed sections of the Work, and isolating parts of completed system.

#### 1.09 ENVIRONMENTAL REQUIREMENTS

- A. Do not install underground piping when bedding is wet.

### PART 2 - PRODUCTS

#### 2.01 INDUSTRIAL AND DOMESTIC WATER PIPING

- A. Copper Tubing: ASTM B88, Type L hard drawn.
  - 1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
  - 2. Joints: ASTM B32, solder, Grade 95TA.
  - 3. Valves: Three-piece ball valves.

#### 2.02 DEIONIZED WATER PIPING

- A. PVC Pipe Schedule 80: ASTM-D-1784.
  - 1. Fittings: Threaded Schedule 80 PVC fittings ASTM - 2464.
  - 2. Joints: Threaded ASTM -2464.

#### 2.03 ACID WASTE AND VENT PIPING

- A. Laboratory Waste and Vent Piping: Spears "LabWaste" CPVC, ASTM D1784.
  - a. Fittings: Spears "LabWaste" CPVC, ASTM D3311, with configurations to maintain ¼ inch per foot drainage slope.
  - b. Joints: Spears one step solvent cement, ASTM F493, specifically formulated for corrosive/acid waste applications. Threaded joints may also be used where required per NPT. Special compression couplings shall be used when making connections to polypropylene, glass or other piping materials.
  - c. Support to avoid stress caused by sagging. Provide supports every 6 feet minimum.

#### 2.04 COMPRESSED AIR, OXYGEN AND NITROGEN PIPING

- A. Copper Tubing: ASTM B88, Type K hard drawn.
  - 1. Fittings: ASME B16.18, cast copper alloy or ASME B16.22, wrought copper and bronze.
  - 2. Joints: ASTM B32, solder, Grade 95TA.

#### 2.05 ARGON GAS PIPING

- A. 316SS Swagelok stainless steel tubing. Match University standard for pressure ratings.
  - 3. Fittings: Swagelok.

#### 2.06 BALL VALVES

- A. Manufacturers:

1. NIBCO
2. Stockham
3. Or equal

- B. 3”and Smaller: Class 150, 400 psi CWP, bronze, three-piece body, chrome plated brass ball, full port, Teflon seats and stuffing box ring, blow-out proof stem, lever handle, solder or threaded ends with union.

## 2.07 GAS BALL VALVES

- B. Construction: Bronze, three piece body, full port for sizes up to 1 inch and conventional port for 1-1/4 to 3 inch sizes, with threaded ends.  
Conforming to MSS SP-110, CSA certified to ANSI/ASME B 16.33 and CGA 3.16 for natural gas to 125 PSIG. Substitute factory install zinc plated steel handle with stainless steel lever handle and nut in corrosive environments.

## 2.08 FIRE STOP SYSTEMS

- A. UL listed assembly. Specified in Division 7 - “Firestopping”.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Verify existing conditions before starting Work.
- B. Verify that excavations are to required grade, dry, and not over-excavated.

### 3.02 PREPARATION

- A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.
- B. Remove scale and dirt, on inside and outside, before assembly.
- C. Prepare piping connections to equipment with flanges or unions.

### 3.03 SAWCUTTING, TRENCHING, BACKFILLING AND CORE DRILLING

- A. Provide all necessary sawcutting and core drilling required for the proper installation of the Work of this Section.
- B. Lay underground lines on undisturbed soil where possible. Excavate under hubs of pipes so that no weight is supported on the hub. Place 6” of clean cohesionless sand ( in the Unified Soils Classification System) minimum all around pipes.
- C. After underground pipe and equipment have been tested and accepted, backfill with the excavated material or acceptable imported soil. Backfill material shall be free of clods or stone larger than 2” in dimension. Install backfill material in thin layers (less than ten inches uncompacted thickness), brought to near the optimum moisture content and compacted to a minimum of 90% of the maximum density obtainable by ASTM Test Method D1557, unless higher density is specified in Division 1 “Earthwork” Section.
- D. If it becomes necessary to import materials from offsite to complete site grading, imported soils should consist of essentially granular, silty sands with low expansion potential and free of grasses, weeds, debris, rocks larger than 3 inches in maximum dimension, and soluble sulfates in excess of 200 parts per million. Imported fill should contain sufficient silt and clay binder to render them stable in footing trenches and capable of maintaining specified elevation tolerances during paving operations.

- E. Paving and other surfaces disturbed by the installation of new lines must be restored to the original line and grade which existed before excavations were made. Sawcut concrete areas to facilitate restored condition.
- F. Sawcutting:
  - 1. Sawcut and/or core drill existing surface to facilitate new piping. Do not cut path or core drill without prior approval from the University's Representative.
  - 2. Segregate and dispose of demolished concrete or other materials.
  - 3. Carefully excavate trench to prevent damage to existing Work. Restore existing Work found damaged to its intended condition.
  - 4. Inform the University's Representative where necessary to replace materials to original condition and maintain integrity with reinforcement methods.
  - 5. Comply with requirements for excavation, backfill and compaction specified in Division 2 "Earthwork Section."
  - 6. Restore any disturbed surfaces to the original condition which existed before.

### 3.04 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.
- C. Route piping in orderly manner and maintain gradient. Route parallel and perpendicular to walls.
- D. Install piping to maintain headroom, conserve space, and not interfere with use of space.
- E. Group piping whenever practical at common elevations.
- F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.
- G. Provide clearance in hangers and from structure and other equipment for installation of insulation and access to valves and fittings.
- H. Provide access where valves and fittings are not exposed.
- I. Install vent piping penetrating roofed areas to maintain integrity of roof assembly.
- J. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.
- K. Prepare exposed, unfinished pipe, fittings, supports, and accessories ready for finish painting. Refer to Division 9 "Painting" Section.
- L. Install valves with stems upright or horizontal, not inverted.
- M. Install water piping to ASME B31.9.
- N. Install supply connections to fixtures through wall as high under fixtures as possible and take off water lines from top of main.
- O. Unions: Install adjacent to each screwed valve and on connections to equipment. Installation of inaccessible unions not approved.
- P. Shut-offs: Install ball valve in each branch line where branch takes off main, at connections to equipment, and as shown to isolate sections of piping and fixtures for repairs.
- Q. Expansion, Hot Water Supply and Return Piping: Provide swing or swivel joints on connections from mains to risers; from risers to branches.
- R. Sleeve pipes passing through partitions, walls and floors.
- S. Inserts:
  - 1. Hang piping from structural frame. Do not support piping from metal deck tabs or metal deck unless approved by University's Representative.
  - 2. Do not hang piping from other building equipment.
  - 3. Provide inserts for placement in concrete formwork.
  - 4. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.

5. Provide hooked rod to concrete reinforcement section for inserts carrying pipe over 4 inches.
6. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
7. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and recessed into and grouted flush with slab.
8. Prime coat exposed steel hangers and supports. Refer to Division 9 Section "Painting". Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.
9. Provide hangers adjacent to motor driven equipment with vibration isolation.
10. Support cast iron drainage piping at every joint.

### 3.05 APPLICATION

- A. Use grooved mechanical couplings and fasteners only in accessible locations.
- B. Install unions downstream of valves and at equipment or apparatus connections.
- C. Install brass male adapters each side of valves in copper piped system. Solder adapters to pipe.
- D. Install ball valves for shut-off and to isolate equipment, fixtures, part of systems, or vertical risers.
- E. Provide cleanouts at changes in direction in waste pipe and every 50 feet within buildings and every 100 feet outside of buildings. Make changes in direction using long sweep bends.

### 3.06 ERECTION TOLERANCES

- A. Establish invert elevations, slopes for drainage to 1/4 inch per foot minimum. Maintain gradients.

### 3.07 ADJUSTING/ TESTING PIPING SYSTEMS

- A. Test Systems as specified. Install shut-off valves to isolate existing systems that do not require testing. Existing systems that have been connected to by new systems shall be tested to the extent of the closest new connection.
- B. Tests must be performed and systems approved prior to painting, covering, or concealing piping.
- C. Provide all test equipment, instrumentation and labor in conjunction with tests.
- D. Prior to test, protect or remove all devices, and other items which are not designed to stand pressures used in test.
- E. Accomplish testing of piping in sections so as not to leave any portion of pipe or joints untested.
- F. Obtain prior approval for test procedures.
- G. Responsibility for Damages: Bear costs of repair and restoration of Work of other trades damaged by tests or cutting done in connection with tests.
- H. Water systems: Test all portions of new water systems at hydrostatic pressure of not less than 150 psig, with 5 psig permissible drop at end of four hours.
- I. Drainage Systems: Fill entire waste and vent system with water to level of highest vent stack. System shall hold water for two hours.
- J. Compressed Air, argon and nitrogen systems: After erection of pipe and tubing but prior to installation of service outlet valves, blow systems clear of free moisture and foreign matter with nitrogen gas. Test in accordance with ANSI B31.1. Install service outlet valves, subject system to test pressure of 150 psi (1034 kPa) with compressed nitrogen. Check with soapy water. Provide 24-hour standing pressure test. Repair or replace as required to eliminate leaks, and retest to demonstrate compliance. Reduce pressure in piping systems other than system under investigation to atmospheric. Check each station outlet of every piping system to determine test gas is dispensed only from outlet of system under investigation. Measure pressure with gage attached to specific adaptor. Do not use universal adaptors. Disconnect test gas and connect proper gas to each system. Purge entire system to remove test gas. Check with analyzer suitable for gas installed.

### 3.08 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM



- A. Prior to starting Work, verify system is complete, flushed and clean. Install shut-off valves to isolate existing systems that do not require disinfecting. Existing systems that have been contaminated in any way from the new work shall be disinfected.
- B. Ensure pH of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).
- C. Inject disinfectant, free chlorine in liquid (preferred) or gas form, throughout system to obtain 50 to 80 mg/L residual. Tablets or powders are not allowed.
- D. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.
- E. Maintain disinfectant in system for 24 hours.
- F. If final disinfectant residual tests less than 25 mg/L, repeat treatment.
- G. Flush disinfectant from system until residual equal to that of incoming water or 0.5 mg/L.
- H. Take samples no sooner than 24 hours after flushing, from 5 percent of outlets and from water entry, and analyze in accordance with AWWA C651.

### 3.09 INDUSTRIAL WATER

- A. Install shut-off valves to isolate existing systems that do not require flushing.
- B. Verify system is complete, flush and clean new and existing systems that have been contaminated in any way during construction.
- C. Bleed water from all outlets to ensure flushing is achieved at 100 percent of outlets.

END OF SECTION 15410