

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  
Fax (805) 893-8592

**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:

Glass Wash Relocation, Biological Sciences Bldg II,  
Bldg 571  
Project No: FM090343S/987723  
**Addendum No. 2**

July 20, 2009

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

Bid date has been changed from Friday, July 24, 2009 at 2:30PM to Tuesday, July 28, 2009 at 2:30PM  
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.

A handwritten signature in black ink, appearing to read "Anna Galanis".

Anna Galanis  
Director, Contracting Services

ADDENDUM NUMBER 2  
To the  
CONSTRUCTION DOCUMENTS  
7-20-2009

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. ADVERTISEMENT FOR BIDS

Item No.

1. Second page, sentence beginning with “Bid Deadline...”  
**CHANGE** to read in it’s entirety as follows:  
“Bid Deadline: Sealed bids must be received on or before 2:30PM on Tuesday, July 28, 2009. Sealed Bids will be received only at: Contracting Services, Facilities Management, Building #439, Door #E, Reception Counter, University of California, Santa Barbara, Santa Barbara, CA 93106-1030.”

II. SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

Item No.

1. Number 4, CHANGE to read in it’s entirety as follows:  
“ Bids will be received on or before the Bid Deadline: 2:30PM, Tuesday, July 28, 2009 and only at: Contracting Services, Facilities Management, Building #439, Door #E, Reception Counter, University of California, Santa Barbara, Santa Barbara, CA 93106-1030.”

III. SPECIFICATIONS

Item No.

1. TABLE OF CONTENTS  
**REPLACE** in it's entirety with attached "Table of Contents Revised per Addendum Two."

Item No.

2. Section 06410 Plastic Laminate Cabinets:  
**DELETE** in its entirety.

Item No.

3. Section 07590 Roof Maintenance and Repair:  
**REPLACE** in it's entirety with attached "Revised Roof Maintenance and Repair, Revised per Addendum Two."

Item No.

4. Section 08110 Steel Doors Frames:  
**REPLACE** in it's entirety with attached "Revised Steel Doors Frames, Revised per Addendum Two."

Item No.

5. Section 08710, Door Hardware, Part 2, Products, 2.03, Keying, Number "3":  
**CHANGE** to read in it's entirety as follows: "Contractor shall furnish permanent cores for UCSB lock shop to key."

Item No.

6. Section 08710, Door Hardware, Hardware Schedule after "End of Section", Hardware Set 1, at Glasswash door Delete line one and two:  
**DELETE** in its entirety:  
Line one and two "1 Set Pivot Reinforced Hinges CB1969R 5 X 4.5 X NRP X 630 STANLEY; 1EA Hinge CB1961R 5 X 4.5 X 630 STANLEY"

Item No.

7. Section 08710, Door Hardware, Hardware Schedule after “End of Section”, Hardware Set 1, at Glasswash door, Add new hardware lines.  
**ADD:**  
“1 EA Continuous Hinge, full mortise Model 83HD x height required, Pemco. 1 EA. Armor Plants 8400-US32Dx H x W-B4E, Stainless Screws- IVES.”

Item No.

8. Section 08710, Door Hardware, Hardware Schedule after “End of Section”, Hardware Set 2, at Autoclave door Delete line one and two:  
**DELETE** in its entirety:  
Line one and two “1 Set Pivot Reinforced Hinges CB1969R 5 X 4.5 X NRP X 630 STANLEY; 1EA Hinge CB1961R 5 X 4.5 X 630 STANLEY”

Item No.

9. Section 08710, Door Hardware, Hardware Schedule after “End of Section”, Hardware Set 2, at Autoclave door, Add new hardware lines.  
**ADD:**  
“1 EA Continuous Hinge, full mortise Model 83HD x height required, Pemco. 1 EA. Armor Plants 8400-US32Dx H x W-B4E, Stainless Screws- IVES.”

Item No.

10. Section 09260, Gypsum Board Assemblies, Part 2, Products, 2.02, Framing Materials, “A”.  
**CHANGE** to read in it’s entirety as follows:  
“A. Studs and Track: ASTM C645; galvanized steel: Use minimum 0.0329 inch base metal thickness (20 ga.) except where heavier gauge is required by ASTM C754 for fire rating or height limitations; minimum 0.0296 inch base metal thickness (20 ga) at partitions receiving abuse-resistant board, and minimum 0.0329 inch base metal thickness (20 ga) at wall hung shelves and wall hung casework. Top track shall have 2- ½ inch extended legs to allow for deflection of overhead construction.  
1. Main Runners for 6 inch Joist Ceilings: 1 ½ inch x 16 gauge cold-rolled steel channels weighting 475 lbs per thousand lineal feet, galvanized or provided with approved corrosion-inhibiting coating.”

Item No.

11. Section 09260, Gypsum Board Assemblies, Part 2, Products, 2.03, Gypsum Board Materials.

**ADD** "E" to read as follows:

"E. Products manufactured in Asia are not acceptable."

Item No.

12. Section 09900- Paints and Coatings:  
**REPLACE** in it's entirety with attached "Revised Section 09900, Paints and Coatings, Revised per Addendum Two".

Item No.

13. Section 15101, Building Services and Process Piping Schedules, SCHEDULE P-5.1, "H".

**CHANGE** to read in it's entirety as follows:

"H. Ball Valves- 2 inch and smaller; 600 psi WOG, three piece bronze body, full port, soldered connections, stainless steel ball and stem, TFE seats and packing, lever handle; NIBCO figure S 595-Y-66 2-1/2 inch shall be S-590-Y-66."

Item No.

14. Section 16131, Conduit, Part 3, Execution, 3.03, Conduit Utilization, "A", after second sentence.

**ADD:**

"Conduit shall terminate in cast conduit fittings."

Item No.

15. Section 16132, Surface Raceways, Part 1, General, 1.01, Section Includes, "A:"  
**DELETE** "A" in its entirety.

Item No.

16. Section 16132, Surface Raceways, Part 2, Products, 2.01, Surface Metal Raceways:  
**DELETE** 2.01 in its entirety.

Item No.

17. Section 16140-2 Wiring Devices, Part 2, Products, 2.01, Outlet Boxes, "C"  
**CHANGE** to read in its entirety:  
"C Material: Presses steel, zinc coated; Cast steel for exposed applications."

Item No.

18. Section 16405, Distribution Equipment, Part 2, Products, 2.03, Cabinets, "A":  
**CHANGE** to read in its entirety:  
"Design standard manufacturer: same manufacturer as for panel boards.  
Square D or equal."

IV DRAWINGS

Item No.

1. A1.01, Partial 4<sup>th</sup> Floor and Reflected Ceiling Plan,:  
"REPLACE in it's entirety with attached Revised Sheet A1.01, Partial 4<sup>th</sup> Floor and Reflected Ceiling Plan revised per Addendum Two."

Item No.

2. A3.01, Interior Elevations and Details,  
"REPLACE in it's entirety with attached Revised Sheet A3.01, Interior Elevations and Details, revised per Addendum Two."

Item No.

3. M2.04, Partial 4<sup>th</sup> Floor Ductwork & Piping Plans, Sheet Notes.  
**ADD** note 37 to read in its entirety:  
"37. Insulate (E) pipe where new pipe connections are made."

Item No.

4. M2.04, Partial 4<sup>th</sup> Floor Ductwork & Piping Plans, Sheet Notes.  
**ADD** note 38 to read in its entirety:  
"38. Remove and re-anchor duct trapeze to make room for partition type 3A."

Item No.

5. P2.04, 4<sup>th</sup> Floor Plan – Plumbing:  
**REPLACE** in it's entirety with attached:  
"Revised P2.04, 4<sup>th</sup> Floor Plan-Plumbing, revised per Addendum Two."

Item No.

6. P5.01, Details  
**REPLACE** in it's entirety with attached  
"Revised P5.01, Details, Revised per Addendum Two."

V CLARIFICATIONS

Item No.

1. E0.02, Title 24 Compliance.:  
Indoor Lighting Schedule part 2 of 2 is not needed.  
Certificate of Compliance Parts 3 of 4 and 4 of 4 are not needed.

END OF ADDENDUM NO 2

DOCUMENT 00010

TABLE OF CONTENTS

CURRENT  
ISSUE

00001 - Project Title Page  
00010 - Table of Contents

DIVISION 1 - GENERAL REQUIREMENTS

01010 - Summary of Work  
01040 - Project Coordination  
01045 - Cutting and Patching  
01046 - Selective Demolition  
01060 - Regulatory Requirements  
01090 - Abbreviations, Symbols, and Definitions  
01100 - Special Project Procedures  
01120 - Alteration Project Procedures  
01150 - Environmental Protection Requirements  
01200 - Project Meetings  
01300 - Submittals  
01310 - Progress Schedules  
01311 - Suspended Loading - Coordination and Limitations  
01340 - Shop Drawings, Product Data, and Samples  
01380 - Construction Photographs  
01400 - Quality Control  
01500 - Construction Facilities and Temporary Controls  
01505 - Construction Waste Management  
01600 - Material and Equipment  
01620 - Anchors and Fasteners  
01630 - Product Options and Substitutions  
01700 - Project Closeout  
01720 - Project Record Documents  
01730 - Operating and Maintenance Data  
01740 - Guarantees, Bonds, and Maintenance Contracts

DIVISION 2 - SITE CONSTRUCTION - NOT USED

DIVISION 3 - CONCRETE - NOT USED

DIVISION 4 - MASONRY - NOT USED

DIVISION 5 - METALS

05500 - Metal Fabrications

DIVISION 6 - WOOD AND PLASTICS

06100 - Rough Carpentry



CURRENT  
ISSUE

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

07590 - Roof Maintenance and Repair  
07840 - Firestopping and Firesafing  
07900 - Joint Sealers

DIVISION 8 - DOORS AND WINDOWS

08110 - Steel Door Frames  
08210 - Flush Wood Doors  
08310 - Access Doors  
08710 - Door Hardware  
08800 - Glazing

DIVISION 9 - FINISHES

09260 - Gypsum Board Assemblies  
09510 - Acoustical Ceilings  
09605 - Vapor Transmission Testing  
09650 - Resilient Tile Flooring  
09675 - Resinous Flooring  
09900 - Paints and Coatings

DIVISION 10 - SPECIALTIES

10260 - Corner Guards  
10520 - Fire Protection Specialties

DIVISION 11 - EQUIPMENT

11534 - Laboratory Service Fittings and Fixtures

DIVISION 12 - FURNISHINGS

12350 - Laboratory Casework and Other Furnishings  
12360 - Plastic Laminate Laboratory Casework

DIVISION 13 - SPECIAL CONSTRUCTION

13850 - Fire Alarm and Detection Systems  
13930 - Standpipe and Sprinkler Systems

DIVISION 14 - CONVEYING SYSTEMS - NOT USED

CURRENT  
ISSUE

DIVISION 15 - MECHANICAL

- 15050 - Basic Mechanical Materials and Methods
- 15057 - Variable Frequency Drives and Controls
- 15060 - Hangers and Supports
- 15070 - Mechanical Sound, Vibration, and Seismic Control
- 15075 - Mechanical Identification
- 15080 - Mechanical Insulation
- 15090 - Mechanical Restoration and Retrofit
- 15100 - Building Services and Process Piping Systems
- 15101 - Building Services and Process Piping Schedules
- 15120 - Piping Specialties
- 15121 - Thermometers and Gauges
- 15122 - Drains and Cleanouts
- 15180 - Heating and Cooling Piping
- 15410 - Plumbing Fixtures
- 15762 - Air Coils
- 15810 - Ducts
- 15831 - Fans and Ventilators
- 15840 - Air Terminal Units
- 15850 - Air Outlets and Inlets
- 15910 - Building Management System
- 15920 - BMS Field Equipment
- 15930 - BMS Sequence of Operation
- 15950 - Testing, Adjusting and Balancing

DIVISION 16 - ELECTRICAL

- 16005 - Installation of Pre-Ordered or University Furnished Equipment
- 16050 - Basic Electrical Materials and Methods
- 16071 - Seismic Control
- 16075 - Electrical Identification
- 16080 - Electrical Testing and Inspection
- 16090 - Electrical Restoration and Retrofit
- 16120 - Conductors and Cables
- 16131 - Conduit
- 16132 - Surface Raceways
- 16134 - Cabinets and Enclosures
- 16140 - Wiring Devices
- 16150 - Wiring Connections
- 16405 - Distribution Equipment
- 16500 - Lighting

END OF DOCUMENT

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**REVISED** SECTION 07590

ROOF MAINTENANCE AND REPAIR

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Repairs to existing roof where damages have occurred as a result of Project alterations.
- B. Repairs shall be performed with an approved cold material application.

1.02 EXISTING WARRANTY

- A. Verify with University if existing roof is under warranty.
- B. If roof is under warranty, notify insuring agency of intent to modify and repair, and obtain instructions concerning materials and methods required to maintain integrity of the warranty. Furnish certificate from agency indicating acceptance and incorporation of repairs in the existing warranty.

1.03 REFERENCES

- A. FS-HH-I-1972/GEN-Polyisocyanurate Insulation.
- B. ASTM D41-Standard Specification for Asphalt Primer for Used in Roofing, Damp-proofing, and Waterproofing.
- C. ASTM D312- Standard Specification for Asphalt Used in Roofing.
- D. ASTM D2178 Standard Specification for Asphalt-Impregnated Glass Felt used in Roofing and Waterproofing.
- E. NRCA-Roofing and Waterproofing Manual, Current Edition.
- F. UL-Fire Hazard Classifications.
- G. UL-Roofing System & Material Guide.
- H. ASTM D2842 - Standard Test Method for Water absorption of Rigid Cellular Plastics.
- I. ASTM E96 - Standard Test Method for Water Vapor Transmission of Materials.
- J. ASTM E108 - Standard Test Methods for Fire Test of Roof Coverings.

1.04 PERFORMANCE REQUIREMENTS

- A. Provide products that are compatible with one another under field conditions, as demonstrated by the roofing manufacturer.
- B. Provide watertight roofing system capable of resisting specified uplift pressures, thermally induced movement and exposure to weather without failing during the specified warranty period.

1.05 SUBMITTALS

- A. Shop Drawings: Detail special joint or termination conditions and conditions of interface with other materials. Drawings must be approved by membrane manufacturer.

- 
- B. Product Data: Describe material to show compliance with specified requirements.
  - C. Informational Submittals:
    - 1. Statement of applicator qualifications.
    - 2. Sample Warranty: Prior to installation, submit manufacturer's warranty form, amended to show specified terms and conditions.

#### 1.06 CERTIFICATES

- A. Manufacturer Certificates: Signed by roofing manufacturer verifying that installer is approved, authorized or licensed by manufacturer to install specified Products.
- B. Installer Certificates: Signed by installer verifying that they have the specified qualifications described below.

#### 1.07 QUALITY ASSURANCE

- A. Manufacturer: Qualified manufacturer having roofing systems listed by UL.
- B. Installer: A company and persons specializing in the application of restoration roofing, with minimum 5 years documented experience and licensed or approved to apply roofing system by manufacturer.
- C. Conform to NRCA Roofing Specifications and roofing membrane manufacturer's instructions.

#### 1.08 PRE-INSTALLATION MEETINGS

- A. Meeting: prior to commencement of roofing repair, review and document methods and procedures, including the following:
  - 1. Participants: authorized representatives of the Contractor, Owners Representative, roofing Subcontractor, roofing manufacturer, and installers of roof accessories and roof-mounted equipment.
  - 2. Review methods and procedures related to roofing installation, including manufacturer's written installation instructions.
  - 3. Review construction schedule and confirm availability of Products, Subcontractor personnel, equipment and facilities.
  - 4. Review condition of existing roof surface.
  - 5. Review flashing details, special roofing details, roof drainage, roof penetrations, equipment curbs, and other conditions affecting roofing installation.
  - 6. Review governing regulatory requirements, and requirements for insurance and certificates as applicable.
  - 7. Review safety requirements, including temporary fall-arrest measures.
  - 8. Review field quality control procedures.

#### 1.09 DELIVERY, STORAGE AND HANDLING

- A. Deliver and store Products undamaged in original containers with manufacturer's labels and seals intact.
- B. Store Products in designated areas elevated off the ground and protected from ultra-violet radiation, inclement weather and construction activities.
- C. Store solvent-based liquids away from excessive heat and open flame.

- D. Store membrane rolls on end, dry, and protected from moisture and damage. Cover rolls, insulation and other moisture-sensitive Products with tarpaulins.

#### 1.10 WARRANTY

- A. Submit extended warranties in accordance with the General Conditions of the Contract.
- B. Installer's Extended Warranty: standard industry 2 year warranty, commencing from the date of Substantial Completion of the Work.
- C. Manufacturer's Extended Warranty: a written guarantee that the manufacturer will replace, at no cost to the Owner, any portion of the roofing membrane which experiences actual leaks resulting from defects in the manufacture of the membrane for a period of 5 years, commencing from the date of Substantial Completion of the Work.

### PART 2 PRODUCTS

#### 2.01 MANUFACTURERS

- A. Tremco.
- B. GAF.
- C. Manville.
- D. Approved substitution per Section 01630.

#### 2.02 MATERIALS

- A. Furnish materials compatible with existing roofing materials. Match or exceed quality, weights, type and finishes of existing materials. Provide, as applicable, but do not be limited to:
  - 1. Vapor retarders: as compatible with insulation adhesive.
  - 2. Repair Mastic: asphalt based, fibrated type;
  - 3. Insulation materials: minimum R19; rigid fiberglass insulation panels, set in adhesive.
  - 4. Ply sheets: heavy-duty asphalt-coated fiberglass Type IV. Provide 4 ply installation.
  - 5. Bitumen: elastomeric modified bitumen, mopping grade.
  - 6. Surface coatings: Single-component, water-based, asphalt restorative top pour.
  - 7. Roofing spar or ballast: pea gravel free of fines, long splinters, dust or foreign matter, nominal ¼ to ½" diameter (verify to match existing gravel size).
  - 8. Base flashings: reinforced modified bitumen.
  - 9. Metal flashings: minimum 26 gauge galvanized metal.
  - 10. Cant strips: non-combustible material.

### PART 3 EXECUTION

#### 3.01 INSPECTION

- A. Inspect existing conditions to ensure they are suitable for roofing work to begin. Do not proceed until unacceptable conditions are corrected.
- B. Ensure substrate is solid, clean, dry and free of any contaminants prior to commencing any roofing work.
- C. Ensure Products are dry prior to installation. Replace damaged Products.

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### 3.02 PREPARATION

- A. Remove, number and neatly store metal counter flashing where approved for re-installation. Discard dented or damaged counter flashing not scheduled for re-installation.
- B. Remove existing roofing materials as designated with spray paint on roof surface.
- C. Clean roof of loose gravel, dirt, and dust by wet-vacuuming. Embedded gravel to remain in place.
- D. Protect existing roofing from damage with minimum ½" thick plywood runways.

### 3.03 MEMBRANE REPAIRS

- A. Blisters:
  - 1. Remove embedded gravel, debris, and dust from area extending at least 8" beyond perimeter of blistered area.
  - 2. Open blisters with intersecting cuts. Do not cut deeper than the last blistered ply.
  - 3. Trim resulting membrane flaps to ensure no overlap will occur when pressed back into position.
  - 4. Dry out moisture found within blister before proceeding.
  - 5. Trowel repair adhesive into opened blister. Firmly press trimmed flaps back into place.
  - 6. Trowel repair adhesive over each cut, extending 6" past the ends and a minimum 8" on either side of the cut.
  - 7. Lay a sufficiently long, 12" wide membrane into repair adhesive and dry trowel into firm, wrinkle-free contact.
  - 8. Over-trowel repair adhesive, ensuring texture of membrane weave is obliterated. Ensure application extends minimum 2" beyond membrane on all sides.
  - 9. Where blisters are more than two plies deep, reinforce cuts with plies of membrane sandwiched in appropriate applications of repair adhesive.
  - 10. Blister Repair Adhesive Application Rate: 1 gallon per 10 square feet.
- B. Unadhered Felt Edges Or Fishmouths:
  - 1. Cut away unadhered ply sheet and felts within 2" of exposed edges. Remove dust and debris, and allow to dry.
  - 2. Apply asphalt mastic to seal.
- C. Split Repair:
  - 1. Remove loose gravel and dust from surfaces within 6" along each side of split.
  - 2. Reinforce and seal splits by embedding two plies of repair membrane between continuous applications of repair adhesive; cover repair membrane completely.
  - 3. Overcoat leading edges of repair material patch with repair adhesive.
  - 4. Split Repair Adhesive Application Rate: 1 gallon per 10 square feet.

### 3.04 CANT STRIPS

- A. Install cant strips at intersections of roofing and vertical surfaces.
- B. Embed in a continuous bed of adhesive applied over existing substrate.
- C. Lay true to line, level and with flush, butt joints and accurately mitred corners.

### 3.05 AGGREGATE SURFACING

- A. Repair damages caused Apply uniform flood coat of asphalt at rate of 60 pounds per square and while hot, apply roofing aggregate at rate of 400 pounds per square.

- 
- B. Evenly distribute aggregate and ensure bond with flood coat. Extend aggregate to bottom edge of cant strips.

3.06 INSTALLATION

- A. Repair damages caused by foot traffic and movement of tools, equipment, and products across existing roof surface.
- B. Where new roof top equipment, pipe vents, and similar roof penetrations occur, install new roofing materials, in strict accordance with material manufacturer or insuring agency instructions, whichever is more stringent..

3.07 FIELD QUALITY CONTROL

- A. Contractor Inspection: Prior to application of aggregate surfacing, inspect completed membrane and flashing for punctures, tears, and discontinuously sealed seams.
- B. Apply additional layer of reinforcing membrane over punctures and tears, extending minimum 50 mm beyond damaged area in all directions, and seal seams. Cover with additional application of restoration coating.
- C. Manufacturer's Field Service: arrange for manufacturer's technical representative to regularly inspect the roofing application (minimum twice per week) and confirm that the roofing system installation is in strict accordance with manufacturer's recommendations.

END OF SECTION

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**REVISED** SECTION 08110

STEEL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Steel doors and frames.

1.02 RELATED SECTIONS

- A. Section 08710 - Door Hardware.
- B. Section 09900 - Paints and Coatings.

1.03 SUBMITTALS: Follow Section 01300.

- A. Schedule: Use same reference numbers for openings as those in Door and Frame Schedule shown on Drawings.
- B. Shop Drawings: Indicate gauges,, location of cutouts for hardware reinforcement and finish. Indicate door elevations, internal reinforcement, closure method, cut outs for glazing, and details of moldings and removable stops.
- C. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, fire-resistance rating, temperature-rise ratings, and finishes. Describe shop primer.

1.04 QUALITY ASSURANCE: Comply with:

- A. ANSI A250.8 unless shown or specified otherwise.

1.05 REGULATORY REQUIREMENTS

- A. Fire rated construction shall comply with ANSI/NFPA 252, UL 10B, or other standards as required by authorities having jurisdiction.
- B. Installed rated frame and door assembly shall comply with ANSI/NFPA 80 for fire rated class indicated.

1.06 DELIVERY, STORAGE AND PROTECTION: Follow Section 01600.

- A. Protect products following ANSI A250.8.
- B. Protect doors and frames with resilient packaging.
- C. Break seal on-site to permit ventilation.

PART 2 PRODUCTS

2.01 MANUFACTURERS: Substitutions are permitted subject to Section 01630.

- A. Steelcraft.



- 
- B. Ceco Door Products
  - C. Curries Company; an Assa Abloy Group company.
  - D. Firedoor Corporation.
  - E. Habersham Metal Products Co.
  - F. Republic Doors and Frames.
  - G. Security Metal Products.

## 2.02 MATERIALS

- A. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Commercial Steel (CS), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- C. Frame Anchors: ASTM A591/A591M, Commercial Steel (CS), 40Z (12G) coating designation; mill phosphatized.
  - 1. For anchors built into exterior walls, steel sheet complying with ASTM A1008/A1008M or ASTM A1011/A1011M, hot-dip galvanized according to ASTM A153/A153M, Class B.
- D. Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A153/A153M.
- E. Drilled Anchors in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hollow metal frames of type indicated.
- F. Grout: ASTM C476, except with a maximum slump of 4 inches (102 mm), as measured according to ASTM C143/C143M.

## 2.03 DOORS AND FRAMES

- A. Interior Non-Rated Doors: ANSI A250.8 Level 2 (heavy duty), 18 gauge Model 2 (seamless hollow steel); core of vertical steel stiffeners and manufacturer's standard sound deadener, except that loose-fill and urethane are not acceptable.
- B. Interior Fire Rated Doors: ANSI A250.8 Level 2 (heavy duty), 18 gauge, Model 2 (seamless hollow steel); mineral fiberboard core.
- C. Door Edge Seams: Requirement for "seamless hollow steel" shall mean that all edge seams are welded, ground, filled and finished prior to applying factory primer.
- D. Internal Reinforcing: All doors shall be fabricated with a steel-stiffened core, consisting of vertically formed 20 gauge (0.8mm) steel sections, extending full-door height. Vertical interior webs shall be no more than 6 inches (152mm) apart, spot welded to face sheets a maximum of 5 inches (127 mm) OC.
- E. Interior Frames: Level 3, 16 gauge.

## 2.04 ACCESSORIES

- A. Glazing Stops: Minimum 21 gauge steel channel shape, butted or mitered corners; prepared for countersunk screws, minimum of two screws per side.

- 
- B. Anchors: Minimum 3 wall anchors per jamb, appropriate for wall construction; floor anchors or additional wall anchors as required.

## 2.05 FABRICATION

- A. Do not begin fabrication until hardware templates have been received from hardware supplier.
- B. Doors: Fabricate to ANSI grade specified.
  - 1. Make tops and bottoms of doors flush with 18 gage roll-formed steel channels; with seams welded and filled; seamless, watertight; no recesses.
  - 2. Where recessed weatherstripping is scheduled, configure doors with special profile.
- C. Frames:
  - 1. Fabricate frames as fully welded units, including welding cracks and crevices, with joints ground smooth.
  - 2. At non-rated frames in masonry, reinforce frames 36 to 60 inches wide (inside dimension) with 12 gauge roll formed steel channels fitted tightly into and tack welded to frame head; channel legs up.
- D. Prepare doors and frames for specified hardware and electrical devices in accordance with ANSI A250.8 and ANSI A115 (where applicable). Coordinate locations of conduit and wiring boxes for electrical connections with Division 16 Sections. Weld hardware reinforcement plates and devices in place.
- E. Provide mortar guard boxes at all frames.
- F. Attach label to fire frame and door units.

## 2.06 FINISH

- A. Interior Doors and Frames (in addition to galvannealing): Universal type shop primer, compatible with field applied latex, alkyd, urethane and epoxy finishes. The following products are approved for use; substitutions are permitted subject to Section 01630:
  - 1. Carboline: "3358" Waterborne Acrylic Primer.
  - 2. Tnemec Company Inc.: "Chem-Prime" 37H-78 Alkyd Phenolic Primer.

## PART 3 EXECUTION

### 3.01 INSTALLATION

- A. Install frames in accordance with SDI-105. Set all door frames with hinge side of jamb not less than 2 inches from wall surface forming an angle of 90 degrees or less with the plane of door on the room side into which the door swings.
- B. Install doors in accordance with ANSI/DHI A115-IG.

### 3.02 FIELD QUALITY CONTROL: Follow Section 01400.

- A. Architectural Hardware Supplier's qualified representative, in conjunction with University Representative will perform random inspections of installation to verify that door and frame preparation and installation, and hardware installation have been performed in accordance with manufacturer's instructions and this specification. Including verification that manufacturer's or specified fasteners have been used for the installation of all hardware items.

3.03 FIELD INSTALLATION TOLERANCES

- A. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

END OF SECTION

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**REVISED** SECTION 09900

PAINTS AND COATINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Field painting and finishing of each and every exposed surface on the Project, except, the following surfaces do not require field painting unless scheduled:
  - 1. Areas scheduled "unpainted", except woodwork, ungalvanized metal or unprimed metal therein.
  - 2. Face brick, glazed masonry, or decorative CMU, except sealer coat on ground face concrete masonry.
  - 3. Stainless steel, brass, bronze, copper or aluminum; except mill finish aluminum.
  - 4. Joint sealers except acrylic latex.
  - 5. Acoustical ceilings including suspension system.
  - 6. Valves, controls, and sprinkler heads.
  - 7. Name plates on equipment.
  - 8. Copper or stainless steel pipe. Paint all other exposed pipe in occupied spaces.
    - a. Exposed Pipe shall mean pipe open to view in the completed construction.
    - b. Concealed Pipe shall mean pipe within floors, walls and above finished ceilings not open to view in the completed construction.
  - 9. Finish hardware except lacquered door closers and other hardware with USP finish.
  - 10. Glass, tile, plastic, plastic laminate or flooring.
  - 11. Light fixtures.
  - 12. Galvanized metal gratings.
  - 13. Items with factory finish (not primer paint), except as specified to receive additional field applied finish coats.

1.02 RELATED SECTIONS

- A. Section 08110 - Steel Door Frames.
- B. Section 08210 - Flush Wood Doors.
- C. Section 15050 - Basic Mechanical Materials and Methods, for field painting of certain mechanical work.
- D. Section 15075 - Mechanical Identification.
- E. Section 16050 - Basic Electrical Materials and Methods, for field painting of certain electrical work.

1.03 DEFINITIONS

- A. "Exposed": Surfaces exposed to view in finished work, including insides of cabinetry, surfaces behind closed doors and grills and louvers.
- B. Other Terms: As interpreted in ASTM D16 or as specified herein.

1.04 SUBMITTALS: Follow Section 01300.

- A. Product List: Manufacturer's list of trademarked products for each coat of each system.

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- B. Product Data: Describe the following:
    - 1. Vehicle type.
    - 2. Percent solids by volume.
    - 3. Method of application.
    - 4. Rate of coverage and dry film thickness for each coat.
    - 5. Instructions for substrate preparation including priming.
    - 6. Recommended ambient temperature and relative humidity range, substrate temperature, moisture content and alkalinity at time of application.
    - 7. Recommendations which differ from specified requirements.
    - 8. VOC Compliance
  - C. Informational Submittals:
    - 1. Certificates and/or test reports showing that products meet specified regulatory requirements.
    - 2. Certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).
    - 3. Statement of applicator qualifications.
  - D. Color Submittals:
    - 1. Five samples to be submitted for initial color selection in the form of manufacturer's color charts. After color selection, the University's Representative will return two sets of color chips for surfaces to be coated.

#### 1.05 QUALITY ASSURANCE

- A. Products shall meet UL flame spread 0; fuel contributed 5; smoke developed 15, per ASTM E84.
- B. Wood surfaces coated with fire retardant paint shall meet UL flame spread 10; smoke developed 35 per ASTM E84.

#### 1.06 QUALIFICATIONS

- A. Applicator: Company specializing in commercial painting and finishing with five years experience.

#### 1.07 REGULATORY REQUIREMENTS

- A. Products shall meet the National Architectural and Industrial Maintenance Paints and Coatings (AIM) Rule and local State VOC regulations.

#### 1.08 REVIEW SAMPLES

- A. Provide four Brush-out Cards (1 Architect, 1 University, 2 Contractor), minimum 8 x 10 inch size, of each selected paint, showing color, texture and degree of gloss.

#### 1.09 DELIVERY, STORAGE AND HANDLING: Follow Section 01600.

- A. Deliver products in sealed containers, labeled to show manufacturer and brand name, type of coating, coverage, surface preparation, drying time, cleanup, color designation, and instructions for mixing and reducing.
- B. Store products at ambient temperature of 45 to 90 degrees F, in well ventilated area, unless required otherwise by manufacturer.

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- 1.10 ENVIRONMENTAL REQUIREMENTS: Unless required otherwise by coating manufacturer, comply with the following:
- A. Provide continuous ventilation and heating to maintain surface and ambient temperatures above 50 degrees F for 24 hours before, during, and 48 hours after application of finishes.
  - B. Do not apply exterior coatings during rain or snow, or when relative humidity is above 50 percent.
  - C. Minimum Application Temperatures for Latex Paints: 45 degrees F interior; 50 degrees F exterior.
  - D. Minimum Application Temperature for Varnish Finishes: 65 degrees F, interior or exterior.
  - E. Provide lighting level of 80 foot candles measured mid-height at substrate surface.
  - F. Do not apply coatings in areas where dust is being generated.
- 1.11 MAINTENANCE MATERIALS: Follow Sections 01700 and 01720.
- A. Provide full containers of paints and finishes in sealed one gallon cans, matching colors and types used. Label each container with color, gloss, and manufacturer's label. Quantity as follows or minimum 10 percent of each color, type and gloss of paint used in the work:
    - 1. Colors using 1 to 19 gallons: One gallon.
    - 2. Colors using 20 to 49 gallons: Two gallons.
    - 3. Colors using 50 gallons or more: Five gallons.

## PART 2 PRODUCTS

### 2.01 GENERAL REQUIREMENTS

- A. Coatings shall have good flow and application properties; capable of drying or curing free of streaks or sags.
- B. Materials for each application shall be compatible with one another and with other materials with which they may come in contact.
- C. Provide accessory materials as recommended by coating manufacturer, whether or not specified, as required to achieve specified finishes.
- D. Substitutions proposed shall include manufacturer's recommendations regarding surface preparation, primers and rate of coverage, which may differ from systems specified.
- E. Gloss Ranges; ASTM D523:

Paint Type	Test Method	Gloss Range
Flat	85 degree meter	Below 15
Eggshell	60 degree meter	5 to 20
Satin	60 degree meter	15 to 35
Semi-Gloss	60 degree meter	30 to 65
Gloss	60 degree meter	Over 65

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2.02 DESIGN STANDARD MANUFACTURERS: BENJAMIN MOORE & COMPANY, PITTSBURGH PAINTS, AND THE SHERWIN-WILLIAMS COMPANY. Substitutions subject to Section 01630 are:

- A. Dunn-Edwards Corp.
- B. Frazee Paint Co.
- C. Porter Paints.
- D. Tnemec Company, Inc.
- E. ICI Devoe.
- F. Other Manufacturers are permitted subject to Section 01630.

2.03 COLORS

- A. Refer to Drawings for Finish Schedule and Plans. If color is not indicated submit request to University's Representative for selection.
- B. A designated color may be required in one or more types and gloss, depending upon paint system specified for each specific surface.
- C. Matching colors shall be exact. Manufacturers' nearest standard color will not be acceptable.

### PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surfaces and substrate conditions are ready to receive work as instructed by paint manufacturer.
- B. Examine surfaces scheduled to be finished before starting. Report any condition that may potentially affect proper application.
- C. Measure moisture content of surfaces using an electronic moisture meter.
- D. Test for alkalinity. Unless otherwise recommended by manufacturer for specific products, surfaces to be finished shall have 14 percent maximum moisture content, with negative alkalinity. Take corrective measures to neutralize alkalinity.
- E. Do not apply finishes unless moisture content and alkalinity of surfaces are within limits acceptable to coating manufacturer.

3.02 PREPARATION

- A. Broom clean floors.
- B. Remove electrical plates, hardware, light fixture trim, and fittings prior to preparing surfaces or finishing.
- C. Mask as necessary to achieve a neat finish painting edge next to dissimilar surfaces.

- D. Furnish drop cloths, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.
- E. Post "WET PAINT" signs. Close off newly painted areas where possible. Remove signs when paint has dried.

### 3.03 SUBSTRATE PREPARATION

#### A. General Requirements:

1. Surfaces shall be dry and in sound condition. Remove oil, dust, dirt, loose rust, peeling paint or other contamination to ensure good adhesion.
2. Remove mildew by washing with a solution of 1 quart liquid household bleach and 3 quarts of warm water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes. Rinse thoroughly with clean water and allow the surface to dry 48 hours before painting. Do not add detergents or ammonia to the bleach/water solution.

B. Aluminum: Remove oil, grease, dirt, oxide and other foreign material by cleaning per SSPC-SP1, Solvent Cleaning.

C. Concrete Masonry Units (CMU): Remove loose mortar and foreign material. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement, and hardeners. Mortar must be cured at least 30 days at 75 degrees F. The pH of the surface shall be between 6 and 9.

D. Copper: Remove oil, grease, dirt, oxide and other foreign material by cleaning per SSPC-SP 2, Hand Tool Cleaning.

E. Gypsum Board: Surface must be clean and dry, with fastener heads set and spackled. Joints must be taped and covered with a joint compound. Spackled fastener heads and tape joints must be sanded smooth and dust removed prior to painting. Exterior surfaces must be spackled with exterior grade compounds.

F. Galvanized Metal: Allow to weather a minimum of 6 months prior to coating. Clean per SSPC-SP1 using detergent and water or a degreasing cleaner, then prime as required. When weathering is not possible or the surface has been treated with chromates or silicates, first Solvent Clean per SSPC-SP1 and apply a test area, priming as required. Allow the coating to dry at least one week before testing. If adhesion is poor, Brush Blast per SSPC-SP7 to remove these treatments.

G. Previously Coated Surfaces: Remove contamination such as oil, grease, loose paint, mill scale dirt, foreign matter, rust, mold, mildew, mortar, efflorescence, and sealers to assure sound bonding to the tightly adhering old paint. Make glossy surfaces of old paint films clean and dull before repainting. Spot prime any bare areas with an appropriate primer.

H. Steel: Clean by one or more of the surface preparations described below, as required to meet specified quality.

1. Solvent Cleaning: SSPC-SP1.
2. Hand Tool Cleaning: SSPC-SP2.
3. Power Tool Cleaning: SSPC-SP3.
4. White Metal Blast Cleaning: SSPC-SP5.
5. Commercial Blast Cleaning: SSPC-SP6.
6. Brush-Off Blast Cleaning: SSPC-SP7.
7. Near-White Blast Cleaning: SSPC-SP10.
8. Power Tool Cleaning to Bare Metal: SSPC-SP11.



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### 3.04 APPLICATION

- A. Dry mil thickness of each coat shall be as scheduled or as recommended by manufacturer. Number of coats scheduled is minimum. Finished application shall be sufficient in total thickness, to completely hide substrate and undercoats.
- B. Where shop coats are specified in other Sections, primer may be omitted except as otherwise specified or recommended by coating manufacturer. Touch up damaged shop coats, using primer compatible with or same as original primer.
- C. Apply each coat to uniform finish, without sags, laps, brush marks or other defects. Apply each coat of paint slightly darker than preceding coat. Allow each coat to dry before next coat is applied. Sand lightly between coats if required to achieve specified finish.
- D. Promptly remove spilled, splashed, or spattered coatings.
- E. After coatings have dried, carefully remove masking. Replace electrical plates, hardware, light fixture trim, and fittings removed prior to finishing.
- F. Repair damage to other surfaces caused by painting and finishing.
- G. Steel doors and frames – primed.
  - 1. Minimum two coats latex, semi-gloss.
  - 2. At light colors, provide the number of coats necessary to conceal the primer and attain an acceptable finish coat.
- H. Immediately prior to application of finish coats to steel, remove all rust and touch up primer. Allow primer to cure prior to application of finish coats.

### 3.05 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Field Paint shop primed equipment. Equipment with shop applied enamel coatings do not require field painting unless specified otherwise.
- B. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components, and paint separately.
- C. Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports in occupied spaces. Except where other coating materials are specified, prime as recommended by coating manufacturer for substrate, and finish as specified for adjacent wall and ceiling surfaces.
- D. Paint interior surfaces of air ducts, and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint to limit of sight line. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.
- E. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

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3.06 INTERIOR PAINTING SCHEDULE

A. Metal - Galvanized:

1. Latex Semi-Gloss Finish - Low Odor - Low VOC:

Sherwin-Williams:

- 1st Coat: DTM Acrylic Primer/Finish, B66W1 (8.0 mils wet, 3.0 mils dry)
- 2nd Coat: Harmony Low Odor Interior Latex Semi-Gloss, B10 Series
- 3rd Coat: Harmony Low Odor Interior Latex Semi-Gloss, B10 Series  
(4.0 mils wet, 1.5 mils dry per coat)

Pittsburgh Paints:

- 1st Coat: PPG Pitt-Tech Int/Ext Industrial DTM Primer/Finish Enamel 90-712 Series  
(5.1 - 7.7 mils wet, 2.0 - 3.0 mils dry)
- 2nd Coat: PPG PURE PERFORMANCE Interior Semi-Gloss Latex 9-500 Series
- 3rd Coat: PPG PURE PERFORMANCE Interior Semi-Gloss Latex 9-500 Series  
(4.0 - 4.6 mils wet, 1.5 - 1.7 mils dry per coat)

Benjamin Moore & Co.:

- 1st Coat: Eco Spec Interior Latex Primer Sealer 231  
(2.9 mils wet, 1.0 mils dry)
- 2nd Coat: Eco Spec Interior Latex Semi-Gloss Enamel 224
- 3rd Coat: Eco Spec Interior Latex Semi-Gloss Enamel 224  
(3.8 mils wet, 1.4 mils dry per coat)

B. Metal - Ceilings: Structural Steel, Joists, Trusses, Beams:

1. Dryfall Waterborne Flat Finish:

Sherwin-Williams:

- 1st Coat: DTM Acrylic Primer/Finish, B66W1 (6.0 mils wet, 3.0 mils dry)
- 2nd Coat: Waterborne Acrylic Dryfall, B42W1 (7.0 mils wet, 3.0 - 5.0 mils dry)

Pittsburgh Paints:

- 1st Coat: PPG Pitt-Tech Int/Ext Industrial DTM Primer/Finish Enamel 90-712 Series  
(5.1 - 7.7 mils wet, 2.0 - 3.0 mils dry)
- 2nd Coat: PPG Speedhide Super Tech Flat Acrylic Latex Dry Fog 6-725  
(6.4 - 8.0 mils wet, 2.1 - 2.6 mils dry)

Benjamin Moore & Co.:

- 1st Coat: Moorcraft Super Hide Latex Primer/Undercoater 284  
(3.0 mils wet, 0.8 mils dry)
- 2nd Coat: Moore's Sweep-Up Spray Latex Flat M53  
(3.8 - 6.2 mils wet, 1.5 - 2.5 mils dry)

C. Metal - Shop Primed:

1. Epoxy (Water Base) Semi-Gloss Finish:

Sherwin-Williams:

- 1st Coat: Water-Based Catalyzed Epoxy Primer, B70W100 (8.0 mils wet, 3.0 mils dry)
- 2nd Coat: Water Based Catalyzed Epoxy, B70/B60V25
- 3rd Coat: Water Based Catalyzed Epoxy, B70/B60V25  
(8.0 mils wet, 3.0 mils dry per coat)

Pittsburgh Paints:

- 1st Coat: PPG Aquapon WB Waterborne Epoxy Primer 98-46  
(7.7 - 10.2 mils wet, 3.0 - 4.0 mils dry)
- 2nd Coat: PPG Aquapon WB Water Base Epoxy 98-1/100 Series
- 3rd Coat: PPG Aquapon WB Water Base Epoxy 98-1/100 Series  
(5.3 - 7.9 mils wet, 2.0 - 3.0 mils dry per coat)

Benjamin Moore & Co.:

- 1st Coat: Moore's Universal Metal Primer M07 (2.9 - 4.8 mils wet, 1.5 - 2.5 mils dry)
- 2nd Coat: Moore's Acrylic Epoxy Coating Semi-Gloss Finish M44-86
- 3rd Coat: Moore's Acrylic Epoxy Coating Semi-Gloss Finish M44-86  
(2.8 - 5.6 mils wet, 1.0 - 2.0 mils dry per coat)

D. Gypsum Board:

1. Epoxy (Water Base) Semi-Gloss Finish:

Sherwin-Williams:

- 1st Coat: PrepRite 200 Latex Primer, B28W200 (4.0 mils wet, 1.2 mils dry)
- 2nd Coat: Water Based Catalyzed Epoxy, B70/B60V25
- 3rd Coat: Water Based Catalyzed Epoxy, B70/B60V25  
(8.0 mils wet, 3.0 mils dry per coat)

Pittsburgh Paints:

- 1st Coat: PPG Speedhide Interior Latex Primer Sealer 6-2  
(3.6 - 4.5 mils wet, 1.0 - 1.3 mils dry)
- 2nd Coat: PPG Aquapon WB Water Base Epoxy 98-1/100 Series
- 3rd Coat: PPG Aquapon WB Water Base Epoxy 98-1/100 Series  
(5.3 - 7.9 mils wet, 2.0 - 3.0 mils dry per coat)

Benjamin Moore & Co.:

- 1st Coat: Moore's Universal Metal Primer M07 (2.9 - 4.8 mils wet, 1.5 - 2.5 mils dry)
- 2nd Coat: Moore's Acrylic Epoxy Coating Semi-Gloss Finish M44-86
- 3rd Coat: Moore's Acrylic Epoxy Coating Semi-Gloss Finish M44-86  
(2.8 - 5.6 mils wet, 1.0 - 2.0 mils dry per coat)

Tnemec:

- 1st Coat: PVA sealer 51-792 (2.0 mils DFT)
- 2nd Coat: Series 113 Satin (4.0 mils DFT, back roll if spray applied)
- 3rd Coat: Series 113 Satin (2.5 mils DFT)

2. Latex Semi-Gloss Finish - Low Odor - Low VOC:

Sherwin-Williams:

- 1st Coat: Harmony Low Odor Interior Latex Primer, B11W900
- 2nd Coat: Harmony Low Odor Interior Latex Semi-Gloss, B10 Series
- 3rd Coat: Harmony Low Odor Interior Latex Semi-Gloss, B10 Series  
(4.0 mils wet, 1.5 mils dry per coat)

Pittsburgh Paints:

- 1st Coat: PPG PURE PERFORMANCE Interior Latex Primer 9-900
- 2nd Coat: PPG PURE PERFORMANCE Interior Semi-Gloss Latex 9-500 Series
- 3rd Coat: PPG PURE PERFORMANCE Interior Semi-Gloss Latex 9-500 Series  
(4.0 - 4.6 mils wet, 1.5 - 1.7 mils dry per coat)

Benjamin Moore & Co.:

- 1st Coat: Eco Spec Interior Latex Primer Sealer 231 (2.9 mils wet, 1.0 mils dry)
- 2nd Coat: Eco Spec Interior Latex Semi-Gloss Enamel 224
- 3rd Coat: Eco Spec Interior Latex Semi-Gloss Enamel 224  
(3.8 mils wet, 1.4 mils dry per coat)

Dunn Edwards

END OF SECTION

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**REVISED** SECTION 12360

PLASTIC LAMINATE LABORATORY CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Casework and countertops.

1.02 RELATED SECTIONS

- A. Section 12350 – Laboratory Casework and Other Furnishings.

1.03 DESIGN AND PERFORMANCE CRITERIA

- A. Dimensions: Cabinets may be manufacturer's standard, provided such standard is not more or less than one inch from length, depth, or height shown.
- B. Where utility chases occur behind cabinets, provide access for maintenance and installation of mechanical and electrical services. Enclosure panels and backs of door or sink cabinets shall be readily removable and replaceable.

1.04 SUBMITTALS: Follow Section 01300.

- A. Shop Drawings: Show cabinet faces, sizes of drawers and doors, hardware, service banks, details of construction, materials. Show roughing-in dimensions to locate mechanical and electrical services. Product descriptions supersede model numbers if discrepancy occurs.
- B. Material Samples: Finish and color samples, fittings, countertops, hardware and other samples to the extent requested.
- C. Informational Submittals:
  - 1. Statement of Installer Qualifications.
  - 2. Certificates: Certify that factory tests specified for mechanical service fixtures have been performed and that products or systems meet or exceed specified requirements.

1.05 QUALIFICATIONS

- A. Installer: Manufacturer's installation crew, or installer approved in writing by manufacturer.

PART 2 PRODUCTS

2.01 PLASTIC LAMINATE LABORATORY CASEWORK

- A. Manufacturers: Products complying with this specification may be provided by the following manufacturers. All plastic laminate laboratory casework shall be provided by a single manufacturer.
  - 1. Hamilton Products, a part of Thermo Fisher Scientific, 1316 18th Street, Two Rivers, WI 54241, Tel: 920 793-1121. website: <http://www.hamiltonlab.com/>
  - 2. Advanced Lab Concepts, P.O. Box 159 Round Rock, TX 78680 Tel: 512 246-8800. website: <http://www.alc-collegedale.com>

3. TMI System Design Corporation, 50 South Third Avenue West, Dickinson, ND 58601 Tel: 701 225-6716. website: <http://www.tmisystems.com/>
4. Substitutions are not permitted.

B. Design Requirements:

1. Door and Drawer Design: Square edged, full flush overlay design with 1/8 inch (3mm) reveal horizontal and vertical and 1/8 inch (3mm) vertical reveal on ends of cabinets. Provide applied panels in areas such as sink cabinets and knee spaces with apron panels to provide a full flush overlay appearance.
2. Pulls on doors shall be mounted vertically and on drawers horizontally.
3. All tall storage cabinets to have toe space to match base units.
4. All cabinets shall be constructed and finished to be suitable for use as stand-alone units and to permit future rearrangement without the need for additional parts or finish or field application of finished cabinet sides.
5. Flush interiors: Set cupboard bottom flush with front end facers. Surface mounted bottoms and offsets caused by front face frames which interfere with ease of cleaning are not acceptable.
6. Widths of drawers in knee opening rails shall not be less than 24 inches (610mm) or the width of the rail whichever is the lesser.
7. Structural Requirements: Work shall conform to the recommended structural requirements and testing of Scientific Equipment and Furniture Association, except as superseded by this specification.
  - a. Seismic Anchor: Provide seismic anchor for freestanding cabinets and cabinets located below fume hoods designated to be removable for access for the disabled. Seismic anchors may be floor or wall attachments, but shall not attach to adjacent casework or work surfaces. Seismic anchors shall be accessible without removal of laboratory casework, furnishings, or equipment. Anchor attachment shall not void UL listing.

C. Materials:

1. Decorative (Plastic) Laminate:
  - a. Grade VGP: For horizontal surfaces. Chemical resistant decorative laminate, laboratory grade, meeting or exceeding NEMA Standard LD3 1995 Grade VGP. Low glare, finely ground textured finish with gloss reading of 12.
  - b. Grade VGS: For vertical surfaces. Decorative laminate, finely ground textured finish, meeting or exceeding NEMA Standard LD3 1995, Grade VGS.
  - c. Grade BKL: Backing sheets. High pressure phenolic meeting or exceeding NEMA Standard LD3 1995, Grade BKL.
  - d. Grade VGL: Cabinet liner. Thermo fused melamine resin, polyester thermo fused or a melamine impregnated foil with an acid catalyzed lacquer finish, laminated to a sanded core material under pressure and heat. Finely ground textured finish. Liner shall meet or exceed NEMA Standard LD3.1 1995, Grade VGL, Color to be almond.
  - e. Grade CLS: High pressure cabinet liner. High pressure decorative laminate, finely ground textured finish, meeting or exceeding NEMA Standard LD3.1 1995 Grade CLS.
2. Core Material:
  - a. M3 Particleboard (NAF: No Added Urea Formaldehyde):
    - 1) Description: 3-ply, FSC Certified, 100 percent recycled wood fiber particleboard with no urea formaldehyde added during the manufacturing process.
    - 2) Formaldehyde Emissions: 0.00 to 0.01 ppm.
    - 3) Reference Standards: Average density of 47 pounds per cubic foot (689kg/m<sup>3</sup>), meeting or exceeding ANSI Standard A208.1-1999 M3 PB Standard specifications.

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- 4) Resin: Panels shall be manufactured with Phenol formaldehyde resin. Resin shall be urea formaldehyde-free and produce no Volatile Organic Compounds (VOC's).
  - 5) Thickness: 3/4 inch (19mm).
  - 6) Moisture Content: less than 8 percent.
  - 7) Modulus of Rupture: 2,393 psf (114kPa).
  - 8) Modulus of Elasticity: 398,900 psf (19,099kPa).
  - 9) Internal Bond: 80 psi (551kPa).
  - 10) Face Screw Holding Strength: 247 lbf (1000N).
  - 11) Edge Screw Holding Strength: 225 lbf (899N).
  - 12) Hardness: 500 lbf (2224N).
  - 13) Thickness Tolerance:  $\pm 0.005$  inches ( $\pm 0.127$ mm) from panel average.
  - 14) Flame spread: ASTM E84 Class 3 or C.
- b. Veneer Core Hardwood Panel for Cabinet Shelves and Toe Kicks: 9-ply hardwood plywood manufactured in accordance with ANSI/HVPA HP-1 with K+ face veneers, 1 inch (25mm) thick. Product shall consist of FSC certified veneers.
3. Hardboard:
    - a. Tempered hardboard designed for strength and moisture resistance, consisting of wood fibers, highly compressed into a hard, dense, 1/4 inch (6mm) thick, homogenous sheet using natural resins and other binders.
    - b. Physical Properties:
      - 1) Average modulus of rupture: 5300 psi (36,540kPa).
      - 2) Density: 50 to 60 lb/ft<sup>3</sup> (800kg/m<sup>3</sup> to 960kg/m<sup>3</sup>).
      - 3) Tensile strength: 3500 psi (24,100kPa).
  4. Laminate Adhesive: Polyvinyl acetate or thermosetting adhesive applied in accordance with NEMA LD 3.1-1995. Contact adhesive is not acceptable.
  5. Dowels: 8mm diameter, minimum, hardwood, laterally fluted with chamfered ends.
  6. Edge Banding:
    - a. 3mm PVC: doors, drawer fronts and cabinet edges where indicated in this specification. T-Mold is not acceptable.
    - b. 0.018 inch (0.5mm) PVC: Exposed other cabinet body edges.
    - c. All PVC edge banding shall be applied with hot melt adhesive. Contact cement is not acceptable.
  7. Glass: Framed glass doors:
    - a. 7/32 inch (5.5mm) nominal laminated glass with 0.060 inch (0.15mm) clear vinyl interlayer, ANSI Z97.1, ASTM C1036 or C1048.
    - b. Without imperfections or marred surfaces.
    - c. Cut or drill to receive hardware.
  8. Metal Parts: Metal parts, table legs, post legs, counter supports, etc., shall be furniture steel, fabricated by welding, then degreased, cleaned, treated and painted to match casework finish and color.
    - a. Colors for all materials, metal parts and hardware shall be selected by the Architect from the manufacturer's full color line.
- D. Construction:
    1. General:
      - a. Cabinet side panels exposed to view after installation shall have finished ends. All side panels not exposed to view after installation may be as listed under "Unexposed" plywood.
      - b. Cabinet Joinery: Tops and bottoms shall be joined to cabinet ends using a minimum of 6 dowels for 24 inch (610mm) deep cabinets and a minimum of 5 dowels for 14 inch (356mm) deep cabinets. Internal cabinet components such as fixed horizontals, rails and verticals are to be doweled or screwed in place. Dowels are to be securely glued and cabinets clamped under pressure during assembly to assure secure joints

- and cabinet squareness. No upright of any kind shall be used at the center of double door cabinets.
2. Base, Wall, Upper, and Tall Cases:
    - a. Cabinet Top: Full sub-tops (rails not acceptable) and bottoms shall be 3/4 inch (18mm) thick core material laminated on the interior with low pressure laminate cabinet liner with a backer sheet of neutral color on the unexposed surface. Laminate interior surface of sink cabinet bottoms with high pressure laminate cabinet liner. Front edges shall be 3mm PVC edge banding. T-Mold not acceptable. All tops shall be solid except for sink base tops, which have a vertical sub front reinforcement panel. Rabbet top and bottom to accept recessed back.
    - b. Cabinet Bottom: Full sub-tops (rails not acceptable) and bottoms shall be 3/4 inch (18mm) thick core material laminated on the interior with low pressure laminate cabinet liner with a backer sheet of neutral color on the unexposed surface. Laminate interior surface of sink cabinet bottoms with high pressure laminate cabinet liner. The bottom surface of all upper cabinets shall be low pressure laminate cabinet liner. Front edges shall be 3mm PVC edge banding. T-Mold not acceptable.
    - c. Cabinet Ends/Sides and Exposed Backs: Cabinet ends shall be 3/4 inch (18mm) thick core material, laminated with vertical surface high pressure laminate on the exterior, and balanced with high pressure cabinet liner on interior. Holes shall be drilled for adjustable shelf clips 1-1/4 inches (32mm) on center. Front edges to be banded with 3mm PVC edging (T-Mold not acceptable). Band bottom edges of wall cabinet ends with 3mm PVC edging. Bore ends to accept doweled top and bottom. Rabbet ends to accept recessed back.
    - d. Cabinet Back, Unexposed: Standard cabinet back to be 1/4 inch (6mm) thick hardboard with one side pre-finished to match interior of cabinet, to be housed 4 sides, sealed with hot melt adhesive and reinforced with 3/4 by 3-1/2 inch (19mm x 89mm) spreaders glued and screwed. 2 at base and wall, 3 at tall. All sink cabinets to have split back, removable from inside. Exposed exterior back on fixed or movable cabinets to be 3/4 inch (18mm) thick core material, laminated with high pressure laminate on the exterior surface and high pressure laminate cabinet liner on the interior surface. Base and drawer cabinets shall be provided with removable back panels easily removable from interior for access to service lines. Fixed backs are not acceptable.
    - e. Cabinet Base: Each cabinet shall be mounted on four levelers. Provide 3/4 inch by 3-3/4 inches (19mm x 95mm) high front hardwood veneer core plywood toe space rail, attached to levelers, forming a 4 inch high by 3 inch (102mm x 76mm) deep toe space, Toe space rail shall be continuous for length of contiguous casework and scribed to floor. Top set resilient base at all exposed casework and all knee spaces to be provided under Division 09.
    - f. Shelving Thickness: Keep 1 of the following 2 paragraphs:
    - g. Shelves:
      - 1) Spans less than 36 inches (914mm): 3/4 inch (19mm) thick hardwood veneer core plywood.
      - 2) All fixed shelves and adjustable shelf spans of 36 inches (914mm) and greater: 1 inch (25mm) thick hardwood veneer core plywood.
      - 3) Front edge of shelves:
        - a) Open shelves: 2 inches (51mm) by 3mm thick PVC safety edging adhered with hot melt glue.
        - b) Enclosed shelves shall be edgebanded.
      - 4) All shelves shall be full-depth
      - 5) Shelf adjustment:
        - a) Wall units: All shelves shall be adjustable on 32mm centers.
        - b) General purpose tall units: One fixed shelf. All others shall be adjustable on 32mm centers.



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- 6) All shelves shall be laminated on both sides with low pressure laminate cabinet liner.
  - h. Provide filler panels where required between cabinets, at corner intersections of cabinets, between cabinets and walls and wherever else required for a complete finished installation. For tall cabinets, filler panels shall be provided for vertical face and top. For wall cabinets, filler panels shall be provided for vertical face, top and bottom. Maximum filler panel width is 1-1/2 inches (38mm), and should be balanced on each end of wall-to-wall elevations.
  - i. Exposed fasteners are not allowed without prior approval of the Architect.
  - j. Doors and Drawer Heads: 3/4 inch (18mm) thick core material laminated with vertical surface high pressure laminate on exposed and semi-exposed surfaces for all doors, and vertical surfaces high pressure laminate on exposed surface and high pressure cabinet liner semi-exposed surfaces for all drawers heads. All corners shall be square and all edges finished with 3mm PVC edge banding, radiused and buffed inside and out, machine-radiused corners.
    - 1) Provide showcase doors with inset glass where indicated. Provide etched vertical hand pulls for sliding doors. Showcase doors for tall and wall cabinets shall not exceed 54 inches (1372mm) in height. Double doors shall be used on all cabinets in excess of 24 inches (914mm) in width. No upright of any type shall be used at center of double door units.
    - 2) Drawer heads shall be manufactured with integral drawer adjusters mortised into drawer head assembly to allow for correct alignment of drawers across the faces of the cabinet elevations.
    - 3) Framed glass tall and wall cabinet doors: Exposed edge of substrate shall be factory primed and painted to match decorative laminate. Provide vinyl glass retainer on cabinet side of door. Manufacturer:
      - a) Sperry Rubber and Plastics Co., Inc. 9146 US Rt. 52, Brookville, IN 47012  
Tel: 800 541-9277, Model No. 03180C.
      - b) Substitutions are permitted subject to Section 01 63 00.
  - k. Drawer Construction:
    - 1) Sides, back and sub-front shall be 1/2 inch (12mm) thick core material, laminated with melamine laminate. Top edge is banded with PVC edging. Paper storage drawers to have a retaining hood at the rear of each drawer. Sides shall be full height with 1/2 inch (13mm) clearance to frame opening. All colors shall be selected by the Architect. Drawers shall be a minimum of 18 inches front to back.
    - 2) Acceptable drawer joinery options:
      - a) Dowel: Glued under pressure; 32mm, minimum, dowel spacing to 4 inches (102mm) high, 64mm dowel spacing above 4 inches (102mm).
      - b) Lock Shoulder: Glued and pin nailed.
    - 3) Drawer bottoms shall be either:
      - a) 1/2 inch (12mm) thick core material, factory-finished with melamine to match cabinet interior, screwed directly to the bottom edges of the drawer box.
      - b) 6mm white PVC-clad hardboard. Bottom shall be grooved into the 4 sided drawer box and sealed with hot melt glue process around entire drawer bottom perimeter. The bottoms of drawer over 24 inches (610mm) in width shall be reinforced with 1/2 by 3 inch (12mm x 75mm) stiffeners, 1 at 24 inches (610mm), 2 at 36 inches (914mm), 4 at 48 inches (1219mm).
  - l. Provide fixed flush panels at sink cabinets, knee opening drawer units, filler panels, and elsewhere, so that all finished panels are in the same plane as cabinet doors and drawers to provide a true flush overlay appearance.
  - m. Knee Space: Knee space panels shall be 3/4 inch (18mm) thick core material, laminated with vertical surface high pressure laminate on the exposed side and with a high pressure cabinet liner on the reverse. Panels shall be removable to provide

clear access to the service zone from the top of the fixed continuous toe space base (refer to Toe Space below) to the underside of the work surface. Drawer fronts to be full width of apron and drawer box to be widest possible width.

- n. Base unit front horizontal intermediate rail: 3/4 inch by 1-1/2 inches (19mm x 38mm) rail shall be provided between doors and drawers. Secure to cabinet end panels.

E. Hardware: As specified elsewhere in this Section.

## 2.02 COUNTERTOPS, BACKSPLASHES, AND END SPLASHES

A. Solid Phenolic Resin:

1. Manufacturers: Products complying with this specification may be provided by the following manufacturers.
  - a. Trespa North America, Ltd., 12315 Oak Knoll Road #110, Poway, CA 92064, Tel: 1-800-487-3772. website: <http://www.trespanorthamerica.com/>
  - b. Or equal (no known equal).
  - c. Substitutions are permitted subject to Section 01630.
2. Basis of design: Acid Resistant Grade - Trespa TOPLAB SSC, or equal (no known equal). Panels shall be of material specifically designed for laboratory work surfaces.
3. Thickness: Material shall have uniform thickness (+0.03 inch) and flatness (maximum difference of 0.03 inch) for 10 foot span.
  - a. Work surface: 3/4 inch.
4. Color
  - a. Black.
  - b. Color sample shall be approved by University's Representative prior to fabrication.
5. Provide the following:
  - a. Drip Grooves: Provided under all work surface exposed edges, unless noted otherwise on the Laboratory Furnishing Drawings. Drip grooves shall be 1/2 inch from the front edge where the top overhangs 1 inch and 1/4 inch from the edge where the edge overhangs 1/2 inch.
  - b. Edge Profile: All exposed edges shall be sanded to a smooth finish and chamfered 1/8 inch (3 mm) at front top edge and at vertical corners, except as indicated
  - c. Marine edges: Where indicated on the Laboratory Furnishing Drawings, shall be formed by adding 1/4 inch thick by 1 inch by 1 inch solid phenolic angle strips to the top of the work surface perimeter using an epoxy or clear sealant, unless otherwise indicated on the Laboratory Furnishing drawings. Edges adjoining the open work surface area shall be splayed at an angle of 45°. Right angle exposed edges shall be sanded to a smooth finish and chamfered 1/8 inch at front top edge and at vertical corners
  - d. Provide all holes and cutouts as required for built-in equipment and mechanical and electrical service fixtures. Verify size of opening with actual size of equipment to be used prior to making openings. Form inside corners to a radius of not less than 1/8 inch. After sawing, rout and file cutouts to ensure smooth, crack-free edges.
  - e. Sink Mounting:
    - 1) Cutouts for under-mounted sinks shall be routed and sanded to form smooth edged openings with the top edges chamfered approximately 1/8 inch. The bottom edge of the sink opening shall be finished smooth with the edge broken to prevent sharpness. Corners of sink cutouts shall be radiused not less than 3/4 inch. Under-mounted sinks shall be supported by brackets blind-fixed to the underside of the work surface.
  - f. Curbs and Splashes:
    - 1) Height: 4 inches, unless noted otherwise on Laboratory Furnishing Drawings.
    - 2) Thickness: 3/4 inch.

- 3) Bonded to the surface of the top to form a square joint. Joints between sections of curb shall be stepped or mitered as necessary to minimize the amount of black core exposed.
  - g. Fix work surface panels with blind fastenings into the back or underside of the panel. Use #10, type A sheet metal screws sized to stop at least 1/8 inch short of the finished face. Pre-drill panel with an 11/64 inch diameter high-speed drill bit aligned with 7/32 inch clearance holes in the supporting structure.
  - h. Form tight-fitting butt joints in the work surface using mechanical fasteners positioned to be concealed after installation.
6. Physical Properties:
- a. Modulus of elasticity:  $1.5 \times 10^6$  psi minimum.
  - b. Shear strength: 2000 psi minimum.
  - c. Compressive strength: 24000 psi minimum.
  - d. Weight: 93 lb/ft<sup>3</sup> maximum.
  - e. Bunsen burner test: 30 seconds; no visible effect.
  - f. Water absorption: 3 percent maximum.
  - g. Service temperature: 350 degree F maximum.
  - h. Non-porous surface and edges.
  - i. Will not support micro-organic growth.
  - j. Chemical resistance: The work surface shall sustain contact with the following chemical concentrations for 24 hours with no detectable stain, loss of gloss or change.
    - 1) Test Procedure: Cover five drops of each reagent with a 25 mm watch glass convex side up to duplicate the trapping of a reagent under a dispensing container. Test all volatiles by using a one ounce bottle stuffed with saturated cotton. After a 24 hour exposure, flush reagents off with water, clean with naphtha and detergent, rinse and wipe dry.
    - 2) Evaluation Ratings:
 

Rating	Effect	Description
0	No effect	No detectable change.
1	Excellent	Slight detectable change in color or gloss.
2	Good	A clearly discernable change in color or gloss but no significant impairment of surface life or function.
3	Fair	Slight surface etching or severe staining.
4	Failure	Pitting, cratering, or erosion of coating. Obvious and significant deterioration.
    - 3) Test results shall not be lower than the following on black material:

Reagent

Reagent	Concentration	Rating
Amyl acetate		0
Ethyl acetate		0
Acetic acid	98%	0
Acetone		0
Acid dichromate	5%	0
Butyl alcohol		0
Ethyl alcohol		0
Methyl alcohol		0

Reagent	Concentration	Rating
Ammonium hydroxide	28%	0
Benzene		0
Carbon tetrachloride		0
Chloroform		0
Chromic acid	60%	0
Cresol		0
Dichloroacetic acid		0
Dimethylformamide		0
Dioxane		0
Ethyl ether		0
Formaldehyde	37%	0
Formic acid	90%	0
Furfural		0
Gasoline		0
Hydrochloric acid	37%	0
Hydrofluoric acid	48%	3
Hydrogen peroxide	3%	0
Tinture of iodine		0
Methyl ethyl ketone		0
Methylene chloride		0
Mono chlorobenzene		0
Naphthelene		0
Nitric acid	20%	0
Nitric acid	30%	0
Nitric acid	70%	0
Phenol	90%	0
Phosphoric acid	85%	0
Silver nitrate		0
Sodium hydroxide	10%	0
Sodium hydroxide	20%	0
Sodium hydroxide	40%	0
Sodium hydroxide		0
Sodium hydroxide, flake		0
Sodium sulfide, saturated		0
Sulfuric acid	33%	0
Sulfuric acid	77%	0
Sulfuric acid	96%	1
50% Sulfuric acid/50% Nitric acid	77%/70%	0
	%	
Toluene		0
Trichloroethylene		0
Xylene		0
Saturated Zinc chloride		0
Aqua regia		0
Betadine (Providine iodine)	10%	0

### PART 3 EXECUTION

#### 3.01 INSTALLATION

- A. Set casework plumb, level, true and securely anchored.
- B. Scribe to abutting surfaces; set level and rigid, and align adjoining pieces of equipment. Apply matching filler pieces where equipment abuts walls or columns, or is to be closed off.
- C. Field weld joints in stainless steel tight, without open seams.
- D. At changes in countertop height, make vertical transition with same material as adjacent countertop.
- E. Seal around countertop penetrations.
- F. Coordinate with Section 16140 to establish height of multi-outlet assemblies.

#### 3.02 ADJUSTING

- A. Adjust doors, drawers, hardware, fixtures and other moving or operating parts to function smoothly and correctly.

#### 3.03 SPECIAL PROTECTION

- A. As soon as countertops are in place, protect from damage.

END OF SECTION