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SANTA BARBARA • SANTA CRUZ

OFFICE OF DESIGN & CONSTRUCTION SERVICES and PHYSICAL FACILITIES

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SENT VIA: FAX ON THIS DATE
 HAND DELIVERY ON THIS DATE
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 UNITED PARCEL SERVICE ON THIS DATE

HOLDERS OF PLANS AND SPECIFICATIONS:

Cage Wash, Biological Sciences Bldg. II, Bldg 571
Project No. FM090221L/981640

Addendum No. THREE

March 5, 2010

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

Bid date has is **Thursday, March 18, 2010 at 2:30P.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.

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

Anna Galanis
Director, Contracting Services

ADDENDUM NUMBER THREE

to the

Construction Documents
March 10, 2010

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. Table of Contents. **ADD** Section 10400, Signs, pages 1-4.

Item No.

2. Section 05120, Structural Steel. **REPLACE** in it's entirety, Section 05120, Structural Steel, with Attached "Revised Section 05120, Structural Steel, Revised per Addendum Three, 13 pages.

Item No.

3. Section 05500, Metal Fabrications. **REPLACE** in it's entirety, Section 05500, Metal Fabrications, with Attached "Revised Section 05500, Metal Fabrications, Revised per Addendum Three, 5 pages.

Item No.

4. Section 08110, Steel Doors and Frames. **REPLACE** in it's entirety, Section 08110, Steel Doors and Frames, with Attached "Revised Section 08100, Steel Doors and Frames, Revised per Addendum Three, 4 pages

Item No.

5. Section 10260, Wall and Corner Guards, **REPLACE** in it's entirety, Section 10260, Wall and Corner Guards, with Attached "Revised Section 10260, Wall and Corner Guards, Revised per Addendum Three, 2 pages

Item No.

6. Section 10400, Signs, **ADD** Section 10400, Signs, Attached, 4 pages

II DRAWINGS

Item No.

1. A5.01, Partition Types & Details, **REPLACE** in it's entirety with Attached A5.01, Partition Types & Details, Revised per Addendum Three, dated 3-4-2010.

Item No.

2. A5.02, Door Schedule & Details, **REPLACE** in it's entirety with Attached A5.02, Door Schedule & Details, Revised per Addendum Three, dated 3-4-2010.

Item No.

3. A6.00, General Lab Plan Symbols Legend, **REPLACE** in it's entirety with Attached A6.00, General Lab Plan Symbols Legend, Revised per Addendum Three, dated 3-4-2010.

Item No.

4. S1.0, General Structural Notes, **REPLACE** in it's entirety with Attached S1.0, 3rd General Structural Notes, Revised per Addendum Three, dated 3-3-2010.

Item No.

5. S5.1. Typical Details, **REPLACE** in it's entirety with Attached S5.1. Typical Details, Revised per Addendum Three, dated 3-3-2010.

Item No.

6. S7.1. Typical Steel Details, **REPLACE** in it's entirety with Attached S7.1. Typical Steel Details, Revised per Addendum Three, dated 3-3-2010.

III CLARIFICATIONS (on questions received)

1. Section 01015 calls for prime contractor to subcontract with "Gertinge" to decommission, dismantle, and re-install Cage Wash from the 7th to the 6th floor under phase 2a. Please provide us with contract information if it is the intent of UCSB to use this as a single source.
 - Gertinge-Scott Chapman, Office (732) 870-2385, Cell (732) 859-2961
2. Asbestos Sampling report #B128735 notes the roofing material as "non detect" However cover page of report provided on January 19th 2010 under Table 1.0 notes the same report as known asbestos material. Please Clarify.
 - The asbestos reports are provided as a convenience to the bidders, as information to bidders. The bidding documents give the direction on the handling of asbestos materials.
3. The Asbestos and PB Leas Survey noted under UCSB Website date January 10th 2010 has very little information regarding the 6th and 7th floors of Building 571. Most of the report deals with the Stem Cell portion of the project. If there is additional Bulk Asbestos Analysis done for rooms on 6th and 7th please provide. Project can only be bid per the information provided.
 - The asbestos reports are provided as a convenience to the bidders, as information to bidders. The bidding documents give the direction on the handling of asbestos materials.

4. Details 16 & 17 on Sheet A5.02 show wall guards and are called out on A1.06. The Specification only has a section 10260 for Corner Guards. Please provide a specification for manufacturer and model number.
 - Refer to revised section 10260 and plans

5. Section 11537 2.01 calls for a bedding dispenser unit. Drawing A1.06 (sixth floor) notes this as CFCI. Drawing 1.07 (7th floor) notes this as OFOI. Is this correct?
 - 6th floor calls for bedding dispenser check equipment schedule and specifications.

6. The Finish Legend on sheets A1.03, A1.04 and A1.06 references R.S. Room Signature and refers you to detail 23/A5.01. We can not locate on the plan where the room signage is to occur.
 - Refer to specification 10400

Is the room signage to be included in our bid? If so please provide the locations or required quantities and a specification.

 - Refer to specification 10400 and drawings.

7. Please clarify if the OFOI Cage Wash and Autoclave will include or exclude the exhaust hood shown on A6.01.
 - Refer to specifications 12350 canopy hoods

8. Plan Specification Notes 6 on sheets A1.03, A1.04 and A1.06 calls for Black Out Window with approved Black Film but there is no specification for the film. Please provide a specification for the approved black film.
 - Refer to revised plans

9. Please provide location for Wall Shelving shown per drawing A5.01 detail 29 and specification 06410. I'm unable to locate and cabinets on the plans.
 - This is a backing detail

10. Detail 11/A5.02 regarding closures at steel beam penetrations is unclear as to how the skewed HSS will be properly sealed off. Please clarify.
 - Refer to Details 21,22,23

11. Detail 4 & 8/S5.1 are not shown anywhere on the plans. How are we to account for the quantity of these items? Should we exclude these and let the mechanical contractor include them in their scope?
 - Refer to revised plans

12. The skewed connection for the HSS at the intersection of gridlines 5 and C.5 takes place at a moment connection. Please provide a detail that clearly show how this connection is supposed to be achieved.
 - Refer to revised plans

13. Will there be adequate demolition of existing wall along gridline C.5 for erection and welding of new WF and HSS beams.
 - Refer to note 10 S7.1

14. In the spec book division 05120 page 10 section 2.03 specifies primer on the structural steel, division 5500 page 4 section 2.03 sub heading B specifies hot dipping galvanizing on all exterior steel, and finally on sheet S1.0 note 12 under the steel heading specs all steel shapes and plates and decking shall be hot dipped galvanized in accordance with G90. What are the actual specifications for the steel involved?
 - Galvanize ALL structural steel as stated in general structural notes, Sheet S1.0 shapes per ASTM A153, fasteners B695 class 40 minimum. Touch up with zinc-rich coating. Repair material shall extend at least three inches beyond edges of damaged areas. Remove and repair galvanized surface as required for field welding in accordance with ASTM-A780, A2; required thickness is 100 micro-inches

15. Structural drawings give us a T.O.S. of 13'-9" & 14'-3" in relationship to the Slab but do not tell us what the slab height is. Is there an elevation drawing available that will give us this information. We need actual building height to determine crane size.
- Approximately 87'6" to roof over 6th story from finish grade, contractor to verify.
16. Details 5 & 6 on S7.1 tell us that the four columns are to be galvanized. Will any of the wide flange beams or tube steel braces be galvanized (not called out on drawings)?
- All W-sections and HSS tubes to be hot dipped galvanized as noted in general structural notes, sheet S1.0
17. Does detail 22 on A5.02 also apply to the wall at grids 5.8 & C.5 (sheet A1.08)?
- Detail 22 A5.02 applies to the wall at C.5
18. Per specification 07530 single-ply membrane roofing page 07530-10, 2.05 roof insulation B. Polyisocyanurate board insulation/on metal deck first layer 1 ½" thick.
- Question: What is the R-Value or the desired thickness for the subsequent layers, minus ½ inch?
- The minimum required R-Value for roof insulation (Climate Zone 6) refer to Title 24 Table 143-A.
19. Sheet A107 shows two areas indicated as 7100 and two areas indicated as 7167 wherein one area would indicated epoxy flooring and the other area would indicated to match existing. Furthermore, 7165C also call for the flooring to match existing. Do all the areas indicated on 7100 and 7167 receive epoxy flooring? What about 7167? Please clarify the type of flooring to be matched on these existing areas.
- New vestibule (extension) 7100 is as noted. Existing 7100 is matching existing. Existing rooms are to match existing.

20. Sheet A107 note 14 calls for a 12x12 walkway pad. Are these walkway pads used at roofs? Please clarify the specific product intended to be used.
- Roof walking pads
21. The partition type 2/2A shown in A501 indicates the application of acoustical sealant at the top and bottom of the wall around all penetrations and cutting. However, details 8 & 7 do not show the installation of the acoustical sealant at the top and bottom of the metal stud framed walls. Is acoustical sealant absolutely required as shown by the partition types?
- Acoustic sealant is required
22. Where is "Plan Specific Notes" #5 on A1.07 in reference to (n) skim coat plaster on existing concrete surface?
- Note 5 refers to ALL concrete surface within extent of project area.
23. Where applicable, will "Plan Demolition Note" #17 and AD1.06 apply to concrete columns at lines B&4 and B&5? Also, will note #5 on A1.06 apply to column at B&4?
- Applies to ALL concrete
24. In regards to columns noted above, will WG (all guard) be required at these locations?
- As per drawings and specifications.

END OF ADDENDUM NO. THREE

Revised SECTION 05120
STRUCTURAL STEEL

PART 1 GENERAL

1.01 DESCRIPTION

- A. Section Includes: Provision of structural steel as indicated on the Contract Drawings. Work includes but is not necessarily limited to the following:
1. Structural steel framing, including all structural steel shown on the structural drawings and all standard shapes, plates and rods shown on the Architectural, Mechanical and Electrical drawings that connect to the building structure.
 2. Anchor rods.
 3. Shop painting.
- B. Related Sections:
1. Section 03200 - Concrete Reinforcement
 2. Section 03300 - Concrete
 3. Section 05310 - Steel Decking
 4. Section 05500 - Metal Fabrications

1.02 REFERENCES

- A. Requirements of GENERAL CONDITIONS and DIVISION NO. 1 apply to all Work in this Section.
- B. Published specifications, standards, tests, or recommended methods of trade, industry, or governmental organizations apply to Work of this Section where cited by abbreviations noted below (latest editions apply).
1. California Building Code (CBC), 2007 Edition.
 2. American Society for Testing and Materials (ASTM).
 3. American Institute of Steel Construction:
 - a. "Specification for Structural Steel Buildings, March 9, 2005" (AISC 360).
 - b. "Specification for Structural Joints Using ASTM A325 or A490 Bolts, June 30, 2004" (AISC 348).
 - c. "Code of Standard Practice for Steel Buildings and Bridges," March 18, 2005 (AISC 303).
 - i. No provision of AISC 303 shall be effective to change the duties and responsibilities of the Owner, Contractor or Structural Engineer from those set forth in these Contract Documents.
 - ii. Where discrepancies exist between the requirements of the Contract Documents and AISC 303, the requirements of the Contract Documents shall govern.
 4. American Welding Society:
 - a. "Structural Welding Code -- Steel" (AWS D1.1), 2002.
 - b. "Standard Symbols for Welding, Brazing and Nondestructive Examination (AWS A2.4).
 - c. "Filler Metal Specifications" (AWS A5).
 - d. "Criteria for Describing Oxygen-Cut Surfaces and Oxygen Cutting Surface Roughness Gauge" (AWS C4.1).
 - e. "Standard for AWS Certification of Welding Inspectors" (AWS QC1).
 5. Society of Protective Coatings:
 - a. Solvent Cleaning (SSPC-SP 1).

- b. Hand Tool Cleaning (SSPC-SP 2).
- c. Brush-Off Blast Cleaning (SSPC-SP 7).
- 6. American Society of Non-Destructive Testing:
 - a. ASNT Standard for Qualification and Certification of Nondestructive Testing Personnel (ANSI/ASNT CP-189-2001).
 - b. Personnel Qualification and Certification in Nondestructive Testing, 2001 (ASNT Recommended Practice No. SNT-TC-1A).

1.03 DEFINITIONS

- A. Extra Smooth: Surfaces noted herein as "Extra Smooth" require a finish with surface variation of 500 micro-inches or less (AWS C4.1, Sample #4).
- B. Gouge: any depression deeper than the overall surface roughness.
- C. Nondestructive Testing: Nondestructive testing (NDT) includes magnetic particle testing (MT), penetrant testing (PT), radiographic testing (RT), and ultrasonic testing (UT). The terms nondestructive examination (NDE) and nondestructive testing (NDT) are synonymous.
- D. Quality Assurance Plan: The Quality Assurance Plan is set of the written requirements containing the set of qualification requirements and procedures that are to be followed by the Owner's Testing Agency to confirm compliance with these requirements.

1.04 QUALIFICATIONS

- A. Steel Fabricator's Qualifications: Fabricator shall have had not less than 5 years' experience in fabrication of structural steel and be able to furnish evidence of his ability, facilities, proficiency of his personnel and completed projects.
- B. Steel Erector's Qualifications: Erector shall have had not less than 5 years' experience in erection of structural steel and be able to furnish evidence of his ability, facilities, proficiency of his personnel and completed projects.
- C. Welder Qualifications: Welders, welding operators, and tackers shall be qualified in accordance with AWS D1.1.
 - 1. Welders shall have a valid Welding Performance Qualification Record (WPQR) for each welding procedure to be performed.
 - 2. Welders whose work fails to pass inspection shall be requalified before performing further welding.
 - 3. Qualification Period: Personnel who have not welded for a period of three or more months shall be requalified. Welding personnel required to be tested using the Supplemental Welding Personnel Testing shall be qualified by test within 12 months prior to beginning welding on the project.
 - 4. The Contractor shall pay costs of certifying qualifications and requalifications.

1.05 QUALITY ASSURANCE

- A. Welding Inspector Qualifications:
 - 1. All Welding Inspectors shall be trained and thoroughly experienced in inspecting welding operations, and qualified as Certified Welding Inspectors (CWI) in accordance with AWS D1.1 and AWS QC1.
 - 2. NDT Personnel Qualifications
 - a. NDT personnel shall be qualified under one of the ASNT documents referenced in this specification. NDT performed by NDT Level I personnel shall be under the close, direct supervision of an NDT Level II.
- B. Bolting Inspector Qualifications: Competency shall be demonstrated through the administration of a written examination and through the hands-on demonstration by the Inspector of the methods to be used for bolt installation and inspection.

- C. Submittals: The Owner's Testing Agency will submit the following items:
1. Quality Assurance Plan: The Quality Assurance Plan shall contain the Quality Assurance and Inspection items contained in this Section.
 2. Qualifications of Owner's Testing Agency management and personnel designated for the project.
 3. Qualification records for Owner's Testing Agency's Inspectors and NDT technicians designated for the project.
 4. Owner's Testing Agency's Quality Control Plan for the monitoring and control of the Agency's operations.
 5. Written Practice for Owner's Testing Agencies: The Owner's Testing Agency shall maintain a Written Practice for the selection and administration of inspection personnel, describing the training, experience and examination requirements for qualification and certification of inspection personnel, including those of subcontracting agencies. The Written Practice shall also describe the Agency's procedures for determining the acceptability of the structure in accordance with the applicable codes, standards, and specifications. The Written Practice shall also describe the Agency's inspection procedures, including general inspection, material controls, visual welding inspection, and bolting inspection.
 - a. Bolting Inspection Procedures: Comply with AISC 348 and the Quality Assurance Plan.
 - b. Welding Inspection Procedures: Meet the requirements of the AWS D1.1 and the Quality Assurance Plan.
 - c. Nondestructive Testing Procedures: The Written Practice shall describe the responsibility of each level of certification for determining the acceptability of material and welds in accordance with the applicable codes, standards, specifications and procedures.

1.06 SUBMITTALS

- A. The following items shall be submitted to the Architect for review. One reproducible copy will be returned. Do not fabricate material prior to obtaining final review of submittals.
1. Manufacturer's test reports and literature describing products excluding those listed in Section 1.06B.
 2. Plans of all levels showing dimensioned location of edge of slab, deck, and openings. Submit prior to Shop and Erection drawings.
 3. Shop and Erection Drawings. Prior to the start of fabrication and erection, submit detailed shop and erection drawings for all structural steel showing:
 - a. Size and location of all structural members and connection material.
 - b. Type, size and location of bolts and welds.
 - c. Identification of high-strength bolted joints as snug-tight, pretensioned or slip-critical, as required by the Contract Documents.
 - d. Locations where the Construction Documents require weld backing to be removed.
 - e. Locations where the Construction Documents require supplemental fillet welds where backing is permitted to remain.
 - f. Locations where the Construction Documents require weld tabs to be removed.
 - g. Clear identification of revisions and revision dates in accordance with AISC 303.
 - h. Other items as required by AISC 303 or AISC 341, Section 5.
 - i. Shop drawings shall include the following additional information:
 - i. Complete information necessary for the fabrication of members including cuts, copes, holes (including weld-access and galvanization venting and drainage), doubler plates, stiffeners, and camber.
 - ii. Surface preparation and finishes, including both painting and grinding.
 - iii. Material grades of all members, connection material, fasteners, and weld filler metal.

- iv. With each shop-drawing submittal, a corresponding erection drawing (or set of drawings) identifying pieces. Erection drawings included in shop-drawing submittals will not be considered part of the submittal and will be neither reviewed nor returned unless they are marked "FOR REVIEW" and have clear identification of revised or new information. Cloning is one acceptable form of identifying revised or new information.
 - j. Erection drawings shall include the following additional information:
 - i. Identification mark of members.
 - ii. Orientation and relation of members to appropriate grid lines.
 - iii. Setting elevations for column bases.
 - iv. Standard and special details for field connections.
 - v. Identification of joints or groups of joints in which a specific assembly order, welding sequence, welding technique, or other special precautions are required.
 - k. Samples: Material samples shall be provided as requested by the Structural Engineer or Owner's Testing Agency.
- B. The following items shall be submitted to the Architect and Owner's Testing Agency. Submittal to the Architect is for record purposes only. No copies will be returned by the Architect.
- 1. Manufacturer's test reports and literature describing products:
 - a. Structural Steel: Material test reports (MTRs), also called mill test reports, for all structural steel. MTRs shall comply with the requirements of ASTM A6. MTRs shall be accompanied by a Certificate of Compliance from the fabricator. Structural steel shall be identified in accordance with CBC Section 2203.
 - b. Fastening Material: Manufacturer's Certifications for fastener components, including bolts, nuts, washers, and direct tension indicators (if used), accompanied by a Certificate of Compliance from the Contractor. Manufacturer certifications shall contain:
 - i. Heat analysis, heat number, and a statement certifying that prohibited elements were not added to produce the bolts.
 - ii. Results of hardness, tensile, and proof load tests, as required and performed.
 - iii. If galvanized, measured zinc coating weight or thickness, and the results of rotational capacity tests, including test method used (solid plate or tension measuring device) and lubricant present.
 - iv. Results of visual inspection for bursts.
 - v. Statement of compliance with dimensional and thread fit requirements.
 - vi. Lot number and purchase order number.
 - vii. For A490 bolts, only the Production Lot Method of testing and certification is acceptable. Shipping Lot Method is not acceptable.
 - c. Welding Consumables: Submit the following items:
 - i. Manufacturer's Certifications for electrodes, fluxes and shielding gasses to be used. Certifications shall satisfy AWS A5 requirements. In addition submit a Certificate of Compliance from the Contractor supplying the materials. Submit certifications that the product meets any additional requirements of the project.
 - ii. Manufacturer's product data sheets for all welding material to be used. The data sheets shall describe the product, limitations of use, recommended welding parameters, and storage and exposure requirements, including baking and rebaking.
 - d. Welded Stud Connectors: Submit the following items:
 - i. Manufacturer's Certification that the studs, as supplied, meet the requirements

- of AWS D1.1.
 - ii. Certified copies of the stud manufacturer's test reports covering the last completed set of in-plant quality control mechanical tests for the diameter supplied.
 - iii. Certified material test reports from the manufacturer. The Manufacturer's Certification shall be accompanied by a Certificate of Compliance from the Contractor.
2. Bolting and Welding Procedures: Procedures shall assign responsibility to a person or position and shall contain enough detail to be useful to the workforce without reference to governing specifications. The procedures need not act as work instructions. Procedures shall be dated and indicate the person or position that has the authority to maintain the procedure.
- a. Fastener Installation Procedures: Submit written procedures for the pre-installation testing, installation, snugging, pre-tensioning, and post-installation inspection of high strength fasteners.
 - b. Welding Procedure Specifications (WPSs): Welding Procedure Specifications (WPSs) shall conform to the requirements of AWS D1.1. Submit Welding Procedure Specifications (WPSs) and Procedure Qualification Records (PQR) as required by AWS D1.1, to be used on the project to the Owner's Testing Agency.
 - c. Use forms provided in Annex E of AWS D1.1 or equivalent.
 - d. Weld Sequence Procedures: Submit written procedures indicating field welding sequences for each type of connection with multiple field-welded joints, and the sequence of such connections to be field-welded at each level.
 - e. Weld Shrinkage and Distortion Control Plan: Where shrinkage is likely to cause distortion or other problems, submit a mitigation plan. The contractor is responsible for determining conditions requiring a Weld Shrinkage and Distortion Control Plan.
3. Welding Performance Qualification Records (WPQRs): Written Welding Performance Qualification Records (WPQRs), in accordance with AWS D1.1, for all welders on the project. Submit documentation that the welder has passed all designated supplemental welder qualification testing required for the types of welding to be performed. Submit documentation showing that the welder continued to use the applicable welding process on an ongoing basis since the WPQR test was conducted.

1.07 STRUCTURAL STEEL PRE-CONSTRUCTION CONFERENCE

- A. Prior to performing any fabrication or erection work, the Owner's Representative, Architect, Structural Engineer, and Owner's Testing Agency, together with Steel Fabricator personnel and Steel Erector personnel supervising the shop, field and Quality Control work shall hold a Pre-construction Conference to review submittal requirements, welding procedures, bolting procedures, fabrication and erection issues, and inspection requirements for all structural steel operations. Conference may be conducted via conference call.

1.08 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, and handle packaged materials in original containers with seals unbroken and labels intact until time of use.
- B. Structural steel shall be stored and handled in a manner that prevents damage or distortion. Discharge materials carefully; do not dump onto ground.
- C. Do not store materials on the structure in a manner that might cause distortion or damage to members of the supporting structure.
- D. Store structural steel members, whether on or off site, above ground on platforms, skids, or other support; store other materials in weather-tight, dry place until use.
- E. Store materials to permit easy access for inspection and identification.

F. Electrode Requirements:

1. Packaging of weld filler metals shall conform to the requirements of AWS D.1.1. FCAW electrodes shall be received in undamaged moisture-resistant containers. They shall be protected against contamination and injury during shipment and storage. When removed from protective packaging and installed on machines, care shall be taken to protect the electrodes and coatings from deterioration or damage.
2. Modification or lubrication of an electrode after manufacture is not permitted, except that drying shall be permitted when recommended by the manufacturer.

- G. Fasteners shall be stored in a protected place. Except for ASTM F1852 "twist-off" type assemblies, clean and relubricate bolts, nuts and washers that become dry or rusty before use. F1852 fastener components may be relubricated following the manufacturer's written instructions, and must be retested after relubrication and prior to use to verify suitability for installation.

1.09 JOB CONDITIONS

- A. Provide the Owner's Testing Agency with free access to places on and off job site where materials are stored or fabricated, to places where equipment is stored or serviced, and to job site.
- B. Sequencing, Scheduling:
1. Notify the Architect and Owner's Testing Agency in sufficient time prior to shop or field fabrication and erection to permit testing and inspection without delaying Work.
 2. Ensure timely delivery of items to be embedded in work of other sections; furnish setting drawings and directions for installation
 3. Provide templates for setting of anchor rods.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Steel Shapes, Plates, Tube, Pipe, and other sections: As noted on drawings.
- B. Standard Threaded Fasteners:
1. Machine Bolts and Nuts: ASTM A307, Grade A.
 2. Plain Washers: ASTM F844.
 3. Beveled Washers: ANSI B18.23.1.
- C. High Strength Bolts, Nuts, and Washers:
1. ASTM A325-N, snug-tight, unless otherwise noted.
 2. Twist-off-Type Tension-Control Bolt Assemblies: ASTM F1852 or ASTM F2280.
 3. Direct Tension Indicators: Load Indicator Washers: ASTM F959
 4. Nuts for High Strength Bolts: ASTM A563.
 5. Washers for High Strength Bolts: ASTM F436.
- D. Welding materials:
1. Comply with AWS D1.1 with a nominal 70 ksi tensile strength.
- E. Welded Stud Connectors:
1. Headed Shear Studs: AWS D1.1 "Type B" automatic end-welded headed studs made from ASTM A108, Grade 1015 or 1020.
 2. Threaded Studs: Automatic end-welded threaded studs made from ASTM A108, Grades 1010 through 1020.
- F. Anchor Rods and Nuts: ASTM F1554; Grade as noted on drawings.
1. Grade 55 shall be weldable per supplement S1.

2. Grades 55 shall have a minimum CVN toughness of 15 ft-lbs at 40° F per supplement S4.
3. Grade 105 shall have a minimum CVN toughness of 15 ft-lbs at -20° F per supplement S5.

G. Threaded Rods: As noted on drawings.

H. Clevises and Turnbuckles: AISI C-1035; in addition clevises and turnbuckles shall have design strengths corresponding to the 2005 AISC Steel Construction Manual with ultimate capacities at least 200% of the tabulated LRFD values.

I. Primer

1. Interior steel: primer shall conform to SSPC Paint Specification No. 25.
2. Primer used on walking surfaces shall meet OSHA requirements for slip resistance.
3. Primers shall contain no lead or chromates.
4. Contractor shall verify compatibility with finish paint.

J. Zinc-Rich Coating for Repair of Galvanized Surfaces: Zinc-rich coatings shall meet the requirements of ASTM A780.

K. Steel shall conform to the requirements of CBC Section 2202.1.

2.02 FABRICATION

A. General Requirements:

1. Fabricate structural steel in accordance with AISC 360 (Chapter M and Section J2.), AISC 303, and AWS D1.1 as applicable to Statically Loaded Structures, except as otherwise noted herein.
 - a. Assume all thermally cut edges are subject to tension stresses.
 - b. Delete paragraphs M4.6 and M5.1 from Chapter M of AISC 360.
2. Fabricate and assemble work in shop to greatest extent possible.
3. Where possible, use procedures that do not require Architect's approval. Such approval may not be given in some circumstances.
4. Coordinate as required for attachment of other work to structural steel.
5. Where required for passage of reinforcing steel shapes, sections, plates, or bars, for weld access, or for galvanization, drill or punch holes as indicated on Contract Drawings. Notify Architect of conditions not shown or noted.
6. Allowable Tolerances: Comply with AISC 360, Chapter M, and AISC 303, Section 6. Where more restrictive tolerances are necessary to properly install other building systems and components then adopt the more restrictive tolerances.

B. Connections:

1. Shop Connections: Bolted or welded as noted.
2. Field Connections: Locate splices only where noted or approved by Architect.
3. To the extent possible, assemble structural steel in the shop prior to galvanization.

C. Bolted Joints:

1. Punch or drill holes 1/16" larger than bolt size. Material having thickness in excess of connector diameter plus 1/8" shall be drilled rather than punched.
2. Ream unfair holes, but only up to next larger bolt size and install a bolt corresponding to the new hole size. Where unfairness exceeds maximum, weld hole in base material solid and drill hole of proper size.
3. Remove burrs that would prohibit solid seating of connected parts.
4. Mark completely tightened bolts with identifying symbol.
5. Provide hardened washers over slotted holes.
6. Assembly of High-Strength Structural Bolted Joints:
 - a. Meet requirements of AISC 348.
 - b. Direct tension indicator washers, where used, shall be provided under the head of slip-critical high strength bolts.

D. Welded Construction: (shop and field)

1. Weld in accordance with AISC 360, AWS D1.1, and CBC Chapter 22.
2. Welding shall be performed in accordance with the WPS for the joint.
3. Welds that will be permanently exposed to view or that will be painted shall have burrs, flux, welding oxide air spots, and discolorations removed. Surfaces of such welds shall be reasonably smooth and uniform.
4. Exterior welds shall be watertight.
5. Each welder working on the project shall be assigned an identification symbol or mark. Each welder shall mark or stamp this identification symbol at each weld completed. Stamps, if used, shall be the low-stress type.
6. Before testing, all welds to be subjected to ultrasonic testing (UT) shall be given a visible mark, "for UT," accurately placed on the steel a distance of 4" away from the root of the edge preparation.
7. Groove welds shall be complete-joint-penetration welds, unless specifically designated otherwise.
8. WPSs shall be available to welders and inspectors prior to and during the welding process. Prior to welding, joint fit-up shall be verified by the welder for conformance with the WPS and AWS D1.1.
9. Supplemental Welding Requirements
 - a. Maximum Preheat and Interpass Temperature: The maximum preheat and maximum interpass temperature permitted is 550° F, measured at a distance of 1" from the point of arc initiation. This maximum temperature may not be increased by the WPS, regardless of qualification testing.
 - b. Nonfusible Backing: The use of nonfusible backing materials, including ceramic and copper, is permitted only with satisfactory welder qualification testing performed using the type of backing proposed for use and using the test plate shown in AWS D1.1, Figure 4.21, except that groove dimensions shall be as provided in the WPS and PQR. For nonfusible weld tabs and short segments of nonfusible weld backing used at the ends of welds between shear plates and column faces, or at the ends of continuity plate welds, special welding personnel and welding procedure qualification testing is not required.
 - c. Peening, Controlled Cooling, and Post-Weld Heat Treatment (PWHT): If peening, controlled cooling, or PWHT are used, they shall be performed in accordance with AWS D1.1 and a written procedure for their performance shall be incorporated into the appropriate WPS.
 - i. If insulating blankets are used to control cooling a written procedure and temperature measurements are not required.
 - ii. The application of heat immediately following completion of a joint to maintain a nominal temperature at or below 550° F is not considered PWHT.
10. Welded Joint Details:
 - a. Weld Backing: The use of weld backing shall be in accordance with AWS D1.1. Weld backing shall be removed where required by the Contract Documents or for the WPS by AWS D1.1.
 - b. Weld dams are not allowed.
 - c. Weld Tabs:
 - i. Use of Weld Tabs: Welds shall be terminated at the end of a joint in a manner that will ensure sound welds. Whenever necessary, this shall be done by use of weld tabs.
 - 1) Weld tabs shall extend beyond the edge of the joint a distance equal to a minimum of the part thickness, but not less than 1."
 - 2) Weld tabs shall be oriented parallel to the joint preparation and to the weld direction.

- 3) Nonfusible weld tabs may be used in applications and locations where qualified in accordance with AWS D1.1, Section 4.
 - d. Weld toes: Weld toes, whether for groove welds or fillet welds, shall provide a smooth transition between the weld and base metal. The as-welded profile is adequate provided it satisfies the criteria of AWS D1.1, Section 5.24.
 - e. Weld access holes:
 - i. Weld access holes shall meet the dimensional, surface finish, and testing requirements of AISC 360 Chapter J1.6 and AWS D1.1, except as otherwise required by the Contract Documents.
 - ii. Where the height of the weld access hole exceeds the quantity $k-tf+1\frac{1}{2}$ " or where the length of the weld access hole exceeds $4tf$ (where k and tf are defined in AISC 360), welded reinforcement is required. Notify the Architect for specific instruction.
 - f. Welding for Moment Connection of Bottom Beam Flange shall be sequenced so as to minimize residual stresses in the joint
 - E. Camber: Provide camber as indicated on contract drawings in accordance with AISC 360 Chapter M2.1.
 - F. Welded Connectors: Install in accordance with AWS D1.1 and manufacturer's recommendations. There shall be no porosity or evidence of lack of fusion between the end of the stud and the steel member.
 - G. Surface Finish
 1. Flush Surfaces: Welds in butt joints required to be flush shall be finished so as to not reduce the thickness of the thinner base metal or weld metal by more than $1/16$ " or 5% of the material thickness, whichever is less. Remaining reinforcement shall not exceed $1/32$ " in height. However, all reinforcement shall be removed where the weld forms part of a faying or contact surface. All reinforcement shall blend smoothly into the plate surfaces with the transition areas free from undercut.
 2. Finish Methods and Values: Chipping and gouging may be used, provided these methods are followed by grinding. Where surface finishing is required, surface shall be Extra Smooth, unless otherwise noted or specified in this document. Measurement of surface finish values by visual appearance or tactile comparison is acceptable.
 - H. Repair of Gouges: Gouges are not permitted in areas requiring an Extra Smooth finish surface, or where specifically prohibited by AWS D1.1 or this Specification. Repair of gouges meet the following requirements, unless otherwise noted:
 1. Shallow Gouges: Gouges up to $3/16$ " deep shall be removed by grinding as per D1.1, or to a radius of not less than $3/8$."
 2. Deep Gouges: Gouges deeper than $3/16$ " shall be repaired by welding. Prior to welding, gouges shall be ground to provide an Extra Smooth contour with a radius not less than $3/8$." The repair area shall be preheated to a temperature between 400° F and 550° F, measured at the point of welding approximately one minute after removal of the heating source, or shall be preheated in accordance with AWS D1.1 Annex XI for high restraint. A written repair WPS for the application shall be followed. Following completion of welding, the area shall be ground Extra Smooth, with fairing of the welded surface to adjoining surfaces where applicable, and shall be inspected using magnetic particle testing (MT).
 3. The transitional slope after gouge removal shall not exceed 1:5.
- 2.03 FINISHES
- A. Walking Surfaces: walking surfaces shall be prepared to comply with OSHA requirements.
 - B. Prime Painting
 1. Surfaces to be painted:

- a. Apply one coat of interior primer to structural steel surfaces exposed to view unless otherwise noted.

C. Galvanization

1. Galvanize steel where required by the Drawings or by other sections of the Specification.
2. Galvanize Shapes in accordance with ASTM A153.
3. Galvanize Fasteners in accordance with ASTM B695, Class 40 minimum.
4. Plug vent and drain holes in galvanized members with polyurethane cap sealed with silicone adhesive.
5. Remove and repair galvanized surface as required for field welding in accordance with ASTM-A780, A2; required thickness is 100 micro-inches. Touch up with zinc-rich coating. Repair material shall extend at least three inches beyond edges of damaged areas.

2.04 SOURCE QUALITY ASSURANCE

A. The Owner's Testing Agency will:

1. Review ladle analysis and certificates of compliance. Where certification is questionable, test material to verify compliance.
2. Inspect shop fabrication.
3. Provide the management, personnel, equipment, and services required to perform the quality assurance functions required below.

B. Welding Inspection: The Welding Inspector will perform the tasks indicated in the following list. This list shall not be considered exclusive of any additional inspection tasks that may be necessary to meet the requirements of AWS D1.1, CBC, and the Quality Assurance Plan

1. Review and understand the applicable portions of the specifications, the Contract Documents and the shop drawings for the project.
2. Verify that all applicable welder qualifications, welding operator qualifications and tack welder qualifications are available, current, accurate, and in compliance with these specifications.
3. Verify welder identification and qualification. Verify that any required supplemental welder qualification testing, if required for the joint, has been executed and that the welder has passed.
4. Verify that each welder has a unique identification mark or die stamp to identify welds.
5. Verify that all applicable Welding Procedure Specifications (WPSs), with Procedure Qualification Records (PQRs) as needed, are available, current and accurate, and comply with AWS D1.1 and this specification.
6. Verify that an approved Welding Procedure Specification (WPS) has been provided and that each welder performing the weld has reviewed the WPS. A copy of the appropriate WPS shall be available for each joint, although need not be present at each joint location.
7. Review mill test reports for all main member and designated connection base material for compliance with the project requirements.
8. Verify base material identification with the contract documents.
9. Verify the electrode, flux and shielding gas certifications for compliance with the Contract Documents.
10. Verify welding consumables with the approved WPSs.
11. Verify that electrodes are used only in the permitted positions and within the welding parameters specified in the WPS.

12. Verify that electrodes and fluxes are properly stored, and that exposure limits for the welding materials are satisfied.
 13. At suitable intervals, observe joint preparation, assembly practice, preheat temperatures, interpass temperatures, welding techniques, welder performance and any post-weld controlled cooling and heat treatment to ensure that the requirements of the WPS and AWS D1.1 are satisfied.
 14. At suitable intervals, verify current and voltage of the welding equipment in application of the WPS, if needed, by a calibrated amp and voltmeter. Current and voltage shall be measured near the arc with this equipment.
 15. Inspect the work to ensure compliance with AWS D1.1 and the specified weld acceptance criteria.
 16. Schedule NDT technicians in a timely manner, after the visual inspection is complete and the assembly has cooled. The final NDT on a specific weld shall be performed at least 24 hours after the welding has been completed.
 17. Mark the welds, parts, and joints that have been inspected, and accepted, with a distinguishing mark or die stamp, or maintain records indicating the specific welds inspected and accepted by each inspector.
 18. Document the accepted and rejected items in a written report. Transmit the report to the designated recipients in a timely manner.
- C. Nondestructive Testing of Welded Joints
1. Magnetic Particle Testing: Magnetic Particle Testing (MT) shall be conducted by the Owner’s Testing Agency at the frequency designated in Table 2-1. MT shall be performed in accordance with AWS D1.1, and AWS D1.8 Annex F.
 2. Ultrasonic Testing: Ultrasonic testing (UT) shall be conducted by the Owner’s Testing Agency for the percentage of joints designated in Table 2-1. UT shall be performed in accordance with AWS D1.1.
 3. Weld Acceptance Criteria shall be in accordance with AWS D1.1. Regions of welds that cannot be inspected shall be identified and recorded, and the Structural Engineer shall be notified.

Table 2-1: Nondestructive Testing Requirements

Weld Category	Nondestructive Testing Requirements	
	Complete-Joint-Penetration Welds ¹	Partial-Joint-Penetration Welds and Fillet Welds
Welds not described below	No NDT required unless otherwise noted	No NDT required unless otherwise noted
Top-flange joints at cantilever beam connections ³ Splices in beam flanges	MT 100% of joints, full length UT 100% of joints, full length	MT 100% of joints, full length

Notes:

1. UT is required only when the weld thickness is $\frac{5}{16}$ " or greater.
2. If any joint fails testing, test 100% of joints until 40 consecutive welds pass. The testing rate may then be reduced to 25%.
3. Test joint on each side of cantilever beam support.
4. Reduce the rate of UT to 25% if after 40 welds have been inspected, an individual

welder's reject rate is less than 5%.

PART 3 EXECUTION

3.01 INSPECTION

- A. Examine units of Work to be placed and verify that all anchor rods have been installed properly and have sufficient bolt and thread elevation.
- B. Do not begin erection before unsatisfactory conditions have been corrected.

3.02 ERECTION

A. General Requirements:

- 1. Erect structural steel in accordance with AISC 360 Chapter M, AISC 303, and AWS D1.1 Structural Steel Welding Code as applicable to Statically Loaded Structures.
- 2. Requirements for bolted and welded joints specified in Part 2 of this Specification shall also apply to field connections unless otherwise noted.
- 3. Erection Tolerances: Do not exceed the erection tolerances specified in AISC 303, Section 7. Where more restrictive tolerances are necessary to properly install other building systems and components then adopt the more restrictive tolerances.
- 4. Where erection requires performing work of fabrication on site, conform to applicable standards for fabrication.

B. Field Cutting or Alteration: There shall be no field cutting, alteration, or repair of structural steel members or of connections without prior review and approval by the Architect. Structural elements with fabrication errors or that do not satisfy tolerance limits shall be repaired. Submit drawings showing reasons for, and details of, proposed corrective work.

C. Temporary Shoring and Bracing: Provide shoring and bracing as needed until permanent lateral-support is in place and complete. Contractor is responsible for identifying the need for temporary shoring and bracing.

D. Erection Procedures: Control erection procedures and sequences to avoid problems caused by temperature differentials and weld shrinkage, and other sources of expansion and contraction.

E. Field Assembly:

- 1. Clean bearing surfaces and surfaces to be in permanent contact before assembling members.
- 2. Do not fasten splices of columns and other members with bearing joints designated on the drawings before abutting surfaces have been brought completely into contact.
- 3. Bolted Construction:
 - a. Installation of high-strength bolts shall conform to ASTM A325 for slip-critical or snug-tightened type joints, as applicable, in accordance with AISC 348. Provide washer under head or nut of high strength bolts. Washer shall be provided under the element being turned during tightening. Bolts in welded connections shall be tensioned after completion of welding.
 - b. At bolted joints designated as Slip-Critical or that require Pretension, use Twist-off-Type Tension-Control bolt assemblies or Direct Tension Indicators.
 - c. Do not use flame cutting to align bolt holes except as permitted by AISC 348 specifications. Ream holes that must be enlarged to admit bolts. When reaming beyond 1/32," drill or ream to the next larger hole size and use the next larger size bolt.
- 4. Mill scale shall be removed from the column in the area where the beam flanges will be welded to the column.

F. Gas Cutting: Use of flame cutting torch will be permitted only after the Architect's prior written approval and only where metal cut will not carry stress during cutting, and cut surfaces will not

be visible. When thermal cutting is permitted, cutting shall be done with a mechanically guided torch or a torch controlled using a guide bar.

- G. Field Touch-Up Painting: After erection, touch-up paint field connections and abrasions resulting from the Work of this Section with same paint used for shop prime painting.
- H. Remove and repair galvanized surface as required for field welding in accordance with ASTM-A780, A2; required thickness is 100 micro-inches. Touch up with zinc-rich coating. Repair material shall extend at least three inches beyond edges of damaged areas.

3.03 CLEANING

- A. After erection, thoroughly clean surfaces of foreign or deleterious matter such as dirt, mud, oil, or grease that would impair bonding of fireproofing, concrete, or other finishes as applicable.

3.04 FIELD QUALITY ASSURANCE

- A. The Owner's Testing Agency will:
 - 1. Verify proper anchor rod group location, elevation, and orientation prior to placement of concrete foundations, and again subsequent to placement of concrete foundations prior to arrival of structural steel.
 - 2. Verify proper anchor rod group location, elevation, and orientation subsequent to placement of concrete foundations prior to arrival of structural steel.
 - 3. Perform field welding inspection and testing in accordance with the requirements in Part 2 of this Specification for shop fabrication, unless otherwise noted.
 - 4. Inspect and test high strength bolted joints in accordance with AISC 348.
 - 5. Sample and test bolt assemblies that include direct tension indicators, on a daily basis to verify proper indication of deformation with required bolt tension for each size and lot.
 - 6. Inspect erected structural steel as required to establish conformity of Work with reviewed shop drawings and Contract Drawings.
 - 7. Perform testing and inspection of welded stud connectors in accordance with requirements of AWS D1.1. After the bend test, the weld section shall not exhibit any tearing or cracking.
 - 8. Forward copies of all test and inspection reports to the Owner, Architect, Structural Engineer, and, Contractor, and the Building Department.

END OF SECTION

Revised Section 05500
METAL FABRICATIONS

PART 1 GENERAL

1.01 DESCRIPTION

- A. Section Includes: Provision of all items of miscellaneous metal and related accessories and fasteners as indicated in Contract Drawings including but necessarily limited to the following:
1. Steel pipe railing, handrails, guardrails and brackets.
 2. Steel stairs.
 3. Continuous inserts for pipe and conduit supports.
 4. Ladders.
 5. Backing and mounting plates for equipment items.
 6. Ceiling support system.
 7. Metal grating with frames and ledger angles.
 8. Anchor bolts.
 9. Sun shade framing.
 10. Seismic joints.
 11. Auxiliary angles brackets.
- B. Related Sections:
1. Section 05120 - Structural Steel

1.02 REFERENCES

- A. Requirements of GENERAL CONDITIONS and DIVISION NO. 1 apply to all Work in this area.
- B. Published specifications, standards, tests, or recommended methods of trade, industry, or governmental organizations apply to Work of this Section where cited by abbreviations noted below (latest additions apply).
1. California Building Code (CBC), 2007 Edition.
 2. American Society for Testing and Materials (ASTM).
 3. Federal Specifications (FS).
 4. American Institute of Steel Construction's "Specification for Structural Steel Buildings."
 5. American Welding Society's "Structural Welding code" (AWS D1.1).
 6. American Iron and Steel Institute's "Specifications for Design of Light Gauge Cold-Formed Stainless Steel Structural Members."
 7. National Association of Architectural Metal Manufacturer's: "Metal Stairs" (NAAMM-MS).
 8. Steel Structures Painting Council's "Painting Manual":
 - a. Solvent Cleaning (SSPCC-SP 1).
 - b. Hand Tool Cleaning (SSPC-SP 2).
 - c. Brush-Off Blast Cleaning (SSPC-SP 7).
 - d. Hot Phosphate Surface treatment (SSPC-PT 4).
 9. American Hot Dip Galvanizers Association, Inc. (AHDGA):
 - a. Inspection manual for hot dip galvanized products.

1.03 QUALITY ASSURANCE

- A. Welded Qualifications: Welders shall be qualified in accordance with AWS D1.1.
- B. Design criteria:
1. Work shall be designed to support normally imposed loads and conform to AISC requirements.
 2. Built-up parts shall not exhibit warp.

1.04 SUBMITTALS

- A. Manufacturer's literature describing products including details and dimensions.
- B. Shop Drawings:
 - 1. Show a large scale construction of various parts, methods of joining, thickness of metals, profiles of surfaces, reinforcing, anchorage, and structural supports. Include information regarding concealed and exposed joints, welds, and fastenings.
 - 2. Where welded connectors and concrete inserts are required to receive work, show size and locations required.
- C. Samples: Only as requested by the Architect.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver, store, and handle packaged materials in original containers with seals unbroken and labels intact until time of use.
- B. Discharge materials carefully and store on clean concrete surface or raised platform in safe, dry area.

1.06 JOB CONDITIONS

- A. Scheduling, Sequencing:
 - 1. Ensure timely fabrication of items to be embedded or enclosed by other work.
 - 2. Furnish information and assistance required for locating embedded items and be responsible for proper locations.

PART 2 PRODUCTS

2.01 BASIC MATERIALS AND ACCESSORIES

- A. Ferrous Metals:
 - 1. Structural Steel Shapes and Plates: ASTM A36, conforming to AISC specifications.
 - 2. Architectural and Miscellaneous Steel Items: ASTM A283.
 - 3. Steel Sheets: ASTM A446, Grade A.
 - 4. Steel Pipe: ASTM A53.
 - 5. Steel Bars: ASTM A36.
 - 6. Steel Tubing: ASTM A500, Grade A.
 - 7. Steel Plate: ASTM A36.
 - 8. Checker Plate: FS QQ-F461c, flat back carbon steel, Pattern 15 or 16.
 - 9. Zinc for galvanizing: ASTM B06 as specified in ASTM A123.
 - 10. Welding electrodes: E-70XX.
 - 11. Grout: Embeco "636" or equal product substituted per Section 01630.
 - 12. Stair Treads: Irving, Reliance, or equal with abrasive metal nosing.
 - 13. Grating: Irving, Reliance or equal typical 1-inch X 3/16-inch beaming bars at 1-3/8-inch centers with 1/4-inch twisted cross bars welded at 4-inch centers, galvanized with bolted anchorage.
- B. Fastenings:
 - 1. Typical Unfinished Bolts, Nuts, and Washers: Low carbon steel standard fasteners, externally and internally threaded, ASTM A307 Grade A; malleable washers.
 - 2. Expansion Bolts: Same as Hilti's "Kwik-Bolt Concrete Anchors"; Wej-It Expansion Products, Inc.'s "Wej-It Concrete Anchors"; or equal product substituted per Section 01630.
- C. Primer: Zinc-chromate type. Same as manufactured by Fuller-O'Brien Corp.'s No. 121-00; The Glidden Co.'s No. 4570; Sinclair paint Co.'s 20; or equal product substituted per Section 01630.

2.02 SPECIALTY FABRICATED PRODUCTS

A. Preparation:

1. Coordinate with other work supporting or adjoining miscellaneous metal and verify requirements for cutting out, fitting, and attaching.
2. Verify sizes, designs, and locations of items; do so at site whenever construction progress permits.

B. General Requirements

1. Fabricate items from materials noted and make true to profiles shown. Obtain the Architect's approval of proposed variations.
2. Miter corners and angles of frames and moldings unless otherwise noted.
3. Perform cutting, shearing, drilling, punching, threading, tapping as required for items or their adjacent work.
4. Drill or punch holes; do not use cutting torch.
5. Ensure shearing and punching leaves true lines and surfaces.
6. Items to be Galvanized: Fabricate in accordance with recommended practices of ASTM A385 and A386 unless specifically noted otherwise.
7. Fabricate exterior items for assembly and installation on site without field-welding of joint.
8. Ensure metal thickness and assembly details provide ample strength and stiffness.
9. Size sleeves for approximately 1/4-inch clearance all around.

C. Fastening:

1. Provide fasteners and anchor assemblies required for complete fabrication, field assembly, and erection.
2. Conceal fastenings wherever practicable.
3. Size internally threaded diameters to accommodate galvanized threaded bolts where galvanizing is required.
4. Permanent connections in Ferrous Metal Items: Employ welding wherever practicable; avoid bolts and screws.

D. Welding:

1. Use electric shielded-arc process according to AWS D1.1.
2. Maintain shape and profile of item welded.
3. Prevent heat blisters, run-throughs, and surface distortions.
4. Welds Normally Exposed to View in Finished Work: Make uniform and grind smooth.
5. Exposed Welds: Remove burrs, flux, welding oxide, air spots and discoloration; grind smooth, polish, or otherwise finish to match material welded.

E. Bolted and Screwed Connections:

1. Use bolts for field connections only, and then only as noted. Countersink heads; finish smooth and flush.
 - a. Provide washers under heads and nuts bearing on wood.
 - b. Draw nuts tight and prevent loosening of permanent connections by nicking threads.
 - c. Use beveled washers where bearing is on sloped surfaces.
2. Where necessary to use screws for permanent connections in ferrous metal, use flat head type, countersink, fill screw slots, and finish smooth and flush.
3. Evenly space exposed heads.

F. Steel Stairs: Fabricate in accordance with NAAMM-MS standards from steel sections as noted.

G. Ferrous metal Pipe Railings:

1. Fabricate in largest sections practicable.
2. Weld shop joints; fit field joints with concealed pins and sleeves.
3. Flush fittings may be used for crosses and tees.
4. Return rails to wall as noted.

5. Close ends with welded cap and ease edges.

H. Handrail Bracket for Pipe Railings: Fabricate according to details.

2.03 FINISHES

A. Preparations of Surfaces:

1. Thoroughly clean mill scale, rust, dirt, grease, and other foreign matter from ferrous metal prior to galvanizing, hot phosphate treatment or painting.
2. Where hand cleaning methods are not adequate, clean in accordance with SSPC-SP 1, SSPC-SP 2, or SSPC-SP 7 as required.
3. Completely eliminate burrs, rough spots and pitting from normally exposed ferrous metal items.

B. Galvanizing:

1. Galvanize items after fabrication in largest sections practicable unless otherwise permitted or recommended by ASTM A384 and A385.
2. Where galvanizing is removed by welding or other assembly procedures, touch up abraded areas with molten zinc or zinc-rich paint.
3. Where ferrous metal item is noted to be galvanized, perform galvanizing in accordance with following standards as applicable to item:
 - a. Hardware items Including Fasteners: ASTM B695, Class 40 minimum.
 - b. Items Both under 1/8-inch Thickness and Fabricated from Rolled, Pressed, and Forged Shapes, Plates, Bars, and Strips: ASTM A383.
 - c. Other Fabricated items: ASTM A153.

C. Finish Schedule: Unless noted otherwise in Materials or Standard Catalog Products Articles.

1. Ferrous Metal, Interior Items:

- a. Concealed: Clean, chemically etch, and shop-apply one prime coat.
- b. Exposed: Clean, treat with hot phosphate, chemically etch, and shop-apply one prime coat.

2. Ferrous metal, Exterior Items:

- a. Concealed: Clean and hot-dip galvanize in accordance with galvanizing standards.
- b. Exposed: Clean, then hot-dip galvanize in accordance with galvanizing standards, chemically etch, and shop-apply one prime coat.

3. Special Ferrous metal Items as Noted Below: Clean and hot-dip galvanize in accordance with galvanizing standards. Do not prime coat.

- a. Miscellaneous metal items in Penthouses such as stairs and railings.

4. Items Noted as Chrome-Plated: Same as US26D finish.

5. Hardware Including Fasteners (Bolts, Nuts, Washers, Etc.):

- a. Finish to match items fastened.
- b. Where galvanizing is required, hot-dip galvanize according to ASTM A153.

2.04 SOURCE QUALITY CONTROL

A. Test and Inspections: The owner will employ testing laboratory to test welds per UBC Section 1701.5.

PART 3 EXECUTION

3.01 INSPECTION

A. Examine areas to receive work and verify that: Setting conditions and dimensions are correct to receive items.

- B. Do not start installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install work plumb, true, rigid, and neatly trimmed out.
- B. Do not tighten fastener through finish alone without spacer washers.
- C. Provide concrete inserts or predrilled expansion bolts in fastening items into concrete.
- D. Protect dissimilar metals from contact with each other or with other materials causing corrosion.
- E. Fasten work tightly to prevent rattle or vibration except where expansion-contraction tolerances are required.
- F. Use nonshrink grout mixed in accordance with manufacturer's direction for setting frames, plates, sills, bolts and similar items.
- G. Set items shown or required to be installed in sleeves with quick-setting anchor cement unless otherwise noted.
- H. Protect metal from damage to surface, profile and shape.

3.03 CLEANING

- A. Remove protective devices only when items will be safe from other construction operations or removal is required to permit related work.
- B. Clean prime-coated items as required for finish painting.

END OF SECTION

Revised SECTION 08110
STEEL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Steel doors and frames.
- B. Interior light frames.

1.02 RELATED SECTIONS

- A. Section 08210 - Flush Wood Doors.
- B. Section 08710 - Door Hardware.
- C. 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.
- H. Or equal, Steel Door Institute (SDI) member manufactures.

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. All anchors and leg angles to be welded.
 - 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. All anchors and leg angles to be welded.
- 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. Special supporting internal reinforcing shall be fabricated with all automatic doors.

- 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. All anchors to be welded.

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 grouted frames as shown on drawings.
- F. Attach label to fire frame and door units.

2.06 FINISH

- A. Exterior Doors and Frames: Galvanize to ASTM A653 G60. Wipe coat galvanizing is not permitted.
- B. Interior and Exterior Doors and Frames (in addition to galvanizing): Manufacturer's standard shop primer paint, compatible with field applied (epoxy) latex or alkyd finishes.

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

Revised - SECTION 10260
WALL AND CORNER GUARDS

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Wall rails, aluminum.
- B. Corner guards, stainless steel.

1.02 SUBMITTALS: Follow Section 01300.

- A. Shop Drawings: Show installation details, blocking required, mounting dimensions and location schedules.
- B. Samples: 12 inch (300 mm) long samples of each product specified, in specified color and finish, showing design and configuration. Include end caps and mounting hardware.
 - 1. Three samples of each type of corner guard.
 - 2. One sample of each type of rail. Include exterior radiused corner and support brackets.

1.03 REGULATORY REQUIREMENTS

- A. Assemblies used on fire rated walls shall not compromise fire rating. Where indicated, provide flush-mounted, UL labeled corner guards to be used with a fire barrier for rated wall construction.

PART 2 PRODUCTS

2.01 CORRIDOR GUARD RAILS, ALUMINUM

- A. Manufacturers:
 - 1. Construction Specialties, Inc.; "Acrovyn ERC – 32A".
 - 2. Life Science Products, Inc.; "Sani-Rail Wall Protection System".
 - 3. Substitutions are permitted subject to Section 01630 not permitted.
- B. Rail: Aluminum; minimum 1/4 inch (6 mm) thick x 4 inch (100 mm) wide extruded aluminum bar with radius edges. Clear anodized finish.
- C. Rail Support Brackets: Aluminum beam section with radius edges; designed to hold back of rail 1-1/2 inches (38 mm) from wall surface. Clear anodized finish. Space not over 4'-0" (1200 mm) OC.
- D. Fabricate guard rails with radiused internal and external corners, following general plane of wall surface, with rail offsets as required. Terminate ends with a smooth 3 inch (76 mm) radius, ending 1/2 inch (13 mm) from wall surface.

2.02 CORNER GUARDS, STAINLESS STEEL

- A. Manufacturers: Substitutions are permitted subject to Section 01630.
 - 1. IPC Door and Wall Protection Systems.
 - 2. Life Sciences Products, Inc.

3. Pawling Corporation.

- B. Description: Surface mounted, flush design with 1/8 inch (3 mm) corner radius, for adhesive installation; 2 x 2 inches x 4'-0" high; 16 gauge; Type 304 stainless steel with NAAMM No. 4 satin finish.

2.03 HARDWARE AND ACCESSORIES

- A. Provide closures, end caps, corner pieces, mounting brackets, and all other accessories shown or required for a complete installation.
- B. Adhesive: As recommended by manufacturer for application.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify substrates and wall areas are ready to receive work of this Section.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. Install corner protection assemblies level, plumb, and true to line without distortions. Do not use materials with chips, voids, stains, or other defects that might be visible in the finished Work.
- B. Provide splices, mounting hardware, anchors, and other accessories required for a complete installation.
- C. Install corner guards at height just above base material indicated on Drawings.
- D. Install stainless steel corner guards using full adhesive application. Remove excess adhesive.

3.03 SPECIAL PROTECTION

- A. Where protective paper is provided, leave it on until final cleaning.

END OF SECTION

SECTION 10400

SIGNS

PART 1 - GENERAL

1.00 DESCRIPTION: Division 1 applies to this Section. Provide interior room and equipment signage and specified in this section.

1.01 GENERAL REQUIREMENTS

- A. The Contractor shall be responsible for the quality of materials and workmanship required for the execution of this contract including the materials and workmanship. Contractor shall be responsible for providing complete and up to date Drawings and Specifications.
- B. Written dimensions on the drawings shall have precedence over scaled dimensions. Contractor shall verify, and be responsible for dimensions and conditions. Shop details must be submitted to University Representative for approval before proceeding with fabrication.
- C. Location of signs: The locations of room signs shall be positioned at all new and remodeled entry office and lab doors, shaft doors, intervening rooms, exit doors etc. Contractor is to arrange a meeting at the site for final location of all elements.
- D. Location of signs: On all equipment installed under this contract. Not limited to cage wash, autoclaves, boilers, exhaust fans etc..
- E. Work shall conform to the Building and Electrical Codes of the City of Santa Barbara, CA and shall be approved and labeled by Underwriters' Laboratories, Inc. where required.

1.02 WORK INCLUDED

- A. Interior Signing- office, room and equipment.

1.03 SUBMITTALS

- A. Submit the following in accordance with Section 01340 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.
- B. Complete shop drawings to University Representative for written approval prior to fabrication. Full-size details of exposed edges, joint between materials, and details which affect appearance must be included. Show locations of required joints and seams.
- C. Samples: Sign material showing finishes, colors and surface texture - full-size units, acceptable units may be installed as part of the work.

1.04 DELIVERY, STORAGE AND HANDLING

- A. Package separately or in like groups of names, labeled as to names enclosed; include installation template, hardware or adhesive specified and installation instructions.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Karman Ltd. – (818) 888-3818
- B. CASigns – (818) 355-5554
- C. Or Equal.

2.02 MATERIALS

A. Adhesives and Tapes

1. Adhesives: Plastic cements used to fabricate plastic parts shall be as recommended by plastic manufacturer.
2. Silicone adhesive used for installing sign items shall be as manufactured by General Electric, Dow Corning or equal. Polyurethane foam tape, black, manufactured by 3M shall be used in conjunction with silicone adhesives for installation of wall signs, in thickness as required.

B. Plastics

1. Front Panel 1/8" thick SAR non-glare acrylic with second surface paint mounted flush to back panel machine polished edges.
2. Back Panel: 1/8" thick acrylic panel painted all sides 9% P4, mounted to wall with VHB tape.
3. Room number: 1/32" thick applied tactile text T4,P4
4. Room name: 1/32" thick applied tactile text T4, P4
5. Office name inserts .063 gap for paper insert and 1/8" non glare acrylic (Acrylic GP P95) with painted 2nd surface 9% P9 cover plate and thumb hole
6. Braille California grade 2 braille

PART 3 - EXECUTION

3.01 FABRICATION

A. General

1. Construct work to eliminate burrs, cutting edges and sharp corners.

2. Except as indicated otherwise, finish surfaces smooth.
 3. Surfaces which are intended to be flat shall be without bulges, oil canning or other physical deformities.
 4. Surfaces which are intended to be curved shall be smoothly free flowing to required shapes.
 5. Carefully follow manufacturers recommended fabricating procedures regarding expansion/contraction, fastening, and restraining of acrylic plastic.
- B. Braille: Contracted Grade 2 Braille shall be used whenever Braille symbols are specifically required. Dots shall be spaced 1/10 in. on center within each cell with 2/10 in. space between cells. Dots shall be raised 1/40 in. above background. Refer to CDC Section 1117B.5.2. All signage shall conform to CBC Section 1117B.5 and 1103.2.4.
- C. Fasteners
1. Fasteners shall be fully concealed wherever possible. Provide counter sunk screws for access panels or where exposed fasteners are required. Methods of fastening shall be detailed and exact specifications for fasteners shall be noted on shop drawings. Any portion of mounting brackets which are visible shall match wall, frame or hardware of sign color as indicated.

3.02 INSTALLATION

- A. Finish surfaces shall be free of brush marks, streaks, laps or pile up of paints, with all surfaces uniformly covered.
- B. Installation Conditions
1. Sign installation shall be carried out in a neat and proper manner equal to the finest quality standards of the industry.
 2. Sign installation shall follow drawings or position standards provided herein or the specification of the designer.
 3. Installed signs shall be clean, properly aligned, level and true to line and dimension, flush to surface unless otherwise specified, and free of imperfections and excess visible adhesive if used, with no damage to sign or surrounding surfaces.
 4. Where stud fastening or other mechanical fasteners are used, adequate mounting shall be provided to prevent unauthorized removal of sign.

5. Protect units from damage until acceptance. Any damage to signs or surrounding surface shall be repaired to the satisfaction of the University representative or shall be replaced.
- C. Inspect adjacent construction and make sure that conditions detrimental to the proper and timely execution of this work have been corrected before proceeding. Proceeding with this work shall indicate acceptance of existing conditions. The Contractor shall be responsible for repairing and repainting of building surfaces, which are damaged as a result of installation of sign items.

3.03 GUARANTEE

- A. Refer to Section 01740 – GUARANTEES, BONDS AND MAINTENANCE CONTRACTS, for submittal forms.
- B. Designer hereby grants the contractor the limited right to fabricate designs herein for the sole purpose of completing this contract. He may not manufacture, reproduce or exhibit these designs or modify them for any other purpose without written approval of Owner.
- C. The Contractor is responsible for engineering, structural rigidity and stability of all signs. Contractor shall visit the site and verify all existing conditions. This shall include local building code criteria.

END OF SECTION