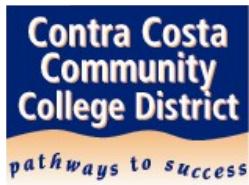


ADDENDUM #1



CONTRA COSTA COMMUNITY COLLEGE DISTRICT

**D-4002 San Ramon Campus Expansion and Renovation Increment 2
Diablo Valley College San Ramon Campus
1690 Watermill Road, San Ramon, CA 94582**

Date: July 22, 2019

NOTICE TO ALL CONTRACTORS:

You are hereby notified of the following changes, clarifications and/or modifications to the original Contract Documents, Project Manual, Drawings, Specifications and/or previous Addenda. This Addendum shall supersede the original Contract Documents and previous Addenda wherein it contradicts the same and shall take precedence over anything to the contrary therein. All other conditions remain unchanged.

This Addendum forms a part of the Contract Documents and modifies the original Contract Documents dated May 30, 2019. Acknowledgement of receipt of this addendum in the space provided in the Bid Proposal Form. Failure to acknowledge may subject proposer to disqualification.

A. Deletions, Additions, Changes, Revisions

a. Changes:

- i. The Pre-Bid Meeting and Job walk time has changed. It is changed from Thursday, July 25, 2019, at 9AM to Thursday, July 25, 2019 at 1PM at the San Ramon Campus.
Location: 1690 Watermill Road, San Ramon, CA 94582**
- ii. The AISC Quality Certification requirement change is provided in the revised specification section 05 12 00 item 1.4 "Qualifications," dated July 22, 2019.**
- iii. The District has recently updated their master control specifications including control schematics. An Addendum regarding updates to the mechanical drawings and specification Division 23, and new specification section 25 00 00 Building Automation Systems will be forthcoming in Addendum 2.**

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If you have any questions regarding this Addendum, please contact:

Mr. Ben Cayabyab, Contracts Manager
Contra Costa Community College District
500 Court St., Martinez, CA 94553

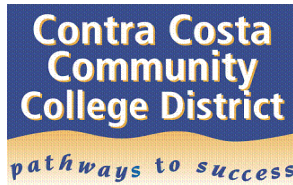
ADDENDUM #1

Email: bcayabyab@4cd.edu

Copy to:

Chris Wade, Sr. Construction Manager
c/o Diablo Valley College District Construction Office
321 Golf Club Road, Pleasant Hill, CA 94523
Email: chrisw@csipm.com

END OF ADDENDUM #1



NOTICE INVITING BIDS

D-4002 San Ramon Campus Increment 2 – Expansion & Renovation

Diablo Valley College San Ramon Campus
1690 Watermill Road, San Ramon, CA 94582

NOTICE IS HEREBY GIVEN that the Governing Board of the Contra Costa Community College District (District), Martinez, California, will receive sealed bid proposals for the furnishing of all labor, materials, equipment, transportation and services for the construction of the project entitled **D-4002 San Ramon Campus Increment 2 – Expansion and Renovation**.

Construction Cost Estimate (Range): **\$8,000,000.00 to \$10,000,000.00**
California License Required: **B - General Building Contractor**

The Overall Project Summary consists of renovations to portions of the existing instructional buildings as well as the construction of a new 6600 SF Library and Learning Resource Center and site improvements. The Invitation to bid specifically addresses the scope related to Increment 2, Renovation.

Increment 2 Work includes, but is not limited to:

1. Renovations at the Learning Commons
2. Renovations at the existing West Building for a new Café, including site improvements for a grease interceptor and trash/recycle/compost enclosure
3. Accessibility upgrades to existing restrooms as needed
4. Construction of a new 6600sf building – Library Learning Resource Center (LLRC)
5. Site Improvement at the new LLRC, including subgrade preparations, rerouting of existing underground utilities, extension of utilities to serve the new buildings and landscape improvements

The District does not provide hardcopies of bid documents or reimburse cost of printing, delivery, or any expenses related to the bidding process.

For information directly from the District, you may also log on to the District Website:

<http://www.4cd.edu/webapps/PurchasingViewBids/default.aspx>. Project documents available include, but are not limited to, plans, specifications, addenda, bidders lists, bid results, etc., and can be viewed on this District webpage. Builders Exchanges around Northern California are also notified.

This project is subject to the terms and conditions of a Project Stabilization Agreement (PSA) executed between the Contra Costa Community College District and the Contra Costa County Building & Construction Trades Council ("Council") and its affiliated local signatory unions.

All questions related to this project must be in writing and are directed to:

Ben M. Cayabyab, Contracts Manager (Interim)
Contra Costa Community College District
500 Court St., Martinez, CA 94553
Email: bcayabyab@4cd.edu

Each bid shall be made on the bid form, which is included in the Bid Documents and when submitted, shall be accompanied by a Bid Bond or Certified Cashier's Check in the amount of 10% of bid (made payable to

the Contra Costa Community College District). The District reserves the right to forfeit Bid Bond submitted for failure of the successful bidder to secure Payment & Performance Bonds.

IMPORTANT INFORMATION:

Pre-Bid Meeting and Job Walk, Date / Time: **July 25, 2019, 1:00 PM (Mandatory)**
Pre-Bid Meeting and Job Walk, Location: **Diablo Valley College, San Ramon Campus**
1690 Watermill Road
San Ramon, CA 94582
Meet at Center Fountain in Plaza

Last Date / Time for Bidder's Requests for Information: **August 5, 2019 at 5:00PM**
Last Day/Time to Issue Addendum: **August 12, 2019 at 5:00PM**
Bids Due No Later Than, Date / Time: **August 19, 2019 at 2:00PM**

Bids Must Be Received at: **Contra Costa Community College District (Lobby)**
500 Court St, Martinez, CA 94553
Attn: Ben Cayabyab – Contracts Manager (CCCCD)

Bids must be received by the District prior to the time and by the date noted above. Bids that are not received by the District prior to the time and by the date noted above will not be accepted, and will be returned to the Bidder unopened.

The successful bidder will be required to furnish a labor and material bond in an amount equal to one hundred percent (100%) of the contract price and a faithful performance bond in an amount equal to one hundred percent (100%) of the contract price, said bonds to be secured from a surety company acceptable to the Contra Costa Community College District and authorized to execute such surety in the State of California.

This project is a public works project and is subject to prevailing wage rate laws. A copy of the prevailing rates of wages is on file with the Contracts & Purchasing Office of the Contra Costa Community College District. Said rates of wages shall be included in the contract for the work by this reference.

Attention is directed to Section 4100 through 4113 of the Public Contract Code concerning Subcontractors, with emphasis on Section 4104, known as the "Subletting and Subcontracting Fair Practices Act, effective July 1, 2014.

Attention is directed to Labor Code Section 1725.5 regarding Department of Industrial Relations (DIR) contractor registration process including registration criteria and implementation of DIR registration requirements. Labor Code Section 1771.7 establishes contractor's obligation to submit Certified Pay Roll (CPR) to the Department of Labor and Standards Enforcement (DLSE) and public works monitoring and enforcement. Labor Code Section 1773.3 requires the District to submit a PWC-100 to DIR for all public works contract awarded effective January 1, 2015.

Attention is directed to Section 00600, Construction Agreement, Article 5, and Section 00700 GENERAL CONDITIONS, Article 8, paragraphs 8.4.1 and 8.4.2, regarding liquidated damages. Liquidated Damages shall be set for **\$1,000 Dollars** for each calendar day the work is delayed beyond the Contract Substantial Completion date. The Governing Board of the Contra Costa Community College District reserves the right to reject any and all bids and/or waive any informality or irregularity in any bid received. No bidder may withdraw their Bid for a period of ninety (90) days after the date set for opening thereof.

END OF SECTION 00100

SECTION 05 12 00
STRUCTURAL STEEL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to work of this section.

1.2 SUMMARY

- A. Extent of structural steel work is shown on drawings including schedules, notes and details that show size and location of members, typical connections, and type of steel required. Furnish all labor, materials, services, equipment and appliances required in conjunction with or related to the furnishing, fabrication, delivery, and erection of all structural steel defined below. Include all supplementary parts, members and connections necessary to complete the structural steel work, regardless of whether all such items are specifically shown or specified on the drawings.
- B. Related Sections
 - 1. Section 03 30 00 – Cast-in-Place Concrete
 - 2. Section 05 50 00 – Metal Fabrications

1.3 DEFINITIONS

- A. Structural Steel shall be defined as that work prescribed in Section 2.1 of the AISC “Code of Standard Practice for Steel Buildings and Bridges” and all other structural steel framing shown on the Structural Drawings.

1.4 QUALIFICATIONS

- A. Fabricator:
 - 1. The structural steel fabricator shall have not less than 5 years experience in the successful fabrication of structural steel similar to this project.
 - 2. The structural steel fabricator must participate in one of the following certification programs. Program certification must be current at the time of bidding and throughout the duration of the project.
 - a. The AISC Quality Certification Program and be designated an AISC Certified Plant in Category STD, Standard for Steel Building Structures.
 - b. The Los Angeles Department of Building and Safety (LADBS) certification program.

enumerated below. OSHA requirements include regulation 29 CFR 1926, Part R, "Safety Standard for Steel Erection".

3. AISC 303 "Code of Standard Practice for Steel Buildings and Bridges," 2016 edition, except as noted herein.
 - a. Certain sections in this specification contain requirements that are more restrictive and/or different than contained in this standard. In such cases, the requirements of this specification shall control.
 4. ANSI/AISC 360, "Specification for Structural Steel Buildings", 2010 edition.
 5. Research Council on Structural Connections (RCSC) "Specification for Structural Joints using High Strength Bolts".
 6. AISC "Steel Construction Manual", Thirteenth Edition
 7. ANSI/AWS D1.1 "Structural Welding Code - Steel.
 8. ANSI/AWS D1.3 "Structural Welding Code – Sheet Steel.
 9. ANSI/AWS D1.8 "Structural Welding Code – Seismic Supplement"
 10. The Society of Protective Coatings "SSPC Painting Manual", Volumes 1 and 2.
- B. Qualifications for Welding Work: Qualify welding processes and welding operators in accordance with AWS "Structural Welding Code - Steel".
- C. Source Quality Control: Materials and fabrication procedures are subject to inspection and tests in the mill, shop, and field by the District's testing laboratory. Such inspections and tests will not relieve the Contractor of responsibility for providing materials and fabrication procedures in compliance with specified requirements. The Contractor shall promptly remove and replace materials or fabricated components which do not comply.
- D. Questions about Contract Documents: The Contractor shall promptly notify the Architect/Engineer whenever design of members and connections for any portion of the structure are not clearly indicated or when other questions exist about the Contract Documents. Such questions shall be resolved prior to the submission of shop drawings.
- E. District's Testing Laboratory Services: Inspection or testing by the District does not relieve the Contractor of his responsibility to perform the Work in accordance with the Contract Documents
- F. Surveyor: The General Contractor shall employ a qualified land surveyor to perform surveys required by this specification.

1.6 SUBMITTALS

- A. Product Data: Submit producer's or manufacturer's specifications and installation instructions for following products; include laboratory test reports and other data to show compliance with specifications (including the specified standards):

1. Structural steel (each type), including certified copies of mill reports covering chemical and physical properties. For structural steel for which evidence exists that the steel may not conform to ASTM requirements, the contractor, where permitted by the engineer, shall engage the services of an independent testing laboratory to test the material according to ASTM A6 and submit certified test reports that verify conformity to ASTM standards. Tests shall be made for each 10 tons of affected material unless otherwise directed by the Engineer.
2. Shrinkage-resistant grout.
3. Unfinished bolts and nuts.
4. Welding electrodes (each type).

B. Shop Drawings and Erection Drawings:

1. All drawings submitted for review shall have the approved shop drawing stamp of the Design Team as part of the title block. The approved shop drawing stamp will be provided in electronic format to the successful bidder.
2. Definitions:
 - a. Shop Drawings: Drawings of the individual structural steel shipping pieces that are to be produced in the fabrication shop.
 - b. Erection Drawings: Field-installation or member-placement drawings that are prepared by the Fabricator to show the location and attachment of the individual shipping pieces.
3. Shop Drawings: Submit for review and approval shop drawings showing complete details and schedules for fabrication and assembly of structural steel members. Structural steel shop drawings shall include the following minimum information:
 - a. Include details of cuts, connections, camber, holes, and other pertinent data. Indicate welds by standard AWS symbols, and show size, length, and type of each weld. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify the type of high-strength bolted connection (slip-critical, direct-tension, or bearing connections). Holes, flange cuts, slots and openings shall be made as required by the structural drawings, all of which shall be properly located by means of templates.
 - b. Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed by others.
 - c. Structural steel shop and erection drawings shall identify:
 - (1) Locations where weld backing is to be removed
 - (2) Locations where fillet weld reinforcement is to be added to steel backing left in place
 - (3) Locations where weld tabs are to be removed
 - (4) Access hole dimensions, surface profile and finish requirements
 - (5) Locations of pre-tensioned bolts
 - (6) Connection material specifications and sizes

- (7) Gusset Plates drawn to scale when they are detailed to accommodate inelastic rotation
 - (8) Non Destructive Testing (NDT) to be performed by the fabricator, if any
 - (9) Indicate joints or groups of joints in which a specific assembly order, welding sequence, welding technique or other special precautions are required
4. Erection Drawings: Submit for review and approval complete erection drawings showing field-installation and member-placing instructions for locating and attaching the individual shipping pieces.
 5. The fabricator alone shall be responsible for all errors of detailing, fabrication, and for the correct fitting of the structural members.
 6. All fabricated material and connections shall fit within architectural constraints.
 7. Structural steel members for which shop drawings have not been reviewed and approved shall not be fabricated.
 8. The omission from the shop drawings of any materials required by the Contract Documents shall not relieve the Contractor of the responsibility of furnishing and installing such materials, even though the shop drawings may have been reviewed and approved.
- C. Surveys: Submit the information requested for all surveys required by this specification.
- D. Test Reports: Submit certified reports of tests required by this Specification Section. Include data on type(s) of tests conducted and test results.
- E. Qualification Data:
1. Submit qualification data, including required certifications, for firms and persons specified in the "Qualifications" section under Part 1, to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and Districts, and other information specified. **Submit QC/QA procedures of the fabricator and erector where AISC certification is requested to be waived.**
 2. Submit Welding Procedure Specifications (WPS) in accordance with ANSI/AWS D1.1 for all welded joints. Submit test reports showing successful passage of qualification tests for all non-prequalified WPSs.
 3. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests as specified in the "Qualifications" section under Part 1. If recertification of welders is required, retesting will be at Contractor's responsibility.
 4. A fabricator that is registered with the local building official and is approved to perform fabrication without special inspection shall submit a certificate of

compliance stating that the work was performed in accordance with the approved construction documents.

F. Substitutions:

1. Substitutions or any other modifications proposed by the Contractor will be considered by the Architect/Engineer only under the following conditions:
 - a. That the request has been made and accepted by the Architect/Engineer and approved by DSA prior to the submission of shop drawings. All substitutions shall be clearly marked and indicated on the shop drawings as a substitute.
 - b. That there is a substantial cost advantage or time advantage to the District; or that the proposed revision is necessary to obtain the required materials or methods at the proper times to accomplish the work in the time scheduled.
 - c. That sufficient sketches, engineering calculations, and other data have been submitted to facilitate checking by the Architect/Engineer, including cost reductions or savings in time to complete the work.
 - d. The contractor agrees to compensate the Architect and Engineer of Record for all labor and expenses associated with reviewing substitutions, including obtaining approval from DSA.
 - e. In no case shall such revisions result in additional cost to the District.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to site at such intervals to ensure uninterrupted progress of work.
- B. Deliver anchor rods and anchorage devices, which are to be embedded in cast-in-place concrete or masonry, in ample time so as not to delay work.
- C. Store materials to permit easy access for inspection and identification. Keep steel members off ground, using pallets, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration. Do not store materials on structure in a manner that might exceed allowable loads on or cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed by Architect/Engineer.
- D. Furnish all fuel, maintenance, and equipment required for hoisting and placement of materials under this contract.
- E. Process, pay for and maintain all permits and certificates of on-site inspection required for derricks, cranes and hoisting equipment. No derrick, crane or hoisting equipment shall be operated without a certificate of operation and a certificate of on-site inspection, as required by governing authorities.
 1. In addition to the above, all hoisting equipment shall be installed, operated and maintained in accordance with all applicable regulations of authorities having jurisdiction.

2. The Contractor shall furnish street storage and sidewalk crossing permits.

1.8 JOB CONDITIONS

- A. The Contractor shall coordinate the fabrication and erection of all structural steel work with the work of other trades.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Structural Steel: All hot rolled steel plates, shapes, sheet piling, and bars shall be new steel conforming to ASTM A6.
- B. Structural steel shall comply with the provisions of the following ASTM Specifications as appropriate for the grades and types, and at the locations as specified on the drawings:
 1. Structural Steel Wide Flange and WT Shapes - High Strength Steel, ASTM A992.
 2. Channels - ASTM A36.
 3. Angle Shapes – ASTM A36.
 4. Structural Steel Plates and Bars - ASTM A36 typical; ASTM A572 Grade 50 where noted.
 5. Steel Pipe - ASTM A53 (Type E or S) Grade B (Fy = 35 ksi).
 6. Square and Rectangular HSS – ASTM A500, Grade B/C (Fy = 46 ksi).
 7. Round HSS – ASTM A500, Grade B/C (Fy = 42 ksi)
 8. Connection Material: Unless noted otherwise on the drawings, all connection material including bearing plates, gusset plates, stiffener plates, filler plates, angles, etc. shall be A36 steel unless an alternate grade of steel with the members connected is specified.
- C. Structural Steel Surfaces: For fabrication of work which will be exposed to view in the completed structure, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness. Remove such blemishes by grinding, or by welding and grinding, prior to cleaning, treating and application of surface finishes.
- D. Structural Bolts and Threaded Fasteners: Structural bolts and threaded fasteners shall comply with the following ASTM Specifications as appropriate for the types and at the locations as specified on the drawings:
 1. ASTM A325 Type 1.

2. Alternative Design Fasteners: Fasteners that incorporate a design feature intended to indicate a predetermined tension or torque (load indicator bolts or “twist-off” bolts) shall conform to the requirements of section 2.8 of the RCSC “Specification for Structural Joints Using ASTM A325 or A490 Bolts”.
 - a. Bolts that are manufactured to conform to ASTM A325 shall additionally conform to ASTM F1852.
 - b. Subject to conformance with specified requirements, acceptable manufacturers include but are not limited to:
 - (1) Nucor Fastener, A Division of Nucor Corporation, Conway, AR and St. Joe, IN.
 - (2) Lake Erie Screw Corp., Lakewood, OH.
 - (3) Vermont Fasteners Manufacturing, Swanton, VT.
 - (4) Lohr Structural Fasteners, Humble TX.
3. Threaded Round Stock - ASTM A36.
4. Bolts and Nuts, High Strength Bolts: Bolts and nuts for all high strength bolts shall be heavy hex head conforming to ANSI Standards B18.2.1 and B18.2.2 respectively. Nuts shall conform to ASTM A563.
5. Washers: All washers shall be circular, flat and smooth and shall conform to the requirements of Type A washers in ANSI Standard B23.1. Washers for high strength bolts shall be hardened and conform to ASTM F436. Beveled washers for American Standard Beams and channels shall be square or rectangular, shall taper in thickness (16 2/3% slope) with an average thickness of 5/16". When an outer face of a bolted part has a slope greater than 1:20 with respect to a plane normal to the bolt axis, a beveled washer shall be used.
6. Zinc-Coated Bolts: ASTM A325 bolts, with their nuts and washers, that are used to connect steel specified as hot-dip galvanized after fabrication shall be zinc-coated either by the hot-dip process in accordance with ASTM A153, Class C or by the mechanical deposition process in accordance with ASTM B695, Class 50, Type 1. The bolts, nuts, and washers shall all be zinc-coated using the same process and they shall be considered together as an assembly and shall be tested and shipped together as such. Comply with all the requirements of ASTM A325 and ASTM A563 as they relate to zinc-coated materials. ASTM F1852 bolts with their nuts, and washers shall be zinc-coated only by the mechanical deposition process in accordance with ASTM B695, Class 50, Type 1. Do not zinc-coat ASTM A490 bolts.
7. Direct Tension Indicators: Compressible washer-type direct-tension indicators conforming to ASTM F959.

Subject to conformance with specified requirements, acceptable manufacturers include but are not limited to:

Applied Bolting Technology, Ludlow, VT
Turnasure, LLC. Langhorne, PA

8. Bolt Lubrication: All bolts shall be well lubricated at time of installation. Dry, rusty bolts will not be allowed.
 9. New Bolts: All bolts shall be new and shall not be reused.
- E. Electrodes for Welding:
1. Provide electrodes that comply with AWS D1.1, "Structural Welding Code - Steel" and that can produce welds that have a minimum Charpy V-notch toughness of 20 ft-lbs at 40° F, unless noted otherwise in these specifications or on the drawings
 2. Electrodes for various welding processes shall be as specified below:
 - a. SMAW - E70XX low hydrogen
 - b. SAW: - F7X-EXXX
 - c. GMAW: - ER70S-X
 - d. FCAW: - E7XT-X
 3. Electrodes shall be compatible with parent metal joined.
- F. Shear Connectors (Headed and Threaded Studs): Shear connectors and their installation shall meet all requirements specified in Section 7, Type B of AWS D1.1 "Structural Welding Code-Steel". Sizes of shear connectors shall be as specified on the drawings.
- G. Anchor Rods:
1. All anchor rods shall conform to ASTM F 1554 unless noted otherwise on the drawings and shall be of the yield strength as specified on the drawings:
 - a. Grade 36 typical, additionally conforming to Supplementary Requirement S1 of ASTM F 1554. Substitution for Grade 36 anchor rods with Grade 55 anchor rods shall only be permitted provided the Grade 55 anchor rods comply with Supplementary requirements S1 of ASTM F1554.
 2. Anchor rods used with galvanized base plates shall be galvanized.
 3. Nuts: All nuts with anchor rods shall be heavy hex head conforming to ASTM A563.
 4. Washers: Unless indicated otherwise, washers for all base plates shall be in accordance with the AISC "Steel Construction Manual", Table 14-2 with holes 1/16" larger than the anchor rod diameter. Washers shall conform to ASTM A36 steel.
- H. Structural Steel Primer Paint:
1. Unless noted otherwise, primer paint shall be the following with the indicated surface preparation:

- a. SSPC-Paint 25.1, Type II; zinc oxide, raw linseed oil and alkyd primer, surface prepared according to SSPC-SP-2 (Hand Tool Cleaning) unless noted otherwise in this specification.
 2. Refer to Architect's drawings and specifications for final paint finish requirements of structural steel. Primer paint shall be compatible with finish paint requirements.
- I. Non-Shrink Grout: Provide grout type(s) as specified on the drawings:

1. Non-Metallic Non-Shrink Grout: Premixed, non-corrosive, non-staining product containing Portland cement, silica sands, shrinkage compensating agents, and fluidity improving compounds. Conform to ASTM C1107. Provide 8000 psi minimum compressive strength as determined by grout cube test at 28 days.

Subject to conformance with specified requirements, acceptable non-shrink grouts include:

"Crystex" and "Duragrout" as manufactured by L&M Construction Chemicals, Inc.

"Sure Grip High Performance Grout," and "1107 Advantage Grout" as manufactured by Dayton-Superior Corporation.

"Masterflow 555", and "Set Grout" as manufactured by BASFConstruction Chemicals.

"Five Star Grout" as manufactured by U.S. Grout Corp.

"NS Grout" as manufactured by The Euclid Chemical Company.

"CG 200 PC", Hilti, Inc.

J. Hot Dip Galvanizing:

1. Scope: All structural steel items and their connections permanently exposed to exterior conditions or that are within areas of unconditioned airspace, whether specified on the drawings or not, shall be hot-dipped galvanized after fabrication unless indicated on the drawings or in Specification Section 09900 to receive a primer and/or finish coat. Such items include, but are not limited to:

- a. Base plates and anchor rods supporting galvanized members shall also be galvanized.
- b. Trash Enclosure members.
- c. Screen wall and Exterior Canopy supporting members.

Examine the architectural and structural drawings for other items required to be hot dipped galvanized.

Zinc-coat all ASTM A307 and A325 bolts nuts, and washers used in the connection of such steel. Field welded connections shall have welds protected with galvanizing repair paint.

2. Surface Preparation: All steel to be hot dip galvanized shall undergo the following surface preparation as specified by the Steel Structures Painting Council (SSPC), Volume 2.
 - a. Remove all grease, oil, grime and foreign contaminants by thorough cleaning with an alkaline or organic solvent followed by thorough rinsing in cold water.
 - b. Remove scale by pickling in diluted sulfuric or hydrochloric acid. Pickling shall be followed by a rinse in warm water and a second rinse in cold water. As an alternative to pickling, the steel may be white metal blast cleaned according to SSPC-SP-5.
 - c. Dip in a flux solution of zinc ammonia chloride followed by drying at room temperature.

3. Zinc Coating: The zinc coating for steel shapes and plates shall conform to ASTM A123. Weight of zinc coating per square foot of surface for 1/8 inch and 3/16" thick steels shall average not less than 2.0 oz. with no individual thickness less than 1.8 oz. The coating weight shall average not less than 2.3 oz. with no individual thickness less than 2.0 oz. for 1/4" thick and heavier steel.

K. Galvanizing Repair Paint: Galvanizing repair paint shall be "ZRC Cold Galvanizing Compound" as manufactured by ZRC Chemical Products or a paint complying with SSPC-Paint 20.

2.2 FABRICATION

A. Shop Fabrication and Assembly:

1. Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specification and as indicated on approved final shop drawings. Provide camber in structural members where indicated. Fabricator shall coordinate connection details, joint fit-up procedures, and field adjustment requirements with erector. The General Contractor shall coordinate provision of all erection bolts, lifting lugs or other devices required for erection with the fabricator and the erector and for interference with architectural finishes and constraints.
2. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.
3. Clearly mark the grade of steel on each piece, distinguishable in the field from floor surfaces, for purpose of field inspection and confirmation of grade of steel.
4. Milled surfaces of built-up sections shall be completely assembled or welded before milling.

5. Fitted stiffeners shall be fabricated neatly between flanges, and the ends of stiffeners shall be milled or ground to secure an even bearing against abutting surfaces. All milled or ground joints shall bear throughout their contact length.
- B. Dimensional Tolerances: Dimensional tolerances of fabricated structural steel shall conform to Section 6.4 of the AISC Code of Standard Practice.
- C. Splices in Structural Steel: Splicing of structural steel members in the shop or the field is prohibited without prior approval of the Engineer. Any member having a splice not shown and detailed on approved shop drawings will be rejected.
- D. Compression Joints: Ends of columns, except as otherwise noted, and other compression joints at splices and other connections as noted on the drawings which depend on contact bearing as part of the splice strength shall be finished to bear in accordance with AISC Specification M2.6 so as to provide complete true bearing in accordance with AISC Specification M4.4.
- E. Cutting: Manual oxygen cutting shall be done only with a mechanically guided torch. An unguided torch may be used provided the cut is not within 1/8 inch of the finished dimension and final removal is completed by means such as chipping or grinding to produce a smooth surface quality free of notches or jagged edges. All corners shall be smooth and rounded to a minimum 1/2" radius.
- F. Holes for Other Work: Provide holes required for securing other work to structural steel framing, and for passage of other work through steel framing members as shown on the contract documents, and/or the final shop drawings.
1. Provide specialty items as indicated to receive other work.
 2. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.
- G. Lifting and Erection Devices: The fabricator shall be responsible for designing, detailing and furnishing all lifting devices and erection aids required for erection. Such devices shall be removed after erection if they interfere with architectural finish requirements.
- H. Drainage Holes: Provide 1 inch diameter drainage (weep) holes in all members (trusses, girders, beams, etc.) exposed to weather where rain water could collect (at low points and/or behind dams caused by connections, stiffener plates, etc.). Show all holes on shop drawings for review by the Engineer.

2.3 WELDING

- A. Code: All shop and field welding shall conform to all requirements in the "Structural Welding Code - Steel", ANSI/AWS D1.1, as published by the American Welding Society (AWS). In addition for projects required to meet the AISC Seismic Provisions for Structural Steel Buildings the provisions of AWS D1.8 shall supplement the provisions of AWS D1.1 where specifically modified by AWS D1.8 and shall apply to the design, fabrication, quality control and quality assurance of welded joints designed in accordance with the AISC Seismic provisions for Steel Buildings.

- B. Welder Certification: All shop and field welders shall be certified according to all the applicable AWS procedures for the welding process and welding position used. Each welder shall be assigned an identifying symbol or mark and all shop and field welded connections containing complete or partial joint penetration welds, multi-pass fillet welds, and fillet welds greater than 5/16" shall be identified by the symbol or mark of the welder responsible for the connection.
- C. Minimum Size and Strength:
1. Fillet Welds: Minimum size of fillet welds shall be as specified in Table J2.4 in AISC Specification, Chapter J.
 2. Partial-Penetration Groove Welds: The minimum effective throat thickness of partial-penetration groove welds shall be as specified in Table J2.1 in AISC Specification, Chapter J.
 3. Minimum Strength of Welded Connections: Except as specified below in "Connections" or noted otherwise on the drawings, all shop and field welds shall develop the full tensile strength of the member or element joined. All members with moment connections as indicated on the drawings shall be welded to develop the full flexural capacity of the member, unless noted otherwise on the drawings.
- D. Filler Metal Requirements: Weld metal shall be as specified in Table J2.5 in AISC Specification, Chapter J and other requirements of this specification.
- E. Welding Procedure Specification:
1. All welding shall be performed in accordance with a Welding Procedure Specification (WPS) as required in AWS D1.1 and approved by the District's Testing Laboratory and the Architect/Engineer. The WPS variables shall be within the parameters established by the filler-metal manufacturer. Engage the services of an independent testing laboratory, DSA approved, to provide the qualification testing required by AWS D 1.1, chapter 4, part B to qualify any non-prequalified WPS needed for the project. The testing laboratory shall prepare Welding Procedure Qualification Records (WPQR) documenting the successful qualification of each Welding Procedure Specification.
- F. Welding Procedures:
1. All welding processes shall comply with the requirements of ANSI/AWS D1.1 unless noted otherwise.
 2. Complete joint penetration welds of beam bottom flanges to column, or to continuity plates shall be sequenced to conform to the requirements of AWS D1.8, Section 6.14.
 3. Built-up sections assembled by welding shall be free of warpage and all axes shall have true alignment.

4. Welds not specified shall, if possible, be continuous fillet welds developing the minimum strength, as specified above, using not less than the minimum fillet welds as specified by AISC.
 5. The toughness and notch sensitivity of the steel shall be considered in the formation of all welding procedures to prevent brittle and premature fracture during fabrication and erection.
 6. Before welding is started, the fabricator shall submit for the approval of the District's Testing Laboratory in consultation with the Architect/Engineer, written Welding Procedure Specification for all joints to be welded. After approval, the Welding Procedure Specification shall be followed without deviation unless specific approval for change is obtained from the District's Testing Laboratory and the Architect/Engineer.
 7. Before welding, particular attention shall be paid to surface preparation, fit up and cleanliness of surfaces to be welded.
 8. Minimum preheat and interpass temperatures for structural steel welding shall be as specified in ANSI/AWS D1.1 and D1.8, except that no welding shall be performed when the ambient temperature is lower than 0 degrees F. The temperature shall be measured from the side opposite that upon which the preheat is applied.
 9. The heat, input, length of weld and sequence of weld shall be controlled to prevent distortions. The surfaces to be welded and the filler metals to be used shall be subject to inspection before any welding is performed.
 10. Welds shall be sound throughout. There shall be no crack in any weld or weld pass. Welds shall be considered sound if they conform to AWS requirements, as confirmed by non-destructive testing.
 11. Welds shall be free from overlap.
 12. Craters shall be filled to the full cross section of the welds.
 13. Fabricator and erector shall coordinate welding responsibility at all welded joints.
- G. Stress Relieving: All welding sequences shall be such as to reduce the residual stresses due to welding to a minimum value. If high residual stresses are present, stress relieving of joints shall be required. Welded connections shall be detailed and designed to minimize the accumulation and concentration of through-thickness strains due to weld shrinkage.

2.4 BOLTING

- A. Bolt Diameter: Minimum bolt diameter shall be 7/8 inch unless noted otherwise.
- B. Connection Type: Unless noted otherwise on the drawings, all bolted connections shall be snug-tightened using high-strength bolts in standard holes (hole diameter nominally 1/16 inch greater than the nominal bolt diameter) with threads included in the shear planes.

Notwithstanding, the contractor shall be responsible to adhere to provisions of AISC Specification Section J1.10, which lists circumstances under which certain connections require pretensioned high strength bolts.

- C. Oversize, Short Slotted and Long Slotted Holes: The dimensions and washer requirements of oversize, short slotted, and long slotted holes shall conform to the AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts."
- D. Fastener Tension:
 - 1. High strength bolts in snug-tightened joints shall be tightened to a snug tight condition only. Do not pretension bolts in snug-tightened joints the same as if they were in slip-critical joints. The snug-tightened condition is defined as the tightness that exists when all plies are in firm contact. This may usually be attained by a few impacts of an impact wrench or the full effort of an ironworker using an ordinary spud wrench.
 - 2. High-strength Bolts in Slip-Critical and Pretensioned Joints:
 - a. High-strength bolts in slip-critical and pretensioned joints shall be tightened to achieve the minimum bolt tension as specified in the AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts" when all the fasteners of a joint are tight.
 - b. Any of the four methods to tighten bolts specified in the AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts" may be used to achieve the minimum bolt tension. The tightening procedure that uses direct tension indicator washers shall conform to the requirements of ASTM F959.
 - c. The Contractor shall cooperate with the District's Testing Laboratory when Arbitration Testing and Inspection is called for due to a disagreement regarding the tension in installed bolts that have been inspected according to the Testing and Inspection portion of this specification section.
- E. Washers: Washers under the bolt head and/or nut shall be used as required by the AISC "Specification for Structural Joints Using ASTM A325 or A490 Bolts."
- F. Bolt Lubrication: All bolts shall be well lubricated at time of installation. Dry, rusty bolts will not be allowed.
- G. Impact Wrenches: Properly sized and lubricated air impact wrenches with adequate air pressure shall be utilized for all bolt installation.
- H. New Bolts: All bolts shall be new and shall not be reused.

2.5 CONNECTIONS

- A. Connection details are indicated on the drawings.
- B. Base Plates and Bearing Plates:

1. Finish: All baseplates and bearing plates shall be finished in accordance with AISC Specification M2.8.
 2. Attachment to Column: Unless shown otherwise on the drawings, all baseplates and bearing plates shall be welded all around to the column with minimum fillet welds as specified in AISC Specification Table J2.4.
 3. Anchor Rod Holes in Baseplates: Hole sizes in baseplates for anchor rods shall be made oversize as described in the AISC "Steel Construction Manual", Table 14-2.
- C. Stiffeners: Provide stiffeners finished to bear under load concentrations where shown on the drawings.
- D. Limitations on Use of A307 Bolts: ASTM A307 bolts shall not be used in any permanent steel-to-steel or concrete-to-steel connection.
- E. Bolts in Combination with Welds: Bolts shall not be considered as sharing the load in combination with welds, except as allowed in AISC Specification Section J1.8.

2.6 SURFACE PREPARATION AND SHOP PRIME PAINTING

- A. Specification: Surface preparation, paint, and painting practices shall conform to the "SSPC Painting Manual", Volumes 1 and 2.
- B. Scope: All steel shall remain unpainted, except the following:
1. Shop prime paint surfaces that are to remain exposed to view in the final construction.
 2. Shop paint any steel that, in the final construction, will not be in a controlled environment and is therefore subject to moisture or high humidity infiltration and that has not been specified to be galvanized.
 3. Shop paint any steel that is shown on the drawings to receive a finished paint system as defined in Specification Section 09 90 00.
 4. Coordinate all shop painting of structural steel with Architect's painting requirements as specified on the architectural drawings and in the specifications. The Fabricator shall be responsible for determining all painting requirements (which surfaces are to be painted or left unpainted) on the project prior to fabrication.
- C. Additional Painting Requirements
1. Extend shop paint to 2" from location of welds on surfaces that are to be field welded.
 2. If individual elements (including the mating surfaces) of an assembly that is required to be painted are painted prior to welding into an assembly, then all painted surfaces affected by welding shall be touched-up and repaired (according to manufacturer's instructions, if any) to prevent corrosion bleeding.

3. The fabricator shall be responsible to ensure that all elements of all assemblies that are to be painted are fabricated so that no exposed surface shall be subject to stains due to corrosion bleeding during the warranty period of the paint.
- D. Surface Preparation - Unpainted Steel: All structural steel that is not specified to receive a shop coat of primer paint shall be prepared in accordance with Society for Protective Coatings specifications as follows:
1. SSPC-SP 2, "Hand Tool Cleaning" or SSPC-SP 3, "Power Tool Cleaning" unless otherwise specified.
- E. Surface Preparation and Primer Paint - Shop Painted Steel:
1. Surface Preparation: Prepare the surface of all structural steel specified to be shop painted as required by the paint manufacturer or the Society for Protective Coatings specifications, but not less than the following:
 - a. SSPC-SP 2, "Hand Tool Cleaning" or SSPC-SP 3, "Power Tool Cleaning" unless otherwise specified.
 2. Priming: Immediately after surface preparation, apply primer to all structural steel specified to be shop primed in strict accordance with manufacturer's instructions and the Society for Protective Coatings specifications. Apply paint at a rate to conform to the manufacturer's written instructions and to provide a dry film thickness of not less than 1.5 mils. Use priming methods that result in full coverage of joints, corners, edges, welds, and all exposed surfaces. Apply two coats to surfaces that are inaccessible after assembly or erection. Change the color of the second coat to distinguish it from the first coat.
 3. Finish Coat: Coordinate shop primer paint requirements with architectural drawings and specifications. The primer selected must be compatible with any specified finish coat.
- F. Shop Touch-Up Painting: The Fabricator shall provide for cleaning and touch-up painting of welds, bolted connections (including nuts, bolts, washers, filler plates, member end supplement plates and welds, if any), and abraded areas. Prior to shipment, apply paint to exposed areas using same materials and surface preparation as used for shop painting. Paint shall be applied by brush or spray with minimum dry film thickness of 1.5 mils.

2.7 SOURCE QUALITY CONTROL

- A. The District's Testing Laboratory shall:
1. Review ladle analysis and mill test reports. Where certification is questionable, test material to verify compliance per CBC 2203A.1.
 2. Visually inspect the seam welds of HSS hollow structural steel sections for visible discontinuities. Include the exterior of the seam weld and the interior at each end of the HSS member.

- B. Inspect shop fabrication per CBC Section 1705A.2.

PART 3 - EXECUTION

3.1 ERECTION

- A. The Erection work shall comply with the requirements of AISC Specification Section M4.
- B. Inspection: Erector shall examine areas and conditions under which structural steel work is to be installed and notify the Contractor and the Architect/Engineer in writing of conditions detrimental to proper and timely completion of the work.
- C. Check elevations of concrete and masonry bearing surfaces and anchor bolt locations prior to erection and submit any discrepancies to the Engineer prior to the start of erection. Corrections or compensating adjustments to the structural steel shall be made and approved prior to the start of erection.
- D. Erection Tolerances: Erection tolerances of anchor rods, embedded items, and all structural steel shall conform to the AISC Code of Standard Practice, Section 7, unless stricter tolerances are specified elsewhere in the contract documents.
- E. Temporary Shoring and Bracing:
 1. Comply with the provisions of the AISC Code of Standard Practice regarding stability of the structure during the erection process, except where stricter requirements are noted herein.
 2. The Erector shall design and provide all required temporary shoring and bracing to hold structural framing securely in position and to safely withstand all loads as specified in the AISC Code of Standard Practice and ASCE 37 unless larger loads are required by the local building code or specified herein. Provide all bracing, any additional structural members, and increase member sizes and/or connections shown on the drawings as required to accommodate the erection loads, methods, sequence of erection, and equipment until the lateral-load resisting or stability-providing system is completely installed. Clearly show all temporary supports and modifications to designed members on the Shop Drawings.
 3. Where architectural or MEP requirements do not allow for any temporary supports, members, erection devices, or connections to be left in place permanently or where such items affect the final structural behavior, they shall be removed by the erector. All costs associated therewith shall be included in the bid price.
- F. Wherever the erection equipment is supported by the structure, the Contractor shall be responsible for the retention of a licensed professional engineer to determine the adequacy of the member supporting the erection equipment in relation to the loads imposed thereon.
- G. Anchor Rods: Furnish anchor rods and other connectors required for securing structural steel to foundations and other in-place work. Furnish 1/8" minimum steel templates for presetting bolts and other anchors to accurate locations. Tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims,

but if protruding, cut off flush with edge of base or bearing plate prior to packing with grout. Use only steel wedges or shims.

- H. Base Plates and Bearing Plates: Remove loose latent material from bearing surfaces and base and bearing plates. Set plates to the elevation indicated on the drawings and level using steel shims (plastic shims will not be allowed) or by three leveling screws with weldments at the plate edges. After all protruding plates have been trimmed, grout plates solidly between bearing surfaces using the specified grout, ensuring no voids are present. Finish exposed surfaces, protect installed materials, and allow to wet cure. For proprietary grout materials, comply with manufacturer's instructions. Tighten anchor bolts after supported members have been positioned and plumbed.
- I. Splices: Splices will be permitted only where indicated on the DSA approved structural drawings and approved shop drawings. Fastenings of splices of compression members shall be done after the abutting surfaces have been brought completely into contact within AISC tolerances. Bearing surfaces and surfaces that will be in permanent contact are to be cleaned before the members are assembled.
- J. Field Assembly of Structural Steel:
1. As erection of the steel progresses, the work shall be fastened securely to safely carry all dead load, wind and erection forces. Particular care shall be exercised to ensure straightness and tautness of bracing immediately upon raising a steel column.
 2. Provide temporary planking and working platforms as necessary to effectively complete work.
 3. Set structural frames accurately to lines and elevations indicated. Align and adjust various members forming part of complete frame or structure before permanently fastening. Clean bearing surfaces and other surfaces which will be in permanent contact before assembly. Perform necessary adjustments to compensate for discrepancies in elevations and alignment. Level and plumb individual members of structure within specified AISC tolerances. The Contractor shall coordinate with Erector and Fabricator regarding possible discrepancies in member lengths between temperature at time of fabrication and temperatures during erection, and shall make necessary adjustments to ensure plumbness within AISC tolerances at 70°F. Compensate for cumulative welding draw, construction loadings, sequential applications of dead loads, or any other predictable conditions that could cause distortions to exceed tolerance limitations.
 4. On welded construction exposed to view or weather, remove erection bolts, fill holes with plug welds or filler and grind smooth at exposed surfaces.
 5. Comply with AISC Specifications for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces receiving field welds.
 6. Comply with all bolting and welding requirements of Part 2 of this specification section.

7. Fillers and shims shall not exceed ¼” thick unless approved by the Structural Engineer and DSA.

- K. Field Modifications to Structural Steel: Errors in shop fabrication or deformation resulting from handling and transportation that prevent the proper assembly and structural fitting of parts shall be reported immediately to the Architect/Engineer, and approval of the method of correction shall be obtained. Approved corrections shall be made at no additional cost to the District. Do not use cutting torches, reamers, or other devices in the field for unauthorized correction of fabrication errors.

- L. Miscellaneous Framing: Provide supplemental structural steel support framing for steel deck where columns, or other framing members or floor openings interrupt normal deck bearing whether shown or not on the architectural, mechanical, or structural drawings.

- M. Removal of Erection Aids and Devices: The erector shall remove all erection aids and devices that interfere with architectural finish or MEP requirements.

- N. Field Touch-Up Painting:
 1. Clean field welds, unpainted areas of bolted connections (including all exposed areas of nuts, bolts, washers, filler plates, member end supplement plates, and welds), and any shop painted areas that are abraded. Apply paint to all exposed areas using same material and surface preparation as used for shop painting. Apply by brush or spray to provide minimum dry film thickness of 1.5 mils.
 2. Clean field welds, ungalvanized areas of bolted connections (including all exposed areas of nuts, bolts, washers, filler plates, member end supplement plates, and welds), and any galvanized areas that are abraded. Prepare surfaces and apply specified galvanizing repair paint in accordance with ASTM A780.
 3. The Contractor shall ensure that, at the substantial completion of the project, all structural steel, bolted and/or welded, required to be painted shall have all necessary steel surfaces painted (including touch-up painting as required) to prevent corrosion bleeding.

- O. Clean Up
 1. Clean up all debris caused by the Work of this Section, keeping the premises neat and clean at all times.
 2. After erection, thoroughly clean surfaces of foreign ore deleterious matter such as dirt, oil or great that would impair the bonding of concrete or other finishes as applicable.

3.2 FIELD QUALITY CONTROL

- A. The District will engage a special inspector and qualified testing and inspection agency (the Testing Laboratory) approved by DSA to perform field tests and inspections and prepare test reports.

B. Scope of Work

1. The District’s Testing Laboratory: An independent testing laboratory will sample and test materials as they are being installed for compliance with acceptance criteria as specified and report and interpret the results. The laboratory shall monitor and report on the installation of constructed work and shall perform tests on the completed construction as required to indicate Contractor’s compliance with the various material specifications governing this work. The District shall be responsible for paying the testing laboratory for these services.
2. The District’s Testing Laboratory or a separate agency shall serve as a Special Inspector to provide Special Inspection services for the items listed below. The scope of such services for each item shall be as defined in the CBC 2016. These inspections are mandatory for conformance to the legal requirements of the building code and shall be in addition to the inspections and tests otherwise defined in this specification.

C. Special Inspections:

1. Inspection of Structural Steel, Bolting, and Welding Material
2. Welding of Structural Steel
3. High-Strength Bolting

D. Qualifications

1. Qualifications of Special Inspector: The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of DSA, for inspection of the particular type of construction or operation being inspected. The Special Inspector shall meet the legal qualifications of the 2016 California Code of Regulations.
2. Testing Laboratory
 - a. The Testing Laboratory shall meet the basic requirements of ASTM E329 and shall submit to the District, Architect, and Engineer evidence of current accreditation from the American Association for Laboratory Accreditation, the AASHTO Accreditation Program or the “NIST” National Voluntary Laboratory Accreditation Program.
 - b. The Testing Laboratory shall be an Approved Agency by the Building Official of the city wherein the project is located to perform Special Inspections and other tests and inspections as outlined in the applicable building code.
 - c. Tests and inspections shall be conducted in accordance with specified requirements, and if not specified, in accordance with the applicable standards of the American Society for Testing and Materials or other recognized and accepted authorities in the field.
3. Qualifications of Welding Inspectors

- a. Inspectors performing visual weld inspection shall meet the requirements of AWS D1.1 Section 6.1.4. Welding inspection shall be supervised and the inspection reports signed by an inspector with current certification as an AWS Certified Welding Inspector (CWI)
 - b. Inspectors performing nondestructive examinations of welds other than visual inspection (MT, PT, UT, RT) shall meet the requirements of AWS D1.1, Section 6.14.6.
- E. Authorities and duties of the District’s Testing Laboratory:
 - 1. Attend Preconstruction Conferences: The District’s Testing Laboratory shall receive from the District and review the project plans and specifications with the Architect and Engineer immediately upon receipt and prior to the start of construction. The Laboratory shall attend preconstruction conferences with the Architect, Engineer, Project Manager, IOR, General Contractor, and Material Suppliers as required to coordinate materials inspection and testing requirements with the planned construction schedule and shall participate in such conferences throughout the course of the project.
 - 2. Cost Proposal: The Testing Laboratory's proposal to the District shall contain unit price stipulations for specified tests and inspections and on an hourly basis for personnel. A total estimated price shall also be submitted.
 - 3. Cooperation with Design Team: The Laboratory shall cooperate with the Architect, Engineer, and Contractor and provide qualified personnel promptly on notice.
 - 4. The Laboratory shall perform the required inspections, sampling, and testing of materials as specified under each section and observe methods of construction for compliance with the requirements of the Contract Documents and the 2010 CBC.
 - 5. Inspections Required by Government Agencies: The Testing Laboratory shall perform inspections and submit reports and certifications as required by government agencies having jurisdiction over the aspects of the project covered by this specification.
 - 6. Notification of Deficiencies in the Work: The Laboratory shall notify the Architect, Engineer, IOR and Contractor within 24 hours of discovery by telephone or e-mail, and then in writing of observed irregularities and deficiencies of the work and other conditions not in compliance with the requirements of the Contract Documents.
 - 7. Reports:
 - a. Information on Reports: The Laboratory shall submit copies of reports of inspections and tests promptly and directly to the parties named below. The reports shall contain at least the following information:
 - (1) Project Name and DSA Application number
 - (2) Date report issued
 - (3) Testing Laboratory name and address

- (4) Name and signature of inspector
- (5) Date of inspection and sampling
- (6) Date of test
- (7) Identification of product and Specification section
- (8) Location in the project
- (9) Identification of inspection or test
- (10) Record of weather conditions and temperature (if applicable)
- (11) Results of test regarding compliance with Contract Documents

b. Copies: The Laboratory shall send signed copies of test and inspection reports to the following parties:

- (1) Copies of Reports to the District or his representative
- (2) Copies of Reports to General Contractor
- (3) Copies of Reports to Architect
- (4) Copies of Reports to the Engineer of responsibility
- (5) Copies to the Inspector of Record (IOR)

c. Certification: Upon completion of the job, the Laboratory shall furnish to the District, Architect, and Engineer of Record, a statement signed by a licensed professional engineer that, to the best of their knowledge, required tests and inspections were made in accordance with the requirements of the Contract Documents.

8. Accounting: The Testing Laboratory shall be responsible for separating and billing costs attributed to the District and costs attributed to the Contractor.
9. Monitoring Product and Material Certifications: The Testing Laboratory shall be responsible for monitoring the submittals of product and material certifications from manufacturers and suppliers as specified in the Specifications and shall report to the District, Architect, and Engineer when those submittals are not made in a timely manner.
10. Limitations of Authority: The Testing Laboratory is not authorized to revoke, alter, relax, enlarge upon, or release any requirements of the Specifications or to approve or accept any portion of the work or to perform any duties of the General Contractor and his Subcontractors

F. Contract Obligations:

1. District Responsibility: The District shall pay for initial shop and field inspections and tests (laboratory services) as required during the fabrication and erection of the structural steel. The Contractor will be liable to the District for the cost for testing and retesting of materials that do not comply with the requirements of the Contract Documents and shall furnish and pay for the testing and inspection of other items as specified in these Specifications.
2. Contractor Responsibility: The Contractor shall provide the Testing Laboratory with the following:

- a. A complete set of shop and erection drawings that have been reviewed by the Architect/Engineer and including all revisions and addenda.
 - b. Cutting lists, order sheets, material bills, shipping bills, and mill test reports.
 - c. Information as to time and place of all rollings and shipment of material to shop.
 - d. Representative sample pieces requested for testing.
 - e. Full and ample means and assistance for testing all material
 - f. Proper facilities, including scaffolding, temporary work platforms, hoisting facilities, etc, for inspection of work in the mills, shop, and field.
3. Testing Laboratory Responsibility: The inspection by the Testing Laboratory of the Fabricator's work shall be in sequence, timely, and performed in such a manner so that corrections can be made without delaying the progress of the work. Inspections shall be performed by qualified technicians with a minimum of two years experience in structural steel testing and inspection. See "Qualifications of Welding Inspectors" above for special requirements for welding inspectors. The Testing Laboratory shall provide test reports of all inspections. All test reports shall indicate types and locations of all defects found during inspection, the measures required and performed to correct such defects, statements of final approval of all welding and bolting of shop and field connections, and other fabrication and erection data pertinent to the safe and proper welding and bolting of shop and field connections. In addition to the parties listed in this Specification the Fabricator and Erector shall receive copies of all test reports.
4. Duties and Responsibilities of the Special Inspector
- a. The special inspector shall observe the work assigned to ascertain, to the best of his/her knowledge, that it is in conformance with the approved design drawings and specifications.
 - b. The special inspector shall keep records of inspections and shall furnish inspection reports to the DSA, the Architect/Engineer, and the District. All discrepancies shall be brought to the immediate attention of the Architect/Engineer, Contractor, and District. A report that the corrected work has been inspected shall be sent to the Architect/Engineer, and the District.
 - c. The special inspector shall create and maintain a log of all discrepancies throughout the duration of the project. This log shall include, but is not limited to the discrepancy date, description of the discrepancy, plans or views or specification reference, description of as-built condition, description of any remedial work performed and status of the discrepancy. This log shall be submitted to the contractor and Architect/Engineer on a periodic basis for review and comment. Upon completion this log shall be submitted as an entirety as an attachment to the final signed report described below.
 - d. The special inspector shall submit a final signed report stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance to the approved plans and specifications and the applicable workmanship provisions of the building code.

5. Rejection of Material or Workmanship: The District, Architect, Engineer, and Testing Laboratory reserve the right to reject any material or workmanship not in conformance with the Contract Documents at any time during the progress of the work. However, this provision does not allow waiving the obligation for timely, in sequence inspections.
- G. Shop Inspections and Tests: The District's Testing Laboratory shall provide the following inspections at the designated fabrication shops:
1. Shop Inspection Waiver: The requirement to perform fabricating shop inspection may be waived if the Fabricator produces evidence from the Building Official of being a registered, approved fabricating shop and if allowed by the Engineer.
 2. An initial shop inspection prior to the start of any fabricating work shall be made to accomplish the following:
 - a. Verify the fabrication shop's certification from AISC.
 - b. Verify the fabricator's fabrication and quality control procedures provide a sound basis for inspection control of workmanship and of the ability to conform to construction documents and industry standards. Review the procedures for completeness and adequacy relative to code requirements for the fabricator's finished product.
 - c. Perform steps 1, 2 and 3 of the section "Weld inspection and Testing" described below when shop welding is to be performed.
 - d. Perform step 1 of the section "High-Strength Bolting Inspection and Testing" described below when shop bolting involving joints that are designated on the plans as Pretensioned or Slip-Critical is to be performed.
 - e. Provide periodic verification of specified camber of steel beams in the unstressed condition.
 - f. For seam welds in hollow structural sections (HSS), conduct a thorough visual examination of the seam weld area for visible discontinuities. Visual examination should include, as a minimum, the exterior of the seam weld and the interior at each end.
 3. Process Monitoring:
 - a. Provide continuous monitoring of welding for all CJP,PJP, Plug and Slot welds, Multipass fillet welds and Single-pass fillet welds greater than 5/16 inch as described below in the Weld Inspection and Testing section.
 - b. Periodically monitor welding of single-pass fillet welds that are less than or equal to 5/16 inch.
 - c. Periodically monitor welding floor and roof deck welds.
 - d. Provide continuous monitoring of high-strength bolt installation in pre-tensioned or slip-critical joints using turn-of-the-nut without matchmarking or calibrated wrench method of bolt installation.
 - e. Periodically monitor high-strength bolt installation in snug-tight joints and in pre-tensioned or slip-critical joints using turn-of-nut with matchmarking, twist-off-bolt or direct tension indicator methods of installation.

- H. Field Inspections: The District's Testing Laboratory shall provide the following inspections in the field:
1. Obtain the planned erection procedure, and review with the Erectors supervisory personnel.
 2. Check the installation of base plates for proper leveling, grout type, and grout application.
 3. Verify that surveys are occurring as specified to check plumbness and frame alignment as erection progresses. Review the submitted survey report.
 4. Conduct welding inspection and verification testing per detailed requirement of section on Welding Inspection and Testing below.
 5. Conduct high-strength bolting inspection per detailed requirements of Section on High-Strength Bolting and Testing below.
 6. Periodically inspect the steel frame for such items as bracing and stiffening details, member locations, and joint details at each connection for compliance with approved construction documents.
 7. Endeavor to guard the District against the Contractor cutting, grinding, reaming, or making any other field modification to structural steel without the prior approval of the Engineer. Report any noted unauthorized modifications to the District and Engineer.
 8. Visually inspect 100% of the galvanized round, square and rectangular tubes for defects like but not limited to cracks at the tube corners.
- I. Weld Inspection and Testing: The District's Testing Laboratory shall make the following inspections and tests of the welds and welding processes. Welds performed in the fabricating shop may be inspected in the field unless continuous monitoring of the welding process is herein specified or if access in the field due to other work or shop finishes makes field inspection impractical:
1. Approve Welding Procedure Specifications submitted by the Contractor. Approve any changes submitted by the Contractor to any WPS that has already been approved. Obtain the Welding Procedure Qualification Record (WPQR) for each successful WPS qualification.
 2. Verify welder qualifications either by certification and/or by retesting. Obtain welder certificates.
 3. Verify welding electrodes to be used and other welding consumables as the job progresses.
 4. Periodically observe joint preparation, assembly practice, welding techniques including preheating and sequence, and the performance of welders with sufficient frequency to assure compliance with code and contract document requirements.

Check preheating to assure conformance with AWS D1.1, Section 5.6. Verify procedure for control of distortion and shrinkage stresses.

5. Observe joint preparation and fit up, backing strips, and runout plates for welded moment connections and column splices.
6. Periodically provide visual inspection of the root pass of partial and complete joint penetration welds.
7. Visually inspect 100 % of welds for proper size, length, location, and weld quality in accordance with AWS D1.1 and D1.8 requirements. Unless specifically noted otherwise, all welding shall be considered statically loaded nontubular connections
8. Visually inspect 100% of the welds of anchors to embedded plates that are to be cast into concrete elements.
9. In addition to the inspections above, perform the following:
 - a. Continuously monitor and observe joint preparation, assembly practice, welding techniques including preheating and sequence, and the performance of welders for 100% of complete joint penetration welds and partial joint penetration welds, Plug and Slot welds, multipass fillet welds, and single-pass fillet welds greater than 5/16 inch. Check preheating to assure conformance with AWS D1.1, Section 5.6. Verify procedure for control of distortion and shrinkage stresses.
 - b. Periodically monitor welding of single-pass fillet welds that are less than or equal to 5/16 inch.
 - c. Periodically monitor the method of attaching the steel floor and roof decking to the structural frame.
 - d. Periodically monitor the welding of headed studs to steel members.
10. Weld Verification Testing Scope:
 - a. Perform nondestructive examination services using a qualified technician with the necessary equipment to perform the following:
 - (1) Nondestructive examination conducted in accordance with the specific requirements for the item being examined including radiographic (RT), ultrasonic (UT), magnetic particle (MT), or dye-penetrant inspection (PT). Nondestructive inspection procedures shall conform to AWS D1.1 and D1.8.
 - (2) Interpret, record, and report results of the nondestructive tests.
 - (3) Mark for repair, any area not meeting Specification requirements. Correction of rejected welds shall be made in accordance with AWS D1.1.
 - (4) Re-examine repair areas and interpret, record, and report the results of examinations of repair welds.
 - (5) Verify that quality of welds meet the requirements of AWS D1.1..
 - b. Fillet welds. provide the following:
 - (1) MT test a minimum of 10% of the length of each fillet weld exceeding 5/16".

- (2) Increase MT testing rate for welders having a high rejection rate as required to ensure acceptable welds.
- c. Partial joint penetration welds, including flare-bevel groove welds, provide the following:
 - (1) MT test a minimum of 25% of the length of each PJP weld exceeding 5/16" effective throat.
 - (2) Periodic MT testing of representative PJP welds 5/16" and less but need not exceed 10% of all such welds, except as provided in (3) below.
 - (3) Increase MT testing rate for welders having a high rejection rate as required to ensure acceptable welds.
- d. Complete joint penetration welds, provide the following:
 - (1) All CJP welds exceeding 5/16" thickness shall be 100% UT tested per AWS D1.1 Chapter 6 Part F. The testing laboratory shall review the CJP joints to determine where geometry or accessibility precludes the use of standard scanning patterns per AWS D1.1 Chapter 6 Part F. At these locations the testing laboratory shall develop and submit for approval a written testing procedure in accordance with AWS D1.1 Annex K.
 - (2) Periodic MT testing of representative CJP welds 5/16" and less not to exceed 10% of all such welds, and 25% of all beam-to-column CJP welds, except as provided in (3) below.
 - (3) Increase MT testing rate for welders having a high rejection rate as required to ensure acceptable welds.
- e. Acceptance Criteria
 - (1) Visual, MT, PT shall be per AWS D1.1 Table 6.1.
 - (2) UT testing shall be per AWS D1.1 6.13.1 and Table 6.2.
- f. Base metal thicker than 1.5 inches, where subjected to through-thickness weld shrinkage strains, shall be UT tested for discontinuities behind and adjacent to such welds. UT testing shall occur no sooner than 24 hours after the weld has cooled to ambient temperatures. Any material discontinuities shall be recorded on the basis of ASTM A435 or ASTM A898 (Level 1 criteria) and reported for Engineer disposition.
- g. Welds of Anchors to Embedded Plates:
 - (1) Headed Studs: Perform field bend tests according to AWS D1.1 on 2% of the studs welded to plates, but not less than one stud per plate.
 - (2) Deformed Bar Anchors: Perform MT testing on 10% of deformed bar anchors larger than #5 bar.
- h. The costs of repairing defective welds and the costs of retesting by the Testing Laboratory providing services for the District shall be borne by the Contractor. If removal of a backing strip is required by the Testing Laboratory to investigate a suspected weld defect, such cost shall be borne by the Contractor.

J. High-Strength Bolting Inspection and Testing: The District's Testing Laboratory shall perform the following inspections and test for connections joined with high-strength bolting. Bolting performed in the shop may be inspected in the field unless continuous monitoring of the bolting operation is herein specified:

1. Observe preinstallation verification testing of the pretensioning method to be used in accordance with the requirements of the "Specification for Structural Joints Using ASTM A325 and A490 Bolts". Daily check the calibration of impact wrenches used in field bolted connections.
 2. Inspect bolt installation for 100% of high strength bolted connections according to inspection procedures outlined in the "Specification for Structural Joints Using ASTM A325 or A490 Bolts".
 3. Perform Arbitration Testing and Inspection according to procedures outlined in the "Specification for Structural Joints using ASTM A325 or A490 Bolts" when a disagreement exists between the Testing Laboratory and the Fabricator as to the minimum tension of installed bolts that have been inspected according to paragraph above.
 4. Monitoring of Bolting Installation:
 - a. Continuous Monitoring: The District's Testing Laboratory shall be continuously present and monitor the bolting installation for compliance with the selected procedure for installation as specified in the "Specification for Structural Joints Using ASTM A325 and A490 Bolts" for joints using high-strength bolts that are designated on the plans as Pretensioned (PT) or Slip-Critical (SC) type joints and that are being installed using the calibrated wrench method or the turn-of-nut without matchmarking method of installation.
 - b. Periodic Monitoring: All other joint types and bolt installation methods may be monitored on a periodic basis.
- K. Non-shrink grout for base plates and bearing plates:
1. Compressive Strength Tests (by the District's Testing Laboratory): Compressive strength of grout shall be determined by testing grout cubes according to the requirements of ASTM C109 - Modified. Test one set of three cubes at 1 day, and one set of three cubes at 28 days.
 2. Frequency of Testing: One set of cubes (6 cubes) shall be made for each day's operation of grouting ducts.

END OF SECTION