



# Leon County

## Board of County Commissioners

301 South Monroe Street, Tallahassee, Florida 32301  
(850) 606-5302 www.leoncountyfl.gov

Purchasing Division  
2284 Miccosukee Road  
Tallahassee, Florida 32308  
(850) 606-1600

### Commissioners

BILL PROCTOR  
District 1

JANE G. SAULS  
District 2

JOHN DAILEY  
District 3

BRYAN DESLOGE  
District 4

BOB RACKLEFF  
District 5

CLIFF THAELL  
At-Large

AKIN AKINYEMI  
At-Large

PARWEZ ALAM  
County Administrator

HERBERT W.A. THIELE  
County Attorney

February 18, 2010

RE: Dr. B. L. Perry Branch Library Expansion  
Bid No: BC-02-24-10-18  
Opening Date: Wednesday, February 24, 2010 at 2:00 PM

### ADDENDUM # 5

Dear Vendor:

This letter serves as Addendum #5 for the above referenced project.

1. Attached is Addendum #5 from the Architect which shall become a part of the Contract Documents.
2. Please note that the Supplement to the Agreement for General Contractor's Services is to be amended in Paragraphs K and L on Page 8 to reflect that the County shall pay for the water and electrical services that are available on site from the existing service. The Contractor shall make all necessary arrangements to utilize these utilities.
3. Contractor's question: Will a Leon County Certified SBE contractor be counted as a minority percentage on this project?

Answer: An SBE contractor may or may not be a certified MBE or WBE. Their participation would only be counted for the proper category if they are certified as an MBE or WBE.

4. The deadline for submitting questions is being revised to 12:00 noon, February 19, 2010.

Acknowledgment of this addendum is required as part of your bid submittal. Failure to acknowledge this addendum may result in rejection of your bid.

Should you have any questions, feel free to call me at (850) 606-1600.

Sincerely,

Keith M. Roberts  
Purchasing Director

## **ADDENDUM #5**

Leon County Florida

### **DR. BL PERRY BRANCH LIBRARY EXPANSION**

Tallahassee, Florida

**18 February 2010**

---

#### **GENERAL**

This addendum becomes part of the Contract Documents. Bidders shall note receipt of this addendum in the appropriate space on the Bid Form.

Bids are due on Wednesday 24 February 2010 at 02:00 PM EST.

---

#### **TECHNICAL**

Below is description of revisions to documents as well as responses to contractors' questions contained in Addendum #5 dated 18 February 2010:

##### **Revisions to Documents:**

- Item No. 1: Refer to attached revised specification section 05120 - Structural Steel for the following revisions:
- a: Revised articles 1.7A and 1.7B to eliminate request of AISC certifications.
- Item No. 2: Refer to new specification section 02361 – TERMITE CONTROL added 18 February 2010.
- Item No. 3: Existing 1999 drawings for BL Perry, Jr. Branch Library are available at the Architect's office. An electronic copy on CD may be obtained by request.
- 

##### **Responses to Contractors' Questions:**

- Question 1: *Sheet F1.1 specifically indicates several items, some of which are detailed on sheet A7.1. Please confirm that only the items specifically detailed on sheet A7.1 are to be included in our proposal and other items on sheet F1.1, which may or may not be labeled (such as the magazine cabinetry and the New Catalog PC), are specifically excluded from our proposal.*

Answer: Bids to include built-ins and items included on sheet A7.1. Furniture and computer equipment shown on sheet F1.1 are not in contract; sheet F1.1 is for information and coordination only.

Question 2: *Will a Leon County Certified SBE contractor be counted as a minority percentage on this project?*

Answer: Please see response from Leon County.

Question 3: *There is a cleaning of air conveyance systems Spec 15844. Will all of the existing duct work and equipment need to be cleaned accordingly?*

Answer: All HVAC equipment interiors shall be cleaned. All duct work shall be sealed during construction to keep dust out of the duct work. If the duct work is not properly sealed during construction the engineer has the option to require the duct work to be cleaned per spec 15844.

Question 4: *Reference Sheet A.7, Note d "Lockable Cabinets"*  
*a. Are drawers to be lockable as well as the cabinets?*  
*b. If drawers are to be lockable, are they to be*  
*i. Gang locks or*  
*ii. Individual locks?*

Answer:  
a. Drawers and cabinets to be lockable  
b. Provide gang locks for drawers.

Question 5: *Reference Sheet A1.1, Note Legend "Hatched Symbol New Casework – See Sheet A7.1" and Sheet A7.1*

- a. Sheet A7.1, Elevation 5 shows the "Hatched Symbol" at the Knee Space. Please confirm this surface is back of the millwork and not the spandrel glass.*
- b. Sheet A7.1, Section D shows a support bracket; however it is not shown in Elevation 5.*
  - i. Please confirm how many support brackets are required.*
  - ii. If the Hatched space reference above is spandrel glass, please provide a connection detail of the bracket to the glass.*

Answer:  
a. Knee space shown with hatch pattern in Elevation 5/A7.1 refers to spandrel glass in the back.  
  
b. Metal bracket is not required; Knee space to be without obstruction under counter. Detail D/A7.1 was used for an alternate that is no longer part of documents. Consequently, a connection detail of the bracket to the glass will not be required.

**SECTION 02361  
TERMITE CONTROL**

**PART I - GENERAL**

**1.1 RELATED DOCUMENTS**

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

**1.2 SUMMARY**

- A. This Section includes the following for termite control:

- 1. Soil treatment.

**1.3 DEFINITIONS**

- A. EPA: Environmental Protection Agency.
- B. PCO: Pest Control Operator.

**1.4 SUBMITTALS**

- A. Product Data: Treatments and application instructions, including EPA-Registered Label.
- B. Product Certifies: Signed by manufacturers of termite control products certifying that treatments furnished comply with requirements.
- C. Qualification Data: For firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified
- D. Soil Treatment Application Report: After application of termiticide is completed, submit report for Owner's record information, including the following as applicable:
  - 1. Date and time of application.
  - 2. Moisture content of soil before application.
  - 3. Brand name and manufacturer of termiticide.
  - 4. Quantity of undiluted termiticide used.
  - 5. Dilutions, methods volumes, and rates of application used.
  - 6. Areas of application.
  - 7. Water source for application.
- E. Warranties: Special warranties specified in this Section.

**1.5 QUALITY ASSURANCE**

- A. Applicator Qualifications: A PCO which is licensed according to regulations of authorities having jurisdiction to apply termite control treatment in jurisdiction where Project is located and who is experienced and has completed termite control treatment similar to that indicated for this Project and whose work has a record of successful in-service performance.
- B. Applicator Qualifications: A PCO who is licensed according to regulations of authorities having the jurisdiction to apply termite control treatment in jurisdiction where Project is located and is an experienced installer who employs workers trained and approved by bait station system manufacture to install manufacturer's products.
- C. Regulatory Requirements: Formulate and apply termiticides, and label with a Federal registration number, to comply with EPA regulations and authorities having jurisdiction.

## 1.6 PROJECT CONDITIONS

- A. Environmental Limitations: To ensure penetration, do not treat soil that is water saturated or frozen. Do not treat soil while precipitation is occurring. Comply with EPA-Registered Label requirements and requirements of authorities having jurisdiction.

## 1.7 COORDINATION

- A. Coordinate soil treatment application with excavating, filling, and grading and concreting operations. Treat soil under footings, grade beams, and ground-supported slabs, before construction.

## 1.8 WARRANTY

- A. Special Warranty: Written warranty, signed by applicator and Contractor certifying that termite control work, consisting of applied soil termiticide treatment, will prevent infestation of subterranean termites. If subterranean termite activity or damage is discovered during warranty period, re-treat soil and repair or replace damage caused by termite infestation.
- B. Warranty Period: Five years from date of Substantial Completion.

## 1.9 MAINTENANCE SERVICE

- A. Continuing Service: Provide a proposal for continuing service, including monitoring, inspection, and retreatment for occurrences of termite activity, from applicator to Owner, in the form of a standard yearly (or other period) continuing service agreement, starting on the date of Substantial Completion. State services, obligations, conditions, and terms for agreement and for future renewal options.

## PART 2 – PRODUCTS

### 2.1 SOIL TREATMENT – Optional

- A. Termiticide: Provide an EPA-Registered termiticide complying with requirements of authorities having jurisdiction, in a soluble or emulsible, concentrated formulation that dilutes with water or foaming agent, and formulated to prevent termite infestation. Use only soil treatment solutions that are not harmful to plants. Provide quantity required for application at the label volume and rate for the maximum termiticide concentration allowed for each specific use, according to the product's EPA-Registered Label.
- B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - 1. AgrEvo Environmental Health Inc.; a Company of Hoechst and Schering, Berlin.
  - 2. American Cyanamid Co.; Agricultural Products Group; Specialty Products Department.
  - 3. Bayer Corp.; Garden & Professional Care.
  - 4. DowElanco.
  - 5. FMC Corp.; Pest Control Specialties.
  - 6. Zeneca Professional Products.

## PART 3 – EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for moisture content of the soil, interfaces with earthwork, slab and foundation work, landscaping, and other conditions affecting performance of termite control. Proceed with application only after unsatisfactory conditions have been corrected.

### 3.2 PREPARATION

- A. General: Comply with the most stringent requirement of authorities having jurisdiction and with manufacturer's written instructions for preparing substrate. Remove all extraneous sources of wood cellulose and other edible materials such as wood debris, tree stumps, and roots, stakes, formwork, and construction waste wood from soil and around foundations.
- B. Fit filling hose connected to water source at the site with a backflow preventer, complying with requirements of authorities having jurisdiction.

### 3.3 APPLICATION, GENERAL

- A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's EPA-Registered Label for products.

### 3.4 APPLYING SOIL TREATMENT

- A. Application: Mix soil treatment termiticide solution to a uniform consistency. Provide quantity required for application at the label volume and rate for the maximum specified concentration of termiticide, according to manufacturer's EPA-Registered Label, to the following so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction. Distribute the treatment evenly.
  - 1. Slabs-on-Grade: Underground-supported slab construction, including footings, building slabs as an overall treatment. Treat soil materials before concrete footings and slabs are placed.
  - 2. Foundations: Adjacent soil including soil along entire inside perimeter of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating slab, and around interior column footers, piers, and chimney bases; and along entire outside perimeter, from grade to bottom of footing. Avoid soil washout around footings.
  - 3. Masonry: Treat woods.
  - 4. Penetrations: At expansion joints, control joints, and areas where slabs will be penetrated.
- B. Avoid disturbance of treated soil after application. Keep off treated areas until completely dry.
- C. Protect termiticide solution, dispersed in treated soils and fills, from being diluted until ground-supported slabs are installed. Use waterproof barrier according to EPA-Registered Label instructions.
- D. Post warning signs in areas of application.
- E. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application.

END OF SECTION 02361

## SECTION 05120 - STRUCTURAL STEEL

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

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

#### 1.2 SUMMARY

- A. The work specified in this section includes all labor, materials, equipment, permits, and services necessary for the fabrication and erection of structural steel and related work, complete, in accordance with the Drawings and as specified herein, including the detailing of all connections.
- B. Structural steel is that work defined in AISC "Code of Standard Practice" and as otherwise shown on Drawings.

#### 1.3 RELATED SECTIONS SPECIFIED ELSEWHERE

- A. Division 3 Section "Cast-In-Place Concrete" for Grouting Base Plates.
- B. Division 3 Section "Concrete Formwork" for Placing Anchor Rods.
- C. Division 5 Section "Steel Joists."
- D. Division 5 Section "Steel Deck."
- E. Division 5 Section "Miscellaneous Metal Fabrication."
- F. Division 7 Section "Fireproofing."
- G. Division 9 Section "Special Coatings."

#### 1.4 RESPONSIBILITIES

- A. The Engineer of Record is responsible for the design of the steel framing and connections as presented in the Contract Documents. No changes to the requirements of the Contract Documents will be considered without complying with the applicable requirements for substitutions. This includes, but is not limited to, connection details, member sizes or steel grades.
- B. The fabricator is responsible for the preparation of Shop and Erection Drawings pursuant to the requirements of the Contract Documents. These drawings shall be prepared by or under the direct supervision and control of a Florida Licensed Engineer, who shall submit a letter to the

Architect stating such. The fabricator's Engineer shall, where necessary, complete the details presented on the Contract Documents and adapt those details to accommodate the atypical conditions. These drawings do not require his signature and seal. Acceptance of the Shop and Erection Drawings by the Architect/Engineer does not relieve the fabricator of the responsibility for accuracy of detail dimensions on the shop drawings and the general fit-up of parts to be assembled in the field.

- C. The fabricator is responsible for the design and detailing of all substitutions, which shall be prepared by or under the direct supervision and control of a Delegated Engineer as defined in the Contract Documents.
- D. The fabricator is responsible for the coordination of all surveyed field conditions and field measurements necessary for the detailing, fabrication and erection of their work. All field measurements shall be provided on the shop drawings prior to submittal.
- E. The Engineer of Record is responsible for the structural adequacy of the structure in the completed project. The erector is responsible for the means, methods and safety of the erection, including all temporary guys, beams, falsework, cribbing or other elements required for the erection operation. If the erector is unsure of these requirements, he shall retain a Florida Licensed Engineer to determine and design all temporary requirements.

#### 1.5 SUBMITTALS

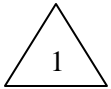
- A. Submit in accordance with conditions of Contract and Division 1 Specification Sections.
- B. Qualifications: Include lists of Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
- C. Product Data for each type of product specified, including the following:
  - 1. Bolts, nuts, and washers, including mechanical properties.
  - 2. Direct-tension indicators.
  - 3. Shear stud connectors.
  - 4. Structural steel coatings.
- D. Fabricator's certification that the chemical and physical properties of the following materials comply with the Project requirements:
  - 1. Structural steel
  - 2. Bolts, nuts and washers.
  - 3. Direct-tension indicators.
  - 4. Shear studs.
  - 5. Welding electrodes.
- E. Welder's certification. Submit to Owner's inspection agency.
- F. Letter from Florida Licensed Engineer responsible for shop drawings.



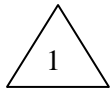
- G. The fabricator shall submit details and complete calculations that clearly identify proposed substitutions for Engineer's review prior to preparation of detailed shop drawings. Proposed variations to details shown on the Contract Drawings will be considered and such variations must have preliminary acceptance prior to the preparation of detailed shop drawings. The details and calculations shall clearly show the capacity of the connections designed by the fabricator. The calculations shall show details of the assembled joint with all bolts and welds required. All design calculations, drawings and details shall be signed, sealed and dated by the Delegated Engineer.
  - H. Submit to the Architect for acceptance shop and erection drawings prepared by or under the direct supervision and control of a Florida Licensed Engineer. See "Shop Drawings and Other Submittals" notes regarding the possible reproduction of Structural Drawings for use as shop or erection drawings. Drawings shall include complete details, dimensions, schedules and procedures for the fabrication, assembly, and sequence of erection.
    - 1. Include details of cuts, connections, camber, holes, threaded fasteners and other pertinent data. Indicate welds by standard AWS A2.4 symbols and show size, length, and type of each weld. Show shop welds on shop drawings and field welds on erection drawings.
    - 2. Provide setting drawings, templates, and directions for installation of anchor rods, embeds and other anchorages to be installed by others.
    - 3. Indicate surface preparation, such as primed, galvanized, etc., of each surface of each piece.
  - I. Before welding is started, the steel fabricator and erector, as applicable, shall submit to the Architect a signed and sealed statement by a Florida Licensed Engineer, who specializes in the design of weldments, that he/she has provided written welding procedures for this Project, establishing the welding process, sequence of assembly, preheat, interpass and post heat requirements in general if high residual stresses are present, and in particular for all members requiring partial or complete penetration groove welding.
  - J. Fabricator's Quality Control Program.
  - K. Fabricator's shop inspection and test reports.
  - L. Substantiating data for primer on Class A faying surface.
- 1.6 CODES AND STANDARDS
- A. Florida Building Code, 2007 Edition with 2009 Supplement.
  - B. AISC "Code of Standard Practice for Steel Buildings and Bridges".
    - 1. Paragraph 4.4. "Approval" is modified such that the Structural Engineer will return submittals to the Architect within ten working days from time of receipt.
  - C. AISC "Specifications for Structural Steel Buildings", including "Commentary" and Supplements thereto as issued.
  - D. AISC "Specifications for Structural Joints using ASTM A 325 or A490 Bolts" approved by the Research Council on Structural Connections of the Engineering Foundation.

- E. AWS D1.1 “Structural Welding Code”.
- F. ASTM A 6 “General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use”.
- G. S.S.P.C. Society for Protective Coatings.
- H. Occupational Safety and Health Act (OSHA), as amended to date.

#### 1.7 QUALITY ASSURANCE



- A. Fabricator Qualifications: Fabricator shall have an a minimum five years of documented successful experience on equivalent projects. Submit copy of résumé demonstrating equivalent project experience.



- B. Erector Qualifications: Erector shall have a minimum five years of documented successful experience on equivalent projects. Submit copy of résumé demonstrating equivalent project experience.

- C. Qualifications for welding work: Qualify welding procedures and operators in accordance with AWS “Standard Qualification Procedure”.

1. The Fabricator for shop welds and the Erector for field welds shall retain a Florida Licensed Engineer, who specializes in the design of weldments to prepare a written welding program pursuant to the requirements of ANSI/AWS D1.1. The program shall include all necessary Welding Procedure Specifications (WPS), all necessary requirements for qualification testing of WPS and welding personnel. The WPS shall include the welding process, sequence of assembly, preheat, interpass and postheat requirements. Welded joints of heavy sections and plates 2 inch thick and greater shall be detailed to limit the amount of weld metal. Double bevels shall be used in lieu of single bevels. Welding shall start at the most restrained part of the weldment and proceed to the least restrained.
2. The Fabricator and Erector, as applicable, shall conduct all necessary tests required by ANSI/AWS D1.1 to qualify the WPS.
3. Provide certification that welders to be employed in work have satisfactorily passed AWS qualification tests for the welding process and position used and have been continuously employed as a welder since certification. If recertification of welders is required, retesting will be Contractor’s responsibility.

- D. The Fabricator shall ultrasonically inspect for laminations all joints where material is subjected to tension in the though thickness direction. Ultrasonic inspection shall extend for a distance of six times the material thickness subject to the through thickness tension, either side of the element delivering the tension.

- E. Stud Application Qualification Test:

1. Prior to erection, conduct stud application qualification tests in accordance with AWS D1.1 Chapter 7.6 and Annex IX. The tests are the responsibility of the Contractor or stud applicator.

2. Prepare specimen plates of A992 steel, minimum 1/2 inch thick, with an SP-6 surface preparation.
  3. Weld a minimum of ten (10) studs through steel deck to the prepared plate(s). The studs and steel deck shall be of the same type as specified for use in the project. Test the studs by the bend test specified in AWS 7.6.6 or Annex IX.
  4. If the tests are conducted by other than the Owner's testing agency, that agency shall be properly notified so that they may be present to witness the entire test procedure.
- F. The Fabricator shall provide a system of quality control, including shop welding inspections and testing, to ensure that the minimum standards specified herein are attained. Submit to Owner, Architect, Engineer and Owner's Testing and Inspection Agency complete details of the quality control program to be used and all testing and inspection reports. Visually inspect 100% of shop welds. Also, as a minimum, perform non-destructive tests of welds in conformance with AWS D1.1 as follows:
1. Splices: 100%.
  2. Full penetration welds: 100% of cantilevered members, 50% for all others.
  3. Partial penetration welds: 25%.
  4. Fillet welds: 10%.
- G. The fabricator may use the following examination methods, in descending order of importance. When a particular examination method for a joint is unfeasible, the highest order method that is practicable shall be used. Standard of acceptance shall be in accordance with AWS D1.1.
1. Ultrasonic Method: In accordance with AWS D1.1.
  2. Radiographic Method: In accordance with ASTM E 94 and ASTM E 142, with a minimum quality level of "2-2T". This procedure is limited to the inspection of groove welds in butt joints only and is not to be used for fillet welds.
  3. Magnetic Particle Method: In accordance with ASTM E109. Use for examining partial penetration welds. Percentage of examinations is defined elsewhere in these specifications. The Yoke method may be used only for supplementary surface examination.
  4. Dye Penetrant Examination Method: In accordance with ASTM E165.
- H. Cleaning and lubrication of ASTM F1852 twist-off-type tension-control bolt assemblies is not permitted.
- I. Turn-of-nut method of bolt tightening is not acceptable.
- J. Preconstruction Meeting: There shall be a Preconstruction Meeting with the Owner, Architect, Structural Engineer, Contractor, Fabricator, Erector, Testing Laboratory and Special Inspector to clarify responsibilities and requirements as set forth in the Contract Documents.
- 1.8 DELIVERY, STORAGE, AND HANDLING
- A. Deliver materials to site at such intervals to insure 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 to not delay work.

- C. Store materials to permit easy access for inspection and identification. Keep steel members off ground, using plates, platforms, or other supports. Protect steel members and packaged materials from corrosion and deterioration.
- D. Store fasteners components in sealed containers until ready to use. Reseal open containers to prevent contamination by moisture or other deleterious substances. Store closed containers in a protective shelter to protect fasteners from dirt and moisture. Only as many fastener components as are anticipated to be installed during the work shift shall be taken from protective storage. Fastener components that are not incorporated into the work shall be returned to protective storage at the end of the work shift. Fasteners from open containers and fasteners that accumulate rust or dirt shall not be used and shall be immediately and permanently removed from the project site.
- E. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures. Repair or replace damaged materials or structures as directed.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Structural steel rolled W and WT shapes: ASTM A 992, Fy=50 ksi.
  - 1. Requirements for Group 4 and 5 Members.
    - a. Steel shall be fine, grained killed steel.
    - b. Charpy V-notch impact tests shall be performed according to ASTM A673, "Sampling Procedure for Impact Testing of Structural Steel": The frequency of testing shall be as prescribed in A673; the test temperature shall be 70 F; the absorbed energy shall be 20 ft.-lb.
    - c. The Fabricator shall submit evidence to the Architect that the mill has complied with the above requirements.
  - 2. Mill Inspection: All structural shapes in Group 4 and 5 shall conform to the requirements of ASTM 898, "Straight Beam Ultrasonic Examination of Rolled Steel Structural Shapes" to assure delivery of shapes free of gross internal discontinuities such as pipe, ruptures, or laminations. The Fabricator shall submit to the Architect evidence of compliance by the mill with this requirement.
- B. Structural steel rolled M, S, C and MC shapes and Angles: ASTM A 36, Fy=36 ksi.
- C. Structural steel plates and bars: ASTM A 36, Fy=36 ksi.
  - 1. All steel plates exceeding 2" in thickness shall conform to the requirements of ASTM A435, "Straight-Beam Ultrasonic Examination of Steel Plates", to assure delivery of steel plates free of gross internal discontinuities such as pipe, ruptures, or laminations. Plates shall be identified by stamping or stenciling "UT 435" adjacent to marking required by the material specification. The Fabricator shall submit to the Architect evidence of compliance by the mill with this requirement.

- D. Cold-formed hollow structural sections (HSS):
1. Round sections: ASTM A500, Grade C,  $F_y=46$  ksi.
  2. Square and Rectangular sections: ASTM A500, Grade B,  $F_y=46$  ksi.
- E. Steel pipe: ASTM A53, Type E or S, Grade B,  $F_y=35$  ksi.
- F. Anchor Rods: ASTM F1554, Grade 55 with Supplementary Requirement S1.
- G. Anchor Rods: ASTM A449 Type 1 threaded, with nuts and washers each end.
- H. Unfinished threaded fasteners: ASTM A 307, Grade A, regular low-carbon steel bolts and nuts.
1. Provide square head and nuts.
- I. High-strength threaded fasteners: Heavy-hex structural bolts, heavy-hex nuts, and hardened washers, as follows:
1. Quenched and tempered medium-carbon steel bolts, nuts and washers, complying with ASTM A325 or A490.
- J. Direct tension indicator washers: ASTM F959.
- K. Bolt Lubrication: All bolts shall be well lubricated at time of installation, dry, rusty bolts will not be allowed. Bolts or nuts shall be wax dipped by the bolt supplier or "Johnson's Stick Wax 140" shall be used with all bolts in the shop or field. Cleaning and lubrication of ASTM 1852 twist-off type tension-control bolts is not permitted.
- L. Electrodes for welding: Comply with AWS D1.1-98, Table 3.1.
1. For complete-joint penetration groove welds, weld metal shall have a charpy V-notch impact strength of 20 ft./lbs.  $-20^{\circ}\text{F}$ .
- M. Headed Studs – Type Shear connectors: ASTM A108, Grade 1015 or 1020, cold finished carbon steel AWS D1.1, Type B with dimensions complying with AISC specifications.
- N. Structural steel primer paint: SSPC – Paint 11 lead and chromate free, V.O.C. complaint, minimum solids 55% by volume. Use for steel not receiving special coatings or fireproofing. Refer to Architectural Drawings and Division 9.
1. Products: Subject to compliance with requirements, provide one of the following:
    - a. Steel spec Heavy Duty Primer; Sherwin Williams.
    - b. Tnemec – Series 10; Tnemec.
    - c. Primatite; Devco.
  2. Provide shop primer and shop applied top coat paint in accordance with Division 9 Section "Special Coatings" where shown on the Architectural Drawings.
  3. Steel permanently exposed to the elements that does not receive a coating, such as cooling tower supports, shall be hot dip galvanized.
- O. Non-metallic shrinkage-resistant grout: Provide in accordance with Section 03300.

## 2.2 FABRICATION

- A. Shop fabrication and assembly: Fabricate and assemble structural assemblies in shop to greatest extent possible. Fabricate items of structural steel in accordance with AISC Specifications and as indicated on final shop drawings. Provide camber in structural members where indicated.
- B. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence that will expedite erection and minimize field handling of materials.
- C. Where finishing is required, complete the assembly, including welding before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs, and other defects.
- D. Camber: Camber of structural steel members is indicated on the drawings.
  - 1. Where possible, camber of beams shall be applied by a cold bend process. The local application of heat may be used to introduce or correct camber, curvature, or straightness, provided the temperature of the heated area, as measured by temperature crayons or other approved means, does not exceed 1200 F.
  - 2. Where indicated on the Drawings in a camber diagram, cantilever or double cantilever beams shall be cambered for the main span and cantilever end separately, either by a staged cold bending process or by the application of heat.
  - 3. Cambers indicated on the drawings are intended to be final cambers at time of erection. The fabricator shall account for camber loss in the initial camber operations and during transportation of material to the site.
  - 4. Beams and trusses detailed without specified camber shall be fabricated so that after erection any natural camber due to rolling or shop fabrication is upward.
  - 5. Specified camber for beams at time of erection shall be within a tolerance of minus zero to plus one-eighth inch for each ten feet of member length.
  - 6. Specified camber for trusses shall be built into the fabrication process with a tolerance of minus zero to plus 10% of the specified camber.
- E. Splices in Structural Steel: Splicing of structural steel members in the shop or the field is prohibited without prior approval of the Architect. Any member having a splice not shown and detailed on approved shop drawings will be rejected.
- F. Compression Joints: Compression joints which depend on contact bearing as part of the splice capacity shall have the bearing surfaces of individual fabricated pieces prepared to a common plane by milling, sawing, or other suitable means.
- G. Connections:
  - 1. Weld shop connections, as indicated.
  - 2. Bolt field connections, except where welded connections are indicated.
  - 3. Provide high-strength, threaded fasteners except for temporary bracing to facilitate erection or otherwise indicated.
  - 4. Faying surfaces, including coatings, for slip-critical connections shall have a minimum Class A slip coefficient.
  - 5. At welded beam-column flange joints, weld backing and run-off tabs shall be removed and repaired, including a 5/16" reinforcing fillet weld on the edge below the complete-joint-penetration groove weld. The exception that the top-flange backing is permitted to

remain if it is attached to the column flange with a continuous fillet weld on the edge below the complete-joint-penetration groove weld.

- H. Bearing and Fit-Up of Column Compression Joints: Compression joints of all columns shall have bearing surfaces finished to a common plane by milling, sawing, or other suitable means. Lack of contact bearing must not exceed 1/16", or corrective measures as defined by AISC Section M4.4 shall be required.
- I. Struts and Braces: Connect struts and braces to resist 50% of the allowable tensile strength of the members, unless otherwise specified.
- J. Compression members composed of two or more rolled shapes separated from one another by intermittent fillers shall be connected to one another at such fillers spaced at intervals so that the least slenderness ratio,  $l/r$ , of either shape, between the fasteners, does not exceed the governing slenderness ratio of the built-up member.
- K. High-strength bolted construction: Install high-strength threaded fasteners in accordance with AISC "Specifications for Structural Joints using ASTM A 325 or A 490 Bolts" (RCSC June 30, 2004).
- L. Welded construction: Comply with AWS D1.1 for procedures, appearance and quality of welds, and method used in correcting welding work.
- M. 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 final shop drawings.
- N. Provide threaded nuts welded to framing, and other specialty items as indicated to receive other work.
- O. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes, or enlarge holes by burning. Drill holes in bearing plates.
- P. Provide weep hole in any confined steel surface capable of retaining water during erection or service. Seal weld as required to prevent migration of water into confined region.

### 2.3 SHOP PAINTING

- A. Surface preparation: After inspection and before shipping, clean steel work to be painted. Remove loose rust, loose mill scale, and spatter, slag or flux deposits. Clean steel in accordance with SSPC: the Society for Protective Coatings. Use SSPC-SP 6, "Commercial Blast Cleaning" for steel to be painted or receive a coating and SSPC-SP 2, "Hand Tool Cleaning," or SSPC-SP 3, "Power Tool Cleaning" for all other conditions
- B. Priming: Unless specified otherwise in Division 9 "Special Coatings" comply with the following: Immediately after surface preparation, apply structural steel primer paint in accordance with manufacturer's instructions and at a rate to provide dry film thickness of not less than 2.5 mils. Use painting methods that result in full coverage of joints, corners, edges and exposed surfaces. Refer to Division 9 Section "Special Coatings" for priming and painting of members to receive coatings.

Shop prime structural steel, except do not prime:

1. Members or portions of members to be embedded in concrete or mortar. Prime embedded steel that is partially exposed on exposed portions and initial 2" of embedded areas only.
  2. Surfaces that are scheduled to receive sprayed-on fireproofing.
  3. Members that are to be hot dip galvanized.
  4. Surfaces within 2" of welds.
  5. The faying surfaces of slip-critical bolted connections. The exception is for members that receive a coating system. There the faying surfaces should receive a primer providing a Class A surface, with a slip coefficient of 0.33. Submit substantiating data in conformance with Appendix A of the AISC "Specification for Structural Joints".
  6. Mask off and do not prime a strip 2" wide on any surfaces to receive a row of headed studs or puddle welds.
- C. Steel members which cannot be readily painted after fabrication, such as back-to-back angles and tees, shall be primed and finish coated prior to fabrication.
- D. Hot dip galvanize members permanently exposed to the elements, such as cooling tower support steel.
- E. Do not print or emboss the name of the fabricator on exposed steel unless it is completely concealed by the finish painting.

## PART 3 - EXECUTION

### 3.1 ERECTION

- A. Surveys: Employ a Florida Licensed Engineer or Land Surveyor for accurate erection of structural steel. Check elevations of concrete and masonry bearing surfaces and locations of anchor bolts and similar devices, before erection work proceeds, and report discrepancies to Architect. Do not proceed with erection until corrections have been made, or until compensating adjustments to structural steel work have been agreed upon with Architect.
- B. Temporary shoring and bracing: Provide temporary shoring and bracing members and connections of sufficient strength to bear imposed loads from steel self weight and erection procedures or any other loads created by other contractors on a temporary basis. Remove temporary members and connections when permanent members are in place and final connections are made. Provide temporary guidelines to achieve proper alignment of structures as erection proceeds.
- C. Temporary planking: Provide temporary planking and working platforms as necessary to effectively complete work.
- D. Anchor rods and bolts: Furnish anchor rods, bolts and other connectors required for securing structural steel to foundations and other in-place work.
1. Furnish templates and other devices as necessary for pre-setting rods, bolts and other anchors to accurate locations.



2. Refer to Division 3 of these specifications for anchor rod installation requirements in concrete, and Division 4 for masonry installation.
- E. Setting bases and bearing plates: Clean concrete and masonry bearing surfaces of bond-reducing materials and clean bottom of base and bearing plate.
1. Set base or bearing plate wedge or other adjusting devices.
  2. Tighten anchor rods after structural steel frame has been 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.
  3. Pack or pour non-shrink grout solidly between bearing surface and base or plate. Ensure that no voids remain. Finish exposed surfaces, protect grout and allow to cure.
  4. For proprietary grout materials, comply with manufacturer's instructions.
  5. Base plates must be grouted a minimum of 72 hours prior to placing concrete slabs on supporting steel structure.
- F. Field assembly: Set structural members accurately to lines and elevations indicated. Align and adjust various members forming a part of a 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. Comply with AISC Code of Standard Practice except where more stringent requirements are contained herein.
1. Level and plumb individual members of structure within specified AISC tolerances.
  2. Establish required leveling and plumbing measurements on mean operating temperature of structure. Make allowances for difference between temperature at time of erection and mean temperature at which structure will be when completed and in service.
- G. Splice members only where indicated and accepted on shop drawings.
- H. Erection bolts: On exposed welded construction, remove erection bolts, fill holes with plug welds and grind smooth at exposed surfaces.
- I. Comply with AISC Specification for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
- J. Do not enlarge unfair holes in members by burning or by use of drift pins. Ream holes that must be enlarged to admit bolts as permitted by Architect.
- K. Tighten bearing-type bolts (A-325N, A-325X, A-490N, and A-490X) to the snug tight condition as follows:
1. Bolts shall be placed in all holes, with washers positioned as required and nuts threaded to complete the assembly.
  2. Compacting the joint to the snug-tight condition shall progress systematically from the most rigid part of the joint.
  3. The snug-tightened condition is the tightness that is attained with a few impacts of an impact wrench or the full effort of an ironworker using an ordinary spud wrench.
  4. More than one cycle through the bolt pattern may be required to achieve the snug-tightened joint.

- L. Tighten slip-critical bolts (A-325SC and A-490SC) to the minimum fastener tension indicated in Table 8.1 of the "Specification for Structural Joints using ASTM A-325 or ASTM A-490 Bolts" as follows:
1. Begin final tightening of slip-critical bolts only after a snug-tight joint as described above is achieved. Progress systematically from the most rigid part of the joint.
  2. If splined end of tension-control bolts is severed prior to achieving snug-tight joint, remove and replace the fastener assembly.
  3. Progress systematically from the most rigid part of the joint.
  4. Determine tension using either load indicator washers or tension-control bolts.

At the Contractor's option, slip-critical bolts may be installed in either standard, oversize, or short slotted holes. Design of connections using slip-critical bolts is based on a Class A faying surface and oversized holes.

- M. Provide hardened washers conforming to ASTM F436 and place under the part being turned.
- N. Do not reuse or retighten bolts which have been fully tightened. Use only non-galvanized nuts and bolts that are clean, rust-free, and well lubricated. Bolts and nuts shall be wax dipped by the bolt supplier or lubricated with Johnson's Stick Wax 140. Cleaning and lubrication of ASTM F1852 twist-off-type tension-control bolts is not permitted.
- O. Where slotted holes are used to accommodate thermal movement, notify the Architect if bolt is expected to hit the end of slot, based on temperature at time of installation.
- P. Store fastener components in sealed containers until ready for use. Reseal open containers to prevent contamination by moisture or other deleterious substances. Store closed containers from dirt and moisture in a protective shelter. Take from protective storage only as many fastener components as are anticipated to be installed during the work shift. Fastener components that are not incorporated into the work shall be returned to protective storage at the end of the work shift. Fasteners from open containers and fasteners that accumulate rust or dirt shall not be used and shall be immediately and permanently removed from the project site.
- Q. Headed shear studs: All welding ferrules for shear connectors shall be removed prior to placement of concrete.
- R. Gas cutting: Do not use gas-cutting torches in field for correcting fabrication errors in primary structural framing. When permitted, finish gas-cut sections equal to a sheared appearance by grinding or reaming. Do not use gas cutting to fabricate bolt holes.
- S. Touch-up painting: Immediately after erection, slag field welds and clean bolted connections and abraded areas of shop paint. Apply paint to exposed areas using original shop primer or cold galvanizing compound. For exposed steel having special coatings system, reapply both primer and top coat per Division 9 Section, "Special Coatings". For galvanized steel, apply Zinc Clad Cold Galvanizing by Sherwin-Williams or Cold Galvanizing by ZRC Chemical by brush or spray to provide a minimum dry film thickness of 3 mils.

### 3.2 QUALITY CONTROL

- A. Shop testing and inspection by the Owner is to evaluate the effectiveness of the Fabricator's required Quality Control and Assurance Program.
- B. Owner will engage a Structural Inspector to perform field inspections pursuant to the Structural Inspection Plan presented on the Drawings.
- C. Owner will engage a testing agency to perform shop inspections, shop testing, field-testing, and to prepare test and inspection reports.
- D. Testing agency shall conduct and interpret tests and state in each report whether test specimens comply with requirements, and specifically state any deviations therefrom.
- E. Provide access for testing agency to places where structural steel work is being fabricated or produced and unobstructed views to all members in nearby storage so that required inspection and testing can be accomplished.
- F. Testing agency may inspect structural steel at plant before shipment; however, Architect reserves the right, at any time before final acceptance, to reject material not complying with specified requirement.
- G. Correct deficiencies in structural steel work which inspections or laboratory test reports have indicated to be not in compliance with requirements. Perform additional tests, at Contractor's expense, as may be necessary to reconfirm any noncompliance of original work, and as may be necessary to show compliance of corrected work.
- H. Shop Inspection and Tests: Testing Agency is to inspect and test during fabrication of structural steel assemblies, as follows:
  - 1. Review shop drawings and shop procedures with Fabricator's supervisory personnel.
  - 2. Request and obtain necessary mill certifications of steel and verify proper material throughout the duration of the job.
  - 3. Verify welding procedure qualifications, either by prequalifications or by witnessing qualification tests.
  - 4. Verify welder qualifications, either by certification and/or by retesting. Obtain welder certificates.
  - 5. Spot check layout and dimensions of jigs and fixtures for joint preparation, and fit up of members.
  - 6. Verify welding electrodes to be used and other welding consumables as the job progresses.
  - 7. Check preheating procedures for conformance to AWS D1.1.
  - 8. Verify procedures for welding in accordance with applicable portions of section 4, "Technique", AWS D1.1.
  - 9. Verify that quality of welds meet the requirements of Paragraph B.15, "Quality of Welds", AWS D1.1.
  - 10. Provide inspection of surface preparation for coating and coating operations in accordance with SSPC VIS 1 and 2.
  - 11. Perform visual inspection of all welds for compliance with Contract Documents. Provide random non-destructive tests of welds in conformance with Section 6 of AWS D1.1, as may be required by Architect, but not less than:
    - a. Full penetration welds: 25%.
    - b. Partial penetration welds: 15%.

- c. Fillet Welds: 10%.
  12. Testing laboratory may use the following examination methods, in descending order of importance. When a particular examination method for a joint is unfeasible, the highest order method that is practicable shall be used. Standard of acceptance shall be in accordance with AWS D1.1.
    - a. Ultrasonic Method: In accordance with AWS D1.1.
    - b. Radiographic Method: In accordance with ASTM E 94 and ASTM E 142, with a minimum quality level of "2-2T". This procedure is limited to the inspection of groove welds in butt joints only and is not to be used for fillet welds.
    - c. Magnetic Particle Method: In accordance with ASTM E109. Use for examining partial penetration welds. Percentage of examinations is defined elsewhere in these specifications. The Yoke method may be used only for supplementary surface examination.
    - d. Dye Penetrant Examination Method: In accordance with ASTM E165.
  13. Ultrasonically inspect for laminations after welding all joints with Group 4 and 5 rolled shapes and plates greater than 1 1/2" thick, where material is subjected to tension in the through thickness direction. The ultrasonic inspection shall extend for a distance of six times the thickness of the plate receiving the through thickness tension, either side of the plate delivering the tension.
  14. Interpret, record, and report all results of the non-destructive tests.
  15. Mark for repair, any area not meeting Specification requirements. Correction of rejected welds shall be made in accordance with Paragraph 3.7, "Corrections", AWS D1.1
  16. Re-examine all repair areas and interpret, record, and report the results of examinations of repair welds.
- I. Field Inspection and Tests: Inspect and Test during the erection of structural steel assemblies as directed by the Engineer of Record, but not less than the following
1. Verify field welding procedures and obtain welder certificates.
  2. Check joint preparation and fit up, backing strips, and runout plates.
  3. Check preheating to assure proper temperature, uniformity, and thoroughness through the full material thickness.
  4. Review welding sequence.
  5. Perform visual inspection of all welds for compliance with Contract Documents. Perform non-destructive tests of welds in conformance with Section 6 of AWS D1.1 as may be required by Architect, but not less than:
    - a. Splices: 100%.
    - b. Full Penetration Welds: 50% except 100% of cantilever members.
    - c. Partial Penetration Welds: 25%.
    - d. Fillet Welds: 10%.
  6. Check 100% of bolted connections according to inspection procedures outlined in the "Specification for Structural Joints using ASTM A325 or A490 Bolts" and as required elsewhere in these specifications.
  7. Production Stud Application Testing: Test the first two studs per welder per day for each set-up and size and type of stud. Test by bending studs 30 degrees using a 4 lb. hammer per AWS D1.1 Section 7.7. Use a 4 lb. hammer to sound 100% of studs. A pinging sound usually represents a sound weld. Studs that produce a "thud" should be bend tested. Passing studs may remain bent while failing studs must be replaced.
  8. Interpret, record, and report all results of the non-destructive tests.
  9. Mark for repair any area not meeting Specification requirements. Correction of rejected welds shall be made in accordance with Paragraph 3.7, "Corrections", AWS D1.1.

10. Re-examine all repair areas and interpret, record, and report the results of examinations of repair welds.
- J. Pre-installation testing of as-received fastener assemblies shall be performed according to the Specifications for Structural Joints using ASTM A325 or A490 Bolts, Section 7 and as follows:
1. Tension Calibrator (a hydraulic device that indicates the pretension that is developed in a bolt that is installed in it) shall be provided by the testing agency, at the Project Site, to confirm the tension force in the fastener assembly.
  2. A sample of not fewer than three complete fastener assemblies from each shipping container shall be checked at the site.
  3. Fastener assemblies tested shall develop a pretension force not less than 1.05 times that required by Table 8.1 in AISC. Minimum passing test force: A325: 3/4"=29.4 kips,

END OF SECTION 05120