RELEASED FOR CONSTRUCTION AND PERMIT

SECTION 05 1200

STRUCTURAL STEEL FRAMING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions, Supplementary General Conditions, and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This section includes structural steel and all related items.

B. Related Sections: The following sections contain requirements that relate to this Section:

1. Division 03 Section "Cast-In-Place Concrete".
2. Division 05 Sections "Steel Joist" and "Steel Roof Decking".

1.3 REFERENCE STANDARDS

A. Except as called for otherwise herein, all fabrication and erection shall meet the ANSI/AISC 360-10, Specifications for Structural Steel Buildings, and AISC 303-05, Code of Standard Practice for Steel Buildings and Bridges, except Section 4.4.

B. AISC Fourteenth Edition, except as noted above.

C. All welding shall be in compliance with the American Welding Society, AWS D1.1 – Latest Edition, Structural Welding Code – Steel.

D. American Society for Testing and Materials:

A36/A36M-08 Standard Specification for Carbon Structural Steel
A307-07b Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength
A325-07a Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength
A6/A6M-08 Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, Sheet Piling, and Bars for Structural Use
A53/A53M-07 Standard Specification for Pipe, Steel, Black and HotDipped, ZincCoated Welded and Seamless
A500/A500M-07 Standard Specification for ColdFormed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes. Use Grade B (Fy = 46,00psi).
A992/A992M-06a Standard Specification for Structural Steel Shapes
E329-98 Standard Specification for Agencies Engaged in Construction Inspection and/or Testing
F1554-07a Standard Specification for Anchor Bolts, Steel, 36,55, and 105 ksi Yield Strength.

E. Fabricator shall be AISC Certified.

1.35 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated as SISC Certified Erector, Category CASE.

B. Fabricator Qualifications: A qualified fabricator who participates in the American Institute of Steel Construction Quality Certification Program and is designated an AISC Certified Plant, Category Cbd. Fabricators not complying with Category Cbd shall have fabrication procedures and fabricated steel tested and inspected by an independent testing agency acceptable to the Structural Engineer. Refer to Source Quality Control section for requirements.

C. Welding: Quality procedures and personnel according to AWS D1.1, "Structural Welding Code – Steel", as record copy indicating compliance.

D. Use prequalifying welding procedures prepared by the fabricator and erector as a written procedure specification.

E. Land Surveyor: Land Surveyor Qualification: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and with a minimum of five years experience in providing surveying services of the kind indicated.

1.4 SHOP DRAWINGS

A. Qualification Data: For installer, fabricator, Professional Engineer, and testing agency as record copy indication compliance.

B. Mill Test Reports: Signed by manufacturers certifying and accompanied by a letter from the Contractor indicating that the following products comply with requirements of the Contract Documents as a record copy indicating compliance.

1. Structural steel including chemical and physical properties.
2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
3. Direct tension indicators.
4. Tension-control, high-strength bolt-nut-washer assemblies.
5. Shear stud connectors
6. Shop primers
7. Nonshrink grout.
8. Weld materials.

C. All drawings for review must be submitted electronically to the Architect, one master submittal will be returned to the Contractor electronically with each disciplines comments marked in a separate color. Submittals shall include erection drawings, sections, and fabrication drawings.

D. Where welded connections are detailed, standard AWS symbols shall be used.

E. Shop drawings shall be made to conform with the design drawings. Contract drawings shall take precedence over shop drawings unless otherwise authorized in writing. Review of the shop drawings by the Architect or the Architect's Structural Engineer does not constitute a change to the contract.

F. All connections and joints shall be completely detailed to cover both shop and field work. Any connections or designs not shown shall be designed by a Design professional licensed in the project State and signed and sealed calculations shall be submitted with the shop drawings.

G. Where the Contractor is in doubt regarding certain dimensions shown on the contract drawings, or if there is an apparent discrepancy on the contract drawings, the Contractor or his agent shall circle and question such dimensions on his shop drawings in an obvious manner. In such cases, the dimensions shall be especially checked or supplied by the Architect.

H. Where project scope includes additions and or renovations to existing structures, all existing dimensions, sizes and conditions shall be field verified by the Contractor prior to the purchase, detailing, or fabrication of any steel.

I. One master electronic copy shall be returned to the contractor with each disciplines marks in a separate color.

1. Final Unrestricted Release: Work may proceed, provided it complies with contract documents, when submittal is returned with the following:

Marking: "No Exceptions Taken".

2. Final-But-Restricted Release: Work may proceed, provided it complies with notations and corrections on submittal and with contract documents, when submittal is returned with the following:

Marking: "Exceptions Noted".

3. Returned by Resubmittal: Do not proceed with work. Revise submittal in accordance with notations thereon, and resubmit without delay to obtain a different action marking. Do not allow submittals with the following marking (or unmarked submittals where a marking is required) to be used in connection with performance of the work:

Marking: "Resubmit".

4. Other Action: Where submittal is returned for other reasons, with Architect's explanation included, it will be marked as follows:

Marking: "Action Not Required".

J. Details shall be furnished of all steel stairs. Stairs shall meet the AISC Code of Standard Practice for Steel Buildings and Bridges, Section 10, Architecturally Exposed Structural Steel.

1. Treads and risers shall be preformed of 14 gauge metal with nosing pan section to be 14 gauge as shown on drawings.
2. Stringers, landing beams, closure plates, stiffeners and connection angles shall be as shown on drawings.
3. Members shall be aligned and true made without offsets or visible flaws.
4. Welds are to be ground smooth and provided to meet these specifications.
5. Selfsupporting stairs will be provided to meet these specifications.
6. Stair rails shall meet architectural details. See Metal Stairs Section.
7. Where stair widths are greater than 5'-0" provide a W6x9 at midspan of pan to span from header to header. Provide a w-tee cut to fit at each riser to support pan.
8. Where steel stair landings are suspended from floors above provide a minimum of a 3x3x1/4" angle hanger. Hang concentrically from floor beam. Contractor coordinate with architectural partition schedule to insure hangers are coordinated within partitions. Do not use rods for hangers.
9. Where landing channels frame into concrete walls, provide double clip angle connection with a minimum of (4) -1"Ø expansion anchors.

K. The Contractor shall be responsible for the conforming of all steel as indicated on the contract drawings.

L. Show steel shear stud size, number and location.

M. All composite floor construction steel shear studs shall be field welded. Steel studs shall project a minimum of 1 ½" above top flute of floor deck.

N. Show type of joist and members to be welded.

O. Provide details of anchoring.

1.5 RESPONSIBILITY FOR ERRORS

A. The Contractor shall be responsible for all errors of detailing, fabrication and for the correct fitting of the structural members. The Contractor shall make all measurements in the field to verify or supplement dimensions shown on shop drawings, and he will verify that all dimensions shown on shop drawings are coordinated with the dimensions and requirements of the architectural plans, elevations and sections.

B. If steel is damaged or does not fit up, the Contractor shall prepare and submit drawings for review to the Architect showing his proposed corrective measures. No modifications shall be made to the steel until such drawings have no exceptions by the Architect.

1.6 TESTS & INSPECTIONS

A. Inspections and tests shall be performed by an independent laboratory complying with ASTM E329 selected and directed by the Architect.

B. The Contractor shall furnish three (3) certified copies of all mill reports covering the chemical and physical properties of the steel used. Reports shall be of steel made within the last 60 days before shipment. Reports shall certify that steel is of domestic manufacture.

C. Inspection of welding shall meet paragraphs 6.1 through 6.5 of AWS D1.1. Inspection of preparation of materials and welding shall be by the visual method as covered in paragraph 8.15 of AWS D1.1 Inspection shall cover the following:

1. Butt welds introduced by the fabricator shall be inspected. Such welds shall be indicated on shop drawings with the appropriate reference welded joint number as shown in Table 8-2 of the AISC Steel Construction Manual..
2. All welds indicated on contract drawings as full penetration welds shall be inspected. Such welds shall be taken to include all welds shown in Table 8-2 of the AISC Steel Construction Manual.
3. If inspection of full strength welding is not accomplished during preparation and welding, nondestructive testing will be provided in compliance with paragraph 6.7 of AWS D1.1. Such testing shall be paid for by the Contractor.
4. If the fabricator elects to use full value for fillet welds as set forth in AISC Steel Construction Manual, initial inspection shall be made of a random selection of 15% of such welds. If the fillet welding fails to pass this inspection than 50% of such welding shall be inspected and passed before acceptance.

D. Inspections shall be in accordance with the International Building Code, Chapter 17, and project Special Inspections Guidelines. The Special Inspection Agency shall be in accordance with ASTM E329-latest edition..

E. Inspection reports shall include a certification that:

1. The work has been checked against the contract drawings and that full strength butt welds have been provided where they were called for on the plans.
2. The work has been checked against the shop drawings and full strength butt welds introduced by the fabricator (see paragraph 1.4 B2) have been provided.
3. That welding has been accomplished to meet ASW Standards and the provisions of this Specification.
4. That high strength bolts have been installed with one hardened washer and they meet the inspection requirements prescribed in the contract specifications.

1.7 ARCHITECTURALLY EXPOSED STRUCTURAL STEEL

A. All steel exposed to pedestrian view shall be considered Architecturally Exposed Structural Steel and shall meet the requirements in Section 10 of the AISC Code of Standard Practice.

B. Connections which are exposed to view shall be welded and have all welds ground smooth.

C. Where Architecturally Exposed Structural Steel is supported by other framing, such framing shall be fabricated and erected to meet the tolerance requirements of Architecturally Exposed Structural Steel.

PART 2 - PRODUCT

2.1 MATERIAL

A. All W Sections and Channels shall conform to A992/A992M Grade 50 Fy=50ksi Steel. All tubes or HSS Sections shall conform to ASTM A500 Fy=46 ksi. All other steel shall conform to ASTM A36/A36M.

B. High strength bolts, nuts and washers shall conform to ASTM A325. Use for all bolted connections unless otherwise noted.

C. All Anchor Rods shall be ASTM F1554, 36 ksi yield strength unless noted otherwise.

D. Machine bolts, nuts and washers shall conform to ASTM A307. Use for bolts set in concrete only.

E. Electrodes for mild steel arc welding shall conform to Classification E7015, E7016, or E7018 of AWS A5.1 – Latest Edition..

F. Materials shall be of domestic manufacture only.

G. Where roof decks frame on to a roof beam member, and it is in a different direction than the beam, provide 3/16" continuous bent plate welded across the top of roof member sloped to match plane of roof deck.

H. When joist framing changes direction, provide a 2½"x2½"x¼" angle vertical leg down and to top of supporting roof member. Horizontal leg of angle shall be at the same elevation as top of joist and top deck.

I. "AX" indicates to provide additional "X" type bridging and to use angle 2½"x2½"x¼" unless a larger size angle is specifically noted on the Contract Documents.

J. H.B. indicates a horizontal bridging of 3"x3"x¼" extended across the top chord of joist or beam to top of column, unless a larger size angle is specifically noted on the Contract Documents.

K. At perimeters of all roofs, openings, changes in roof and where high and low roofs occur, provide a minimum angle size of 4x3x1/4" continuous angle field welded to joist or beam unless noted otherwise on plans.

L. At perimeters of all floors, openings and expansions joints provide a minimum of a ¼" thick closure bent plate extending from centerline of floor members to edge of slab x height of slab unless noted otherwise.

M. Where floor slabs occur, closure angle at sill face shall have ¾"Ø headed studs x 5" long welded to vertical face of angle unless noted otherwise. Studs shall be spaced at 12" max.

At composite floor construction, all floor openings 12"x12" and larger shall be framed with W8X10 on four sides; two of which will frame to adjacent composite beams.

At roof top units provide a CS-0.7 framing at perimeter of unit. Provide solid wood blocking between deck and channel typical. Maximum span of channel shall not exceed 6'-0" typ.

N. At elevator pit the general contractor shall provide a vertical tube minimum T.S.6x6x1/4" with base plate expansion anchored to floor and slip connection at underside of floor or roof above at each rail location. General Contractor coordinate bracing requirements with the elevator manufacturer.

CONNECTIONS

A. GENERAL

1. Beam and girder connections shall meet Tables 10-1 through 10-11 of the AISC Steel Construction Manual, Thirteenth Edition unless noted otherwise on plans.
2. At composite floor construction, where reactions are shown on plan, connections shall develop 125% of reaction shown.
3. Unrestrained Members: Except as otherwise indicated by the design, all connections of beams or girders shall be designed as flexible and may ordinarily be proportioned for the reaction shears only. If, however, the connection is eccentric, provision shall be made for the resulting moment.
4. Where final connection is to be welded, provision shall be made for erection and fastening the members together during erection and alignment.
5. Except where called for otherwise, field connections shall be bolted.
6. Placement of Bolts and Welds: The bolts or welds at the ends of any member transmitting stresses into that member shall preferably have their centers of gravity on the gravity axis of the member; otherwise, provision shall be made for the effect of the resulting eccentricity. Pins shall be located to counteract the effect of bending due to dead load.
7. Connections for bracing members carrying calculated forces shall have sufficient bolts or welds to develop the force indicated. Unless higher forces are indicated, connections shall be designed for a minimum of 12,000 pounds.
8. Eccentric Connections: Members meeting at a point shall have their gravity axis meet at a point if practical, if not provision shall be made for bending stresses due to eccentricity.
9. In tension members composed of two angles, a pitch of 3'6" will be allowed and in compression members 2'0", but the ratio l/r for each angle between spacers shall be not more than ¾ of that for the whole member.
10. The distance between the holes in the ends of diagonal tension bracing members shall be 1/8" less than the actual distance so that during erection an initial stress can be introduced by means of a drift pin.
11. Fabricator shall punch all holes for the attachment of nailers, hangers or other work to the steel.
12. Where a steel joist is designated on plans as a strut joist, it shall serve as an erection strut and have bolted end connections. Provision shall be made in the steel to receive these joists and two 9/16" OH shall be provided for each connection (OSHA).
13. Where diagonal bracing is shown and forces are not provided on diagrams, connection shall develop the full tensile/compressive force of that member at each end.
14. Where diagonal bracing occurs over a basement wall, or shear wall, contractor shall provide a shear transfer connection from base gusset to top of concrete wall.
15. At all column splices, connections shall be moment splices with full penetration welds all around.

B. WELDS

1. Welding and joint details shall meet the requirements of the AWS D1.1 and the AISC Steel Construction Manual, Thirteenth Edition with the following limitations:
2. All welders used shall be currently qualified for the most complex weld to be accomplished.
3. Welds shall not be made through galvanizing unless properly prepared or compatible welding rods used.

C. HIGH STRENGTH STEEL BOLTS

1. High strength steel bolts connections shall be provided and installed in accordance with Research Council on Structural Connections. "Specifications for Structural Joints Using ASTM A325 or A490 Bolts", 2004 edition. This document is available in the AISC Steel Construction Manual.
2. Bolts, nuts, and washers shall conform to ASTM A325.
3. Bolts shall be equipped with nut and one hardened washer. Washers shall be flat and smooth but if the bearing faces of the bolted parts have a slope of more than 1:20 with respect to a plane normal to the bolt axis, smooth beveled washers shall be used to compensate for the lack of parallelism.
4. Bolts shall be in bearing and threads shall be included in the shear plane.
5. Bolts shall be tightened by use of a power wrench or manual torque wrench calibrated to the minimum bolt pretension prescribed in the Specifications. The turn of the nut method will not be accepted. Tension control bolts are recommended.

D. EXPANSION BOLTS

1. Bolts for attaching steel to existing concrete shall be one of the following:
   a. "Wedge Anchors" as manufactured by Phillips Drill Co., Inc., Michigan City, Indiana 46360.
   b. "Parabolt" as manufactured by the Molly Co., 504 Mt. Laurel Ave., Temple, Pa. 19560
   c. "KwikBolt" as manufactured by McCulloch Industries, 1125 Washington Ave., Minneapolis, Minn. 55415.
   d. "Wejit" as manufactured by Expansion Products, Inc., Industrial Park, Broomfield, Colorado 80020.
2. Holes for expansion bolts shall be made by first securing the steel in place then drilling the holes through the holes in the steel using the steel as a template. Drilling of the holes by center measurement will not be permitted. Reaming or punching of the holes in the steel will not be permitted. The drill size shall be of the same diameter as the bolt.

E. PAINT

1. Approved paints are as follows:
   a. L. Sonneborn Sons SRP-444;
   b. Pittsburgh Protects;
   c. Rust-Oleum Corporation 1000;
   d. Tnemec Company #67 Specification Primer;
   e. Sherwin Williams Kem Kromik Primer.

PART 3 - EXECUTION

3.1 WORKMANSHIP

A. The steel fabricator shall have a current AISC Fabrication Certificate.

B. All work shall be executed by skilled workmen under experienced supervision.

C. Both shop and field welding shall be done by certified welders.

3.2 FABRICATION

A. All structural material shall be fabricated and assembled in the shop to the extent that additional assembly is restricted by shipping limitations. Flamecutting and punching shall be done to prescribed dimensions. Burrs and shavings shall be removed. Parts not connected on the shop shall be secured by bolts to prevent loss of damage in shipping and handling.

B. Shop punching shall be without ragged or torn edges. The diameter of the punch shall not exceed that of the bolt or the diameter of the die exceed that of the bolt by more than 1/16 inch. The thickness of the material in punched work shall not exceed the normal diameter of the bolts plus 1/8 inch. Holes shall be spaced so that when parts are assembled, bolts will enter without distortion. Holes shall be enlarged only by reaming. Drift pins shall not enlarge or distort the holes.

C. Shop connections may be welds or high strength steel bolts unless specified otherwise.

D. All members shall be free from twists, kinks, buckles or open joints. Parts assembled with bolts shall be in close contact except where separators are prescribed. All members shall be so made that when assembled, the parts shall come together without shimming.

E. Open holes shall be provided for bolted connections of other work under the General Contract to Structural Metal Work.

F. Metal shall be properly prepared in accordance with shop details before welding is begun.

G. No shop splice or other connection welded or otherwise shall be made without having been detailed on shop drawings and approved by the Design Professional.

H. Steel shear studs shall be attached using a special installation welding gun with ceramic ferrule spacers.

I. Where connections are indicated on the Contract Drawings, no deviation from the type and method thereof shall be made without the approval of the Design Professional. One sided or other types of eccentric connections will not be permitted without the approval of the Design Professional.

J. Provide web stiffeners in all girders and beams at points of concentrated loads or bearings.

K. Architecturally Exposed Structural Steel shall meet the following criteria:

1. Form work true to line and level with accurate angles and surfaces and straight edges. Ease exposed edges. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
2. Weld corners and seams continuously and in accord with AWS recommendations. Grind exposed welds smooth and flush to match and blend with adjoining surfaces.
3. Seams in pipes and tubes shall all be turned to face the same direction. Seams shall be located where they are least noticeable to pedestrian view. Seam location shall be shown on shop drawings.
4. Provide anchorage of type shown on approved shop drawings coordinated with the supporting structure.

3.3 SHOP PAINTING

A. All steel and iron work shall be thoroughly cleaned of mill scale, rust, dirt, oils and grease by use of wire brushes and scrapers and all members except those encased in concrete shall be given one shop coat of a rust inhibitive paint. Minimum dry film thickness shall be 2 mils.

B. Paint shall be used from original containers without dilution.

C. Steel to be encased in concrete or to receive sprayon fireproofing shall not be painted.

3.4 ERECTION PRECAUTIONS

A. It shall be the responsibility of the Contractor to secure steel against displacement during erection and to maintain it against displacement until the erection of all steel is completed, all floor and roof decks are in place, and all exterior masonry is completed.

B. All structural metal work shall be accurately set and secured with temporary or permanent connections as erected.

C. All structural metal work shall have temporary guys, braces and stays to hold it in position until it is permanently secure. In general, exterior masonry, diagonal bracing and or moment frames are relied upon to secure the steel, therefore, temporary bracing shall be maintained until all is in place.

D. Column bases are designed as unrestrained and columns shall be guyed, braced or stayed as erected. (Staying may be accomplished by fastening to framing members attached to a section of framing already braced.)

3.5 ERECTION

A. Field connections may be welds or high strength steel bolts unless specified otherwise.

B. Bolts for structural work exposed to the weather shall be dipped in rust inhibitive paint just before they are put in place.

C. Anchor bolts shall be located and built into the connecting work in advance. All columns shall have a minimum of (4) anchor bolts. Column bases shall be set on four metal shims and grouted solid with a minimum of 1-1/2" thick nonshrink, nonmetallic, cementitious type grout. Grouting shall be performed prior to loading column. Contractor shall have testing company present to observe grouting. All copies of reports shall be forwarded to the Architect/Design Professional.

D. Bearing plates shall be set in nonshrink, nonmetallic, cementitious type grout.

E. No erection holes shall be burned or enlarged with a torch.

F. After assembly, the various members forming parts of a completed frame or structure shall be aligned and adjusted before being permanently fastened. Tolerance shall conform to AISC. Fastening of splices of compression members shall be done after the abutting surfaces have been brought completely into contact. Bearing surfaces and surfaces that will be in permanent contact shall be cleaned before the members are assembled. Unless removal is required by the Architect, erection bolts used in welded construction shall be tightened and left in place.

G. As erection progresses the work shall be fastened to take care of all dead load, wind and erection stresses. Splices will be permitted only where indicated.

H. As erection progresses steel joists designated on plans as strut joists shall be bolted in place with two ½" high strength bolts to serve as an erection strut. (OSHA)

I. All bolts, including anchor bolts, shall expose 1½ threads minimum after nut is tightened.

REVISIONS:		
NO	DATE	COMMENTS
1	01.15.19	Permit Set

RETAIL DEVELOPMENT
POP'S WINE & SPIRITS
2-1 764 TR A-B MCFARLAND 400 IND PARK
MCFARLAND PKWY ALPHARETTA GA 30004

Specifications

PROJ. NO: 201812
DATE: 01-15-19

S7.2