REGISTERED ARCHITECT
JAMES RICHMON
WIER, Jr.
4446
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STATE OF MISSISSIPPI

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Project Name: PPSD CTE Renovations
Project Number: 25-009

ADDENDUM NO. 2

NOTICE TO ALL DOCUMENT HOLDERS:

The following additions, deletions, changes and clarifications to the drawings and specifications are to be included as part of the Contract Documents.

SPECIFICATIONS

ITEM NO. 01 **03.1000 Concrete Formwork**
REPLACE the section 03.1000 Concrete Formwork with the attached.

ITEM NO. 02 **03.2000 Concrete Reinforcement**
REPLACE the section 03.2000 Concrete Reinforcement with the attached.

ITEM NO. 03 **03.3000 Cast-In-Place Concrete**
REPLACE the section 03.3000 Cast-In-Place Concrete with the attached.

ITEM NO. 04 **05.1200 Structural Steel Framing**
REPLACE the section 05.1200 Structural Steel Framing with the attached.

ITEM NO. 05 **05.4000 Cold-Formed Metal Framing**
REPLACE the section 05.4000 Cold-Formed Metal Framing with the attached.

Encl: 03.1000 Concrete Formwork (8.5x11), 03.2000 Concrete Reinforcement (8.5x11), 03.3000 Cast-In-Place Concrete (8.5x11), 05.1200 Structural Steel Framing (8.5x11), 05.4000 Cold-Formed Metal Framing (8.5x11)

Cc: All document holders

2727 OLD CANTON RD | SUITE 200 | JACKSON, MS 39216 | 601.321.9107WBAARCHITECTURE.COM

CONCRETE FORMWORK

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the contact, including General and Supplementary Conditions and other Division 1 specification sections, apply to this section.

1.2 SCOPE

A. This work includes all concrete formwork and other related items necessary to complete the project indicated by the contract documents unless specifically excluded.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Wood forms to be ¾" exterior grade plywood on studs and joists. Lumber shall be 2" (nominal) X width required for strength, conforming with PS-20. Studs, girts and wales shall be not less than 2" X 4" (nominal), selected for straightness.

B. Form ties: Standard snap ties, 1-1/2" breakback. Holes for ties to be ¼" (minimum) smaller than outer core dimension.

C. Form oil: Approved non-staining type, "Noxcrete" or equal. Oil must not affect bonding or finishes on exposed concrete.

PART 3 - EXECUTION

3.1 FORM CONSTRUCTION

A. Wood forms are required for all foundations. Earth forms are allowed for sloping sides of grade beams to be poured with floor slabs.

B. Forms shall be properly aligned, adequately braced and mortar tight to produce concrete shapes required by drawings. Align forms so that the actual surface does not vary from true surface more than 1/8". The surface shall be clean, undamaged, and free of offsets and irregularities at joints. Adequately brace and frame to retain true shapes under vibration and placing strains without leaks, bowing, or deflection.

C. Studs, girts, and wales shall not be less than 2x4, S4S construction of standard grade Douglas fir or equal, selected for straightness. All wales shall consist of at least two 2X4's. Studs and girts shall not be spaced more than 16", wales not more than 24", and ties not more than 27".

D. Lightly oil work forms prior to placing reinforcing, and with oil not permitted on the reinforcing. Where form oil is used, remove excess before pouring concrete.

E. Formwork shall comply with “Recommended Practice for Concrete Formwork” ACI 347, unless specified herein otherwise.

F. Clean formed cavities of debris prior to placing concrete. This may be performed by flushing with water or compressed air. The latter method is preferred and use of water must be approved by Architect prior to using this method. All debris to be moved to a central location where it is to be removed in its entirety.

3.2 INSERTS AND FASTENING DEVICES FOR OTHER WORK

A. Provide for installation of inserts, hangers, metal ties, anchors, bolts, dowels, nailing strips, grounds and other fastening devices required for attachment of other work. Locate partitions for other trades prior to pouring concrete in order that conduits, sleeves and inserts required by others will be installed in the proper locations. Hang tie or form in all inserts, do not place in wet concrete by hand.

B. Do not install sleeves in any concrete beams or piers except upon approval of the Architect or as detailed in the Drawings. Do not put aluminum conduits in concrete.

C. Seal all formwork to avoid water or paste leaks at joints.

D. Verify location and properly install all utility sleeves prior to concrete placement.

3.3 FORM REMOVAL

A. Formwork for sides of beams and similar vertical forms not supporting the weight of the concrete may be removed after 24 hours providing the concrete has hardened sufficiently to resist damage from the removal operation.

END OF SECTION

CONCRETE REINFORCEMENT

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of contract, including General and Supplementary Conditions and other Division 1 specification sections, apply to this section.

1.2 WORK INCLUDED

A. Reinforcing steel bars, welded steel wire fabric for cast-in-place concrete.

B. Support chairs, bolsters, bar supports, spacers, and other devices for supporting reinforcement.

1.3 REFERENCES

A. The following specifications, standards and codes shall govern the fabrications and placement of concrete reinforcement, unless modified by this Specification:

1. American Concrete Institute (ACI)
    a. ACI 301 – Structural Concrete for Buildings.
    b. ACI 318 – Building Code Requirements for Reinforced Concrete.
    c. ACI SP – 66 – Detailing Manual.
2. American Society for Testing and Materials (ASTM)
    a. ASTM A185 – Welded Steel Wire Fabric for Concrete Reinforcement.
    b. ASTM A165 – Deformed and Plain Billet Steel Bars for Concrete Reinforcement.
    c. ASTM 1676/A 767M-97 – Specification for Zinc – Coated (Galvanized) Steel Bars for Concrete Reinforcement.
3. American Welding Society (AWS)
    a. AWS D1.4 – Structural Welding Code for Reinforcing Steel.
    b. AWS D12.1 – Welding Reinforcement Steel, Metal Inserts and Connections in Reinforced Concrete Construction.
4. Concrete Reinforcing Steel Institute (CRSI)
    a. CRSI – Manual of Practice
    b. CRSI 62 – Recommended Practice for Placing Reinforcing Bars.
    c. CRSI 65 – Recommended Practice for Placing Bar Supports, Specifications and Nomenclature.

1.4 SUBMITTALS

A. Submit shop drawings under provisions of Section 01330 detailing reinforcing steel in accordance with ACI-315-74, indicating sizes, spacings, locations and quantities of reinforcing steel, wire fabric, bending and cutting schedules, splicing, stirrup spacing, supporting and spacing devices and dowels.

B. Submit shop drawings to the Architect that show approval of the Contractor. Do not fabricate material until approval of the Architect has been obtained.

C. Under no circumstances will field fabrication such as bending be allowed. All necessary dowels, etc., will be fabricated by the steel supplier.

D. Manufacturer Certificates shall be submitted to certify that products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

A. Perform concrete reinforcement work in accordance with CRSI Manual of Standard Practice and Documents 63 & 65.

B. Conform to ACI 315-99.

C. Acceptable Manufacturers: Regularly engaged in the manufacture of steel bars and welded wire fabric.

D. Installers Qualifications: Three years experience in the installation of steel bar and welded wire reinforcing.

E. Testing Laboratory to inspect reinforcing location, size, grade, and splice length for conformance with Contract Documents. The Testing Laboratory shall inform the Architect and Contractor of work not conforming to the Contract Documents and provide written a report to the Architect of compliance. Concrete shall not be poured until the Testing Laboratory issues approval.

1.6 DELIVERY, HANDLING AND STORAGE

A. Deliver reinforcing to project site in bundles marked with metal gauges indicating contents of bundle keyed to shop drawings.

B. Store at site on skids, off-grade, in manner to prevent soiling, contamination or other damage.

C. Handle as required to prevent bending, kinking or other damage.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Reinforcing Steel: ASTM A615, grade 60 deformed billet steel bars, domestic manufactured.

2.2 ACCESSORY MATERIALS

A. Tie Wier: Minimum 18 gauge annealed type.

B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during installation and placement of concrete.

C. Provide chairs with plastic-coated feet.

D. Other Supports: No Brick or Concrete block chairs will be allowed. Brick masonry or concrete masonry shall not be used to support reinforcing steel.

PART 3 - EXECUTION

3.1 **FABRICATION**

A. Fabrication in accordance with ACI 315-99, providing concrete cover specified in the contract documents.

B. Locate reinforcing splices not indicated on Drawings at points of minimum stress.

C. No hand sticking of reinforcement after commencement of concrete pour.

D. Do not place concrete if reinforcing bar temperature is below 35° F.

3.2 **PLACEMENT**

A. Clean excavations, forms, etc., of loose earth, water, debris, trash, etc.
B. Check forms for levelness and plumbness. Verify proper alignment and bracing.
C. Verify that all other trades have their materials in place.
D. Clean reinforcement of loose scale, loose rust, oil or other material, which will reduce bond with concrete.
E. Reinforcement shall be placed in accordance with CRSI “Recommended Practice for Placing Reinforcing Bars”.
F. Provide and install chairs, bolsters, bar supports and spacers to properly position and secure the bars and mesh while concrete is being poured.
G. Install reinforcement and position so as to maintain the concrete cover indicated on the Drawings.
H. Use soft, black annealed tie wire to secure steel at laps, splices and intersections. See additional information in Drawings.
I. Reinforcement for 1 day’s pour shall be completely placed and an approval made by the Architect prior to starting the pour.

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION

A. Furnish, place and finish the cast-in-place concrete and related items as indicated on the Drawings and as specified herein.

B. Related work specified elsewhere:
1. Section 03.1000 Concrete Formwork
2. Section 03.2000 Concrete Reinforcement

1.2 REFERENCES

A. American Society for Testing and Materials (ASTM)
1. ASTM C33 Specification for Concrete Aggregates.
2. ASTM C94 Specification for Ready-Mix Concrete.
3. ASTM C150 Specification for Portland Cement.
4. ASTM C260 Specification for Air-Entraining Admixtures for Concrete.
5. ASTM C494 Specification for Chemical Admixtures for Concrete.
6. ASTM C618 Specification for Fly Ash and Raw or Calcinated Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.

B. American Concrete Institute (ACI)
1. ACI 301-99 Specifications for Structural Concrete.
2. ACI 302.1R-96 Guide for concrete Floor and Slab Construction.
3. ACI 304R-00 Measuring, Mixing, Transporting and Placing Concrete.
4. ACI 305R-99 Hot Weather Concreting.
5. ACI 306.1-90 Cold Weather Concreting.
6. ACI 308-92 Standard Practice for Curing Concrete.
7. ACI 318R-99 Building Code Requirements for Structural Concrete.

1.3 LABORATORY TESTS AND CONTROL

A. The Contractor shall engage the services of a recognized independent Testing Laboratory approved by the Architect and paid for by the Contractor to furnish the following:

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1 Certification Program, or the requirements of ASTM C 1077.

2. Inspection and report for reinforcement see section 03200.

3. During construction: Casting and testing of concrete cylinders, and furnishing reports of all tests. The Contractor shall notify the Testing Laboratory of all pours 24 hours in advance to permit all tests to be made.

4. Ready-Mix Concrete Producer shall provide design and control of mixes for all concrete. Testing Agency shall verify that only mixes approved by the Architect are used.

B. Cylinders are to be cast on the job according to ASTM C 31 and laboratory compression test will follow (ASTM C 39). A set of four cylinders shall be cast for each test specimen. One set of cylinders shall be cast for each class (design mix) of concrete for each 75 cubic yards, or portion thereof, placed. A minimum of one set of cylinders shall be cast for each class of concrete placed per day. One cylinder from the laboratory will be tested at 7 days. Two cylinders from the laboratory will be tested at 28 days. The fourth cylinder will be held in reserve for future testing or in the case of an improper sample, as may be required.

C. The following documentation and testing shall be completed for each set of cylinders:

1. Compressive Strength (ASTM C 39)
2. Slump (ASTM C143)
3. Air Content (ASTM C 231 or C 173)
4. Location of placement the sample represents
5. Document other information such as the addition of water, excessive wait time, etc.

D. Conduct a slump test on the first load of each class of concrete delivered each day and periodically thereafter to ensure compliance. Perform a slump test after any water is added and when test cylinders are formed.

E. Slump exceeding the specified maximum, in two consecutive tests on different portions of the sample, will be cause for rejection of the load.

F. Additional testing and samples shall be required for the first load delivered in the morning and in the afternoon for each mix design placed, when any change in consistency or appearance of the concrete indicates that a test should be made, and at any other time during the progress of the work when requested by the Architect.

G. If an inadequate number of tests are conducted, the strength of the concrete in place shall be considered questionable and shall be subject to further testing at the expense of the Contractor. If cylinder breaks indicate low concrete strengths, the strength of the concrete shall be considered questionable and shall be subject to further testing at the expense of the Contractor. If ongoing cylinder breaks indicate low concrete strengths, the strength of the concrete shall be considered questionable and further testing as deemed necessary by the Architect may be required and will be at the expense of the Contractor.

H. Copies of all test reports shall be distributed to the Architect, Structural Engineer, and Contractor.

I. Test results obtained by use of an impact hammer or sonoscope will not be considered conclusive in evaluating strengths of concrete.

1.4 ENVIRONMENTAL CONDITIONS

A. Do not start or continue a pour during rain or snow. Pour only to suitable cut-off point after start of inclement weather.

B. Place concrete where temperatures will remain 40° F and above for at least 24 hours, unless otherwise approved. Maintain minimum concrete temperatures of 50° F for 72 hours after completing pour.

C. During hot weather or periods of low humidity combined with a definite breeze, rapid loss of moisture shall be discouraged by thoroughly wetting forms. Moisture loss from the concrete shall be minimized prior to finishing by use of a fine fog spray or evaporation retardant. At these times, particular attention shall be given to providing an adequate number of finishers to expedite this operation.

D. Do not spray concrete with an open water hose.

1.5 TOLERANCES

A. Reinforcement:
1. Bars shall meet following requirements for fabricating tolerances:
    a. Sheared length: Plus or minus one inch.
    b. Depth of truss bars: Plus 0, minus 1/2- inch.
    c. Overall dimension of stirrups, ties, and spirals: Plus or minus 1/2-inch.
    d. Other bends: Plus or minus one inch.
2. Bars shall be placed to following tolerances:
    a. Concrete cover to formed surfaces: Plus or minus 1/4-inch.
    b. Minimum spacing between bars: Minus 1/4 inch.
    c. Top bars in slabs and beams:
        1) Members eight inches deep or less: Plus or minus 1/4-inch.
        2) Members more than eight inches but not over two feet deep: Plus or minus 1/2-inch.
        3) Members more than two feet deep: Plus or minus one inch.
    d. Crosswise members: Spaced evenly within two inches.
    e. Lengthwise of members: Plus or minus two inches.

3. Bars may be moved as necessary to avoid interference with other reinforcing steel, conduits or embedded items. If bars are moved more than one bar diameter or enough to exceed above tolerances, resulting arrangement of bars is subject to approval of the structural Engineer.

B. Concrete:
1. Float and broom finish: Plane within 1/4-inch in 10-feet as determined by a 10-foot straightedge.
2. Steel trowel finish: See requirements specified elsewhere in this Section.
3. Smooth hardened finish: For all rooms with sealed concrete floors.

1.6 NOTICES

A. Architect shall be given written notice a minimum of 48 hours prior to any concrete pour. If the Architect has no conflict he/she will authorize the pour schedule. If a pour is delayed for more than 2 hours, due to the work not being prepared and ready for inspection the pour shall be rescheduled for 24 hours later. No concrete shall be poured without the Architect or his Representative being present, unless otherwise approved by the Architect.

1.7 SUBMITTALS

A. Mix Design: Submit the concrete mix design for each class of concrete to the Architect for approval prior to construction. Historical strength data shall be submitted showing that the proposed mix design has historically been acceptable for the specified strength.

B. Curing Procedures: Submit a description of the curing procedures that will be used to the Architect for approval prior to construction. The description shall include verification from the Contractor that the curing procedures and any products used for curing are compatible with the finish flooring.

C. Product Data: Submit manufacturer's product data with application and installation instructions for proprietary materials and items, admixtures, patching compounds, curing compounds and others (if requested) for approval by the Architect.

D. Submit layout and details of construction joints for Architect/Engineer review and approval.

E. Samples: Submit samples of materials as specified and as otherwise requested by Architect, including names, sources and descriptions.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Portland Cement, ASTM C150, Type I or II. Pozzolan conforming to ASTM C 618 shall be blended with the Portland Cement in an amount approved by the Structural Engineer.

B. Water: ASTM C 94/C 94M and potable. From city water supply.

C. Typical aggregate for normal weight concrete: ASTM C 33 or aggregate with a proven record of producing concrete with adequate strength and durability, sand and gravel.
1. Maximum gravel size shall be as follows:
   a. ACI 301-99 Paragraph 4.2.2.3 for concrete at footings, grade beams, columns, walls, beams and slabs. Max. size 3/4".
2. Aggregates must be free from lignite or any other deleterious materials (0.5% limit).

D. Cementitious Non-Shrink Grout: CRD-C 588, factory pre-mixed, non-metallic grout.
1. "Masterflow 713" by Master Builders, Inc.
2. "Sonogrout 10k"by Sonneborn-Chemrex
3. "Dry Pack Grout" by Euclid Chemical Co.
4. "Five Star Grout" by Five Star Products, Inc.
5. "Duragrout" by L&M Construction Chemicals, Inc.

E. Admixtures:
1. Air Entrainment – ASTM C 260.
2. Chemical – ASTM C 494.
3. Retardant – Pozzolith retardant as manufactured by Master Builders, or equal.

F. Curing Compound: “Clear Bond”, manufactured by Guardian Chemical Co., “Kure-N-Seal”, manufactured by Sonneborn, or approved equal.

G. Polyethylene Sheets: Clear polyethylene sheets, 4 mils thick, meeting requirements of ASTM D 4397.

H. Absorptive Cover: Burlap Cloth made from jute of kenaf, weighing approximately 9 oz. /sq. yd., complying with AASHTO M 182, Class 2.

I. Bonding Compound: Polyvinyl acetate, rewettable type.

J. Expansion Joint Filler: Pre-molded, closed-cell polyethylene equal to Sonoflex. Thickness as shown.

K. Storage of Materials: Cement and aggregate shall be stored in such a manner as to prevent their deterioration and the intrusion of foreign matter. Any material which has deteriorated or which has been contaminated will not be used for concrete work.

2.2 CONCRETE MIXES

A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete determined by either laboratory trial mixes or field experience.

1. Use a qualified independent Testing Agency or Ready-Mix Concrete Producer for preparing and reporting proposed concrete mixture designs for the trial batch method.

B. Proportion mixtures to provide normal-weight concrete with the following properties:

1. Minimum Compressive Strength: as indicated on Drawings.

2. Slump Limit: 4 inches, plus or minus 1 inch at point of placement.

C. Chemical Admixtures: Use admixtures according to manufacturer’s written instructions.

1. Use water-reducing and retarding admixture in concrete, as required, for placement and workability.

2. Chemical admixtures must be approved by the Architect prior to use.

D. Use ready-mix concrete, mixed and delivered in accordance with ASTM C 94. Uniformly and accurately control proportions of material weight. Control mixes for concrete of strengths as described in Section 03310, 2.02 B.

E. Calcium chloride shall not be used.

F. The proportions of aggregate to cement for any concrete mix shall be such as to produce a mixture which will work readily into corners and angles of the forms and around reinforcement with the method of placing employed on the work, but without permitting the materials to segregate or excess free water to collect on the surface.

G. Concrete of the strength and slump as called for on the plans and in the specifications shall be proportioned according to the American Concrete Institute's Recommended Practice 613.

H. In determining water content for all mixes of concrete, as set forth in the plans, the surface water contained in the aggregates must be included as part of the mixing water in computing the water content. Any and all admixtures shall be proportioned with this factor accounted for in computing mixing water.

PART 3 - EXECUTION

3.1 CONSTRUCTION LAYOUT

A. Layout all concrete structural work in accordance with the Contract Documents.

B. Verify prior to placement, all dimensions, alignments, anchor bolts, utilities and other building components.

3.2 PREPARATION OF FORM SURFACES

A. Coat contact surfaces of forms with a non staining form coating compound before reinforcement is placed.

B. Thin form-coating compounds only with thinning agent of type, in amount and under conditions as directed by form-coating compound manufacturer. Do not allow excess form-coating material to accumulate in forms or to come into contact with concrete surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer’s instruction.

C. Prior to placing, forms shall be cleaned free of foreign material and shall be washed down with water. Excess debris and standing water shall be removed from forms.

D. Placing shall be a continuous operation between planned construction joints with fresh cement mixed only with plastic concrete already in place. Avoid cold joints.

E. When stoppage of concreting operation occurs for any reason, place construction joints either horizontally or vertically as needed and as approved by the Architect. All construction joints will be adequately keyed so as to provide a firm tie between the adjacent concrete pour.

3.3 **MIXING**

A. Delivery tickets shall show class of concrete, batch number, mix by number with maximum size aggregates, admixtures, air content, slump, and time of loading.

B. Each batch shall be mixed for at least one minute for the first cubic yard and an additional 15 seconds for each additional yard. After all ingredients are in the mixer, then the entire content of the mixing drum shall be discharged before recharging.

C. Addition of water to mix at project site must be approved by the ready-mix supplier and noted by the Testing Laboratory, and delivery ticket shall be noted with amount of water, and signed by the party adding the water. Water shall not be added at the project site unless such water was accounted for in the mix design. All testing shall be performed after the addition of water.

D. Retempering or remixing of concrete which has partially set will not be permitted.

E. Batch mixing on site will not be permitted.

F. Temperature of mixing water shall be a maximum of 55 degrees F. for cold weather concreting and a maximum of 90 degrees F. for concrete placed in hot weather. See paragraph 3.12 of this section.

3.4 **PLACING CONCRETE**

A. Concrete shall be placed so as to avoid segregation of materials and to prevent cold joints by avoiding re-handling, by keeping pours generally level, and by adequate vibration.

B. Placing is not to be started during rain or snow, and if placing is underway when such conditions occur, continue operations only long enough to provide a suitable construction joint.

C. Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.
   1. When air temperature has fallen to or is expected to fall below 40°F, uniformly heat water and aggregates before mixing to obtain a concrete mixture temperature of not less than 50°F and not more than 80°F at point of placement.
   2. Do not use frozen materials.
   3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mix designs.

D. Hot-Weather Placement: Comply with ACI 301 and as follows when hot-weather conditions exist:
   1. Cool ingredients before mixing to maintain concrete temperature below 90°F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Do not place if concrete is over 90°F.

E. During hot weather or periods of low humidity combined with a definite breeze, rapid loss of moisture from the concrete shall be minimized prior to finishing by use of a fine fog spray or evaporation retardant. At these times particular attention shall be given to providing an adequate number of finishers to expedite this operation.

F. Vibration shall be thorough, using vibrators small enough to work within reinforcing. The vibrator shall be inserted at intervals not exceeding 80% of the vibrator's diameter of influence. Avoid under-vibration and over-vibration of concrete. Vibrate to remove all air from concrete but not so much to produce segregation. Do not transport concrete in forms by vibration.

3.5 FINISH FOR FORMED SURFACES

A. Form Finish (for grade beams and piers, unless otherwise indicated): This is the concrete surface having texture imparted by form facing material used, with tie holes and defective areas filled, repaired and patched; and with fins and other projections exceeding 1/4" in height rubbed down or chipped off.

3.6 FINISH FOR FLOOR SLABS

A. Trowel finish floor surfaces scheduled for floor surfaces scheduled to receive floor covering.

B. Non-slip Broom Finish: Apply non-slip broom finish to exterior finish concrete platforms, steps, and ramps, and elsewhere as indicated. Immediately after trowel finishing, slightly roughen concrete surface by brooming with fiber bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect before application.

C. Trowel to a smooth finish after the slab is screeded and floated. Start trowelling when all water has disappeared from the surface to first level the surface, then start final trowelling when concrete has set where it no longer shows indentation from finger pressure. Trowel to a hard, smooth surface free of marks. Dusting with cement and sand will not be permitted. Application of water to the concrete surface will not be permitted prior to the initial set.

D. Grind smooth any surface defects, which would telegraph through the applied floor covering.

E. Fill any surface with defects or local flatness/levelness that does not meet the flatness specified tolerances.

3.7 CONSTRUCTION JOINTS

A. Locate construction joints in grade beams and slabs as directed by Architect or Engineer.

B. Allow concrete to set for 24 hours before any adjoining pour is started. Slabs across the joint shall be level, and the surface shall not be feathered.

C. Before proceeding with the next pour at a joint, thoroughly clean the joint, remove all loose laitance, and brush-in a thick cement slurry.

3.8 CURING

A. Keep all concrete moist for seven (7) days after placing. Cover with 4 mil polyethylene sheets, and leave forms in place, or use curing compound which does not interfere with floor finish, all combined with regular wetting as necessary. The curing process may be reduced to three days with the use of a high early-strength concrete that reaches 3,000 psf within 3 days (72 hours). The contractor shall submit a plan for curing procedures to the Architect for approval prior to any concrete pour.

3.9 **MISCELLANEOUS CONCRETE ITEMS**

A. Filling-In: Fill in holes and openings left in concrete structures for passage of work by other trades, unless otherwise shown or directed, after work of other trades is in place. Mix, place and cure concrete as herein specified, to blend with in-place construction. Provide other miscellaneous concrete filling shown or required to complete work. Tie in fill holes with rebar epoxy into foundation. Bars and requirements per Architect.

B. All areas under concrete floor slab shall have joints in vapor barrier lapped at least 6”. Take care to lay material smooth and even, and avoid tearing or puncturing. Seal tightly at all expansion joints and spaces around pipes, conduits and other penetrations using grade 495 sensitive tape. (See Damproofing Section 07150)

3.10 **CONCRETE SURFACE REPAIRS**

A. Patching Defective Areas: Repair and patch defective area with cement mortar immediately after removal of forms, when acceptable to Architect.

B. Cut out honeycomb, rock pockets, voids over ¼” in any dimension and holes left by tie rods and bolts down to solid concrete but, in no case, to a depth of less than 1”. Make edges of cuts perpendicular to the concrete surface.

C. Thoroughly clean, dampen with water and brush-coat the area to be patched with specified bonding agent. Place patching mortar after bonding compound has dried.

D. For exposed-to-view surfaces, blend white Portland cement and standard Portland cement so that, when dry, patching mortar will match color surrounding. Provide test areas at inconspicuous location to verify mixture and color match before proceeding with patching. Compact mortar in place and strike-off slightly higher than surrounding surface. Lightly hand-sand patch after set to blend. Do NOT over patch areas or over sand surrounding areas.

E. Repair of Formed Surfaces: Remove and replace concrete having defective surfaces if defects cannot be repaired to specified requirements. Surface defects as such include color and texture irregularities, cracks, spalls, air bubbles, honeycomb, rock pockets, fins and other projections on surface, and stains and other discoloration that cannot be removed by cleaning. Flush out form tie holes, fill with dry pack mortar.

F. Repair concealed formed surfaces, where possible, that contain defects that affect the durability of concrete. If defects cannot be repaired, remove and replace concrete.

G. Repair of Unformed Surfaces: Test unformed surface, such as monolithic slabs, for flatness and levelness and verify surface plane to tolerances specified for each surface and finish. Correct low and high areas as herein specified. Test unformed surfaces sloped to drain for trueness of slope, in addition to smoothness, using a template having required slope. If defects cannot be repaired, remove and replace concrete.

H. Repair finished unformed surfaces that contain defects which affect durability of concrete. Surface defects as such, include crazing, cracks in excess of 0.01” wide or which penetrate to reinforcement or completely through non-reinforced sections regardless of width, spalling, pop-outs, honeycomb, rock pockets and other objectionable conditions. If defects cannot be repaired, remove and replace concrete.

I. Correct high areas in unformed surfaces by grinding, after concrete has cured as least 14 days.

J. Correct low areas in unformed surfaces during or immediately after completion of surface finishing operations by cutting out low areas and replacing with fresh concrete. Finish repaired areas to blend into adjacent concrete. Proprietary patching compounds may be used when accepted by the Architect.

K. Repair defective areas, except random cracks and single holes not exceeding 1” diameter, by cutting out and replacing with fresh concrete. Remove defective areas to sound concrete with clean, square cuts and expose reinforcing steel with at least ¾” clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding compound. Mix patching concrete of same materials to provide concrete of same type or class as original concrete. Place, compact and finish to blend with adjacent finished concrete. Cure in the same manner as adjacent concrete.

L. Repair isolated random cracks and single holes no over 1” in diameter by dry-pack method. Groove top of cracks and cut-out holes to sound concrete and clean of dust, dirt and loose particles. Dampen cleaned concrete surfaces and apply bonding compound. Mix dry pack, consisting of one part Portland cement to 2-1/2 parts fine aggregate passing a No. 15 mesh sieve, using only enough water as required for handling and placing. Place dry-pack after bonding compound has dried. Compact dry-pack mixture in place and finish to match adjacent concrete. Keep patched area continuously moist for not less than 72 hours.

END OF SECTION

SECTION 05.1200

STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Furnish and install all structural steel items as indicated on the drawings and as specified herein. Extent of structural steel work is shown on drawings, including notes and details to show size and location of members, typical connections, and type of steel required.

B. Structural steel is that work defined in AISC "Code of Standard Practice" and as otherwise shown on drawings.

C. Miscellaneous Metal Fabrications are specified elsewhere in Division 5.

1.2 REFERENCES

A. AISC "Code of Standard Practice for Steel Buildings and Bridges".

B. AISC "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings", including the "Commentary" and Supplements thereto as issued.

C. AISC "Specifications for Structural Joints using ASTM A 325 or A 490 Bolts" approved by the Research Council on Riveted and Bolted Structural Joints of the Engineering Foundation.

D. AWS D1.1 "Structural Welding Code".

E. ASTM A 6 "General Requirements for Delivery of Rolled Steel Plates, Shapes, Sheet Piling and Bars for Structural Use".

1.3 PERFORMANCE REQUIREMENTS

A. Steel fabrication and erection shall be done in compliance with AISC code.

1.4 QUALITY ASSURANCE

A. Inspection: Inspection shall be completed by the Special Inspector as indicated in the Drawings.

B. Provide certification that welders to be employed in work are AWS certified. Conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies. Inspect and test during erection of structural steel for compliance with AWS D1.1.

C. Correct deficiencies in structural steel work which inspections and 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 non-compliance of original work, and as may be necessary to show compliance of corrected work.

1.5 SUBMITTALS

A. Shop Drawings: Submit shop drawings including complete details and schedules for fabrication and assembly of structural steel members procedures and diagrams.

1. 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.

2. Provide setting drawings, templates, and directions for installation of anchor bolts and other anchorages to be installed by others.

B. Steel Stairs: Submit certification that the design of steel stairs was completed by a Mississippi registered Professional Engineer and submit full shop drawings for the stairs.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials in a location and manner to keep mud, oil, and rust from contaminating product.

B. Deliver anchor bolts and anchorage devices, which are to be embedded in cast-in-place concrete in ample time to not delay that 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 erosion and deterioration.

D. Do not store materials on structure in a manner that might cause distortion or damage to members or supporting structures.

PART 2 PRODUCTS

2.1 MATERIALS

A. High-Strength Low-Alloy Steel: ASTM A 242 or ASTM A 588.

B. Structural Steel Shapes, Plates and Bars: ASTM A 36, ASTM A992 for all wide flange beams and columns. Base plates: ASTM A 572 Grade 50

C. Cold-Formed Steel Tubing: ASTM A 500, Grade B or C.

D. Hot-Formed Steel Tubing: ASTM A 501.

E. Steel Pipe: ASTM A 500, Grade B or C.

F. Anchor Rods: ASTM F 1554 55 ksi, as indicated in the Drawings.

H. High-Strength Threaded Fasteners: Heavy hexagon structural bolts, heavy hexagon nuts, and hardened washers, as follows:

I. Structural Steel Primer Paint: Fabricator's standard rust-inhibiting primer. Do not paint steel that will receive a sprayed-on fireproofing coating unless UL listed for compatibility.

J. Non-Metallic Shrinkage-Resistant Grout: Corps of Engineers CRD-C588, Type M, pre-mixed factory- packaged aggregate grouting compound.

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

2.3 FINISHES

A. Solvent clean prior to other cleaning to remove any oil or grease.

B. Hand clean with wire brushes or equal to remove all loose scale and paint.

C. Metal Surfaces, General: For fabrication of work which will be exposed to view, 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. See the drawings for steel members that will be permanently exposed. These locations require special finishes.

PART 3 EXECUTION

3.1 EXAMINATION

A. Visually determine that Project is ready to begin the work of this Section; beginning of work indicates acceptance of conditions. Notify Architect in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Architect.

3.2 PREPARATION

A. Furnish templates and other devices as necessary for presetting bolts and other anchors to accurate locations.

B. Setting Bases and Bearing Plates: Clean concrete and masonry bearing surfaces of bond-reducing materials and roughen to improve bond to surfaces. Clean bottom surface of base and bearing plates.

3.3 INSTALLATION

A. Anchor Rods: Furnish anchor rods and other connectors required for securing structural steel to foundations and other in-place work.

B. Set loose and attached base plates and bearing plates for structural members on steel shim plates or leveling nuts.

C. Tighten anchor bolts 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.

D. Pack grout solidly between bearing surfaces and bases or plates to ensure that no voids remain. Finish exposed surfaces, protect installed materials, and allow to cure.

E. Field Assembly: Set structural frames 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.

F. 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" (RCRBSJ).

G. Welded Construction: Comply with AWS Code for procedures, appearance and quality of welds, and methods used in correcting welding work.

3.4 TOLERANCES

A. Will be as per AISC recommendations except as noted in the drawings for architecturally exposed steel members.

3.5 ADJUSTING

A. Adjust members as necessary to be compatible with the final product. Notify Architect before substantially altering any member.

END OF SECTION

COLD-FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Bearing and Non-load-bearing interior and exterior wall framing and associated accessories.

1.2 REFERENCES

A. AISI S100-07 – North American Specification for the Design of Cold-Form Steel Structural Members.

B. AISI S200-07 – North American Standard for Cold-formed Steel Framing – General Provisions.

C. ANSI Z49.1 – Safety in Welding, Cutting, and Allied Processes.

D. ASTM A653 – Standard Specification for Sheet Steel, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvanized) by the Hot-Dip Process.

E. ASTM A924 – Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

F. AWS D1.3 – Structural Welding Code: Sheet Steel.

G. SSMA – Steel Stud Manufacturers Association Product Technical Information.

1.3 DESIGN REQUIREMENTS

A. Design of the following is the sole responsibility of the Contractor:

1. Cold-formed exterior and interior steel studs including tracks, bridging, and window or door framing.

2. Cold-formed ceiling systems.

3. Connections for cold-formed steel framing.

4. Any required temporary and permanent restraint/bracing.

B. Cold-formed framing shall be designed by a Structural Engineer licensed in the state of Mississippi.

C. Cold-formed steel design, fabrication and erection shall conform to AISI S100 and AISI S200.

D. Stud depth, layout and configuration of cold-formed exterior steel studs shall be compatible with the plans, sections, and details of the Construction Documents.

1.4 SUBMITTALS

A. Product Data: For each type of cold-formed metal framing product and accessory indicated.

Include manufacturer's installation instructions, indicating procedures and conditions requiring special attention.

B. Shop Drawings:

1. Shall include but not necessarily be limited to the following:

a. Plans, cross-sections, or elevations as necessary to adequately depict component locations.

b. Framing details at wall openings including jamb members, headers, sills, and connections.

c. Connection details showing screw types and locations, weld lengths or other fastener requirements.

d. Bracing locations and details. Any required bracing to the primary structure that is or is not shown in the Construction Documents shall be specifically identified.

2. Design loads.

3. Deflection limits.

4. Shall be sealed by a Mississippi licensed Professional Engineer.

1.5 QUALITY ASSURANCE

A. Installer qualifications: An experienced installer who has successfully completed cold-formed metal framing similar in material, design and extent to the indicated for this project.

B. Welding: Quality procedures and personnel according to AWS D1.1, "Structural Welding Code - Steel," and AWS D1.3, "Structural Welding Code - Sheet Steel."

C. AISC Specifications: Comply with AISI's Specification for the Design of Cold-Formed Steel Structural Members" for calculating structural characteristics of cold formed metal framing. Comply with CCFSS Technical Bulletin: AISI Specification Provisions for Screw Connections.

1.6 DELIVERY, STORAGE AND HANDLING

A. Protect cold formed metal framing from corrosion, deformation or other damage during deliver, storage and handling.

B. Store cold-formed metal framing protected with a weatherproof covering and ventilate to avoid condensation.

PART 2 - PRODUCTS

2.1 **ACCEPTABLE MANUFACTURERS**

A. Products by the following manufacturers are acceptable:

1. ClarkDietrich Steel Framing, West Chester, OH. Tel. (800) 543-7140.

2. Simpson Strong-Tie, Pleasanton, CA. Tel. (800) 925-5099
3. Marino/Ware, South Plainfield, NJ. Tel. (800) 627-4661.
4. The Steel Network, Durham, NC. Tel. (919) 845-1025.
5. TrusSteel, Grand Prairie, TX. Tel. (888) 565-9181.
6. Prior approved equal.

2.2 MATERIALS

A. Steel Sheet: ASTM A 1003/A 1003M, Structural Grade, Type H, galvanized with a minimum G60 metallic coating according to ASTM A 653.

2.4 FABRICATION

A. Framing components may be prefabricated into panels prior to erection. Prefabricated panels shall be square with components attached by welding to prevent racking. Handling and lifting of panels shall be done in a manner as to not cause distortion in any member.

B. All framing components shall be cut squarely for attachment to perpendicular members, or as required for an angular fit against abutting members. Members shall be held positively in place until properly fastened.

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine condition of slab and other related surfaces prior to installation and do not proceed until any defects are corrected.

3.2 INSTALLATION

A. Install light gage framing, fasteners, trim and accessories in conformance with approved drawings and manufacturer's specifications.

B. Install all studs at the spacing indicated in the Drawings.

C. Tracks shall be securely anchored to the supporting structure as indicated in the Drawings.

D. Studs shall be plumbed, aligned and securely attached to each side of the flange or web of the top and bottom tracks.

E. At track butt joints, abutting pieces of track shall be securely anchored to a common structural element, or they shall be butt welded or spliced together as indicated in the drawings.

F. Splices in studs are not permitted.

G. Wall stud bridging shall be installed as indicated in the drawings.

3.4 QUALITY CONTROL:

A. Provide special inspection as indicated in the structural drawings.

END OF SECTION