D+P Architects, PLLC
P.O. Box 703
Meridian, MS 39302
www.davispurdyarchitects.com

Frank Cochran Center Renovation

ADDENDUM NO. 1

TO: All Bidders on the Above Referenced Product
FROM: Davis Purdy Architects, PLLC
DATE: May 31, 2023
SUBJECT: **ADDENDUM NO. 1**

ACKNOWLEDGEMENT OF RECEIPT OF ADDENDUM IS REQUIRED ON BID

Clarifications and revisions to Contract Documents for the referenced project are as follows:

1. **REPLACE:** Replace the following Specification section dated 5/17/2023: **INDEX TO SPECIFICATIONS** with Specification section **INDEX TO SPECIFICATIONS** dated 5/31/2023. Specification Section INDEX TO SPECIFICATIONS is attached.

2. **REPLACE:** Replace the following Specification section dated 5/12/2023: **00 43 21 ALLOWANCE FORM** with Specification section **00 43 21 ALLOWANCE FORM** dated 5/31/2023. Specification Section 00 43 21 ALLOWANCE FORM is attached.

3. **REPLACE:** Replace the following Specification section dated 5/12/2023: **00 43 22 UNIT PRICES FORM** with Specification section **00 43 22 UNIT PRICES FORM** dated 5/31/2023. Specification Section 00 43 22 UNIT PRICES FORM is attached.

4. **CLARIFICATION:** Specification section **00 43 73 – PROPOSED SCHEDULE OF VALUES FORM** is NOT required to be submitted with bids.

5. **ADD:** Add the following Specification sections dated 5/31/2023:

    a. **03 10 00 – Concrete Forming and Accessories**. Specification section 03 10 00 is attached.

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b. **03 20 00 – Concrete Reinforcing**. Specification section 03 20 00 – Concrete Reinforcing is attached.
c. **03 30 00 – Cast-in-place Concrete**. Specification section 03 30 00 – Cast-in-place Concrete is attached.
d. **03 35 00 – Concrete Finishing**. Specification section 03 35 00 – Concrete Finishing is attached.
e. **03 39 00 – Concrete Curing**. Specification section 03 39 00 – Concrete Curing is attached.
f. **04 05 03 – Masonry Mortaring and Grouting.** Specification section 04 05 03 – Masonry Mortaring and Grouting is attached.
g. **05 05 19 – Post-installed Concrete Anchors.** Specification section 05 05 19 – Post-installed Concrete Anchors is attached.
h. **05 12 00 – Structural Steel Framing.** Specification section 05 12 00 – Structural Steel Framing is attached.
i. **05 40 00 – Cold-Formed Metal Framing.** Specification section 05 40 00 – Cold-Formed Metal Framing is attached.
j. **05 50 00 – Metal Fabrications.** Specification section 05 50 00 – Metal Fabrication is attached.

Submitted By

John L. Purdy, AIA
Davis Purdy Architects, PLLC
May 31, 2023

ACKNOWLEDGEMENT OF RECEIPT OF THIS ADDENDUM IS REQUIRED AND SHALL BE INDICATED ON BID

INDEX TO SPECIFICATIONS

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INDEX TO SPECIFICATIONS

SECTION 00 43 21
ALLOWANCE FORM

SECTION 00 43 21 - ALLOWANCE FORM

1.1 BID INFORMATION

A. Bidder: _____.

B. Project Name: Frank Cochran Center Renovations

C. Project Location: 1725 Carousel Dr., Meridian, MS 39307

D. Owner: City of Meridian

E. Architect: Davis Purdy Architects, PLLC

F. Architect Project Number: 22-025

1.2 BID FORM SUPPLEMENT

A. This form is required to be attached to the Bid Form.

B. The undersigned Bidder certifies that Base Bid submission to which this Bid Supplement is attached includes those allowances described in the Contract Documents and scheduled in Section 01 21 00 "Allowances."

1.3 SCHEDULE OF ALLOWANCES

A. Allowance No. 1: Door Hardware: Include in the Bid amount Seven Hundred Fifty Dollars ($750.00) per door leaf for the purchase and installation of door hardware.

B. Allowance No. 2: Carpet Tile: Include in the Bid amount of Eight Dollars per square foot ($8/sf) for purchase and installation of carpet tile.

C. Allowance No. 3: Porcelain Floor & Wall Tile: Include in the Bid amount of Twelve Dollars per square foot ($12/sf) for the purchase and installation of porcelain wall and floor tile.

D. Allowance No. 4: Luxury Vinyl Tile: Include in the Bid amount of Ten Dollars per square foot ($10/sf) for the purchase and installation of luxury vinyl floor tile.

E. Allowance No. 5: Contingency Allowance: Include in the Bid amount of Twenty Five Thousand Dollars ($25,000.00) for any unforeseen circumstances and/or conditions.

F. Allowance No. 6: Removal of Obstructions Allowance: Include in the Bid amount of Ten Thousand Dollars ($10,000.00) for Removal of Obstructions required.

SECTION 00 43 21
ALLOWANCE FORM

1.4 SUBMISSION OF BID SUPPLEMENT

A. Respectfully submitted this ____ day of _____, 2023.

B. Submitted By:_____(Insert name of bidding firm or corporation).

C. Authorized Signature:_____(Handwritten signature).

D. Signed By:_____(Type or print name).

E. Title: _____(Owner/Partner/President/Vice President).

END OF SECTION 00 43 21

SECTION 00 43 22
UNIT PRICES FORM

SECTION 00 43 22 - UNIT PRICES FORM

1.1 BID INFORMATION

A. Bidder: _____.

B. Project Name: Frank Cochran Center Renovation

C. Project Location: 1725 Carousel Dr., Meridian, MS 39307

D. Owner: City of Meridian

E. Architect: Davis Purdy Architects, PLLC

F. Architect Project Number: 22-025

1.2 BID FORM SUPPLEMENT

A. This form is required to be attached to the Bid Form.

B. The undersigned Bidder proposes the amounts below be added to or deducted from the Contract Sum on performance and measurement of the individual items of Work and for adjustment of the quantity given in the Unit-Price Allowance for the actual measurement of individual items of the Work.

C. If the unit price does not affect the Work of this Contract, the Bidder shall indicate "NOT APPLICABLE."

1.3 UNIT PRICES

A. Unit-Price No. 1: Removal of Obstructions – Refer to Specification section 00 43 21 ALLOWANCE FORM.

B. Unit-Price No. 3: 8” Non-Reinforcing Portland Cement Concrete Pavement: 700 PSI Flex

1. _____ Dollars ($_____) per Square Yard (S.Y.)

C. Unit-Price No. 4: Dowel Rods

1. _____ Dollars ($_____) per Each

SECTION 00 43 22
UNIT PRICES FORM

D. Unit-Price No. 4: Tie Bars

1. _____ Dollars ($_____) per Each

E. Unit-Price No. 5: Joint Sealing Filler

1. _____ Dollars ($_____) per Linear Feet (L.F.)

F. Unit-Price No. 6: Inlets with Frame and Grate

1. _____ Dollars ($_____) per Each

1.4 SUBMISSION OF BID SUPPLEMENT

A. Respectfully submitted this ____ day of _____, 2020.

B. Submitted By:_____(Insert name of bidding firm or corporation).

C. Authorized Signature:_____(Handwritten signature).

D. Signed By:_____(Type or print name).

E. Title:_____(Owner/Partner/President/Vice President).

END OF SECTION 00 43 22

SECTION 03 10 00 – CONCRETE FORMING AND ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Formwork for cast-in place concrete.
2. Shoring, bracing, and anchorage.
3. Architectural form liners.
4. Form accessories.
5. Form stripping.

B. Related Sections:
1. Section 03 20 00 - Concrete Reinforcing.
2. Section 03 30 00 - Cast-In-Place Concrete.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT – Not Applicable

1.3 REFERENCES

A. American Concrete Institute:
1. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials.
2. ACI 301 - Specifications for Structural Concrete.
3. ACI 318 - Building Code Requirements for Structural Concrete.
4. ACI 347 - Guide to Formwork for Concrete.

B. American Forest and Paper Association:
1. AF&PA - National Design Specifications for Wood Construction.

C. The Engineered Wood Association:
1. APA/EWA PS 1 - Voluntary Product Standard for Construction and Industrial Plywood.

1.4 DESIGN REQUIREMENTS

A. Design, engineer and construct formwork, shoring and bracing in accordance with ACI 318 to conform to design and applicable code requirements to achieve concrete shape, line and dimension as indicated on Drawings.

1.5 PERFORMANCE REQUIREMENTS

A. Vapor Retarder Permeance: Maximum when tested in accordance with ASTM E96/E96M, water method.

SECTION 03 10 00
CONCRETE FORMING AND ACCESSORIES

1.6 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Shop Drawings:
1. Submit formwork, shoring, and reshoring shop drawings.
2. Indicate the following:
a. Pertinent dimensions, openings, methods of construction, types of connections, materials, joint arrangement and details, ties and shores, location of framing, studding and bracing, and temporary supports.
b. Means of leakage prevention for concrete exposed to view in finished construction.
c. Sequence and timing of erection and stripping assumed compressive strength at time of stripping, height of lift and height of drop during placement.
d. Vertical, horizontal and special loads in accordance with ACI 347, Section 2.2 and camber diagrams, when applicable.
e. Notes to formwork erector showing size and location of conduits and piping embedded in concrete in accordance with ACI 318, Section 6.3.
f. Procedure and schedule for removal of shores and installation and removal of reshores.

C. Product Data: Submit data on void form materials and installation requirements.

D. Design Data:
1. Indicate design data for formwork shoring and reshores.
2. Indicate loads transferred to structure during process of concreting, shoring and reshoring.
3. Include structural calculations to support design.

1.7 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 347, ACI 301, and ACI 318.

B. For wood products furnished for work of this Section, comply with AF&PA.

C. Maintain one copy of each document on site.

1.8 QUALIFICATIONS

A. Design formwork under direct supervision of Engineer experienced in design of this Work.

1.9 MOCK-UP – Not Required

1.10 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Products storage and handling requirements.

B. Deliver void forms and installation instructions in manufacturer's packaging.

C. Store off ground in ventilated and protected manner to prevent deterioration from moisture.

1.11 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Coordinate this Section with other sections of work, requiring attachment of components to formwork.

PART 2 PRODUCTS

2.1 WOOD FORM MATERIALS

A. Form Materials: At discretion of Contractor.

B. Plywood: Douglas Fir species; select sheathing grade; sound undamaged sheets with clean, true edges.

C. Lumber Forms:
1. Application: Use for edge forms and unexposed finish concrete.
2. Boards: 6 inches or 8 inches in width, ship lapped or tongue and groove, “Standard” Grade Douglas Fir, conforming to WCLIB Standard Grading Rules for West Coast Lumber. Surface boards on four sides.

D. Lumber:
1. SYP species; #2 Grade with stamped grade.

2.2 FORMWORK ACCESSORIES

A. Form Ties: Snap-off type, galvanized metal, adjustable length, cone type, with waterproofing washer. Ties to be free of defects capable of leaving holes larger than 1inch in concrete surface.

B. Spreaders: Standard, non-corrosive metal form clamp assembly, of type acting as spreaders and leaving no metal within 1 inch of concrete face. Wire ties, wood spreaders or through bolts are not permitted.

C. Form Anchors and Hangers:
1. Do not use anchors and hangers exposed concrete leaving exposed metal at concrete surface.
2. Symmetrically arrange hangers supporting forms from structural steel members to minimize twisting or rotation of member.
3. Penetration of structural steel members is not permitted.

D. Form Release Agent: Colorless mineral oil that will not stain concrete, or absorb moisture, or impair natural bonding or color characteristics of coating intended for use on concrete.
   1. Manufacturers:
      a. Arcal Chemical Corporation Arcal-80.
      b. Industrial Synthetics Company Synthex.
      c. Nox-Crete Company Nox-Crete Form Coating.
      d. Substitutions: Section 01 60 00 - Product Requirements Not Permitted.

E. Corners: Chamfer, rigid plastic or wood strip type; maximum possible lengths.

F. Dovetail Anchor Slot: Galvanized steel, 22gage thick, foam filled, release tape sealed slots, anchors for securing to concrete formwork.

G. Flashing Reglets: Galvanized steel, 22 gage thick, longest possible lengths, with alignment splines for joints, non-filled, release tape sealed slots, anchors for securing to concrete formwork.

H. Vapor Retarder: Where indicated on Drawings, 8 mil thick polyethylene sheet.

I. Bituminous Joint Filler: ASTM D1751.

J. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Size, strength and character to maintain formwork in place while placing concrete.

K. Water Stops: Rubber, minimum 1,750 psi tensile strength, minimum 50 degrees F to plus 175 degrees F working temperature range, maximum possible lengths, ribbed profile, preformed corner sections, heat welded jointing.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify lines, levels, and centers before proceeding with formwork. Verify dimensions agree with Drawings.

C. When formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement before proceeding, request instructions from Architect/Engineer.

3.2 INSTALLATION

A. Earth Forms:
   1. Trench earth forms neatly, accurately, and at least 2 inches wider than footing widths indicated on Drawings.

2. Trim sides and bottom of earth forms.
3. Construct wood edge strips at top of each side of trench to secure reinforcing and prevent trench from sloughing.
4. Form sides of footings where earth sloughs.
5. Tamp earth forms firm and clean forms of debris and loose material before depositing concrete.

B. Formwork - General:
1. Provide top form for sloped surfaces steeper than 1.5 horizontal to 1 vertical to hold shape of concrete during placement, unless it can be demonstrated that top forms can be omitted.
2. Construct forms to correct shape and dimensions, mortar-tight, braced, and of sufficient strength to maintain shape and position under imposed loads from construction operations.
3. Camber forms where necessary to produce level finished soffits unless otherwise shown on Drawings.
4. Carefully verify horizontal and vertical positions of forms. Correct misaligned or misplaced forms before placing concrete.
5. Complete wedging and bracing before placing concrete.

C. Forms for Smooth Finish Concrete:
1. Use steel, plywood or lined board forms.
2. Use clean and smooth plywood and form liners, uniform in size, and free from surface and edge damage capable of affecting resulting concrete finish.
3. Install form lining with close-fitting square joints between separate sheets without springing into place.
4. Use full size sheets of form lines and plywood wherever possible.
5. Tape joints to prevent protrusions in concrete.
6. Use care in forming and stripping wood forms to protect corners and edges.
7. Level and continue horizontal joints.
8. Keep wood forms wet until stripped.

D. Erect formwork, shoring, and bracing to achieve design requirements, in accordance with requirements of ACI 301, ACI 318.

E. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shores.

F. Obtain Architect/Engineer’s approval before framing openings in structural members not indicated on Drawings.

G. Install chamfer strips on external corners of beams, joists, columns and etc.

H. Install void forms in accordance with manufacturer's recommendations.

3.3 APPLICATION - FORM RELEASE AGENT

A. Apply form release agent on formwork in accordance with manufacturer's recommendations.

B. Apply prior to placement of reinforcing steel, anchoring devices, and embedded items.

C. Do not apply form release agent where concrete surfaces are indicated to receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

D. Reuse and Coating of Forms: Thoroughly clean forms and reapply form coating before each reuse. For exposed work, do not reuse forms with damaged faces or edges. Apply form coating to forms in accordance with manufacturer’s specifications. Do not coat forms for concrete indicated to receive “scored finish”. Apply form coatings before placing reinforcing steel.

3.4 INSTALLATION - INSERTS, EMBEDDED PARTS, AND OPENINGS

A. Install formed openings for items to be embedded in or passing through concrete work.

B. Locate and set in place items required to be cast directly into concrete.

C. Coordinate with Work of other sections in forming and placing openings, slots, reglets, recesses, sleeves, bolts, anchors, other inserts, and components of other Work.

D. Position recessed reglets for brick veneer masonry anchors in accordance with spacing and intervals specified in Section 04 20 00.

E. Install accessories straight, level, and plumb. Ensure items are not disturbed during concrete placement.

F. Install water stops continuous without displacing reinforcement. Heat seal joints watertight.

G. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.

H. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.

I. Form Ties:
   1. Use sufficient strength and sufficient quantity to prevent spreading of forms.
   2. Place ties at least 1 inch away from finished surface of concrete.
   3. Leave inner rods in concrete when forms are stripped.

4. Space form ties equidistant, symmetrical and aligned vertically and horizontally unless otherwise shown on Drawings.

J. Arrangement: Arrange formwork to allow proper erection sequence and to permit form removal without damage to concrete.

K. Construction Joints:
1. Install surfaced pouring strip where construction joints intersect exposed surfaces to provide straight line at joints.
2. Just prior to subsequent concrete placement, remove strip and tighten forms to conceal shrinkage.
3. Show no overlapping of construction joints. Construct joints to present same appearance as butted plywood joints.
4. Arrange joints in continuous line straight, true and sharp.

L. Embedded Items:
1. Make provisions for pipes, sleeves, anchors, inserts, reglets, anchor slots, nailers, water stops, and other features.
2. Do not embed wood or uncoated aluminum in concrete.
3. Obtain installation and setting information for embedded items furnished under other Specification sections.
4. Securely anchor embedded items in correct location and alignment prior to placing concrete.
5. Verify conduits and pipes, including those made of coated aluminum, meet requirements of ACI 318 for size and location limitations.

M. Openings for Items Passing Through Concrete:
1. Frame openings in concrete where indicated on Drawings. Establish exact locations, sizes, and other conditions required for openings and attachment of work specified under other sections.
2. Coordinate work to avoid cutting and patching of concrete after placement.
3. Perform cutting and repairing of concrete required as result of failure to provide required openings.

N. Screeds:
1. Set screeds and establish levels for tops of concrete slabs and levels for finish on slabs.
2. Slope slabs to drain where required or as shown on Drawings.
3. Before depositing concrete, remove debris from space to be occupied by concrete and thoroughly wet forms. Remove freestanding water.

O. Screed Supports:
1. For concrete over waterproof membranes and vapor retarder membranes, use cradle, pad or base type screed supports which will not puncture membrane.
2. Staking through membrane is not be permitted.

P. Cleanouts and Access Panels:
   1. Provide removable cleanout sections or access panels at bottoms of forms to permit inspection and effective cleaning of loose dirt, debris and waste material.
   2. Clean forms and surfaces against which concrete is to be placed. Remove chips, saw dust and other debris. Thoroughly blow out forms with compressed air just before concrete is placed.
   3. Install Clean Outs in concrete form 30” x 30” x 8” thick.

3.5 FORM CLEANING

A. Clean forms as erection proceeds, to remove foreign matter within forms.

B. Clean formed cavities of debris prior to placing concrete.

C. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.

D. During cold weather, remove ice and snow from within forms. Do not use de-icing salts. Do not use water to clean out forms, unless formwork and concrete construction proceed within heated enclosure. Use compressed air or other means to remove foreign matter.

3.6 FORM REMOVAL

A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads and removal has been approved by Architect/Engineer.

B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.

C. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.

D. Leave forms in place for minimum number of days as specified in ACI 347.

3.7 ERECTION TOLERANCES

A. Construct formwork to maintain tolerances required by ACI 301 and ACI 318.

B. Tolerances: Construct formwork to produce completed concrete surfaces within construction tolerances specified in ACI 117.

C. Construct and align formwork for elevator hoistway in accordance with ASME A17.1.

D. Camber slabs and beams 1/4 inch per 10 feet in accordance with ACI 301 and ACI 318.

3.8 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and items are secure.

C. Notify Architect/Engineer after placement of reinforcing steel in forms, but prior to placing concrete.

D. Schedule concrete placement to permit formwork inspection before placing concrete.

END OF SECTION

SECTION 03 20 00 – CONCRETE REINFORCING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Reinforcing bars.
2. Welded wire fabric.
3. Reinforcement accessories.

B. Related Sections:
1. Section 03 10 00 - Concrete Forming and Accessories.
2. Section 03 30 00 - Cast-In-Place Concrete.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT – Not Applicable

1.3 REFERENCES

A. American Concrete Institute:
1. ACI 301 - Specifications for Structural Concrete.
2. ACI 318 - Building Code Requirements for Structural Concrete.
3. ACI SP-66 - ACI Detailing Manual.

B. ASTM International:
1. ASTM A82/A82M - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
2. ASTM A184/A184M - Standard Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement.
3. A185/A185M-07 Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
4. ASTM A496/A496M - Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement.
5. ASTM A497/A497M - Standard Specification for Steel Welded Wire Fabric, Deformed, for Concrete Reinforcement.
6. ASTM A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

C. American Welding Society:
1. AWS D1.4 - Structural Welding Code - Reinforcing Steel.

D. Concrete Reinforcing Steel Institute:
1. CRSI - Manual of Standard Practice.
2. CRSI - Placing Reinforcing Bars.

SECTION 03 20 00
CONCRETE REINFORCING

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Shop Drawings: Indicate bar sizes, spacings, locations, and quantities of reinforcing steel and welded wire fabric, bending and cutting schedules, and supporting and spacing devices.

C. Certificates: Submit AWS qualification certificate for welders employed on the Work.

D. Manufacturer's Certificate: Certify Products meet or exceed specified requirements.
   1. Submit certified copies of mill test report of reinforcement materials analysis.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with CRSI - Manual of Standard Practice ACI 301 and ACI 318.

B. Prepare shop drawings in accordance with ACI SP-66.

C. Maintain one copy of each document on site.

1.6 QUALIFICATIONS

A. Welders: AWS qualified within previous 12 months.

1.7 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Coordinate with placement of formwork, formed openings and other Work.

PART 2 PRODUCTS

2.1 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M, 60 ksi yield grade, deformed billet bars, uncoated finish.

B. Plain Wire: ASTM A82/A82M; unfinished.

C. Welded Deformed Wire Fabric: ASTM A497/A497M; in flat sheets, coiled rolls; unfinished.

2.2 ACCESSORY MATERIALS

A. Tie Wire: Minimum 16 gage annealed type.

B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions including load bearing pad on bottom to prevent vapor retarder puncture.

C. Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather Exposed Concrete Surfaces: type; size and shape to meet Project conditions.

2.3 FABRICATION

A. Fabricate concrete reinforcement in accordance with CRSI Manual of Practice ACI 318 applicable code.

B. Form standard hooks for 180 degree bends, stirrup and tie hooks, as indicated on Drawings.

C. Form reinforcement bends with minimum diameters in accordance with ACI 318.

D. Fabricate column reinforcement with offset bends at reinforcement splices.

E. Form spiral column reinforcement from minimum 3/8 inch diameter continuous deformed bar or wire.

F. Form ties and stirrups from the following:
   1. For bars No. 10 and Smaller: No. 3 deformed bars deformed wire.
   2. For bars No. 11 and Larger: No. 4 deformed bars deformed wire.

G. Weld reinforcement in accordance with AWS D1.4.

H. Locate reinforcement splices not indicated on Drawings, at point of minimum stress. Review location of splices with Architect/Engineer.

2.4 SOURCE QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Testing, inspection and analysis requirements.

B. Make completed reinforcement available for inspection at manufacturer’s factory prior to packaging for shipment. Notify Architect/Engineer at least seven days before inspection is allowed.

C. When fabricator is approved by authority having jurisdiction, submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.
   1. Specified shop tests are not required for Work performed by approved fabricator.

PART 3 EXECUTION

3.1 PLACEMENT

A. Place, support and secure reinforcement against displacement. Do not deviate from required position beyond specified tolerance.
   1. Do not weld crossing reinforcement bars for assembly except as permitted by Architect/Engineer.

B. Do not displace or damage vapor retarder.

C. Accommodate placement of formed openings.

D. Space reinforcement bars with minimum clear spacing in accordance with ACI 318 or of one bar diameter, but not less than 1 inch.
   1. Where bars are indicated in multiple layers, place upper bars directly above lower bars.

E. Maintain concrete cover around reinforcement in accordance with ACI 318 applicable code as follows:

Reinforcement Location		Minimum Concrete Cover
Footings and Concrete Formed Against Earth		3 inches
Concrete exposed to earth or weather	No. 6 bars and larger	2 inches
	No. 5 bars and smaller	1-1/2 inches
Supported Slabs, Walls, and Joists	No. 14 bars and larger	1-1/2 inches
	No. 11 bars and smaller	3/4 inches

Beams and Columns		1-1/2 inches
Shell and Folded Plate Members	No. 6 bars and larger	3/4 inches
	No. 5 bars and smaller	1/2 inches

F. Splice reinforcing where indicated on Drawings.

3.2 ERECTION TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Install reinforcement within the following tolerances for flexural members, walls, and compression members:

Reinforcement Depth	Depth Tolerance	Concrete Cover Tolerance
Greater than 8 inches	plus or minus 3/8 inch	minus 3/8 inch
Less than 8 inches	plus or minus 1/2 inch	minus 1/2 inch

C. Install reinforcement within the tolerances specified in ACI 530.1 for foundation walls.

3.3 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Field inspection and testing will be performed by Owner’s testing laboratory in accordance with ACI 318 applicable code.

C. Provide free access to Work and cooperate with appointed firm.

D. Reinforcement Inspection:
   1. Placement Acceptance: Specified and ACI 318 material requirements and specified placement tolerances.

2. Welding: Inspect welds in accordance with AWS D1.1.
3. Periodic Placement Inspection: Inspect for correct materials, fabrication, sizes, locations, spacing, concrete cover, and splicing.
4. Weldability Inspection: Inspect for reinforcement weldability when formed from steel other than ASTM A706/A706M.
5. Continuous Weld Inspection: Inspect reinforcement as required by ACI 318 applicable code.
6. Periodic Weld Inspection: Other welded connections.

END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

SECTION 03 30 00 – CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SUMMARY

A. Section includes cast-in-place concrete for the following:
   1. Building frame members.
   2. Shear walls.
   3. Elevator shaft walls.
   4. Foundation walls.
   5. Supported slabs.
   6. Slabs on grade.
   7. Control, expansion and contraction joint devices.
   8. Equipment pads.
   9. Light pole base.
   10. Flagpole base.
   11. Thrust blocks.
   12. Manholes.

B. Related Sections:
   1. Section 03 10 00 - Concrete Forming and Accessories: Formwork and accessories. Placement of joint device in formwork.
   2. Section 03 20 00 - Concrete Reinforcing.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT – Not Applicable

1.3 REFERENCES

A. American Concrete Institute:
   1. ACI 301 - Specifications for Structural Concrete.
   2. ACI 305 - Hot Weather Concreting.
   3. ACI 306.1 - Standard Specification for Cold Weather Concreting.
   4. ACI 308.1 - Standard Specification for Curing Concrete.
   5. ACI 318 - Building Code Requirements for Structural Concrete.

B. ASTM International:
   1. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
   2. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
   3. ASTM C33 - Standard Specification for Concrete Aggregates.
   4. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
   5. ASTM C150 - Standard Specification for Portland Cement.
   6. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete.

7. ASTM C330 - Standard Specification for Lightweight Aggregates for Structural Concrete.
8. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete.
9. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.
10. ASTM C1116 - Standard Specification for Fiber-Reinforced Concrete and Shotcrete.
11. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures.
12. ASTM D994 - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type).
13. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
14. ASTM D1752 - Standard Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.

1.4 PERFORMANCE REQUIREMENTS

A. Vapor Retarder Permeance: Maximum when tested in accordance with ASTM E96/E96M, water method.

1.5 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit data on joint devices, attachment accessories, and admixtures.

C. Design Data:
   1. Submit concrete mix design; for each concrete strength. Submit separate mix designs when admixtures are required for the following:
      a. Hot and cold weather concrete work.
      b. Air entrained concrete work.
   2. Identify mix ingredients and proportions, including admixtures.
   3. Identify chloride content of admixtures and whether or not chloride was added during manufacture.

D. Samples: Submit two 3” x 6 inch long samples of expansion/contraction joint and control joint.

E. Manufacturer's Installation Instructions: Submit installation procedures and interface required with adjacent Work.

1.6 CLOSEOUT SUBMITTALS

A. Section 01 70 00 - Execution and Closeout Requirements: Closeout procedures.

B. Project Record Documents: Accurately record actual locations of embedded utilities and components concealed from view in finished construction.

1.7 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 301, ACI 318.

B. Conform to ACI 305 when concreting during hot weather.

C. Conform to ACI 306.1 when concreting during cold weather.

D. Acquire cement and aggregate from one source for Work.

E. Maintain one copy of each document on site.

1.8 MOCKUP

A. Section 01 40 00 - Quality Requirements: Requirements for mockup.

B. Construct mockup for architectural concrete surfaces receiving special treatment or finish as result of formwork.

C. Mockup Panel: Sufficient size to indicate special treatment or finish required.

D. When requested by Architect/Engineer, cast concrete against sample panel. Obtain acceptance of resultant surface finish prior to erecting formwork.

E. Locate where directed by Architect/Engineer; in drainage area at back porch with exposed flag stone.

F. Incorporate accepted mockup as part of Work.

1.9 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.

B. Maintain concrete temperature after installation at minimum 50 degrees F for minimum 7 days.

C. Maintain high early strength concrete temperature after installation at minimum 50 degrees F for minimum 3 days.

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

1.10 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Coordinate placement of joint devices with erection of concrete formwork and placement of form accessories.

PART 2 PRODUCTS

2.1 CONCRETE MATERIALS

A. Cement: ASTM C150, Type I – Normal, Portland type.

B. Normal Weight Aggregates: ASTM C33.
   1. Coarse Aggregate Maximum Size: 1 ½ inches. In accordance with ACI 318.

C. Water: ACI 318; potable, without deleterious amounts of chloride ions.

2.2 ADMIXTURES

A. Air Entrainment: ASTM C260.

B. Chemical: ASTM C494/C494M.
   1. Type A - Water Reducing.
   2. Type B – Retarding.
   3. Type C - Accelerating.
   4. Type D - Water Reducing and Retarding.
   5. Type E - Water Reducing and Accelerating.
   6. Type F - Water Reducing, High Range.
   7. Type G - Water Reducing, High Range and Retarding.

C. Fly Ash: ASTM C618 Class.

D. Silica Fume: ASTM C1240.

E. Plasticizing: ASTM C1017/C1017M Type I, plasticizing.

2.3 ACCESSORIES

A. Bonding Agent: Polymer resin emulsion, Polyvinyl Acetate, or Latex emulsion.

B. Vapor Retarder: ASTM E1745 Class A; 6 mil thick clear polyethylene film; type recommended for below grade application. Furnish joint tape recommended by manufacturer.

C. Non-Shrink Grout: ASTM C1107/C1107M; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 psi in 48 hours and 7,000 psi in 28 days.

D. Concrete Reinforcing Fibers: ASTM C1116, high strength industrial-grade fibers specifically engineered for secondary reinforcement of concrete. Tensile strength -130 ksi; toughness 15 ksi; 3/4 inch long fibers, 34 million/lb fiber count.

2.4 JOINT DEVICES AND FILLER MATERIALS

A. Joint Filler Type A: ASTM D1751, ASTM D994.

B. Construction Joint Devices: Integral extruded plastic; ½ inch thick, formed to tongue and groove profile, with removable top strip exposing sealant trough, knockout holes spaced at 6 inches, ribbed steel spikes with tongue to fit top screed edge.

C. Expansion and Contraction Joint Devices: ASTM B221 alloy, extruded aluminum; resilient elastomeric filler strip with Shore A.

D. Sealant: Cold applied two part liquid neoprene.

2.5 CONCRETE MIX

A. Select proportions for concrete in accordance with ACI 318 without trial mixtures or field experience when approved by Architect/Engineer. Minimum 5.5 sacks of cement each yard.

B. Provide concrete to the following criteria:

Material and Property	Measurement
Compressive Strength (7 day)	2400 psi
Compressive Strength (28 day)	3500 psi

C. Admixtures: Include admixture types and quantities indicated in concrete mix designs only when approved by Architect/Engineer.

D. Ready Mixed Concrete: Mix and deliver concrete in accordance with ASTM C94/C94M, ASTM C685/C685M.

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify requirements for concrete cover over reinforcement.

C. Verify anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with placing concrete.

3.2 PREPARATION

A. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent. Remove laitance, coatings, and unsound materials.

B. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.

C. Remove debris and ice from formwork, reinforcement, and concrete substrates.

D. Remove water from areas receiving concrete before concrete is placed.

3.3 PLACING CONCRETE

A. Place concrete in accordance with ACI 301, ACI 318.

B. Notify testing laboratory [and Architect/Engineer] minimum 24 hours prior to commencement of operations.

C. Ensure reinforcement, inserts, embedded parts, formed expansion and contraction joints are not disturbed during concrete placement.

D. Install vapor retarder under interior slabs on grade in accordance with ASTM E1643. Lap joints minimum 6 inches and seal watertight by adhesive applied between overlapping edges and ends.

E. Repair vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.

F. Separate slabs on grade from vertical surfaces with ¾ inch thick joint filler.

G. Place joint filler in floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.

H. Extend joint filler from bottom of slab to within ¼ inch of finished slab surface. Conform to Section 07 90 00 for finish joint sealer requirements.

I. Install construction joint devices in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.

J. Apply sealants in joint devices in accordance with Section 07 90 00.

K. Deposit concrete at final position. Prevent segregation of mix.

L. Place concrete in continuous operation for each panel or section determined by predetermined joints.

M. Consolidate concrete.

N. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

O. Place concrete continuously between predetermined expansion, control, and construction joints.

P. Do not interrupt successive placement; do not permit cold joints to occur.

Q. Place floor slabs in saw cut pattern indicated.

R. Saw cut joints within 12 hours after placing. Use 3/16 inch thick blade, cut into ¼ depth of slab thickness.

S. Screed floors and slabs on grade level, maintaining surface flatness of maximum ¼ inch in 10 ft.

3.4 SEPARATE FLOOR TOPPINGS – Not Applicable

A. Prior to placing floor topping, roughen substrate concrete surface and remove deleterious material. Broom and vacuum clean.

B. Place required dividers, and reinforcing to be cast in.

C. Apply bonding agent to substrate.

D. Screed toppings level, maintaining surface flatness of maximum 1/8 inch in 10 ft.

3.5 CONCRETE FINISHING

A. Finish concrete floor surfaces in accordance with ACI 301, ACI 318.

B. Wood float surfaces receiving quarry tile, ceramic tile, and terrazzo with full bed setting system.

C. Steel trowel surfaces receiving carpeting, resilient flooring, seamless flooring, thin set quarry tile, and thin set ceramic tile.

D. Steel trowel surfaces which are indicated to be exposed.

E. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at ¼ inch per foot nominal as indicated on drawings.

3.6 CURING AND PROTECTION

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
   1. Protect concrete footings from freezing for minimum 5 days.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

C. Cure concrete in accordance with ACI 308. – No liquid curing agent at stained floors.

D. Cure floor surfaces in accordance with ACI 301, ACI 318. – No liquid curing agent at stained floors.

E. Ponding: Maintain 100 percent coverage of water over floor slab areas continuously for 7 days.

F. Spraying: Spray water over floor slab areas and maintain wet for 7 days.

3.7 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Field inspection and testing will be performed by Owner’s testing laboratory in accordance with ACI 318 applicable code.

C. Provide free access to Work and cooperate with appointed firm.

D. Submit proposed mix design of each class of concrete to testing firm for review prior to commencement of Work.

E. Concrete Inspections:
   1. Continuous Placement Inspection: Inspect for proper installation procedures.
   2. Periodic Curing Inspection: Inspect for specified curing temperature and procedures.

F. Strength Test Samples:
   1. Sampling Procedures: ASTM C172.
   2. Cylinder Molding and Curing Procedures: ASTM C31/C31M, cylinder specimens, field cured.
   3. Sample concrete and make one set of three cylinders for every 75 cu yds or less of each class of concrete placed each day and for every 5,000 sf of surface area for slabs and walls.
   4. When volume of concrete for any class of concrete would provide less than 5 sets of cylinders, take samples from five randomly selected batches, or from every batch when less than 5 batches are used.
   5. Make one additional cylinder during cold weather concreting, and field cure.

G. Field Testing:
   1. Slump Test Method: ASTM C143/C143M.
   2. Air Content Test Method: ASTM C173/C173M, ASTM C231.
   3. Temperature Test Method: ASTM C1064/C1064M.
   4. Measure slump and temperature for each compressive strength concrete sample.
   5. Measure air content in air entrained concrete for each compressive strength concrete sample.

H. Cylinder Compressive Strength Testing:
   1. Test Method: ASTM C39/C39M.
   2. Test Acceptance: In accordance with ACI 318 applicable code.
   3. Test one cylinder at 7 days.
   4. Test two cylinders at 28 days.

I. Maintain records of concrete placement. Record date, location, quantity, air temperature and test samples taken.

3.8 PATCHING

A. Allow Architect/Engineer to inspect concrete surfaces immediately upon removal of forms.

B. Excessive honeycomb or embedded debris in concrete is not acceptable. Notify Architect/Engineer upon discovery.

C. Patch imperfections as directed by Architect/Engineer in accordance with ACI 301, ACI 318.

3.9 DEFECTIVE CONCRETE

A. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.

B. Repair or replacement of defective concrete will be determined by Architect/Engineer.

C. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect/Engineer for each individual area.

END OF SECTION

SECTION 03 35 00 – CONCRETE FINISHING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Finishing concrete floors and floor toppings.
2. Floor surface treatment.

B. Related Sections:
1. Section 03 30 00 - Cast-In-Place Concrete: Prepared concrete floors ready to receive finish; control and formed expansion and contraction joints and joint devices.

1.2 REFERENCES

A. American Concrete Institute:
1. ACI 301 - Specifications for Structural Concrete.
2. ACI 302.1 - Guide for Concrete Floor and Slab Construction.

B. ASTM International:
1. ASTM E1155 - Standard Test Method for Determining Floor Flatness and of Levelness Using the F-number System.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit data on concrete hardener, sealer, curing compounds compatibilities, and limitations.

1.4 SUSTAINABLE DESIGN SUBMITTALS

A. Section 01 81 13 – Sustainable Design Requirements: Requirements for sustainable design submittals.

B. Manufacturer's Certificate: Certify products meet or exceed specified sustainable design requirements.
1. Materials Resources Certificates:
a. Certify recycled material content for recycled content products.
b. Certify source for regional materials and distance from Project site.
2. Indoor Air Quality Certificates:
a. Certify volatile organic compound content for each flooring system.

SECTION 03 35 00
CONCRETE FINISHING

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 301 and ACI 302.1.

B. Maintain one copy of document on site.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

B. Applicator/Installer: Company specializing in performing work of this section with minimum 3 years documented experience.

1.7 MOCK-UP

A. Section 01 40 00 - Quality Requirements: Requirements for mockup.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

B. Deliver materials in manufacturer's packaging including application instructions.

1.9 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements: Environmental conditions affecting products on site.

B. Temporary Heat: Ambient temperature of 50 degrees F minimum.

C. Ventilation: Sufficient to prevent injurious gases from temporary heat or other sources affecting concrete.

1.10 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Coordinate the Work with concrete floor placement and concrete floor curing.

PART 2 PRODUCTS

2.1 SUSTAINABILITY CHARACTERISTICS

A. Section 01 81 13 - Sustainable Design Requirements: Requirements for sustainable design compliance.

SECTION 03 35 00
CONCRETE FINISHING

2.2 MANUFACTURERS

A. Penetrating Sealant: Provide penetrating sealant by one the listed manufactures:
1. Harry S. Peterson, Co., Inc. – Product: Iso-Flex 620 Siloxane Sealer
2. Euclid Chemical Co. – Product: Euco-Guard
3. Guardian Chemical Company – Product: Clear Bond
4. Nox-Crete Chemicals – Product: Stifel
5. BASF Chemical Company
6. Cresset Chemical Company
7. Davis Colors
8. Dayton Superior Corp. .
9. L & M Construction Chemicals
10. L M Scofield Co.
11. Sika Corp.
12. Substitutions: Section 01 60 00 - Product Requirements Permitted.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify floor surfaces are acceptable to receive the Work of this section.

3.2 FLOOR FINISHING

A. Finish concrete floor surfaces in accordance with ACI 301.

B. Wood float surfaces receiving ceramic tile, with full bed setting system.

C. Steel trowel surfaces receiving carpeting, resilient flooring, seamless flooring, thin set ceramic tile.

D. Steel trowel surfaces which are scheduled, indicated to be exposed.

E. In areas with floor drains, maintain design floor elevation at walls; slope surfaces uniformly to drains at 1/8 inch per foot nominal.

3.3 FLOOR SURFACE TREATMENT

A. Apply sealer according to Manufacturer instructions.

3.4 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Maximum Variation of Surface Flatness for Exposed Concrete Floors: 1/4 inch in 10 ft.

C. Maximum Variation of Surface Flatness Under Seamless Resilient Flooring: 1/4 inch in 10 ft.

D. Maximum Variation of Surface Flatness Under Carpeting: 1/4 inch in 10 ft.

END OF SECTION

SECTION 03 39 00 – CONCRETE CURING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes initial and final curing of horizontal and vertical concrete surfaces.

B. Related Sections:
1. Section 03 30 00 - Cast-In-Place Concrete.
2. Section 03 35 00 - Concrete Finishing.

1.2 REFERENCES

A. American Concrete Institute:
1. ACI 301 - Specifications for Structural Concrete.
2. ACI 302.1 - Guide for Concrete Floor and Slab Construction.
3. ACI 308.1 - Standard Specification for Curing Concrete.
4. ACI 318 - Building Code Requirements for Structural Concrete.

B. ASTM International:
1. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete.
2. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
3. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete.
4. ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting.

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal procedures.

B. Product Data: Submit data on curing compounds, compatibilities, and limitations.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 301 ACI 302.1 ACI 318.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

B. Deliver curing materials in manufacturer's packaging including application instructions.

SECTION 03 39 00
CONCRETE CURING

PART 2 PRODUCTS

2.1 MATERIALS

A. Membrane Curing Compound Type A: ASTM C309, Type 1, Class A.

B. Polyethylene Film Type E: ASTM C171, ASTM D2103, 6 mil thick, clear.

C. Water: Potable, not detrimental to concrete.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify substrate surfaces are ready to be cured.

3.2 INSTALLATION - HORIZONTAL SURFACES

A. Cure concrete in accordance with ACI 308.1.

B. Membrane Curing Compound: Apply curing compound in two coats with second coat applied at right angles to first.

C. Polyethylene Film: Spread over floor slab areas, lap edges and sides, seal with pressure sensitive tape and cover with plywood; maintain in place for 7 days.

3.3 INSTALLATION - VERTICAL SURFACES

A. Cure concrete in accordance with ACI 308.1

B. Spraying: Spray water over surfaces and maintain wet for 7 days.

C. Membrane Curing Compound: Apply compound in two coats with second coat applied at right angles to first.

3.4 PROTECTION OF FINISHED WORK

A. Section 01 70 00 - Execution and Closeout Requirements: Protecting finished Work.

B. Do not permit traffic over unprotected floor surface.

SECTION 03 39 00
CONCRETE CURING

3.5 SCHEDULES

A. Concrete Pavement: Membrane curing compound, opaque color.

B. Other Floor Areas: Membrane curing compound, acrylic type, translucent color.

END OF SECTION

SECTION 04 05 03 – MASONRY MORTARING AND GROUTING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes mortar and grout for masonry.

B. Related Sections:
1. Section 04 20 00 - Unit Masonry: Installation of mortar and grout.
2. Section 04 20 13 - Single-Wythe Unit Masonry: Installation of mortar and grout.
3. Section 04 20 16 - Reinforced Unit Masonry: Installation of mortar and grout.
4. Section 04 20 19 - Veneer Unit Masonry: Installation of mortar and grout.
5. Section 04 42 13 - Masonry-Supported Stone Cladding

1.2 REFERENCES

A. American Concrete Institute:
1. ACI 530 - Building Code Requirements for Masonry Structures.
2. ACI 530.1 - Specifications for Masonry Structures.

B. ASTM International:
1. ASTM C5 - Standard Specification for Quicklime for Structural Purposes.
2. ASTM C91 - Standard Specification for Masonry Cement.
3. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete.
4. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic Cement Concrete.
5. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar.
6. ASTM C150 - Standard Specification for Portland Cement.
7. ASTM C199 - Standard Test Method for Pier Test for Refractory Mortars.
8. ASTM C206 - Standard Specification for Finishing Hydrated Lime.
9. ASTM C270 - Standard Specification for Mortar for Unit Masonry.
10. ASTM C387/C387M - Standard Specification for Packaged, Dry, Combined Materials for Mortar and Concrete.
11. ASTM C404 - Standard Specification for Aggregates for Masonry Grout.
12. ASTM C476 - Standard Specification for Grout for Masonry.
13. ASTM C595 - Standard Specification for Blended Hydraulic Cements.
14. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
15. ASTM C1019 - Standard Test Method for Sampling and Testing Grout.
16. ASTM C1142 - Standard Specification for Extended Life Mortar for Unit Masonry.
17. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms.
18. ASTM C1329 - Standard Specification for Mortar Cement.
19. ASTM C1357 - Standard Test Method for Evaluating Masonry Bond Strength.

SECTION 04 05 03
MASONRY MORTARING AND GROUTING

1.3 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal requirements.

B. Samples: Submit two samples of mortar, illustrating mortar color and color range.

C. Design Data: Submit design mix when Property specification of ASTM C270 is to be used, required environmental conditions, and admixture limitations.

D. Test Reports:
   1. Submit reports on mortar indicating conformance of mortar to property requirements of ASTM C270 mortar to requirements of ASTM C1142 component mortar materials to requirements of ASTM C270 and test and evaluation reports to ASTM C780 for aggregate ratio and water content, air content, consistency and compressive strength.
   2. Submit reports on grout indicating conformance of grout to property requirements of ASTM C476 component grout materials to requirements of ASTM C476 and test and evaluation reports to ASTM C1019.

E. Manufacturer's Installation Instructions: Submit manufacturer's installation instructions.

F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 530 and ACI 530.1.

B. Perform Work in accordance with State standard.

C. Maintain one copy copies of each document on site.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Section 01 60 00 - Product Requirements.

B. Cold Weather Requirements: In accordance with ACI 530.1 when ambient temperature or temperature of masonry units is less than 40 degrees F.

C. Hot Weather Requirements: In accordance with ACI 530.1 when ambient temperature is greater than 100 degrees F or ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph.

SECTION 04 05 03
MASONRY MORTARING AND GROUTING

PART 2 PRODUCTS

2.1 MORTAR AND MASONRY GROUT

A. Manufacturers:
1. CTS Cement Manufacturing Co.
2. Glen-Gery.
3. Holcim Ltd.
4. LaFarge Corp.
5. Lehigh Portland Cement.
6. Substitutions: Section 01 60 00 - Product Requirements.

2.2 COMPONENTS

A. Portland Cement: ASTM C150, Type I or Type II, color as required by owner.

B. Quicklime: ASTM C5, non-hydraulic type.

C. Grout Aggregate: ASTM C404, fine.

D. Water: Clean and potable.

E. Mortar Color: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979. Use only pigments with a record of satisfactory performance in masonry mortar. Manufactured by Davis Colors, Lanxess Corp. or Solomon Colors Inc.

F. Calcium chloride is not permitted.

2.3 MIXES

A. Mortar Mixes:
1. Extended Life Mortar: ASTM C1142, Type; RS.
2. Mortar For Structural Masonry: ASTM C270, Type S using Proportion specification.
3. Mortar For Non-Structural Masonry: ASTM C270, Type S using Proportion specification.
4. Pointing Mortar: ASTM C 395, Type N using Proportion specification. Color to match as required.
5. Stain Resistant Pointing Mortar: One part Portland cement, 1/8 part hydrated lime, and two parts graded (80 mesh) aggregate, proportioned by volume. Add aluminum tristearate, calcium stearate, or ammonium stearate equal to 2 percent of Portland cement by weight.
6. Mortar For Glass Unit Masonry: ASTM C270, Type S using Proportion specification.

7. Pointing Mortar for Glass Unit Masonry: ASTM C270Mortar for Firebrick Masonry: Fireclay type.

B. Mortar Mixing:
   1. Thoroughly mix mortar ingredients in accordance with ASTM C270 in quantities needed for immediate use.
   2. Achieve uniformly damp sand immediately before mixing process.
   3. Add mortar color and admixtures to achieve uniformity of mix and coloration.
   4. Re-temper only within two hours of mixing.

C. Grout Mixes:
   1. Grout for Non-Structural Masonry: 2,000 psi strength at 28 days; 8-11 inches slump; mixed in accordance with ASTM C476 Fine grout.
   2. Grout for Structural Masonry: 2,000 psi strength at 28 days; 8-11 inches slump; mixed in accordance with ASTM C476 Fine Coarse grout.
   3. Application:
      a. Coarse Grout: For grouting spaces with minimum 4 inches dimension in every direction.
      b. Fine Grout: For grouting other spaces.

D. Grout Mixing:
   1. Mix grout in accordance with ASTM C94/C94M, modified to use ingredients complying with ASTM C476.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Request inspection of spaces to be grouted.

3.2 PREPARATION

A. Apply bonding agent to existing concrete surfaces.

3.3 INSTALLATION

A. Install mortar and grout in accordance with ACI 530.1 Specifications for Masonry Structures.

3.4 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements 01 70 00 - Execution and Closeout Requirements: Field inspecting, testing, adjusting, and balancing.

B. Establishing Mortar Mix: In accordance with ASTM C270.

C. Testing Frequency: One set of specified tests for every 5,000 sf of completed wall area.

D. Testing of Mortar Mix: In accordance with ASTM C780 for aggregate ratio and water content, air content, consistency, and compressive strength.

E. Testing of Grout Mix: In accordance with ASTM C1019 for compressive strength and in accordance with ASTM C143/C143M for slump.

F. Test flexural bond strength of mortar and masonry units to ASTM C1357; test in conjunction with masonry unit sections specified.

G. Test compressive strength of mortar and masonry to ASTM C1314; test in accordance with masonry unit sections specified.

3.5 SCHEDULES

A. Exterior Cavity Wall: Brick masonry with Type S mortar with Type N pointing mortar.

B. Interior Unit Masonry: CMU partitions with Type N mortar.

END OF SECTION

SECTION 05 05 19
POST-INSTALLED CONCRETE ANCHORS

SECTION 05 05 19 – POST-INSTALLED CONCRETE ANCHORS

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes: Cast-in and drilled-in anchors for concrete.

B. Related Sections:

1. Division 3 Concrete Sections.
2. Divison 4 Masonry Sections.
3. Division 5 Metals Sections.
4. Division 22 Hangers and Supports Section.
5. Division 23 Hangers and Supports Section.
6. Division 26 Hangers and Supports Section.

1.02 SUBMITTALS

A. General: Submit in accordance with *Conditions of the Contract* and Division 1 Submittal Procedures Section.

1. Product specifications with recommended design values and physical characteristics for epoxy dowels, expansion and undercut anchors.
2. Samples: Representative lengths and diameters of each type anchor shown on the Drawings.
3. Quality Assurance Submittals:
   a. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
   b. Certificates:
      1) ICC-ES Evaluation Reports.
4. Manufacturer's installation instructions.
5. Installer Qualifications & Procedures: Submit installer qualifications as stated in Section 1.03.B. Submit a letter of procedure stating method of drilling, the product proposed for use, the complete installation procedure, manufacturer training date, and a list of the personnel to be trained on anchor installation.

B. Closeout Submittals: Submit the following:

1. Record Documents: Project record documents for installed materials in accordance with Division 1 Closeout Submittals Section.

SECTION 05 05 19
POST-INSTALLED CONCRETE ANCHORS

1.03 QUALITY ASSURANCE

A. Installer Qualifications:

1. Drilled-in anchors shall be installed by an installer with at least **three** years of experience performing similar installations.

B. Certifications: Unless otherwise authorized by the Engineer, anchors shall have one of the following certifications:

1. ICC-ES Evaluation Report indicating conformance with current applicable ICC-ES Acceptance Criteria.

1.04 DELIVERY, STORAGE AND HANDLING

A. General: Comply with Division 1 Section–Product Storage and Handling Requirements.

1. Store anchors in accordance with manufacturer's recommendations.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Fasteners and Anchors:

1. Bolts and Studs: ASTM A307; ASTM A449 where "high strength" is indicated on the Drawings.
2. Carbon and Alloy Steel Nuts: ASTM A563.
3. Carbon Steel Washers: ASTM F436.
4. Carbon Steel Threaded Rod: ASTM F1554 Grade 36, or ASTM F1554 Grade 55, or ASTM F1554 Grade 105.
5. Wedge Anchors: ASTM A510; or ASTM A108.
6. Stainless Steel Bolts, Hex Cap Screws, and Studs: ASTM F593.
7. Stainless Steel Nuts: ASTM F594.
8. Zinc Plating: ASTM B633.
9. Hot-Dip Galvanizing: ASTM A153.
10. Metric Anchor Bolts, Screws, and Studs: ISO 898 Part 1.
11. Metric Anchor Nuts: EN 24033.
12. Metric Anchor Stainless Steel Bolts, Screws, and Studs: ISO 3506 Part 1.
13. Metric Anchor Stainless Steel Nuts: ISO 3506 Part 2.

14. Reinforcing Dowels: ASTM A615

2.02 CAST-IN-PLACE BOLTS

A. Anchors, Bolts, Nuts, and Washers: Bolts and studs, nuts, and washers shall conform to ASTM A307, Grade A, and ASTM A449, ASTM A563, and ASTM F436, as applicable. Hot-dip galvanized bolts and studs including associated nuts and washers in accordance with ASTM A153.

2.03 DRILLED-IN ANCHORS

A. Wedge Anchors: Wedge type, torque-controlled, with impact section to prevent thread damage complete with required nuts and washers. Provide anchors with length identification markings conforming to ICC-ES AC01 or ICC-ES AC193. Type and size as indicated on Drawings.

1. Interior Use: Unless otherwise indicated on the Drawings, provide carbon steel anchors with zinc plating in accordance with ASTM B633, Type III Fe/Zn 5 (SC1).

2. Where anchor manufacturer is not indicated, subject to compliance with requirements and acceptance by the Engineer, provide the following:

a. Hilti Kwik Bolt 3, ICC ESR-1385 and ESR-2302.

b. Hilti Kwik Bolt TZ, ICC ESR-1917 and ESR-3785 (carbon steel and AISI Type 304 or 316 Stainless Steel).

B. Screw Anchors: screw type. Pre-drilling of the hole requires a standard ANSI drill bit with the same diameter as the anchor and installing the anchor will be done with an impact wrench. Provide anchors with a diameter and anchor length marking on the head. Type and size as indicated on Drawings.

1. Interior Use: Unless otherwise indicated on the Drawings, provide carbon steel anchors with zinc plating equivalent to DIN EN ISO 4042 (8μm min.).

2. Exterior Use: As indicated on the Drawings, provide mechanically galvanized or stainless steel anchors. Mechanically galvanized steel anchors shall meet ASTM B695, Class 55 specifications. Stainless steel anchors shall be AISI **[Type 316]** stainless steel. Avoid installing stainless steel anchors in contact with galvanically dissimilar metals.

3. Where anchor manufacturer is not indicated, subject to compliance with requirements and acceptance by the Engineer, provide the following:

a. Hilti Kwik HUS-EZ (KH-EZ), KH-EZ C, KH-EZ E, KH-EZ I, KH-EZ P, ICC ESR-3027 (carbon steel).

b. Hilti KH-EZ CRC, ICC ESR-3027 (mechanically galvanized carbon steel).

c. Hilti KH-EZ SS316, ICC ESR-3027 (stainless steel).

d. Hilti Kwik HUS.

C. Heavy Duty Metric Sleeve Anchors: Torque-controlled, exhibiting follow-up expansion under load, with provision for rotation prevention during installation. Type and size as indicated on Drawings.

1. Interior Use: Unless otherwise indicated on the Drawings, provide carbon steel anchors manufactured from materials conforming to ISO 898 Part 1, with zinc plating equivalent to ASTM B633, Type III Fe/Zn 5 (5μm min.).

2. Where anchor manufacturer is not indicated, subject to compliance with requirements and acceptance by the Engineer, provide the following:

a. Hilti HSL, HSLG, or HSLB.

b. Hilti HSL-3, HSL-3-G, or HSL-3-B, ICC ESR-1545 (carbon steel).

c. Hilti HSL-3-R, ICC ESR-1545 (stainless steel)

D. Heavy Duty Metric Undercut Anchors: Bearing-type. Installed anchor shall have a minimum tension bearing area in the concrete, measured as the horizontal projection of the bearing surface, not less than two times the net tensile area of the anchor bolt. The installed anchor shall exhibit a form fit between the bearing elements and the undercut in the concrete. Type and size as indicated on Drawings.

1. Interior Use: Unless otherwise indicated on the Drawings, provide carbon steel anchors manufactured from materials conforming to ISO 898 Part 1, with zinc plating equivalent to ASTM B633, Type III Fe/Zn 5 (5μm min.).

2. Where anchor manufacturer is not indicated, subject to compliance with requirements and acceptance by the Engineer, provide the following:

a. Hilti HDA, ICC ESR-1546.

E. Cartridge Injection Adhesive Anchors: Threaded steel rod, inserts or reinforcing dowels, complete with nuts, washers, polymer or hybrid mortar adhesive injection system, and manufacturer's installation instructions. Type and size as indicated on Drawings.

1. Interior Use: Unless otherwise indicated on the Drawings, provide carbon steel threaded rods conforming to ASTM F1554 Grade 36, or ASTM F1554 Grade 55, or ASTM F1554 Grade 105 with zinc plating in accordance with ASTM B633, Type III Fe/Zn 5 (SC1) [or carbon steel HIT-Z rods conforming to ASTM A510 with chemical composition of AISI 1038].

2. Reinforcing dowels shall be A615 Grade 60.

3. Where anchor manufacturer is not indicated, subject to compliance with requirements and acceptance by the Engineer, provide the following:

a. Hilti HAS threaded rods with HIT-HY 200 Safe Set System using Hilti Hollow Drill Bit and VC 150/300 vacuum System for anchor and rebar anchorage to concrete, ICC ESR-3187.

b. Hilti HIT-Z anchor rods with HIT-HY 200 Safe Set System for anchorage to concrete, ICC ESR-3187.

c. Hilti HAS threaded rods with HIT-RE 500 V3 Safe Set System using Hilti Hollow Drill Bit and VC 150/300 vacuum System for anchor and rebar anchorage to concrete, ICC ESR-3814.

F. Capsule Anchors: Threaded steel rod, inserts and reinforcing dowels with 45 degree chisel point, complete with nuts, washers, glass or foil capsule anchor system containing polyvinyl or urethane methacrylate-based resin and accelerator, and manufacturer's installation instructions. Type and size as indicated on Drawings.

1. Interior Use: Unless otherwise indicated on the Drawings, provide chisel-pointed carbon steel rods conforming to ASTM F1554 Grade 55, or ASTM F1554 Grade 105 with zinc plating in accordance with ASTM B633, Type III Fe/Zn 5 (SC1).

2. Where anchor manufacturer is not indicated, subject to compliance with requirements and acceptance by the Architect, provide the following:

a. Hilti HVA Adhesive System with HVU2 capsules.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Cast-In-Place Bolts: Use templates to locate bolts accurately and securely in formwork.

B. Drilled-In Anchors:

1. Drill holes with rotary impact hammer drills using carbide-tipped bits, hollow drill bit system, or core drills using diamond core bits. Drill bits shall be of diameters as specified by the anchor manufacturer. Unless otherwise shown on the Drawings, all holes shall be drilled perpendicular to the concrete surface.

a. Cored Holes: Where anchors are permitted to be installed in cored holes, use core bits with matched tolerances as specified by the manufacturer. Properly clean cored hole per manufacturer's instructions.

b. Embedded Items: Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Exercise care in

coring or drilling to avoid damaging existing reinforcing or embedded items. Notify the Engineer if reinforcing steel or other embedded items are encountered during drilling. Take precautions as necessary to avoid damaging prestressing tendons, electrical and telecommunications conduit, and gas lines.

c. Base Material Strength: Unless otherwise specified, do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.

2. Perform anchor installation in accordance with manufacturer instructions.

3. Wedge Anchors, Heavy-Duty Sleeve Anchors, and Undercut Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in part to be fastened. Set anchors to manufacturer's recommended torque, using a torque wrench. Following attainment of 10% of the specified torque, 100% of the specified torque shall be reached within 7 or fewer complete turns of the nut. If the specified torque is not achieved within the required number of turns, the anchor shall be removed and replaced unless otherwise directed by the Engineer.

4. Cartridge Injection Adhesive Anchors: Clean all holes per manufacturer instructions to remove loose material and drilling dust prior to installation of adhesive. Inject adhesive into holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive. Follow manufacturer recommendations to ensure proper mixing of adhesive components. Sufficient adhesive shall be injected in the hole to ensure that the annular gap is filled to the surface. Remove excess adhesive from the surface. Shim anchors with suitable device to center the anchor in the hole. Do not disturb or load anchors before manufacturer specified cure time has elapsed.

5. Capsule Anchors: Perform drilling and setting operations in accordance with manufacturer instructions. Clean all holes to remove loose material and drilling dust prior to installation of adhesive. Remove water from drilled holes in such a manner as to achieve a surface dry condition. Capsule anchors shall be installed with equipment conforming to manufacturer recommendations. Do not disturb or load anchors before manufacturer specified cure time has elapsed.

6. Observe manufacturer recommendations with respect to installation temperatures for cartridge injection adhesive anchors and capsule anchors.

3.02 REPAIR OF DEFECTIVE WORK

A. Remove and replace misplaced or malfunctioning anchors. Fill empty anchor holes and patch failed anchor locations with high-strength non-shrink, nonmetallic grout. Anchors that fail to meet proof load or installation torque requirements shall be regarded as malfunctioning.

3.03 FIELD QUALITY CONTROL

A. Tension testing should be performed in accordance with ASTM E488.

B. Torque shall be applied with a calibrated torque wrench.

C. Proof loads shall be applied with a calibrated hydraulic ram. Displacement of adhesive and capsule anchors at proof load shall not exceed D/10, where D is the nominal anchor diameter.

D. Minimum anchor embedments, proof loads and torques shall be as shown on the Drawings.

END OF SECTION

SECTION 05 12 00
STRUCTURAL STEEL FRAMING

SECTION 05 12 00 – STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Structural shapes.
2. Channels and angles.
3. Hollow structural sections.
4. Structural pipe.
5. Structural plates and bars.
6. Floor plates.
7. Bolts, connectors, and anchors.
8. Grout.

B. Related Requirements:
1. Section 03 60 00 - Grouting: Grout for setting base plates.
2. Section 05 21 00 - Steel Joist Framing.
3. Section 05 31 13 - Steel Floor Decking: Support framing for small openings in floor deck.
4. Section 05 31 23 - Steel Roof Decking: Support framing for small openings in roof deck.
5. Section 05 50 00 - Metal Fabrications: Steel fabrications affecting structural steel work.
6. Section 07 81 00 - Applied Fireproofing: Fireproof protection to framing and metal deck systems.

1.2 PRICE AND PAYMENT PROCEDURES

A. Section 01 20 00 - Price and Payment Procedures Contract Sum/Price

B. Structural Steel Framing:
1. Basis of Payment: Includes structural members fabricated, installed, and anchored.

1.3 REFERENCE STANDARDS

A. American Institute of Steel Construction:
1. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges.
2. AISC 341 - Seismic Provisions for Structural Steel Buildings.
3. AISC 360 - Specification for Structural Steel Buildings.

B. American Society of Civil Engineers:
1. ASCE 19 - Standard Applications of Steel Cables for Buildings.

C. ASTM International:

SECTION 05 12 00
STRUCTURAL STEEL FRAMING

1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
2. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
3. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished.
4. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
5. ASTM A193/A193M - Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service.
6. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
7. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
8. ASTM A354 - Standard Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners.
9. ASTM A449 - Standard Specification for Quenched and Tempered Steel Bolts and Studs.
10. ASTM A490 - Standard Specification for Structural Bolts, Alloy Steel, Heat Treated, 150 ksi Minimum Tensile Strength.
11. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
12. ASTM A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
13. ASTM A514/A514M - Standard Specification for High-Yield-Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding.
14. ASTM A529/A529M - Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality.
15. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts.
16. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
17. ASTM A588/A588M - Standard Specification for High-Strength Low-Alloy Structural Steel with 50 ksi (345 MPa) Minimum Yield Point to 4-in. (100-mm) Thick.
18. ASTM A618/A618M - Standard Specification for Hot-Formed Welded and Seamless High-Strength Low-Alloy Structural Tubing.
19. ASTM A786/A786M - Standard Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates.
20. ASTM A847/A847M - Standard Specification for Cold-Formed Welded and Seamless High Strength, Low Alloy Structural Tubing with Improved Atmospheric Corrosion Resistance.
21. ASTM A852/A852M - Standard Specification for Quenched and Tempered Low-Alloy Structural Steel Plate with 70 ksi (485 MPa) Minimum Yield Strength to 4 in. (100 mm) Thick.
22. ASTM A913/A913M - Standard Specification for High-Strength Low-Alloy Steel Shapes of Structural Quality, Produced by Quenching and Self-Tempering Process (QST).
23. ASTM A992/A992M - Standard Specification for Structural Steel Shapes.

24. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.
25. ASTM E94 - Standard Guide for Radiographic Examination.
26. ASTM E164 - Standard Practice for Ultrasonic Contact Examination of Weldments.
27. ASTM E165 - Standard Test Method for Liquid Penetrant Examination.
28. ASTM E709 - Standard Guide for Magnetic Particle Examination.
29. ASTM F436 - Standard Specification for Hardened Steel Washers.
30. ASTM F959 - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners.
31. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.
32. ASTM F1852 - Standard Specification for Twist Off Type Tension Control Structural Bolt/Nut/Washer Assemblies, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
33. ASTM F2329 - Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners.

D. American Welding Society:
   1. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
   2. AWS D1.1 - Structural Welding Code - Steel.

E. SSPC: The Society for Protective Coatings:
   1. SSPC - Steel Structures Painting Manual.
   2. SSPC Paint 15 - Steel Joist Shop Paint.
   3. SSPC Paint 20 - Zinc-Rich Primers (Type I - Inorganic and Type II - Organic).
   4. SSPC SP 3 - Power Tool Cleaning.
   5. SSPC SP 6 - Commercial Blast Cleaning.
   6. SSPC SP 10 - Near-White Blast Cleaning.

1.4 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Requirements for coordination.

B. Coordinate work with the following:
   1. Section 05 50 00 for miscellaneous steel supports other than structural steel.
   2. Section 07 81 00 for finishes on structural steel receiving fireproofing.

1.5 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Requirements for submittals.

B. Shop Drawings:
   1. Indicate profiles, sizes, spacing, and locations of structural members, openings, attachments, and bolts.
   2. Connections not detailed.

3. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.

C. Manufacturer's Mill Certificate: Certify products meet or exceed specified requirements.

D. Mill Test Reports: Submit indicating structural strength, destructive and non-destructive test analysis.

E. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.

1.6 SUSTAINABLE DESIGN SUBMITTALS

A. Section 01 81 13 - Sustainable Design Requirements: Requirements for sustainable design submittals.

B. Manufacturer's Certificate: Certify products meet or exceed specified sustainable design requirements.

1.7 QUALITY ASSURANCE

A. Perform Work in accordance with the following:
1. Structural Steel: AISC 360.
2. Architecturally Exposed Structural Steel: AISC 303, Section 10.
3. High Strength Bolted Connections: RCSC Specification for Structural Joints using ASTM A 325 or A 490 Bolts.
4. Steel Cable Structures: ASCE 19.

B. Perform Work in accordance with State of Mississippi codes and standards.

C. Maintain one copy of each document on site.

1.8 QUALIFICATIONS

A. Fabricator: Company specializing in performing Work of this section with minimum three (3) years documented experience with the following current AISC Certification:
1. Standard Steel Building Structures (STD).
2. Conventional Steel Building Structures (SBD).

B. Erector: Company specializing in performing Work of this section with minimum three (3) years documented experience with the following current AISC Certification:
1. Certified Steel Erector (CSE).

C. Shop Painter: Company specializing in performing Work of this section with minimum three (3) years documented experience with the following current AISC Certification:
1. Sophisticated Paint Endorsement - Enclosed (P1).
2. Sophisticated Paint Endorsement - Covered (P2).

3. Sophisticated Paint Endorsement - Outside (P3).

D. Welders and Welding Procedures: AWS D1.1 qualified within previous 12 months.

PART 2 PRODUCTS

2.1 SUSTAINABILITY CHARACTERISTICS

A. Section 01 81 13 - Sustainable Design Requirements: Requirements for sustainable design compliance.

2.2 STRUCTURAL STEEL

A. Structural W-Shapes: ASTM A992/A992M. ASTM A572/A572M; Grade 50.

B. Structural M-Shapes: ASTM A36/A36M. ASTM A529/A529M; Grade 36

C. Structural S-Shapes: ASTM A36/A36M; Grade 36.

D. Structural T-Shapes: Cut from structural W-shapes, M-shapes, or S-shapes.

E. Channels and Angles: ASTM A36/A36M; Grade 36.

F. Round Hollow Structural Sections: ASTM A500/A500M; Grade B.

G. Rectangular Hollow Structural Sections: ASTM A500/A500M; Grade B

H. Structural Pipe: ASTM A53/A53M; Grade B.

I. Structural Plates and Bars: ASTM A36/A36M; Grade 36

J. Floor Plates: ASTM A786/A786M.

2.3 BOLTS, CONNECTORS, AND ANCHORS

A. Bolts: Heavy hex, structural type.
   1. ASTM A325; Type 1, plain

B. Nuts: ASTM A563

C. Washers: ASTM F436; Type 1, beveled.

D. Compressible-Washer-Type Direct Tension Indicators: ASTM F959; Type 325 Type 490.

E. Anchor Rods: ASTM A36/A36M.
   1. Shape: Hooked.
   2. Plate Washers: ASTM A36/A36M.

F. Threaded Rods: ASTM A36/A36M.

G. Forged Structural Steel Hardware:
   1. Clevises and Turnbuckles: ASTM A108; Grade 1085.
   2. Eye Nuts and Eye Bolts: ASTM A108; Grade 1030.
   3. Sleeve Nuts: ASTM A108; Grade 1018.
   4. Rod Ends, Yoke Ends and Pins, Cotter Pins, and Coupling Nuts: Carbon steel.

2.4 WELDING MATERIALS

A. Welding Materials: AWS D1.1; type required for materials being welded.

2.5 FABRICATION

A. Space shear stud connectors at not applicable, unless indicated otherwise on Drawings.

B. Continuously seal joined members by continuous welds. Grind exposed welds smooth.

C. Fabricate connections for bolt, nut, and washer connectors.

D. Develop required camber for members.

2.6 FINISHES

A. Prepare structural component surfaces in accordance with SSPC SP 3.

B. Shop prime structural steel members. Do not prime surfaces that will be fireproofed, field welded, or in contact with concrete.

C. Galvanizing: ASTM A123/A123M; hot dip galvanize after fabrication.

D. Galvanizing for Bolts, Connectors, and Anchors:
   1. Hot-Dipped Galvanizing:
      a. Bolts, Nuts, and Washers: ASTM F2329.
      b. Connectors and Anchors: ASTM A153/A153M.
   2. Mechanical Galvanizing: ASTM B695; Class 50 minimum.

2.7 ACCESSORIES

A. Grout: Non-shrink type, pre-mixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing additives, capable of developing minimum compressive strength of 7,000 psi.

B. Shop Primer: SSPC Paint 15, Type 1, red oxide.

C. Touch-Up Primer: Match shop primer.

2.8 SOURCE QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Testing, inspection and analysis requirements.

B. Shop test bolted and welded connections as specified for field quality control tests.

C. When fabricator is approved by authority having jurisdiction, submit certificate of compliance indicating Work performed at fabricator's facility conforms to Contract Documents.
   1. Specified shop tests are not required for Work performed by approved fabricator.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation examination.

B. Verify bearing surfaces are at correct elevation.

C. Verify anchors rods are set in correct locations and arrangements with correct exposure for steel attachment.

3.2 PREPARATION

A. Section 01 70 00 - Execution and Closeout Requirements: Requirements for installation preparation.

B. Furnish templates for installation of anchor rods and embedments in concrete and masonry work.

3.3 ERECTION

A. Allow for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in alignment until completion of erection and installation of permanent bracing.

B. Field-weld components and shear connectors indicated on Drawings.

C. Field-connect members with threaded fasteners; torque to required resistance tighten to snug tight for bearing type connections.

D. Do not field cut or alter structural members without approval of Architect/Engineer.

E. After erection, touch up welds and abrasions to match shop finishes.

3.4 GROUT INSTALLATION

A. Grout under base plates in accordance with Section 03 60 00.

B. Fill void under bearing surface with grout. Install and pack grout to remove air pockets.

C. Moist cure grout.

D. Remove forms after grout is set. Trim grout edges to from smooth surface, splayed 45 degrees.

E. Tighten anchor bolts after grout has cured for a minimum of 3 days.

3.5 TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

C. Maximum Offset From Alignment: 1/4 inch.

3.6 FIELD QUALITY CONTROL

A. Section 01 40 00 - Quality Requirements: Requirements for inspecting, testing.

B. Bolted Connections: Inspect in accordance with AISC 303.
   1. Visually inspect all bolted connections.
   2. For Direct Tension Indicators, comply with requirements of ASTM F959. Verify that gaps are less than gaps specified in Table 2.

C. Welding: Inspect welds in accordance with AWS D1.1.
   1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
   2. Visually inspect all welds.
   3. Ultrasonic Inspection: ASTM E164; perform on all full penetration welds.
   4. Liquid Penetrant Inspection: ASTM E165.
   5. Magnetic Particle Inspection: ASTM E709.
   6. Radiographic Inspection: ASTM E94.

D. Correct defective bolted connections and welds.

END OF SECTION

SECTION 05 40 00 – COLD-FORMED METAL FRAMING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes load bearing formed steel stud exterior wall, interior wall, framing; and formed steel joist, purlin, girts, slotted channel, framing, and bridging.

B. Related Sections:
1. Section 05 12 00 - Structural Steel Framing.
2. Section 06 10 00 - Rough Carpentry.
3. Section 07 21 16 - Blanket Insulation: Insulation within framing members.
4. Section 09 22 16 - Non-Structural Metal Framing.

1.2 REFERENCES

A. American Iron and Steel Institute:
1. AISI General - Standard for Cold-Formed Steel Framing - General Provisions.
2. AISI Header - Standard for Cold-Formed Steel Framing - Header Design.
3. AISI NAS - North American Specification for Design of Cold-Formed Steel Structural Members.
4. AISI PM - Standard for Cold-Formed Steel Framing - Prescriptive Method for One and Two Family Dwellings.

B. ASTM International:
1. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members.
2. ASTM C955 - Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases.

C. American Welding Society:
1. AWS D1.1 - Structural Welding Code - Steel.
2. AWS D1.3 - Structural Welding Code - Sheet Steel.

D. California Department of Health Services:
1. CA/DHS/EHLB/R-174 - Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda.

E. Green Seal:
1. GC-03-2nd Edition, January 7, 1997 - Anti-Corrosive Paints.

F. National Association of Architectural Metal Manufacturers:

1. NAAMM ML/SFA 540 - Lightweight Steel Framing Systems Manual.

G. SSPC: The Society for Protective Coatings:
   1. SSPC Paint 15 - Steel Joist Shop Paint.
   2. SSPC Paint 20 - Zinc-Rich Primers (Type I - Inorganic and Type II - Organic).

H. Steel Stud Manufacturers Association:
   1. SSMA - Product Technical Information.

1.3 SYSTEM DESCRIPTION

A. Size components to withstand design loads in accordance with ASCE 7-16.

B. Maximum Allowable Deflection: See Tab 1604.3, IBC 2018.

C. Wall System:
   1. Design to AISI NAS, AISC General, and AISC Header.
   2. Design to provide for movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
   3. Design system to accommodate:
      a. Construction tolerances, deflection of building structural members, and clearances of intended openings.
      b. Expansion and contraction of members and building movement without damage to connections or members.
   4. Seismic Loads: Design and size components to withstand seismic loads and sway displacement as calculated in accordance with ASCE 7-16.

1.4 PERFORMANCE REQUIREMENTS

A. Select stud thickness to resist minimum 5 psf uniform load and maximum 1/240 deflection.

1.5 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal requirements.

B. Shop Drawings:
   1. Indicate component details, framed openings, bearing, anchorage, loading, welds, type and location of fasteners, and accessories or items required of related Work.
   2. Indicate stud, floor joist, ceiling joist, roof joist, roof rafter, and roof truss layout.

3. Describe method for securing studs to tracks and for bolted or welded framing connections.
4. Submit calculations for loadings and stresses of specially fabricated framing, and roof trusses, under Professional engineer's seal.

C. Product Data: Submit data on standard framing members; describe materials and finish, product criteria, and limitations.

D. Manufacturer's Installation Instructions: Submit special procedures, and perimeter conditions requiring special attention.

E. Mill Certifications: Submit mill certifications for steel delivered to site. Certify steel bare metal thickness in 0.001 inch, yield strength, tensile strength, total elongation in 2 inch or 8 inch gauge length, chemical analysis, and galvanized coating thickness.

F. Design Data: Submit design calculations.

1.6 QUALITY ASSURANCE

A. Calculate structural properties of framing members in accordance with AISI NAS.

B. Furnish framing materials in accordance with SSMA - Product Technical Information.

C. Perform Work in accordance with the following:
1. Framing: AISI General and AISI NAS.
2. Headers: AISI Header.
3. Trusses: AISI Truss.
4. Wall Studs: AISI WSD.
5. Lateral Design: AISI Lateral.
6. Residential Framing: AISI PM.

D. Maintain one copy on site.

E. Perform Work in accordance with State of Mississippi Public Work's standard.

F. Maintain one copy of each document on site.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing Work of this section with minimum 3 years documented experience.

C. Design structural elements under direct supervision of Professional Engineer experienced in design of this Work and licensed in State of Mississippi.

D. Form, fabricate, provide, and connect components in accordance with NAAMM ML/SFA 540 - Lightweight Steel Framing Systems Manual.

1.8 MOCKUP

A. Section 01 40 00 - Quality Requirements: Mockup requirements.

B. Construct exterior framed wall including corner condition mockup, 8 x 8 x 1 feet including insulation, sheathing, window frame, door frame, and interior and exterior finish specified in other sections. Coordinate with installation of associated Work of Section 09 21 16.

C. Locate where directed by Architect/Engineer.

D. Retain accepted mockup as completed Work.

1.9 COORDINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

PART 2 PRODUCTS

2.1 COLD-FORMED METAL FRAMING

A. Manufacturers:

1. AllSteel Products, Inc.
2. Central States Manufacturing, Inc.
3. ClarkWestern Building Systems, Inc
4. Consolidated Fabricators Corp.
5. Craco Metals Manufacturing, LLC.
6. Dietrich Metal Framing; Clarkwestern Dietrich Building Systems LLC.
7. Formetal Co. Inc (The)
8. Marino\WARE.
9. MBA Building Supplies.
10. MBCI
11. McElroy Metal
12. Nuconsteel, A Nucor Company.
13. Olmar Supply, Inc.

14. Quail Run Building Materials, Inc.
15. SCAFCO Corporation.
16. Southeastern Stud & Components, Inc.
17. State Building Products, Inc.
18. Steel Construction Systems.
19. Steel Elements International, LLC.
20. Steel Network Inc.
21. Steel Structural Systems
22. Steeler, Inc.
23. Telling Industries.
24. United Metal Products, Inc.
25. Substitutions: Section 01 60 00 - Product Requirements

B. Cold-Formed Metal Framing: ASTM C955.

2.2 FRAMING COMPONENTS

A. Steel Sheet: ASTM A1003/A1003M; Structural Grade, Type H, metallic coated:
   1. Grade: As required by performance requirements.
   2. Coating: G60.

B. Studs: Steel sheet, formed to channel shape, solid or punched web, knurled faces.

C. Joists, Purlins, and girts: Steel sheet, formed to channel, hat, or zee shape, solid web.

D. Track: Steel sheet, formed to channel shape; same width as studs, tight fit; solid web.

2.3 ACCESSORIES

A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined by performance requirements specified.

2.4 FASTENERS

A. Self-drilling, Self-tapping Screws, Bolts, Nuts, and Washers: Steel, hot dip galvanized.

B. Anchorage Devices: Power actuated, drilled expansion bolts, or screws with sleeves.

C. Welding: In conformance with AWS D1.1 and AWS D1.3.

2.5 FABRICATION

A. Fabricate assemblies of formed sections of sizes and profiles required.

B. Fit, reinforce, and brace framing members to suit design requirements.

C. Fit and assemble in largest practical sections for delivery to site, ready for installation.

SECTION 05 40 00
COLD-FORMED METAL FRAMING

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify substrate surfaces building framing components are ready to receive Work.

C. Verify rough-in utilities are in proper location.

3.2 ERECTION OF STUDS

A. Align floor and ceiling tracks; locate to wall partition layout. Secure in place with fasteners at maximum 24 inches oc. Coordinate installation of acoustic sealant with floor and ceiling tracks.

B. Place studs as indicated on drawings; not more than 2 inches from abutting walls and at each side of openings. Connect studs to tracks using clip and tie fastener method.

C. Construct corners using minimum three studs. Double stud wall openings, door jambs, and window jambs.

D. Erect load bearing studs one piece full length. Splicing of studs is not permitted.

E. Erect load bearing studs, brace, and reinforce to develop full strength, to achieve design requirements.

F. Fully seat axial loaded studs in receiving tracks (maximum 1/16 inch gap between stud and track web).

G. Coordinate placement of insulation in multiple stud spaces after erection.

H. Install intermediate studs above and below openings to align with wall stud spacing.

I. Install studs with deflection allowance in stud track, directly below horizontal building framing at non-load bearing framing.

J. Attach cross studs furring channels to studs for attachment of fixtures anchored to walls.

K. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.

L. Touch-up field welds and damaged metallic coatings surfaces with primer to match shop coating.

M. Complete framing ready to receive finish/substrate.

3.3 ERECTION OF JOISTS AND PURLINS

A. Install framing components.

B. Make provisions for erection stresses. Install temporary bracing to maintain alignment, until permanent bracing and attachments are installed.

C. Place joists and purlins as shown on drawings. Connect joists to supports using fastener welding method.

D. Set floor, ceiling, and joists parallel and level, with lateral bracing and bridging.

E. Locate joist end bearing directly over load bearing studs or install load distributing member to top of stud track.

F. Install web stiffeners at reaction points.

G. Touch-up field welds and damaged metallic coatings surfaces with primer to match shop coating.

H. Complete framing ready to receive finish/substrate.

3.4 ERECTION TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Maximum Variation from Indicated Position: 1/8 inch in 10 feet.

C. Maximum Variation of Members from Plane: 1/8 inch in 10 feet.

3.5 SCHEDULES (SEE DRAWINGS)

END OF SECTION

SECTION 05 50 00 – METAL FABRICATIONS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes shop fabricated metal items.
1. Structural supports for miscellaneous attachments.
2. Anchor bolts.

B. Related Sections:
1. Section 03 30 00 - Cast-In-Place Concrete: Execution requirements for embedded anchors and attachments for metal fabrications specified by this section in concrete.
2. Section 04 20 00 - Unit Masonry: Execution requirements for embedded anchors and attachments for metal fabrications specified by this section in masonry.
3. Section 05 12 00 - Structural Steel Framing: Structural steel column anchor bolts.
4. Section 05 21 00 - Steel Joist Framing: Structural joist bearing plates, including anchorage.
5. Section 05 31 13 - Steel Floor Decking: Bearing plates, angles, and for metal deck bearing, including anchorage.
6. Section 05 51 00 - Metal Stairs.
7. Section 05 52 00 - Metal Railings.
8. Section 09 90 00 - Painting and Coating: Field applied paint finish.

1.2 UNIT PRICE - MEASUREMENT AND PAYMENT – N/A

1.3 REFERENCES

A. Aluminum Association:
1. AA DAF-45 - Designation System for Aluminum Finishes.

B. American Architectural Manufacturers Association:
1. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum.
2. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
3. AAMA 2604 - Voluntary specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.

4. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

C. ASTM International:
1. ASTM A36/A36M - Standard Specification for Carbon Structural Steel.
2. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
3. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
4. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
5. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
6. ASTM A269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service
7. ASTM A276 - Standard Specification for Stainless Steel Bars and Shapes.
8. ASTM A297/A297M - Standard Specification for Steel Castings, Iron-Chromium and Iron-Chromium-Nickel, Heat Resistant, for General Application.
9. ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
10. ASTM A312/A312M - Standard Specification for Seamless and Welded Austenitic Stainless Steel Pipes.
11. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
12. ASTM A354 - Standard Specification for Quenched and Tempered Alloy Steel Bolts, Studs, and Other Externally Threaded Fasteners.
13. ASTM A479/A479M - Standard Specification for Stainless Steel Bars and Shapes for Use in Boilers and Other Pressure Vessels.
14. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
15. ASTM A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
16. ASTM A554 - Standard Specification for Welded Stainless Steel Mechanical Tubing.
17. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts.
18. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
19. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
20. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
21. ASTM A992/A992M - Standard Specification for Structural Steel Shapes.

22. ASTM B26/B26M - Standard Specification for Aluminum-Alloy Sand Castings.
23. ASTM B85 - Standard Specification for Aluminum-Alloy Die Castings.
24. ASTM B177 - Standard Guide for Chromium Electroplating on Steel for Engineering Use.
25. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
26. ASTM B210 - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes.
27. ASTM B211 - Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod, and Wire.
28. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
29. ASTM B695 - Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.
30. ASTM F436 - Standard Specification for Hardened Steel Washers.
31. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength.

D. American Welding Society:
1. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination.
2. AWS D1.1 - Structural Welding Code - Steel.
3. AWS D1.6 - Structural Welding Code - Stainless Steel.

E. California Department of Health Services:
1. CA/DHS/EHLB/R-174 - Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda.

F. Green Seal:
1. GC-3 - Environmental Criteria for Anti-Corrosive Paints.
2. GC-03-2nd Edition, January 7, 1997 - Anti-Corrosive Paints.

G. National Ornamental & Miscellaneous Metals Association:
1. NOMMA Guideline 1 - Joint Finishes.

H. SSPC: The Society for Protective Coatings:
1. SSPC - Steel Structures Painting Manual.
2. SSPC SP 1 - Solvent Cleaning.
3. SSPC SP 10 - Near-White Blast Cleaning.
4. SSPC Paint 15 - Steel Joist Shop Paint.
5. SSPC Paint 20 - Zinc-Rich Primers (Type I - Inorganic and Type II - Organic).

SECTION 05 50 00
METAL FABRICATIONS

1.4 SUBMITTALS

A. Section 01 33 00 - Submittal Procedures: Submittal requirements.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable. Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.

C. Welders Certificates: Certify welders employed on the Work, verifying AWS qualification within previous 12 months.

1.5 SUSTAINABLE DESIGN SUBMITTALS

A. Section 01 81 13 - Sustainable Design Requirements: Requirements for sustainable design submittals.

B. Manufacturer's Certificate: Certify products meet or exceed specified sustainable design requirements.
   1. Materials Resources Certificates:
      a. Certify source and origin for salvaged and reused products.
      b. Certify recycled material content for recycled content products.
      c. Certify source for regional materials and distance from Project site.
   2. Indoor Air Quality Certificates:
      a. Certify volatile organic compound content for each interior paint and coating.

C. Product Cost Data: Submit cost of products to verify compliance with Project sustainable design requirements. Exclude cost of labor and equipment to install products.
   1. Provide cost data for the following products:
      a. Salvaged, refurbished, and reused products.
      b. Products with recycled material content.
      c. Regional products.

1.6 QUALITY ASSURANCE

A. Finish joints in accordance with NOMMA Guideline 1.

B. Perform Work in accordance with State standard.

C. Maintain one copy of each document on site.

1.7 QUALIFICATIONS

A. Design under direct supervision of Professional Engineer experienced in design of this Work and licensed in State of Mississippi.

SECTION 05 50 00
METAL FABRICATIONS

1.8 MOCKUP - N/A

1.9 DELIVERY, STORAGE, AND HANDLING

A. Section 01 60 00 - Product Requirements: Product storage and handling requirements.

B. Accept metal fabrications on site in labeled shipments. Inspect for damage.

C. Protect metal fabrications from damage by exposure to weather.

1.10 FIELD MEASUREMENTS

A. Verify field measurements are as on shop drawings. Contractor shall field-verify all measurements shown on Drawings prior to fabrication and construction.

PART 2 PRODUCTS

2.1 SUSTAINABILITY CHARACTERISTICS

A. Section 01 81 13 - Sustainable Design Requirements: Requirements for sustainable design compliance.

B. Materials and Resources Characteristics:
1. Recycled Content Materials: Furnish materials with maximum available recycled content.
2. Regional Materials: Furnish materials extracted, processed, and manufactured within 500 miles of Project site.

C. Indoor Environmental Quality Characteristics:
1. Paints and Coatings: Maximum volatile organic compound content in accordance with product and testing requirements of CA/DHS/EHLB/R-174.

D. Indoor Environmental Quality Characteristics:
1. Interior Anti-Corrosive Paints: Maximum volatile organic compound content in accordance with GC-03.

2.2 MATERIALS - STEEL

A. Structural W-Shapes: ASTM A992/A992M.

B. Channels and Angles: ASTM A36/A36M.

C. Steel Plate: ASTM A36/A36M.

D. Hollow Structural Sections: ASTM A500/A500M, Grade B.

E. Steel Pipe: ASTM A53/A53M, Grade B Schedule 40.

F. Sheet Steel: ASTM A653/A653M, Grade 33 Structural Quality, galvanized.

G. Bolts: ASTM A325; Type 1.

H. Nuts: ASTM A563 heavy hex type.

I. Washers: ASTM F436; Type 1.

J. Welding Materials: AWS D1.1; type required for materials being welded.

K. Shop Primer: SSPC Paint 15, Type 1, red oxide.

L. Touch-Up Primer: Match shop primer.

M. Touch-Up Primer for Galvanized Surfaces: SSPC Paint 20 Type I Inorganic.

2.3 STRUCTURAL SUPPORTS

A. Joist Hangers: As shown on Drawings or equal substitution approved by Engineer of Record.

B. Other Structural Supports: Steel sections, shape and size as indicated on Drawings or required to support applied loads with maximum deflection of 1/240 of the span; prime paint, one coat.

2.4 ANCHORS

A. Anchors: As shown on Drawings.

2.5 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Continuously seal joined members by intermittent welds and plastic filler.

D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

E. Exposed Welded Joints: NOMMA Guideline 1 Joint Finish.

F. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

G. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.6 FACTORY APPLIED FINISHES - STEEL

A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

B. Do not prime surfaces in direct contact with concrete or where field welding is required.

C. Prime paint items with one coat except where galvanizing is specified.

D. Galvanizing: ASTM A123/A123M; hot dip galvanize after fabrication.

E. Galvanizing for Fasteners, Connectors, and Anchors:
1. Hot-Dipped Galvanizing: ASTM A153/A153M.
2. Mechanical Galvanizing: ASTM B695; Class 50 minimum.

F. Chrome Plating: ASTM B177, weight, nickel-chromium alloy, polished finish.

2.7 FABRICATION TOLERANCES

A. Squareness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.

D. Maximum Bow: 1/8 inch in 48 inches.

E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.1 EXAMINATION

A. Section 01 30 00 - Administrative Requirements: Coordination and project conditions.

B. Verify field conditions are acceptable and are ready to receive Work.

SECTION 05 50 00
METAL FABRICATIONS

3.2 PREPARATION

A. Clean and strip primed steel items to bare metal and aluminum where site welding is required.

B. Supply steel items required to be cast into concrete or embedded in masonry with setting templates to appropriate sections.

3.3 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Make provisions for erection stresses. Install temporary bracing to maintain alignment, until permanent bracing and attachments are installed.

C. Field weld components indicated on shop drawings.

D. Perform field welding in accordance with AWS D1.1.

E. Obtain approval of Architect/Engineer prior to site cutting or making adjustments not scheduled.

F. After erection, touch up welds, abrasions, and damaged finishes with prime paint or galvanizing repair paint to match shop finishes.

3.4 ERECTION TOLERANCES

A. Section 01 40 00 - Quality Requirements: Tolerances.

B. Maximum Variation from Plumb: 1/4 inch per story or for every 12 ft in height whichever is greater, non-cumulative.

C. Maximum Offset From Alignment: 1/4 inch.

D. Maximum Out-of-Position: ¼ inch.

3.5 FIELD QUALITY CONTROL

A. Welding: Inspect welds in accordance with AWS D1.1.

SECTION 05 50 00
METAL FABRICATIONS

END OF SECTION