100% PROJECT MANUAL

COMMERCE 2.0 MGD GROVE CREEK WPCP

COMMERCE, GEORGIA

for

CITY OF COMMERCE

BID DOCUMENTS

March 2025

Prepared By

Goodwyn Mills Cawood, LLC
6120 Powers Ferry Road NE
Suite 200
Atlanta, GA 30339
T: 770.952.2481
www.gmcnetwork.com

GMC PROJECT NUMBER: CATL230033

STATE OF GEORGIA
GOODWYN MILLS CAWOOD, LLC
No.PEF007898
Exp.06.30.2026
CERTIFICATE OF AUTHORIZATION

GEORGIA
REGISTERED
No. PE051452
PROFESSIONAL
Graham Sizemore
03.19.2025
ENGINEER
GRAHAM S. SIZEMORE

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Goodwyn Mills Cawood, LLC
Post Office Box 242128
Montgomery, AL 36124-2128
and
Birmingham, Alabama
Andalusia, Alabama
Auburn, Alabama
Daphne, Alabama
Eufaula, Alabama
Huntsville, Alabama
Mobile, Alabama
Vernon, Alabama
Lutz, Florida
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COMMERCE 2.0 MGD GROVE CREEK
WATER POLLUTION CONTROL PLANT

FOR

CITY OF COMMERCE

COMMERCE, GEORGIA

GMC PROJECT NO. CATL230033

TABLE OF CONTENTS

DIVISION 01 – GENERAL REQUIREMENTS

01 10 00	Summary
01 15 00	Measurement and Payment
01 21 00	Allowances
01 26 00	Contract Modification Procedures
01 29 00	Payment Procedures
01 29 00A	Contractor Progress Lien Waiver
01 29 00B	Subcontractor Progress Lien Waiver
01 31 00	Project Management and Coordination
01 32 00	Construction Progress Documentation
01 32 33	Photographic Documentation
01 33 00	Submittal Procedures
01 40 00	Quality Requirements
01 42 00	References
01 50 00	Temporary Facilities and Controls
01 60 00	Product Requirements
01 70 00	Execution and Closeout Requirements
01 78 23	Operation and Maintenance Data
01 78 39	Project Record Documents
01 79 00	Demonstration and Training
01 81 00	Geotechnical Data

DIVISION 02 – (NOT USED)

DIVISION 03 – CONCRETE

03 20 00	Anchorage in Concrete
03 30 00	Cast-in-Place Concrete
03 39 00	Concrete Curing
03 60 00	Grouting

DIVISION 04 – MASONRY

04 00 10	Unity Masonry Assemblies

DIVISION 05 – METALS

05 12 00	Structural Steel
05 35 15	Cold-Formed Metal Framing
05 40 00	Aluminum Handrail

05 50 00	Metal Fabrications
05 51 19	Metal Grating Stairs
05 52 13	Pipe and Tube Railings
05 53 13	Bar Gratings
05 60 00	Aluminum Hatches

DIVISION 06 – WOOD, PLASTICS, AND COMPOSITES

06 10 53	Miscellaneous Rough Carpentry
06 16 00	Sheathing
06 60 00	FRP Weir Plates, Scum Baffles and Brackets

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

07 21 00	Thermal Insulation
07 41 13	Standing-Seam Metal Roof Panels
07 42 93	Soffit Panels
07 54 23	Thermoplastic-Polyolefin (TPO) Roofing
07 62 00	Sheet Metal Flashing and Trim
07 84 00	Firestopping
07 92 00	Joint Sealants

DIVISION 08 – OPENINGS

08 11 13	Hollow Metal Doors and Frames
08 51 13	Aluminum Windows
08 71 00	Door Hardware

DIVISION 09 – FINISHES

09 22 16	Non-Structural Metal Framing
09 29 00	Gypsum Board
09 51 13	Acoustical Panel Ceilings
09 96 00	High-Performance Coatings

DIVISION 10 – SPECIALTIES

10 14 00	Signage

DIVISION 11 - 12 – (NOT USED)

DIVISION 13 – SPECIAL CONSTRUCTION

13 10 00	Bypass Pumping
13 31 00	Fiberglass Reinforced Building Enclosure
13 34 23.11	Fabricated Electrical Houses

DIVISION 14 – 22 (NOT USED)

DIVISION 23 – HEATING, VENTILATING, AND AIR CONDITIONING (NOT USED)

DIVISION 24 – 25 (NOT USED)

DIVISION 26 – ELECTRICAL

26 05 00	Common Work Results for Electrical
26 05 19	Conductors
26 05 26	Grounding and Bonding
26 05 33	Raceways and Boxes
26 05 73	Short Circuit/Coordination Study
26 22 13	Low Voltage Transformers
26 24 16	Panelboards
26 27 26	Wiring Devices
26 28 11	Molded Case Circuit Breakers
26 28 16	Safety Switches
26 29 23	Variable Frequency Drives
26 32 13	Generators
26 35 26	Active Harmonic Filter
26 36 23	Automatic Transfer Switches
26 50 00	Lighting

DIVISON 27 – COMMUNICATIONS

27 05 26	Grounding and Bonding for Communications Systems
27 05 28	Pathways for Communications Systems
27 05 28.29	Hangers and Supports for Communications Systems
27 11 00	Communications Equipment Room Fittings
27 13 23	Communications Optical Fiber Backbone Cabling
27 15 13	Communications Copper Horizontal Cabling
27 15 23	Communications Optical Fiber Horizontal Cabling

DIVISION 28 – 30 (NOT USED)

DIVISION 31 – EARTHWORK

31 05 16	Aggregates for Earthwork
31 10 00	Site Clearing
31 20 00	Earth Moving
31 23 16.13	Excavation and Trenching
31 23 16.26	Rock Removal
31 23 19	Dewatering
31 25 00	Erosion and Sedimentation Controls
31 50 00	Excavation Support and Protection

DIVISION 32 – EXTERIOR IMPROVEMENTS

32 05 19	Geosynthetics for Exterior Improvements
32 12 16	Asphalt Paving
32 13 13	Concrete Paving
32 31 13	Chain Link Fence and Gates
32 91 13	Soil Preparation
32 92 00	Turf and Grasses
32 92 19	Seeding and Restoration

DIVISION 33 – UTILITIES

33 01 30.13	Sewer and Manhole Testing
33 01 30.51	Pumping and Bypassing
33 01 30.61	Sewer and Pipe Joint Sealing
33 01 30.62	Manhole Grout Sealing
33 05 05.31	Hydrostatic Testing
33 05 13	Manholes and Structures
33 05 16.13	Precast Concrete Utility Structures
33 05 26	Utility Identification
33 31 00	Sanitary Utility Sewerage Piping
33 41 13	Public Storm Utility Drainage Piping

DIVISION 34 – 39 (NOT USED)

DIVISION 40 – PROCESS INTERCONNECTIONS

40 05 06	Couplings Adapters Specials for Process Piping
40 05 07	Hangers and Supports for Process Piping

40 05 13	Common Requirements for Process Piping
40 05 19	Ductile Iron Process Pipe
40 05 23	Stainless Steel Process Pipe and Tubing
40 05 31	Thermoplastic Process Pipe
40 05 51	Common Requirements for Process Valves
40 05 53	Identification for Process Piping
40 05 57	Actuators for Process Valves and Gates
40 05 59	Aluminum Slide Gates
40 05 62	Plug Valves
40 05 63	Ball Valves
40 05 64	Butterfly Valves
40 05 65.23	Swing and Disc Check Valves
40 05 78.21	Air Release Valves for Wastewater Service
40 42 13	Process Piping Insulation
40 70 00	Instrumentation Devices
40 71 13	Magnetic Flow Meters
40 71 69	Parshall Flume
40 72 13	Ultrasonic Level Meters
40 72 43.00	Pressure and Differential Pressure Type Level Meters
40 72 76	Level Switches
40 73 13	Pressure & Differential Pressure Gauges
40 73 64	Annular Pressure Seals
40 75 00	Refrigerated Auto Sampler
40 75 13	PH ORP Sensors
40 75 43	Fluorescent Dissolved Oxygen Measuring
40 90 00	Instrumentation and Control for Process Systems
40 94 03	Programmable Logic Controller Subsystem (PLCS)

DIVISION 41 - MATERIAL PROCESSING & HANDLING EQUIP

41 15 13	Chemical IBC Tote Scale
41 22 14	Jib Cranes
41 22 24	Electrified Monorail Hoist

DIVISION 42 (NOT USED)

DIVISION 43 – PROCESS GAS AND LIQUID HANDLING, PURIFICATION AND STORAGE EQUIPMENT

SECTION 04 00 10 – UNIT MASONRY ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. The extent of each type of masonry work is indicated on the Drawings and Schedules.

B. This Section includes the following:

1. Concrete unit masonry.
2. Decorative concrete masonry units.
3. Standard grey color mortar at painted interior and concealed locations and custom colored mortar at exposed exterior and other locations.
4. Anchors, ties, reinforcing, insulation, masonry accessories, concealed flashings, and steel lintels.
5. Cavity Drainage Material.
6. Water Repellents:

    a. Field mixed as integral component of all exterior mortar and grout.
    b. Field applied to all completed exterior masonry work.

1.2 RELATED DOCUMENTS:

A. Related work specified elsewhere includes:

1. Section 03 30 00 – Cast-in-Place Concrete
2. Section 07 21 00 – Thermal Insulation
3. Section 07 92 00 – Joint Sealants
4. Section 09 96 00 - High-Performance Coatings

1.3 SYSTEM PERFORMANCE REQUIREMENTS

A. Provide concrete unit masonry that develops the following installed compressive strengths (f'_m): f'_m = 1,500 psi.

1.4 SUBMITTALS

A. General:

1. Submit the following in accordance with Conditions of the Contract.
2. Manufacturer's product data for each different masonry unit, accessory, water repellents, and other manufactured product indicated, including certifications that each item and type complies with specified requirements.

    a. Include instructions for handling, storage, installation, and protection.

B. Shop drawings for reinforcing, if any, detailing fabrication, bending, and placement of unit masonry reinforcing bars. Comply with ACI 315 "Details and Detailing of Concrete Reinforcing" showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of masonry reinforcement.

C. Samples for initial verification purposes, the following:

1. Colored masonry mortar samples to coordinate with brick color scheme selected by Owner.
2. Split face CMU color samples, showing full extent of colors and variations anticipated, for each standard and special shape unit.

1.5 QUALITY ASSURANCE

A. Fire Performance Characteristics: Where indicated, provide materials and construction identical to those of assemblies whose fire resistance has been determined per ASTM E 119 by a testing and inspecting organization, by equivalent concrete masonry thickness, or by another means, as acceptable to authorities having jurisdiction.

B. Single-Source Responsibility for Masonry Units: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces.

C. Single-Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source and producer for each aggregate.

D. Single-Source Responsibility for Water Repellents: Obtain integrated applied water repellents from a single manufacturer for the entire project.

1. Verify full compatibility with any other coatings, fluid applied waterproofing, etc., prior to application of this and other products. Notify Engineer in writing and in detail, of any incompatible products, prior to any application, and await Engineer’s written direction on how to proceed.

E. Field-Constructed Mock-Ups: Prior to installation of unit masonry (min 30 days), erect sample wall panels to further verify selections made under sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution. Build mock-ups to comply with the following requirements, using materials indicated for final unit of Work:

1. Locate mock-ups on site in locations indicated or, if not indicated, as directed by Engineer.
2. Build mock-ups for the following types of masonry in sizes of approximately 4 feet long by 4 feet high by full thickness, including face and backup wythes as well as accessories.

    a. Each type of exposed unit masonry construction, utilizing mortar color and joint detail selected and/or specified.
    b. Incorporate integral and applied water repellents, the same as required for the completed work.

3. Notify Engineer one week in advance of the dates and times when mock-ups will be erected.

4. Protect mock-ups from the elements with weather-resistant membrane.
5. Retain and maintain mock-ups during construction in undisturbed condition as standard for judging completed unit masonry construction.

    a. When directed, demolish and remove mock-ups from Project site.

F. Subcontractors:

1. Subcontractors shall have been established in their own firms for at least 5 verifiable years and shall have successfully completed at least 4 verifiable projects of this size, scope, and complexity. Furnish names and telephone numbers of General Contractors for each project submitted for consideration of experience requirements.

1.6 DELIVER, STORAGE, AND HANDLING

A. Deliver masonry materials to project in undamaged condition.

B. Store and handle masonry units off the ground, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not place until units are in an air-dried condition.

C. Store cementitious materials and insulation off the ground, under cover, and in dry location.

D. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

E. Store masonry accessories including metal items to prevent corrosion and accumulation of dirt and oil.

F. Store water repellents in strict accordance with manufacturer's written recommendations, off of ground, under cover, and otherwise as required to protect from damage, contamination, etc.

1.7 PROJECT CONDITIONS

A. Protection of Masonry:

1. During erection, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
2. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
3. Where one wythe of multi-wythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe and hold cover in place.

B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.

C. Stain Prevention:

1. Prevent grout, mortar, and soil from staining the face of masonry to be left exposed, painted, and/or to receive any other coatings. Remove immediately any grout, mortar, and soil that come in contact with such masonry.
2. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface, until landscaping or other improvements indicated adjacent to completed masonry work are in place.
3. Protect sills, ledges, and projections from mortar droppings.
4. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes from mortar droppings, coatings, water repellents, and/or any other damage.

D. Clean Air Space:

1. Prevent grout and mortar from occurring in, bridging, forming ledges, and/or filling air space between masonry and back-up walls.
2. Remove excess grout and mortar flush with back side of masonry as work progresses, using trowel, board pulled up through air space, or other effective and acceptable method(s), pre-approved by Engineer.

E. Cold-Weather Construction: Comply with referenced unit masonry standard for cold-weather construction and the following:

1. Do not lay masonry units that are wet or frozen.
2. Remove masonry damaged by freezing conditions.

F. Hot-Weather Construction: Comply with referenced unit masonry standard, or applicable Building Code requirements.

G. Thoroughly clean and rinse all masonry prior to application of water repellents, water-proofing, coatings, paint, etc. Comply with written recommendations of each manufacturer of products to be applied to masonry work.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Comply with referenced unit masonry standard and other requirements specified in this Section applicable to each material indicated.

2.2 CONCRETE MASONRY UNITS

A. General:

1. Comply with requirements indicated below applicable to each form of concrete masonry unit required.
2. Provide special shapes where indicated and as follows:

a. For lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.

b. Square-edged units for outside corners, except where indicated as bullnose, or otherwise required.

3. Size: Provide concrete masonry units complying with requirements indicated below for size that are manufactured to specified face dimensions within tolerances specified in the applicable referenced ASTM specification for concrete masonry units.
4. Concrete Masonry Units:

   a. Manufacturer's standard 16-inches long x 8-inches x 8-inches nominal dimension, unless indicated otherwise on Drawings.
   b. Provide manufactured 1/4-notched foundation block and other preformed shapes, if any, as indicated on the Drawings.

5. Concrete Building Brick: Standard Modular, 3-5/8-inches wide by 2-1/4-inches high by 7-5/8-inches long.
6. Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated.

B. Hollow Load-Bearing Concrete Masonry Units - (CMU):

1. ASTM C 90, Grade N, Type 1.
2. Unit Compressive Strength: Provide units with minimum average net area compressive strength of 1,900 psi.
3. Weight Classification: Lightweight, at above-grade locations.
4. Weight Classification: Normal weight, at below-grade locations.

C. Concrete Building Brick:

1. ASTM C 55, Grade N, Type 1.
2. Unit Compressive Strength: Provide units with minimum average net area compressive strength of 3,500 psi.
3. Weight Classification: Lightweight.

B. Decorative CMUs: ASTM C90.

1. Density Classification: Normal weight.
2. Size (Width): Manufactured to dimensions specified in "CMUs" Paragraph.
3. Pattern and Texture:

   1. Standard pattern, split-face finish.

   (ii) Colors: As selected by Engineer from manufacturer's full range.

2.3 MORTAR AND GROUT MATERIALS

A. Portland Cement for Grout: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce required mortar color.

B. Masonry Cement:

1. ASTM C 91.

2. For colored pigmented mortars use premixed colored masonry cements of formulation required to produce color to match that at existing facilities indicated.

C. Sand: ASTM C 144.

D. Hydrated Lime: ASTM C 207, Type S.

E. Aggregate for Mortar:

1. ASTM C 144, except for joints less than 1/4 inch use aggregate graded with 100 percent passing the No. 16 sieve.
2. White Mortar Aggregates: Natural white sand or ground white stone.

F. Aggregate for Grout: ASTM C 404.

G. Colored Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with record of satisfactory performance in masonry mortars.

H. Water: Clean and potable.

2.4 REINFORCING STEEL

A. General: Provide reinforcing steel complying with requirements of referenced unit masonry standard and this article.

B. Steel Reinforcing Bars: Billet steel complying with ASTM A 615.

2.5 JOINT REINFORCEMENT

A. General:

1. Provide joint reinforcement complying with requirements of referenced unit masonry standards and this article, formed from the following:
2. Galvanized carbon steel wire, coating class as required by referenced unit masonry standard for application indicated, complying with ASTM A 82, hot-dipped galvanized after fabrication to comply with ASTM A 153, class B-2 coating (1.5 ounces per square foot).

B. Description: Provide welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10 feet in widths approximately 2 inches less than nominal width of walls and partitions, as required for full mortar embedment and mortar coverage of not less than 5/8 inch at exterior sides and not less than 1/2 inch elsewhere; with prefabricated corner and tee units, and complying with requirements indicated below, unless otherwise indicated:

1. Wire Diameter for Side Rods: 09 gage
2. Wire Diameter for Cross Rods: 0.1483 inch (9 gage).
3. For single-wythe CMU masonry provide type as follows with single pair of side rods:

a. Truss design with continuous diagonal cross rods spaced not more than 16 inches o.c.

4. For multi-wythe masonry provide type as follows:

    a. Truss design with diagonal cross rods spaced not more than 16 inches o.c. and number of side rods as follows:

        1) Number of Side Rods for Multi-wythe Concrete Masonry: One side rod for each face shell of hollow masonry units more than 4 inches in nominal width plus one side rod for each wythe of masonry 4 inches or less in nominal width.

C. Manufacturers: Subject to compliance with requirements, provide joint reinforcement by one of the following:

1. AA Wire Products Co.
2. Dur-O-Wal, Inc.
3. Heckman Building Products, Inc.
4. Hohmann & Barnard, Inc.
5. Masonry Reinforcing Corp. of America.
6. National Wire Products Industries.
7. Southern Construction Products, Inc.

2.6 TIES AND ANCHORS, GENERAL

A. General: Provide ties and anchors specified in subsequent articles that comply with requirements for metal and size of referenced unit masonry standards and of this article.

B. Galvanized Carbon Steel Wire:

1. ASTM A 82, coating class as required by referenced unit masonry standard for application indicated.
2. Wire Diameter: 0.1875 inch.

C. Galvanized Steel Sheet as follows: ASTM A 366 (commercial quality) cold-rolled carbon steel sheet hot-dip galvanized after fabrication to comply with ASTM A 153, Class B2 (for unit lengths over 15 inches) and Class B3 (for unit lengths under 15 inches), for sheet metal ties and anchors exposed to the weather and not completely embedded in mortar and grout.

D. Thickness of Steel Sheet Galvanized After Fabrication: Uncoated thickness of steel sheet hot-dip galvanized after fabrication:

1. 0.0598 inch (16 gage).

E. Steel Plates and Bars: ASTM A 36, hot-dip galvanized to comply with ASTM A 123 or ASTM A 153, Class B3, as applicable to size and form indicated.

F. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. AA Wire Products Co.
2. Dur-O-Wal, Inc.
3. Heckman Building Products, Inc.
4. Hohmann & Barnard, Inc.

5. Masonry Reinforcing Corp. of America.
6. National Wire Products Industries.
7. Southern Construction Products, Inc.

2.7 ADJUSTABLE ANCHORS, FOR CONNECTING MASONRY TO STRUCTURAL FRAMEWORK

A. General: Two-piece assemblies as described below allowing vertical or horizontal differential movement between wall and framework parallel to plane of wall, but resisting tension and compression forces perpendicular to it.

B. For anchorage to new concrete, provide manufacturer's standard with dovetail anchor section formed from sheet metal and triangular-shaped wire tie section sized to extend within 1-inch of masonry face and 16-inches o.c. vertically and 24-inches o.c. horizontally (minimum).

C. For anchorage to steel framework provide manufacturer's standard anchors with crimped 1/4-inch-diameter wire anchor section for welding to steel and triangular-shaped wire tie section sized to extend within 1-inch of masonry face and 24-inches o.c. vertical (minimum):

1. Wire Diameter: 0.1875 inch.

2.8 RIGID ANCHORS AT LOCATIONS INDICATED OR REQUIRED

A. Provide straps of form and length indicated, or required (if any), fabricated from metal strips 1-1/2-inches wide by 1/4-inch thick.

2.9 MISCELLANEOUS ANCHORS AT LOCATIONS INDICATED OR AS REQUIRED BY PROJECT CONDITIONS

A. Unit Type Masonry Inserts new in Concrete: Cast iron or malleable iron inserts of type and size indicated.

B. Dovetail Slots for New Concrete: Furnish dovetail slots, with filler strips, of slot size indicated, fabricated from 0.0336-inch (22-gage) galvanized sheet metal.

C. Anchor Bolts: Steel bolts complying with A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers; hot-dip galvanized to comply with ASTM A 153, Class C; of diameter and length indicated and in the following configurations, as indicated on the Drawings, or if not indicated, as required for the intended use:

1. Headed bolts.
2. Nonheaded bolts, straight.
3. Nonheaded bolts, bent in manner indicated.

2.10 ADJUSTABLE MASONRY VENEER ANCHORS FOR CONNECTING MASONRY TO METAL STUDS AND WHERE THRU-WALL JOINT REINFORCING CANNOT BE USED

A. General: Provide 2-piece assemblies where required (if any), allowing vertical or horizontal differential movement between wall and framework parallel to plane of wall, but resisting tension and compression forces perpendicular to it; for attachment over sheathing to metal studs or masonry back-up and with the following structural performance characteristics:

1. Structural Performance Characteristics: Capable of withstanding a 100-lbf load in either tension or compression without deforming over, or developing play in excess of, 0.05-inch.

B. Screw-Attached (to studs) and expansion anchor attached (to existing masonry back-up) Masonry Veneer Anchors:

1. Units consisting of wire tie section and metal anchor section complying with the following requirements:

a. Wire Tie Shape: Z-shaped pintel.
b. Wire Tie Length: As required to extend 1-1/2-inches into masonry wythe of veneer face.

2. Anchor Section: 16-gauge sheet metal plate, with screw hole(s) at top and outward legs bent to form leg to bridge insulation and abut studs, or masonry; of overall size as required for intended application.

C. Steel Drill Screws for Steel Studs or Masonry: ASTM C 954 except manufactured with hex washer head and neoprene washer, #10 diameter by length required to penetrate steel stud flange by not less than 3-exposed threads, and masonry but not less than 1-inch, and with corrosion protective coating; as recommended by manufacturer for the intended use.

D. Products: Subject to compliance with requirements, provide products of one of the following manufacturers:

1. Jim Taylor, Inc./Ty-wal.
2. National Wire Products Industries/Pos-i-tie.
3. Elco Industries/Tapcon
4. Hilti Corporation
5. Rawl Plug Co., Inc. (Zamac Nail-in anchor system, additional acceptable fasteners for masonry veneer and some other anchors).

E. Galvanize all components

2.11 POST-INSTALLED ANCHORS, WHERE INDICATED OR AS REQUIRED

A. Anchors as described below, with capability to sustain, without failure, load imposed within factors of safety indicated, as determined by testing per ASTM E 488, conducted by a qualified independent testing laboratory.

1. Type: Expansion anchors.
2. Material: Zinc-plated carbon steel, hot-dipped galvanized after fabrication, or Zamac, or other non-corrosive or coated material in compliance with requirements and submitted for prior approval.

3. For post-installed anchors in grouted concrete masonry units: Capability to sustain, without failure, a load equal to 6-times loads imposed by masonry.

2.12 EMBEDDED FLASHING MATERIALS

A. Rubberized Asphalt and Cross-Laminated Polyethylene Film Composite Sheet Flashing:

1. Flexible sheet flashings especially formulated from rubberized asphalt and composite with materials, to remain flexible and waterproof in concealed masonry applications, black in color and of thickness indicated below:

a. Thickness: 40-mils.

2. Product/Manufacturer: "Perm-A-Barrier," as manufactured by W. R. Grace & Co., or pre-approved equivalent submitted at least 14-days prior to original Bid Date and subsequently approved, including mastic, and where required companion surface conditioner product, and all other materials and components required.
3. Application: Use where flashing is fully concealed in masonry, including in part, wall flashing, below parapets, wall caps and sills, at lintels, above grade weeps at base of exterior walls, etc.

B. Adhesive for Flashings: Bituthene mastic, except when other type recommended by manufacturer of flashing material for use indicated.

2.13 MISCELLANEOUS MASONRY ACCESSORIES

A. Nonmetallic Expansion Joint Strips: Pre-molded filler strips complying with ASTM D 1056, Type 2 (closed cell), Class A (cellular rubber and rubber-like materials with specific resistance to petroleum base oils), Grade 1 (compression-deflection range of 2-5 psi), compressible up to 35 percent, of width and thickness indicated, formulated from the following material:

1. Flexible Cellular Neoprene.

B. Preformed Control Joint Gaskets:

1. Material as indicated below, designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated, or if not indicated, T-shape (or other special shapes required by project conditions to fit inside sash block, and of depth through joint to allow proper sealant application with only one backer rod.
2. Styrene-Butadiene Rubber Compound: ASTM D 2000, Designation 2AA-805.

C. Bond Breaker Strips: Asphalt-saturated organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

D. Weep Holes, provide the following: Cotton sash cord; 3/8-inch outside diameter by length(s) as required to overlap cord 2-inches past adjacent weep hole at bottom of air space at interior wall cavity, extend through exterior wythe(s), and 4-inches on exterior side - until water repellent is applied and excess is trimmed flush with raked mortar joint at flashing.

1. Wet cord prior to embedding in mortar.

2.14 MASONRY CLEANERS

C. Proprietary Buffered Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1) Diedrich Technologies, Inc.
2) EaCo Chem, Inc.
3) ProSoCo, Inc.
4) Or Approved Equal.

B. Chemical Applicator must be trained and use equipment approved by the chemical manufacturer

2.15 MORTAR AND GROUT MIXES

A. General:

1. Do not add admixtures including coloring pigments, air-entraining agents, accelerators, retarders, water repellent agents, antifreeze compounds, or other admixtures, unless otherwise indicated.
2. Do not use calcium chloride in mortar or grout.

B. Mixing: Combine and thoroughly mix cementitious, water and aggregates in a mechanical batch mixer; comply with referenced ASTM standards for mixing time and water content.

C. Mortar for Unit Masonry:

1. Comply with ASTM C 270, Proportion Specification, for types of mortar required, unless indicated otherwise.
2. Use type M mortar for masonry below grade and in contact with earth, and where indicated.
3. Use type S mortar for reinforced masonry and where indicated.
4. Use type S mortar for exterior, above-grade load-bearing and non-loadbearing walls and parapet walls; for interior load-bearing walls; for interior non-loadbearing partitions, and for other applications where another type is not indicated.

D. Mortar Colors: To coordinate with brick and block veneer color selections as approved by Owner.

E. Grout for Unit Masonry:

1. Comply with ASTM C 476 for grout for use in construction of reinforced and nonreinforced unit masonry. Use grout of consistency indicated or if not otherwise indicated, of consistency (fine or coarse) at time of placement which will completely fill all spaces intended to receive grout.
2. Use fine grout in grout spaces less than two inches (2") in horizontal direction, unless otherwise indicated.

3. Use coarse grout in grout spaces two inches (2") or more in least horizontal dimension, unless otherwise indicated.

2.16 DRAINAGE FILL FOR CAVITY WALLS

A. General:

1. Provide drainage fill at flashing locations in cavity walls and where shown.

B. Manufacturers:

1. Spycor Building Products – Mount Pleasant, SC (MBII Mortar Break)
2. MasonPro – Northville, MI (Pronet DT)
3. Approved Equal

B. Drainage Fill System.

1. Polymer Core geomatrix woven into a 1.5” thick mat with approximate installed depth of 10 inches.

2.17 WATER REPELLENT

A. Provide from a manufacturer and by an applicator complying with experience requirements in "Special Conditions," as follows: 40% Silane Solution in alcohol carrier.

B. Submit for approval prior to application.

C. Application rate not to exceed 125 SF per gallon.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other specific conditions, and other conditions affecting performance of unit masonry.

1. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of unit masonry, if any.

B. Examine rough-in and built-in construction to verify actual locations of other or related work, prior to installation.

C. Do not proceed until any unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Comply with referenced unit masonry standards and other requirements indicated, applicable to each type of installation included in Project.

B. Thickness: Build cavity and composite walls and other masonry construction to the full thickness shown. Build single-wythe walls to the actual thickness of the masonry units, using units of nominal thickness indicated.

C. Build chases and recesses as shown or required to accommodate items specified in this and other Sections of the Specifications. Provide not less than 8 inches of masonry between chase or recess and jamb of openings and between adjacent chases and recesses.

D. Leave openings for equipment to be installed before completion of masonry. After installation of equipment, complete masonry to match construction immediately adjacent to the opening.

E. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full-size units without cutting where possible.

1. Use dry cutting saws to cut concrete masonry units.

F. Wetting Clay Brick: Wet brick made from clay or shale which have ASTM C 67 initial rates of absorption (suction) of much than 30 grams per 30 sq. in. per minute. Use wetting methods which ensure each clay masonry unit being nearly saturated but surface dry when laid.

G. Do not wet concrete masonry units.

H. Cleaning Reinforcing: Before placing, remove loose rust, ice and other coatings from reinforcing.

I. Wet sash cord weeps prior to embedding in mortar, so it will not draw water out of mortar.

3.3 CONSTRUCTION TOLERANCES – REQUIRED FOR ACCEPTANCE

A. Comply with construction tolerances of referenced unit masonry standards.

B. Variation from Plumb: For vertical lines and surfaces of columns, walls and arises do not exceed 1/4-inches in 10-feet, or 3/8-inches in a story height not to exceed 20-feet, nor 1/2-inches in 40-feet or more. For external corners, expansion joints, control joints, and other conspicuous lines, do not exceed 1/4-inches in any story or 20-feet maximum, nor 1/2-inch in 40-feet or more. For vertical alignment of head joints do not exceed plus or minus 1/4-inches in 10-feet, 1/2-inch maximum.

C. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4-inches in any bay or 20-feet maximum, nor 1/2-inches in 40' or more. For top surface of bearing walls do not exceed 1/8-inches between adjacent floor elements in 10' or 1/16" within width of a single unit.

D. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls and partitions, do not exceed 1/2" in any bay or 20' maximum, nor 3/4" in 40' or more.

E. Variation in Cross Sectional Dimensions: Do not exceed bed joint thickness indicated by more than plus or minus 1/8". Do not exceed head joint thickness indicated by more than plus or minus 1/8".

3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurate locating of openings, movement-type joints, returns, and offsets. Avoid the use of less-than-half-size units at corners, jambs, and where possible at other locations.

B. Layup walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other construction.

C. Bond Pattern for Exposed Masonry: Lay exposed masonry in the following bond pattern; do not use units with less that nominal 4-inch horizontal face dimensions at corners or jambs.

1. Running bond, unless otherwise indicated on Drawings.

D. Lay concealed masonry with all units in a wythe in running bond or bonded by lapping not less than 2 inches. Bond and interlock each course of each wythe at corners. Do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs.

E. Stopping and Resuming Work: In each course, rack back 1/2-unit length in each course; do not tooth. Clean exposed surfaces of set masonry, wet masonry units lightly (if required), and remove loose masonry units and mortar prior to laying fresh masonry.

F. Built-In Work:

1. As construction progresses, build-in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.
2. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.
3. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of zinc expanded metal lath in the joint below and rod mortar or grout into core.
4. Fill cores in hollow concrete masonry units with grout 3 courses (24 inches) under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

G. Build non-load-bearing interior partitions full height of story to underside of sold floor or roof structure above unless otherwise indicated.

1. Install compressible filler in joint between top of partition and underside of structure above.
2. Fasten partition top anchors to structure above and building into top of partition. Grout cells of CMUs solidly around plastic tubes down into grout to provide ½-in clearance between end of anchor rod and end of tube. Space anchors 48 inches o.c. unless otherwise indicated.

3.5 MORTAR BEDDING AND JOINTING

A. Lay hollow concrete masonry units as follows:

1. With full mortar coverage on horizontal and vertical face shells and cross webs.
2. Bed webs in mortar in starting course on footings and in all courses of walls, piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.
3. For starting course on footings where cells are not grouted, spread out full mortar bed including areas under cells.

B. Cut joints flush for masonry walls to be concealed or to be covered by base, crown moulding, and/or other materials, unless otherwise indicated.

C. Tool all joints in exposed exterior work as follows:

1. Tooled slightly concave with a tool of at least 50% but no more than 100% larger than joint width, at CMU and concealed masonry.

D. Tool all joints in all interior work as follows:

1. Tooled same as for CMU and concealed masonry at exterior.
2. Struck smooth behind base and crown mouldings.

E. Maintain joint widths of 3/8 inch, except for minor variations required to maintain bond alignment, or as otherwise required to align with or mach adjacent existing work.

F. Collar Joints: After each coarse is laid, fill vertical longitudinal joint between wythes solidly with mortar, for the following work:

1. Exterior walls, except where clear air space above flashing is indicated.
2. Interior bearing walls.

3.6 STRUCTURAL BONDING OF MULTI-WYTHE MASONRY

A. Use continuous horizontal joint reinforcement installed in horizontal mortar joints for bond tie between wythes, at 16 inches o.c. vertically (maximum) at running bond and 8 inches o.c. (maximum) at stacked bond.

B. Corners:

1. Provide interlocking masonry unit bond in each course at corners, unless otherwise shown.
2. Provide continuity with horizontal joint reinforcement at corners using prefabricated "L" units, in addition to masonry bonding.

C. Intersecting and Abutting Walls:

1. Unless vertical expansion or control joints are shown or necessary at juncture, provide same type of bonding specified for structural bonding between wythes and space as follows:
2. Provide individual metal ties to columns and stud walls, at 16 inches o.c. vertically (maximum).

a. Provide additional anchors within 1'-0" of openings and at intervals around perimeter not exceeding 3'-0" o.c.

3. Provide continuity with horizontal joint reinforcement using prefabricated "T" units.
4. Provide continuous dovetail slots, with anchors at 16 inches o.c. maximum vertically and 24 inches o.c., at new concrete back-up walls, columns, etc.

3.7 MASONRY CAVITY WALL AND MASONRY – CELL INSULATION

A. Provide a thermal and acoustical amino-plast foam insulation inside unit masonry cells according to Section 07 21 00 – Thermal Insulation.

3.8 CAVITIES/AIR SPACES

A. Keep cavities/air spaces clean of mortar droppings and other materials during construction. Strike joints facing cavities/air spaces flush.

1. Where not possible and at metal studs, tie exterior wythe to backup with individual metal ties spaced not more than 16 inches o.c. vertically and 24" o.c. horizontally. Stagger alternate courses.

B. Provide weepholes in exterior wythe of new cavity walls, located immediately above ledges and flashing, spaced 32 inches o.c. unless otherwise indicated.

C. Tie exterior wythe to backup and multi-wythe walls with continuous horizontal joint reinforcing at 16 inches o.c. vertically.

3.9 HORIZONTAL JOINT REINFORCEMENT

A. General: Provide continuous horizontal joint reinforcement as indicated and as required by Code, but not more than 16 inches o.c. vertically at running bond and 8 inches o.c. vertically at stacked bond. Install longitudinal side rods in mortar for their entire length with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcing a minimum of 6 inches.

B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

C. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

D. Reinforce masonry openings greater than 1'-0" wide, with horizontal joint reinforcement placed in 2 horizontal joints approximately 8" apart, immediately above the lintel and immediately below the sill. Extend reinforcement a minimum of 2’-0" beyond jambs of the opening except at control joints.

3.10 ANCHORING MASONRY WORK

A. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:

1. Provide an open space not less than 1 inch in width between masonry and structural member, unless otherwise indicated. Keep open space free of mortar or other rigid materials.
2. Anchor masonry to structural members with flexible anchors which allow 4-way movement embedded in masonry joints and attached to structure.
3. Space anchors as indicated, but not more than 16 inches o.c. vertically and 24 inches o.c. horizontally.

B. Anchor single-wythe masonry veneer to studs with masonry veneer anchors to comply with the following requirements:

1. Fasten each anchor section through sheathing to studs with 2 metal fasteners of type indicated.
2. Embed tie section in masonry joints. Provide not less than 1-inch air space between back of masonry veneer wythe and face of sheathing.
3. Locate anchor section relative to course in which tie section is embedded to allow maximum vertical differential movement of tie up and down.
4. Space anchors as indicated but not more than 16 inches o.c. vertically and 24 inches o.c. horizontally with not less than one anchor for each 2 sq. ft. of wall area. Install additional anchors within 1'-0" of openings and at intervals around perimeter not exceeding 3'-0" o.c.

3.11 CONTROL AND EXPANSION JOINTS

A. General: Install control and expansion joints in unit masonry where existing in floor slabs, walls, and roof, and as required (or otherwise indicated). Build in related items as the masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement.

B. Form control joints in concrete masonry as follows: Install preformed control joint gaskets designed to fit standard sash block. Fill recesses with backer rod and flexible sealant, as specified in Section 07 92 00 - Joint Sealers.

C. Where not otherwise indicated, provide control joints at straight runs of masonry walls, not to exceed 30'-0" o.c. at exterior walls and 40'-0" o.c. at interior walls. Obtain prior approval from Engineer for specific locations.

3.12 LINTELS

A. Install galvanized steel lintels where indicated.

B. Provide masonry lintels where shown and wherever openings of more than 1'-0" for brick size units and 2'-0" for block size units are shown without structural steel or other supporting lintels. Provide precast or formed-in-place masonry lintels. Cure precast lintels before handling and installation. Temporarily support formed-in-place lintels.

1. For hollow concrete masonry unit walls, use specially formed bond beam units with reinforcement bars placed as indicated and filled with coarse grout.

C. Provide minimum bearing of 8 inches at each jamb, unless otherwise indicated.

1. Unless indicated otherwise, fill jamb cells with concrete, from structure below up to bottom of lintel bearing, 8 inches wide x wall thickness minimum.

3.13 FLASING/WEEP HOLES

A. General: Install embedded concealed flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to the downward flow of water in exterior walls, and where indicated.

B. Prepare masonry surfaces so that they are smooth and free from projections that could puncture flashing. Place through-wall flashing on sloping bed of mortar and cover with mortar. Seal penetrations in flashing with adhesive/sealant/tape, as recommended by flashing manufacturer before covering with mortar.

1. Where indicated or required by manufacturer, provide continuous seal at top edge, using their recommended materials.

C. Install flashings as follows:

1. At lintels and shelf angles, extend flashing a minimum of 4 inches (nominal) into masonry at exterior end. Extend flashing from exterior face of outer wythe of masonry, through the outer wythe, turned up a minimum of 4 inches, and seal to the interior face of the back-up wall.
2. At heads and sills, extend flashing as specified above unless otherwise indicated but turn up ends not less than 2 inches to form a pan.
3. Cut off flashing 1/2-inch from exterior face of wall and rake joint in accordance with flashing manufacturer's requirements.
4. Comply with manufacturer's instructions and recommendations.
5. Seal top edge of flashing with manufacturer's recommended product.

D. Install weep holes, in the head joints in exterior wythes of the first course of masonry immediately above embedded flashings and as follows:

1. Form weep holes with product specified in 2.14.
2. Space weep holes 32 inches o.c., unless otherwise indicated.
3. Wet cotton sash cord prior to embedding in mortar.

3.14 INSTALLATION OF REINFORCED UNIT MASONRY

A. General: Install reinforced unit masonry to comply with requirements of referenced unit masonry standards, and as indicated on the Drawings.

3.15 REPARING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units and in fresh mortar or grout, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge any voids or holes, except weep holes, and completely fill with mortar. Point-up all joints including corners, openings, and adjacent construction to provide a neat, uniform appearance, prepared for application of sealants.

C. Final Cleaning - After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave 1/2 panel un-cleaned for comparison purposes. Obtain Engineer’s approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
4. Saturate wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
5. Clean brick by means of bucket and brush hand-cleaning method described in BIA "Technical Note No. 20 Revised", to clean brick masonry made of clay or shale, except use detergent as the masonry cleaner.
6. Clean concrete masonry by means of cleaning method indicated in NCMA TEK 45 applicable to type of stain present on exposed surfaces.

    a. Comply with masonry manufacturer's instructions.

3.16 WATER REPELLENTS

A. Apply water repellents to all exterior masonry after thorough cleaning and rinsing, prior to any backfill or any other concealment.

B. Install in strict accordance with manufacturer's written recommendations.

3.17 PROTECTIONS

A. Trim excess sash cord flush with cured mortar joint at exterior side of walls.

B. Protection: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure unit masonry is without damage and deterioration at time of Substantial Completion.

END OF SECTION 04 00 10