SP- 230374
(New)

SPECIAL PROVISIONS
FOR
WELCOME SIGNS

Black Hawk County
HSIPX-057-2(031)--3L-07

Effective Date
November 18, 2025

THE STANDARD SPECIFICATIONS, SERIES 2023, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

230374.01 GENERAL.

A. Description.
Provide masonry work as shown in the contract documents.

B. Definitions.
- Cast Stone: Architectural precast concrete building units intended to simulate natural cut stone.
- CMU(s): Concrete masonry unit(s).
- Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

C. Submittals.

1. **Cast Stone Sign Panels.**
   - **a.** Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for cast stone units.
   - **b.** Shop Drawings: Show fabrication and installation details for cast stone units. Include dimensions, details of reinforcement and anchorages if any, and indication of finished faces. Include wall elevations showing layout of units and locations of joints and anchors.
   - **c.** Samples for Initial Selection: For colored mortar.
   - **d.** Samples for Verification:
     - **1)** For each color and texture of cast stone required, 6 inches square in size.
     - **2)** For colored mortar. Make Samples using same sand and mortar ingredients to be used on project.
   - **e.** Qualification Data for manufacturer: Include copies of material test reports for completed projects, indicating compliance of cast stone with ASTM C 1364.
   - **f.** Material Test Reports: For each mix required to produce cast stone, based on testing according to ASTM C 1364. Provide test reports based on testing within previous 2 years.

2. **Unit Masonry.**

a. Product Data: For each type of product indicated and accessory required.
b. Test reports shall include:
1) Compressive strength
2) 24 hour cold water absorption
3) 5 hour boil absorption
4) Saturation coefficient
5) Initial Rate of Absorption (IRA)
6) Efflorescence
7) Weather classification
c. Certificate of conformance shall state that brick meets or exceeds applicable ASTM specification.
d. Shop Drawings: For the following:
1) Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
2) Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement."

3. Stone Masonry.
a. Submit manufacturer's product data for each type of stone and accessory required.
b. Submit cutting and setting drawings for cut and cast stone work showing dimensions and arrangement.
c. Submit samples of each type and color of stone required. Include the full range of exposed color and texture proposed for the work. Provide cut stone samples not less than 12 inch by 12 inch in size. Final approval of all colors must be obtained prior to any fabrication beginning.
d. Provide 4 feet by 4 feet mock-up panel to remain on site during construction.

D. Quality Assurance.

1. Manufacturer Qualifications for Cast Stone Units:
a. A qualified manufacturer of cast stone units similar to those indicated for this project, with sufficient production capacity to manufacture required units.
b. Manufacturer is a producing member of the Cast Stone Institute.

2. Testing Agency Qualifications: An independent testing agency qualified according to ASTM E 329 for testing indicated, as documented according to ASTM E 548.

3. Materials and methods of construction shall comply with the following standards:
- Brick Institute of America, (BIA): Technical Notes on Brick Construction.
- National Concrete Masonry Association, (NCMA): TEK Bulletins.
- ASTM.

4. Comply with the applicable requirements of local governing authorities and ANSI A41.1, Building Code Requirements for Masonry, for the types of masonry construction indicated.

5. Installation: Performed only by skilled masons with satisfactory record of performance on completed projects of comparable size and quality.

6. Source Limitations for Stone, Cast Stone, or Masonry: Obtain stone units, cast stone units, or masonry units through one source from a single manufacturer. Provide each type of material from only one quarry or manufacturer to ensure consistent color range and texture.

7. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

E. Delivery, Storage, and Handling.

1. Coordinate delivery to minimize the need for on-site storage and to avoid delaying the work.

2. Pack, handle, and ship stone and cast stone units in suitable packs or pallets.
   a. Lift with wide-belt slings; do not use wire rope or ropes that might cause staining. Move units, if required, using dollies with wood supports.
   b. Store units on wood skids or pallets with nonstaining, waterproof covers. Arrange to distribute weight evenly and to prevent damage to units. Ventilate under covers to prevent condensation.

3. **Unit Masonry Materials.**
   a. Deliver, store, and handle masonry materials to prevent damage and soiling.
   b. Stack masonry units off the ground on wood pallets or platforms. Exercise particular care in the storage, handling, and installation of masonry units. Exposed masonry is utilized as a "finish material". Do not build soiled or damaged masonry units into the work.

4. Masonry accessories: Deliver, store, and handle masonry accessories to prevent weather damage and deterioration.

5. **Mortar Materials.**
   a. Deliver cement, lime, and admixture materials in manufacturer's unopened and undamaged containers with labels intact and legible. Store materials off the ground, under cover, and protect from weather damage and deterioration.
   b. Stockpile and handle aggregates to prevent mixing with foreign materials.

F. Project Conditions.

1. Do not use metal accessories with loose rust or other coatings, including ice, which will reduce bond.

2. Protect partially-complete masonry work against weather damage and moisture, when work is not in progress. Cover tops of walls with strong, waterproof membrane. Extend membrane at least 2 feet down both sides of walls and hold securely in place.

3. Brace unsupported and newly-laid masonry walls. Maintain bracing in place until walls reach design strength.

4. **Cold Weather Requirements.**
   a. Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.
   b. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40º F and above and will remain so until cast stone has dried, but not less than 7 days after completing cleaning.
   c. Precondition masonry materials to maintain minimum 50º F. temperatures when installed.
   d. Protect masonry from freezing when the temperature of the outside air is 40º F. and falling. Heat materials and provide temporary protection of completed portions of masonry work. Comply with BIA "Construction and Protection Recommendations for Cold Weather Masonry Construction" and NCMA "TEK Bulletin No. 16A".
   e. No masonry work will be permitted when outside air temperature is below 25º F.
   f. Do not use frozen materials or materials mixed or coated with ice or frost.
   g. Do not build on frozen work. Remove and replace masonry work damaged by frost or freezing.
   h. Do not use anti-freeze or calcium chloride in any mortar.
   i. Protect completed masonry work against freezing for not less than 4 days after laying.

5. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

6. Protect ledges and projections from mortar droppings. Remove excess mortar and stains as work progresses.

7. Protect adjacent work from damage, soiling, and staining during masonry work operations.

230374.02 MATERIALS.

A. Cast Stone Materials.

1. General: Comply with ASTM C 1364 and the following:

2. Portland Cement: ASTM C 150, Type I, containing not more than 0.60% total alkali when tested according to ASTM C 114.

3. Coarse Aggregates: Granite, quartz, or limestone complying with ASTM C 33; gradation as needed to produce required textures and colors as needed to produce required cast stone colors.

4. Fine Aggregates: Natural sand or crushed stone complying with ASTM C 33, gradation as needed to produce required textures and colors as needed to produce required cast stone colors.

5. Color Pigment: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures, color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.

6. Admixtures: Do not use admixtures unless specified or approved in writing by the Engineer.
   a. Do not use admixtures that contain more than 0.1% water-soluble chloride ions by mass of cementitious materials. Do not use admixtures containing calcium chloride.
   b. Use only admixtures that are certified by manufacturer to be compatible with cement and other admixtures used.
   a. Air-Entraining Admixture: ASTM C 260.
   b. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.
   c. Water-Reducing, Retarding Admixture: ASTM C 494/C 494M, Type D.
   d. Water-Reducing, Accelerating Admixture: ASTM C 494/C 494M, Type E.

7. Reinforcement: Deformed steel bars complying with ASTM A 615/A 615M. Use galvanized or epoxy-coated reinforcement when covered with less than 1 1/2 inches of cast stone material.
   a. Epoxy Coating: ASTM A 775/A 775M.
   b. Galvanized Coating: ASTM A 767/A 767M.

8. Embedded Anchors and Other Inserts: Fabricated from stainless steel complying with ASTM A 240/A 240M, ASTM A 276, or ASTM A 666, Type 304.

B. Cast Stone Units.

1. Provide cast stone units complying with ASTM C 1364 using the vibrant dry tamp or wet-cast method.

2. Provide units that are resistant to freezing and thawing as determined by laboratory testing according to ASTM C 666, Procedure A, as modified by ASTM C 1364.

3. Fabricate units with sharp arris and details accurately reproduced with indicated texture on all exposed surfaces, unless otherwise indicated.
   a. Slope exposed horizontal surfaces 1:12, unless otherwise indicated.
   b. Provide raised fillets at backs of sills and at ends indicated to be built into jambs.

c. Provide drips on projecting elements, unless otherwise indicated.

4. Fabrication Tolerances:
- **a.** Variation in Cross Section: Do not vary from indicated dimensions by more than 1/8 inch.
- **b.** Variation in Length: Do not vary from indicated dimensions by more than 1/360 of the length of unit or 1/8 inch , whichever is greater, but in no case by more than 1/4 inch.
- **c.** Warp, Bow, and Twist: Not to exceed 1/360 of the length of unit or 1/8 inch, whichever is greater.
- **d.** Location of Grooves, False Joints, Holes, Anchorages, and Similar Features: Do not vary from indicated position by more than 1/8 inch on formed surfaces of units and 3/8 inch on unformed surfaces.

5. Cure units by one of the following methods:
- **a.** Cure units with steam in enclosed curing room at temperature of 105ºF or above and 95 to 100% relative humidity for 6 hours.
- **b.** Cure units with dense fog and water spray in enclosed warm curing room at 95 to 100% relative humidity for 24 hours.
- **c.** Cure units to comply with one of the following:
  - **1)** Not less than 5 days at mean daily temperature of 70º F or above.
  - **2)** Not less than 6 days at mean daily temperature of 60º F or above.
  - **3)** Not less than 7 days at mean daily temperature of 50º F or above.
  - **4)** Not less than 8 days at mean daily temperature of 45º F or above.

6. Acid etch units after curing to remove cement film from surfaces to be exposed to view.

7. Colors and Textures: Basis-of-Design color selection is Edwards Cast Stone Company, Color 60-128.

8. Color and Texture: Provide units with fine-grained texture and buff color resembling Indiana limestone.

9. Employ an independent testing agency to sample and conduct one test of cast stone units for resistance to freezing and thawing according to ASTM C 1364.

C. Cast Stone Accessories.

1. Anchors: Type and size indicated, fabricated from stainless steel complying with ASTM A 240/A 240M, ASTM A 276, or ASTM A 666, Type 304.

2. Anchors: Type and size indicated, fabricated from steel complying with ASTM A 36/A 36M, and hot-dip galvanized to comply with ASTM A 123/A 123M.

3. Dowels: Round stainless-steel bars complying with ASTM A 276, Type 304, and 1/2 inch diameter.

4. Joint Sealant and Backing: Elastomeric sealant shall comply with ASTM C 920 and be appropriate for use with cast stone to establish and maintain a water- and air-tight continuous joint seal without staining or deteriorating joint substrates. Sealant color is to match the color of the cast stone units. Obtain sealant through one source from a single manufacturer. Store and handle materials in compliance with manufacturer's written recommendations. Sealant backing shall comply with ASTM C 1330, Type C or B, and shall be non-staining and compatible with joint substrates, sealant, primers and other joint fillers used.

5. Proprietary Acidic Cleaner: Manufacturer's standard-strength, general-purpose cleaner designed for removing mortar/grout stains, efflorescence, and other construction stains from

new masonry surfaces without discoloring or damaging masonry surfaces; expressly approved for intended use by cast stone manufacturer and expressly approved by cleaner manufacturer for use on cast stone and adjacent masonry materials.

D. Concrete Masonry Units.

1. Unit standard: All concrete masonry units must conform to ASTM C90, the standard specification for load-bearing concrete masonry units.

2. Compressive strength: For structural applications, CMUs must have a minimum net area compressive strength of 1,900 pounds per square inch (psi).

3. Regional Materials: CMUs shall be manufactured within 500 miles of project site from aggregates and cement that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles of project site.

4. Shapes: Provide shapes indicated on contract documents

5. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed work.

E. Unit Masonry Accessories.

1. Horizontal joint reinforcement: Welded truss type with deformed continuous side rods and plain cross rods. Prefabricate in lengths not less than 10 feet with matching corners and tee units. Unit width of 1 1/2 inches to 2 inches less than wall thickness.
a. Multiple wythe masonry: Single 9 gage side rods; 9 gage cross rods.
b. Finish: 1.5 ounce hot-dip galvanized finish.

2. Reinforcing bars: ASTM A615, Grade 60, new domestic deformed steel bars of sizes indicated.

3. Cleaning agents: Commercial cleaning solutions which will not harm masonry or adjacent materials and is acceptable to the masonry manufacturer. Muriatic acid is not acceptable as a cleaning agent.

F. Stone Materials.

1. Natural Limestone Veneer – Ledge Collection – Sandhill Rustic color by Halquist Stone Co. Inc., Sussex, Wisconsin 53089. (262) 246-9000.

2. Cast Stone Caps – Match product requirements outlined in Section 9.15.1 Cast Stone Sign Walls. Basis-of-Design color selection is Color 60-128 – meant to match color and texture from University Avenue sign walls. Edwards Cast Stone Company, Dubuque, Iowa, 52003, (563) 556-0535.

3. Provide sound stone uniform in color and texture, free from mineral stains, other foreign matter, and defects detrimental to appearance and durability. Color range, texture, and finish of cut stone materials shall be within range of Engineer's accepted samples.

4. Embedded Anchors and Other Inserts: Fabricated from stainless steel complying with ASTM A 240/A 240M, ASTM A 276,

G. Cut Stone Fabrication.

1. Fabricate stone work as indicated or as accepted and detailed on final shop drawings.

2. **Fabrication Tolerances:**
   a. Variation in Cross Section: Do not vary from indicated dimensions by more than 1/8 inch.
   b. Variation in Length: Do not vary from indicated dimensions by more than 1/360 of the length of unit or 1/8 inch, whichever is greater, but in no case by more than 1/4 inch.
   c. Warp, Bow, and Twist: Not to exceed 1/360 of the length of unit or 1/8 inch, whichever is greater.

3. Location of Grooves, False Joints, Holes, Anchorages, and Similar Features: Do not vary from indicated position by more than 1/8 inch on formed surfaces of units and 3/8 inch on unformed surfaces.

4. Cut accurately to shape and dimensions indicated or accepted final shop drawings.
   a. Dress joints, bed, and vertical, straight at 90 degree angle to face. Provide drips and washes as indicated.
   b. Joint width: Cut to allow uniform 1/4inch wide joints unless previously stated otherwise.
   c. Thickness: Provide thickness indicated.
   d. Jointing: Provide as indicated; when not indicated, in accordance with industry standards and practices.

H. Stone Masonry Accessories.

1. Anchors: Type and size indicated, fabricated from stainless steel complying with ASTM A 240/A 240M, ASTM A 276, or ASTM A 666, Type 304.

2. Dowels: Round stainless-steel bars complying with ASTM A 276, Type 304, and 1/2 inch diameter.

I. Mortar and Grout Materials.

1. Portland cement: ASTM C150, Type I, natural color.

2. Hydrated lime: ASTM C207, Type S.

3. Aggregate:
   - Masonry mortar: ASTM C144, clean masonry sand, not over 10% to pass No. 100 sieve.
   - Masonry grout: ASTM C404, clean pea gravel, maximum 3/8 inch size.
   - Aggregate for mortar and grout shall be extracted, harvested, or recovered, as well as manufactured, within 500 miles of project site.

4. Water: Clean, fresh, and potable.

5. Colored mortar pigment: Lime-proof and alkalai-proof mineral oxide pigments. Color as indicated on contract documents. Submit color samples with shop drawings.

J. Masonry Mortar and Grout Mixes.

1. Type M mortar for structural applications:
   - ASTM C270 proportions by volume.
   - Minimum average compressive strength at 28 days of 2500 psi:
   - 1 part Portland cement.
   - 1/4 part hydrated lime.
   - Not less than 2 1/4 and not more than 3 times the sum of the volumes of cement used of damp, loose sand.

2. Type N Mortar for veneer applications.
   - ASTM C270 proportions by volume.
   - Minimum average compressive strength at 28 days of 750 psi.
   - One part Portland cement.
   - One part hydrated lime.
   - Six part sand by volume.

3. Coarse grout: ASTM C476 proportions by volume. Minimum average compressive strength at 28 days of 2500 psi:
   - 1 part Portland cement.
   - 0 to 1/10 part hydrated lime.
   - Not less than 1 and not more than 2 times the volume of cement used of damp, loose coarse aggregate.

4. Measure and batch material either by volume or weight. Use accurate measuring devices to ensure uniformity and coloration of mix. Shovel count measurement of sand is not acceptable.

5. Mix cementitious material and aggregate in a clean mechanical mixer for at least 5 minutes. Add water in amount to provide satisfactory workable consistency of mortar.

6. Proportion colored mortar pigment with other ingredients to match the approved samples.

7. Retemper mortar as required within 2 hours of mixing to replace water lost by evaporation. Use and place mortar in final position within 2 1/2 hours of the initial mixing. Discard mortar after 2 1/2 hours of the initial mixing.

230374.03 CONSTRUCTION.

A. Examination.

Examine substrates and installation conditions. Do not start unit masonry work until unsatisfactory conditions are corrected.

B. Setting Cast Stone in Mortar.

1. Install cast stone units to comply with requirements in Division 04 Section "Unit Masonry."

2. Set cast stone as indicated on contract documents. Set units accurately in locations indicated with edges and faces aligned according to established relationships and indicated tolerances.

3. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure units in place.

4. Wet joint surfaces thoroughly before applying mortar or setting in mortar.

5. Set units in full bed of mortar with full head joints, unless otherwise indicated.
   a. If not indicated, set units with joints 1/4 to 3/8 inch wide.
   b. Build anchors and ties into mortar joints as units are set.
   c. Fill dowel holes and anchor slots with mortar.
   d. Fill collar joints solid as units are set.
   e. Build concealed flashing into mortar joints as units are set.
   f. Keep head joints in coping and other units with exposed horizontal surfaces open to receive sealant.

g. Keep joints at shelf angles open to receive sealant.

6. Rake out joints for pointing with mortar to depths of not less than 3/4 inch. Rake joints to uniform depths with square bottoms and clean sides. Scrub faces of units to remove excess mortar as joints are raked.

7. Point mortar joints by placing and compacting mortar in layers not greater than 3/8 inch. Compact each layer thoroughly and allow it to become thumbprint hard before applying next layer.

8. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.

9. Provide expansion, control, and pressure-relieving joints of widths and at locations indicated. Keep joints free of mortar and other rigid materials. Form open joint of width indicated, but not less than 3/8 inch.

10. Prepare joints indicated to receive sealant and apply sealant of type and at locations indicated to comply with applicable requirements of cast stone joint sealants.

11. Prime cast stone surfaces to receive sealant and install compressible backer rod in joints before applying sealant, unless otherwise indicated.

C. Setting Anchored Cast Stone with Sealant-Filled Joints.

1. Set cast stone as indicated on contract documents. Set units accurately in locations indicated with edges and faces aligned according to established relationships and indicated tolerances.
   a. Install anchors, supports, fasteners, and other attachments indicated or necessary to secure units in place.
   b. Shim and adjust anchors, supports, and accessories to set cast stone in locations indicated with uniform joints.

2. Keep cavities open where unfilled space is indicated between back of cast stone units and backup wall; do not fill cavities with mortar or grout.

3. Fill anchor holes with sealant. Where dowel holes occur at pressure-relieving joints, provide compressible material at ends of dowels.

4. Set cast stone supported on clip or continuous angles on resilient setting shims. Use material of thickness required to maintain uniform joint widths. Hold shims back from face of cast stone a distance at least equal to width of joint.

5. Keep joints free of mortar and other rigid materials. Remove temporary shims and spacers from joints after anchors and supports are secured in place and cast stone units are anchored. Do not begin sealant installation until temporary shims and spacers are removed. Form open joint of width indicated, but not less than 3/8 inch.

6. Prepare joints and apply sealant of type and at locations indicated to comply with applicable requirements of cast stone joint sealants.

7. Prime cast stone surfaces to receive sealant and install compressible backer rod in joints before applying sealant, unless otherwise indicated.

D. Installation Tolerances for Cast Stone.

1. Variation from Plumb: Do not exceed 1/8 inch in 10 feet.

2. Variation from Level: Do not exceed 1/8 inch in 10 feet.

3. Variation in Joint Width: Do not vary joint thickness more than 1/8 inch in 36 inches or one-fourth of nominal joint width, whichever is less.

4. Variation in Plane between Adjacent Surfaces (Lipping): Do not vary from flush alignment with adjacent units or adjacent surfaces indicated to be flush with units by more than 1/16 inch, except due to warpage of units within tolerances specified.

E. Adjusting and Cleaning Cast Stone.

1. Remove and replace stained and otherwise damaged units and units not matching approved samples. Cast stone may be repaired if methods and results are approved by the Engineer.

2. Replace units in a manner that results in cast stone matching approved samples, complying with other requirements, and showing no evidence of replacement.

3. In-Progress Cleaning: Clean cast stone as work progresses.
- **a.** Remove mortar fins and smears before tooling joints.
- **b.** Remove excess sealant immediately, including spills, smears, and spatter.

4. Final Cleaning: After mortar is thoroughly set and cured, clean exposed cast stone as follows:
- **a.** Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
- **b.** Test cleaning methods on sample; leave one sample uncleaned for comparison purposes. Obtain Engineer’s approval of sample cleaning before proceeding with cleaning of cast stone.
- **c.** Protect adjacent surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
- **a.** Wet surfaces with water before applying cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
- **b.** Clean cast stone by bucket-and-brush hand-cleaning method described in BIA Technical Notes No. 20.
- **a.** Clean cast stone with proprietary acidic cleaner applied according to manufacturer's written instructions.

F. Masonry Preparation.

1. Establish lines, levels, and coursing.

2. Lay masonry units dry. Do not wet concrete masonry units.

3. Clean cut stone work before setting by thoroughly scrubbing with fiber bristle brushes and clean water. Drench stone with clean water just prior to setting.

4. Do not use masonry units with chips, cracks, voids, stains, or other visible defects.

5. Excavation
- **a.** Contractor shall excavate to the lines and grades shown on the plans. Contractor shall take precautions to minimize over-excavation. Over-excavation shall be filled with compacted infill material, or as directed by the Engineer, at the Contractor's expense.
- **b.** Contractor shall verify location of existing structures and utilities prior to excavation. Contractor shall ensure all surrounding structures are protected from the effects of

wall excavation. Excavation support, if required, is the responsibility of the Contractor.

6. **Foundation Preparation**
   - **a.** Following the excavation, the foundation soil shall be examined by the Engineer to assure actual foundation soil strength meets or exceeds the assumed design bearing strength. Soils not meeting the required strength shall be removed and replaced with infill soils, as directed by the Engineer.
   - **b.** Foundation soil shall be proof-rolled and compacted to 95% standard Proctor density and inspected by the Engineer prior to placement of leveling pad materials.

7. **Leveling Pad Construction**
   - **a.** Leveling pad shall be placed as shown on the plans. The leveling pad should extend laterally at least a distance of 6 inches from outside edge of foundation.
   - **b.** Granular leveling pad material shall match specifications for modified subbase and be compacted to provide a firm, level bearing surface on which to place the first course of units. Well-graded sand can be used to smooth the top 1/2 to 1/4 inch of the leveling pad. Compaction will be with mechanical plate compactors to achieve 95% of maximum standard Proctor density (ASTM D 698).

G. CMU Installation.

1. Install bricks with 3/8 inch joints as shown in the contract documents.

2. Build masonry construction to the full thickness indicated. Build single-wythe walls to the actual thickness of the masonry units, using units of nominal thickness.

3. Cut masonry units with masonry saws to provide clean, sharp, unchipped edges. Cut units as required to provide pattern shown and to fit adjoining work. Where cutting is required, use the largest size units possible. Provide 100% solid units where webs would be exposed.

4. Layout walls in advance for accurate spacing of surface bond patterns, with uniform joint widths, and to properly locate openings, movement-type joints, returns, and offsets.

5. Lay masonry plumb and true. Provide corners and angles square, with courses level, accurately spaced, and coordinated with other work. Use double lines at multiple wythe walls.

6. Pattern bond: Lay exposed masonry in running bond with vertical joint in each course centered on units in courses above and below. Bond and interlock each course of each wythe at corners. Do not use units with less than 4 inch of horizontal face dimensions at corners or jambs.

7. Lay face brick and other solid masonry units with completely filled bed and head joints. Butter ends with sufficient mortar to fill head joints and shove into place. Do not slush head joints.

8. Compress and cut joints flush for masonry walls which are to be concealed or to be covered by other materials.

9. Tool joints in all exposed masonry work to a concave joint.

10. Remove masonry units disturbed after laying; clean and reset in fresh mortar.

11. Step back unfinished work for joining new work. Rake back 1/2 unit length in each course; do not tooth. Clean exposed surfaces and remove loose masonry units and mortar prior to laying fresh masonry.

12. Provide interlocking masonry bond in each course at corners and intersecting walls.

13. As the work progresses, build in items furnished by other trades. Fill in solidly with masonry around built-in items.
- **a.** Where built-in items are to be embedded in cores of hollow masonry units, please a layer of metal lath in the joints below and rod grout into core.
- **b.** Provide solid masonry bearing for all load-bearing members. Provide solid masonry units or hollow units filled solid.
- **c.** Take particular care to embed conduits and pipes within concrete masonry without fracturing exposed shells. Where electric conduit, outlets, switch boxes, and similar items occur, grind, and cut units before building in services.
- **d.** Install reinforcing steel and grout where indicated. Comply with drawing details for reinforcing steel size, spacing, and grouting.

14. Horizontal joint reinforcing: Provide continuous joint reinforcing as indicated.
- **a.** Lap reinforcement where sections but into each other.
- **b.** Fully embed side rods in mortar.

H. CMU Cleaning.

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

2. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

3. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

4. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
- **a.** Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
- **b.** Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Engineer’s approval of sample cleaning before proceeding with cleaning of masonry. Before applying any cleaning agent to the entire area, clean a sample area of approximately 20 square feet in a location acceptable to the Engineer. Do not proceed with cleaning until the sample area has been approved.
- **c.** Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
- **d.** Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
- **e.** Clean brick by bucket-and-brush hand-cleaning method described in BIA Technical Notes 20.
- **f.** Clean masonry with a proprietary acidic cleaner applied according to manufacturer's written instructions.
- **g.** Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.
- **h.** Clean stone trim to comply with stone supplier's written instructions.

i. Clean limestone units to comply with recommendations in ILI's "Indiana Limestone Handbook."

5. Acid cleaning of masonry not permitted. Install and protect installed masonry so that acid cleaning is not required at completion of work.

I. Installation of Cut Stone.

1. Set stone in accordance with drawing details and final shop drawings for stone work. Provide anchors, supports, and other attachments shown, or necessary to secure stonework in place. Shim and adjust accessories as required for proper setting of stone.

2. Erect cut stone work plumb and true with joints uniform in width and accurately aligned.

J. Cleaning Stone Masonry.

1. Remove and replace stone units which are loose, broken, stained, or otherwise damaged. Provide new matching units, install as specified.

2. Clean stonework not less than 6 days after completion of work, using clean water and stiff-bristle brushes. Do not use wire brushes, acid type cleaning agents or other cleaning compounds with caustic or harsh fillers.

3. Cleaning agents and methods shall be acceptable to the Engineer.

4. Upon completion of the work, remove from site all excess materials, debris, tools, and equipment. Repair damage resulting from stone masonry work operations.

K. Disposal and Clean-up.
Unless otherwise indicated, excess materials are Contractor's property. Remove waste and legally dispose of off the Contract Authority’s property. Repair damage resulting from work operations.

230374.04 METHOD OF MEASUREMENT.
Lump sum. No method of measurement.

230374.05 BASIS OF PAYMENT.
Payment will at the lump sum contract price for Landscaping, Primary Welcome Sign and Landscaping, Secondary Welcome Sign. These items include landscaping elements pertaining to primary and secondary welcome signs, including all costs to install cast stone as shown in the contract documents. Lump sum price includes furnishing all materials, equipment, and labor necessary for installation of the landscaping elements as shown in contract documents.