SP- 127035
(New)

Iowa Department of Transportation

SPECIAL PROVISIONS
FOR
WATER FEATURE

Dubuque County
SB-IA-2100(675)--7T-31

Effective Date
September 15, 2015

THE STANDARD SPECIFICATIONS, SERIES 2012, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract apply to this Section.

1.2 SUMMARY

A. Section Includes:
1. Dry-laid stone walls.
2. Limestone slabs for waterfall.
3. Water feature cobbles.
4. Accent boulders.
5. Millstones.
6. Stone Overflow Weir.
7. Miscellaneous materials.

1.3 SUBMITTALS

A. Samples for Verification: For each of the following:
1. Provide photographs of limestone blocks/slabs to be used for water feature. Photograph shall contain an object such as a tape measure for scale and photograph demonstrating type, size and color conformance. Provide location and contact information for source quarry.
2. Provide photographs of accent boulders. Photograph shall contain an object such as a tape measure for scale and photograph demonstrating type, size and color conformance. Provide location and contact information for source quarry.
3. Water Feature Cobbles: Provide two or three water feature cobble units indicating the general size, dimension, surface texture, and color variation of the lot. Provide contact

information for supplier or source quarry.

4. Millstones: Provide photographs of millstones. Photograph shall contain an object such as a tape measure for scale and photograph demonstrating type, size and color conformance. Provide location and contact information for source manufacturer or supplier.
5. EPDM Waterproofing membrane: 12 by 12 inch sample.
6. Manufacturer's Data for all manufactured products listed under "Miscellaneous Materials", this section. Data must be reviewed and approved by the Engineer before use on this project.

B. Shop Drawings: Submit shop drawings for the water feature to the Engineer for review and approval at least 14 working days in advance of ordering any components. Shop drawings shall include all pertinent designs, details, material call-outs, electrical components, plumbing components, hardware, connections, structural components, reinforcing, and/or attachments. The Engineer has the right to approve or reject or make changes to the shop drawings based on the design intent.

1. By approving and submitting shop drawings, product data and samples the Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that he has checked and coordinated information contained within such submittals with the requirements of the work and the contract documents.
2. The Contractor is not relieved of responsibility for any deviation from the requirements of the contract documents by the Engineer's approval of the shop drawings, product data or samples unless the Contractor has given written approval to the specific deviation. The Contractor is not relieved of responsibility for errors or omissions in the shop drawings, product data or samples by the Engineer's approval thereof.
3. Direct specific attention, in writing or on resubmitted shop drawings, product data or samples, to revisions other than those requested by the Engineer on previous submittals.
4. No portion of the work requiring submission of a shop drawing, product or sample shall be commenced until the submittal has been approved by the Engineer.
5. Submit two hard copies of all shop and setting drawings every time a submission is made until final approval is received.
6. Mark all shop drawings submitted with the name of the project, numbered consecutively and bear the stamp of approval of the Contractor as evidence that the drawings have been checked by the Contractor. Any drawings submitted without this stamp of approval will not be considered and will be returned to the Contractor for resubmission.

C. Limestone Testing: Limestone shall be tested by a laboratory certified by the State of Iowa for the following Standard Methods of Testing Dimensional Stone: modulus of rupture (ASTM C99) for wet and dry condition; compressive strength (ASTM C-170) for wet and dry conditions; and absorption (ASTM C-97). Samples submitted for testing shall be indicative of the type and size for each material that will be used on the project. Test results shall demonstrate that the stone meets the requirements outlined in this Section and is suitable for custom-fabricated landscape pieces for vertical and horizontal installations in exterior environments with exposure to weathering, fluctuating water level exposures and long-term inundation

D. Stone Finish Testing: Surface finishes for each type of finish indicated in this Section shall be tested for dynamic coefficient of friction in accordance with ANSI B101.3. The testing must demonstrate that the finish achieves a value of 0.42 or greater (high) slip resistance potential. Submit testing results to the Engineer for review and approval of finishes before final fabrication of stone products.

E. Limestone Standards: All limestone used on the project shall conform to the following minimum material standards and specifications:

1. Material Standards: Comply with ASTM C 568/C568 M. Stone must meet or exceed requirements set forth for the classifications listed in this Section.

2. Classification: Type II (Medium Density) allowed, Type III (High Density) preferred.
3. Description: Dolomitic
4. Variety for New Stone: Native Dubuque Limestone as quarried and custom fabricated by a single source located within 50 miles of the project site.
5. Color: Dubuque Stone Beige.

F. Qualification Data: For qualified landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience.

G. The Engineer is solely responsible for review and approval of submittals. The project Landscape Architect can only make observations and general recommendations at the request of the Engineer but cannot change the contract or approve results.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape Installer whose work water features of a similar nature, size, and material type has resulted in successful design installations.
1. Experience: 3 years' experience in landscape installation, specifically large-scale municipal or corporate water features.
2. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site at all times when work is in progress.

B. Mockups
1. Provide 8 foot section each of dry-laid stone retaining walls and limestone slabs for waterfalls including typical workmanship, construction, and layouts as indicated in the drawings.
   a. Notify the Engineer 7 working days in advance of dates and times when mockups will be constructed.
   b. Obtain the Engineer’s approval of mockups before starting construction on the remainder of the wall and/or waterfall.
   c. Maintain approved mockups during construction in an undisturbed condition as a standard for judging the completed waterfall.
   d. Approved mockups may become part of the completed Work if undisturbed at the time of Substantial Completion.
2. Provide a 4 foot by 4 foot section of water feature cobbles including typical workmanship, construction, and layouts as indicated in the drawings.
   a. Notify the Engineer 7 working days in advance of dates and times when mockup will be constructed.
   b. Obtain the Engineer’s approval of mockup before starting construction on the remainder of the stone cobbles.
   c. Maintain approved mockups during construction in an undisturbed condition as a standard for judging the completed water feature cobbles.
   d. Approved mockup may become part of the completed work if undisturbed at the time of acceptance.

C. Conduct a Preinstallation Conference at the project site with, at a minimum, the Installer’s project supervisor, the Contractor, and the Engineer present. Review methods and procedures related to limestone slab, water feature cobbles, millstone and waterproofing membrane installation including, but not limited to, the following:
1. Location(s)
2. Construction schedule. Verify ability of materials, Installer’s personnel, equipment, and facilities needed to make progress and avoid delays.
3. Material verification.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Limestone slabs, millstones accent boulders and water feature cobbles are to be delivered in good condition free from shipping damage. Protect from damage after delivery to construction staging area and/or site. At all times, handle units to prevent damage; chipped, cracked, or otherwise damaged units will be replaced at no additional cost to the Contracting Authority.

B. Store geosynthetics and waterproofing membrane in manufacturer's original packaging with labels intact or in a safe, secure location. Store and handle geosynthetics and waterproofing membrane to prevent deterioration or damage due to sunlight, chemicals, flames, temperatures above 160°F or below 32°F, and other conditions that might damage them. Verify identification of geosynthetics and waterproofing membrane before using and examine them for defects.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, and dimensions of water feature and construction contiguous with water feature by field measurements before proceeding with installation work.

B. Interruption of Existing Services or Utilities: Do not interrupt services or utilities to facilities occupied by Contracting Authority or others unless permitted under the following conditions and then only after arranging to provide temporary services or utilities according to requirements indicated:
   1. Notify the Engineer no fewer than 2 days in advance of proposed interruption of each service or utility.
   2. Do not proceed with interruption of services or utilities without the Engineer’s written permission.

C. Weather Limitations: Proceed with water feature installations only when existing and forecasted weather conditions permit work to be performed when beneficial and optimum results may be obtained.

D. Contractor shall protect all adjacent plants, lawns, and grass areas from damage at all times. Damaged plants, lawns or grass areas shall be replaced or treated as required to conform to specifications herein for fresh stock.

E. Work area shall be kept clean and orderly during the installation period. Under no condition shall debris from water feature activities result in a safety hazard on-site or to adjacent off-site property. Damage to lawns adjacent construction and/or plantings incurred as a result of water feature installation operations shall be repaired by the Contractor that causes the damage at no cost to the Contracting Authority.

PART 2 - PRODUCTS

2.1 DRY-LAID STONE RETAINING WALL UNITS

A. Source: New Limestone

B. Dimensions:
   1. Height: 3 inch, 4 inch, 5 inch, 6 inch & 8 inch
   2. Depth: 12 inches
   3. Length: Length of blocks will vary but shall be no more than 42 inches and no less than 12 inches.
   4. Dimensional Tolerance: 1/2 inch

C. Pattern: Coursed

D. Finish:
   1. Exposed vertical faces – rockface
   2. Exposed horizontal faces - sawn
   3. Vertical and horizontal joints – sawn

2.2 LIMESTONE SLABS FOR WATERFALL

A. Source: New Limestone.

B. Dimensions:
   1. Height: 12 inch, +/- 1/2 inch.
   2. Depth: 36 inch, +/- 2 inch.
   3. Lengths: Refer to the drawings.
   4. Dimensional Tolerances: Given above individually for height and depth.

C. Pattern: Random.

D. Finish: Splitface

2.3 WATER FEATURE COBBLES

A. Dimensions:
   1. Width/Depth: Oval-shaped, 5 inches – 10 inches across
   2. Thickness: 3 inches to 5 inches
   3. Type: Water feature cobbles shall be smooth, generally uniform, oval or oblong shaped.

B. Finish: Smooth, tumbled surface finish.

C. Material: Granite

D. Color: Blend of gray, charcoal, and brown color ranges.
   1. Provide sample for approval, see section “Submittals”.

E. Source: Contractor can submit local alternates for granite cobble material, if available. Alternates would require review and approve by the Engineer before use on project.

2.4 ACCENT BOULDERS

A. Source: New Limestone.

B. Dimensions:
   1. Size: 10 inches to 2 feet 6 inches, approximate dimensions.
   2. Finish: Quarried chunks of material with flat bottom.

2.5 MILLSTONE

A. Dimensions:
   1. Diameter: 4 feet 0 inches diameter.
   2. Depth: 8 inches.
   3. Diameter of Opening: 9 inches.

B. Type: Granite.

C. Color: Charcoal.
   1. Provide sample for approval, see section “Submittals”.

D. Source: Obtain the millstones from any source, with local sources taking precedence. Source and all millstone characteristics are subject to review and approval by the the Engineer prior to use on the project.

2.6 STONE OVERFLOW WEIR

A. Source: New Limestone.

B. Dimensions:
1. As indicated in the drawings.

2.7 MISCELLANEOUS MATERIALS

A. EPDM Waterproofing Membrane: 60 mil EPDM flexible rubber pond liner with a minimum 20 year manufacturer's guarantee against UV breakdown. Ozone resistant. Membrane shall be inert to biological degradation and resist naturally-encountered chemicals, alkalis, and acids. Color shall be black.

B. Geotextile: For protecting waterproofing membrane. Nonwoven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 %.
1. Apparent Opening Size: No. 70 to 100 sieve, maximum; ASTM D 4751.
2. Minimum Grab Tensile Strength: 110 lb; ASTM D 4632.
3. Minimum Weight: 8 oz./sq. yd

C. Geotextile: For separating aggregate from surrounding soils or construction. Woven needle-punched geotextile, manufactured for subsurface drainage applications, made from polyolefins or polyesters; with elongation greater than 50 %.
1. Apparent Opening Size: No. 70 to 100 sieve, maximum; ASTM D 4751.
2. Minimum Grab Tensile Strength: 110 lb; ASTM D 4632.
3. Minimum Weight: 4 oz./sq. yd

D. Crushed Stone Base Course, Granular Backfill and Free Draining Backfill Material: Refer to Iowa DOT Standard Specifications.

E. Soil Materials: Satisfactory soils as defined in Standard Specifications and all supplemental Reference Notes and Plan Notes.

F. Elastomeric Sealant: Waterproofing sealant suitable for exterior applications below water line. Single or multi-component. Compliant with ASTM C920-11. Color: clear. Sealant shall be applied to interface between the pipe and millstone to form a watertight seal.

G. Marine Silicone: Mildew resistant, non-sagging, moisture curing silicone rubber sealant which will remain flexible and adhere to adjacent surfaces. Suitable for below waterline applications. Silicone must be extremely strong, non-shrinking, permanent bond. Medium paste. Color: Clear.

H. EPDM Bonding Adhesive: solvent-based contact adhesive designed specifically for bonding EPDM membranes to approved substrates, including masonry and stone.
1. Install per manufacturer's written specifications.

I. Pipe Boot: Firestone Quickseam Pipe Boot Flashing, or approved equal which is suitable for pond installations and for pipe sizing indicated in the drawings. Contractor is responsible for sizing the pipe boot correctly according to pipe and connection sizes. Seal to Waterproof Membrane with Marine Silicone.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive water feature for compliance with requirements and conditions affecting installation and performance of all water feature work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas, planting beds, and existing plants from damage caused by water feature installation operations.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Contractor shall contact the Engineer at least 7 working days in advance of water feature installation to coordinate layout.

3.3 INSTALLATION

A. General: Lay out water feature as indicated in the drawings and based on discussion at Preinstallation Conference.

B. Replace adjacent planting areas damaged by excavation or installation, including soil materials, to the satisfaction of the Engineer.

3.4 WALL INSTALLATION

A. General: Lay units in pattern and as indicated in the drawings and based on discussion at Preinstallation Conference.

B. Special Backfill, Gradation No. 31: Refer to Section 2102 of Standard Specifications.

C. Graded Stone Base: Refer to Section 2210 of Standard Specifications.

D. First Course: Place first course of wall units for full length of wall. Place units in firm contact with each other, properly aligned and level. Correct any gaps or unlevel edges between stones before placing subsequent courses.

E. Subsequent Courses for Vertical Walls: Remove excess fill and debris from tops of units in course below. Place units in firm contact, properly aligned, and directly on course below and offset from initial coursing to allow for pattern as indicated in the drawings. No joint between two stones of one course shall be aligned with the joint between two stones of an adjacent course.

F. Subsequent Courses for Wall with Batter: Remove excess fill and debris from tops of units in course below. Place units in firm contact, properly aligned, on course below and with batter indicated in the drawings. Offset from initial coursing to allow for pattern as indicated in the drawings. No joint between two stones of one course shall be aligned with the joint between two stones of an adjacent course.

G. Provide dowels where indicated in the drawings. Apply stone adhesive to dowels and stone or concrete for all doweled connections.

H. Place geogrid soil reinforcement in horizontal joints for all retaining walls that exceed 36 inch height and according to soil-reinforcement manufacturer's written instructions. Embed reinforcement a minimum of 8 inches into retaining wall and stretch tight over compacted backfill. Anchor soil reinforcement before placing fill.
   1. Place additional soil reinforcement at corners and curved walls to provide continuous reinforcement.
   2. Place geosynthetics with seams, if any, oriented perpendicular to retaining walls.
   3. Do not dump fill material directly from trucks onto geosynthetics.
   4. Place at least 6 inches of fill over reinforcement before compacting with tracked vehicles or 4 inches before compacting with rubber-tired vehicles.
   5. Do not turn vehicles on fill until first layer of fill is compacted and second layer is placed over each soil-reinforcement layer.

I. Apply stone adhesive to secure top course of all dry-laid walls. Follow adhesive manufacturer's written preparation, installation, and curing instructions.

J. Fill placement: Place layer of drainage fill at least 12 inches wide behind wall and wrap with geotextile fabric as indicated in the drawings.

K. Place specified soil material to minimum depths as indicated in the drawings.

L. Slope grade at base of wall away from wall or as indicated in the drawings. Provide uniform slopes that will prevent ponding.

3.5 WATER FEATURE COBBLE INSTALLATION

A. General: Lay units in pattern and as indicated in the drawings and based on discussion at Preinstallation Conference.

B. Place units in firm contact, properly aligned, and directly on surface below as indicated in the drawings.

3.6 MISCELLANEOUS INSTALLATION

A. General: Lay materials in pattern and as indicated in the drawings and based on discussion at Preinstallation Conference.

B. EPDM and Geotextile Fabric Placement: Install geotextile below EPDM membrane as indicated in the drawings. Install geotextile above EPDM membrane only below accent boulders and where membrane meets and wraps up wall. EPDM shall wrap up stone wall vertically and be adhered to two stone courses wherever possible as indicated in the drawings. If turning back and adhering between two stone courses is not possible (depending on stone thickness), membrane shall be wrapped up 6 inches vertically and adhered to vertical surface of stone wall.
   1. Use full sheets wherever possible to construction water feature. Seams shall only be allowed as directed by the Engineer.
   2. Contractor shall lay out entire waterproofing membrane for all water feature construction and obtain approval of waterproofing membrane installation and integrity from the Engineer before continuing with any additional water feature construction.
   3. Place waterproofing membrane as indicated in drawings and integrated into wall and water feature construction.

C. Separation Geotextile Placement: Place separation geotextile fabric behind wall and wrap so that adjacent sections overlap by a minimum of 6 inches and the bottom wraps a minimum of 18 inches. Separation Geotextile should be finished below the top course of the wall so that the fabric is not apparent once the bed is mulched.

D. Limestone Slabs for Waterfalls: Install limestone slabs for waterfalls in accordance with this Section, subsection “Wall Installation” and as indicated in drawings.

E. Place accent boulders as indicated in the drawings and as directed by the Engineer. Boulders shall be in firm contact with the surfaces below and shall not be loose or unstable.

F. Place millstone as indicated in the drawings and as directed by the Engineer. Millstone shall be in firm contact with the surfaces below and shall not be loose or unstable.

G. Apply all sealants, caulks, or elastomeric jointing components to clean surfaces and allow to dry completely before allowing exposure to water. Protect from adverse weather conditions during curing time. If seal fails to set, the Contractor will be responsible for removing sealants completely, re-cleaning surfaces, and re-sealing connections.

3.7 ADJUSTING

A. Remove and replace any waterfall construction units (limestone slabs, water feature cobbles, millstones, etc) of the following descriptions:
1. Broken, chipped, stained, spalling, or otherwise damaged units.

B. Replace any units that do not comply with approved Samples, mockups, or other requirements. Replace in a manner that shows no evidence of replacement.

C. Damage to the waterproofing membrane during water feature construction will warrant full replacement of membrane and new construction of water feature. Patching a damaged waterproofing membrane is not acceptable.

3.8 CLEAN-UP AND PROTECTION

A. During water feature installation, keep adjacent paving and construction clean and work area in an orderly condition.

B. Protect adjacent plants and lawns from damage due to water feature installation operations. Protect water feature from damage due to installation operations of other contractors.

3.9 DISPOSAL

A. Remove any and all surplus and waste material including excess subsoil, unsuitable soil, trash, stone, mulches, accessories and debris and legally dispose of them off Contracting Authority's property.

3.10 METHOD OF MEASUREMENT

A. The Water Feature will be paid for as a lump sum.

3.11 BASIS OF PAYMENT

A. The Contractor will be paid the contract unit price for Water Feature as a lump sum which shall be full compensation for design, supply and installation of the Water Feature and for furnishing all materials, equipment and labor necessary to construct the Water Feature in accordance with the contract documents.