SECTION 03 48 26  
PRECAST CONCRETE MEMORIAL WALL UNITS

SPEC WRITER NOTES:  
1. Use this section only for NCA projects.  
2. Delete between // --- // if not applicable to project. Also delete any other item or paragraph not applicable in the section and renumber the paragraphs.

PART 1 - GENERAL  

1.1 GENERAL PROVISIONS  
Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 1 - GENERAL REQUIREMENTS, which are hereby made part of this Section of the Specifications.

1.1 DESCRIPTION  
A. This section covers the manufacture and installation of precast concrete memorial wall units, as shown on the plans and specified herein, including the steel reinforcement, steel embedment plates, required sleeves, and fasteners.

SPEC WRITER NOTES: Modify, add or delete, the items of work indicated in the following paragraph to reflect the project specific finishes for caps and memorial markers.

1.2 RELATED WORK  
A. Cast-in-place concrete work: Section 03 30 00, CAST-IN-PLACE CONCRETE.  
B. Workmanship for sealant application: Section 07 92 00, JOINT SEALANTS.  
C. Memorial Wall Cap - Section 04 72 00, CAST STONE MASONRY.  
D. Decorative Gravel-Section 32 90 00, PLANTING.  
//E. Installation of memorial markers: Section 04 73 00, MEMORIAL MARKERS-MARBLE.//  
//E. Installation of memorial markers: Section 04 73 10, MEMORIAL MARKERS-GRAINITE.//  
F. Plaster Finish: Section 09 24 00, PORTLAND CEMENT PLASTERING

1.3 MANUFACTURER / INSTALLER QUALIFICATIONS  
A. Precast concrete memorial wall units shall be product of manufacturer/installer who has a minimum of 3 years experience in fabrication and installation of precast concrete units similar in material and design to the extent indicated on the drawings and specified herein.

1.4 ALLOWABLE TOLERANCES  
A. Manufacturing and installation tolerances shall be as follows:
1. Variation of anchors and fasteners for memorial markers from dimensions specified -- 1/64-inch
2. Variation in overall dimensions of precast element (height and width and depth inside and outside) -- 1/16-inch
3. Variation in thickness of walls of precast units -- 1/16-inch
4. Maximum vertical and horizontal differential between adjacent units in installed position -- 1/8-inch

1.5 SUBMITTALS

A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, furnish the following:

1. Samples: Submit sample of all fastening systems and mounting hardware including, but not limited to, the following:
   a. Stainless Steel Angle (rosette plates of varying sizes depending on position of marble/granite marker on memorial wall—see drawings).
   b. Stainless Steel Bolt and Washers
   c. Stainless Steel Spring Plate
   d. Tamperproof Stainless Steel Bolt
   e. Stainless Steel Rosette
   f. Stainless Steel Expansion Anchors and Bolts

2. Shop Drawings: Complete shop and installation drawings of all precast concrete memorial wall units, showing all dimensions, sizes of units, and details of construction, installation and relation to adjoining work, joint locations and details, reinforcements, anchorage, attachments, inserts, location of all predrilled sleeves (see Fabrication, Paragraph 2.17) and other trades, joint treatment, finishes, and other work required for a complete installation.

3. Manufacturer’s Literature and Data:
   a. Each type of fastener or anchorage
   b. Instructions for final cleaning
   c. Coating and/or sealers

4. Certificates: Manufacturers qualifications specifying precast concrete memorial wall units meet the requirements of ACI 533.3R as specified.

1.6 DELIVERY, STORAGE

A. Ship precast concrete memorial wall units to site with adequate protection to prevent chipping, breaking and other damage. //Provide
lifting devices that will allow the units to be set without the use of lifting straps that wrap around the unit. Materials shall be marked giving proper identification and location. Store materials in protected areas to prevent damage, injurious effects of weather and inclusion of foreign matter.

1.7 COORDINATION

A. Coordinate the manufacture and installation of precast concrete memorial wall units with related work of other sections of the Specifications. Provide templates for inserts and other devices for anchoring precast concrete memorial wall units to the work of other trades, or other adjoining units, in sufficient time to be built into adjoining construction. Perform cutting, fitting and other related work in connection with erection of precast concrete memorial wall unit work.

1.8 GUARANTEE

A. Guarantee precast concrete memorial wall unit work, including anchorage, joint treatment and related components to be free from all defects in materials and workmanship, including cracking and spalling and after erection, for a period of not less than one year.

1.9 APPLICABLE PUBLICATIONS

A. The publications listed below from a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

B. Federal Specifications (Fed.Spec.):
   QQ-S-766C (5) ............ Steel Plates, Sheets, and Strip-Corrosion Resisting
   QQ-W-423B ............... Wire, Steel, Corrosive-Resisting
   TT-S-00227E (3) ........ Sealing Compound Elastomeric Type, Multi-Component (For Caulking, Sealing, And Glazing In Building And Other Structures)
   TT-S-00230C (2) ........ Sealing Compound: Elastomeric Type, Single Component (For Caulking, Sealing and Glazing In Building and Other Structures)

C. American Concrete Institute (ACI) Publications:
   ACI 533.3R-70 .......... Fabrication, Handling And Erection of Precast Concrete.

D. American Society for Testing Materials (ASTM) Standards:
   A36/A36M-08 .......... Structural steel.

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A83/A82M-07 .......... Steel Wire, Plain, for Concrete Reinforcement
A186/A185M-07 .......... Welded Steel Wire Fabric for Concrete Reinforcement.
A615/A615M-08b .......... Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
C33-08 ................. Concrete aggregates.
C 150-87 ............... Portland Cement.

E. American Welding Society (AWS) Publications:
AWS D 1. 1-90 .......... Structural Welding Code
AWS D1.4-80 .......... Welding Reinforcing Steel

PART 2 – PRODUCTS

2.1 COARSE AGGREGATE
A. Hard durable aggregate carefully graded from coarse to fine in proportions required to match approved samples.

2.2 AGGREGATE FOR BACK-UP MIX (FINE AND COARSE AGGREGATE LIGHTWEIGHT):
A. ASTM C33. Limit gradation as required to produce specified appearance and quality of concrete.

2.3 PORTLAND CEMENT
A. ASTM C150, Type I and Type III; Color as required to match existing.

2.4 WATER
A. Water shall be clean, fresh and potable.

2.5 STRUCTURAL STEEL
A. ASTM A36.

2.6 STEEL FABRIC REINFORCEMENT
A. ASTM A185, galvanized.

2.7 STEEL WIRE REINFORCEMENT
A. ASTM A82, cold drawn.

2.8 REINFORCING STEEL
A. ASTM A615, deformed, Grade 60.

2.9 MISCELLANEOUS STAINLESS STEEL ITEMS
A. Bolts, nuts, washers, anchors, inserts, and the like for handling, erection, or use by other trades.

2.10 BACK-UP MATERIAL
A. Closed cell neoprene, butyl, polyurethane, vinyl or polyethylene foam rod, diameter approximately 1- 1/3 times the Joint width.

2.11 BOND BREAKERS
A. Type and material recommended by sealant manufacturer.
2.12 SEALING COMPOUND  
A. Fed. Spec. TT-S-00230 C, Type 11, Class A, or ASTM C 920-87, Type S, Grade NS, Class 25.

2.13 ROSETTES  
A. To be produced from sheet goods like or similar to #316 stainless steel as manufactured by Aeon Manufacturing Co. Inc., Harbor City, CA. Thickness to be 0.100 inch. Die stamp, producing an eight-petal flower pattern. Luster finish. 1” in diameter with slight convex; center hole of 0.218”, concentric to outer edge, with shoulder recess of 0.400” in diameter and 0.035” in depth. Rosettes shall match existing in place at the site in color, finish and design.

2.14 CAST STONE CAPS  
A. Cast stone shall meet the requirements of Section 04 72 00 CAST STONE MASONRY.

2.15 DECORATIVE GRAVEL  
A. See Section 32 90 00, PLANTING

2.16 CONCRETE FOOTINGS  
A. See Section 03 30 00, CAST-IN-PLACE-CONCRETE

2.17 FABRICATION  
A. Memorial wall units shall be of size and form as indicated on the plans.

B. Concrete for precast memorial wall units shall have minimum compressive strength of 5,000 psi at 28 days.

C. Provide additional steel reinforcing as required for casting, handling and erection loads.

D. Back-up Mix: Porosity, strength, weight and gradation of coarse aggregate shall be as required to produce specified characteristics.

E. Memorial wall units shall be cast in steel forms designed to suit shape and finish required and to withstand high frequency vibration. Concrete shall be deposited in oiled forms. Form oil shall be non-staining type. Vibrations, where required, shall be continuous during process of casting to attain through compaction, complete embedment of reinforcement and to assure concrete of uniform and maximum density without segregation of mix and full thickness of precast element is attained.

a. Anchors, lifting devices, provisions for cutouts and openings, dovetail slots, reglets, inserts and similar items required for the
work of other trades shall be accurately positioned in forms before casting elements.

b. All fastener location holes, including those for anchoring of units and attachment of memorial markers, shall be field drilled for anchor bolts.

F. Cement, aggregate, and water shall be obtained from single sources for facing mix of precast concrete work in order to assure regularity of appearance and uniformity of color.

G. Architectural Finish: Exposed faces shall have smooth finish, rubbed with a fine abrasive or stone hone to create a cast stone like finish, uniformly smooth. Use ample water during rubbing to prevent working up a lather of mortar or changing texture of concrete. There shall be no air bubble marks or other such imperfections visible on the surface. Back of columbaria shall be finished as indicated in section 09 24 00 PORTLAND CEMENT PLASTERING to match the administration building.

H. Curing: Precast concrete shall be cured as required to develop specified structural characteristics and shall be stored in a manner that will permit all surfaces to cure equally and minimize warping, without staining the exposed faces.

PART 3 - EXECUTION

3.1 CONCRETE FOOTINGS

A. Place concrete footings per lines and grades indicated on the drawings and in accordance with Section 03 30 00, CAST-IN-PLACE CONCRETE.

3.2 HANDLING AND INSTALLATION

A. Before beginning installation, inspect work of other trades insofar as it affects the work of this Section. Commencing installation of precast concrete memorial wall units will be construed as acceptance, as suitable, of such work of other trades. Memorial wall units shall be handled in a nearly vertical plane at all times and stacked vertically on wood supports of adequate strength, until erected. Cover and protect precast concrete memorial wall units against staining and other damage. Reinstall, realign and otherwise correct improperly installed units.

1. Accurately place and securely anchor precast concrete memorial wall units to adjoining construction in accordance with approved shop and installation drawings.
3.3 SETTING

A. Concrete footings (pads) for columbaria shall be constructed to meet all structural requirements to meet local soil and climate conditions and the weight and dimensions of the columbaria.

B. Joints shall be filled with sealant. Surfaces and other joints for precast concrete memorial wall units shall be cleaned of all dust, dirt and other foreign matter. Each precast element shall be set level and true to line with uniform joints. Joints required to have sealant shall be kept free of dirt and other contaminants for their full depth. Precautions shall be taken to protect precast concrete work from being damaged and soiled during and after installation. Wedges, spacers or other appliances that are likely to cause staining shall be removed from joints. Where two units are butted together, alignment shall be precise so that a smooth continuous line is produced.

C. Cast stone caps shall be installed on top of the columbaria. A urethane caulking adhesive shall be in place prior to setting the capping. Four (4) anchor bolts (2 each side) shall be placed through top row of niche wall and into capping on each unit. The cap lengths shall match the memorial wall unit length such that caulk joints between memorial wall units are aligned with the caulk joints between the caps. At locations requiring a concrete spacer between an end or corner pilaster and the adjacent memorial wall unit, the terminal cap shall extend over the spacer, with the terminal caulk joint aligning with the caulk joint that occurs between the concrete spacer and the adjacent pilaster. In locations where memorial wall units step, the cap length shall extend beyond the face of the memorial wall unit as shown on the drawings.

D. Place decorative gravel to the line and grade as indicated on the drawings. See Section 32 90 00, PLANTING.

3.4 SEALING OF JOINTS

A. Where shown and where required to make the work watertight, joints between precast concrete memorial wall units and between other precast elements and adjoining masonry, concrete and other materials shall be filled with back-up material for depth extending as required to form joint of depth recommended by sealant manufacturer. Provide bond breakers, at base of sealant where space for back-up does not exist and to prevent sealant from bonding to material at base of joint.
B. Workmanship shall be in accordance with Section 07 92 00, JOINT SEALANTS.

3.5 CLEANING
A. After installation is complete, clean precast memorial wall units using materials, equipment and methods recommended by manufacturer.

3.6 REPLACEMENT AND REPAIR
A. Precast concrete memorial wall units that are damaged, cracked, stained, improperly fabricated or otherwise defective shall be removed and be replaced. Precast units having minor defects, not affecting serviceability or appearance may be repaired when approved by the Resident Engineer. Repaired work shall be sound, permanent, and flush with adjacent surfaces and of color and texture matching similar adjoining surfaces and shall show no line of demarcation between original and patched surfaces. Replacement and repairs shall be done at no additional cost to the Government.

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