

SECTION 03 48 24
PRECAST CONCRETE COLUMBARIUM UNITS

SPEC WRITER NOTES:

1. Use this section only for NCA projects.
2. Delete "/" and between //----// if not applicable to project. Also delete any other items in the section not applicable to project and renumber the paragraphs.

PART 1 - GENERAL

1.1 SUMMARY

- A. This section covers the manufacture and installation of precast concrete columbarium units, as shown on the drawings and specified herein, including but not limited to: the steel reinforcement, steel embedment plates, required sleeves, finished exposed surfaces, preparation of setting surface, adhesive, columbarium fasteners, and niche cover anchor clip assemblies.
- B. Acceptable designs of the columbarium units' components are provided as shown on the Drawings. The Contractor may use this design for this Work or may propose alternate designs of the corresponding components as follows:
 1. Design for alternate columbarium units shall comply with the design criteria as per Articles 1.3.F and shall comply with the functional tests as per Article 1.3.G of this Specification.
 2. Unless indicated otherwise, all provisions of this Specification shall apply to the Contractor proposed design.
- C. The Government may accept or reject part or all of any design proposed by the Contractor.

SPEC WRITER NOTES:

1. Modify or delete Paragraph D to correspond to the project design.
- D. This section includes preparation, cleaning and finishing of exposed faces of the columbarium units as indicated on drawings or described herein.

1.2 RELATED DOCUMENTS

SPEC WRITER NOTES:

1. Modify or delete documents listed below that do not correspond to the project design. Coordinate with other disciplines.
- A. Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

- B. Section 01 81 11, SUSTAINABLE DESIGN REQUIRMENTS, for Sustainable Design Requirements.
- C. Section 01 81 13, SUSTAINABLE CONSTRUCTION REQUIREMENTS, for Sustainable Construction Requirements.
- D. Section 31 20 00, EARTH MOVING.
- E. Section //03 30 00, CAST-IN-PLACE CONCRETE//03 30 53, CAST-IN-PLACE CONCRETE (SHORT FORM)// for cast-in-place concrete work.
- F. Section 04 20 00, UNIT MASONRY for concrete masonry unit or brick work.
- G. Section //04 43 00, NATURAL STONE VENEER//04 40 10, CUT STONE ASSEMBLIES// for columbarium wall stone caps.
- H. Section //04 43 00, NATURAL STONE VENEER//04 40 10, CUT STONE ASSEMBLIES// for columbarium wall stone veneer.
- I. Section 04 73 00, COLUMBARIUM NICHE COVERS.
- J. Section 07 92 00, JOINT SEALANTS, for workmanship of joint sealant application.

1.3 QUALITY ASSURANCE

- A. Manufacturer's and Installer's Qualifications: Prior to commencement of work, submit documentation regarding the experience of his precast concrete supplier and his precast concrete installer in the design, manufacture and installation of Precast Concrete structures and custom units.
- B. Precast concrete manufacturer's qualified Registered Professional Structural Engineer to certify that precast reinforced concrete conforms to specified requirements.
- C. Codes and regulations of the Federal, State and County authorities shall apply.
- D. Fabricate to dimensions shown or approved. Replace or correct Columbarium Units that do not comply with the individual dimensions and tolerances.
- E. Before starting production of Precast Concrete Columbarium Units, furnish at the site, two complete Precast Concrete Columbarium Units, to demonstrate quality of construction. Commence production of columbarium units only after written approval has been obtained from the Contracting Officer's Representative (COR).

SPEC WRITER NOTES:

1. The following paragraph 1.3.F is intended for the case where the manufacturer is new and has never successfully provided these units for NCA project(s). For manufacturers

regularly providing these units for NCA projects, a variance from this requirement is typically requested by the contractor and approved following submittal of the past history of successful installations at NCA projects. In addition the typical variance request asks that the first shipment of units to actually be used for the project be used as the basis for demonstration of quality. Modify the following paragraph as appropriate.

F. Design Criteria:

1. The Columbarium Units shall be of the following type, style, and size:
 - a. Type: Precast concrete, reinforced.
 - b. Size: Interior and exterior dimensions as indicated on plans.
2. Columbarium top shall be capable of structurally supporting imposed service live load of no less than 240 Kgs./Square Meter (50 lb./ft²), and dead loads based on cap (coping) thickness and heights, including material composition and element section properties, mortar and grout, and dead loads based on concrete top element sectional properties.
3. Submit to the COR for review and approval 5 sets of design documentation showing structural design of the complete Columbarium. This documentation shall include dimensions, methods of construction, and calculations. All design calculations and drawings shall be signed and sealed by qualified Professional Structural Engineer licensed in the state of the project location.

G. Functional Load Tests: If required by the COR, a functional load test will be made at the //Government's//Contractor's// expense to ensure that the columbarium proposed by the Contractor, as furnished, will be capable of supporting loads stated in Article 1.3.F.2. The functional test will consist of the following loading conditions:

1. Unconfined Loading: The columbarium will be placed on a flat surface with no support against the sides. The entire top of the columbarium will be subjected to a simulated uniform load of live load of 240 Kgs./Square Meter (50 lb./ft²) and required dead load simulating cap, mortar, and grout as they will be installed. The load will be maintained for no less than 72 hours. At end of the loading period, the maximum deflection of the Columbarium top

elements shall be no more than 3 mm (1/8"). Upon removal of the load from the unit the residual deflection shall be no more than 1.5 mm (1/16") and concrete elements shall be free of all structural distress.

1.4 MANUFACTURER QUALIFICATIONS

- A. Precast concrete columbarium units shall be a product of the manufacturer who has a minimum of 3 years of experience in fabrication of the precast concrete columbarium units similar in material, design, and quantity to that indicated on the drawings and specified herein. Current plant certification for the location(s) that will be producing the units for this project from the National Precast Concrete Association (NPCA) shall be provided as a submittal prior to any work being performed.
- B. Manufacturer's that have successful experience fabricating precast concrete niche units for cemeteries outside of NCA, may be selected by the Contractor. Contractor is hereby notified that the submittal process for a manufacturer with no previous NCA experience shall require additional submittal review time.C. Supply and Installation of fastener system shall be by product manufacturers and installers, both whom have had a minimum of 3 years of experience in installation of similar design to that indicated on the drawing. Supply and installation shall be by the same entity.

1.5 INSTALLER QUALIFICATIONS

- A. Precast concrete columbarium unit installer shall have been regularly engaged for at least three years in installation of precast concrete similar to this project. Installers that have previously completed at least three successful NCA columbarium projects within the past 10 years are deemed to be acceptable. Installer to submit successful projects for NCA review. Installer to submit resumes with names of those experienced installers performing the installation.
- B. Installer shall have had a minimum of 3 years of experience in installation of niche cover attachment hardware.

SPEC WRITER NOTES:

- 1. Modify the following paragraph on a project basis to ensure compliance for the products that are to be used for the work of this section.

1.6 SUSTAINABILITY REQUIREMENTS

- A. Materials in this section may contribute towards contract compliance with sustainability requirements. See Section 01 81 11, SUSTAINABLE DESIGN REQUIRMENTS and Section 01 81 13, SUSTAINABLE CONSTRUCTION REQUIREMENTS, for project // local/regional materials, // low-emitting materials, // recycled content, // certified wood // _____// requirements.
- B. Blended Cement: It is the intent of this specification to reduce CO2 emissions and other environmentally detrimental effects resulting from the production of portland cement by requiring that all concrete mixes, in aggregate, utilize blended cement mixes to displace portland cement typically included in conventional construction. Provide the following submittals:
1. Copies of concrete design mixes for all installed concrete.
 2. Copies of typical regional baseline concrete design mixes for all compressive strengths used on the Project.
 3. Quantities in cubic yards of each installed concrete mix.
- C. Biobased Material: For products designated by the USDA's BioPreferred® program, provide products that meet or exceed USDA recommendations for biobased content, subject to the products compliance with performance requirements in this Section. For more information regarding the product categories covered by the BioPreferred® program, please visit <http://www.biopreferred.gov/>.

1.7 REGULATORY REQUIREMENTS FOR RECYCLED CONTENT

- A. Products and Materials with Post-Consumer Content and Recovered Materials Content:
1. Contractor is obligated by contract to satisfy Federal mandates for procurement of products and materials meeting recommendations for post-consumer content and recovered materials content; the list of designated product categories with recommendations has been compiled by the EPA - refer to <https://www.epa.gov/greenerproducts/identify-greener-products-and-services/>
 2. Materials or products specified by this section may be obligated to satisfy this Federal mandate and Comprehensive Procurement Guidelines program.
 3. The EPA website also provides tools such as a Product Supplier Directory search engine and product resource guides.

- B. Fulfillment of regulatory requirements does not relieve the Contractor of satisfying sustainability requirements stipulated by Section 01 81 11, SUSTAINABLE DESIGN REQUIREMENTS, as it relates to recycled content; additional product and material selections with recycled content may be required, as determined by Contractor's Sustainability Action Plan.

1.8 ALLOWABLE TOLERANCES

- A. In addition to tolerances of individual elements required by American Concrete Institute Publication 533.3R, erection tolerances shall be as follows:
1. Variation of anchors and fasteners from dimensions specified:
1.5 mm (1/16")
 2. Variation in height and width of individual precast unit: 3 mm (1/8")
 3. Variation in overall dimension of set precast units and joints within columbarium wall (height and width): 3 mm (1/8")
 4. Maximum joint variance between adjacent units in erected position: 3 mm (1/8")
 5. Variation in thickness of precast elements: 3 mm (1/8")
 6. Maximum vertical difference between adjacent columbarium units in installed position: 3 mm (1/8")

1.9 SUBMITTALS

- A. In accordance with Division 1 Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, and SAMPLES, furnish the following:
1. Samples of all fastening systems, mounting hardware and exposed surface finishes including, but not limited to, the following:

SPEC WRITER NOTES:

 1. Modify the following if the rosette attachment system is NOT to be the standard Stainless-Steel system.
 - a. Stainless Steel Angle with threaded spring clip to receive the Tamper-Proof Stainless-Steel Bolt
 - b. Stainless Steel Bolt, Nut and Washers
 - c. Tamper-Proof Stainless-Steel Bolt
 - d. Stainless Steel Rosette
 - e. Stainless Steel Expansion Anchors, Bolts and pins
 - f. Stainless Steel Ferrule loop insert.
 - g. Shims
 - h. Washers

2. Samples of two complete Precast Concrete Columbarium Units, to demonstrate quality of construction, delivered to the site to be approved prior to production.
- 3 Samples of adhesives and grouts.
4. Samples of concrete repair and/or patching materials.
5. Shop Drawings: Complete shop and erection drawings of all precast concrete columbarium units, showing:
 - a. All dimensions and details of construction.

SPEC WRITER NOTES:

1. Modify the following paragraph.

Columbarium niche units are preferred to be closed end niche units. Some national cemeteries may choose to have open end niche units. The VA PM shall determine which niche unit design is appropriate for the project.

- b. Installation and relation to adjoining work.
 - 1) Show the individual units //open ended against closed ended and that web centerline distance is maintained across the joint between units//.
 - 2) Show that the overall length of the wall, with multiple precast units is to be set with the indicated overall in place length, within the allowable tolerances (show the installation tolerances).
 - 3) For back-to-back precast niche units show that the web centerlines for the back-to-back units align. The locations of the cap vertical joints shall be centered on the niche web centerlines, within the allowable tolerances.

SPEC WRITER NOTES:

1. Modify or delete the following paragraph if the design drawings do not clearly show that the cap joints and centerlines of niche webs below are to align, within a specified construction tolerance.
- 4) Detail where the precast niche units are to be set in the field so the centerline of niche webs will align with the centerline of cap joints above, within the allowable tolerances, when the drawings or details indicate this alignment.

- c. Reinforcements, anchorage, attachments, inserts, location of all pre-drilled sleeves and other items to be installed in the work of other trades.
 - d. Joint treatment, joint alignment coordinated with cap stone joints.
 - e. Any other work required for a complete installation.
 - f. Provide evidence, such as meeting minutes, that the Contractor to be installing the cast-in-place concrete foundations for the columbarium niche units and piers has been contacted prior to any work relating to the footings for the columbarium construction, and that the construction of the concrete support (foundations) work has been coordinated with the precast columbarium unit manufacturer and installer prior to pouring of concrete foundations.
6. Production Drawings:
- a. Elevation view of each structural element.
 - b. Plan view of unit.
 - c. Sections and details to show quantities and position of reinforcing steel, anchors, inserts, and essential embedded and non-embedded hardware for fabrication, handling, transportation, and installation.
 - d. Lifting and erection inserts.
 - e. Dimensions and finishes.
 - f. Method of transportation.
 - g. Method of erection and handling.
7. Erection Drawings:
- a. Elevation view of each typical wall segment of interconnected precast niche units, with the overall in place length and position of the precast niche assembly.
 - b. Section view of the precast niche units, as they are to be installed, with the critical alignment elements and field placed dimensions indicated. For double sided units, as an example, the face of niche unit to face of backed up niche unit shall be indicated with the construction tolerances for the in-place units indicated. Clearly indicate how the units are going to be set in the field to achieve the intended installed conditions.
 - c. Provide setting drawing(s) that indicate how the precast niche units are to be positioned on the foundations, to meet the design

drawings. The setting drawings shall be submitted based upon the field conditions for the foundations for the segments upon which the precast niche units are to be set. Any discrepancies that exist greater than 1/4" from the design drawings shall be clearly indicated as the foundations are to be constructed within this tolerance. The setting of the precast concrete niche units shall not begin until this information has been provided and approved by the RE/COR, or adjustments made to the foundations that are acceptable to the RE/COR.

- d. Provide coordination drawings indicating the locations for the weld plates in the precast niche units as well as in the foundations. Coordinate this information so the weld plates are installed in the correct locations to align within allowable tolerances.
8. Manufacturer's Literature and Data:
 - a. Each type of Concrete Fastener, including adhesive and anchor devices.
 - b. Instructions for final cleaning.
 - c. Concrete stain/coating, including color charts of manufacturers standard color palette (If applicable for this project.)
 - d. Written instructions of how the exposed-to-view concrete of the precast niche units is to be cleaned and prepared prior to application of the approved stain/coating indicated above.
 9. Certificates: Current plant certification for the location(s) that will be producing precast concrete units for this project from the National Precast Concrete Association (NPCA).
 10. Certificates: Installer's qualifications documenting the quality and quantity of experience of the precast concrete installer in the installation of precast concrete structures and custom units.
 11. Certificates: Manufacturer of the precast niche units shall provide a written certification, prior to shipping the materials, that the products being shipped have been checked and that they meet the dimensional criteria as indicated, within the allowable tolerances for individual units, and that they can be assembled as part of the identified wall segments, within the allowable in place dimensions indicated, within the allowable tolerances indicated. The above manufacturing certifications shall be provided no later than immediately before the units are offloaded at the site. Units that

do not meet these criteria shall either be returned or marked in such a manner that indicates they are not to be used for the project work. It is the Contractor's responsibility to ensure that all units that are installed in the project work have been certified by the manufacturer of the units. The Contractor shall be responsible for disposal of any units that are not acceptable for installation in the project work at no cost to the Government.

1.10 DELIVERY, STORAGE

- A. Ship precast concrete columbarium units to site with adequate protection to prevent chipping, breaking and other damage. Materials shall be marked giving proper identifications and location. Store materials in protected areas to prevent damage including vandalism, injurious effects of weather and inclusion of foreign matter.
- B. Provide access to the units for field verification of the manufacturing dimensions and whether the units are within allowable tolerances.

1.11 COORDINATION

- A. Coordinate the manufacture and erection of precast concrete columbarium units with related work of other sections of the Specifications. Provide templates for inserts and other devices for anchoring precast concrete columbarium units to the work of other trades, in sufficient time to be built into adjoining construction. Perform cutting, fitting and other related work in connection with erection of precast concrete columbarium unit work. See Section 01 33 23 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES for details regarding the coordination of work.

1.12 GUARANTEE

- A. Guarantee precast concrete columbarium 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, completed work will be subject to terms of "Guarantee" article in Division 1 Specification Sections except that guarantee period is one year.

1.13 APPLICABLE PUBLICATIONS

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in text by the basic designation only. Comply with applicable provisions and recommendations of the following, except as otherwise shown or specified.

SPEC WRITER NOTES:

2.6 STEEL WIRE REINFORCEMENT

- A. ASTM A1064, cold drawn.

2.7 REINFORCING STEEL

- A. ASTM A615/A615-M12, deformed, Grade 60.

2.8 MISCELLANEOUS GALVANIZED STEEL ITEMS

- A. Bolts, nuts, washers, anchors, inserts, and the like for handling, erection, or use by trades.

SPEC WRITER NOTES:

1. The spec writer shall modify the following section, if the niche cover attachment hardware is to be other than the NCA standard stainless steel rosette system.

2.9 NICHE COVER ATTACHMENT HARDWARE (ROSETTES)

- A. VA National Cemetery Administration, standard stainless-steel rosette, mounting brackets, and bolts for complete attachment of the niche covers to the precast columbarium units are to be as shown on drawings:

1. Rosettes

- a. ASTM Type 316 stainless steel sheet goods, 2.7 mm (0.100 inch) thick.
- b. Die stamp, producing an eight-petal flower pattern as shown on drawings, 25 mm (one-inch) diameter with slight convex; center hole of 5.5 mm (0.218"), concentric to outer edge, with shoulder recess of 10 mm (0.400") in diameter and 1mm (0.035") in depth.
- c. Luster finish.
- d. Where indicated, Rosettes shall match existing in place at the site in color, finish, and design.

2. Interior mounting and attachment elements:

- a. ASTM Type 316 stainless steel tamper-resistant bolts, nuts, washers, anchors, mounting brackets, inserts and the like.

2.10 JOINT 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 JOINT SEALANTS

- A. Elastomeric, single-component, non-staining silicone sealant, meeting requirements of ASTM C 920, Type S, Grade NS, Class 25 or higher. Color to match ultimate finish of vertical precast web unit face.

2.13 FABRICATION

- A. Precast concrete columbarium units shall NOT be: fabricated, delivered or incorporated in the work until samples have been approved. Adhere to National Precast Concrete Association (NPCA) standards for fabrication, handling, and erection. Tolerances shall be as indicated herein.
1. Concrete for precast columbarium units shall have minimum compressive strength of 35 MPa (5,000 psi) at 28 days.
 2. Provide additional steel reinforcing as required for casting, handling and erection loads. Adhere to American Welding Society (AWS) Publications AWS D1.1/D1.1M:2020 and AWS D1.4/D1.4M:2011 for structural welding codes and requirements.
 3. Back-up Mix: Porosity, strength, weight and gradation of coarse aggregate shall be as required to produce specified characteristics.
 4. Columbarium 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, notches, inserts and similar items required for the work of other trades shall be accurately positioned in forms before casting elements.
 - b. Fastener location holes, including those for anchoring of units and attachment of niche covers, shall be cast into units. Drilling into precast concrete columbarium units, after fabrication, shall not be acceptable, except where pins are to be inserted through the tops of the units into the caps above, or where pins are to be inserted through the bottom of the precast niche units into the foundation below. Pin hole locations shall be to the sides of niche and shall not be centered in the niche.
 5. 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.

6. Finish: Exposed faces shall have smooth natural concrete finish, unless otherwise noted. Following removal from the forms but before shipping to the site, the manufacturer shall process and clean the face of the units of all debris and form oil to ensure that the discoloration and blemishes on the niche faces are removed. //The entire surface of the niche faces shall then receive an evenly applied sack-rubbed finish before shipping to the site.// Units that arrive at the site with blemishes and discoloration are subject to rejection. SPEC WRITER NOTES:
 1. Select the finish for the back side of the niche units, when exposed to view. Be aware that manufacturers construct their units differently and some may not be able to create a finished back during manufacturing because their units have backs against forms. A broom finish, as an example, may not be achievable by all manufacturers.
- a. Back side of single columbarium units, with back exposed to view shall have surface finish as indicated on the drawings.

SPEC WRITER NOTES:

 1. Modify the information on the surface finish on the back of units based upon local conditions and grading, access, etc. Anti-graffiti coating should be considered for exposed backs of units. Modify this section accordingly.
- b. Specified surface finish for the exposed back of the columbarium units shall be applied during the appropriate time of fabrication and curing. Seal coating of exposed back of units shall be applied as per manufacturer's recommendations.
7. 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.

SPEC WRITER NOTES:

1. Delete the following paragraph 2.16 if
 - (1) the back sides of precast niche units are installed with a masonry veneer or if
 - (2) the site-specific conditions do not require anti-graffiti treatment.

2.16 ANTI-GRAFFITI COATING IF USED

- A. Furnish and install a permanent two coat anti-graffiti coating system, matte type finish (non-gloss), designed to be applied on concrete and brick surfaces and to provide a minimum life, as indicated in the manufacturer's literature, of 10 years. The coating system shall be clear. SPEC WRITER NOTES:
 1. Delete the following paragraph if the precast niche units are to be provided and installed without a high-build niche face coating. Consult with PM for direction.
 2. Most projects will not have niche face coating.

2.17 NICHE FACE COATING IF USED

- A. All exposed to view faces and edges of columbarium niches shall receive approved coating as noted herein. Basis of Design for coating shall be MasterProtect® HB 300 SB Waterborne, high-build, modified acrylic water proof coating manufactured by Master Builders Solutions Construction Systems US, LLC, or approved equal. The application procedures for the niche face coating shall achieve the manufacturer required coating thickness as is indicated on a properly primed substrate as required for Warranty applications of the product (8-10 dry mils). If two coats of high-build, modified acrylic water proof coating are not provided, one coat of primer (basis of design MasterProtect® FL 749) is required followed by one coat of high-build, modified acrylic water proof coating, with the applications resulting in the required coating thickness per the manufacturer's recommendations (8-10 dry mils). Primer shall be a different color than the final coat. Color of niche face coating to be determined during columbarium mock-up review.

PART 3 - EXECUTION**3.1 HANDLING AND INSTALLATION**

- A. Before beginning installation, inspect work of other trades in-so-far as it affects the work of this Section. Install units by competent installation crews meeting the requirements of paragraph 1.4 B.

Commencing installation of precast concrete columbarium units will be construed as acceptance, as suitable, of such work of other trades. Concrete base for the columbarium units shall be inspected and modified as required, grinding off high spots, to become an acceptable base upon which to install the units. Columbarium 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 columbarium units against staining and other damage. Reinstall, realign and otherwise correct improperly installed units.

1. Accurately place and securely anchor precast concrete columbarium units to adjoining construction in accordance with approved shop and erection drawings.

3.2 SETTING

- A. Each precast element shall be set level and true to line with uniform joints as specified within the allowable tolerances, and as needed to result in the overall length of the wall assembly being the specified dimension, within the allowable construction tolerances. Joints that are required to have sealants shall be kept free of dirt and other contaminants for at least the depth to the contact points of the backer rod. Precautions shall be taken to protect precast concrete work from being damaged and soiled during and after installation. Wedges, spacers or other appliances which are likely to cause staining shall be removed from joints.
- B. Setting of the precast niche units is intended to meet the design drawings within the allowable construction tolerances indicated. There are certain visual relationships that are most critical in the final installation to achieve the design intent. Generally, the consistency of the cap overhang in front of the precast niches, as well as the symmetry of the overhang distance are critical. For double-sided columbarium niche units, as an example, the distance from the face of niche unit to the face of niche units, when installed back-to-back, is a critical dimension when setting the units. Maintaining this dimension in setting the units, especially at the top of the precast niche units, will allow the caps to be manufactured the same width, and the placement should produce the correct overhang and be symmetrical. The distance from the center of vertical webs on adjoining units are critical as maintaining these allows the proper setting of the niche covers.

SPEC WRITER NOTES:

1. Modify the following based upon the information provided in the drawings to complete this paragraph.
2. If the additional information is not to be included in the drawings, modify the material in this paragraph to include descriptions of any other critical aesthetic dimensional relationships that should be used carefully during the construction of the foundations and setting of the precast niche units and caps for the columbarium units.

//Refer to the drawings for additional information regarding the critical element relationships to be used during the creation of the foundations and setting of the precast units.//

- C. Where shown, joints shall be filled with sealant and bond breaking material. Surfaces and other joints for precast concrete columbarium units shall be cleaned of all dust, dirt and other foreign matter.

SPEC WRITER NOTES:

1. Delete the following paragraph 3.2.C if the precast niche units are to be provided without anti-graffiti coating.

- D. Exposed surfaces of units for which the final finish is an anti-graffiti coating shall either be protected by anti-graffiti coating at the manufacturer or shall be otherwise protected from vandalism until units are installed and field-applied coating is applied following installation. Units that have been damaged on exposed surfaces by graffiti, when not coated in advance shall be rejected and removed from the site.

SPEC WRITER NOTES:

1. Indicate in the drawings any specific procedures that should be followed by the Contractor in cleaning, preparing, installing, and finishing the joint sealant for the various locations within the columbarium complex. Modify the following paragraphs accordingly.

3.3 SEALING OF JOINTS

- A. Joints between precast concrete columbarium niche units and between other precast elements and adjoining masonry, concrete and other materials shall be filled with bond breaking material for depth extending as required to form joint of depth as shown or recommended by sealant manufacturer. Provide bond breaking tape, at base of sealant

where space for bond breaking materials do not exist and to prevent sealant from bonding to material at base of joint to avoid three-sided sealant adhesion failures.

1. Workmanship shall be in accordance with Division 1 Specification Sections and Section 07 92 00, JOINT SEALANTS, except as indicated below.
2. All joints shall be mechanically cleaned and primed with the sealant manufacturer's recommended joint primer, immediately prior to placing the joint sealant.
3. Contractor shall use painter's tape during the completion of critical (highly visible) joints to receive sealant to produce a consistent thickness and appearance.
4. Joint sealant process shall be undertaken only when there is no contaminants (such as dirt and dust) in the air. Joints must be protected from contamination until the sealant will no longer be permanently discolored by dirt, dust or debris that sticks to the surface of the sealant before it dries.

3.4 CLEANING

- A. After erection is complete, clean precast columbarium units using materials, equipment and methods recommended by manufacturer.

3.5 REPLACEMENT AND REPAIR

- A. Precast concrete columbarium units which are damaged, cracked, stained, improperly fabricated, have exposed reinforcing, or otherwise defective shall be removed and replaced at no additional cost to the Government. Precast units having minor defects not affecting serviceability, structural integrity of niche cover anchoring system, may be repaired when approved by the COR. Minor defects on exposed to view units shall be repaired. Repaired work shall be sound, permanent, smooth, 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.

SPEC WRITER NOTES:

1. Coordinate with the project manager regarding which finish is required for the precast niche units. Select from the options below.

//3.6 APPLYING NICHE FACE COATING

- A. Apply specified niche face coating to the entire front face of properly prepared precast concrete niche units (complete), per manufacturer's standard specifications and recommendations.//

//3.6 ACID ETCHING OF NICHE FACE

- A. Manufacturer shall create an acid etch finish to the exposed face(s) of precast niche units. Concrete for precast columbarium units shall have a color admixture integrated into the mix and an acid-etched finish. Manufacturer shall create the acid-etched finish using acid and hot-water solution, equipment, application techniques, and cleaning procedures to expose aggregate and surrounding matrix surfaces. Contractor shall submit sample of acid etch finish for review and approval by COR prior to fabrication of precast niche units.//

//3.6 APPLYING SACK-RUBBED FINISH COATING

- A. Apply sack-rub-finish to the entire front face of properly prepared and installed precast concrete niche units. After dampening the surface, and before it dries, a mixture of dry cement and sand shall be rubbed over it with a wad of burlap or a sponge rubber float to remove surplus mortar and fill the voids. Provide sample mockup (independent of installed niches) for approval.//

- - - END - - -