

SECTION 03 48 24
PRECAST CONCRETE COLUMBARIUM UNITS

SPEC WRITER NOTES:

1. Use this section only for NCA projects.
2. Delete 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

- A. Section 31 20 00, EARTH MOVING
- B. Section 03 30 53, CAST-IN-PLACE CONCRETE (SHORT FORM) for Cast-in-place concrete work.
- C. Section 04 20 00, UNIT MASONRY for stone or brick work.

D. Section 07 92 00, JOINT SEALANTS, Materials and Workmanship for sealant application.

E. Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

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 Resident Engineer/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 Resident Engineer 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.
- G. Functional Load Tests: If required by the Resident Engineer, a functional load test will be made at the //Government's//Contractor's// expense to insure 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 AND INSTALLER QUALIFICATIONS

- A. Precast concrete columbarium units shall be product of 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.

- B. Precast concrete columbarium units installer shall have been regularly engaged for at least three years in installation of precast concrete similar to this project.
- 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.

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.

1.5 SUSTAINABILITY REQUIREMENTS

- A. Materials in this section may contribute towards contract compliance with sustainability requirements. See Section 01 81 11, SUSTAINABLE DESIGN REQUIRMENTS, 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/>.

1.6 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 <http://www.epa.gov/wastes/consERVE/tools/cpg/products/>
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.

1.7 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:
3 mm (1/8")
 2. Variation in overall dimensions of precast element (height and width): 3 mm (1/8")
 3. Maximum differential between adjacent units in erected position:
3 mm (1/8")
 4. Variation in thickness of precast panels and elements:
3 mm (1/8")
 5. Maximum vertical differential between adjacent columbarium units in installed position: 3 mm (1/8")

1.8 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 follow 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.
 - b. Installation and relation to adjoining work.
 - 1) Show the individual units open ended against closed ended, where applicable 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 will align, for the locations below the cap joints, 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 that the Contractor to be installing the cast in place concrete foundations for the columbarium and pier units 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.
6. Production Drawings:
- a. Elevation view of each structural element.
 - b. Planametric 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, and 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 concrete of the precast niche units is to be cleaned and prepared prior to application of the approved stain/coating indicated above.
 9. Certificates: Manufacturer's qualifications specifying precast concrete columbarium units meet the requirements of ACI 533.3R and as specified.
 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.

1.9 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.

1.10 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.

1.11 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.

1.12 APPLICABLE PUBLICATIONS

- A. Publications listed below form a part of this specification to 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:

1. Remove reference citations that do not remain in Part 2 or Part 3 of edited specification.
2. Verify and make dates indicated for remaining citations the most current

at date of submittal; determine changes from date indicated on the TIL download of the section and modify requirements impacted by the changes.

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.
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D. American Society for Testing Materials (ASTM) Standards:

A36/A36M-08	Structural Steel
ASTM A276-13	Stainless Steel Bars and Shapes
A615/A615M-12	Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
A1064/A1064M-13	Standard Specifications for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
C33/C33M-12	Concrete Aggregates
C150/C150M-12	Portland Cement

E. American Welding Society (AWS) Publications:

AWS D1.1/D1.1M-12(e11)	Structural Welding Code
AWS D1.4/D1.4M-11	Welding Reinforcing Steel

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURER

- A. Manufacturers that have previously completed at least one successful NCA columbarium project are deemed to be acceptable for processing their units through the procedures according to these specifications and the drawings.
- B. Manufacturers that do not have previous successful experience for a NCA columbarium project may be selected by the Contractor for the project. Contractor is hereby notified that the submittal process for a

manufacturer with no previous NCA experience with a successful columbarium project, typically takes longer to process.

2.2 COARSE AGGREGATE

- A. Hard durable aggregate carefully graded from coarse to fine in proportions required to match approved samples of precast concrete columbarium units.

2.3 AGGREGATE FOR BACK-UP MIX (FINE AND COARSE AGGREGATE LIGHTWEIGHT) :

- A. ASTM C33. Limit gradation as required to produce the specified appearance and quality of concrete.

2.4 PORTLAND CEMENT

- A. ASTM C150, Type I and Type II; Color as required.

2.5 STRUCTURAL STEEL

- A. ASTM A36.

2.6 STEEL FABRIC REINFORCEMENT

- A. ASTM A1064, galvanized.

2.7 STEEL WIRE REINFORCEMENT

- A. ASTM A1064, cold drawn.

2.8 REINFORCING STEEL

- A. ASTM A615, deformed, Grade 60.

2.9 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.

2.11 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.

2. Interior mounting and attachment elements:

- a. ASTM Type 304 or 316 stainless steel tamper-resistant bolts, nuts, washers, anchors, mounting brackets, inserts and the like.

2.12 BACK-UP MATERIAL

- A. Closed cell neoprene, butyl, polyurethane, vinyl or polyethylene foam rod, diameter approximately 1-1/3 times the joint width.

2.13 BOND BREAKERS IF USED

- A. Type and material recommended by sealant manufacturer.

2.14 SEALING COMPOUND IF USED

- A. Fed. Spec. TT-S-00230 C, Type II, Class A, or ASTM C 920-11, Type S, Grade NS, Class 25.

2.15 FABRICATION

- A. Precast concrete columbarium units shall NOT be: fabricated, delivered or incorporated in the work until samples have been approved. Precast concrete shall comply with ACI 533.3R, except as modified 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.
 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, dovetail slots, notches, reglets, 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.

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. The face of the units shall be processed by the manufacturer, following removal from the forms to insure that the discoloration and blemishes on the niche faces are removed before shipping to the site.

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 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.

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 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 that the caps 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, especially across the joints between precast niche units where open and closed end units are joined, 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. 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. Modify the following paragraph, or 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.
2. Recommend requiring that all joints be mechanically cleaned, then cleaned with the sealant manufacturer's recommended joint primer, immediately prior to placing the joint sealant.
3. Recommend requiring that the Contractor use painters tape during the completion of critical (highly visible) joints to receive sealant to produce a consistent thickness and appearance.
4. Recommend adding requirements to the specifications or drawings that require that the joint sealant process be undertaken when there is not dirt and dust in the air, until the sealant has set, or requiring that the joints be protected from contamination by airborne particles from the placement 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.

3.3 SEALING OF JOINTS

A. Where shown and/or wherever required to make the work watertight, joints between precast concrete columbarium 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 as shown or 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.

1. Workmanship shall be in accordance with Division 1 Specification Sections and Section 07 92 00, JOINT SEALANTS.

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 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, 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. Delete the following paragraph 3.6 if the precast niche units are to be provided and installed without a field applied coating on exposed back and sides.

3.6 FINISHING OF EXPOSED FACES

- A. Apply coating to complete, cleaned exposed concrete back and sides as per manufacturer's standard specifications and recommendations.

- - - END - - -