

PART 1 GENERAL

1.01 SUMMARY

- A. The following specification provides recommendations for incorporating details from VoidForm Products, LLC into design documents. It is intended as a discretionary document and does not override sound engineering practice contained within contract documents.
- B. Void forms serve the primary purpose of isolating structural elements from the damaging effects of expansive, seismic, or corrosive soil, in addition to alternate reasons where separation may be needed.

1.02 REFERENCE STANDARDS

- A. Test equipment calibration in conformance with ASTM E4 or equivalent

1.03 QUALITY CONTROL

- A. Compression testing on void forms shall be performed to verify load capacity.
- B. Failure is defined as the point at which either maximum load capacity or maximum allowable deflection is achieved.

1.04 DELIVERY, STORAGE, AND HANDLING

- A. Procure prefabricated forms and installation instructions.
- B. Store prefabricated corrugated forms off the ground in a ventilated and protected manner to prevent deterioration from moisture absorption.
- C. Protect plastic products from damage and exposure to sunlight.

PART 2 PRODUCTS

2.01 MATERIAL PROPERTIES

- A. Void forms shall provide temporary support for the placement of cast-in-place concrete during the concrete set period.
- B. Once the concrete is self-supporting, the uplift forces from expansive soils shall not be transmitted to the foundation structure by the void forms.
- C. The physical characteristics of the void forms and required components are defined by and tailored to the foundation design, site soil characteristics, and the potential vertical rise (PVR) or potential vertical movement (PVM) furnished in the geotechnical report.

2.02 VOID FORM TYPES

- A. **CORRUGATED PAPER VOID FORMS** - Shall be provided where specified and shown on the drawings.
 - 1. Shall be the product of VoidForm Products, LLC or approved equal. Void forms should be products specified within the SureVoid® product line. The SureVoid void forms are degradable, lose strength through moisture absorption, and create an effective isolation solution for cast-in-place concrete. The void form components shall be constructed of a double-faced partially wax-impregnated or standard kraft corrugated paper that is laminated with moisture-resistant adhesive. Fully wax-impregnated corrugated paper is not acceptable due to its resistance to deterioration. The interior construction shall be of a uniform, cellular configuration. Where required and applicable on construction plans in accordance with the intended design, SureVoid products acquired should be of the following:

- A. ArcVoid® - Pre-manufactured void forms that are less than or equal to the beam width, having a curved, radial, vertically-supported edge adjacent to the drilled pier that conforms to the pier diameter
 - B. PierVoid® - Pre-manufactured void forms that surround the entire pier perimeter, having a curved, radial, vertically-supported edge adjacent to the drilled pier that conforms to the pier diameter
 - C. SlabVoid® - Void forms that properly create void space directly under structural concrete slabs
 - D. SureTop™ - Cylindrical, corrugated forms that contain the upper 2-foot portion of poured-in-place concrete piers. They provide a solution to mushroomed piers that create many problems with PierVoid
 - E. TrenchVoid® - Void forms that properly create void space directly under earth-formed concrete grade beams and walls
 - F. Vertical SeparatorVoid™ - Specially designed, vertical void forms that separate a freshly placed concrete wall from an existing vertical structure where minimal space prohibits conventional forming
 - G. WallVoid® - Void forms that properly create void space directly under panel-formed concrete walls
 - H. Other – Custom-shaped blockouts available to create other spaces in concrete forming
2. The void forms are designed to support typical, applied vertical loads until such loads can be supported by the concrete structure. (Note: Careful consideration of several factors should be given, such as all live or dead loads, weight of moving equipment, height of the concrete drop, vibrator frequency, ambient temperature, etc. Manufacturer should be notified of unique applications or additional working loads that fall outside of normal industry standards.)
 3. The void forms are designed to lose strength upon prolonged contact with moisture, which normally accumulates beneath slabs and beams. Sufficient deterioration to mitigate uplift forces in soil is a function of moisture absorption into the paper fibers. Substantial moisture gain will occur within a few days, weeks, or months after the concrete is placed depending on environmental conditions.
- B. CORRUGATED PLASTIC VOID FORMS** - Shall be provided where specified and shown on the drawings.
1. Shall be the product of VoidForm Products, LLC or approved equal. Void forms should be products specified within the StormVoid® product line. The StormVoid support network is impervious to moisture and is designed to bend and compress with sufficient pressure, effectively creating a void space into which soil can expand without causing structural damage. The void form interior components shall be constructed of flexible, fluted polypropylene copolymer (PPC) plastic assembled in a grid pattern. The design uniformly supports and distributes imposed concrete loads while creating a permanent void space. StormVoid can be used to create the specified void space when unexpected weather or wet soil conditions would otherwise prevent the installation of traditional corrugated paper void forms. Where required and applicable on construction plans in accordance with the intended design, StormVoid products acquired should be of the following:
 - A. StormVoid (Beam) – Void forms that properly create void space directly under concrete grade beams and walls

- B. StormVoid (Arc Cutout) - Pre-manufactured void forms that are less than or equal to the beam width, having a curved, radial, vertically-supported edge adjacent to the drilled pier that conforms to the pier diameter
 - C. StormVoid (Slab) - Void forms that properly create void space directly under structural concrete slabs
 - D. StormVoid (Pier) - Pre-manufactured void forms that surround the entire pier perimeter, having a curved, radial, vertically-supported edge adjacent to the drilled pier that conforms to the pier diameter
 - E. SureTop – Cylindrical, corrugated forms that contain the upper 2-foot portion of poured-in-place concrete piers. They provide a solution to mushroomed piers that create many problems with PierVoid
- C. SOIL RETAINERS** - Shall be provided where specified and shown on the drawings to prevent migration of backfill under suspended foundation elements. Retainers shall be composed of high-density polyethylene (HDPE) or polypropylene copolymer (PPC) materials that are not adversely affected by moisture. They must be rigid, impact-resistant, and have sufficient strength to resist lateral loads applied by backfill soil.
- 1. Soil retainers shall be:
 - A. BackFill Retainer™ (PPC) by VoidForm Products, LLC or approved equal (Note: Use the 3/8" thickness for void spaces up to 8", the 1/2" thickness for void spaces up to 16", the 3/4" thickness for void spaces up to 22", and the 1" thickness for void spaces up to 24". Unless noted otherwise, BackFill Retainers shall extend above and below the void space in accordance with the manufacturer's recommended minimums (in inches), taking into account the potential vertical movement (PVM) or potential vertical rise (PVR) of the soil as determined in the geotechnical report or as shown in the general notes of the structural plans.
 - B. SureRetainer® (HDPE) by VoidForm Products, LLC or approved equal (Note: Use the 14" height as recommended for void spaces up to 8", the 20" height for void spaces up to 12", and the 26" height for void spaces up to 16".)
- D. COVER BOARD** - Shall be provided for placement over the top surface of all installed void forms to prevent pinpoint loading damage to the void forms, distribute working loads, span small gaps, and provide a suitable surface for foot traffic during placement.
- 1. Cover Board shall be:
 - A. SureCover Board™ by VoidForm Products, LLC or approved equal – available as 1/4" MDF or 7/16" OSB. SureCover Board is used primarily with corrugated paper void products due to its inherent susceptibility to moisture.
 - B. StormCover Board™ Sheet by VoidForm Products, LLC or approved equal – a 5mm plastic cover sheet used primarily with corrugated plastic void products to provide a waterproof solution in harmony with their wet application.
- E. VAPOR RETARDER** - Plastic sheets available in a variety of grades and thicknesses that are placed between the void form system and the bottom of the concrete to inhibit moisture and harmful vapors from coming up into the structure. The vapor retarder supplied by VoidForm shall be specified by the structural engineer and selected from the Barrier-Bac product line or approved equal.
- 1. Barrier-Bac vapor retarder products meet the following:
 - A. ASTM E1745 Class A, Band C
 - B. ASTM E145
 - C. ASTM D1709

- D. ASTM E96
- 2. Barrier-Bac vapor retarder products include:
 - A. VB-250 (10 mil) Vapor Retarder - manufactured to the highest standards with proprietary polyolefin resins developed for the construction industry. The folding style is easier for construction workers to align and tape together.
 - A. VB-350 (15mil) Vapor Retarder - manufactured with the same composition as VB-250 but in 15 mil thickness.
 - B. VBC-350 (31mil) Composite Vapor Retarder - the composite structure contains a ribbed side and a flat textured side. The ribbed side has a much higher coefficient of friction (0.6 COF) than the competitor's smooth surface (approx. 0.2 COF). The other side is layered with geotextile fabric, over which concrete is poured. This fabric layer provides a mechanical bond with concrete. The increased adhesion strength greatly improves slab protection from moisture migration by maintaining intimate contact with the slab.
- 3. Barrier-Bac's vapor retarders provide:
 - A. Low permeance to impede moisture and vapor
 - B. High tensile strength to maintain uniformity of the slab
 - C. High puncture resistance
- 4. Accessories required with the vapor barrier include:
 - A. Barrier-Bac White Bond Tape to seal all overlapping seams (6" minimum overlap) and penetrations

PART 3 INSTALLATION

3.01 SUBGRADE PREPARATION

- A. Verify grading lines, levels, and centers before proceeding with formwork. Ensure that dimensions correlate with drawings.

3.02 INSTALLATION – VOID FORMS

- A. Shall be placed in accordance with VoidForm Products' installation instructions and in a manner that will provide tight joints to prevent concrete from flowing into gaps during placement. Bridge small gaps with cover board per manufacturer's directions.
- B. SureVoid products shall be protected from moisture before installation. Any forms that are damaged due to exposure to moisture must be replaced before concrete is placed.
- C. StormVoid products can be installed on wet ground with a stable base.
- D. Void forms shall be placed on level ground to avoid projections that may cause point loads.
- E. Applied concrete loads (i.e. live loads) should not exceed maximum recommendation as indicated on each product listed.

3.03 INSTALLATION – SOIL RETAINERS

- A. Backfill Retainer should extend above and below the void space as recommended for the size and space. Backfill Retainer should be installed with the flutes in a vertical direction and can be installed either before or after concrete placement.
- B. SureRetainer should extend above and below the void space as recommended for the size and space. SureRetainer should be installed at an angle after form removal.

3.04 INSTALLATION – COVER BOARD

- A. Cover Board should be placed over the top surface of all void forms as they are being installed to distribute working loads, bridge small gaps, and protect the void form's exterior cover from puncture by steel chairs and workman's boots. It will also prevent fatigue of the void form interior caused by repeated foot traffic.

3.05 INSTALLATION – VAPOR RETARDER

- A. Vapor retarder should be installed over the cover board following void form placement and prior to rebar installation. See manufacturer's instructions for proper installation procedures. Vapor retarder should not be placed under the void forms on the supporting soil which will prevent capillary absorption. Void forms should not be wrapped with the vapor barrier or any other plastic membrane.

END OF SECTION