

PART 1 GENERAL

1.01 SUMMARY

- A. The purpose of this specification is to provide overarching recommendations for the use of void forms and associated products manufactured by VoidForm Products, LLC on the project.
- 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. This specification works in conjunction with other approved documents released by VoidForm Products, LLC which may include charts, tables, more specific specifications, testing data, or Best Practice guidelines etc. VoidForm Products, LLC reserves the right to update this specification, or any other documents released by VoidForm Products, LLC at any time without notice.

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.

1.05 DEFINITIONS

- A. **Void Forms** – Void forms serve the primary purpose of isolating structural elements from the damaging effects of soil movement. This movement may be due to the effects of moisture condition upon the soil (expansion/contraction), seismicity, or corrosion. Other conditions which generate a need to separate soil from the structure may also apply.
- B. **VoidForm** – VoidForm Products, LLC
- C. **Plans** – Where the word Plan or Plans is used it has the meaning of “Plans Approved by the Jurisdiction having Authority” which comprise all or part of the plans which the project is intended to be constructed from. VoidForm would prefer to always work from, and bid, projects based on the latest Plans. The state of Approval of the Plans is not under the control of VoidForm and consequently VoidForm cannot be held responsible for the consequences of bidding or providing information in any form that results in action based on plans that are at some preliminary state prior to Jurisdiction Approval or released as final documents (signed) by the Design Professionals of Record. The terms Plans, design or design documents, drawings, project documents, contract documents, construction documents, foundation plan, framing plans etc. as mentioned herein all have the same meaning as Plans mentioned above.
- D. **Engineer** – The term Engineer shall mean the Engineer of Record (EOR) or Design Professional of Record (DPOR) responsible for the project documents (plans) (all or part) that specify or dictate the need for VoidForm Products.

1.06 GOVERNING SPECIFICATION

- A. In the case where a VoidForm minimum specification allows for a value that is less than in some way other than specified in the Plans, the Plans shall govern. It is never the intent for

VoidForm to supersede the plans or specifications of the EOR/DPOR. The EOR/DPOR is responsible for the acceptance of the VoidForm Product. If a VoidForm minimum specification is greater than a specification by the EOR/DPOR the EOR/DPOR is likewise still responsible for the use of the VoidForm Product.

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. 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 Slab - Void forms that properly create void space directly under structural concrete slabs
 - C. 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
 - 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

C. SOIL RETAINERS - Shall be provided where specified and shown on the plans 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 as follows:
 - 3/8" thickness for void spaces up to 8"
 - 1/2" thickness for void spaces up to 14"
 - 3/4" thickness for void spaces up to 20"
 - 1" thickness for void spaces up to 24"

Unless noted otherwise, the BackFill Retainers shall extend above and below the void space in accordance with the manufacturer's recommended minimums. The specifier shall consider any additional extension for PVR or PVM as may be required by the Structural or Geotechnical Engineer of Record as presented in the plans.

- B. SureRetainer® (HDPE) by VoidForm Products, LLC or approved equal as follows:

- 14" height for void spaces up to 8"
- 20" height for void spaces up to 12"
- 26" height for void spaces up to 16"

The above recommended minimums are not intended to supersede more stringent requirements as determined by the Structural or Geotechnical Engineer of Record as presented in the plans.

- 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 should not exceed maximum recommendation as indicated on each product listed.

3.03 INSTALLATION – SOIL RETAINERS

- A. Backfill Retainer
 - 1. Place BackFill Retainers with flutes positioned vertically
 - 2. Ensure the above and below heights are consistent throughout the length of the retainer
 - 3. Backfill with non-expansive non-cohesive material preferred or as otherwise recommended by project Geotechnical Report or as Specified by Engineer of Record (EOR)
 - 4. Tamp embedded BackFill Retainer soil to "very stiff to hard" consistency fill side
 - 5. Attach to Grade Beam as per EOR recommendations
- B. SureRetainer
 - 1. SureRetainer shall extend above and below the void space the minimum distance as recommended by the manufacturer for the size and space.
 - 2. SureRetainer shall 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