SuperVoid Systems, LLC
1172 County Road 24
Prattville, AL 36067-8243
www.supervoid.com
Texas Registered Engineering Firm F-17554

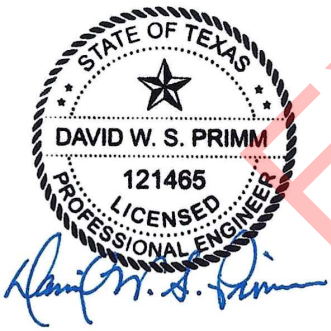
Larry W. Primm
334-730-3614
David S. Primm, P.E.
334-221-5761

September 13, 2023

Project Submittal:

Re: ***SuperVoid*** **- Smart Void® Utility Protection Systems**
UPS-12 Series Utility Protection System with Clamp Hangers

Project:	**Samsung SAS T-PJT** **Taylor, TX**
Submitted to:	Michael Hutchcraft Kilgore Round Rock, Texas
Architect:	Page Southerland Page, Inc. Austin, Texas
Consulting Engineer:	Derek C. Gaskamp, P.E. Infinity MEP Consultants Austin, Texas
Submitted By:	**David W. S. Primm, P.E.** Chief Engineer **SuperVoid Systems, LLC** Prattville, Alabama Cell: 334-221-5761 primmd@supervoid.com www.supervoid.com Alabama PE No. 33265 Alabama Certificate of Authorization No. CA-5306-E Colorado PE No. 52091 Mississippi PE No. 27016 Mississippi Certificate of Authorization No. 28319 Texas PE No. 121465 *Texas Registered Engineering Firm F-17554*



Please be advised that we have reviewed the project documents. The geotechnical engineer states that the Potential Vertical Rise (PVR) for the soil at this site are calculated to be up to 4.5 inches. We recommend the UPS-12 Series, 12 inch deep SuperVoid Smart Void® Utility Protection System with SuperVoid Clamp Hanger Hardware for under slab piping in all areas on this project. This system has historically offered satisfactory utility protection for PVRs up to about 7-8 inches. The UPS-12 Series system should offer the protection required for the plumbing system, is cost effective, and is relatively easy to install correctly. Please direct question or comments about this recommendation to David S. Primm, P.E., SuperVoid Chief Engineer.

SuperVoid - Utility Protection System UPS-12

SuperVoid basis of design assumes that the void space will be drained, and that the hanger rods will remain in a straight, plumb, undamaged condition prior to concrete slab placement. Carton forms should be pre-punctured to accommodate the hanger rods. Hanger rods shall not be used to puncture carton forms as this may damage the rods.

Nominal 24" Granular Non-Cohesive Backfill Covering Over the TOP of the UPS Unit *Backfill NOT SHOWN FOR CLARITY*

WHERE 24" OF BACKFILL COVER OVER THE TOP OF THE UPS UNIT IS NOT ACHIEVABLE, A 1" DIAMETER SCHEDULE 40 PVC SLEEVE SHOULD EXTEND FROM THE BOTTOM OF THE PLATE WASHER TO THE TOP OF THE SUPERVOID CLAMP HANGER.

COARSE CONCRETE SAND BACKFILL IS RECOMMENDED

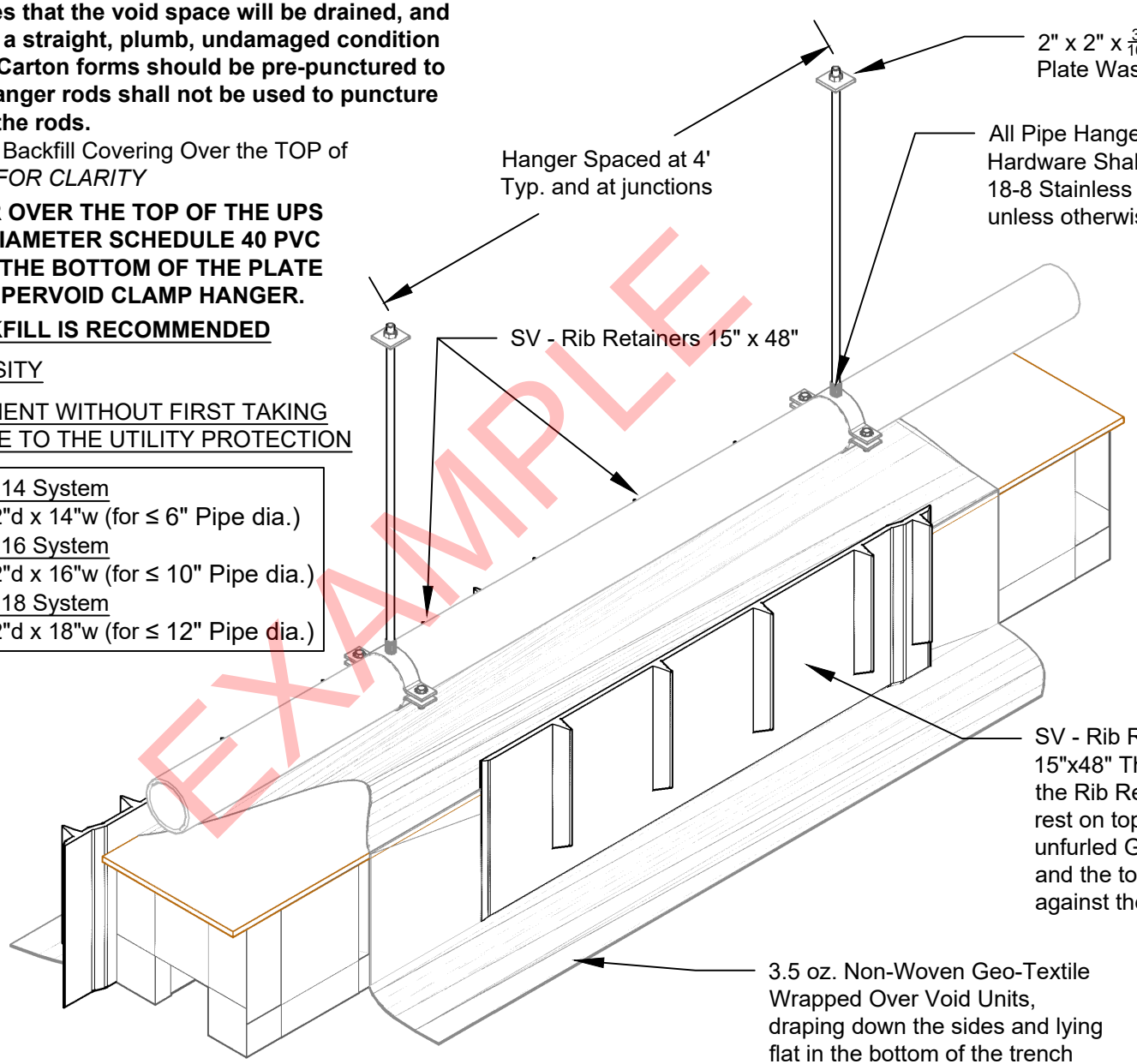
DO NOT COMPACT TO HIGH DENSITY

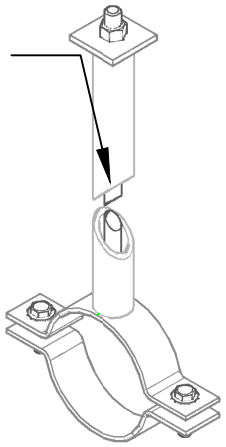
DO NOT RUN OVER WITH EQUIPMENT WITHOUT FIRST TAKING MEASURES TO PREVENT DAMAGE TO THE UTILITY PROTECTION SYSTEM.

UPS-1214 System
- 12"d x 14"w (for ≤ 6" Pipe dia.)

UPS-1216 System
- 12"d x 16"w (for ≤ 10" Pipe dia.)

UPS-1218 System
- 12"d x 18"w (for ≤ 12" Pipe dia.)





Drawn by: David S. Primm, P.E.* - Chief Engineer SuperVoid Systems, LLC

*Licensed in AL, CO, MS, & TX - (334)221-5761, primmd@supervoid.com

UPS-12

SuperVoid - Utility Protection System UPS-12

SuperVoid basis of design assumes that the void space will be drained, and that the hanger rods will remain in a straight, plumb, undamaged condition prior to concrete slab placement. Carton forms should be pre-punctured to accommodate the hanger rods. Hanger rods shall not be used to puncture carton forms as this may damage the rods.

Nominal 24" Granular Non-Cohesive Backfill Covering Over the TOP of the UPS Unit *Backfill NOT SHOWN FOR CLARITY*

WHERE 24" OF BACKFILL COVER OVER THE TOP OF THE UPS UNIT IS NOT ACHIEVABLE, A 1" DIAMETER SCHEDULE 40 PVC SLEEVE SHOULD EXTEND FROM THE BOTTOM OF THE PLATE WASHER TO THE TOP OF THE SUPERVOID CLAMP HANGER.

COARSE CONCRETE SAND BACKFILL IS RECOMMENDED

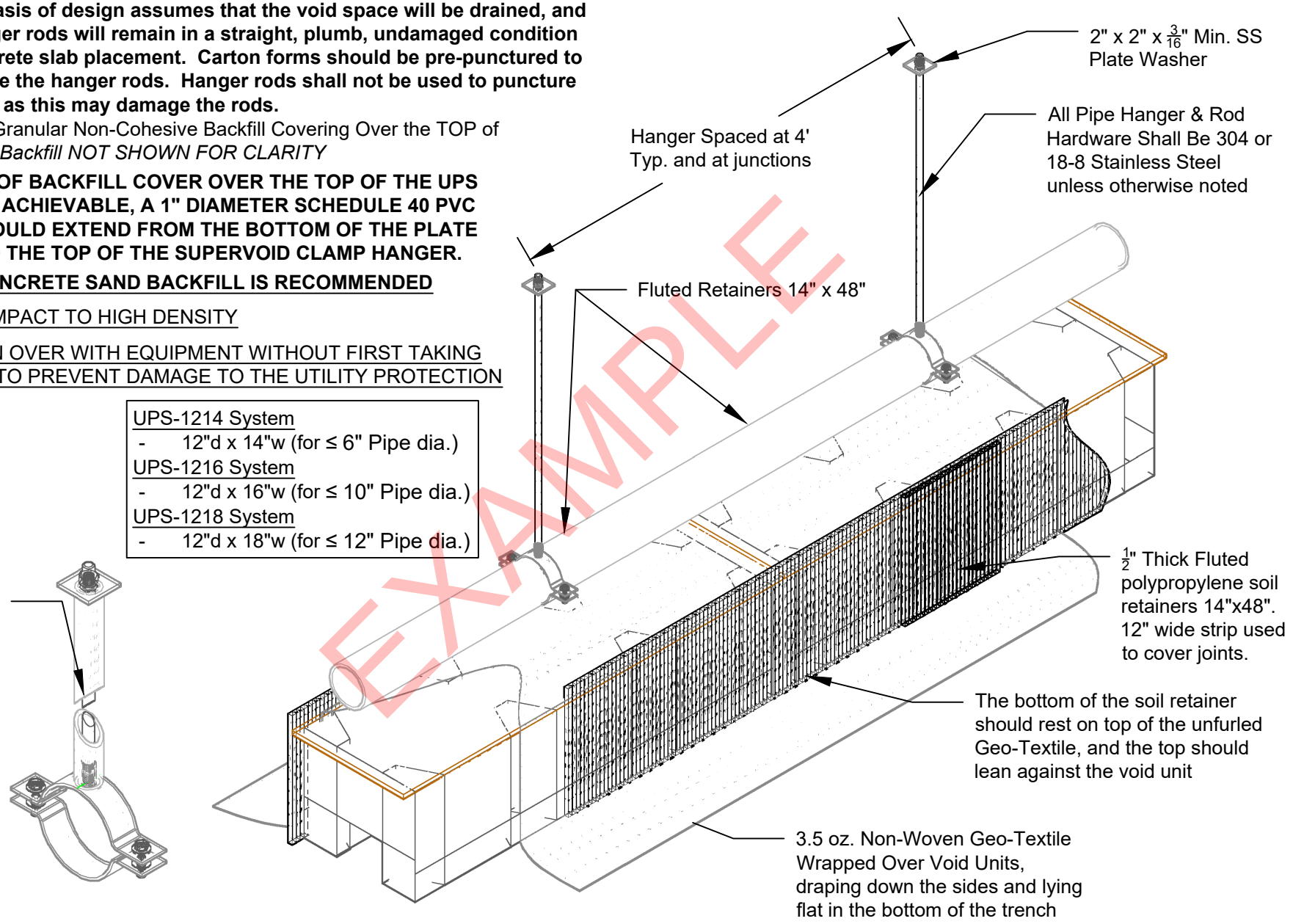
DO NOT COMPACT TO HIGH DENSITY

DO NOT RUN OVER WITH EQUIPMENT WITHOUT FIRST TAKING MEASURES TO PREVENT DAMAGE TO THE UTILITY PROTECTION SYSTEM.

UPS-1214 System
- 12"d x 14"w (for ≤ 6" Pipe dia.)

UPS-1216 System
- 12"d x 16"w (for ≤ 10" Pipe dia.)

UPS-1218 System
- 12"d x 18"w (for ≤ 12" Pipe dia.)



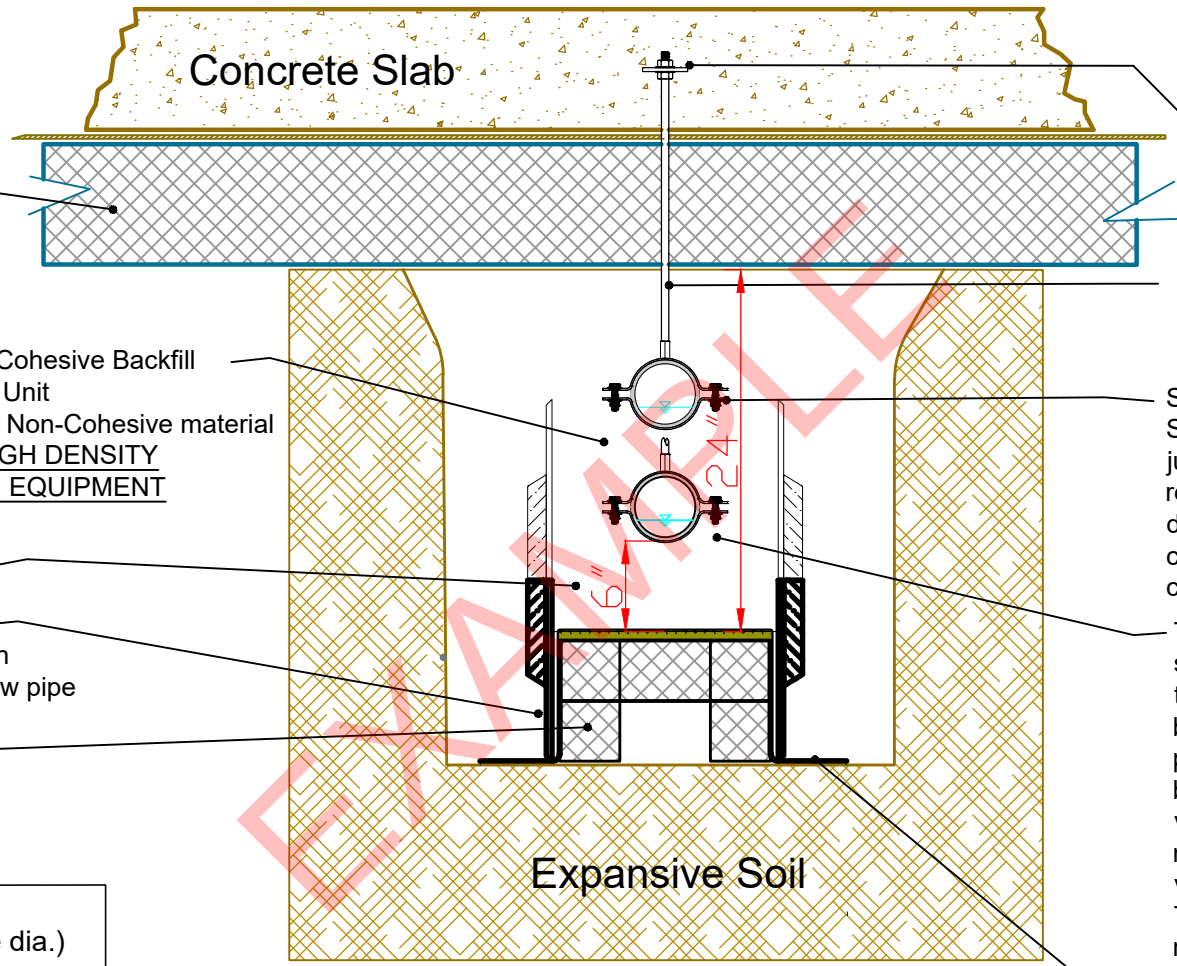
Drawn by: David S. Primm, P.E.* - Chief Engineer SuperVoid Systems, LLC

*Licensed in AL, CO, MS, & TX - (334)221-5761, primmd@supervoid.com

UPS-12 with Alternate Fluted Retainer

SuperVoid - Smart Void® UPS - 12 Series
12 Deep" Utility Protection System

PIPE VOID . . . SIMPLIFIED



TYPICAL, NOT TO SCALE

UPS-1214 System
- 12"d x 14"w (for ≤ 6" Pipe dia.)

UPS-1216 System
- 12"d x 16"w (for ≤ 10" Pipe dia.)

UPS-1218 System
- 12"d x 18"w (for ≤ 12" Pipe dia.)

UPS-1224 System
- 12"d x 24"w (for ≤ 18" Pipe dia.)

NOTE Where pipes exit the building, at least the last two hanger rods should be sheathed with the **PVC sleeve** as shown on isometric drawing sheet.

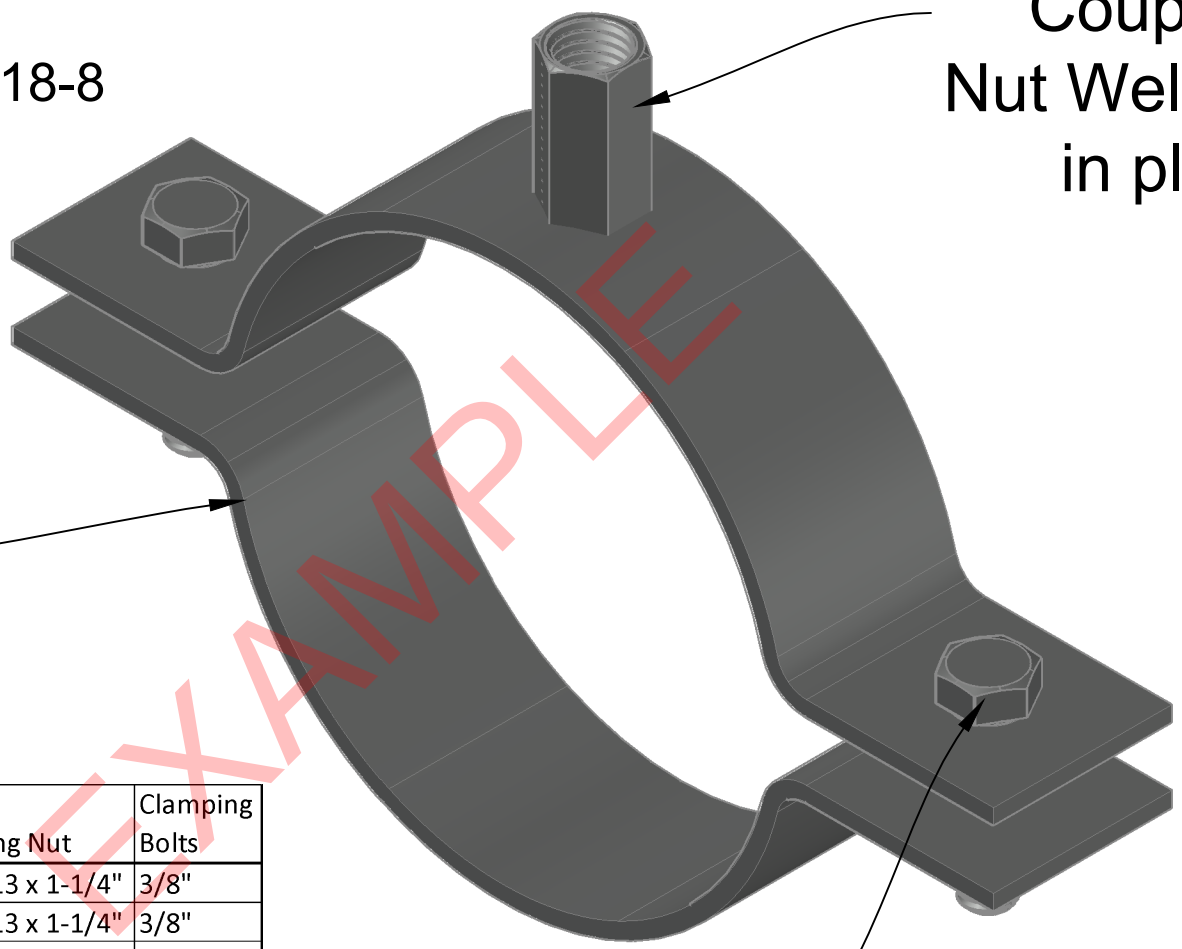
Drawn by: David S. Primm, P.E.* - Chief Engineer SuperVoid Systems, LLC

*Licensed in AL, CO, MS, & TX - (334)221-5761, primmd@supervoid.com

SuperVoid Systems, LLC
Prattville, AL - www.supervoidsystems.com

SuperVoid - Clamp Hanger - Typical

All materials shall be
Stainless Steel, 304 or 18-8



Pipe Size	Rod Thread	Hanger Thickness	Hanger Width	Coupling Nut	Clamping Bolts
2"	1/2" - 13	1/8"	1-1/4"	1/2" - 13 x 1-1/4"	3/8"
3"	1/2" - 13	1/8"	1-1/4"	1/2" - 13 x 1-1/4"	3/8"
4"	1/2" - 13	1/8"	1-1/4"	1/2" - 13 x 1-1/4"	3/8"
6"	5/8" - 11	1/8"	1-1/2"	5/8" - 11 x 1-3/4"	3/8"
8"	3/4" - 10	3/16"	1-3/4"	3/4" - 10 x 2-1/4"	1/2"
10"	7/8" - 9	1/4"	1-3/4"	7/8" - 9 x 2-1/2"	1/2"
12"	7/8" - 9	1/4"	2"	7/8" - 9 x 2-1/2"	3/4"
14"	1" - 8	1/4"	2-1/2"	1" - 8 x 2-1/2"	3/4"

Drawn by: David S. Primm, P.E.* - Chief Engineer SuperVoid Systems, LLC

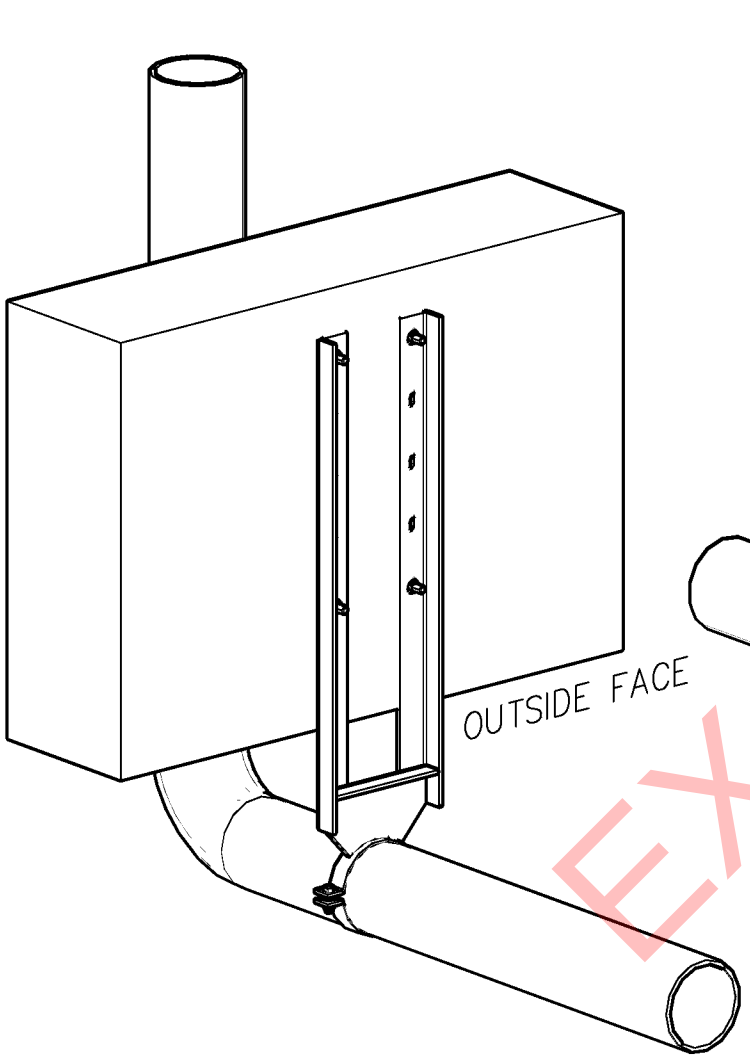
*Licensed in AL, CO, MS, & TX - (334)221-5761, primmd@supervoid.com

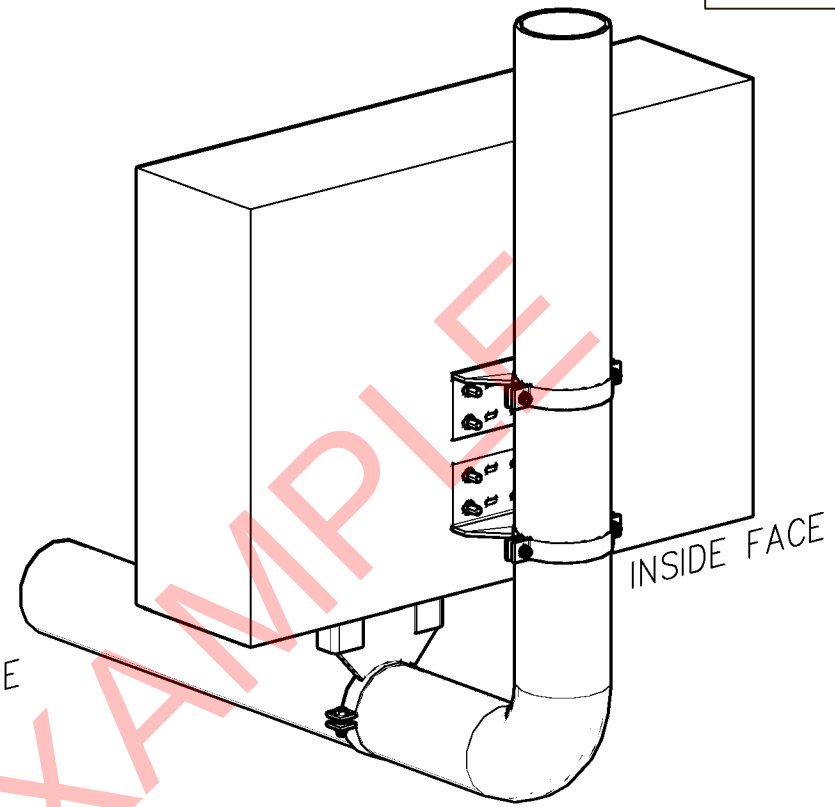
Isometric View

FIRE WATER SERVICE ENTRY STABILIZER, FOR 8IN PIPE
BY SUPERVOID SYSTEMS, LLC

DRAWING DATE: MAY 25, 2023

SUPERVOID SYSTEMS, LLC
DAVID PRIMM, P.E.: 334-221-5761
PRIMMD@SUPERVOID.COM
LARRY PRIMM: 334-730-3614
LPRIMM@SUPERVOID.COM





THE FIRE WATER SERVICE ENTRY STABILIZER AS PROVIDED BY SUPERVOID SYSTEMS, LLC IS CONSTRUCTED FROM TYPE 304 STAINLESS STEEL WITH 18-8 STAINLESS STEEL FASTENERS. ALL HEX CAP SCREWS ARE MINIMUM $\frac{1}{2}$' IN DIAMETER. ALL ANCHORS ARE $\frac{1}{2}$"X7" WEDGE ANCHORS. IN THIS CONFIGURATION THE RATED CAPACITIES ARE BELOW:

MINIMUM ULTIMATE THRUST RESISTANCE RATING: 38 KIPS

MINIMUM ULTIMATE UPLIFT RESISTANCE RATING: 33 KIPS

ESTIMATED MAXIMUM THRUST FORCE FOR 8" PIPE AT 200PSI: 10 KIPS

UPLIFT FORCES SHOULD BE NEGLIGIBLE AS THE SUPERVOID UTILITY PROTECTION SYSTEM WILL BE POSITIONED UNDER THE PIPE AT THE FACE OF THE PERIMETER BEAM AND UNDER THE BUILDING FOUNDATION.

Installation Instructions

The Geo-Fabric prevents subsequent lateral infiltration of soil into the void space. Be sure to seal the Void.

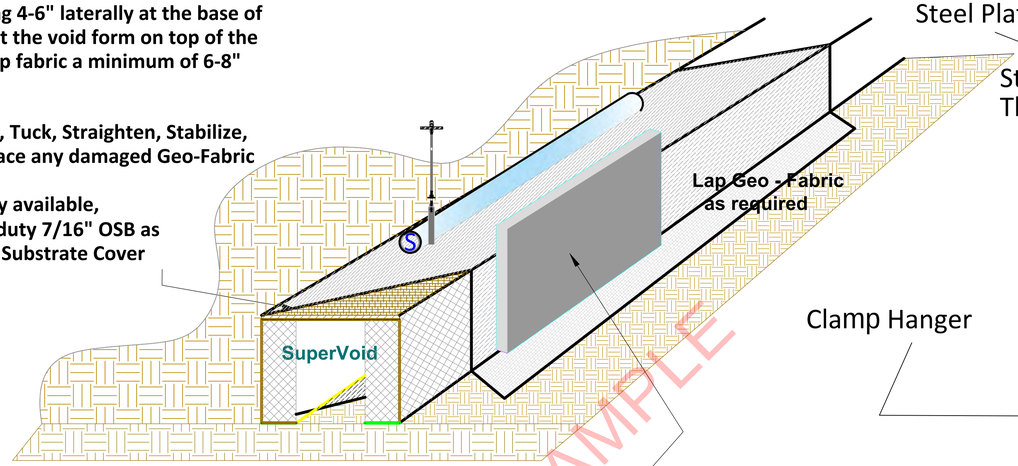
Cover Void Form and Substrate completely including top and sides with 3.5 - 4 oz. Non-Woven Geo-Fabric, all fabric longitudinal end laps should be 8-10".

Place the fabric on the adjacent ground extending 4-6" laterally at the base of the Void Form, or if the underlying soil is soft, set the void form on top of the Geo-Fabric, pull over the top of the void form, lap fabric a minimum of 6-8" and secure.

Insure that the Geo-Fabric is continuous. Inspect, Tuck, Straighten, Stabilize, Refit, Geo-Fabric prior to backfill. Repair or replace any damaged Geo-Fabric material.

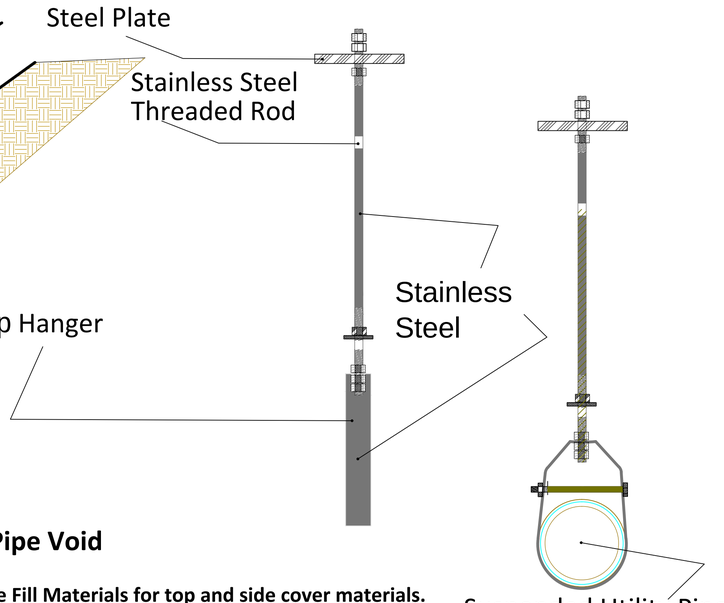
Under-Slab Pipe/Conduit Voids
Plumbing & Conduits
Void Forms - Earth Retaining
Geo - Fabric Instructions

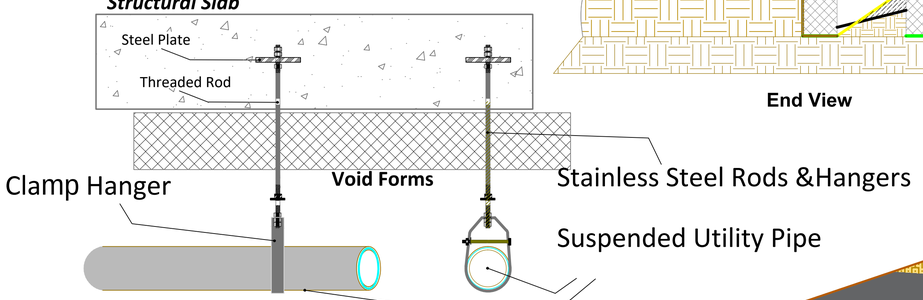
Commonly available, standard duty 7/16" OSB as approved Substrate Cover Sheet.

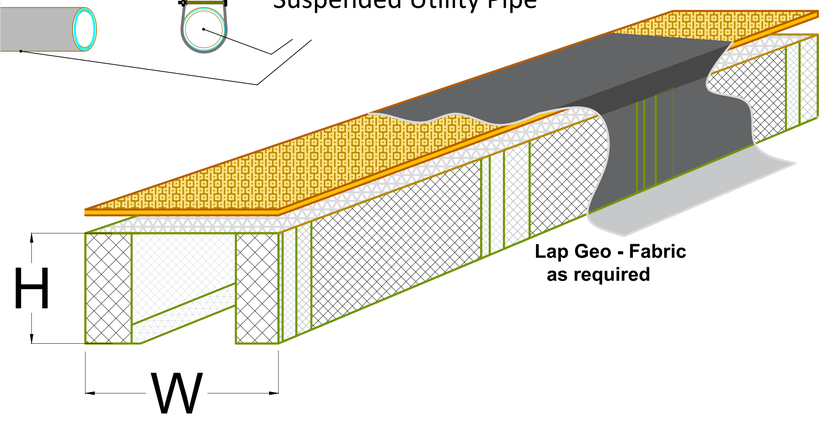


End View

Install SV - Rib Retainers for 12"d applications







Back Filling Pipe Void

Use Non-Cohesive Fill Materials for top and side cover materials. (Medium to Course Sand)

**Note... The backfill material on top of the Pipe Void System serves as a weighted ballast. When the underlying "Expansive Soil" generates uplift pressures, the mass or weight of the backfill cover (Sand) resists the uplift and the void system absorbs and interupts the soil pressure and vertical/latteral movement. **

Cover Top of Voids a minimum of 24 - 30", when possible. The elevation of the piping may be installed at any elevation above the top of the OSB substrate and 4" - 6" of recommended minimum sand cover.

When deep installations require stepping back slopes for excavation safety reasons, the initial non-cohesive fill material may be discontinued above 30" - 36" of height above the top of the void form. Native or other suitable types of materials may be used to complete the filling process with zero to minimal compaction recommended. *High density compaction of fill materials is not recommended or required.*

Do Not Drive Equipment Over An Installed System!!

Always practice and follow fully all applicable safety regulations.
Call SuperVoid (334) 730-3614 (Larry) or (334) 251-5761 (David)
for any questions or further direction.

SuperVoid - Smart Void® Pipe Void - "Simplified"

Project
Piping 2017
Anywhere

SUPERVOID
* 1172 County Road 24 * Prattville, AL 36067-8243 * 334.730.3614

04-2017
Revised:
Revised:
Drawn By: LWP
SHEET
SV-01

Division _____

Sections _____

GENERAL SPECIFICATIONS FOR
UTILITY PROTECTION SYSTEMS

1. Overview:

   This specification covers Sacrificial Utility Protection Pipe Void Form Systems, hereinafter referred to as "Utility Protection Systems". Utility Protection Systems shall always be used in conjunction with Rigid Retainers as a **SYSTEM** to maintain void spaces below critical building systems during and after construction. Rigid Retainers are covered by a separate specification. Utility Protection Systems serve as sacrificial falsework, which isolate critical building systems, such as utility pipes and electrical conduits, from the potentially damaging effects of expansive soils. The Utility Protection Systems furnished for this project shall be in accordance with these specifications and in reasonably close conformity with the lines, grades, design and dimensions shown on the plans or as established by the Engineer. The Utility Protection Systems shall be resistant to water and UV rays and shall be chiefly comprised of carbon steel expanded metal, which is structurally efficient and biodegradable. The carbon steel shall contain a minimum of 40% RECYCLED material. In situations where two or more specifications apply to this work, the most stringent requirements shall govern.

2. Utility Protection Systems Structure:

   A. Utility Protection Systems shall provide a dimensionally stable void space, maintaining uniform separation between the base soil and the critical building systems. The Utility Protection Systems shall have sufficient structural strength to maintain the intended void space while experiencing the anticipated construction loads.

   B. The Utility Protection Systems shall be designed to perform as sacrificial falsework and shall remain in place after construction and shall not be reused.

   C. Serving as a structural fuse, Utility Protection Systems shall reduce the accumulation of forces on critical building systems which can result from soil movement. The Utility Protection Systems shall absorb or redirect the forces of soil movements by: crumpling, crushing, collapsing, deforming, material section degradation, soil extrusion, open corrugation load span designs or combination of any or all load relief design functions.

3. Utility Protection Systems Material:

   A. Utility Protection Systems shall be constructed from Carbon Steel Expanded Metal, Types I & II, conforming to ASTM F1267 and shall be assembled when required with 15ga. galvanized steel C-Rings.

   B. The carbon steel shall conform to ASTM A1011 and contain a minimum of 40% RECYCLED material.

   C. All assembly and/or fabrications of the Utility Protection Systems shall occur entirely within the United States.

   D. The Utility Protection Systems material shall not promote the formation or emergence of mold spore, organic or other biological colonization.

E. The Utility Protection Systems must be able to be delivered and stored unprotected in the open jobsite environment for a minimum of 90 days without loss of design strength.

4. Utility Protection Systems Material, Minimum Physical Properties Requirements:

   A. Utility Protection Systems shall be naturally waterproof in terms of its intended use in this section.

   B. Utility Protection Systems shall have negligible buoyancy.

   C. Utility Protection Systems shall maintain structural integrity in 100% relative humidity.

   D. Utility Protection Systems material shall not emit offensive off-gassing odors during decomposition.

   E. The structural integrity of the Utility Protection Systems shall be unaffected by high/low ambient temperatures and elevated surface temperatures from direct sunlight extremes, above or sub-freezing, frozen soil and ice buildup.

   F. Utility Protection Systems must have an industry history of providing consistent performance integrity during and after all types of weather event applications, while in readiness storage or installed, without the threat of partial or full section premature collapse during concrete casting.

   G. Utility Protection Systems strength shall not be affected by becoming damp, wet, or when completely submerged in standing water.

   H. Utility Protection Systems must be fire-resistant

5. Utility Protection Systems Material, Minimum Performance Requirements:

   A. The Utility Protection Systems (system) shall be designed to provide sufficient dynamic live and dead load support capacities of but not limited to all loads common to this type of construction;
      - Installation of utility piping and/or conduit – dead/live loads
      - Placement of backfill materials (See Bedding and Backfill material sub-section 6)
      - Manpower and foot traffic loads

   B. Sub-standard Utility Protection Systems cover sheet substrates, can affect desired performance; use only the types of substrates as those approved for use and recommended by the Utility Protection Systems manufacturer.

   C. Substrate materials shall originate from FSC (Forest Stewardship Council, United States) mills and be in new or like new condition, performing to APA (The Engineered Wood Association) current standards.

6. Bedding and Backfill Material:

   A. Select Bedding and Backfill material shall be placed on both sides of the Utility Protection System shall embed the system up to at least the top of the pipe.

   B. <u>Select backfill material shall be “Concrete Sand” with gradation as per Texas Department of Transportation’s requirements for Portland cement Concrete (Item 421) Fine Aggregate</u>

      - **Fine Aggregate.** Fine aggregate shall be washed and consist of clean, hard, durable and uncoated particles of natural or manufactured sand or a combination thereof, without a mineral filler. It shall be free from frozen material or injurious amounts of salt, alkali, vegetable matter or other objectionable material and it shall not contain more than 0.5 percent by weight of clay

lumps. When the aggregate is subjected to the color test for organic impurities in accordance with Test Method Tex-408-A, the test result shall not show a color darker than standard.

When tested in accordance with Test Method Tex-401-A, the fine aggregate or combinations of aggregates, shall conform to the gradation requirements shown in following table.

FINE AGGREGATE GRADATION CHART								
	(%) Percent Retained on Each Sieve							
Aggregate Grade No.	3/8 in.	No.4	No.8	No.16	No. 30	No. 50	No. 100	No. 200
1	0	0 - 5	0 - 20	15 - 20	35 - 75	65 - 90	90 - 100	97 - 100

- Mineral Fillers are not permitted.
- Native soils may be placed on top of the select backfill material but should be free from lumps, cobbles, and other deleterious material. This soil should not be compacted with compaction equipment.

Approved Utility Protection Systems Manufacturers meeting All Required Section Specifications:

1) ***SuperVoid Systems, LLC***

www.SuperVoid.com

1172 County Rd. 24

Prattville, Alabama 36067

Larry W. Primm
Founder

334-730-3614

Lprimm@SuperVoid.com

David S. Primm, P.E.
Chief Engineer

334-221-5761

primmd@SuperVoid.com

2) **Other Utility Protection Systems manufacturers must meet ALL of the requirements stated in these specifications and be approved prior to project bid in order to be considered.**

Division _____

Sections _____

GENERAL SPECIFICATIONS FOR

CONCRETE VOID FORM SYSTEMS / UTILITY PROTECTIONS SYSTEMS PERMANENT RIGID SOIL RETAINER

1. Overview:

   This specification covers Permanent Rigid Soil Retainers, hereinafter referred to as "Rigid Retainers," also known as "Rib Retainers. Rigid Retainers serve as soil retainers, which maintain and preserve void envelopes beneath structural concrete and other critical building systems and components, thereby isolating them from the potential damaging effects of expansive soils. The Rigid Retainers furnished for this project shall be in accordance with these specifications and in reasonably close conformity with the lines, grades, design and dimensions shown on the plans or as established by the Engineer. The Rigid Retainers shall be resistant to water and UV rays and shall be chiefly comprised of extruded or injection molded High Density Polyethylene (HDPE), which is structurally efficient and non-biodegradable. **The HDPE shall contain a minimum of 95% RECYCLED material.** (5% for colorant and plastic foaming additives) In situations where two or more specifications apply to this work, the most stringent requirements shall govern.

2. Rigid Retainer Structure:

   a) Rigid Retainers shall maintain a dimensionally stable void space beneath structural concrete and other critical building systems and components by physically restraining backfill material from entering the void space. The Rigid Retainers shall have sufficient structural strength to maintain the intended void space, without excessive deflection, while experiencing the anticipated lateral earth pressures.

   b) The Rigid Retainers shall be designed to perform as a permanent soil retaining structure which shall remain in place after construction and shall not be reused.

   c) For "**Best Practice Standards**," the Rigid Retainers recommended installation is to overlap concrete castings by at least six (6) inches and extend a minimum of at least six (6) inches into the subgrade.

   d) Rigid Retainers should be secured to the concrete at the top with at least three (3) anchors of sufficient size and securing strength, one at each end of the overlapping joint seal design and one centered.

   e) A "**Minimum Design Standard**," for the Rigid Retainers shall be designed to overlap concrete castings by at least three (3) inches and extend a minimum of at least three (3) inches into the subgrade.

3. Rigid Retainer Material:

   a) The Rigid Retainers shall be constructed from extruded or injection molded High Density Polyethylene (HDPE).

   b) The HDPE material shall be either HDPE-8 (Crate Grade) or HDPE-8 (Pail Grade) **and shall contain a minimum of 95% RECYCLED material**. (5% for colorant and plastic foaming additives)

   c) The HDPE shall conform to the following: ASTM D 1238 or ASTM D 1238E, ASTM D 4883

   ASTM D 638, ASTM D 790, ASTM D 256, ASTM D 2240 and ASTM D 648.

d) Rigid Retainers shall be manufactured entirely within the United States.

4. Rigid Retainer Material, Minimum Physical Properties Requirements:
   a) Rigid Retainer shall be naturally waterproof in terms of its intended use in this section.
   b) Rigid Retainer shall have negligible buoyancy.
   c) Rigid Retainer shall maintain structural integrity in 100% relative humidity.
   d) Rigid Retainer material shall be non-biodegradable.

5. Rigid Retainer Material, Minimum Performance Requirements:
   a) Rigid Retainers material shall provide sufficient dynamic live and dead load support capacities of but not limited to all loads common to this type of construction;
      - Installation of backfill material – construction live loads
      - Manpower and foot traffic loads
   b) Rigid Retainers material shall possess sufficient structural strength to resist anticipated lateral earth pressures.
   c) Rigid Retainers must be able to be delivered and stored unprotected in the open jobsite environment for a minimum of 90 days without loss of design strength.
   d) The structural integrity and installation of the Rigid Retainer shall be functionally unaffected by high/low ambient temperatures and elevated surface temperatures from direct sunlight extremes, above or sub-freezing, frozen soil and ice buildup.
   e) Rigid Retainer material strength shall not be affected by becoming damp, wet, or when completely submerged in standing water.
   f) These Rigid Retainer general specifications, with recommended application height and position adjustments, also apply to other Rigid Retainer assemblies such as, **SV** – Pipe Void Systems.

6. Rigid Retainer, Industry History:
   a) Rigid Retainer must have an industry history of providing consistent performance integrity during and after all types of weather event applications, while in readiness storage or installed, without the threat of partial or full section collapse during or after backfill.

Approved Rigid Retainers Manufacturers meeting All Required Section Specifications:

1) ***SuperVoid Systems, LLC***

www.SuperVoid.com

1172 County Rd. 24

Prattville, Alabama 36067

Larry W. Primm Founder	David S. Primm, P.E. Chief Engineer
334-730-3614	334-221-5761
Lprimm@SuperVoid.com	primmd@SuperVoid.com

2) **Other Retainer manufacturers must meet ALL of the requirements stated in these specifications and be approved prior to project bid in order to be considered.**

Division _____

Sections _____

GENERAL SPECIFICATIONS FOR

PIPE CLAMP HANGER SYSTEM

1. Overview:

   This specification covers the Pipe Clamp Hanger System as manufactured by SuperVoid Systems, LLC. The Pipe Clamp Hanger System is an assemblage of all Stainless Steel components and is intended for use as part of the overall SuperVoid Pipe Void Systems, but may be used for other applications. The Pipe Clamp Hanger is specifically designed to aid construction, minimize pipe movement potential, and to distribute loads around the circumference of the pipe.

2. Pipe Clamp Hanger Structure:

   A. The Pipe Clamp Hanger shall be constructed from flat bar material which shall be shaped such that it will have appropriate curvature to match the outer diameter of the corresponding pipe and have a flange on each side of the curve. Bolt holes in the flanges allow for the upper and lower pieces to be bolted together holding the Pipe Clamp Hanger firmly in place.

   B. The upper piece of the Pipe Clamp Hanger shall mirror the lower piece, but shall have a coupling nut welded to the top of it. The coupling nut is for receiving the threaded rod which ties the Pipe Clamp Hanger to the concrete slab above it. The coupling nut shall possess a fillet weld around the entire base connecting it entirely to the Pipe Clamp Hanger's upper piece.

3. Pipe Clamp Hanger Material:

   A. The Pipe Clamp Hanger shall be constructed from flat bar material which is 304 Stainless Steel. The fasteners and threaded rod used shall be constructed from 18-8 Stainless Steel.

4. All assembly and/or fabrications of the Pipe Clamp Hanger shall occur entirely within the United States.

Approved Utility Stabilization Systems Manufacturers meeting All Required Section Specifications:

1) ***SuperVoid Systems, LLC***

www.SuperVoid.com

1172 County Rd. 24, Prattville, Alabama 36067

Larry W. Primm	David S. Primm, P.E.
Founder	Chief Engineer
334-730-3614	334-221-5761
Lprimm@SuperVoid.com	primmd@SuperVoid.com

2) **Other Pipe Clamp Hanger manufacturers must meet ALL of the requirements stated in these specifications and be approved prior to project bid in order to be considered.**