Operation and Maintenance Manual

Project 2422.0
South Campus Parking Lot Expansion
University of Kentucky

Lexington, KY

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Table of Contents

Spec Section 02721 Underground Detention System

Section 1

Product Data

Storm Sewer Underground Detention System

Spec Section 02721

StormTech SC-740 Chamber

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots thus maximizing land usage for commercial and municipal applications.

StormTech®
Detention • Retention • Recharge

Subsurface Stormwater Management℠

StormTech SC-740 Chamber
(not to scale)

Nominal Chamber Specifications

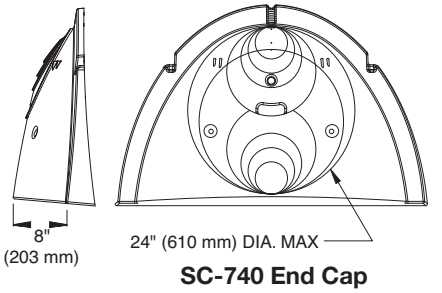
Size (L x W x H)
85.4" x 51.0" x 30.0"
(2170 x 1295 x 762 mm)

Chamber Storage
45.9 ft³ (1.30 m³)

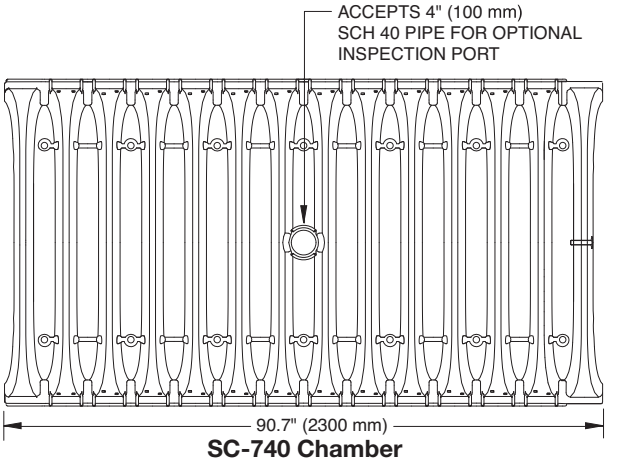
Minimum Installed Storage*
74.9 ft³ (2.12 m³)

Weight
74.0 lbs (33.6 kg)

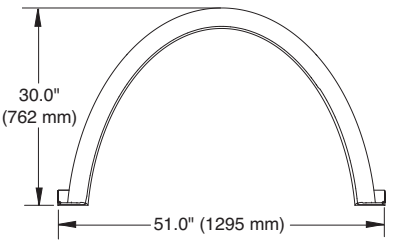
Shipping
30 chambers/pallet
60 end caps/pallet
12 pallets/truck

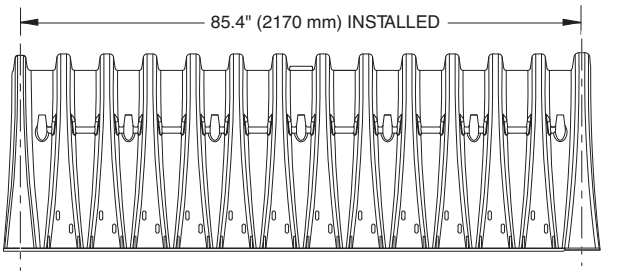


SC-740 End Cap

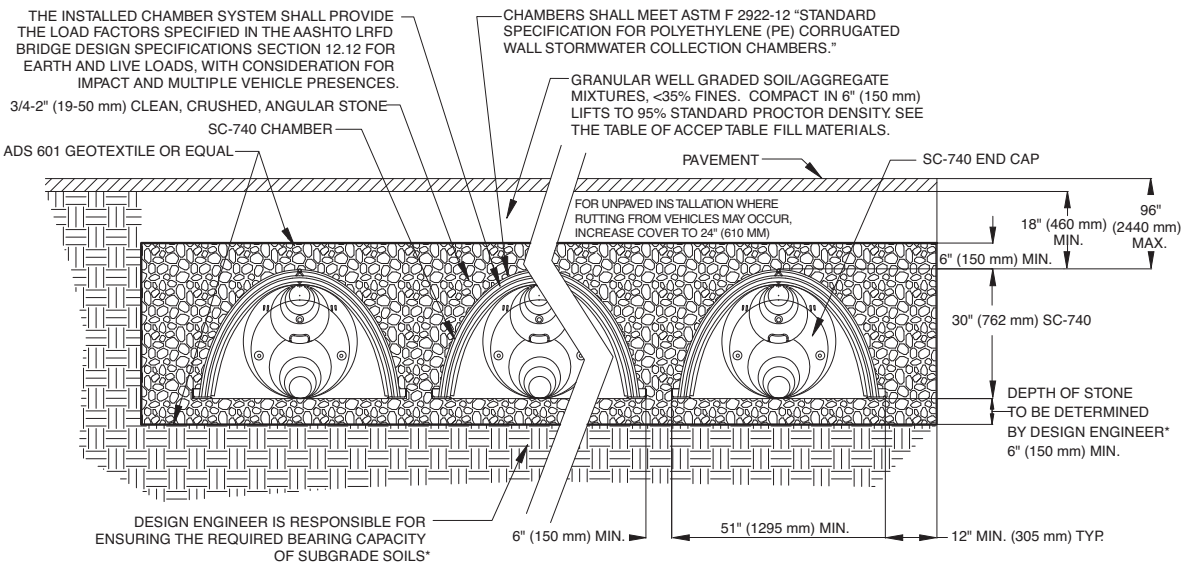


SC-740 Chamber





Typical Cross Section Detail
(not to scale)



THIS CROSS SECTION DETAILS THE REQUIREMENTS NECESSARY TO SATISFY THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12 FOR EARTH AND LIVE LOADS USING STORMTECH CHAMBERS

MADE IN THE U.S.A.

SC-740 Cumulative Storage Volumes Per Chamber

Assumes 40% Stone Porosity. Calculations are Based Upon a 6" (152 mm) Stone Base Under the Chambers.

Depth of Water in System Inches (mm)	Cumulative Chamber Storage Ft³ (m³)	Total System Cumulative Storage Ft³ (m³)
42 (1067)	45.90 (1.300)	74.90 (2.121)
41 (1041)	45.90 (1.300)	73.77 (2.089)
40 (1016)	Stone 45.90 (1.300)	72.64 (2.057)
39 (991)	Cover 45.90 (1.300)	71.52 (2.025)
38 (965)	45.90 (1.300)	70.39 (1.993)
37 (948)	45.90 (1.300)	69.26 (1.961)
36 (914)	45.90 (1.300)	68.14 (1.929)
35 (889)	45.85 (1.298)	66.98 (1.897)
34 (864)	45.69 (1.294)	65.75 (1.862)
33 (838)	45.41 (1.286)	64.46 (1.825)
32 (813)	44.81 (1.269)	62.97 (1.783)
31 (787)	44.01 (1.246)	61.36 (1.737)
30 (762)	43.06 (1.219)	59.66 (1.689)
29 (737)	41.98 (1.189)	57.89 (1.639)
28 (711)	40.80 (1.155)	56.05 (1.587)
27 (686)	39.54 (1.120)	54.17 (1.534)
26 (660)	38.18 (1.081)	52.23 (1.479)
25 (635)	36.74 (1.040)	50.23 (1.422)
24 (610)	35.22 (0.977)	48.19 (1.365)
23 (584)	33.64 (0.953)	46.11 (1.306)
22 (559)	31.99 (0.906)	44.00 (1.246)
21 (533)	30.29 (0.858)	41.85 (1.185)
20 (508)	28.54 (0.808)	39.67 (1.123)
19 (483)	26.74 (0.757)	37.47 (1.061)
18 (457)	24.89 (0.705)	35.23 (0.997)
17 (432)	23.00 (0.651)	32.96 (0.939)
16 (406)	21.06 (0.596)	30.68 (0.869)
15 (381)	19.09 (0.541)	28.36 (0.803)
14 (356)	17.08 (0.484)	26.03 (0.737)
13 (330)	15.04 (0.426)	23.68 (0.670)
12 (305)	12.97 (0.367)	21.31 (0.608)
11 (279)	10.87 (0.309)	18.92 (0.535)
10 (254)	8.74 (0.247)	16.51 (0.468)
9 (229)	6.58 (0.186)	14.09 (0.399)
8 (203)	4.41 (0.125)	11.66 (0.330)
7 (178)	2.21 (0.063)	9.21 (0.264)
6 (152)	0	6.76 (0.191)
5 (127)	0	5.63 (0.160)
4 (102)	Stone Foundation 0	4.51 (0.125)
3 (76)	0	3.38 (0.095)
2 (51)	0	2.25 (0.064)
1 (25)	0	1.13 (0.032)

Note: Add 1.13 cu. ft. (0.032 m³) of storage for each additional inch (25 mm) of stone foundation.

Storage Volume Per Chamber

	Bare Chamber Storage	Chamber and Stone Stone Foundation Depth in. (mm)		
	ft³ (m³)	6 (150)	12 (305)	18 (460)
StormTech SC-740	45.9 (1.3)	74.9 (2.1)	81.7 (2.3)	88.4 (2.5)

Note: Storage volumes are in cubic feet per chamber. Assumes 40% porosity for the stone plus the chamber volume.

Amount of Stone Per Chamber

	Stone Foundation Depth		
ENGLISH TONS (CUBIC YARDS)	6"	12"	18"
StormTech SC-740	3.8 (2.8 yd³)	4.6 (3.3 yd³)	5.5 (3.9 yd³)
METRIC KILOGRAMS (METER³)	**150 mm**	**305 mm**	**460 mm**
StormTech SC-740	3450 (2.1 m³)	4170 (2.5 m³)	4490 (3.0 m³)

Note: Assumes 6" (150 mm) of stone above, and between chambers.

Volume of Excavation Per Chamber

	Stone Foundation Depth		
	6" (150 mm)	12" (305 mm)	18" (460 mm)
StormTech SC-740	5.5 (4.2)	6.2 (4.7)	6.8 (5.2)

Note: Volumes are in cubic yards (cubic meters) per chamber. Assumes 6" (150 mm) of separation between chamber rows and 18" (460 mm) of cover. The volume of excavation will vary as the depth of the cover increases.

STANDARD LIMITED WARRANTY OF STORMTECH LLC ("STORMTECH"): PRODUCTS

(A) This Limited Warranty applies solely to the StormTech chambers and endplates manufactured by StormTech and sold to the original purchaser (the "Purchaser"). The chambers and endplates are collectively referred to as the "Products."

(B) The structural integrity of the Products, when installed strictly in accordance with StormTech's written installation instructions at the time of installation, are warranted to the Purchaser against defective materials and workmanship for one (1) year from the date of purchase. Should a defect appear in the Limited Warranty period, the Purchaser shall provide StormTech with written notice of the alleged defect at StormTech's corporate headquarters within ten (10) days of the discovery of the defect. The notice shall describe the alleged defect in reasonable detail. StormTech agrees to supply replacements for those Products determined by StormTech to be defective and covered by this Limited Warranty. The supply of replacement products is the sole remedy of the Purchaser for breaches of this Limited Warranty. StormTech's liability specifically excludes the cost of removal and/or installation of the Products.

(C) **THIS LIMITED WARRANTY IS EXCLUSIVE. THERE ARE NO OTHER WARRANTIES WITH RESPECT TO THE PRODUCTS, INCLUDING NO IMPLIED WARRANTIES OF MERCHANT-ABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.**

(D) This Limited Warranty only applies to the Products when the Products are installed in a single layer. **UNDER NO CIRCUMSTANCES, SHALL THE PRODUCTS BE INSTALLED IN A MULTI-LAYER CONFIGURATION.**

(E) No representative of StormTech has the authority to change this Limited Warranty in any manner or to extend this Limited Warranty. This Limited Warranty does not apply to any person other than to the Purchaser.

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StormTech SC-310 Chamber

Designed to meet the most stringent industry performance standards for superior structural integrity while providing designers with a cost-effective method to save valuable land and protect water resources. The StormTech system is designed primarily to be used under parking lots thus maximizing land usage for commercial and municipal applications.

StormTech®
Detention • Retention • Recharge
Subsurface Stormwater Management℠

StormTech SC-310 Chamber
(not to scale)

Nominal Chamber Specifications

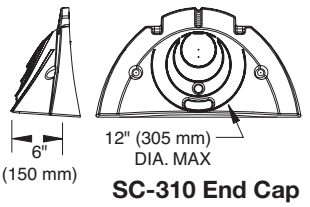
Size (L x W x H)
85.4" x 34.0" x 16.0"
(2170 x 864 x 406 mm)

Chamber Storage
14.7 ft³ (0.42 m³)

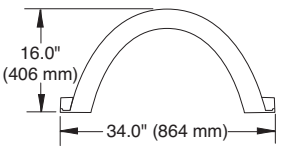
Minimum Installed Storage*
31.0 ft³ (0.88 m³)

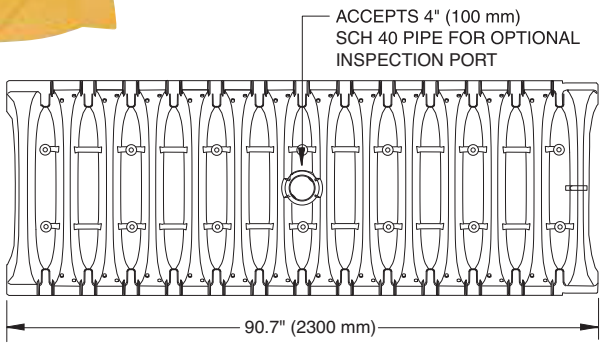
Weight
37.0 lbs (16.8 kg)

Shipping
41 chambers/pallet
108 end caps/pallet
18 pallets/truck

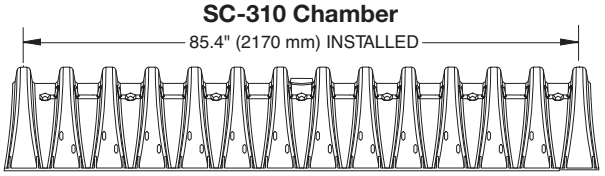


SC-310 End Cap

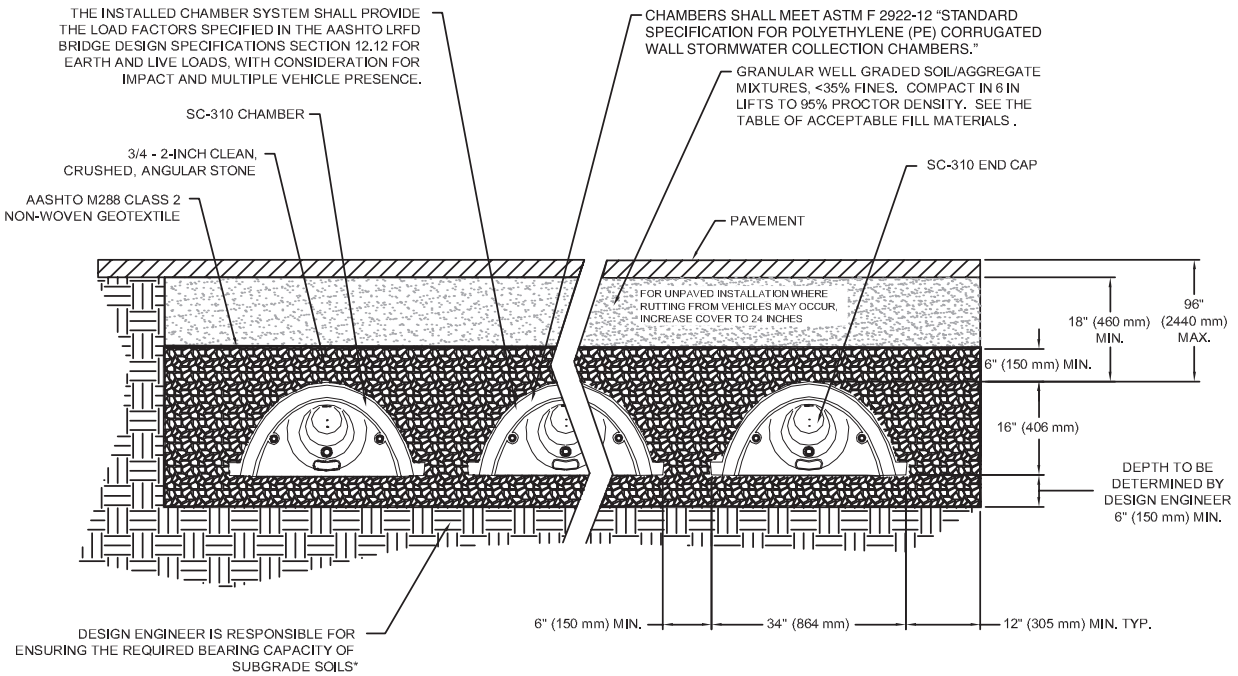




SC-310 Chamber



Typical Cross Section Detail
(not to scale)



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SC-310 Cumulative Storage Volumes Per Chamber

Assumes 40% Stone Porosity. Calculations are Based Upon a 6" (152 mm) Stone Base Under the Chambers.

Depth of Water in System Inches (mm)	Cumulative Chamber Storage ft³ (m³)	Total System Cumulative Storage ft³ (m³)
28 (711)	14.70 (0.416)	31.00 (0.878)
27 (686)	14.70 (0.416)	30.21 (0.855)
26 (680)	Stone 14.70 (0.416)	29.42 (0.833)
25 (610)	Cover 14.70 (0.416)	28.63 (0.811)
24 (609)	14.70 (0.416)	27.84 (0.788)
23 (584)	14.70 (0.416)	27.05 (0.766)
22 (559)	14.70 (0.416)	26.26 (0.748)
21 (533)	14.64 (0.415)	25.43 (0.720)
20 (508)	14.49 (0.410)	24.54 (0.695)
19 (483)	14.22 (0.403)	23.58 (0.668)
18 (457)	13.68 (0.387)	22.47 (0.636)
17 (432)	12.99 (0.368)	21.25 (0.602)
16 (406)	12.17 (0.345)	19.97 (0.566)
15 (381)	11.25 (0.319)	18.62 (0.528)
14 (356)	10.23 (0.290)	17.22 (0.488)
13 (330)	9.15 (0.260)	15.78 (0.447)
12 (305)	7.99 (0.227)	14.29 (0.425)
11 (279)	6.78 (0.192)	12.77 (0.362)
10 (254)	5.51 (0.156)	11.22 (0.318)
9 (229)	4.19 (0.119)	9.64 (0.278)
8 (203)	2.83 (0.081)	8.03 (0.227)
7 (178)	1.43 (0.041)	6.40 (0.181)
6 (152)	0	4.74 (0.134)
5 (127)	0	3.95 (0.112)
4 (102)	Stone Foundation 0	3.16 (0.090)
3 (76)	0	2.37 (0.067)
2 (51)	0	1.58 (0.046)
1 (25)	0	0.79 (0.022)

Note: Add 0.79 cu. ft. (0.022 m³) of storage for each additional inch (25 mm) of stone foundation.

Storage Volume Per Chamber

	Bare Chamber Storage ft³ (m³)	Chamber and Stone Stone Foundation Depth in. (mm)		
		6 (150)	12 (305)	18 (460)
StormTech SC-310	14.7 (0.4)	31.0 (0.9)	35.7 (1.0)	40.4 (1.1)

Note: Storage volumes are in cubic feet per chamber. Assumes 40% porosity for the stone plus the chamber volume.

Amount of Stone Per Chamber

	Stone Foundation Depth		
ENGLISH TONS (CUBIC YARDS)	**6"**	**12"**	**18"**
StormTech SC-310	2.1 (1.5 yd³)	2.7 (1.9 yd³)	3.4 (2.4 yd³)
METRIC KILOGRAMS (METER³)	**150 mm**	**305 mm**	**460 mm**
StormTech SC-310	1830 (1.1 m³)	2490 (1.5 m³)	2990 (1.8 m³)

Note: Assumes 6" (150 mm) of stone above, and between chambers.

Volume of Excavation Per Chamber

	Stone Foundation Depth		
	6" (150 mm)	**12" (305 mm)**	**18" (460 mm)**
StormTech SC-310	2.9 (2.2)	3.4 (2.6)	3.8 (2.9)

Note: Volumes are in cubic yards (cubic meters) per chamber. Assumes 6" (150 mm) of separation between chamber rows and 18" (460 mm) of cover. The volume of excavation will vary as the depth of the cover increases.

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Section 2

Installation Guide & Maintenance

Storm Sewer Underground Detention System

Spec Section 02721

StormTech®
Detention • Retention • Water Quality
A division of ADS

SC-310/SC-740/DC-780

StormTech Construction Guide

REQUIRED MATERIALS AND EQUIPMENT LIST

- Acceptable fill materials per **Table 1**
- Woven and non-woven geotextiles
- StormTech solid end caps and pre-cored end caps
- StormTech chambers
- StormTech manifolds and fittings

IMPORTANT NOTES:

A. This installation guide provides the minimum requirements for proper installation of chambers. Non-adherence to this guide may result in damage to chambers during installation. Replacement of damaged chambers during or after backfilling is costly and very time consuming. It is recommended that all installers are familiar with this guide, and that the contractor inspects the chambers for distortion, damage and joint integrity as work progresses.

B. Use of a dozer to push embedment stone between the rows of chambers may cause damage to chambers and is not an acceptable backfill method. Any chambers damaged by using the "dump and push" method are not covered under the StormTech standard warranty.

C. Care should be taken in the handling of chambers and end caps. Avoid dropping, prying or excessive force on chambers during removal from pallet and initial placement.

Requirements for System Installation

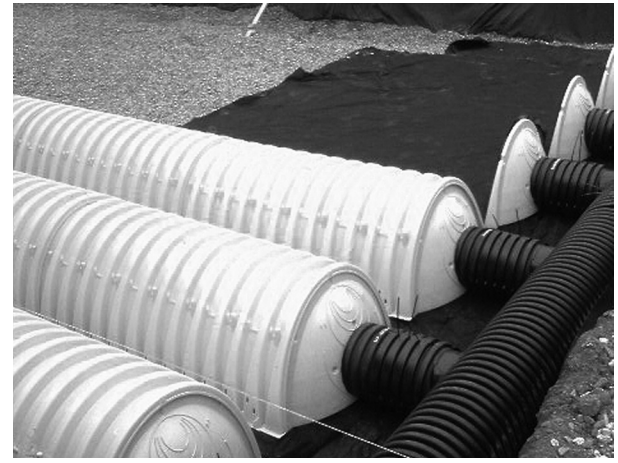
Excavate bed and prepare subgrade per engineer's plans.

Place non-woven geotextile over prepared soils and up excavation walls.

Place clean, crushed, angular stone foundation 6" (150 mm) min. Install underdrains if required. Compact to achieve a flat surface.

Manifold, Scour Fabric and Chamber Assembly

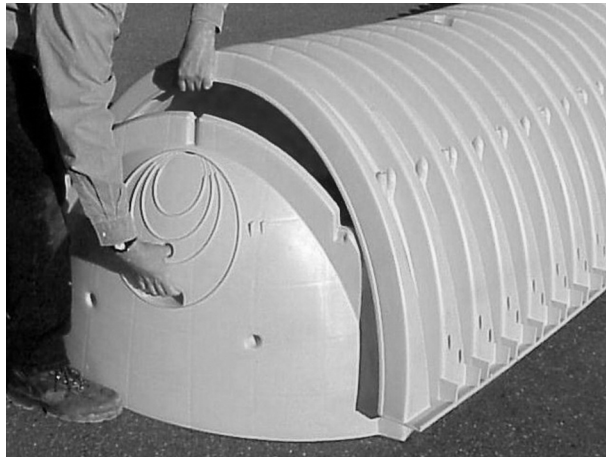
Install manifolds and lay out woven scour geotextile at inlet rows [min. 12.5 ft (3.8 m)] at each inlet end cap. Place a continuous piece (no seams, double layer) along entire length of Isolator® Row(s).



Align the first chamber and end cap of each row with inlet pipes. Contractor may choose to postpone stone placement around end chambers and leave ends of rows open for easy inspection of chambers during the backfill process.

Construct the chamber bed by overlapping the chambers lengthwise in rows. Attach chambers by overlapping the end corrugation of one chamber on to the end corrugation of the last chamber in the row. Be sure that the chamber placement does not exceed the reach of the construction equipment used to place the stone.

Attaching the End Caps



Lift the end of the chamber a few inches off the ground. With the curved face of the end cap facing outward, place the end cap into the chamber's end corrugation.

Prefabricated End Caps

24" (600 mm) inlets are the maximum size that can fit into a SC-740/DC-780 end cap and must be prefabricated with a 24" (600 mm) pipe stub. SC-310 chambers with a 12" (300 mm) inlet pipe must use a prefabricated end cap with a 12" (300 mm) pipe stub.

Isolator Row

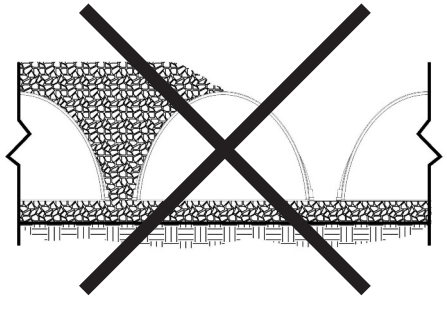
Drape a strip of ADS non-woven geotextile over the row of chambers (not required over DC-780). This is the same type of non-woven geotextile used as a separation layer around the angular stone of the StormTech system.

Initial Anchoring of Chambers – Embedment Stone

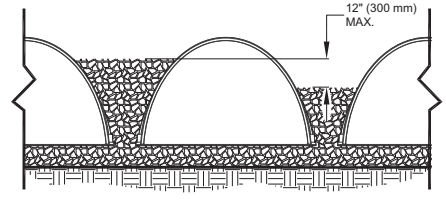
Initial embedment shall be spotted along the centerline of the chamber evenly anchoring the lower portion of the chamber. This is best accomplished with a stone conveyor or excavator reaching along the row.

No equipment shall be operated on the bed at this stage of the installation. Excavators must be located off the bed. Dump trucks shall not dump stone directly on to the bed. Dozers or loaders are not allowed on the bed at this time.

Backfill of Chambers – Embedment Stone

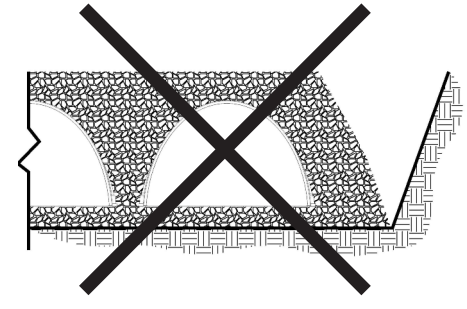


UNEVEN BACKFILL

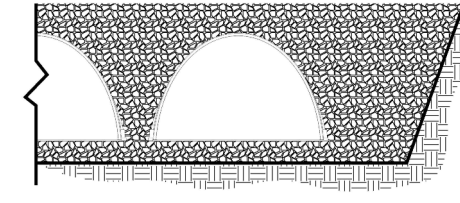


EVEN BACKFILL

Backfill chambers evenly. Stone column height should never differ by more than 12” (300 mm) between adjacent chamber rows or between chamber rows and perimeter.



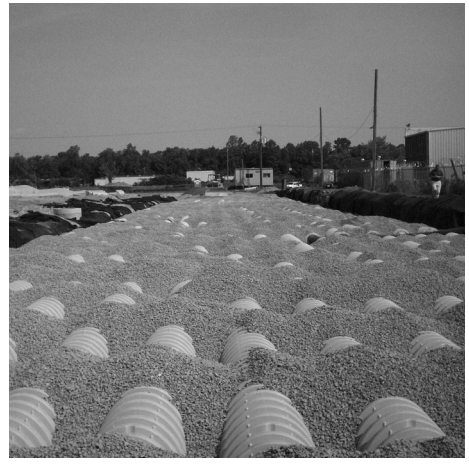
PERIMETER NOT BACKFILLED



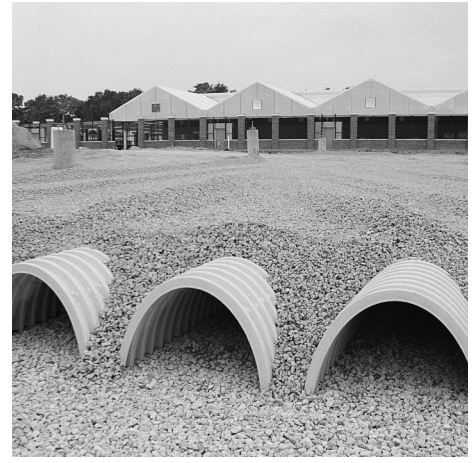
PERIMETER FULLY BACKFILLED

Perimeter stone must be brought up evenly with chamber rows. Perimeter must be fully backfilled, with stone extended horizontally to the excavation wall.

Backfill of Chambers – Embedment Stone and Cover Stone

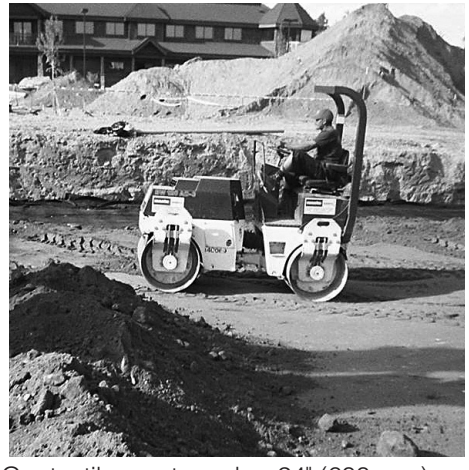


Continue evenly backfilling between rows and around perimeter until embedment stone reaches tops of chambers. Perimeter stone must extend horizontally to the excavation wall for both straight or sloped sidewalls. **Only after chambers have been backfilled to top of chamber and with a minimum 6" (150 mm) of cover stone on top of chambers can small dozers be used over the chambers for backfilling remaining cover stone.**



Small dozers and skid loaders may be used to finish grading stone backfill in accordance with ground pressure limits in Table 2. They must push material parallel to rows only. Never push perpendicular to rows. StormTech recommends that the contractor inspect chambers before placing final backfill. Any chambers damaged by construction shall be removed & replaced.

Final Backfill of Chambers – Fill Material



Install non-woven geotextile over stone. Geotextile must overlap 24" (600 mm) min. where edges meet. Compact each lift of backfill as specified in the site design engineer's drawings. Roller travel parallel with rows.

StormTech Isolator Row Detail

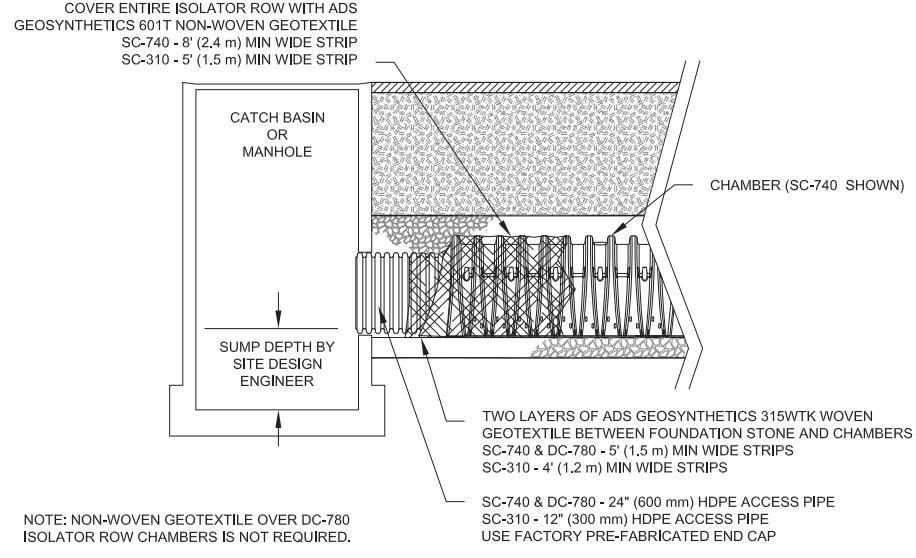


Table 1 – Acceptable Fill Materials

Material Location	Description	AASHTO M43 Designation[1]	Compaction/Density Requirement
Ⓓ **Final Fill:** Fill Material for layer 'D' starts from the top of the 'C' layer to the bottom of flexible pavement or unpaved finished grade above. Note that the pavement subbase may be part of the 'D' layer.	Any soil/rock materials, native soils or per engineer's plans. Check plans for pavement subgrade requirements.	N/A	Prepare per site design engineer's plans. Paved installations may have stringent material and preparation requirements.
Ⓒ **Initial Fill:** Fill Material for layer 'C' starts from the top of the embedment stone ('B' layer) to 18" (450 mm) above the top of the chamber. Note that pavement subbase may be part of the 'C' layer.	Granular well-graded soil/aggregate mixtures, <35% fines or processed aggregate. Most pavement subbase materials can be used in lieu of this layer.	AASHTO M45 A-1, A-2-4, A-3 or AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	Begin compaction after min. 12" (300 mm) of material over the chambers is reached. Compact additional layers in 6" (150 mm) max. lifts to a min. 95% Proctor density for well-graded material and 95% relative density for processed aggregate materials. Roller gross vehicle weight not to exceed 12,000 lbs (53 kN). Dynamic force not to exceed 20,000 lbs (89 kN)
Ⓑ **Embedment Stone:** Embedment Stone surrounding chambers from the foundation stone to the 'C' layer above.	Clean, crushed, angular stone nominal size distribution 3/4 - 2" (20 mm - 50 mm)	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	No compaction required.
Ⓐ **Foundation Stone:** Foundation Stone below the chambers from the subgrade up to the foot (bottom) of the chamber.	Clean, crushed, angular stone, nominal size distribution 3/4 - 2" (20 mm - 50 mm)	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	Place and compact in 6" (150 mm) lifts using two full coverages with a vibratory compactor.[2, 3]

PLEASE NOTE:

1. ***The listed AASHTO designations are for gradations only. The stone must also be clean, crushed, angular. For example, a specification for #4 stone would state: "clean, crushed, angular no. 4 (AASHTO M43) stone".***
2. ***StormTech compaction requirements are met for 'A' location materials when placed and compacted in 6" (150 mm) (max) lifts using two full coverages with a vibratory compactor.***
3. ***Where infiltration surfaces may be comprised by compaction, for standard installations and standard design load conditions, a flat surface may be achieved by raking or dragging without compaction equipment. For special load designs, contact StormTech for compaction requirements.***

Figure 1 – Inspection Port Detail

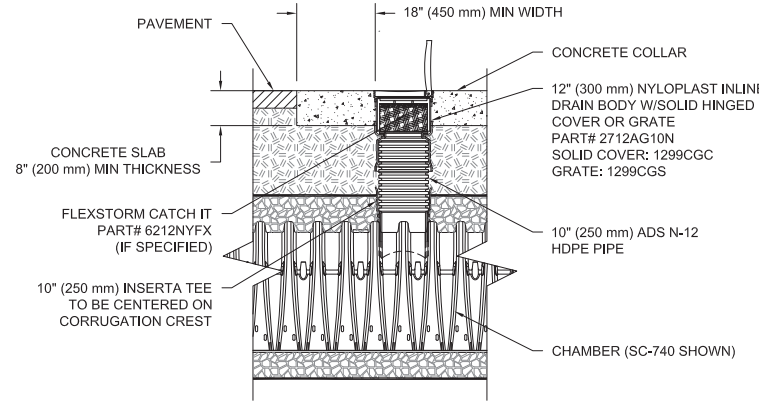
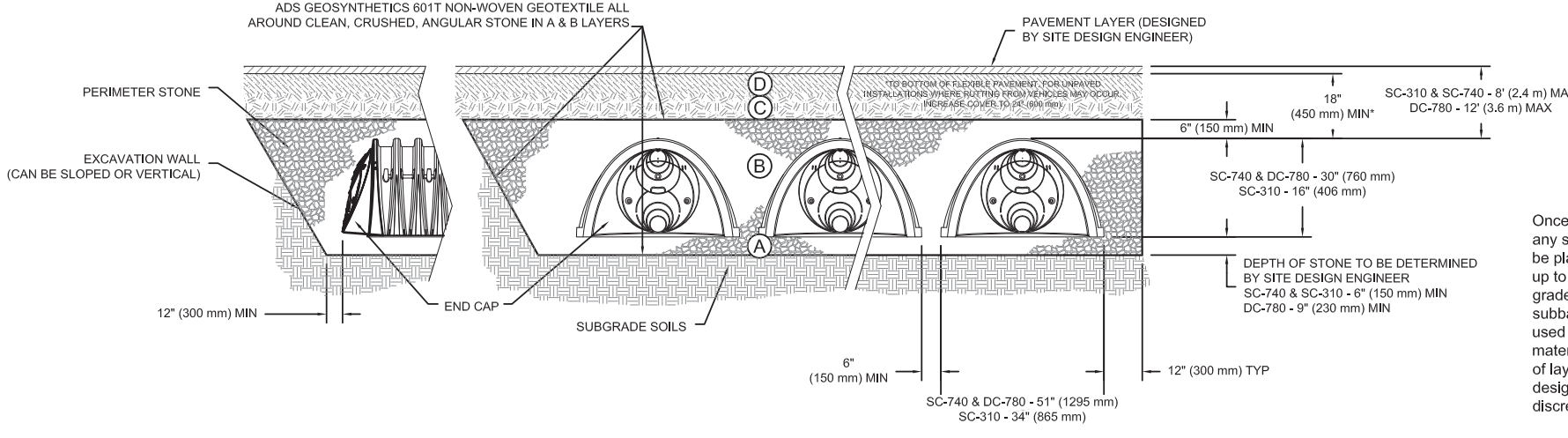


Figure 2 – Fill Material Locations



Once layer 'C' is placed any soil/material can be placed in layer 'D' up to the finished grade. Most pavement subbase soils can be used to replace the materials requirements of layer 'C' or 'D' at the design engineer's discretion.

NOTES:

1. *36" (900 mm) of stabilized cover materials over the chambers is required for full dump truck travel and dumping.*
2. *During paving operations, dump truck axle loads on 18" (450 mm) of cover may be necessary. Precautions should be taken to avoid rutting of the road base layer, to ensure that compaction requirements have been met, and that a minimum of 18" (450 mm) of cover exists over the chambers. Contact StormTech for additional guidance on allowable axle loads during paving.*
3. *Ground pressure for track dozers is the vehicle operating weight divided by total ground contact area for both tracks. Excavators will exert higher ground pressures based on loaded bucket weight and boom extension.*
4. *Mini-excavators (< 8,000lbs/3,628 kg) can be used with at least 12" (300 mm) of stone over the chambers and are limited by the maximum ground pressures in Table 2 based on a full bucket at maximum boom extension.*
5. *Storage of materials such as construction materials, equipment, spoils, etc. should not be located over the StormTech system. The use of equipment over the StormTech system not covered in Table 2 (ex. soil mixing equipment, cranes, etc) is limited. Please contact StormTech for more information.*
6. *Allowable track loads based on vehicle travel only. Excavators shall not operate on chamber beds until the total backfill reaches 3 feet (900 mm) over the entire bed.*

Table 2 – Maximum Allowable Construction Vehicle Loads[5]

Material Location	Fill Depth over Chambers in. [mm]	Maximum Allowable Wheel Loads		Maximum Allowable Track Loads[6]		Maximum Allowable Roller Loads
		Max Axle Load for Trucks lbs [kN]	Max Wheel Load for Loaders lbs [kN]	Track Width in. [mm]	Max Ground Pressure psf [kPa]	Max Drum Weight or Dynamic Force lbs [kN]
(D) Final Fill Material	36" [900] Compacted	32,000 [142]	16,000 [71]	12" [305] 18" [457] 24" [610] 30" [762] 36" [914]	3420 [164] 2350 [113] 1850 [89] 1510 [72] 1310 [63]	38,000 [169]
(C) Initial Fill Material	24" [600] Compacted	32,000 [142]	16,000 [71]	12" [305] 18" [457] 24" [610] 30" [762] 36" [914]	2480 [119] 1770 [85] 1430 [68] 1210 [58] 1070 [51]	20,000 [89]
	24" [600] Loose/Dumped	32,000 [142]	16,000 [71]	12" [305] 18" [457] 24" [610] 30" [762] 36" [914]	2245 [107] 1625 [78] 1325 [63] 1135 [54] 1010 [48]	20,000 [89] Roller gross vehicle weight not to exceed 12,000 lbs. [53 kN]
	18" [450]	32,000 [142]	16,000 [71]	12" [305] 18" [457] 24" [610] 30" [762] 36" [914]	2010 [96] 1480 [71] 1220 [58] 1060 [51] 950 [45]	20,000 [89] Roller gross vehicle weight not to exceed 12,000 lbs. [53 kN]
(B) Embedment Stone	12" [300]	16,000 [71]	NOT ALLOWED	12" [305] 18" [457] 24" [610] 30" [762] 36" [914]	1540 [74] 1190 [57] 1010 [48] 910 [43] 840 [40]	20,000 [89] Roller gross vehicle weight not to exceed 12,000 lbs. [53 kN]
	6" [150]	8,000 [35]	NOT ALLOWED	12" [305] 18" [457] 24" [610] 30" [762] 36" [914]	1070 [51] 900 [43] 800 [38] 760 [36] 720 [34]	NOT ALLOWED

Table 3 – Placement Methods and Descriptions

Material Location	Placement Methods/ Restrictions	Wheel Load Restrictions	Track Load Restrictions	Roller Load Restrictions
		See Table 2 for Maximum Construction Loads		
(D) Final Fill Material	A variety of placement methods may be used. All construction loads must not exceed the maximum limits in Table 2.	36" (900 mm) minimum cover required for dump trucks to dump over chambers.	Dozers to push parallel to rows until 36" (900mm) compacted cover is reached.[4]	Roller travel parallel to rows only until 36" (900 mm) compacted cover is reached.
(C) Initial Fill Material	Excavator positioned off bed recommended. Small excavator allowed over chambers. Small dozer allowed.	Asphalt can be dumped into paver when compacted pavement subbase reaches 18" (450 mm) above top of chambers.	Small LGP track dozers & skid loaders allowed to grade cover stone with at least 6" (150 mm) stone under tracks at all times. Equipment must push parallel to rows at all times.	Use dynamic force of roller only after compacted fill depth reaches 12" (300 mm) over chambers. Roller travel parallel to chamber rows only.
(B) Embedment Stone	No equipment allowed on bare chambers. Use excavator or stone conveyor positioned off bed or on foundation stone to evenly fill around all chambers to at least the top of chambers.	No wheel loads allowed. Material must be placed outside the limits of the chamber bed.	No tracked equipment is allowed on chambers until a min. 6" (150 mm) cover stone is in place.	No rollers allowed.
(A) Foundation Stone	No StormTech restrictions. Contractor responsible for any conditions or requirements by others relative to subgrade bearing capacity, dewatering or protection of subgrade.			

Section 3

Shop Drawings & Calculations

Storm Sewer Underground Detention System

Spec Section 02721

PROJECT INFORMATION	
ENGINEERED PRODUCT MANAGER:	SANDY COLLINS-CAMARGO 859-421-6429 SANDY.CAMARGO@ADS-PIPE.COM
ADS SALES REP:	MIKE ROBERTS 859-533-2157 MIKE.ROBERTS@ADS-PIPE.COM
PROJECT NO:	98509

ADVANCED DRAINAGE SYSTEMS, INC.

UK SOUTH CAMPUS EXPANSION

LEXINGTON, KY

STORMWATER CHAMBER SPECIFICATIONS

1. CHAMBERS SHALL BE STORMTECH SC-740, SC-310, OR APPROVED EQUAL.
2. CHAMBERS SHALL BE MANUFACTURED FROM VIRGIN POLYPROPYLENE OR POLYETHYLENE RESINS.
3. CHAMBER ROWS SHALL PROVIDE CONTINUOUS, UNOBSTRUCTED INTERNAL SPACE WITH NO INTERNAL SUPPORT PANELS THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION.
4. THE STRUCTURAL DESIGN OF THE CHAMBERS, THE STRUCTURAL BACKFILL, AND THE INSTALLATION REQUIREMENTS SHALL ENSURE THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET FOR: 1) LONG-DURATION DEAD LOADS AND 2) SHORT-DURATION LIVE LOADS, BASED ON THE AASHTO DESIGN TRUCK WITH CONSIDERATION FOR IMPACT AND MULTIPLE VEHICLE PRESENCES.
5. CHAMBERS SHALL MEET ASTM F2922 (POLYETHYLENE) OR ASTM F2418 (POLYPROPYLENE), "STANDARD SPECIFICATION FOR THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
6. CHAMBERS SHALL BE DESIGNED AND ALLOWABLE LOADS DETERMINED IN ACCORDANCE WITH ASTM F2787, "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
7. ONLY CHAMBERS THAT ARE APPROVED BY THE SITE DESIGN ENGINEER WILL BE ALLOWED. THE CHAMBER MANUFACTURER SHALL SUBMIT THE FOLLOWING UPON REQUEST TO THE SITE DESIGN ENGINEER FOR APPROVAL BEFORE DELIVERING CHAMBERS TO THE PROJECT SITE:
   a. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE SAFETY FACTORS ARE GREATER THAN OR EQUAL TO 1.95 FOR DEAD LOAD AND 1.75 FOR LIVE LOAD, THE MINIMUM REQUIRED BY ASTM F2787 AND BY AASHTO FOR THERMOPLASTIC PIPE.
   b. A STRUCTURAL EVALUATION SEALED BY A REGISTERED PROFESSIONAL ENGINEER THAT DEMONSTRATES THAT THE LOAD FACTORS SPECIFIED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SECTION 12.12, ARE MET. THE 50 YEAR CREEP MODULUS DATA SPECIFIED IN ASTM F2418 OR ASTM F2922 MUST BE USED AS PART OF THE AASHTO STRUCTURAL EVALUATION TO VERIFY LONG-TERM PERFORMANCE.
   c. STRUCTURAL CROSS SECTION DETAIL ON WHICH THE STRUCTURAL EVALUATION IS BASED.
8. CHAMBERS AND END CAPS SHALL BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

IMPORTANT - NOTES FOR THE BIDDING AND INSTALLATION OF THE SC-310/SC-740 SYSTEM

1. STORMTECH SC-310 & SC-740 CHAMBERS SHALL NOT BE INSTALLED UNTIL THE MANUFACTURER'S REPRESENTATIVE HAS COMPLETED A PRE-CONSTRUCTION MEETING WITH THE INSTALLERS.
2. STORMTECH SC-310 & SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/SC-780 CONSTRUCTION GUIDE".
3. CHAMBERS ARE NOT TO BE BACKFILLED WITH A DOZER OR AN EXCAVATOR SITUATED OVER THE CHAMBERS.

   STORMTECH RECOMMENDS 3 BACKFILL METHODS:
   - STONESHOOTER LOCATED OFF THE CHAMBER BED.
   - BACKFILL AS ROWS ARE BUILT USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
   - BACKFILL FROM OUTSIDE THE EXCAVATION USING A LONG BOOM HOE OR EXCAVATOR.
4. THE FOUNDATION STONE SHALL BE LEVELED AND COMPACTED PRIOR TO PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS SHALL BE PROPERLY SEATED PRIOR TO PLACING STONE.
6. MAINTAIN MINIMUM - 6" (150 mm) SPACING BETWEEN THE CHAMBER ROWS.
7. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE A CLEAN, CRUSHED, ANGULAR STONE 3/4-2" (20-50 mm).
8. THE CONTRACTOR MUST REPORT ANY DISCREPANCIES WITH CHAMBER FOUNDATION MATERIALS BEARING CAPACITIES TO THE SITE DESIGN ENGINEER.
9. ADS RECOMMENDS THE USE OF "FLEXSTORM CATCH IT" INSERTS DURING CONSTRUCTION FOR ALL INLETS TO PROTECT THE SUBSURFACE STORMWATER MANAGEMENT SYSTEM FROM CONSTRUCTION SITE RUNOFF.

NOTES FOR CONSTRUCTION EQUIPMENT

1. STORMTECH SC-310 & SC-740 CHAMBERS SHALL BE INSTALLED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
2. THE USE OF CONSTRUCTION EQUIPMENT OVER SC-310 & SC-740 CHAMBERS IS LIMITED:
   - NO EQUIPMENT IS ALLOWED ON BARE CHAMBERS.
   - NO RUBBER TIRED LOADERS, DUMP TRUCKS, OR EXCAVATORS ARE ALLOWED UNTIL PROPER FILL DEPTHS ARE REACHED IN ACCORDANCE WITH THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
   - WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT CAN BE FOUND IN THE "STORMTECH SC-310/SC-740/DC-780 CONSTRUCTION GUIDE".
3. FULL 36" (900 mm) OF STABILIZED COVER MATERIALS OVER THE CHAMBERS IS REQUIRED FOR DUMP TRUCK TRAVEL OR DUMPING.

USE OF A DOZER TO PUSH EMBEDMENT STONE BETWEEN THE ROWS OF CHAMBERS MAY CAUSE DAMAGE TO THE CHAMBERS AND IS NOT AN ACCEPTABLE BACKFILL METHOD. ANY CHAMBERS DAMAGED BY THE "DUMP AND PUSH" METHOD ARE NOT COVERED UNDER THE STORMTECH STANDARD WARRANTY.

CONTACT STORMTECH AT 1-888-892-2694 WITH ANY QUESTIONS ON INSTALLATION REQUIREMENTS OR WEIGHT LIMITS FOR CONSTRUCTION EQUIPMENT.

PROPOSED LAYOUT - BED A

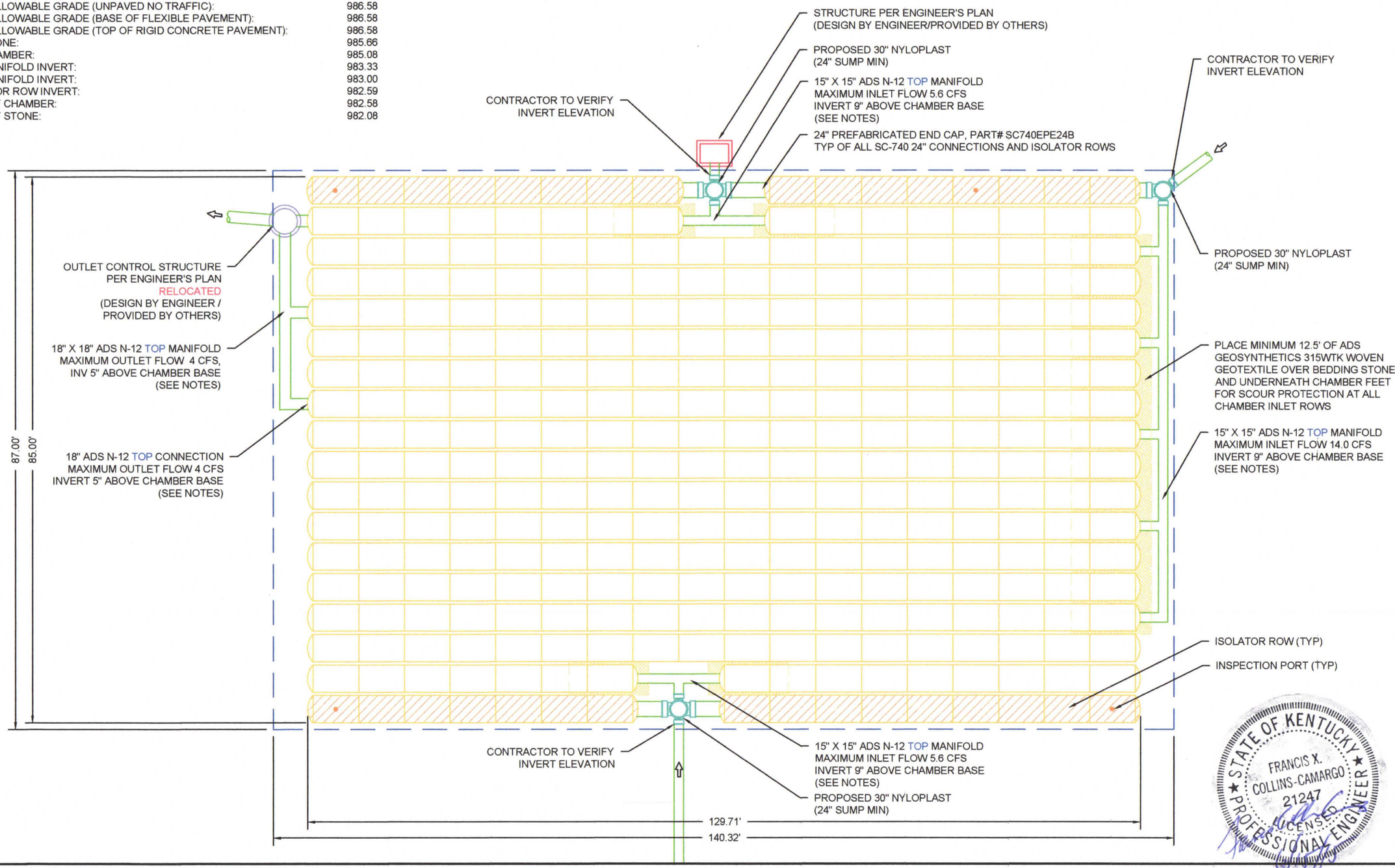
(316) STORMTECH SC-740 CHAMBERS
(44) STORMTECH SC-740 END CAPS
INSTALLED WITH 7" COVER STONE, 6" BASE STONE, 40% STONE VOID
INSTALLED SYSTEM VOLUME: 26,210 CF (PERIMETER STONE INCLUDED)
WATER QUALITY VOLUME BELOW ELEVATION 983.0: 6,536 CF
AREA OF SYSTEM: 12,208 FT²
PERIMETER OF SYSTEM: 455 FT

PROPOSED ELEVATIONS

MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	993.08
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	987.08
MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	986.58
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	986.58
MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	986.58
TOP OF STONE:	985.66
TOP OF CHAMBER:	985.08
15" TOP MANIFOLD INVERT:	983.33
18" TOP MANIFOLD INVERT:	983.00
24" ISOLATOR ROW INVERT:	982.59
BOTTOM OF CHAMBER:	982.58
BOTTOM OF STONE:	982.08

NOTES

- MANIFOLD SIZE TO BE DETERMINED BY SITE DESIGN ENGINEER. SEE TECH SHEET #7 FOR MANIFOLD SIZING GUIDANCE.
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.
- THE SITE DESIGN ENGINEER MUST REVIEW ELEVATIONS AND IF NECESSARY ADJUST GRADING TO ENSURE THE CHAMBER COVER REQUIREMENTS ARE MET.



STATE OF KENTUCKY
FRANCIS X. COLLINS-CAMARGO
21247
LICENSED PROFESSIONAL ENGINEER

UK SOUTH CAMPUS EXPANSION
LEXINGTON, KY

DATE: 5-5-15 | DRAWN: NPB | CHECKED: GFI
PROJECT #: 98509

REV	DRW	CHK	DESCRIPTION
6-10-15	NPB	GFI	INCREASE VOLUME BED A

StormTech®
Detention • Retention • Water Quality
70 INWOOD ROAD, SUITE 3 | ROCKY HILL | CT | 06067
860-529-8188 | 888-892-2694 | WWW.STORMTECH.COM

ADS®
ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

30'
15'
0

PROPOSED LAYOUT - BED B

(595) STORMTECH SC-310 CHAMBERS
(70) STORMTECH SC-310 END CAPS
INSTALLED WITH 11" COVER STONE, 6" BASE STONE, 40% STONE VOID
INSTALLED SYSTEM VOLUME: 22,311 CF (PERIMETER STONE INCLUDED)
AREA OF SYSTEM: 15,493 FT²
PERIMETER OF SYSTEM: 502 FT

PROPOSED ELEVATIONS

MAXIMUM ALLOWABLE GRADE (TOP OF PAVEMENT/UNPAVED):	993.58
MINIMUM ALLOWABLE GRADE (UNPAVED WITH TRAFFIC):	987.58
MINIMUM ALLOWABLE GRADE (UNPAVED NO TRAFFIC):	987.08
MINIMUM ALLOWABLE GRADE (BASE OF FLEXIBLE PAVEMENT):	987.08
MINIMUM ALLOWABLE GRADE (TOP OF RIGID CONCRETE PAVEMENT):	987.08
TOP OF STONE:	986.50
TOP OF CHAMBER:	985.58
8" TOP MANIFOLD INVERT:	984.54
12" ISOLATOR ROW/BOTTOM MANIFOLD INVERT:	984.33
8" BOTTOM MANIFOLD INVERT:	984.30
BOTTOM OF CHAMBER:	984.25
15" TRUNK MANIFOLD INVERT:	984.25
18" TRUNK MANIFOLD INVERT:	984.09
UNDERDRAIN INVERT:	983.75
BOTTOM OF STONE:	983.75

NOTES

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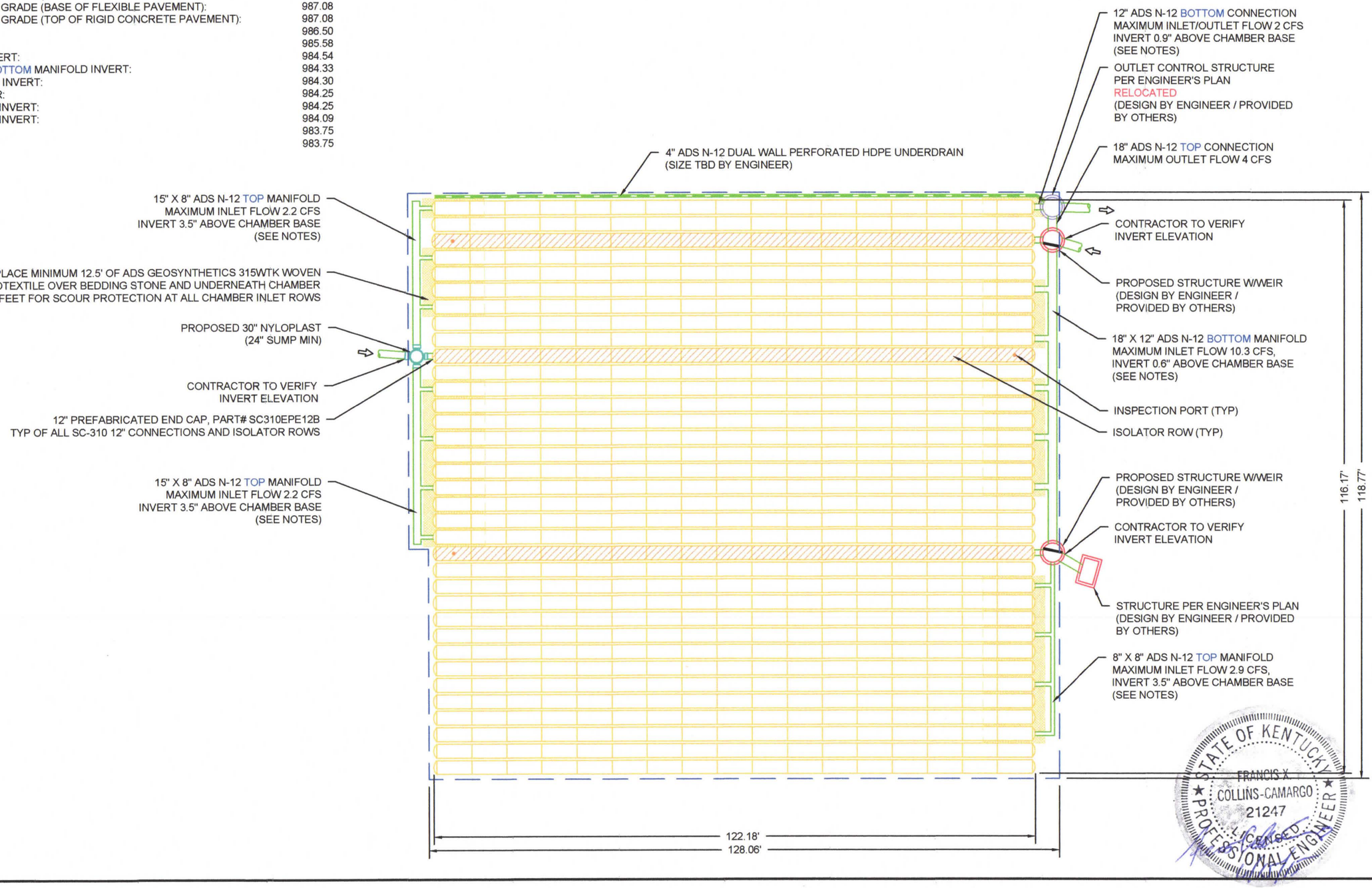
- DUE TO THE ADAPTATION OF THIS CHAMBER SYSTEM TO SPECIFIC SITE AND DESIGN CONSTRAINTS, IT MAY BE NECESSARY TO CUT AND COUPLE ADDITIONAL PIPE TO STANDARD MANIFOLD COMPONENTS IN THE FIELD.



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UK SOUTH CAMPUS EXPANSION
LEXINGTON, KY

DATE: 5-5-15 | DRAWN: NPB | CHECKED: GFI | PROJECT #: 98509

REV	DRW	CHK	DESCRIPTION
6-10-15	NPB	GFI	INCREASE VOLUME BED A

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ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

40'
20'
0

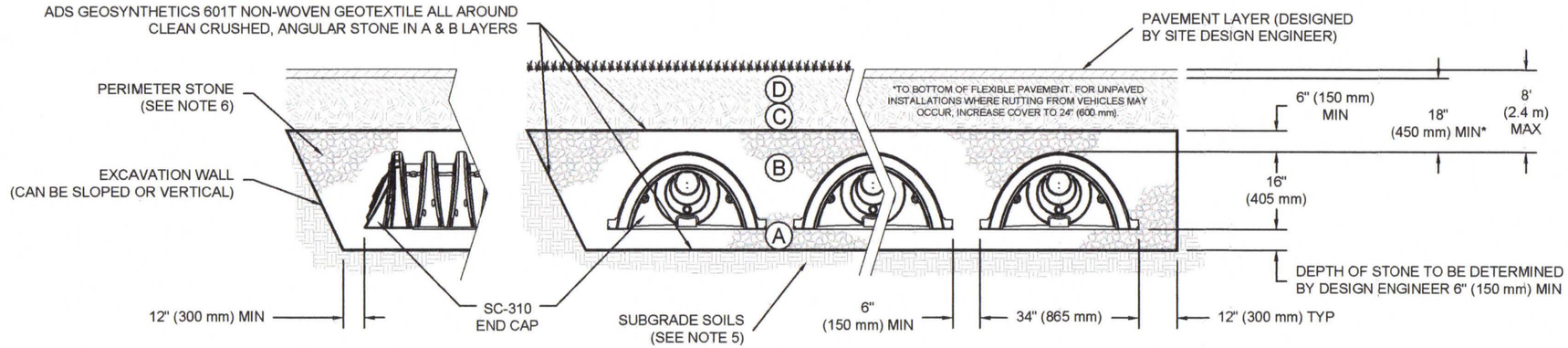
THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OF RECORD. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.

ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE

ACCEPTABLE FILL MATERIALS: STORMTECH SC-310 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH (20-50 mm)	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
A	**FOUNDATION STONE:** FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH (20-50 mm)	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE.[2 3]

PLEASE NOTE:
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) (MAX) LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.



NOTES:

1. SC-310 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM F2922
"STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-310 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
3. "ACCEPTABLE FILL MATERIALS" TABLE ABOVE PROVIDES MATERIAL LOCATIONS, DESCRIPTIONS, GRADATIONS, AND COMPACTION REQUIREMENTS FOR FOUNDATION, EMBEDMENT, AND FILL MATERIALS.
4. THE "SITE DESIGN ENGINEER" REFERS TO THE ENGINEER RESPONSIBLE FOR THE DESIGN AND LAYOUT OF THE STORMTECH CHAMBERS FOR THIS PROJECT.
5. THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
6. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
7. ONCE LAYER 'C' IS PLACED, ANY SOIL/MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.

REV	DRW	CHK	DESCRIPTION
6-10-15	NPB	GFI	INCREASE VOLUME BED A

UK SOUTH CAMPUS EXPANSION
LEXINGTON, KY

DATE: 5-5-15 DRAWN: NPB
PROJECT #: 98509 CHECKED: GFI

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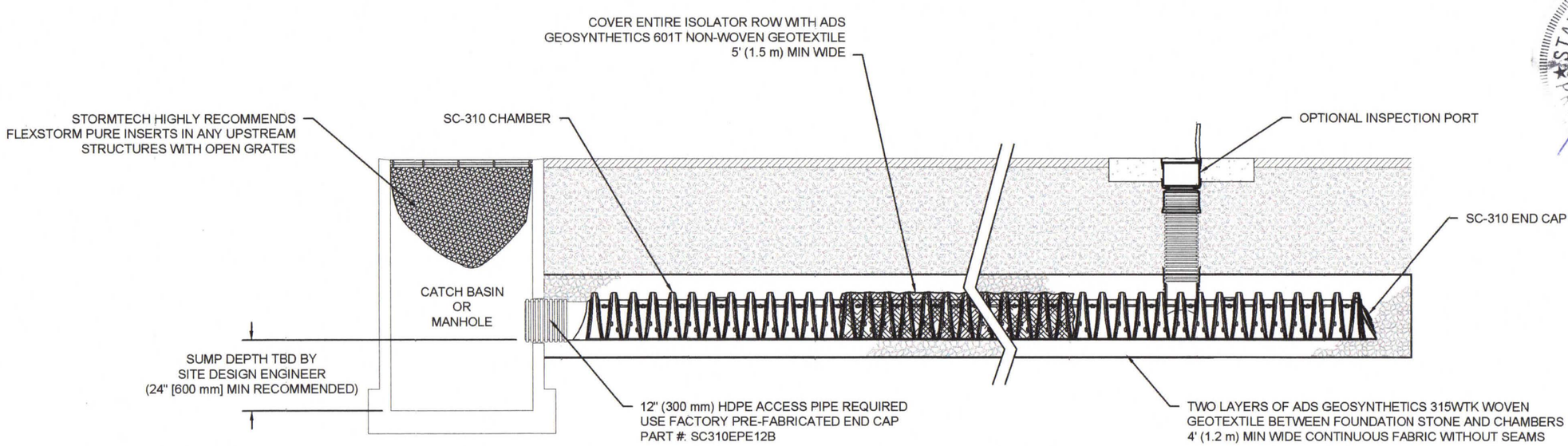
THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO ADS UNDER THE DIRECTION OF THE SITE DESIGN ENGINEER OR OTHER PROJECT REPRESENTATIVE. THE SITE DESIGN ENGINEER SHALL REVIEW THIS DRAWING PRIOR TO CONSTRUCTION. IT IS THE ULTIMATE RESPONSIBILITY OF THE SITE DESIGN ENGINEER TO ENSURE THAT THE PRODUCT(S) DEPICTED AND ALL ASSOCIATED DETAILS MEET ALL APPLICABLE LAWS, REGULATIONS, AND PROJECT REQUIREMENTS.



SC-310 ISOLATOR ROW DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
  - A.3. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
    - ii) FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

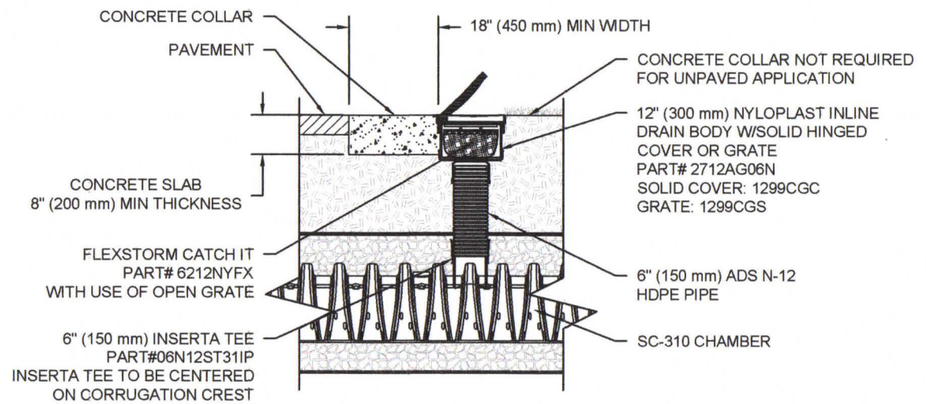
STEP 2) CLEAN OUT ISOLATOR ROW USING THE JETVAC PROCESS
- A. A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45" (1.1 m) OR MORE IS PREFERRED
- B. APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C. VACUUM STRUCTURE SUMP AS REQUIRED

STEP 3) REPLACE ALL COVERS, GRATES, FILTERS, AND LIDS; RECORD OBSERVATIONS AND ACTIONS.

STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

1. INSPECT EVERY 6 MONTHS DURING THE FIRST YEAR OF OPERATION. ADJUST THE INSPECTION INTERVAL BASED ON PREVIOUS OBSERVATIONS OF SEDIMENT ACCUMULATION AND HIGH WATER ELEVATIONS.
2. CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.



SC-310 6" INSPECTION PORT DETAIL
NTS

STATE OF KENTUCKY
FRANCIS X. COLLINS-CAMARGO
21247
LICENSED
PROFESSIONAL ENGINEER

UK SOUTH CAMPUS EXPANSION
LEXINGTON, KY

DATE: 5-5-15 | DRAWN: NPB | CHECKED: GFI | PROJECT #: 98509

REV	DRW	CHK	DESCRIPTION
6-10-15	NPB	GFI	INCREASE VOLUME BED A

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ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

MATERIAL LOCATION		DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	**FINAL FILL:** FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	**INITIAL FILL:** FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (450 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, <35% FINES OR PROCESSED AGGREGATE. MOST PAVEMENT SUBBASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	AASHTO M145[1] A-1, A-2-4, A-3 OR AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 12" (300 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (150 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
B	**EMBEDMENT STONE:** FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4-2 INCH (20-50 mm)	AASHTO M43[1] 3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
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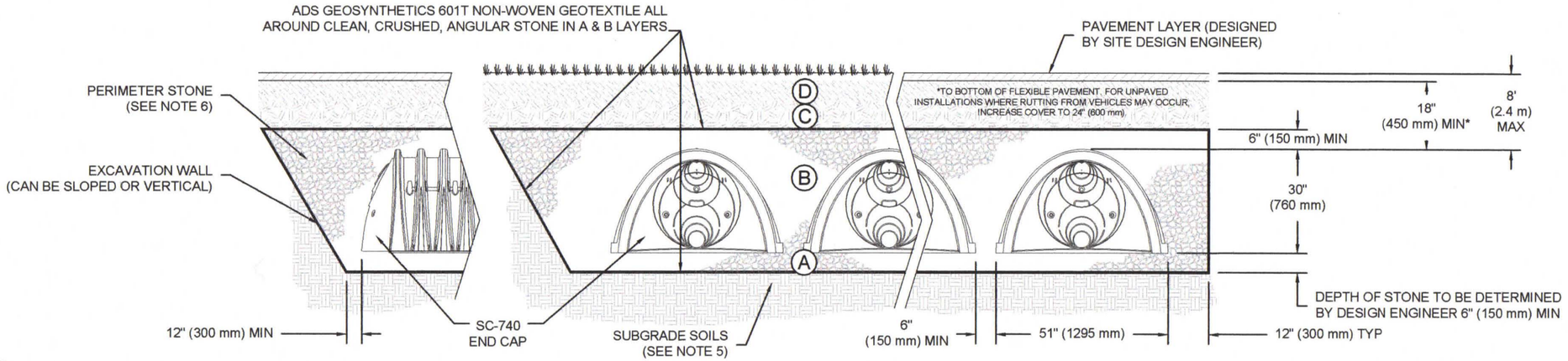

NOTES:

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REV	DRW	CHK	DESCRIPTION
6-10-15	NPB	GFI	INCREASE VOLUME BED A

UK SOUTH CAMPUS EXPANSION
LEXINGTON, KY

DATE: 5-5-15 | DRAWN: NPB
PROJECT #: 98509 | CHECKED: GFI

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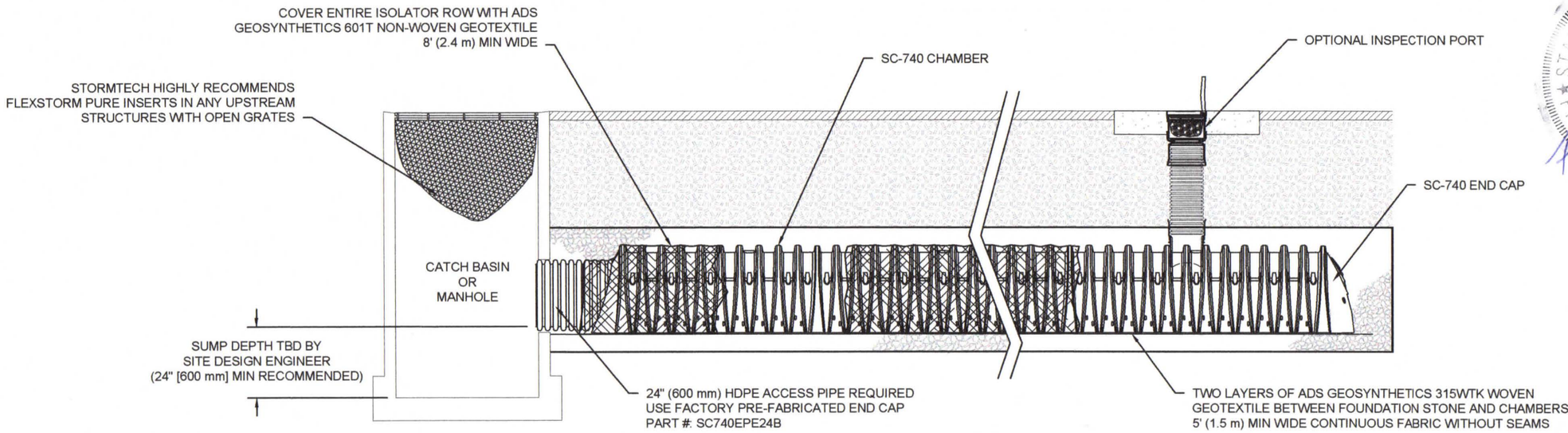

SC-740 ISOLATOR ROW DETAIL
NTS

INSPECTION & MAINTENANCE

STEP 1) INSPECT ISOLATOR ROW FOR SEDIMENT
- A. INSPECTION PORTS (IF PRESENT)
  - A.1. REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
  - A.2. REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
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  - A.4. LOWER A CAMERA INTO ISOLATOR ROW FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
  - A.5. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B. ALL ISOLATOR ROWS
  - B.1. REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW
  - B.2. USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW THROUGH OUTLET PIPE
    - i) MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
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  - B.3. IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

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STEP 4) INSPECT AND CLEAN BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.

NOTES

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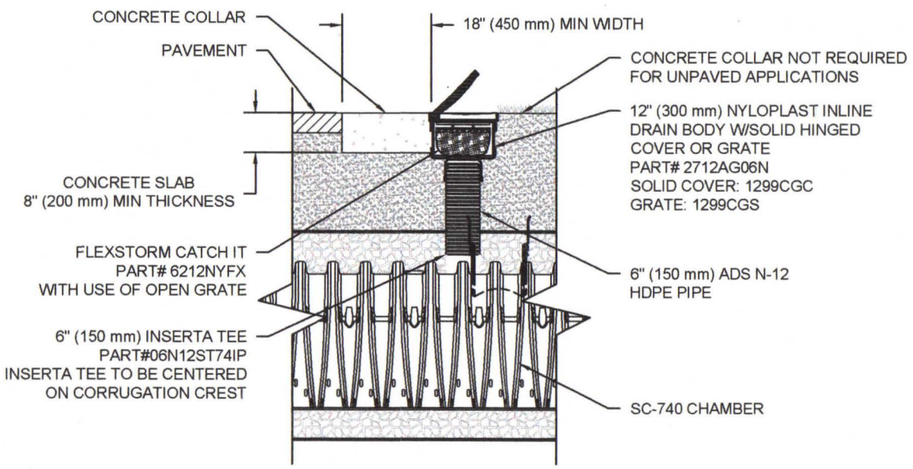

SC-740 6" INSPECTION PORT DETAIL
NTS

STATE OF KENTUCKY
FRANCIS X. COLLINS AMARGO
21247
PROFESSIONAL ENGINEER

REV	DRW	CHK	DESCRIPTION
6-10-15	NPB	GFI	INCREASE VOLUME BED A

UK SOUTH CAMPUS EXPANSION
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SC-740 TECHNICAL SPECIFICATION

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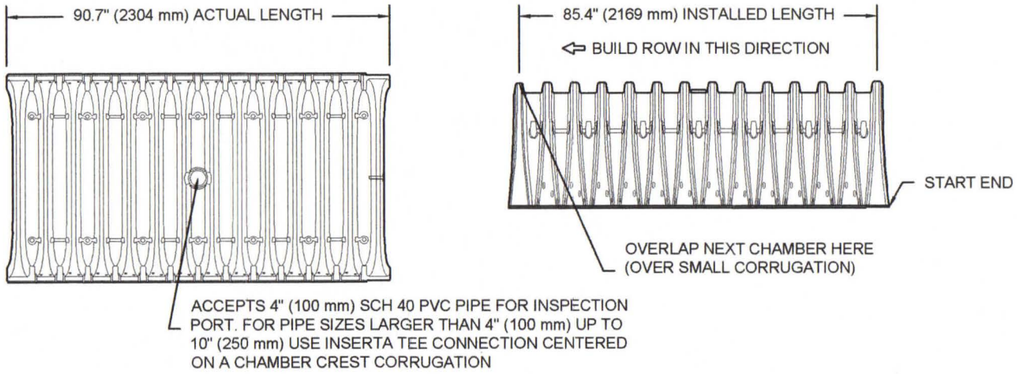


NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	51.0" X 30.0" X 85.4"	(1295 mm X 762 mm X 2169 mm)
CHAMBER STORAGE	45.9 CUBIC FEET	(1.30 m³)
MINIMUM INSTALLED STORAGE*	74.9 CUBIC FEET	(2.12 m³)
WEIGHT	75.0 lbs.	(33.6 kg)

*ASSUMES 6" (152 mm) STONE ABOVE, BELOW, AND BETWEEN CHAMBERS

PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
PRE-CORED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC740EPE06T / SC740EPE06TPC	6" (150 mm)	10.9" (277 mm)	18.5" (470 mm)	---
SC740EPE06B / SC740EPE06BPC			---	0.5" (13 mm)
SC740EPE08T /SC740EPE08TPC	8" (200 mm)	12.2" (310 mm)	16.5" (419 mm)	---
SC740EPE08B / SC740EPE08BPC			---	0.6" (15 mm)
SC740EPE10T / SC740EPE10TPC	10" (250 mm)	13.4" (340 mm)	14.5" (368 mm)	---
SC740EPE10B / SC740EPE10BPC			---	0.7" (18 mm)
SC740EPE12T / SC740EPE12TPC	12" (300 mm)	14.7" (373 mm)	12.5" (318 mm)	---
SC740EPE12B / SC740EPE12BPC			---	1.2" (30 mm)
SC740EPE15T / SC740EPE15TPC	15" (375 mm)	18.4" (467 mm)	9.0" (229 mm)	---
SC740EPE15B / SC740EPE15BPC			---	1.3" (33 mm)
SC740EPE18T / SC740EPE18TPC	18" (450 mm)	19.7" (500 mm)	5.0" (127 mm)	---
SC740EPE18B / SC740EPE18BPC			---	1.6" (41 mm)
SC740EPE24B*	24" (600 mm)	18.5" (470 mm)	---	0.1" (3 mm)

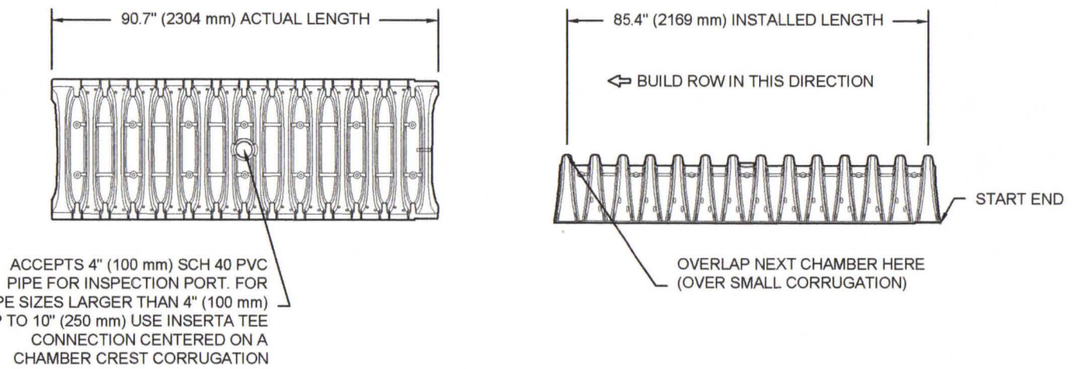
ALL STUBS, EXCEPT FOR THE SC740EPE24B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

* FOR THE SC740EPE24B THE 24" (600 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 1.75" (44 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

SC-310 TECHNICAL SPECIFICATION

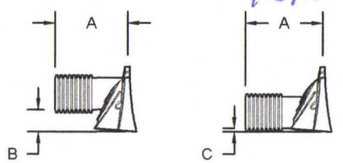
NTS



NOMINAL CHAMBER SPECIFICATIONS

SIZE (W X H X INSTALLED LENGTH)	34.0" X 16.0" X 85.4"	(864 mm X 406 mm X 2169 mm)
CHAMBER STORAGE	14.7 CUBIC FEET	(0.42 m³)
MINIMUM INSTALLED STORAGE*	31.0 CUBIC FEET	(0.88 m³)
WEIGHT	35.0 lbs.	(16.8 kg)

*ASSUMES 6" (152 mm) ABOVE, BELOW, AND BETWEEN CHAMBERS



PRE-FAB STUBS AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PRE-FAB STUBS AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
PRE CORED END CAPS END WITH "PC"

PART #	STUB	A	B	C
SC310EPE06T / SC310EPE06TPC	6" (150 mm)	9.6" (244 mm)	5.8" (147 mm)	---
SC310EPE06B / SC310EPE06BPC			---	0.5" (13 mm)
SC310EPE08T / SC310EPE08TPC	8" (200 mm)	11.9" (302 mm)	3.5" (89 mm)	---
SC310EPE08B / SC310EPE08BPC			---	0.6" (15 mm)
SC310EPE10T / SC310EPE10TPC	10" (250 mm)	12.7" (323 mm)	1.4" (36 mm)	---
SC310EPE10B / SC310EPE10BPC			---	0.7" (18 mm)
SC310EPE12B	12" (300 mm)	13.5" (343 mm)	---	0.9" (23 mm)

ALL STUBS, EXCEPT FOR THE SC310EPE12B ARE PLACED AT BOTTOM OF END CAP SUCH THAT THE OUTSIDE DIAMETER OF THE STUB IS FLUSH WITH THE BOTTOM OF THE END CAP. FOR ADDITIONAL INFORMATION CONTACT STORMTECH AT 1-888-892-2694.

* FOR THE SC310EPE12B THE 12" (300 mm) STUB LIES BELOW THE BOTTOM OF THE END CAP APPROXIMATELY 0.25" (6 mm). BACKFILL MATERIAL SHOULD BE REMOVED FROM BELOW THE N-12 STUB SO THAT THE FITTING SITS LEVEL.

NOTE: ALL DIMENSIONS ARE NOMINAL

STATE OF KENTUCKY
FRANCIS X. COLLINS-CAMARGO
21247
LICENSED PROFESSIONAL ENGINEER

REV	DRW	CHK	DESCRIPTION
6-10-15	NPB	GFI	INCREASE VOLUME BED A

UK SOUTH CAMPUS EXPANSION
LEXINGTON, KY

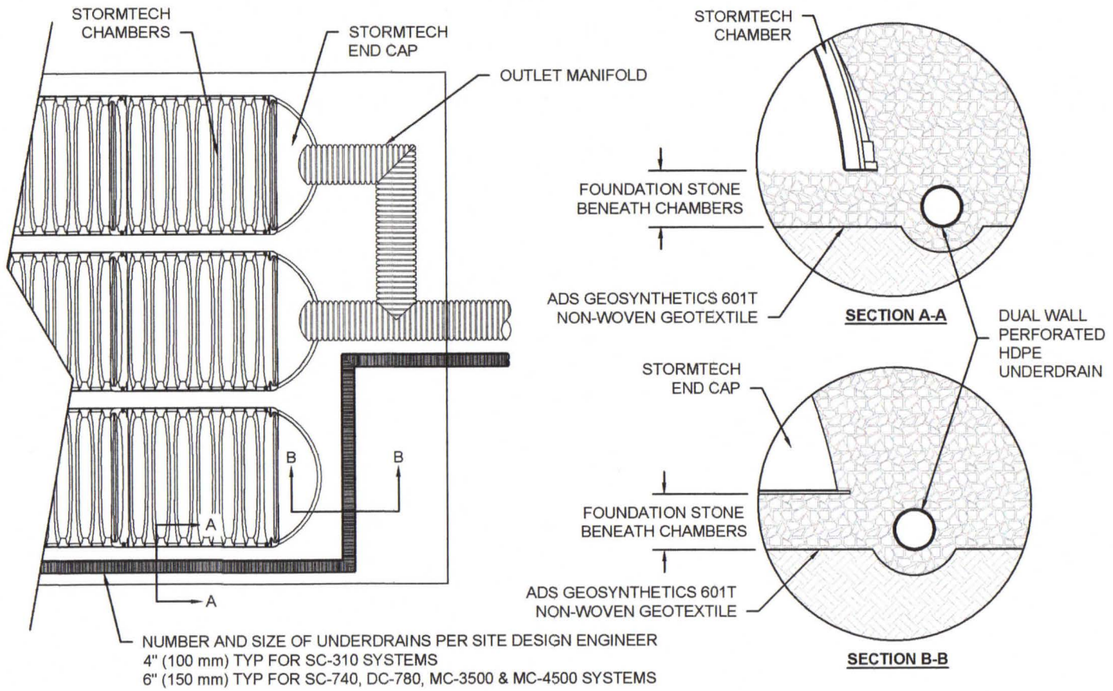
DATE: 5-5-15 | DRAWN: NPB | CHECKED: GFI | PROJECT #: 98509

StormTech
Detention•Retention•Water Quality
70 INWOOD ROAD, SUITE 3 | ROCKY HILL | CT | 06067
860-529-8188 | 888-892-2694 | WWW.STORMTECH.COM

ADS
ADVANCED DRAINAGE SYSTEMS, INC.
4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

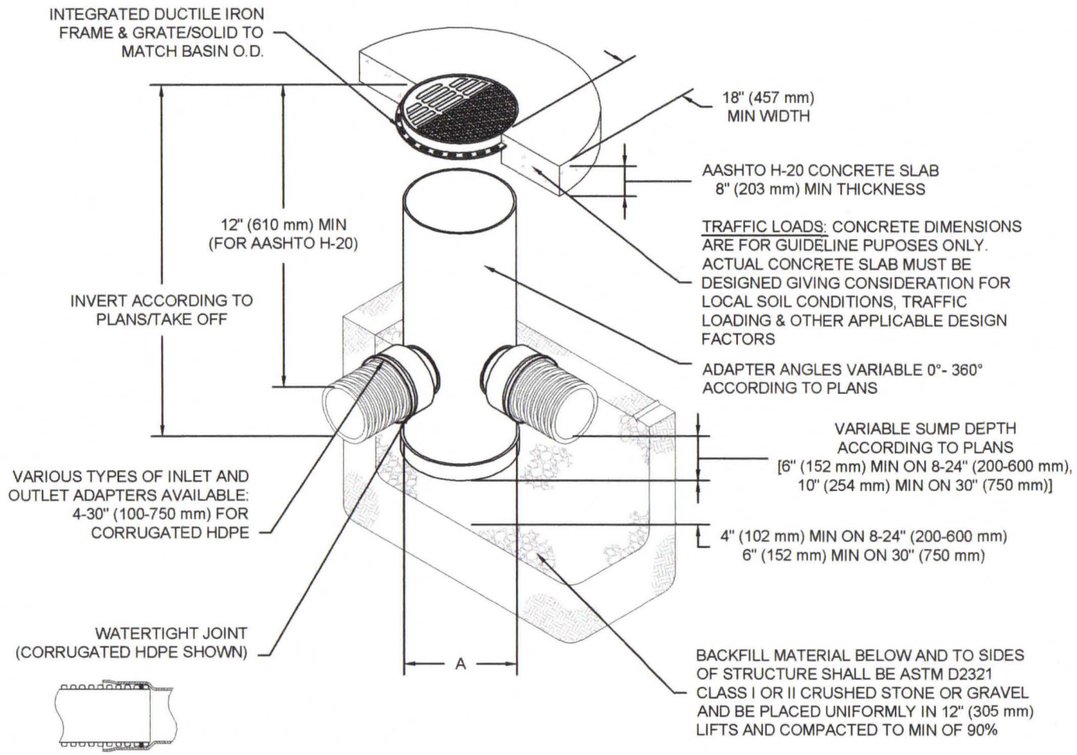
UNDERDRAIN DETAIL

NTS



NYLOPLAST DRAIN BASIN

NTS



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NOTES

1. 8-30" (200-750 mm) GRATES/SOLID COVERS SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
2. 12-30" (300-750 mm) FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS & HANCOR DUAL WALL) & SDR 35 PVC
5. FOR COMPLETE DESIGN AND PRODUCT INFORMATION: **WWW.NYLOPLAST-US.COM**
6. TO ORDER CALL: **800-821-6710**

A	PART #	GRATE/SOLID COVER OPTIONS		
8" (200 mm)	2808AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
10" (250 mm)	2810AG	PEDESTRIAN LIGHT DUTY	STANDARD LIGHT DUTY	SOLID LIGHT DUTY
12" (300 mm)	2812AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
15" (375 mm)	2815AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
18" (450 mm)	2818AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
24" (600 mm)	2824AG	PEDESTRIAN AASHTO H-10	STANDARD AASHTO H-20	SOLID AASHTO H-20
30" (750 mm)	2830AG	PEDESTRIAN AASHTO H-20	STANDARD AASHTO H-20	SOLID AASHTO H-20

UK SOUTH CAMPUS EXPANSION
LEXINGTON, KY

DATE: 5-5-15 | DRAWN: NPB | CHECKED: GFI | PROJECT #: 98509

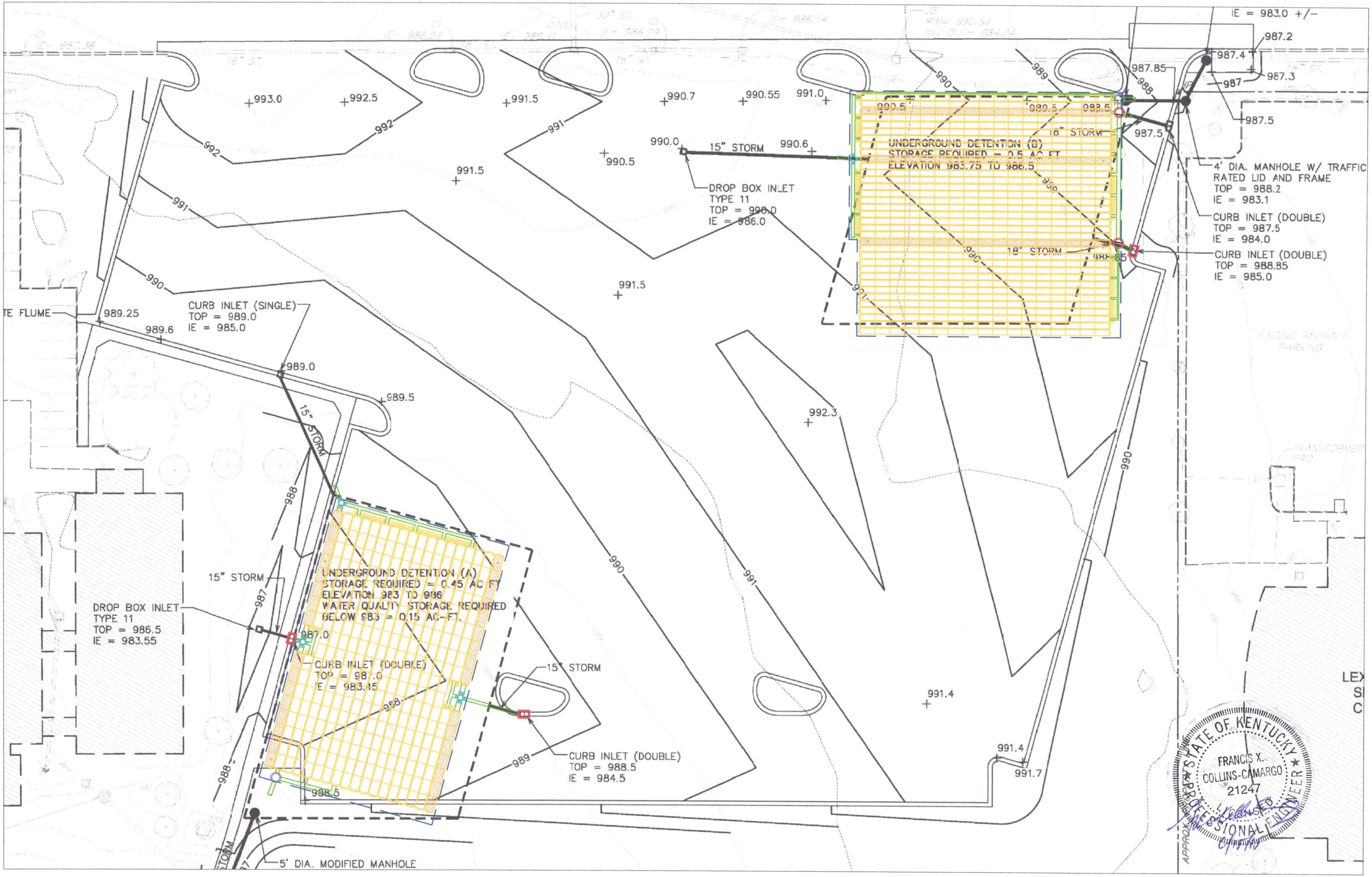
REV	DRW	CHK	DESCRIPTION
6-10-15	NPB	GFI	INCREASE VOLUME BED A

3130 VERONA AVE
BUFORD, GA 30518
PHN (770) 932-2443
FAX (770) 932-2490
www.nyloplast-us.com

Nyloplast

4640 TRUEMAN BLVD
HILLIARD, OH 43026
1-800-733-7473

ADS
ADVANCED DRAINAGE SYSTEMS, INC.



UNDERGROUND DETENTION (B)
STORAGE REQUIRED = 0.5 AC-FT
ELEVATION 983.75 TO 986.5
15" STORM
DROP BOX INLET
TYPE 11
TOP = 990.0
IE = 986.0
18" STORM
4' DIA. MANHOLE W/ TRAFFIC RATED LID AND FRAME
TOP = 988.2
IE = 983.1
CURB INLET (DOUBLE)
TOP = 987.5
IE = 984.0
CURB INLET (DOUBLE)
TOP = 988.85
IE = 985.0
IE = 983.0 +/-
CURB INLET (SINGLE)
TOP = 989.0
IE = 985.0
UNDERGROUND DETENTION (A)
STORAGE REQUIRED = 0.45 AC-FT
ELEVATION 983 TO 986
WATER QUALITY STORAGE REQUIRED
BELOW 983 = 0.15 AC-FT.
DROP BOX INLET
TYPE 11
TOP = 986.5
IE = 983.55
CURB INLET (DOUBLE)
TOP = 987.0
IE = 983.45
CURB INLET (DOUBLE)
TOP = 988.5
IE = 984.5
5' DIA. MODIFIED MANHOLE
STATE OF KENTUCKY
FRANCIS X. COLLINS-CAMARGO
21247
LICENSED PROFESSIONAL ENGINEER

Project: **UK SOUTH CAMPUS BED A**

Chamber Model -	SC-740	
Units -	**Imperial**	Click Here for Metric
Number of chambers -	244	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	981.66	ft
Amount of Stone Above Chambers -	6	in
Amount of Stone Below Chambers -	11	in
Area of system -	9542	sf

☑ Include Perimeter Stone in Calculations

Min. Area - 8248 sf min. area

Height of System *(inches)*	Incremental Single Chamber *(cubic feet)*	Incremental Total Chamber *(cubic feet)*	Incremental Stone *(cubic feet)*	Incremental Ch & St *(cubic feet)*	Cumulative Chamber *(cubic feet)*	Elevation *(feet)*
47	0.00	0.00	318.07	318.07	21676.34	985.58
46	0.00	0.00	318.07	318.07	21358.27	985.49
45	0.00	0.00	318.07	318.07	21040.20	985.41
44	0.00	0.00	318.07	318.07	20722.14	985.33
43	0.00	0.00	318.07	318.07	20404.07	985.24
42	0.00	0.00	318.07	318.07	20086.00	985.16
41	0.05	13.42	312.70	326.12	19767.94	985.08
40	0.16	39.75	302.17	341.92	19441.82	984.99
39	0.28	68.79	290.55	359.34	19099.90	984.91
38	0.60	147.37	259.12	406.49	18740.56	984.83
37	0.80	195.62	239.82	435.44	18334.07	984.74
36	0.95	231.96	225.28	457.24	17898.63	984.66
35	1.07	262.18	213.19	475.38	17441.39	984.58
34	1.18	288.04	202.85	490.89	16966.01	984.49
33	1.27	308.82	194.54	503.36	16475.12	984.41
32	1.36	330.62	185.82	516.44	15971.76	984.33
31	1.45	354.80	176.15	530.95	15455.32	984.24
30	1.52	372.03	169.25	541.29	14924.38	984.16
29	1.58	386.09	163.63	549.72	14383.09	984.08
28	1.64	400.72	157.78	558.50	13833.37	983.99
27	1.70	414.68	152.19	566.88	13274.87	983.91
26	1.75	427.71	146.98	574.70	12708.00	983.83
25	1.80	439.89	142.11	582.00	12133.30	983.74
24	1.85	452.62	137.02	589.64	11551.30	983.66
23	1.89	461.91	133.30	595.22	10961.67	983.58
22	1.93	471.90	129.31	601.20	10366.45	983.49
21	1.97	481.90	125.31	607.21	9765.25	983.41
20	2.01	490.42	121.90	612.32	9158.04	983.33
19	2.04	498.98	118.48	617.45	8545.72	983.24
18	2.07	506.29	115.55	621.84	7928.27	983.16
17	2.10	513.60	112.63	626.23	7306.43	983.08
16	2.13	520.16	110.00	630.16	6680.20	982.99
15	2.15	525.54	107.85	633.39	6050.04	982.91
14	2.18	531.20	105.59	636.79	5416.65	982.83
13	2.20	536.40	103.51	639.91	4779.86	982.74
12	2.21	538.59	102.63	641.22	4139.95	982.66
11	0.00	0.00	318.07	318.07	3498.73	982.58
10	0.00	0.00	318.07	318.07	3180.67	982.49
9	0.00	0.00	318.07	318.07	2862.60	982.41
8	0.00	0.00	318.07	318.07	2544.53	982.33
7	0.00	0.00	318.07	318.07	2226.47	982.24
6	0.00	0.00	318.07	318.07	1908.40	982.16
5	0.00	0.00	318.07	318.07	1590.33	982.08
4	0.00	0.00	318.07	318.07	1272.27	981.99
3	0.00	0.00	318.07	318.07	954.20	981.91
2	0.00	0.00	318.07	318.07	636.13	981.83
1	0.00	0.00	318.07	318.07	318.07	981.74

Project: **UK SOUTH CAMPUS BED B**

Chamber Model -	SC-310	
Units -	**Imperial**	Click Here for Metric
Number of chambers -	595	
Voids in the stone (porosity) -	40	%
Base of Stone Elevation -	983.75	ft
Amount of Stone Above Chambers -	11	in
Amount of Stone Below Chambers -	6	in
Area of system -	15493	sf Min. Area - 14115 sf min. area

☑ Include Perimeter Stone in Calculations

Height of System *(inches)*	Incremental Single Chamber *(cubic feet)*	Incremental Total Chamber *(cubic feet)*	Incremental Stone *(cubic feet)*	Incremental Ch & St *(cubic feet)*	Cumulative Chamber *(cubic feet)*	Elevation *(feet)*
33	0.00	0.00	516.43	516.43	22311.66	986.50
32	0.00	0.00	516.43	516.43	21795.23	986.42
31	0.00	0.00	516.43	516.43	21278.80	986.33
30	0.00	0.00	516.43	516.43	20762.36	986.25
29	0.00	0.00	516.43	516.43	20245.93	986.17
28	0.00	0.00	516.43	516.43	19729.50	986.08
27	0.00	0.00	516.43	516.43	19213.06	986.00
26	0.00	0.00	516.43	516.43	18696.63	985.92
25	0.00	0.00	516.43	516.43	18180.20	985.83
24	0.00	0.00	516.43	516.43	17663.76	985.75
23	0.00	0.00	516.43	516.43	17147.33	985.67
22	0.06	34.99	502.44	537.43	16630.90	985.58
21	0.15	92.05	479.61	571.67	16093.47	985.50
20	0.27	158.19	453.16	611.35	15521.80	985.42
19	0.54	324.15	386.77	710.92	14910.46	985.33
18	0.70	418.91	348.87	767.78	14199.53	985.25
17	0.82	490.60	320.20	810.79	13431.76	985.17
16	0.92	550.11	296.39	846.50	12620.97	985.08
15	1.01	603.92	274.86	878.79	11774.47	985.00
14	1.09	651.26	255.93	907.19	10895.68	984.92
13	1.15	686.80	241.71	928.51	9988.49	984.83
12	1.21	722.89	227.28	950.17	9059.98	984.75
11	1.27	758.55	213.01	971.57	8109.81	984.67
10	1.32	788.12	201.19	989.30	7138.25	984.58
9	1.36	812.17	191.57	1003.73	6148.94	984.50
8	1.40	835.97	182.04	1018.02	5145.21	984.42
7	1.43	853.60	174.99	1028.59	4127.19	984.33
6	0.00	0.00	516.43	516.43	3098.60	984.25
5	0.00	0.00	516.43	516.43	2582.17	984.17
4	0.00	0.00	516.43	516.43	2065.73	984.08
3	0.00	0.00	516.43	516.43	1549.30	984.00
2	0.00	0.00	516.43	516.43	1032.87	983.92
1	0.00	0.00	516.43	516.43	516.43	983.83

Operation and Maintenance Manual

Project 2422.0
South Campus Parking Lot Expansion
University of Kentucky

Lexington, KY

Consultants:

Bell Engineering
2480 Fortune Drive,
Suite 350
Lexington, KY 40509
Phone: (859) 278-5412

Staggs & Fisher Consulting Engineers, Inc.
3264 Lochness Drive
Lexington, KY 40517
Phone: (859) 271-3246

Contractor:

ATS Construction
3009 Atkinson Ave, Suite 400
Lexington, KY 40509
Phone: (859) 223-7001

Subcontractors:

Fox Enterprises
408 Jason Dr.
Richmond, KY 40475
Phone: (859) 623-9963

Arrow Electric Contractors
2321 Maggard Dr
Lexington, KY 40511
Phone: (859) 259-1647

Lola Miller Services, Inc.
720 E. Louden Ave.
Lexington, KY 40505
Phone: (859) 252-0720

Bourne-Clark Construction, LLC
2070 Winchester Road
Mt. Sterling, KY 40353
Phone: (859) 498-0755

Table of Contents

Specification Section 165600 Exterior Lighting

Section 1

Product Data

Exterior Lighting

Spec Section 165600

Staggs and Fisher
Consulting Engineers, Inc

3264 Loch Ness Drive
Lexington, Kentucky 40517
Phone 859-271-3246
Fax 859-271-3246
Email info@sfengineering.com

Gregory G. Carter, P.E.
Daniel H. Bransom, P.E.
A. Taggart Foster, P.E.
Christopher C. Keath, P.E.
John R. Mason, P.E.
William P. Wilson, P.E.
Greg W. Kraeszig, P.E.
Wayne A. Thomas, P.E.
Jenny L. Leitch, P.E.

Member of the Consulting Engineers Council

The following comments are in response to Staggs and Fisher's review of the attached shop drawing submittal.

Description of Submittal: Lighting & Quazite Submittal

Job Name: UK South Campus Parking Lot

Job No: 15307

Date: June 17, 2015

Reviewed By: Walt Shropshire

Remarks (if applicable):

New poles & bases need to match the existing poles & bases.

X REVIEWED FURNISH AS CORRECTED

REJECTED REVISE AND RESUBMIT

Checking is only for general conformance with the design concept of the project and general compliance with the information given in the contract documents. Any action shown is subject to the requirements of the drawings and specification. Contractor is responsible for : Quantities, dimensions which shall be confirmed and correlated at the job site, and fabrication processes and techniques of construction.

Staggs and Fisher
Consulting Engineers, Inc.
3264 Lochness Drive
Lexington, Kentucky 40517
(859) 271-3246

BY: Walter S Shropshire

DATE: June 17, 2015

June 4, 2015

University of Kentucky

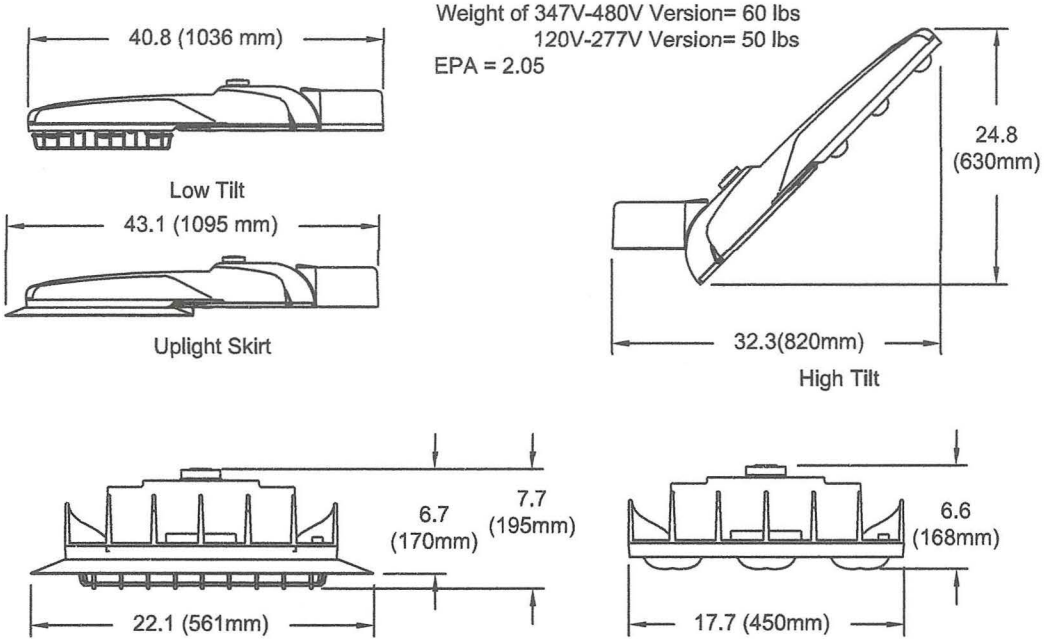
Project #2422.0

South Campus Parking Lot Expansion

Lighting & Quazite JB Submittal

Please return (1) copy of submittals singed or stamped "Approved"

ARROW ELECTRIC CO., INC. Louisville and Lexington Kentucky • (502) 367-0141 • (859) 259-1647
EQUAL OPPORTUNITY EMPLOYER



MONGOOSE LED™
LED Roadway Lighting

Infrastructure
Outdoor

HOLOPHANE®
LEADER IN LIGHTING SOLUTIONS
An AcuityBrandsCompany

MGLED	6	5K	AS
Series Code	Number of LED'S	Color Temperature	Voltage
	4= 4 COB	4K= 4000 Kelvin	AS= 120V-277V
	5= 5 COB	5K= 5000 Kelvin	AH= 347V-480V
	6= 6 COB		
	7= 7 COB		
	8= 8 COB		
	9= 9 COB		

W	L	A	Z
Optics	Tilt Range	Mounting	Color
N = Narrow Roadway	H = High (27° - 45°)	V = Vertical Tenon	G = Gray
M = Medium Roadway	L = Low (0° - 18°)	H = Horizontal Arm	H = Graphite
W = Wide Roadway		A = Architectural	K = Black
F = Forward Throw (Type 4)			N = Green
A = Area (Type 5)			W = White
			Z = Bronze

ORDERING INFORMATION:

Standard Options

NL = NEMA Label
P3 = 3 PIN NEMA Photocontrol Receptacle
P5 = 5 PIN NEMA Photocontrol Receptacle
P7 = 7 PIN NEMA Photocontrol Receptacle
DM = 0V – 10V dimmable driver
DE = ROAM Concierge/Enterprise
VE = ROAMview
PCSS = DSS 120-277V Photocontrol
PCL1 = DLL 120V Photocontrol
PCL3 = DLL 347V Photocontrol
PCL4 = DLL 480V Photocontrol
PSC = Shorting Cap
SP= Individual unit/Sample pack
US = Uplight Skirt (DLC Approved)

Special Options *

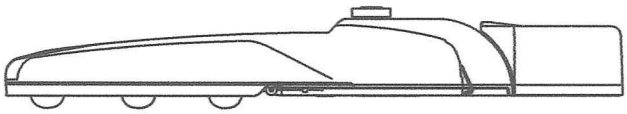
ML=Multi-Level Dimming
CLO = Constant Lumen Output
*Additional information is required from the customer. Please contact Infrastructure TSG for assistance.

Accessories

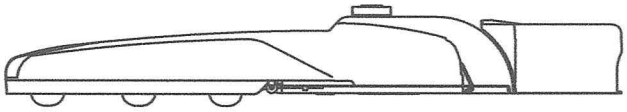
MGLEDWG = WIRE GUARD KIT

ORDER #:	
TYPE:	
DRAWN:	BGW
DATE:	11/19/14
DWG #:	MONGOOSE LED

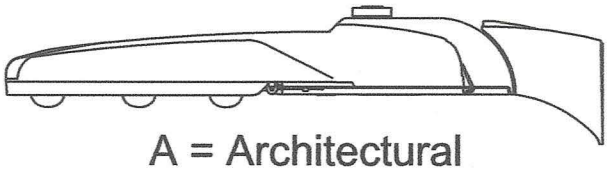
Mounting



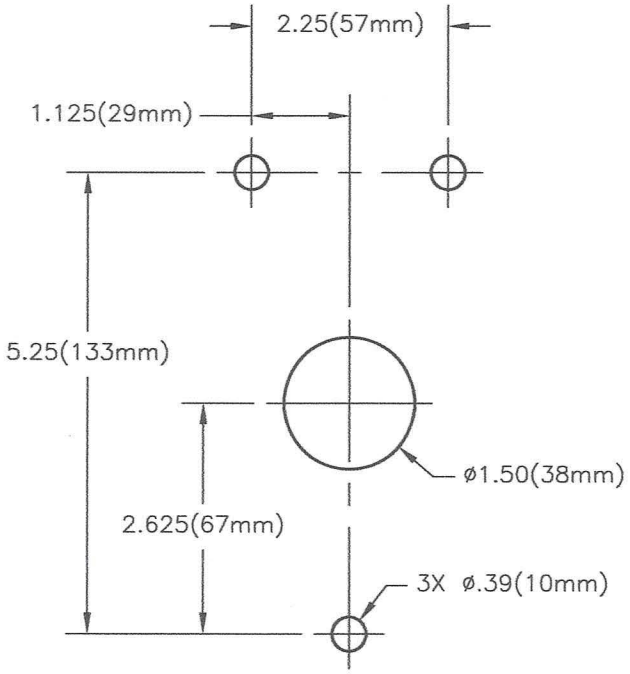
V = Vertical Tenon
Attaches to 2" Vertical Tenon



H = Horizontal Arm
Attaches to 2" Horizontal Arm



A = Architectural
Attaches to Square Pole or Tenon
Adaptor (See Pole Pattern Below)



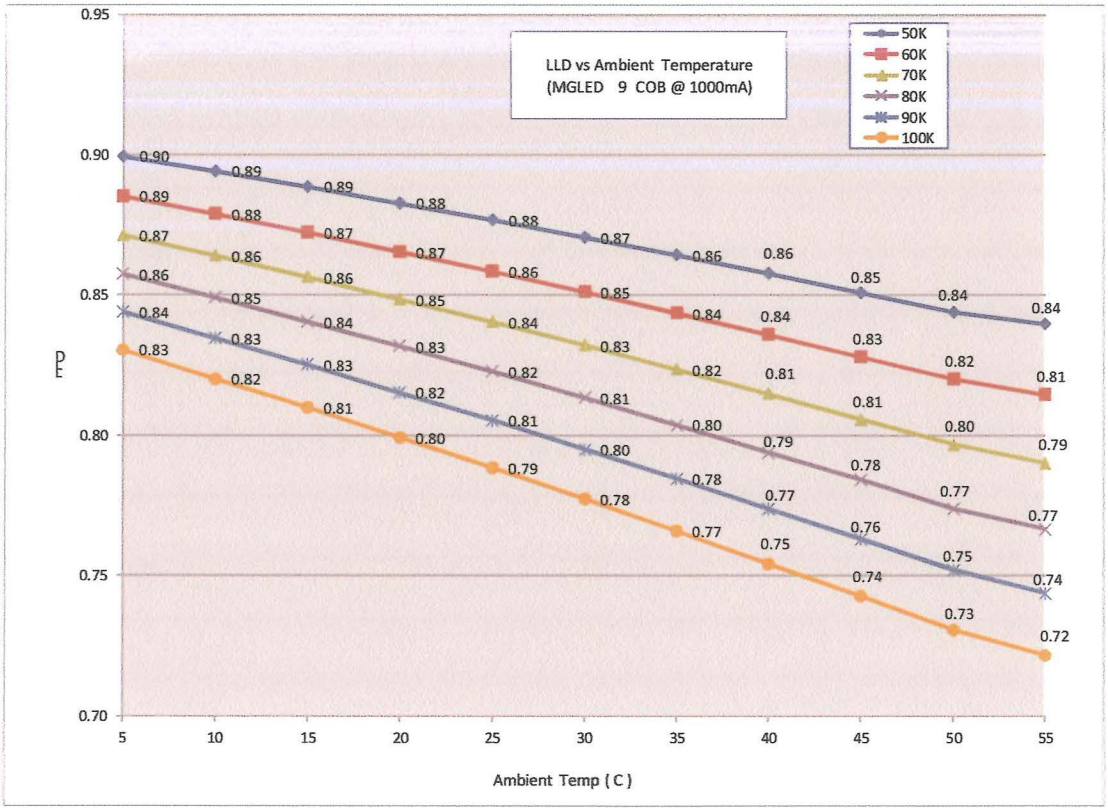
MONGOOSE LED™
LED Roadway Lighting

Infrastructure
Outdoor

HOLOPHANE®
LEADER IN LIGHTING SOLUTIONS
An AcuityBrandsCompany

ORDER #:	
TYPE:	
DRAWN:	BGW
DATE:	10/23/13
DWG #:	MONGOOSE LED

LED Count	Distribution	Lumens	LPW	Input Watts
9 Chip	Narrow	36,507	99	367
	Medium	36,095	98	
	Wide	35,869	98	
	Forward Throw	34,420	94	
	Area	38,181	104	
8 Chip	Narrow	32,577	99	328
	Medium	32,188	98	
	Wide	32,093	98	
	Forward Throw	30,741	94	
	Area	34,068	104	
7 Chip	Narrow	28,756	99	290
	Medium	28,423	98	
	Wide	28,278	98	
	Forward Throw	27,102	93	
	Area	30,046	104	
6 Chip	Narrow	24,540	100	245
	Medium	24,299	99	
	Wide	24,140	99	
	Forward Throw	23,130	94	
	Area	25,609	105	
5 Chip	Narrow	20,631	100	206
	Medium	20,381	99	
	Wide	20,316	99	
	Forward Throw	19,413	94	
	Area	21,514	104	
4 Chip	Narrow	16,638	99	168
	Medium	16,446	98	
	Wide	16,378	97	
	Forward Throw	15,620	93	
	Area	17,357	103	



MONGOOSE LED™
LED Roadway Lighting

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HOLOPHANE®
LEADER IN LIGHTING SOLUTIONS
An AcuityBrandsCompany

ORDER #:
TYPE:
DRAWN: BGW
DATE: 10/23/13
DWG #: MONGOOSE LED

Specifications

Optical
Performance is comparable to 150 - 400 watt HID
IP66 rated borosilicate glass optics ensure longevity and minimize dirt depreciation
4,000K CCT, 70 CRI Min. or optional 5,000K CCT, 70 CRI Min.
Available with Narrow roadway, Medium Roadway, Wide Roadway, Forward Throw, and Area Type lighting distributions

Electrical
Electronic driver has an expected life of 100,000 hours at 25°C
LED light engines are rated > 100,000 at 25°C, L70
Robust ANSI/IEEE C62.4 Category C (10kV/5kA) fixture protection is provided by a specially designed Acuity surge protection device

Mechanical
Rugged low copper diecast aluminum coupled with a rigorous 5-stage pretreatment, epoxy basecoat and polyester topcoat yield a finish that achieves a scribe creepage rating of 8 after 5,000 hours of salt spray.
Removable "power door" facilitates product installation and maintenance
Corrosion resistant stainless steel latches ensure secure closure over the long fixture life
Multiple mounting configurations allow for attachment to horizontal mast arms, pole top tenons, and direct mounting to square poles. All Mountings are 3G vibration rated per ANSI C136
Adjustable fixture tilt from 0 - 45 degrees provides flexibility to optimize lighting performance

Controls
Premium solid state locking-style photocontrol - PCSS (10 year rated life)
Extreme long life solid state locking-style photocontrol - PCLL (20 year rated life)
Multi-level dimming
DE and VE options allow the fixture to be dimmed using the ROAM control system

Warranty & Standards
5 Year limited warranty. Full warranty terms located at
http://www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx
Rated for -40C to 40C ambient
CSA Certified to US and Canadian standards

MONGOOSE LED™
LED Roadway Lighting

Infrastructure
Outdoor

HOLOPHANE®
LEADER IN LIGHTING SOLUTIONS
An AcuityBrandsCompany

ORDER #:
TYPE:
DRAWN: BGW
DATE: 10/23/13
DWG #: MONGOOSE LED

HOLOPHANE®
LEADER IN LIGHTING SOLUTIONS
An AcuityBrands Company

Catalog Number **09237-1 BZ; 09237-2 BZ**	
Type	Notes
OLF1 and OLF2	

09237

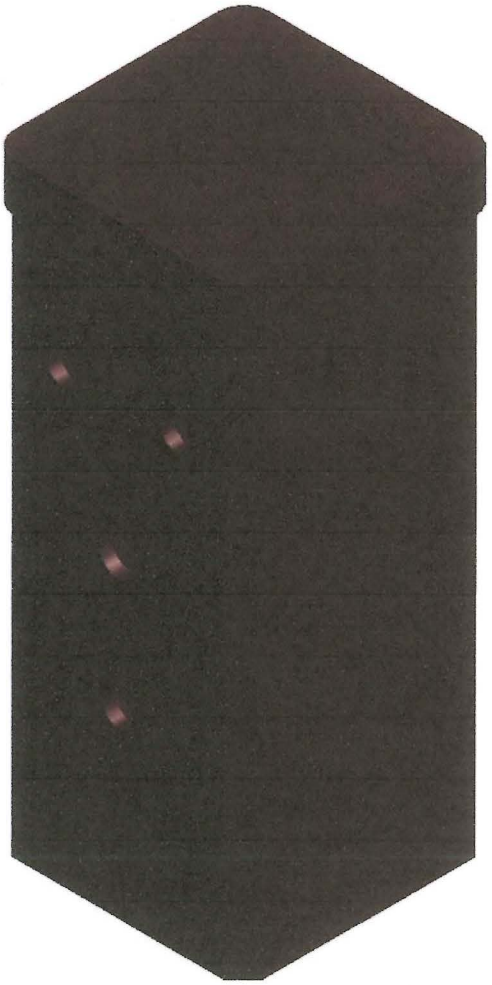
POST-ARM

Aluminum Arm (09237)

SPECIFICATIONS

Prefix: 09237-1 Aluminum Arm 1 Unit - Qty 3
09237-2 Aluminum Arm (2 @ 180) - Qty 7

Finish: Bronze



Customer Approval:

signature date

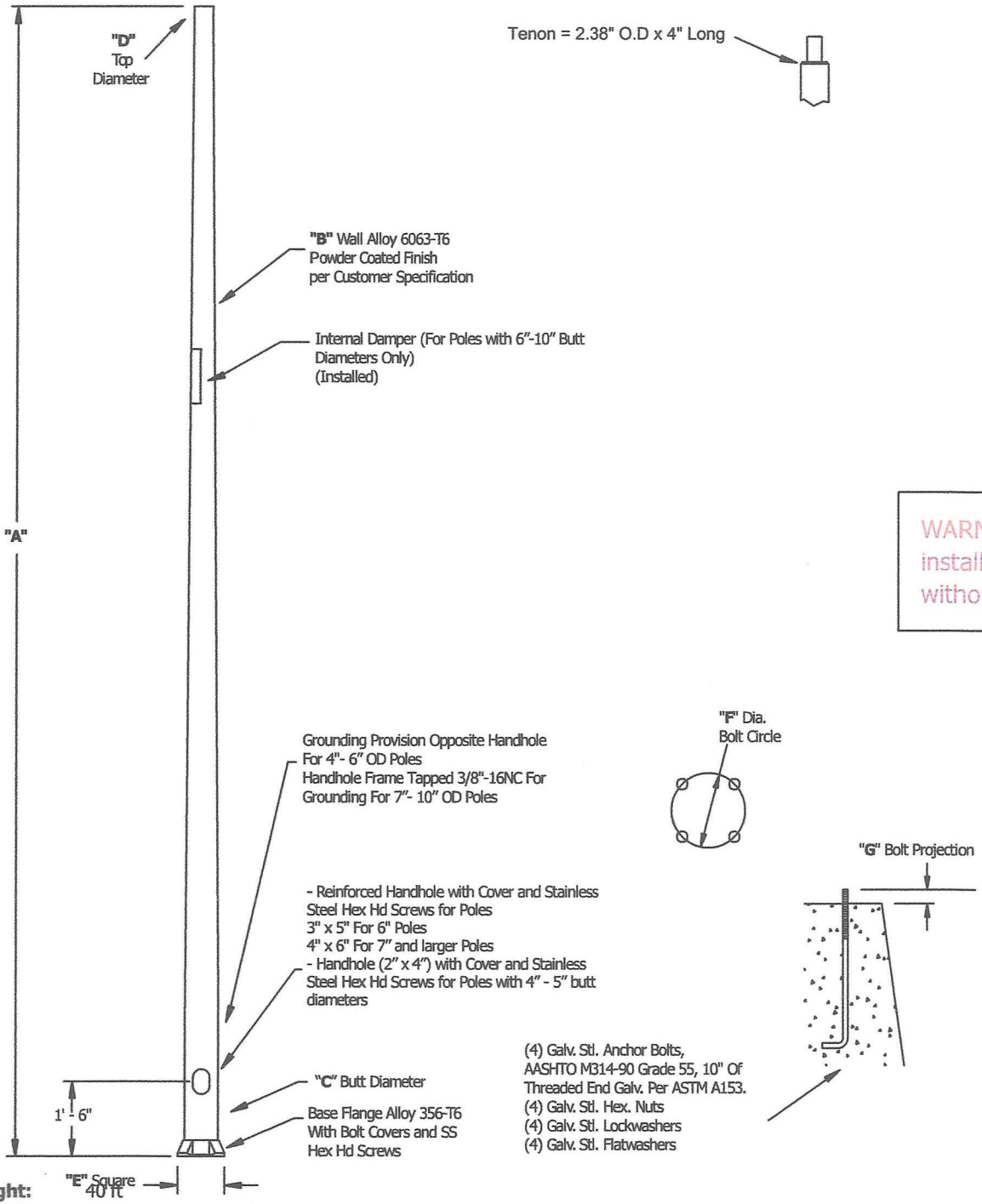
Job Name: Product Basket
Client Name:

Created By: Michael McGuire Date: 20-Dec-13

aluminum pole products

hapco

4 Bolt Base RTA40D8B4-



Mounting Height:	40 ft
Wall Thickness:	.188 in
Butt Diameter:	8 in
Top Diameter:	4.5 in
Base Diameter:	11.25 in
Bolt Circle:	11 -12 in
Bolt Projection:	2.75 in
Bolt Size:	1 x 36 x 4
Net Weight:	200
Luminary Weight:	100
Arm Length:	
Quantity:	10

Maximum EPA

70:	7.1
80:	4.2
90:	2.9
100:	2.1
110:	1.4

Accessories

Your Name:	
Representative Name:	
Architect Name:	
Project Name:	UK South Campus Parking Lot Expansion
Customer P.O. #:	
Finish:	Holophane Bronze
Date:	05/28/2015
Notes:	Holophane Bronze Paint Part Numbers: Sherwin Williams Powder - #PDS4-00002 Wet - #F78XXN0505

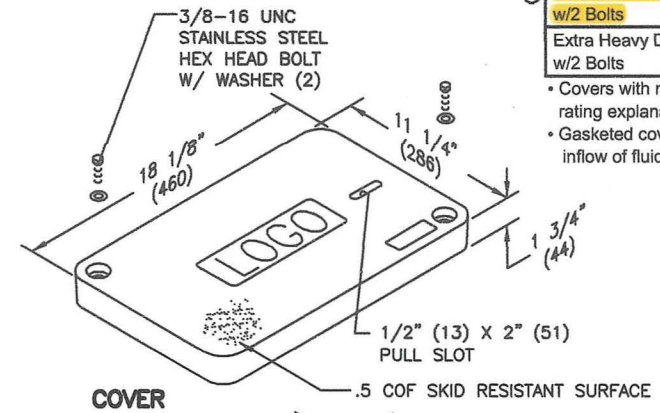
SPECIFICATIONS/DATA

11" x 18" PG Style (Stackable) Assembly

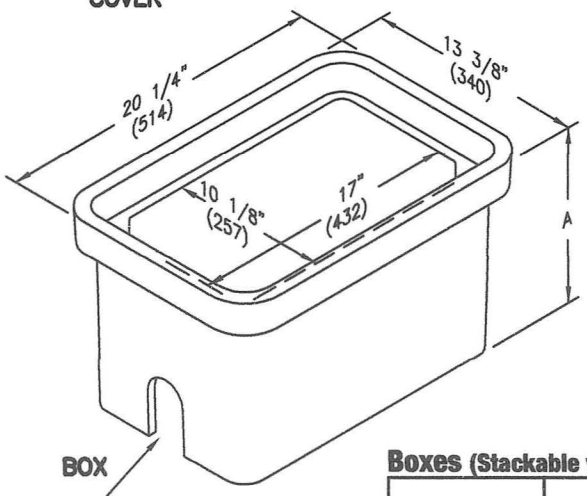
Covers (Blank unless logo is specified)

	DESCRIPTION	PART NO.	WEIGHT #	DESIGN/TEST LOAD #	ANSI TIER*
UL	W/2 Bolts	PG1118CA00	27 (12.2 kg)	8,000 / 12,000	8
UL	Gasketed w/2 Bolts	PG1118CG00	27 (12.2 kg)	8,000 / 12,000	8
UL	No Bolts	PG1118WA00	27 (12.2 kg)	8,000 / 12,000	8
UL	Heavy Duty w/2 Bolts	PG1118HA00	27 (12.2 kg)	15,000 / 22,500	15
UL	Gasketed Heavy Duty w/2 Bolts	PG1118HG00	27 (12.2 kg)	15,000 / 22,500	15
	Extra Heavy Duty w/2 Bolts	PG1118HH00	27 (12.2 kg)	22,500 / 33,750	22

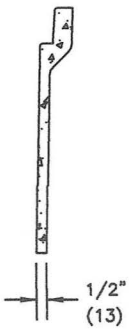
- Covers with meter lids available upon request. See page 12 or page 56 for meter lid cover load rating explanation.
- Gasketed covers and bolt grommets must be used with a gasketed box. Gaskets reduce the inflow of fluids but do not make the enclosure water tight.



COVER



BOX



2X 2 1/2" (64) X 4" (102) MOUSEHOLES (PG1118BB only)

Boxes (Stackable with self-aligning, replaceable EZ-Nut)

	DESCRIPTION	PART NO.	WEIGHT #	DIMENSION A	DESIGN/TEST LOAD #	ANSI TIER*
UL	Open Bottom	PG1118BA12	40 (18 kg)	12" (305 mm)	22,500 / 33,750	22
		PG1118BA18	53 (24 kg)	18" (457 mm)	22,500 / 33,750	22
UL	Open Bottom w/ Gasket	PG1118BG12	40 (18 kg)	12" (305 mm)	22,500 / 33,750	22
		PG1118BG18	53 (24 kg)	18" (457 mm)	22,500 / 33,750	22
UL	Open Bottom w/ 2 Mouseholes	PG1118BB12	40 (18 kg)	12" (305 mm)	22,500 / 33,750	22
		PG1118BB18	53 (24 kg)	18" (457 mm)	22,500 / 33,750	22
UL	Solid Bottom	PG1118DA12	43 (19.5 kg)	12 1/2" (318 mm)	22,500 / 33,750	22
		PG1118DA18	60 (27 kg)	18 1/2" (470 mm)	22,500 / 33,750	22
UL	Solid Bottom w/ Gasket	PG1118DG12	43 (19.5 kg)	12 1/2" (318 mm)	22,500 / 33,750	22
		PG1118DG18	60 (27 kg)	18 1/2" (470 mm)	22,500 / 33,750	22
UL	Footed Box	PG1118JA12	41 (19 kg)	12 1/2" (318 mm)	22,500 / 33,750	22
		PG1118JA18	55 (25 kg)	18 1/2" (470 mm)	22,500 / 33,750	22

Dimensions & weights in parentheses are metric equivalent.
* Loadings comply with ANSI/SCTE 77 (see page 9).

Section 2

Shop Drawing

Exterior Lighting

Spec Section 165600

LIGHT FIXTURE SCHEDULE:

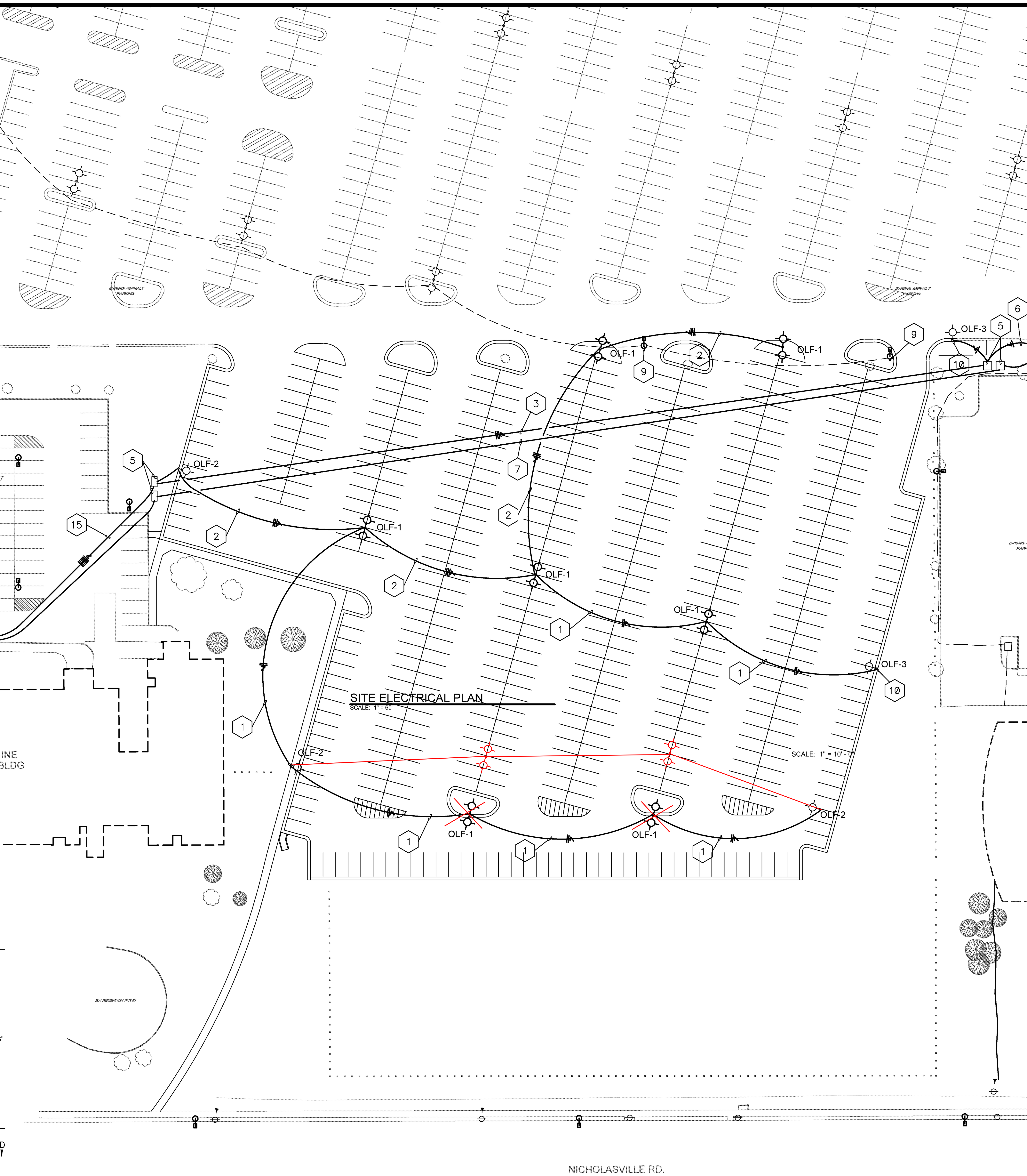
OLF-1 LED AREA LIGHT WITH LOW COPPER DIECAST ALUMINUM FINNED HOUSING, REMOVEABLE POWER DOOR, STAINLESS STEEL LATCHES, CAST ALUMINUM ARCHITECTURAL POLE MOUNTING ARM, 100,000 HOUR L70 RATED LIFE LED LIGHT ENGINE, TYPE II MEDIUM DISTRIBUTION 24,718 DELIVERED LUMEN LED ARRAY, CSA LISTED FOR WET LOCATIONS, AND LIMITED FIVE YEAR WARRANTY. TWO FIXTURES TO BE MOUNTED TO 40' ALUMINUM POLE.FIXTURE AND POLE SHALL MATCH EXISTING SOUTH PARKING LOT POLE BEING RELOCATED.

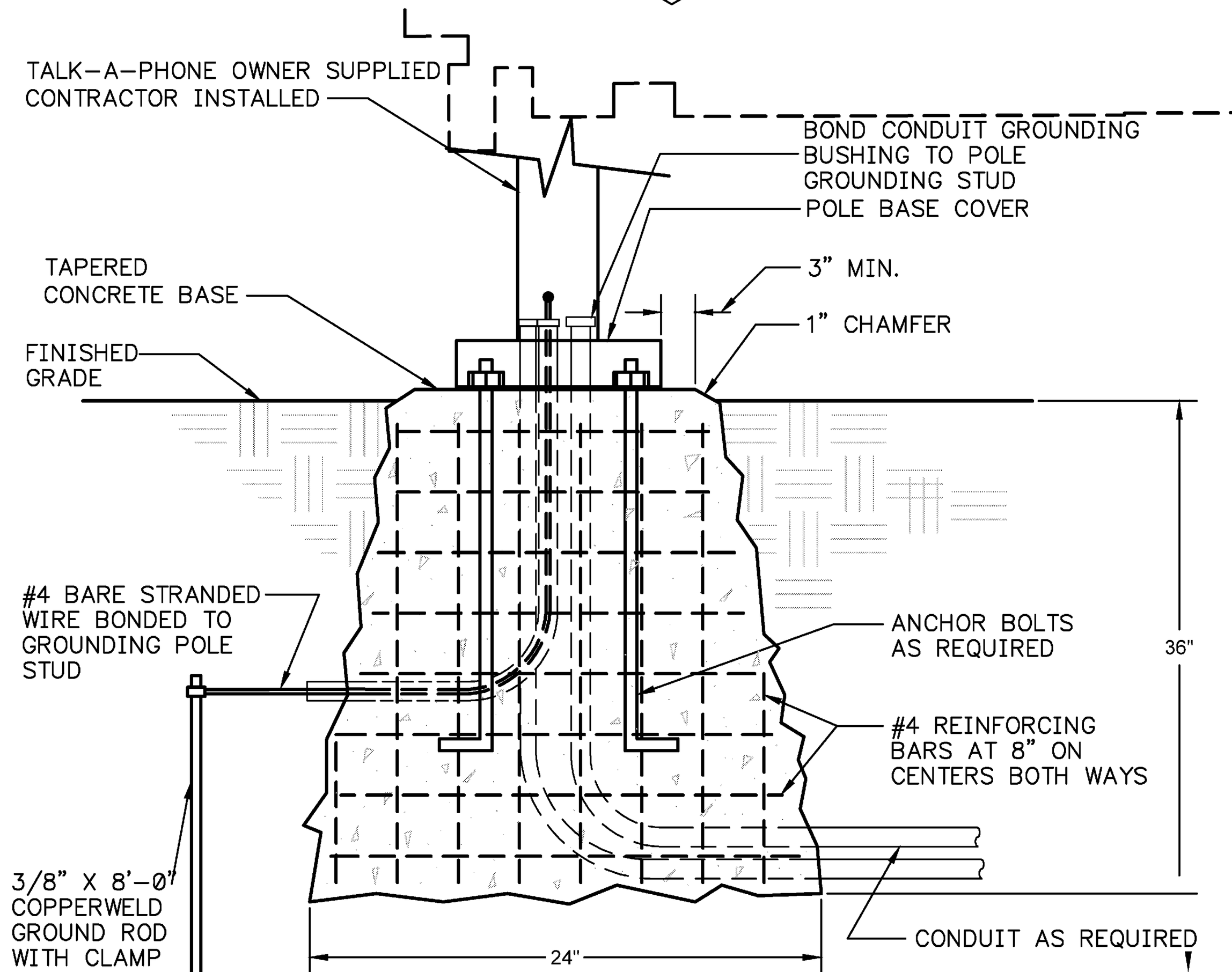
HOLOPHANE MGLED 6COB 5K IIM L A SSS40 DM19 AND HAPCO POLE

OLF-2 LED AREA LIGHT WITH LOW COPPER DIECAST ALUMINUM FINNED HOUSING, REMOVEABLE POWER DOOR, STAINLESS STEEL LATCHES, CAST ALUMINUM ARCHITECTURAL POLE MOUNTING ARM, 100,000 HOUR L70 RATED LIFE LED LIGHT ENGINE, TYPE II MEDIUM DISTRIBUTION 24.718 DELIVERED LUMEN LED ARRAY, CSA LISTED FOR WET LOCATIONS, AND LIMITED FIVE YEAR WARRANTY. ONE FIXTURE TO BE MOUNTED TO A 40' STEEL POLE AT 180 DEGREES. FIXTURE AND POLE TO MATCH EXISTING SOUTH PARKING LOT POLE BEING RELOCATED.

HOLOPHANE MGLED 6COB 5K IIM LA SSS40 DM28 AND HAPCO POLE

OLF-3 EXISTING LIGHT POLE AND FIXTURE IN NEW LOCATION.





TALK-A-PHONE BASE DETAIL STANDARD
NO SCALE

GENERAL NOTES: SITE UTILITIES

A THE CONTRACT DOCUMENTS SHOW THE APPROXIMATE LOCATION OF THE EXISTING AND NEW SUBSURFACE UTILITY LINES. THESE LINES HAVE BEEN IDENTIFIED AND LOCATED AS ACCURATELY AS POSSIBLE USING AVAILABLE INFORMATION. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL ACTUAL LOCATIONS. IF ANY CHARTED, UNCHARTED OR MISLOCATED UTILITY SERVICE IS INTERRUPTED FOR ANY REASON, THE CONTRACTOR WILL WORK CONTINUOUSLY TO RESTORE SERVICE TO THE SATISFACTION OF THE OWNER.

B THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL EXISTING UNDERGROUND UTILITIES PRIOR TO EXCAVATING. THE OWNER WILL NOT LOCATE THESE UTILITIES FOR THE CONTRACTOR. IF AN OUTSIDE SERVICE OR COMPANY IS REQUIRED TO ACCURATELY LOCATE BURIED UTILITIES THE CONTRACTOR IS RESPONSIBLE FOR SCHEDULING THIS WORK AND IS RESPONSIBLE FOR THE COSTS. THE CONTRACTOR SHOULD CONTACT APPROPRIATE UTILITY COMPANIES BEFORE DOING ANY EXCAVATING.

C LOCATIONS OF UTILITIES ARE APPROXIMATE AND SUBJECT TO MINOR CHANGES IN THE FIELD. DO NOT SCALE THE DRAWINGS.

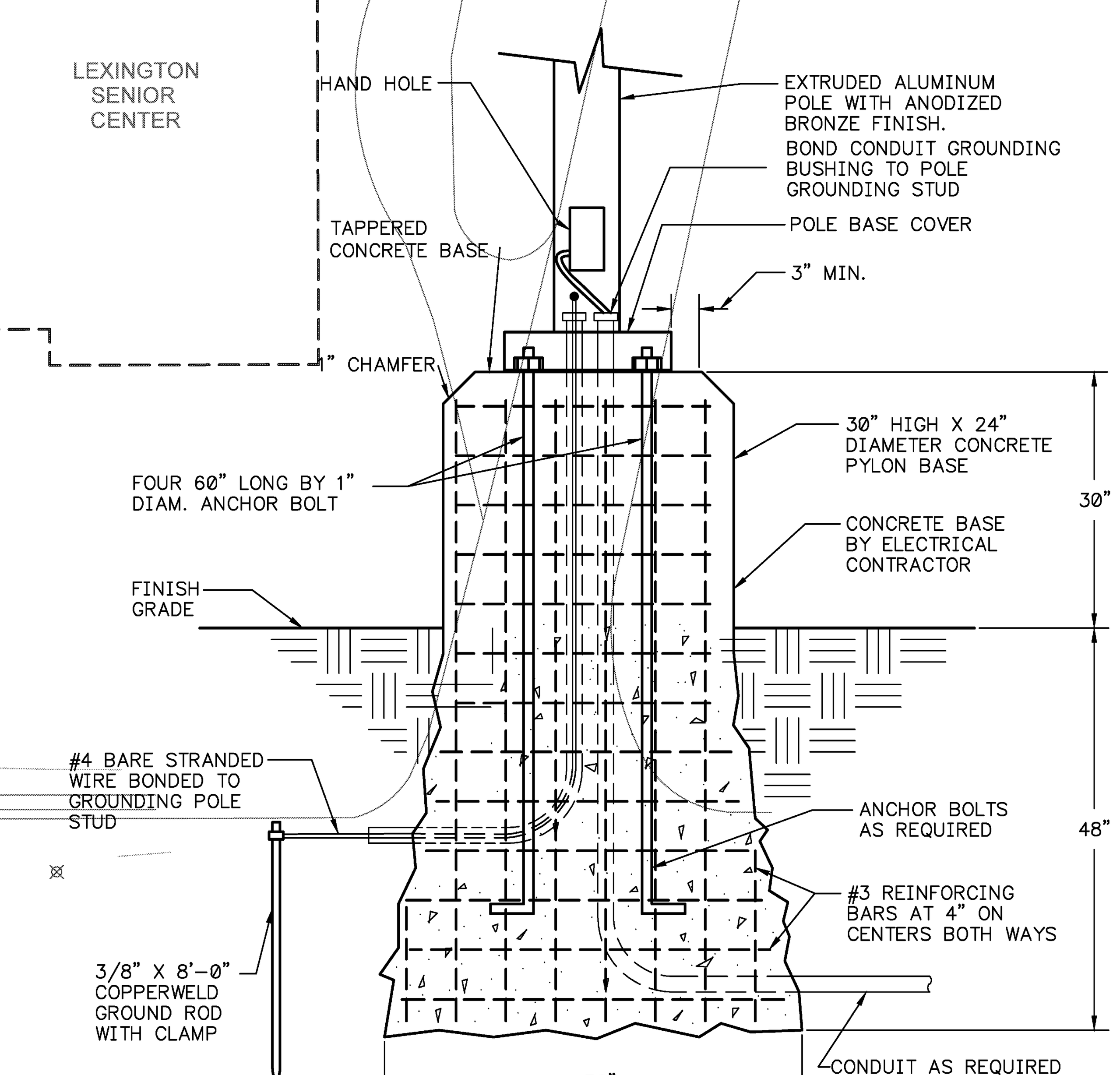
D INSTALL UNDERGROUND BRANCH CIRCUITS WITH 2'-0' MINIMUM COVER.

E EXCAVATION: MATERIALS TO BE EXCAVATED SHALL INCLUDE EARTH AND ANY OTHER MATERIAL, INCLUDING ROCK, ENCOUNTERED IN THE TRENCH EXCAVATION.

F SITE LIGHTING CIRCUITS SHALL BE MINIMUM #6 CONDUCTORS IN 1 - 1/4" CONDUIT.

CODED NOTES:

1. 2#6'S (2 HOTS) AND 1#8 GND. IN 1-1/4"C.
2. 4#6'S (3 HOTS AND 1 NEUTRAL) AND 1#8 GND. IN 1-1/4"C.
3. 3-#6'S (2 HOTS) AND 1-#6 NEUTRAL IN 1-1/4"C.
4. EXISTING ITE PANELBOARD IN BASEMENT. PROVIDE 2-30A/2P BREAKERS TO FEED NEW LIGHTS, AND 1-20A/2P TO BUS STOP TO FEED TALK-A-PHONE.
5. 12"x15"x24" DEEP SOLID BOTTOM FRP STRAIGHT QUAZITE IN GROUND BOX WITH GASKETED TWO BOLT COVER TIER 15 (15,000/22,000 LB) LOAD RATING. LABEL BOXES "ELECTRIC" FOR POWER AND "COMMUNICATIONS" FOR FIBER. FINAL BOX LOCATIONS WILL BE FIELD LOCATED AND MAY MOVE TO PARKING ROWS TO THE SOUTH.
6. EXTEND 2-#6'S AND #8 GND. TO TALK-A-PHONE FOR 120V POWER. COIL #6'S IN PULL BOX FOR FUTURE EXTENSION TO BUS STOP. FINAL BOX LOCATIONS WILL BE FIELD LOCATED AND MAY MOVE TO PARKING ROWS TO THE SOUTH.
7. PROVIDE 1-2"C. TO COMMUNICATION MANHOLE U137 FOR FUTURE.
8. EXISTING COMMUNICATIONS MANHOLE U137 IN THE BASEMENT OF ANIMAL SCIENCE.
9. REMOVE EXISTING LIGHT FIXTURE CONCRETE BASE AND ALL BRANCH CIRCUIT WIRING. POLE AND LIGHT SHALL BE RELOCATED IN NEW LOCATION.
10. NEW LOCATION FOR EXISTING LIGHT.
11. EXISTING SQUARE D PANELBOARD. PROVIDE 3 NEW 20A/2P, AND 1 20A/1P BREAKERS FOR NEW LIGHTS AND TALK-A-PHONE. MARK EXISTING LIGHTING BREAKERS AS SPARE FOR FUTURE BUS STOP.
12. 30A 6 POLE MECHANICALLY HELD CONTACTOR WITH HAND-OFF-AUTO SWITCH CONTACTS FOR PHOTOCELL AND BUILDING CONTROLS CONNECTIONS. MOUNT NEXT TO EXISTING EXTERIOR LIGHTING CONTACTOR. PROVIDE 3/4" CONDUIT BETWEEN CONTACTORS FOR CONTROL WIRING. ROUTE NEW LIGHTING CIRCUITS THRU CONTACTOR.
13. ROUTE FEEDER ON THE NORTH WALL OF THE AREAWAY WITH RIGID STEEL CONDUIT. EXTEND INTO THE BASEMENT TO PANELBOARD PB WITH EMT CONDUIT.
14. MANHOLE IS BEYOND THE LIMITS OF THE DRAWINGS, SEE DIMENSIONS PROVIDED FOR THE ACTUAL DISTANCE.
15. 7-#6'S (HOTS) AND 1-#6 NEUTRAL AND 1-#8 GND. IN 2"C.



DETAIL OF PYLON BASE FOR LIGHTING FIXTURES OLF-1 & OLF-2
NO SCALE

NOTE:

IT IS NOT INTENDED THAT THE PLANS SHOW ALL OFFSETS IN PIPES, CONDUITS, AND DUCTS REQUIRED FOR INSTALLATION OF THE WORK. DETAILS AND SECTIONS ARE INCLUDED FOR SOME AREAS TO SHOW INTENDED RELATIONSHIP OF THE WORK OF VARIOUS TRADES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SUB-CONTRACTORS TO COORDINATE INSTALLATION OF THE WORK AND TO PROVIDE THE NECESSARY OFFSETS, TRANSFORMATIONS AND FITTINGS REQUIRED. NO ADDITIONAL COMPENSATION WILL BE ALLOWED FOR CORRECTING CONFLICTS BETWEEN THE WORK OF VARIOUS TRADES. DETAILS AND SECTIONS ARE SHOWN FOR THE CONTRACTORS CONVENIENCE AND SHALL NOT BE CONSIDERED COMPLETE IN EVERY DETAIL.

Staggs and Fisher Consulting Engineers, Inc.
3264 Lochness Drive Lexington, Kentucky 40517
(859) 271-3246

DESIGNER	DESIGNER
DRAWN	DRAWN
CHECKED	CHECKED?
APPROVED	APPROVED

DATE	BY	REVISION

GRAPHIC SCALE

SCALE: AS NOTED ON DWG

STATE OF KENTUCKY
GREGORY G. CARTER
14715
LICENSED PROFESSIONAL ENGINEER

bell engineering
Lexington, KY (859) 278-5412
Hopkinsville, KY (270) 886-5466

2422.0 SOUTH CAMPUS PARKING LOT EXPANSION
CAPITAL PROJECT MANAGEMENT DIVISION
UNIVERSITY OF KENTUCKY
LEXINGTON, KENTUCKY

SITE UTILITIES PLAN

DIVISION	GENERAL
CONTRACT NO.	600-048
DATE	MAY 2015
SHEET NO.	U10

S:\15307 UK South Campus Parking Lot Expansion #2\Site\SITE-1.dwg, 5/6/2015 2:41:09 PM, 0 DWG To PDF.pc3

Section 3

Inspections

Exterior Lighting

Spec Section 165600

Final Electrical Inspections to be Inserted Here