



GENERAL

- 1. CHAMBERS MUST BE XERXES® HYDROCHAIN™ VAULT. ONLY PRODUCTS APPROVED BY THE SITE DESIGN ENGINEER ARE PERMITTED.
- 2. CHAMBERS MUST BE MANUFACTURED BY COMPRESSION MOLDING OF FIBERGLASS REINFORCED COMPOSITE.
- 3. CHAMBERS MUST BE EVALUATED AND TESTED TO MEET OR EXCEED THE STANDARDS IN ASTM F2418 STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS.
- 4. CHAMBERS MUST HAVE AN OPEN BOTTOM. CHAMBERS MUST BE CONTINUOUS, UNOBSTRUCTED, AND WITHOUT INTERNAL SUPPORT THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION AND MAINTENANCE.
- 5. THE INSTALLED CHAMBER SYSTEM MUST BE DESIGNED TO MEET THE LOAD REQUIREMENTS OF ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" FOR:
 - A. INSTANTANEOUS LIVE LOAD FROM AASHTO DESIGN TRUCK AT MINIMUM COVER
 - B. MAXIMUM DEAD LOAD (100-YEAR)
 - C. 1-WEEK AASHTO DESIGN TRUCK LOAD AT MINIMUM COVER
- 6. THE INSTALLED CHAMBER SYSTEM MUST BE DESIGNED TO MEET THE LOAD REQUIREMENTS OF AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SPECIFICATION 12.12 FOR:
 - A. LONG-DURATION DEAD LOADS
 - B. SHORT-DURATION LIVE LOADS WITH IMPACT AND MULTIPLE VEHICLE PRESENCE
- 7. CHAMBERS MUST MAINTAIN STIFFNESS THROUGH TEMPERATURE RANGES OF -40 DEGREES FAHRENHEIT TO 180 DEGREES FAHRENHEIT.
- 8. THE CHAMBER MUST INTERCONNECT USING AN OVERLAPPING CORRUGATION JOINT.
- 9. THE STORMWATER CHAMBER SYSTEM SHALL INCORPORATE A MAIN HEADER FOREBAY FOR STORMWATER TREATMENT AND SYSTEM MAINTENANCE WHICH HAS BEEN TESTED TO A MINIMUM OF 80% OF TSS REMOVAL FOLLOWING NJCAT TESTING PROTOCOLS.
- 10. CHAMBERS AND END CAPS MUST BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

INSTALLATION

- 1. INSTALLATION MUST NOT START UNTIL A PRE-CONSTRUCTION MEETING HAS BEEN HELD WITH THE MANUFACTURER'S REPRESENTATIVE AND THE INSTALLERS.
- 2. INSTALLATION MUST BE IN ACCORDANCE WITH THE CONSTRUCTION PLANS AND HYDROCHAIN™ INSTALLATION MANUAL.
- 3. BACKFILLING OVER CHAMBERS MUST NOT BE DONE WITH A DOZER OR AN EXCAVATOR LOCATED OVER THE CHAMBERS. SEE THE INSTALLATION MANUAL FOR MAXIMUM EQUIPMENT LOADS BASED ON THE DEPTH OF COVER OVER THE CHAMBERS. RECOMMENDED BACKFILL METHODS INCLUDE:
 - A. USING A STONE SHOOTER LOCATED OFF THE CHAMBER BED.
 - B. BACKFILLING WHILE PLACING ROWS USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
 - C. BACKFILLING FROM OUTSIDE THE EXCAVATION USING A LONG BOOM EXCAVATOR.
- 4. THE FOUNDATION STONE MUST BE LEVELED AND COMPACTED BEFORE PLACING CHAMBERS.
- 5. JOINTS BETWEEN CHAMBERS MUST BE PROPERLY SEATED BEFORE PLACING STONE.
- 6. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE CLEAN, CRUSHED, ANGULAR STONE MEASURING 3/8 - 1 1/2 INCHES (8-32 MM).
- 7. ANY DISCREPANCIES WITH CHAMBER FOUNDATION BEARING CAPACITIES MUST BE REPORTED TO THE SITE ENGINEER.
- 8. IT IS RECOMMENDED TO INSTALL EROSION AND SEDIMENT CONTROL MEASURES TO PROTECT THE STORMWATER SYSTEM DURING ALL PHASES OF CONSTRUCTION.

Visit www.xerxes.com for the installation manual and additional resources.

Contact your sales representative or email the following Xerxes contacts for support.

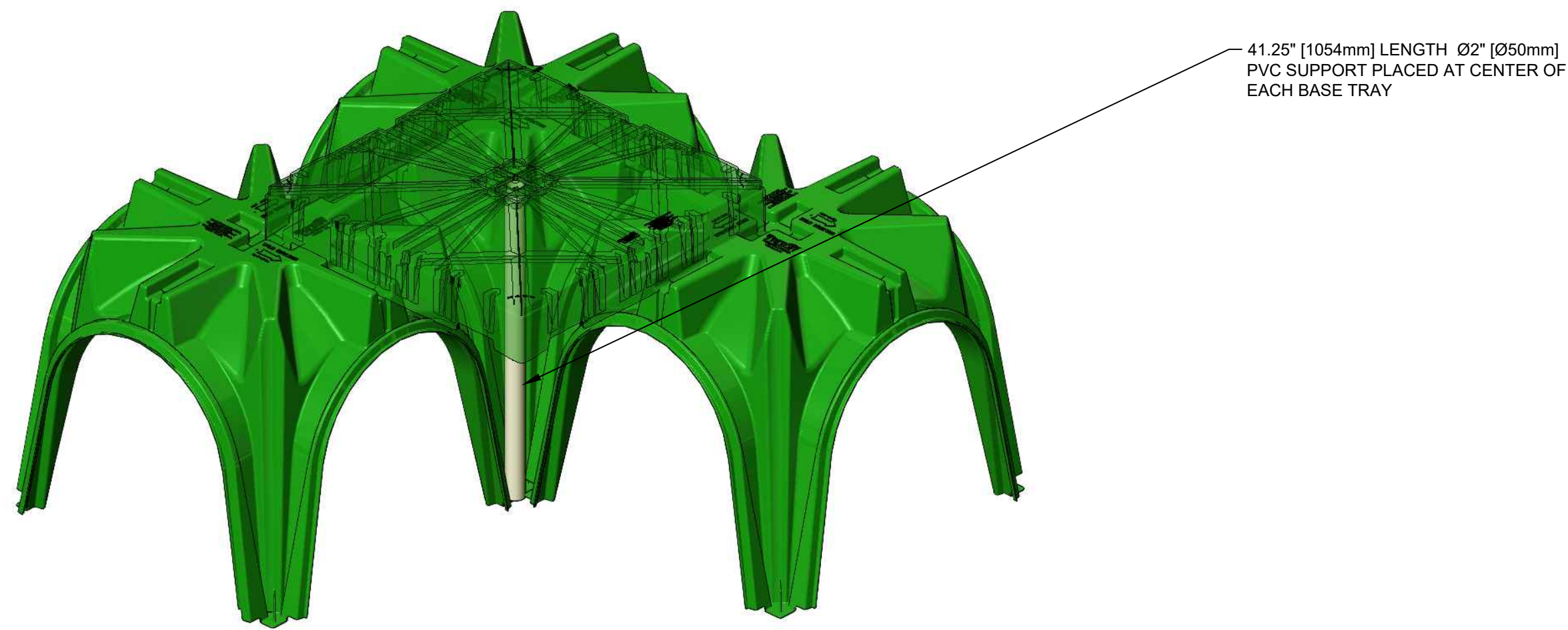
North America: eng.support@mattr.com
Outside North America: hydrochain.int@mattr.com



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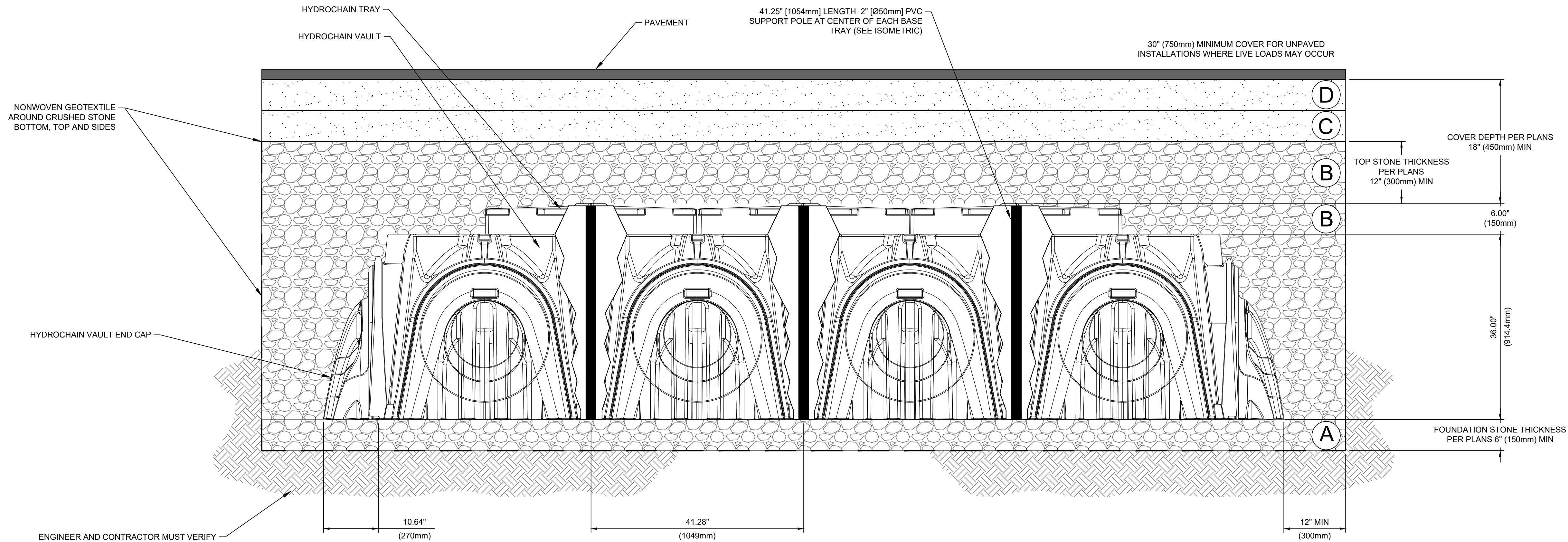
HYDROCHAIN
VAULT
SPECIFICATIONS



ISOMETRIC VIEW
SCALE: NTS

STANDARD FILL MATERIALS				
	MATERIAL LOCATION	DESCRIPTION	AASHTO M43 DESIGNATION	COMPACT/DENSITY REQUIREMENT
D	FILL MATERIAL FROM 18" (450mm) ABOVE VAULT TO GRADE	ANY SOIL/ROCK MATERIALS. NATIVE SOILS OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	PER PLANS	PREPARE PER ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	FILL MATERIAL FOR 12" (300mm) TO 18" (450mm) ABOVE VAULT AND 24" (600mm) FOR UNPAVED INSTALLATIONS	GRANULAR WELL-GRADED SOIL/ AGGREGATE MIXTURES. <35% FINES. MOST PAVEMENT SUB-BASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10 M145: A-1, A-2, A-3	COMPACT IN MAXIMUM 6" (150mm) LIFTS. SEE NOTES.
B	SIDE AND TOP STONE	3/8" - 1 1/2" (8-32mm) CLEAN, CRUSHED, ANGULAR STONE	5, 56, 57, 6	NO COMPACTION REQUIRED.
A	FOUNDATION STONE	3/8" - 1 1/2" (8-32mm) CLEAN, CRUSHED, ANGULAR STONE	5, 56, 57, 6	PLATE COMPACT OR ROLL. SEE NOTES.

NOTE:
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3. AS AN ALTERNATE TO PROCTOR TESTING AND FIELD DENSITY MEASUREMENTS ON OPEN GRADED STONE, HYDROCHAIN COMPACTION REQUIREMENTS ARE MET WHEN PLACED AND COMPACTED IN 6" (150mm) MAXIMUM LIFTS USING TWO FULL PASSES WITH A VIBRATORY COMPACTOR.



TYPICAL VAULT CROSS SECTION
SCALE: NTS

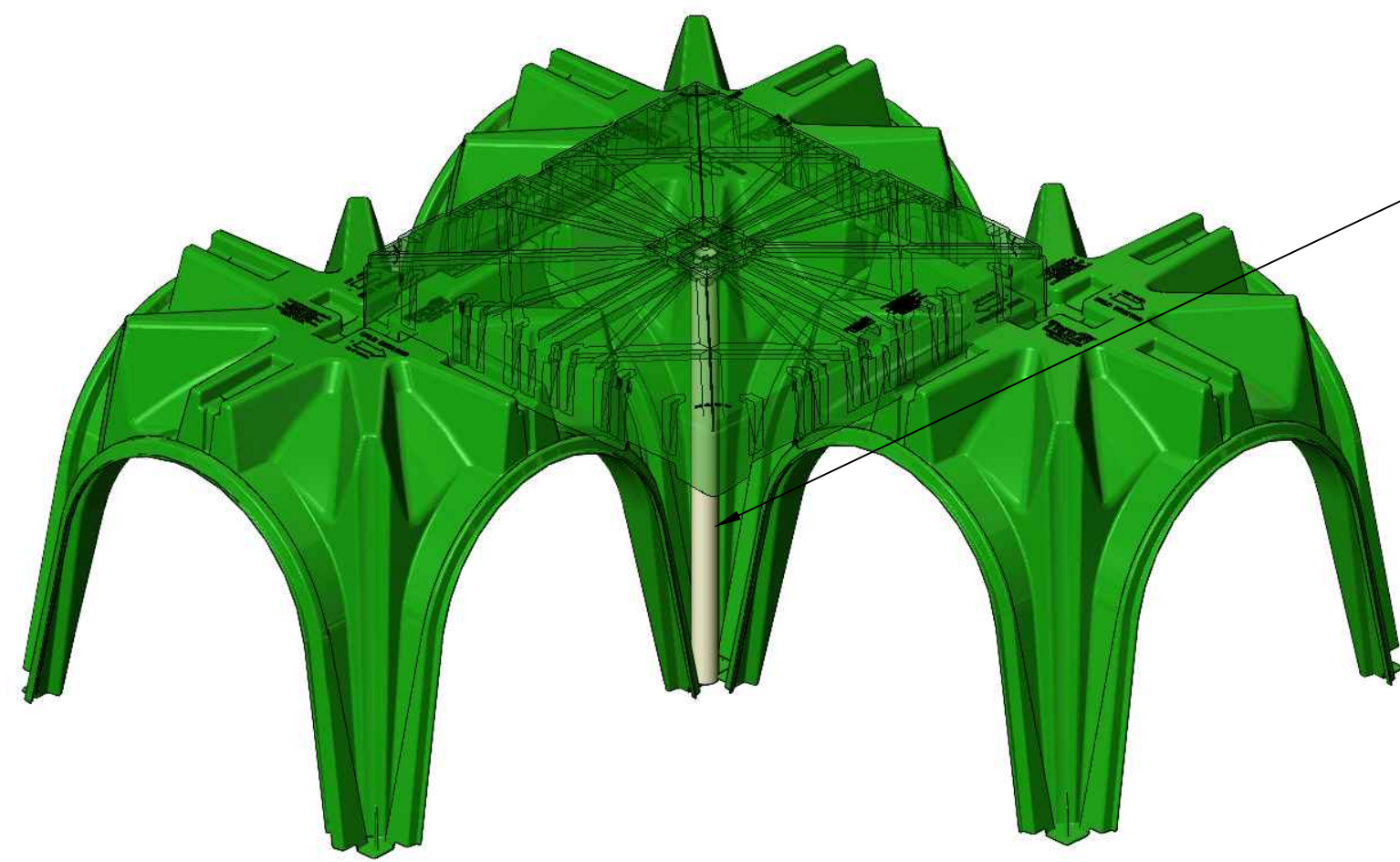
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HYDROCHAIN™
VAULT WITH TRAY
CROSS SECTION DETAIL

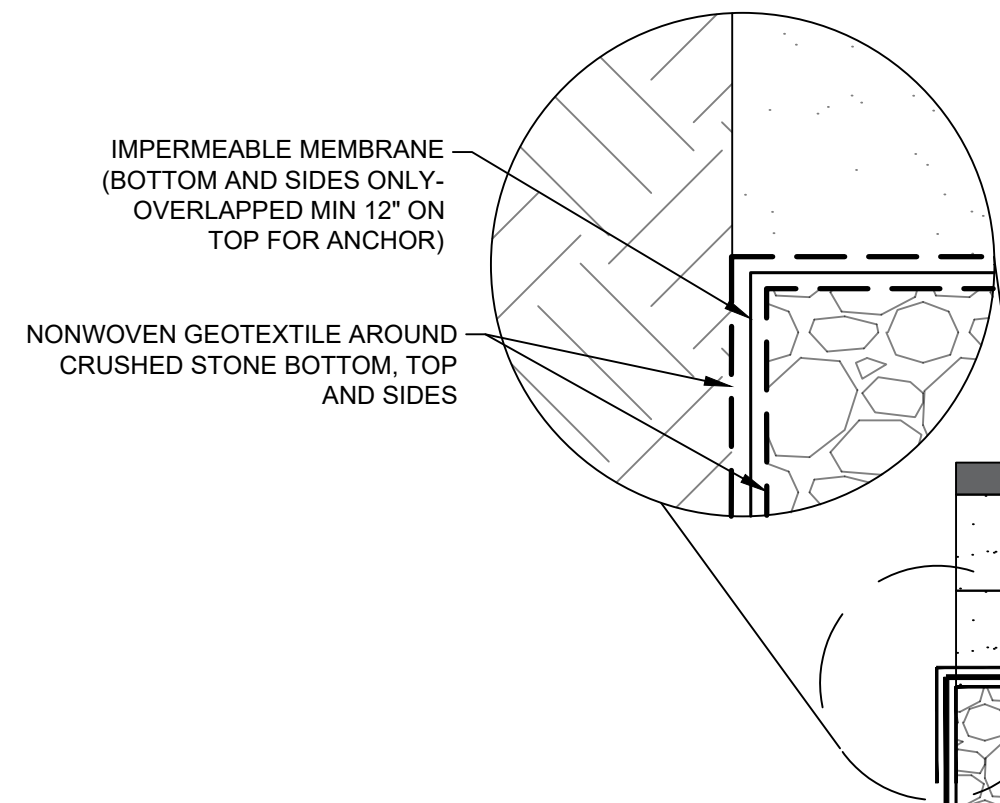


ISOMETRIC VIEW
SCALE: NTS

41.25" [1054mm] LENGTH Ø2" [Ø50mm]
PVC SUPPORT PLACED AT CENTER OF
EACH BASE TRAY

STANDARD FILL MATERIALS				
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C	FILL MATERIAL FOR 12" (300mm) TO 18" (450mm) ABOVE VAULT AND 24" (600mm) FOR UNPAVED INSTALLATIONS	GRANULAR WELL-GRADED SOIL/ AGGREGATE MIXTURES. <35% FINES. MOST PAVEMENT SUB-BASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10 M145: A-1, A-2, A-3	COMPACT IN MAXIMUM 6" (150mm) LIFTS. SEE NOTES.
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IMPERMEABLE MEMBRANE
(BOTTOM AND SIDES ONLY-
OVERLAPPED MIN 12" ON
TOP FOR ANCHOR)
NONWOVEN GEOTEXTILE AROUND
CRUSHED STONE BOTTOM, TOP
AND SIDES

HYDROCHAIN VAULT END CAP

UNDERDRAIN PER PLANS

IMPERMEABLE MEMBRANE BETWEEN 2
LAYERS OF NON-WOVEN GEOTEXTILE
(SEE DETAIL SECTION ABOVE)

HYDROCHAIN TRAY
HYDROCHAIN VAULT

12.00"
(305mm)

PAVEMENT

41.25" [1054mm] LENGTH 2" [Ø50mm] PVC
SUPPORT POLE AT CENTER OF EACH BASE
TRAY (SEE ISOMETRIC)

30" (750mm) MINIMUM COVER FOR UNPAVED
INSTALLATIONS WHERE LIVE LOADS MAY OCCUR

D

C

B

B

A

COVER DEPTH PER PLANS
18" (450mm) MIN

TOP STONE THICKNESS
PER PLANS
12" (300mm) MIN

6.00"
(150mm)

36.00"
(914.4mm)

FOUNDATION STONE THICKNESS
PER PLANS 6" (150mm) MIN

10.64"
(270mm)

41.28"
(1049mm)

12" MIN
(300mm)

ENGINEER AND CONTRACT MUST VERIFY THAT
THE SUBGRADE SOILS MEET THE MINIMUM
BEARING CAPACITY AND ARE SUITABLE FOR
SYSTEM INSTALLATION

TYPICAL VAULT CROSS SECTION
SCALE: NTS

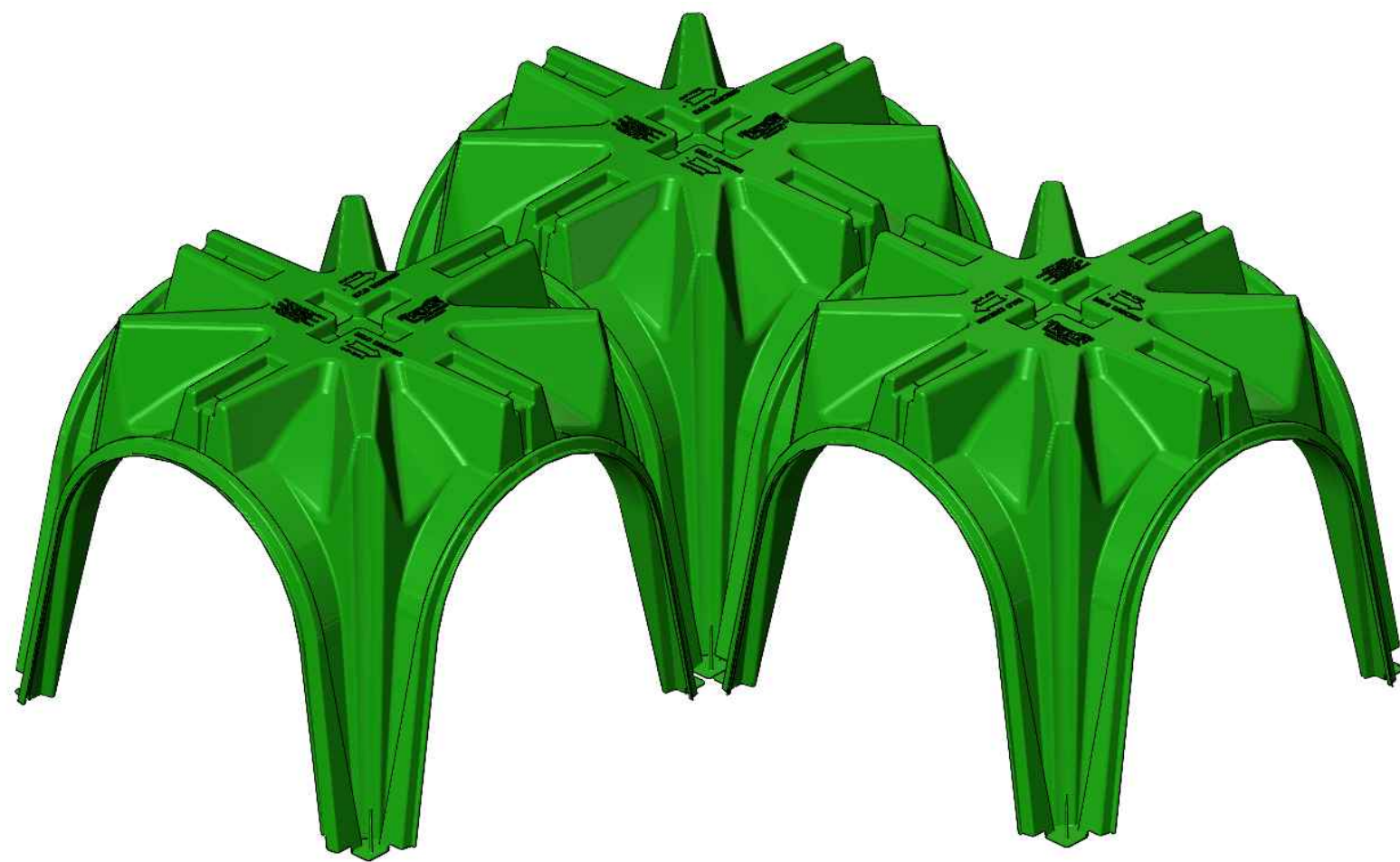


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HYDROCHAIN™
VAULT WITH TRAY
CROSS SECTION DETAIL WITH LINER

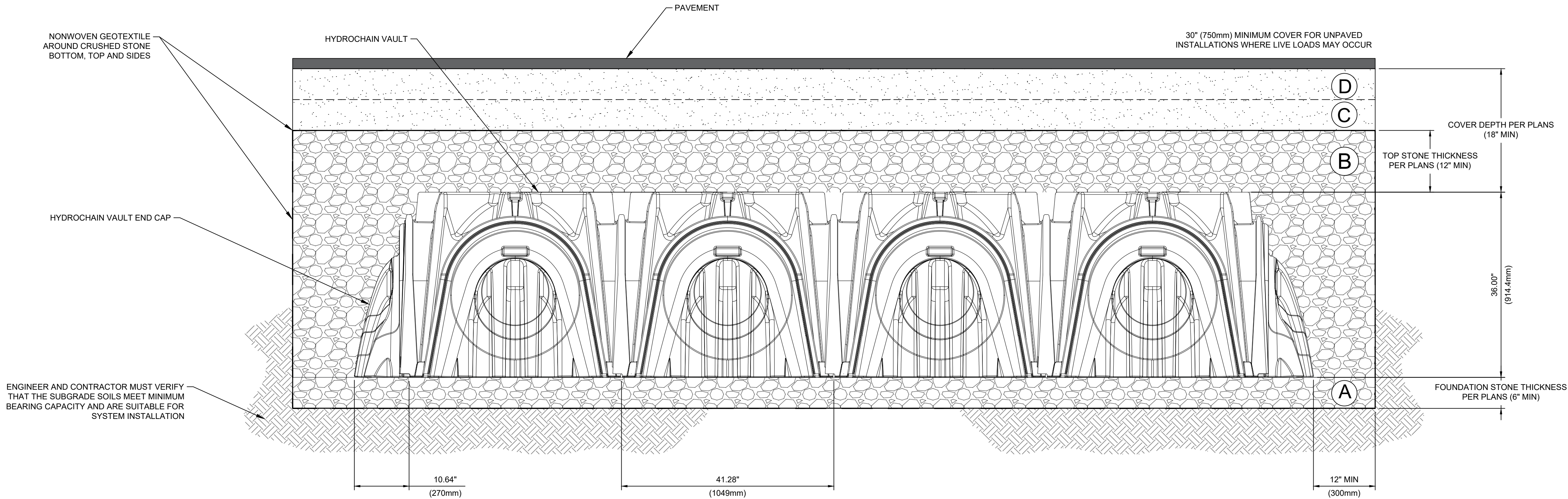
DATE 04/12/2024 SHEET 1 OF 1



ISOMETRIC VIEW
SCALE: NTS

STANDARD FILL MATERIALS				
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TYPICAL VAULT CROSS SECTION
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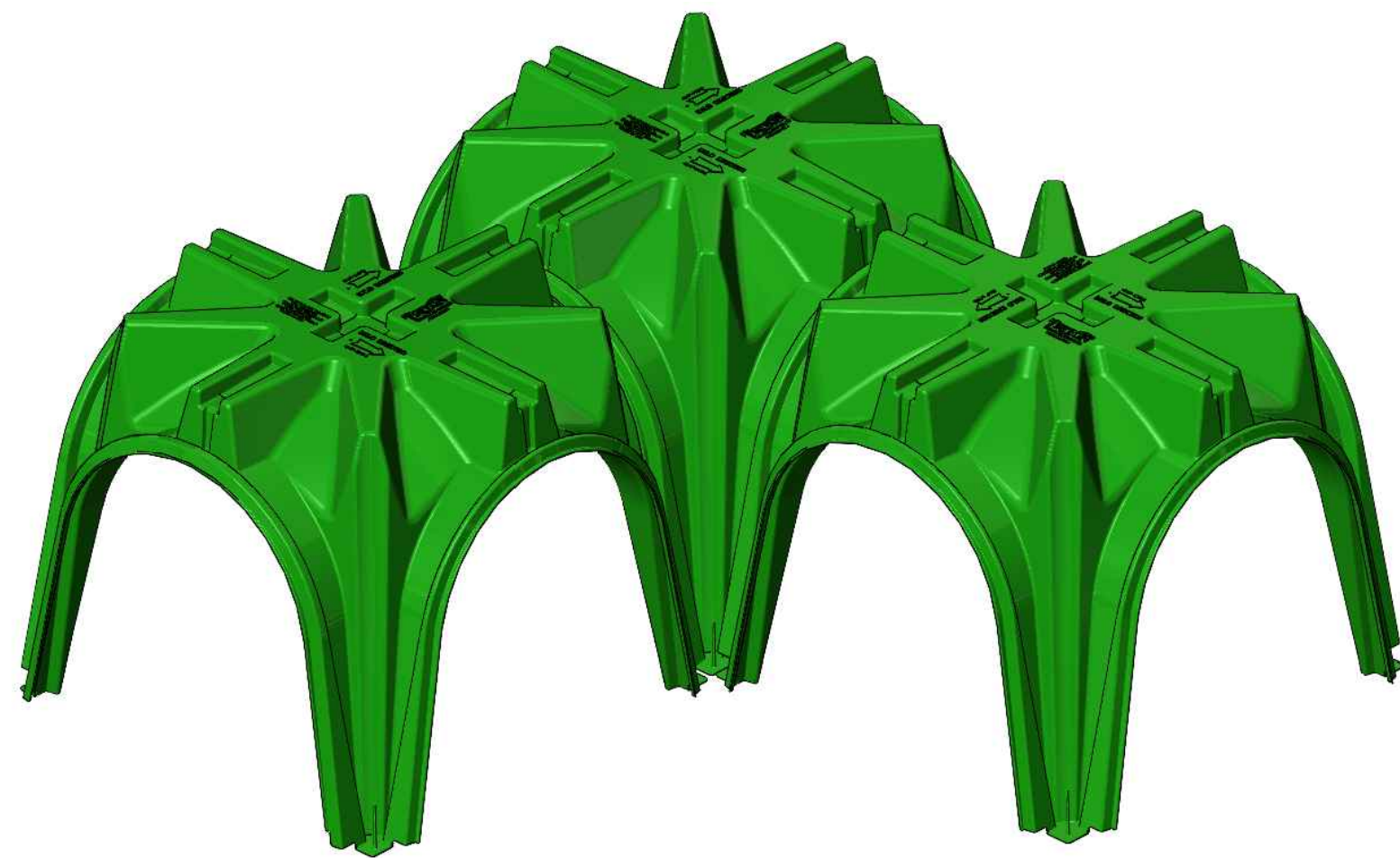


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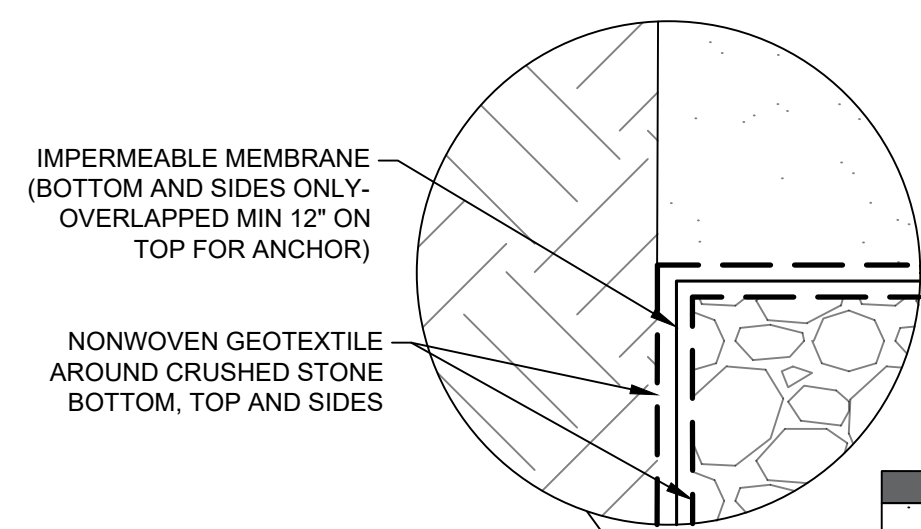


HYDROCHAIN™
VAULT
CROSS SECTION DETAIL

DATE 04/15/2024 SHEET 1 OF 1



ISOMETRIC VIEW
SCALE: NTS

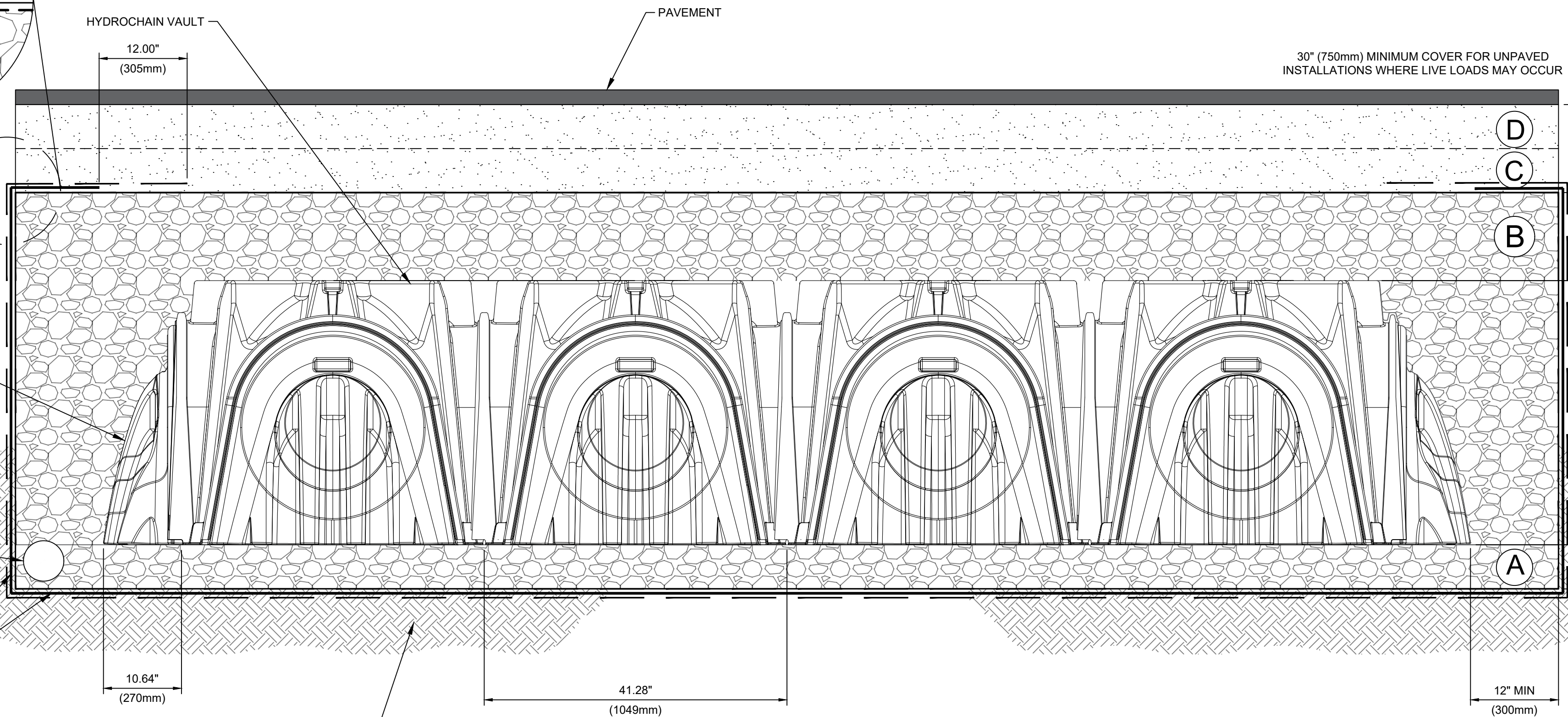


HYDROCHAIN VAULT END CAP

UNDERDRAIN PER PLANS

IMPERMEABLE MEMBRANE BETWEEN 2
LAYERS OF NON-WOVEN GEOTEXTILE
(SEE DETAIL SECTION ABOVE)

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TYPICAL VAULT CROSS SECTION
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HYDROCHAIN™
VAULT
CROSS SECTION WITH LINER DETAIL

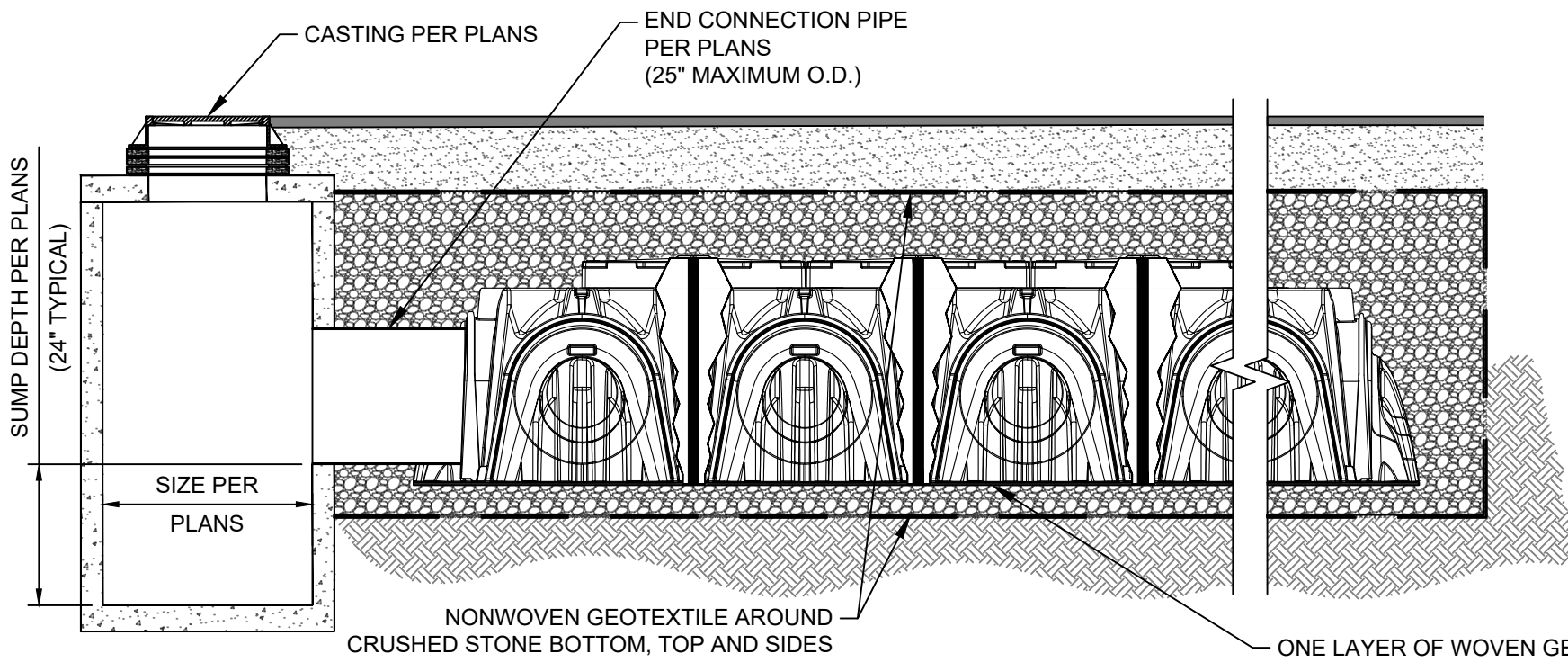
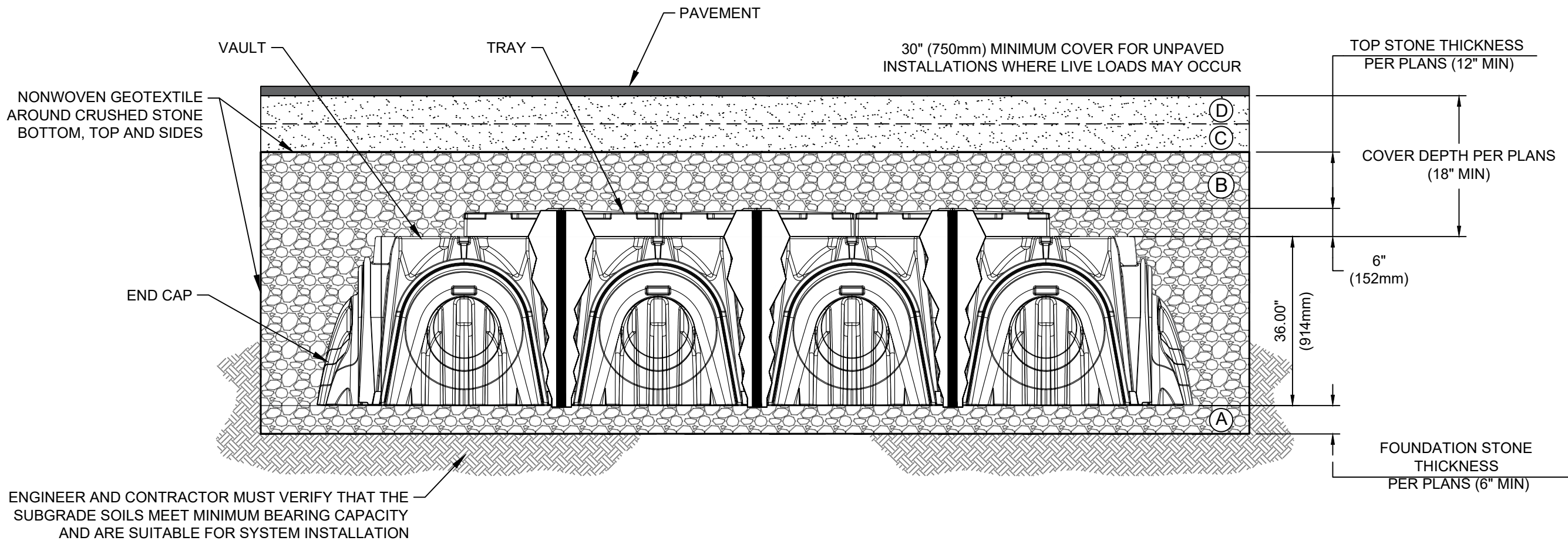
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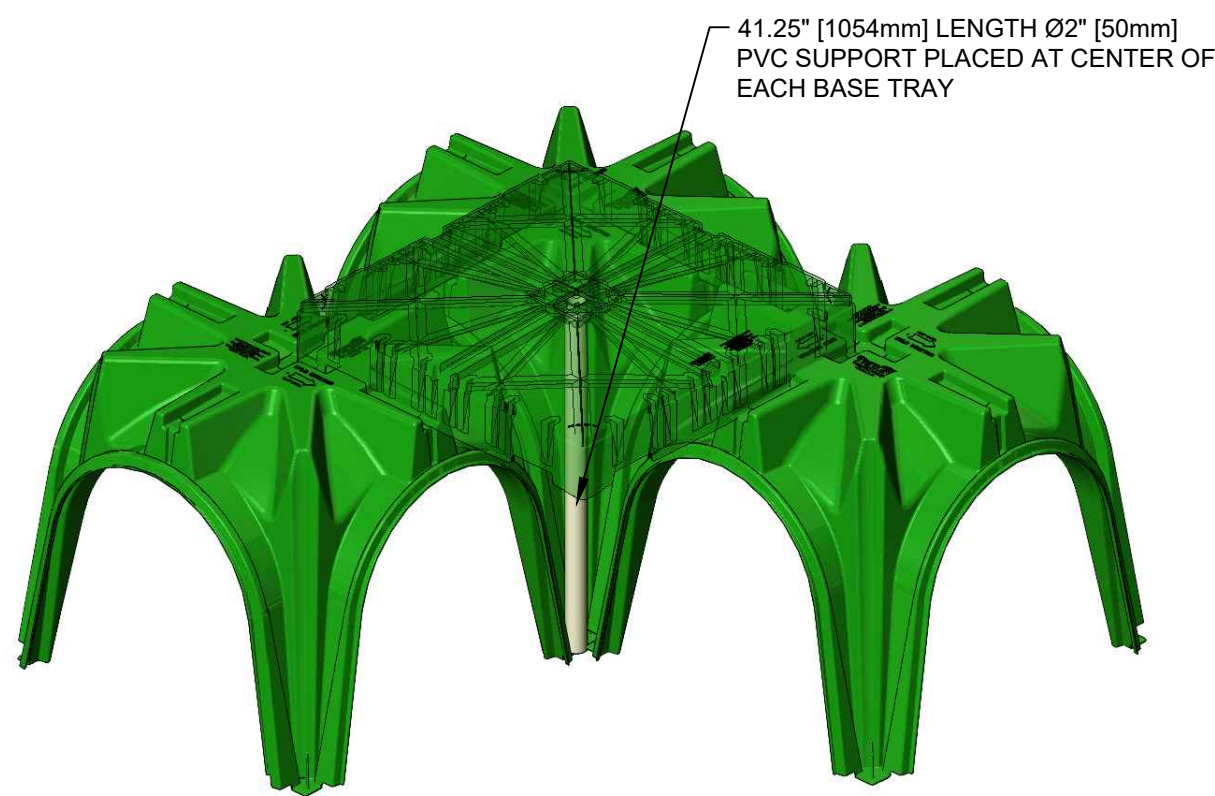
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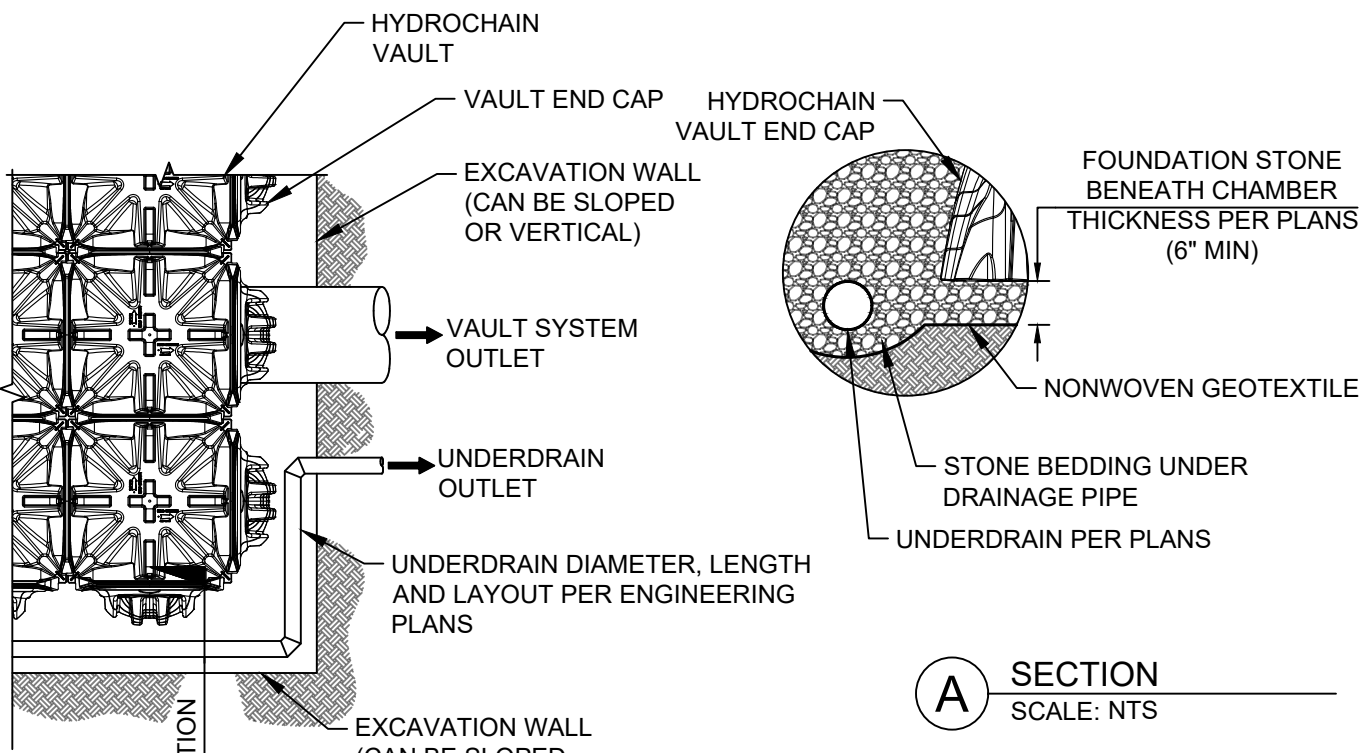


VAULT CROSS SECTION

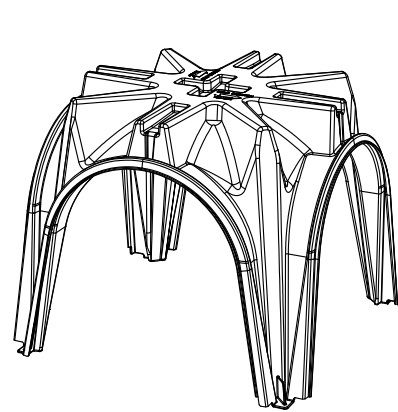
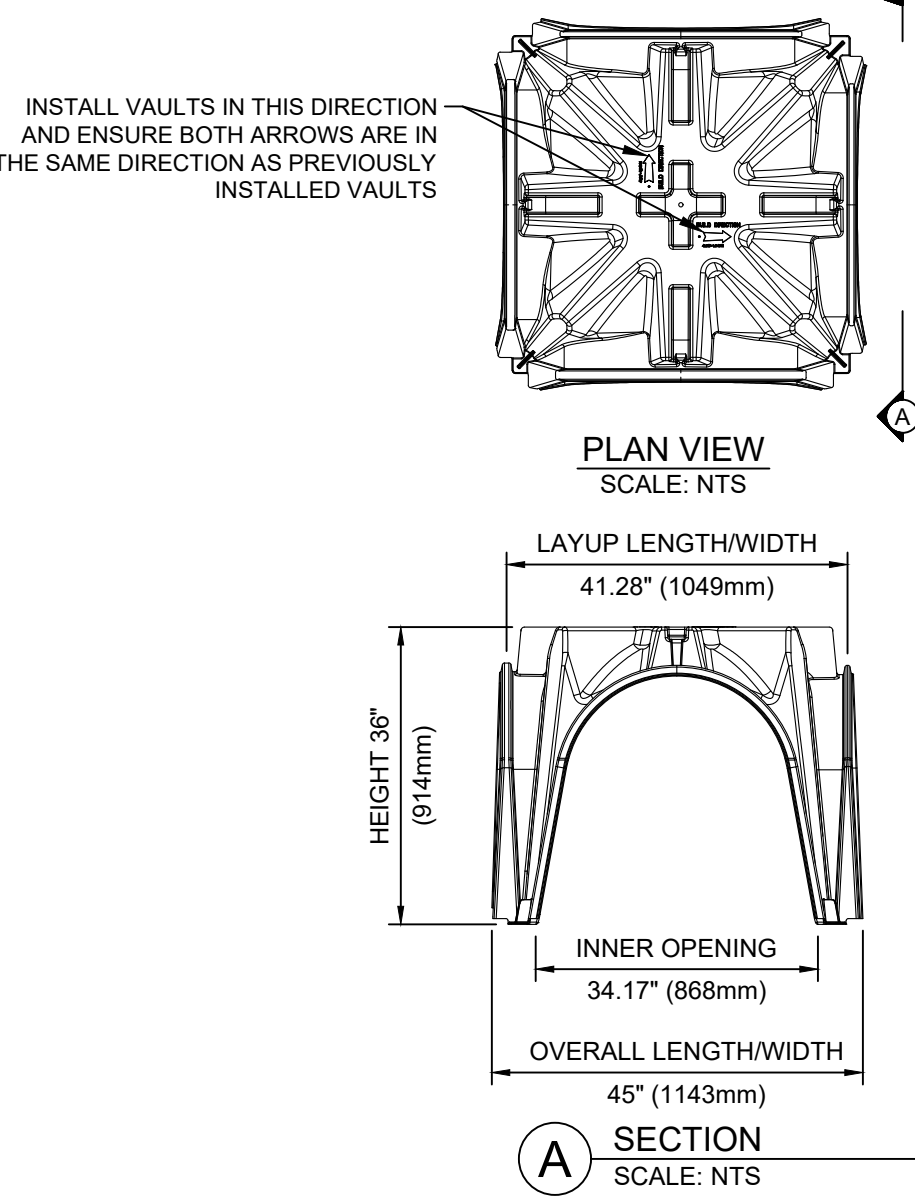
- NOTES:
- INSTALL THE FOREBAY, VAULTS, AND END CAPS IN ACCORDANCE WITH THE SITE SPECIFIC PLANS, HYDROCHAIN INSTALLATION MANUAL AND SUPPLEMENTAL DOCUMENTS. REFERENCE THE QR CODE BELOW FOR PRODUCT DOCUMENTS.
 - CONDUCT INSPECTION AND MAINTENANCE IN ACCORDANCE WITH HYDROCHAIN VAULT OPERATION AND MAINTENANCE MANUAL.



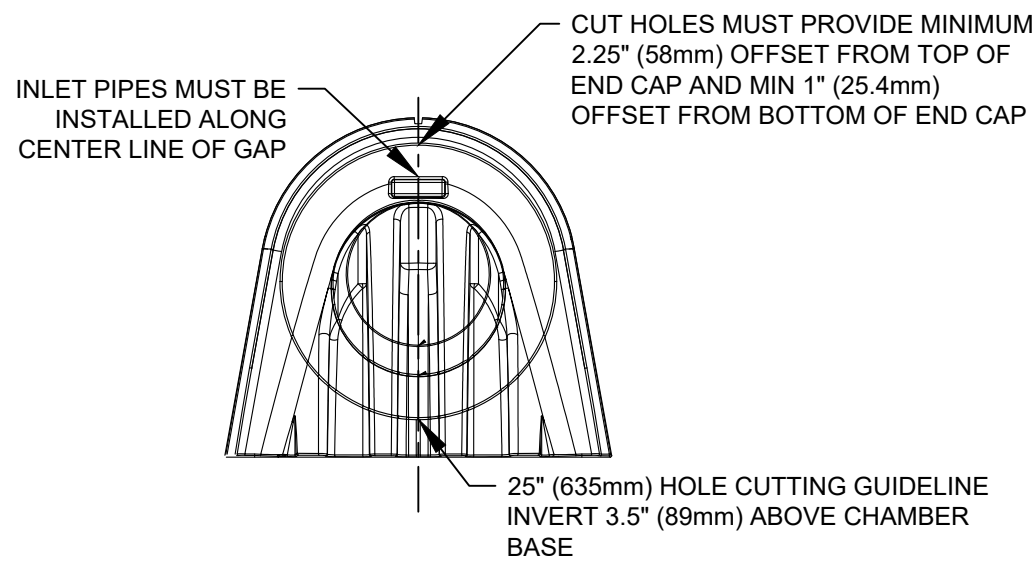
ISOMETRIC VIEW
NTS



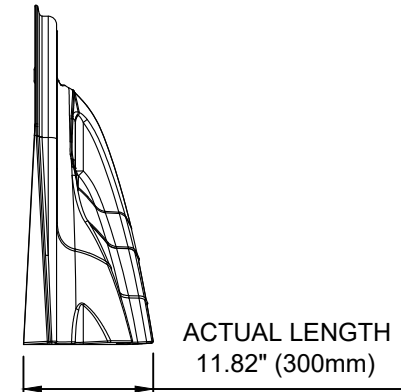
UNDERDRAIN DETAIL



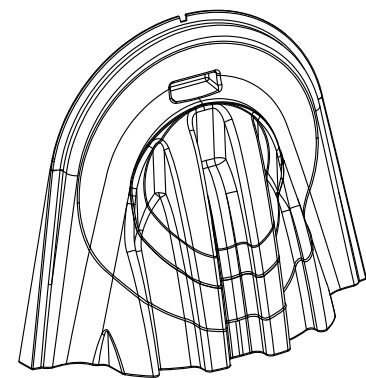
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SCALE: NTS



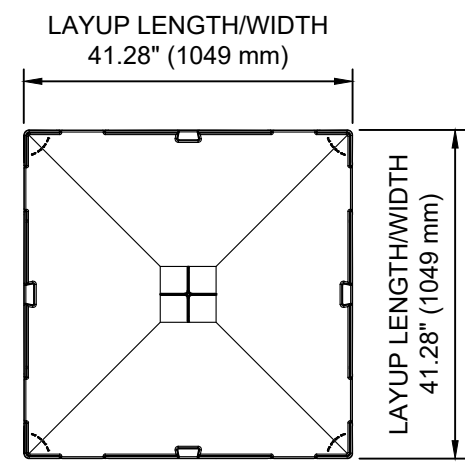
VAULT END CAP: ALLOWED PIPE PLACEMENT AREA
SCALE: NTS



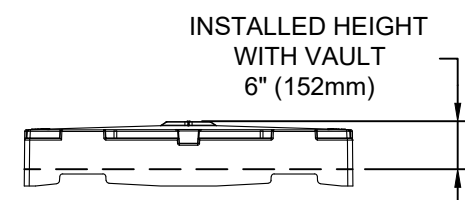
SIDE VIEW
SCALE: NTS



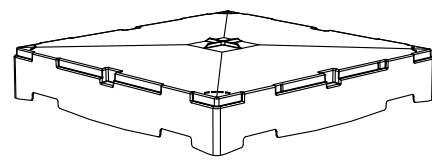
ISOMETRIC
SCALE: NTS



PLAN VIEW
SCALE: NTS



SIDE VIEW
SCALE: NTS



ISOMETRIC
SCALE: NTS

VAULT PROPERTIES	
NOMINAL DIMENSIONS (LAYOUT LENGTH X LAYOUT WIDTH X HEIGHT)	41.28" X 41.28" X 36.00" (1049mm X 1049mm X 914mm)
BARE CHAMBER STORAGE	28.79 CUBIC FEET (0.815 CUBIC METERS)
VAULT WEIGHT	50 lbs (22.7 kg)
INSTALLED STORAGE WITHOUT TRAY (6" BASE STONE, 12" TOP STONE)	36.21 CUBIC FEET (1.025 CUBIC METERS)
INSTALLED STORAGE WITH TRAY (6" BASE STONE, 12" TOP STONE)	43.78 CUBIC FEET (1.240 CUBIC METERS)
ASSUMING A MIN OF 6" (150mm) STONE BELOW, 12" (300mm) STONE ABOVE, AND 40% STONE POROSITY (DOES NOT INCLUDE 12" (300mm) PERIMETER STONE VOLUME)	

VAULT END CAP PROPERTIES	
NOMINAL DIMENSIONS (LAYOUT LENGTH X LAYOUT WIDTH X HEIGHT)	10.64" X 35.24" X 30.88" (270mm X 895mm X 784mm)
BARE END CAP STORAGE	2.16 CUBIC FEET (0.061 CUBIC METERS)
END CAP WEIGHT	15 lbs (6.8 kg)
ASSUMING A MIN OF 6" (150mm) STONE BELOW, 12" (300mm) STONE ABOVE, AND 40% STONE POROSITY (DOES NOT INCLUDE 12" (300mm) PERIMETER STONE VOLUME)	

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- CHAMBERS MUST MAINTAIN STIFFNESS THROUGH TEMPERATURE RANGES OF -40 DEGREES FAHRENHEIT TO 180 DEGREES FAHRENHEIT.
- THE CHAMBER MUST INTERCONNECT USING AN OVERLAPPING CORRUGATION JOINT.
- THE STORMWATER CHAMBER SYSTEM SHALL INCORPORATE A MAIN HEADER FOREBAY FOR STORMWATER TREATMENT AND SYSTEM MAINTENANCE WHICH HAS BEEN TESTED TO A MINIMUM OF 80% OF TSS REMOVAL FOLLOWING NJCAT TESTING PROTOCOLS.
- CHAMBERS AND END CAPS MUST BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

INSTALLATION

- INSTALLATION MUST NOT START UNTIL A PRE-CONSTRUCTION MEETING HAS BEEN HELD WITH THE MANUFACTURER'S REPRESENTATIVE AND THE INSTALLERS.
- INSTALLATION MUST BE IN ACCORDANCE WITH THE CONSTRUCTION PLANS AND HYDROCHAIN™ INSTALLATION MANUAL.
- BACKFILLING OVER CHAMBERS MUST NOT BE DONE WITH A DOZER OR AN EXCAVATOR LOCATED OVER THE CHAMBERS. SEE THE INSTALLATION MANUAL FOR MAXIMUM EQUIPMENT LOADS BASED ON THE DEPTH OF COVER OVER THE CHAMBERS. RECOMMENDED BACKFILL METHODS INCLUDE:
 - USING A STONE SHOOTER LOCATED OFF THE CHAMBER BED.
 - BACKFILLING WHILE PLACING ROWS USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
 - BACKFILLING FROM OUTSIDE THE EXCAVATION USING A LONG BOOM EXCAVATOR.
- THE FOUNDATION STONE MUST BE LEVELED AND COMPACTED BEFORE PLACING CHAMBERS.
- JOINTS BETWEEN CHAMBERS MUST BE PROPERLY SEATED BEFORE PLACING STONE.
- EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE CLEAN, CRUSHED, ANGULAR STONE MEASURING 3/8 - 1 1/2 INCHES (8-32 MM).
- ANY DISCREPANCIES WITH CHAMBER FOUNDATION BEARING CAPACITIES MUST BE REPORTED TO THE SITE ENGINEER.
- IT IS RECOMMENDED TO INSTALL EROSION AND SEDIMENT CONTROL MEASURES TO PROTECT THE STORMWATER SYSTEM DURING ALL PHASES OF CONSTRUCTION.



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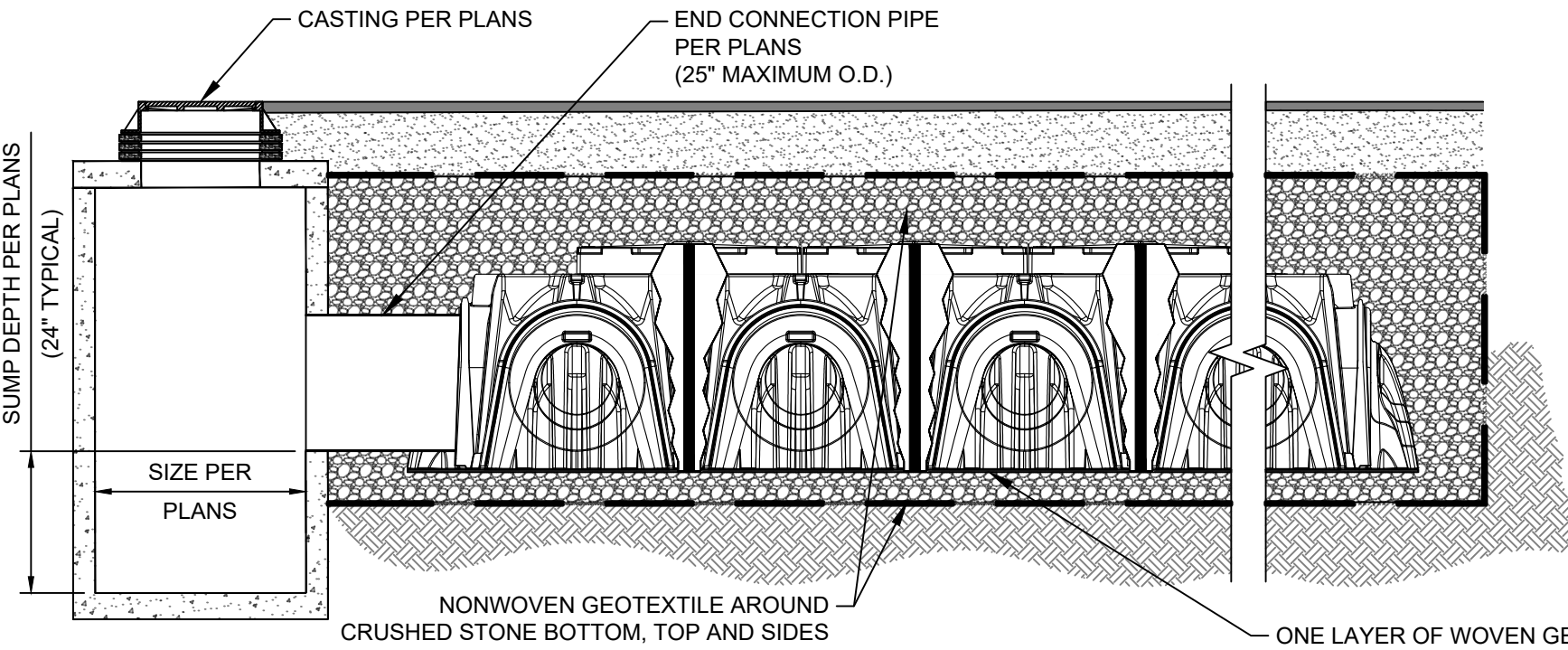
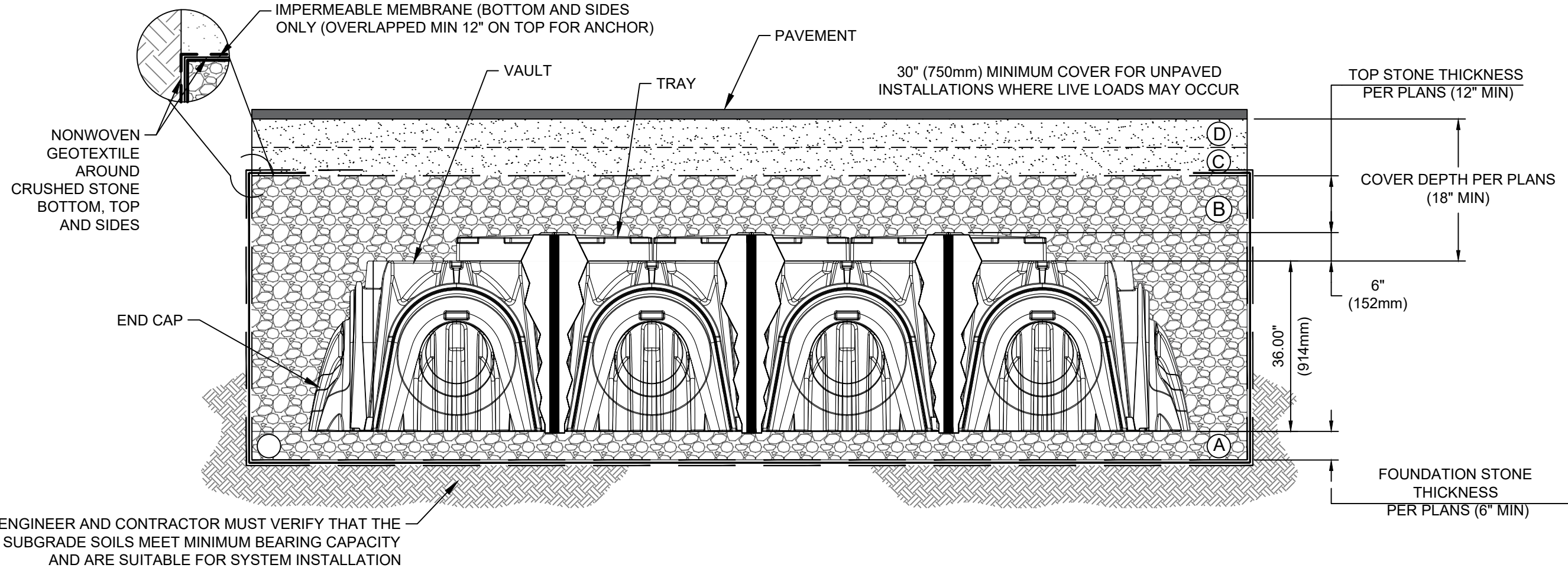
HYDROCHAIN™
VAULT WITH TRAY
STANDARD DETAILS

DATE 04/15/2024 SHEET 1 OF 1

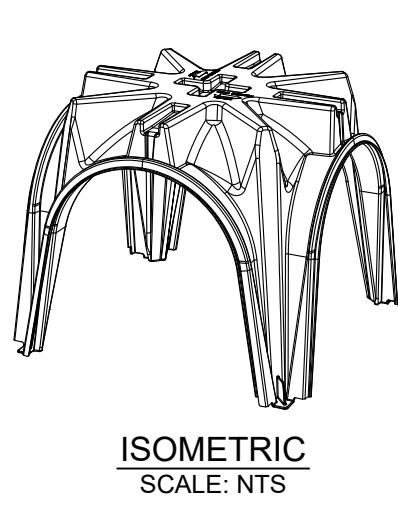
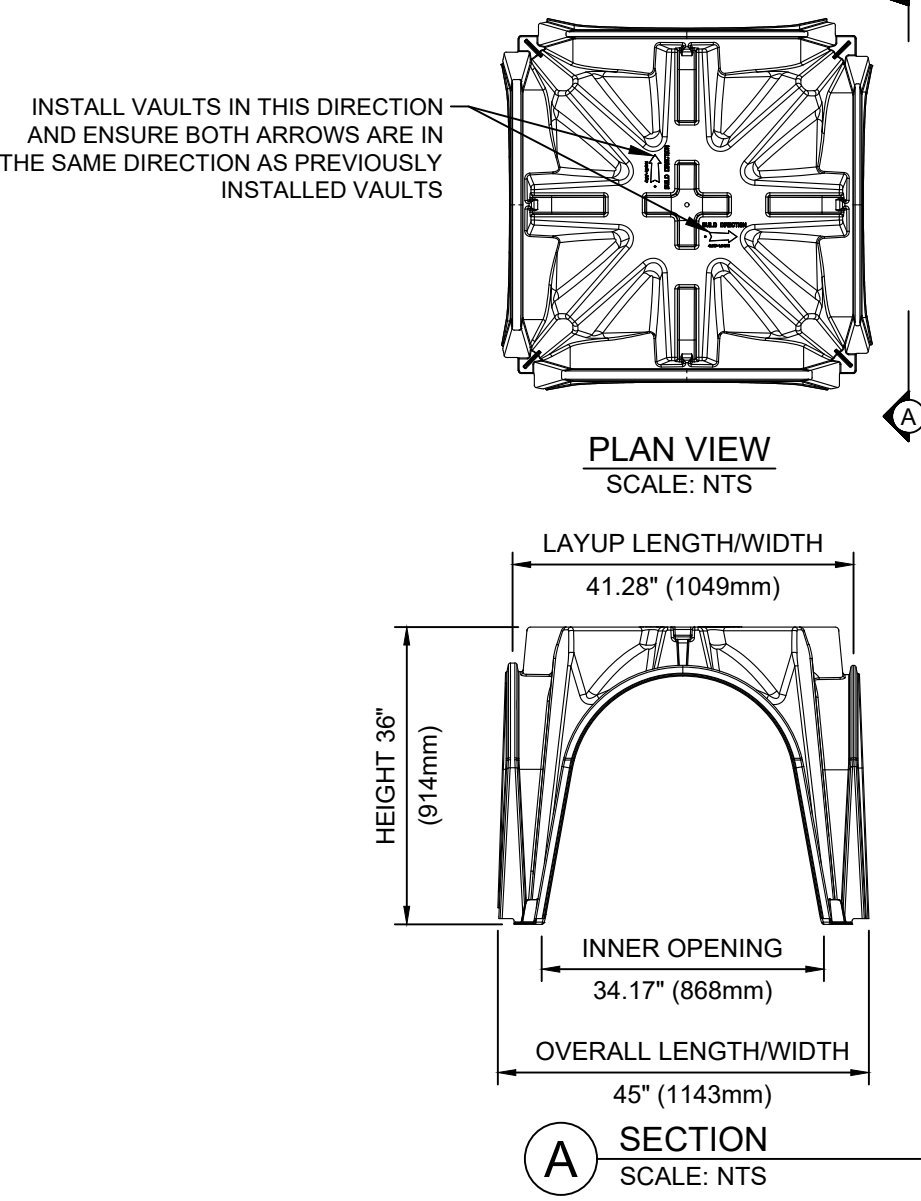
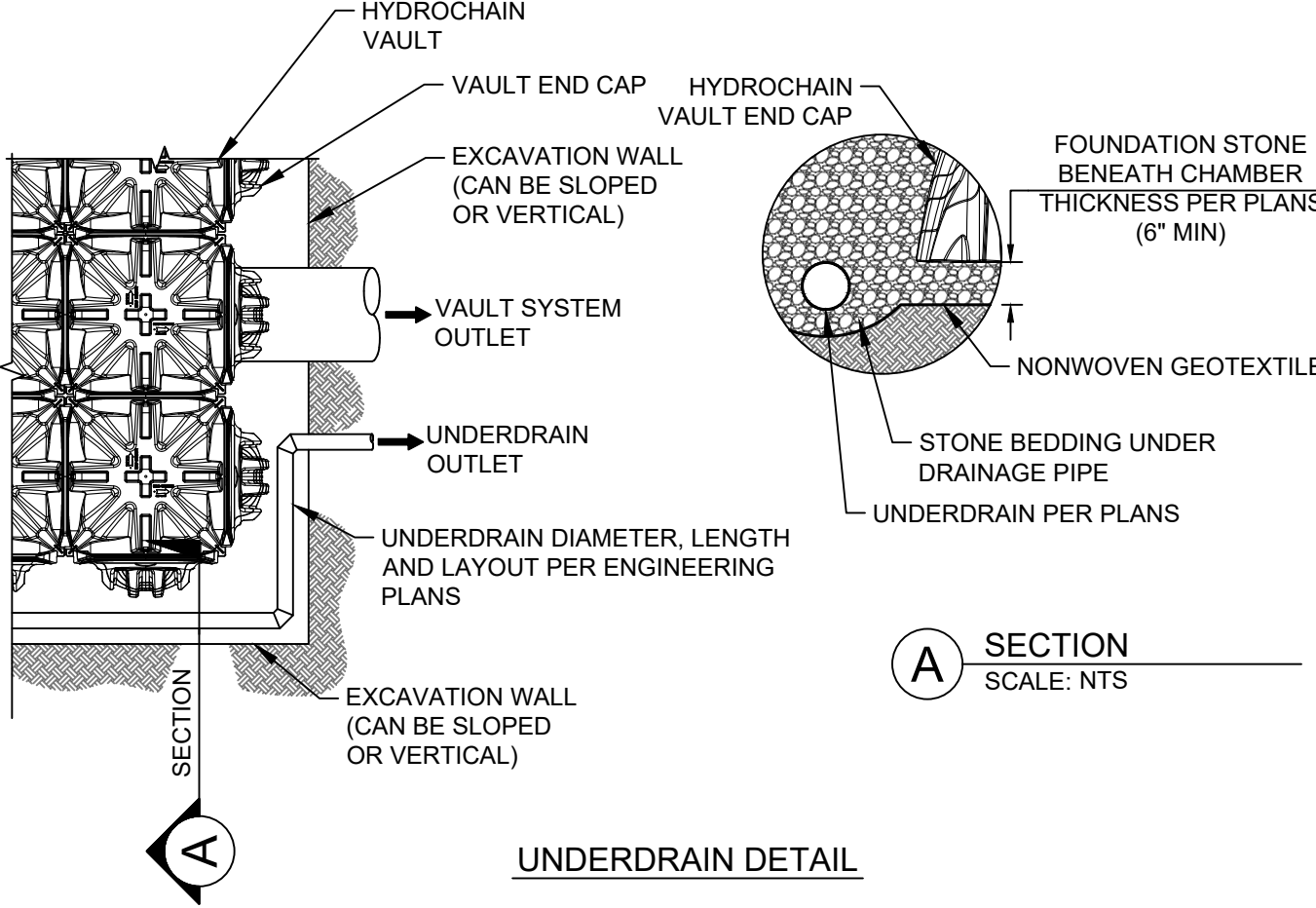
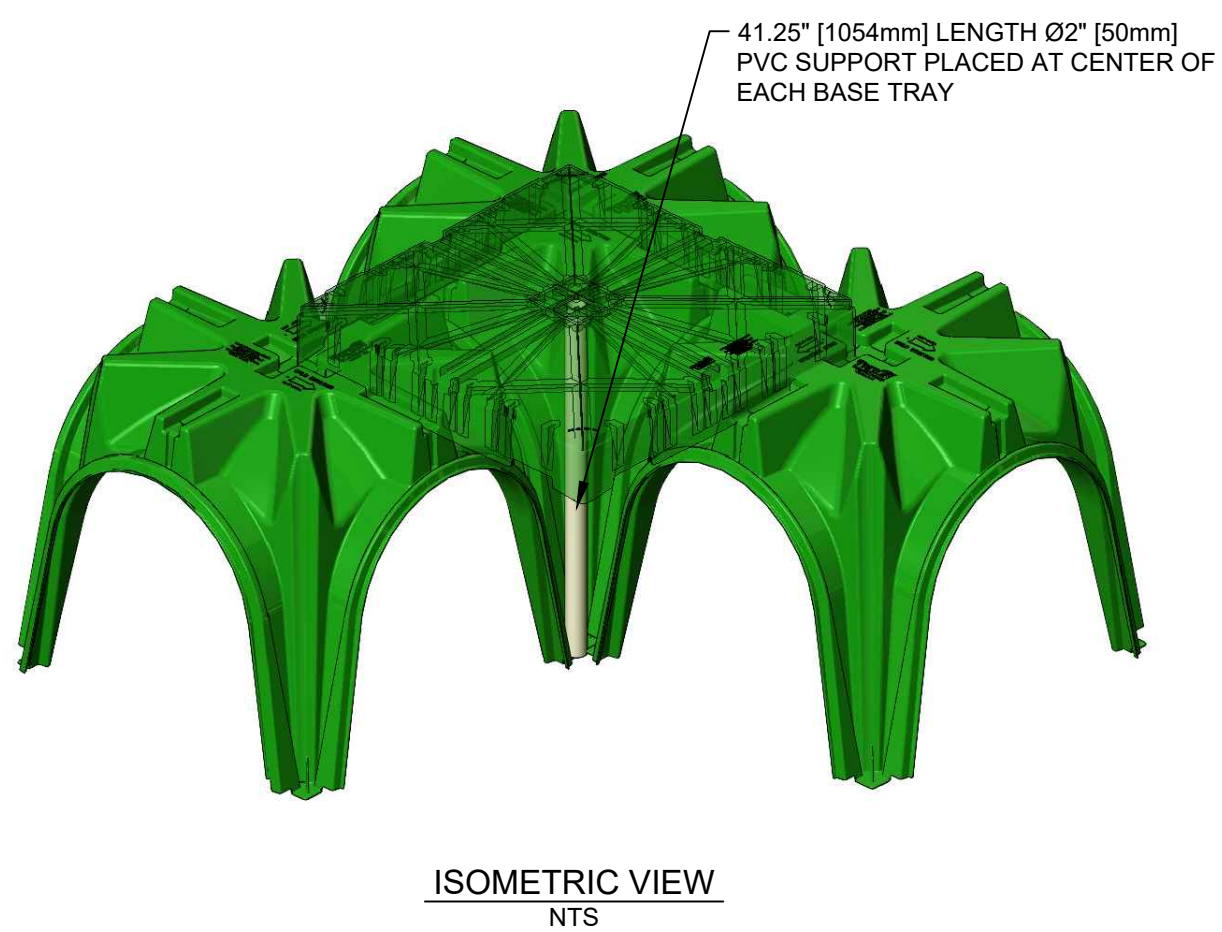
STANDARD FILL MATERIALS				
	MATERIAL LOCATION	DESCRIPTION	AASHTO M43 DESIGNATION	COMPACT/DENSITY REQUIREMENT
D	FILL MATERIAL FROM 18" (450mm) ABOVE VAULT TO GRADE	ANY SOIL/ROCK MATERIALS, NATIVE SOILS OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	PER PLANS	PREPARE PER ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	FILL MATERIAL FOR 12" (300mm) TO 18" (450mm) ABOVE VAULT AND 24" (600mm) FOR UNPAVED INSTALLATIONS	GRANULAR WELL-GRADED SOIL/ AGGREGATE MIXTURES, <35% FINES. MOST PAVEMENT SUB-BASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10 M145: A-1, A-2, A-3	COMPACT IN MAXIMUM 6" (150mm) LIFTS. SEE NOTES.
B	SIDE AND TOP STONE	3/8" - 1 1/2" (8-32mm) CLEAN, CRUSHED, ANGULAR STONE	5, 56, 57, 6	NO COMPACTION REQUIRED.
A	FOUNDATION STONE	3/8" - 1 1/2" (8-32mm) CLEAN, CRUSHED, ANGULAR STONE	5, 56, 57, 6	PLATE COMPACT OR ROLL. SEE NOTES.

NOTE:

- INSTALL VAULTS AND END CAPS IN ACCORDANCE WITH THE SITE SPECIFIC PLANS, HYDROCHAIN INSTALLATION MANUAL AND SUPPLEMENTAL DOCUMENTS. REFERENCE THE QR CODE BELOW.
- THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR.
- AS AN ALTERNATE TO PROCTOR TESTING AND FIELD DENSITY MEASUREMENTS ON OPEN GRADED STONE, HYDROCHAIN COMPACTION REQUIREMENTS ARE MET WHEN PLACED AND COMPACTED IN 6" (150mm) MAXIMUM LIFTS USING TWO FULL PASSES WITH A VIBRATORY COMPACTOR.

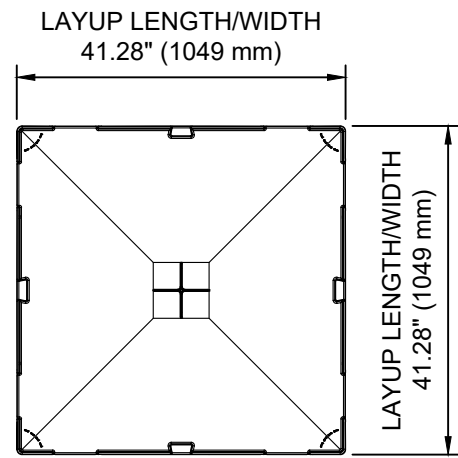


- NOTES:
- INSTALL FOREBAY, VAULTS, AND END CAPS IN ACCORDANCE WITH THE SITE SPECIFIC PLANS, HYDROCHAIN INSTALLATION MANUAL AND SUPPLEMENTAL DOCUMENTS. REFERENCE THE QR CODE BELOW FOR PRODUCT DOCUMENTS.
 - CONDUCT INSPECTION AND MAINTENANCE IN ACCORDANCE WITH HYDROCHAIN VAULT OPERATION AND MAINTENANCE MANUAL.

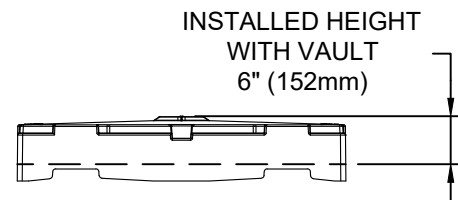


VAULT PROPERTIES	
NOMINAL DIMENSIONS (LAYUP LENGTH X LAYUP WIDTH X HEIGHT)	41.28" X 41.28" X 36.00" (1049mm X 1049mm X 914mm)
BARE CHAMBER STORAGE	28.79 CUBIC FEET (0.815 CUBIC METERS)
VAULT WEIGHT	50 lbs (22.7 kg)
INSTALLED STORAGE WITHOUT TRAY (6" BASE STONE, 12" TOP STONE)	36.21 CUBIC FEET (1.025 CUBIC METERS)
INSTALLED STORAGE WITH TRAY (6" BASE STONE, 12" TOP STONE)	43.78 CUBIC FEET (1.240 CUBIC METERS)
ASSUMING A MIN OF 6" (150mm) STONE BELOW, 12" (300mm) STONE ABOVE, AND 40% STONE POROSITY (DOES NOT INCLUDE 12" (300mm) PERIMETER STONE VOLUME)	

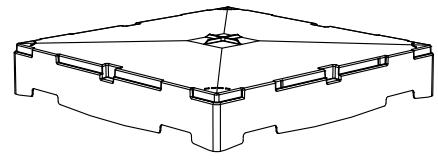
VAULT END CAP PROPERTIES	
NOMINAL DIMENSIONS (LAYUP LENGTH X LAYUP WIDTH X HEIGHT)	10.64" X 35.24" X 30.88" (270mm X 895mm X 784mm)
BARE END CAP STORAGE	2.16 CUBIC FEET (0.061 CUBIC METERS)
END CAP WEIGHT	15 lbs (6.8 kg)
ASSUMING A MIN OF 6" (150mm) STONE BELOW, 12" (300mm) STONE ABOVE, AND 40% STONE POROSITY (DOES NOT INCLUDE 12" (300mm) PERIMETER STONE VOLUME)	



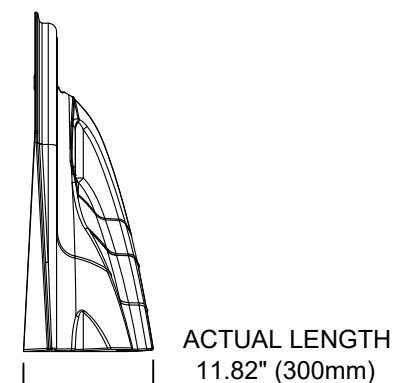
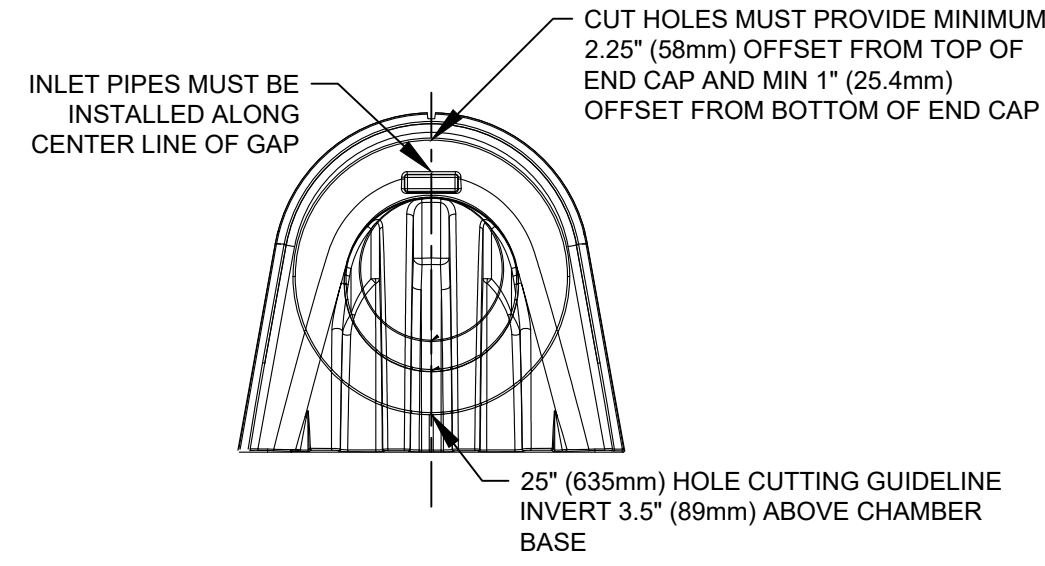
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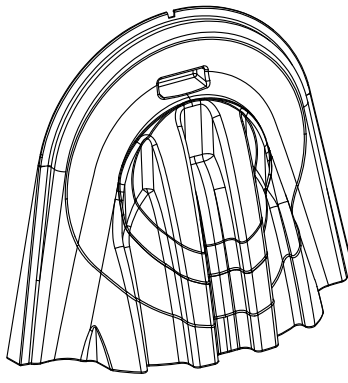
SIDE VIEW SCALE: NTS



ISOMETRIC SCALE: NTS



SIDE VIEW SCALE: NTS



ISOMETRIC SCALE: NTS

VAULT END CAP

GENERAL

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- CHAMBERS MUST BE MANUFACTURED BY COMPRESSION MOLDING OF FIBERGLASS REINFORCED COMPOSITE.
- CHAMBERS MUST BE EVALUATED AND TESTED TO MEET OR EXCEED THE STANDARDS IN ASTM F2418 STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS.
- CHAMBERS MUST HAVE AN OPEN BOTTOM. CHAMBERS MUST BE CONTINUOUS, UNOBSTRUCTED, AND WITHOUT INTERNAL SUPPORT THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION AND MAINTENANCE.
- THE INSTALLED CHAMBER SYSTEM MUST BE DESIGNED TO MEET THE LOAD REQUIREMENTS OF ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" FOR:
A. INSTANTANEOUS LIVE LOAD FROM AASHTO DESIGN TRUCK AT MINIMUM COVER
B. MAXIMUM DEAD LOAD (100-YEAR)
C. 1-WEEK AASHTO DESIGN TRUCK LOAD AT MINIMUM COVER
- THE INSTALLED CHAMBER SYSTEM MUST BE DESIGNED TO MEET THE LOAD REQUIREMENTS OF AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SPECIFICATION 12.12 FOR:
A. LONG-DURATION DEAD LOADS
B. SHORT-DURATION LIVE LOADS WITH IMPACT AND MULTIPLE VEHICLE PRESENCE
- CHAMBERS MUST MAINTAIN STIFFNESS THROUGH TEMPERATURE RANGES OF -40 DEGREES FAHRENHEIT TO 180 DEGREES FAHRENHEIT.
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- THE STORMWATER CHAMBER SYSTEM SHALL INCORPORATE A MAIN HEADER FOREBAY FOR STORMWATER TREATMENT AND SYSTEM MAINTENANCE WHICH HAS BEEN TESTED TO A MINIMUM OF 80% OF TSS REMOVAL FOLLOWING NJCAT TESTING PROTOCOLS.
- CHAMBERS AND END CAPS MUST BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

INSTALLATION

- INSTALLATION MUST NOT START UNTIL A PRE-CONSTRUCTION MEETING HAS BEEN HELD WITH THE MANUFACTURER'S REPRESENTATIVE AND THE INSTALLERS.
- INSTALLATION MUST BE IN ACCORDANCE WITH THE CONSTRUCTION PLANS AND HYDROCHAIN™ INSTALLATION MANUAL.
- BACKFILLING OVER CHAMBERS MUST NOT BE DONE WITH A DOZER OR AN EXCAVATOR LOCATED OVER THE CHAMBERS. SEE THE INSTALLATION MANUAL FOR MAXIMUM EQUIPMENT LOADS BASED ON THE DEPTH OF COVER OVER THE CHAMBERS. RECOMMENDED BACKFILL METHODS INCLUDE:
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- IT IS RECOMMENDED TO INSTALL EROSION AND SEDIMENT CONTROL MEASURES TO PROTECT THE STORMWATER SYSTEM DURING ALL PHASES OF CONSTRUCTION.



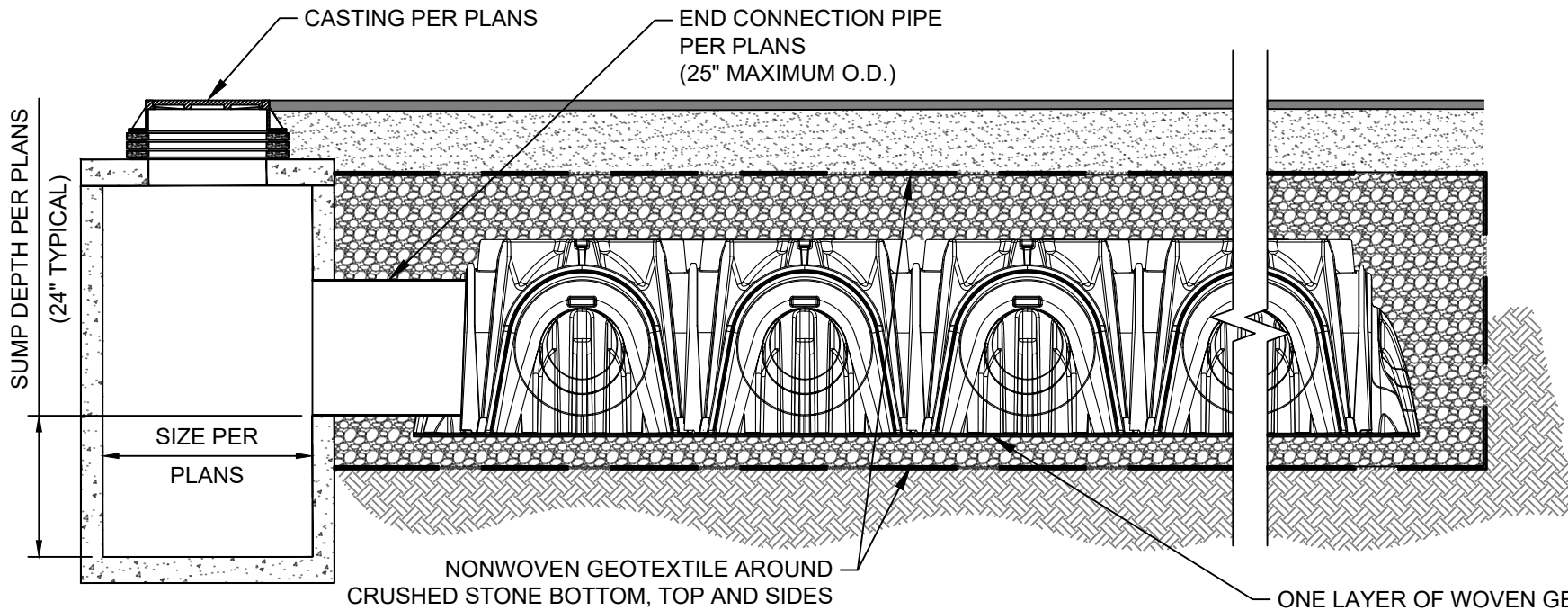
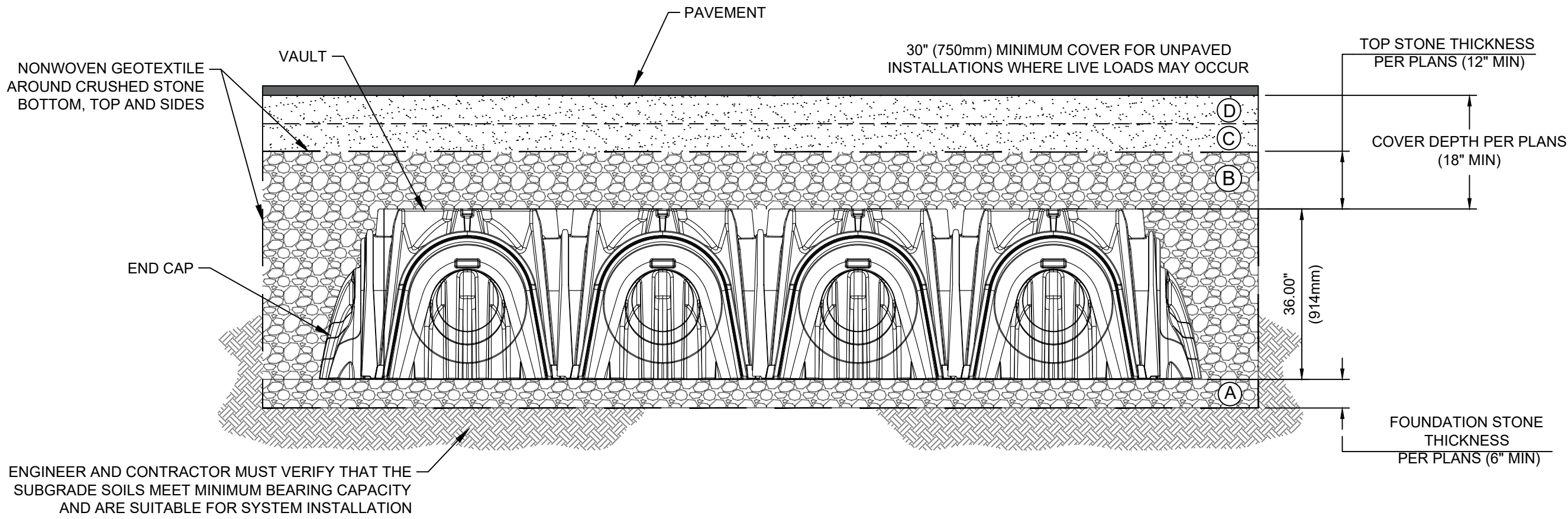
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HYDROCHAIN™
VAULT WITH TRAY
STANDARD DETAILS WITH LINER

STANDARD FILL MATERIALS				
	MATERIAL LOCATION	DESCRIPTION	AASHTO M43 DESIGNATION	COMPACT/DENSITY REQUIREMENT
D	FILL MATERIAL FROM 18" (450mm) ABOVE VAULT TO GRADE	ANY SOIL/ROCK MATERIALS, NATIVE SOILS OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	PER PLANS	PREPARE PER ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	FILL MATERIAL FOR 12" (300mm) TO 18" (450mm) ABOVE VAULT AND 24" (600mm) FOR UNPAVED INSTALLATIONS	GRANULAR WELL-GRADED SOIL/ AGGREGATE MIXTURES, <35% FINES. MOST PAVEMENT SUB-BASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10 M145: A-1, A-2, A-3	COMPACT IN MAXIMUM 6" (150mm) LIFTS. SEE NOTES.
B	SIDE AND TOP STONE	3/8" - 1 1/2" (8-32mm) CLEAN, CRUSHED, ANGULAR STONE	5, 56, 57, 6	NO COMPACTION REQUIRED.
A	FOUNDATION STONE	3/8" - 1 1/2" (8-32mm) CLEAN, CRUSHED, ANGULAR STONE	5, 56, 57, 6	PLATE COMPACT OR ROLL. SEE NOTES.

NOTE:
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2. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR.
3. AS AN ALTERNATE TO PROCTOR TESTING AND FIELD DENSITY MEASUREMENTS ON OPEN GRADED STONE, HYDROCHAIN COMPACTION REQUIREMENTS ARE MET WHEN PLACED AND COMPACTED IN 6" (150mm) MAXIMUM LIFTS USING TWO FULL PASSES WITH A VIBRATORY COMPACTOR.

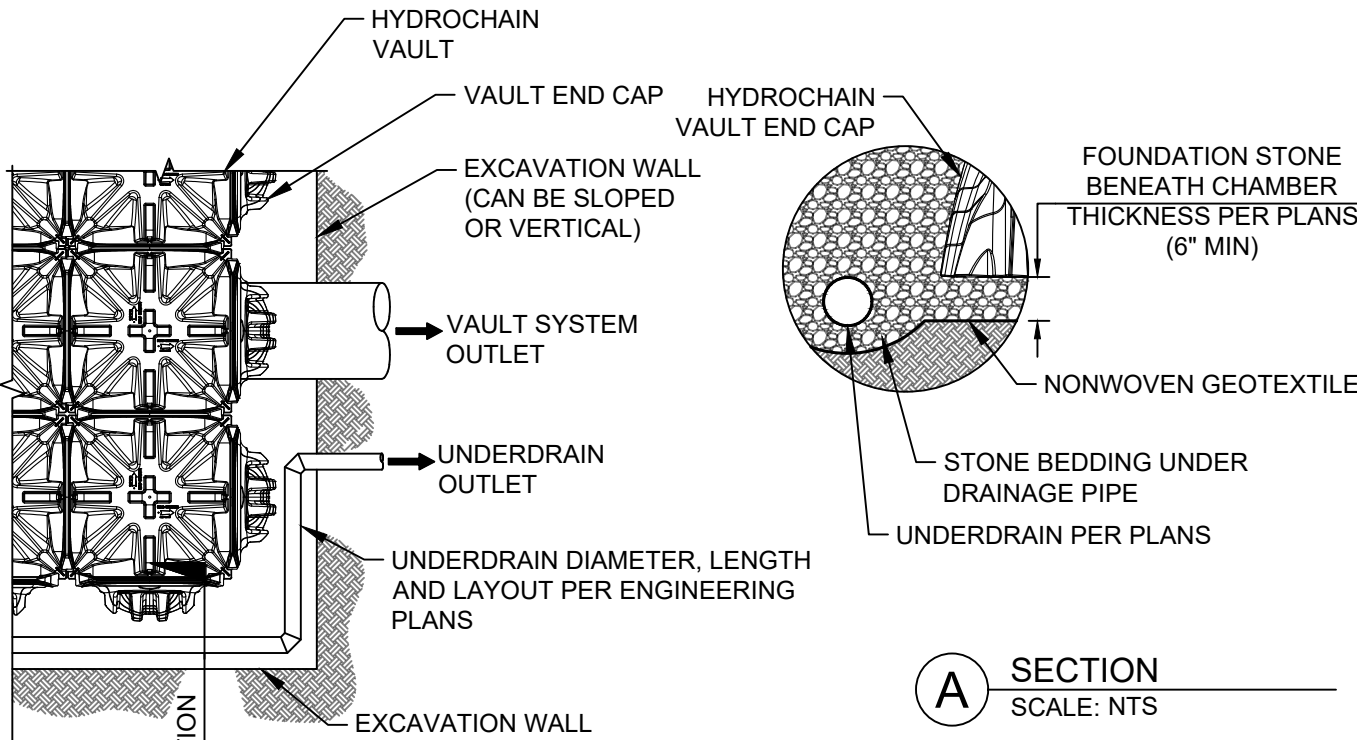


VAULT CROSS SECTION

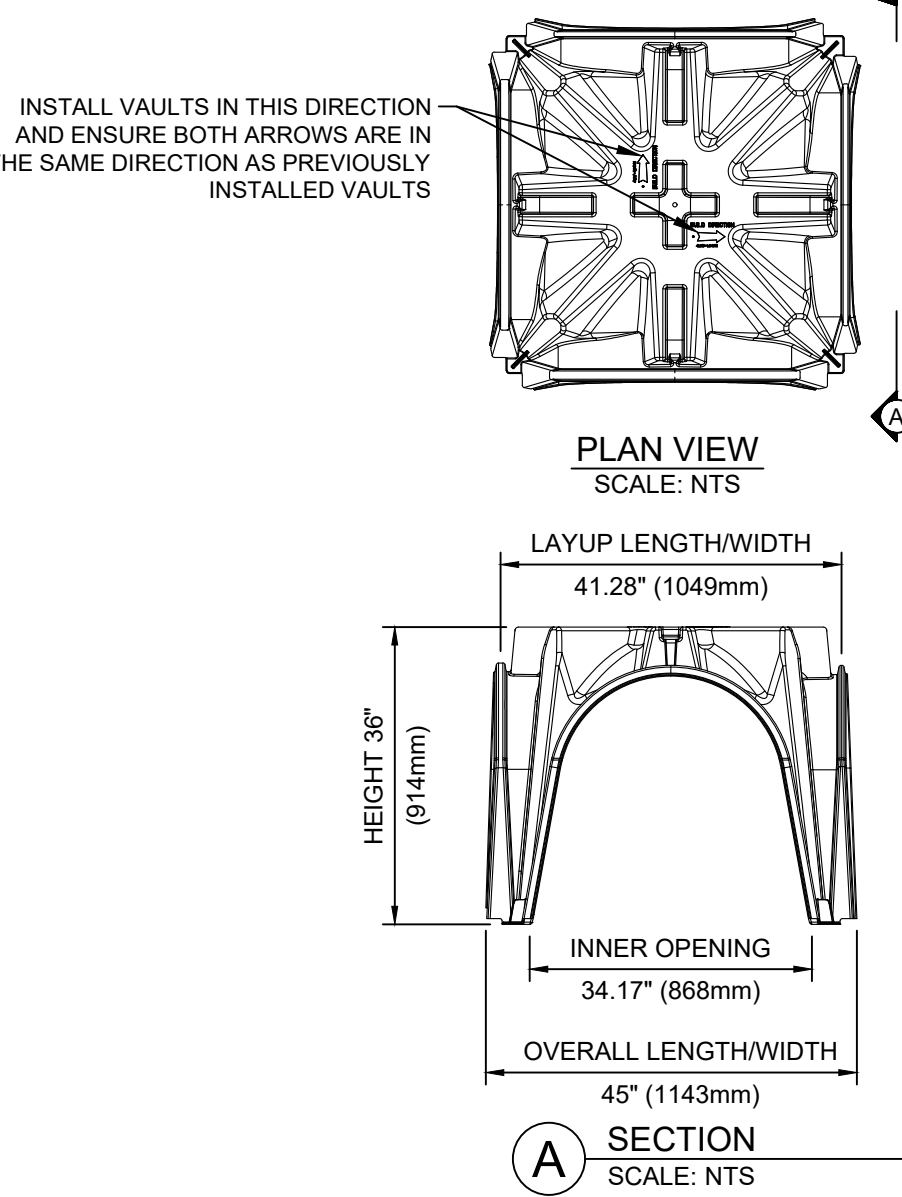
- NOTES:
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ISOMETRIC VIEW
NTS

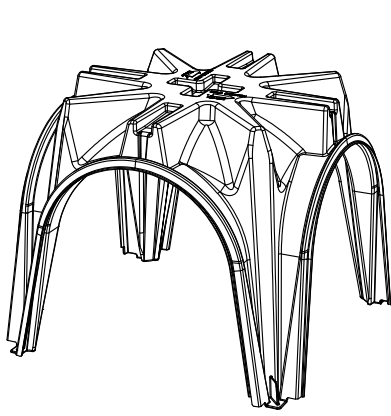


UNDERDRAIN DETAIL

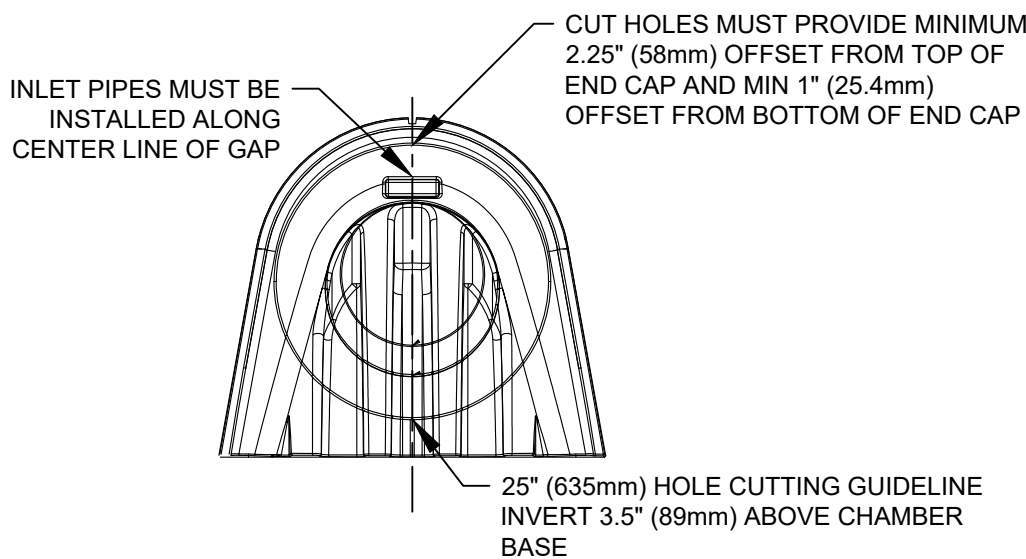


PLAN VIEW
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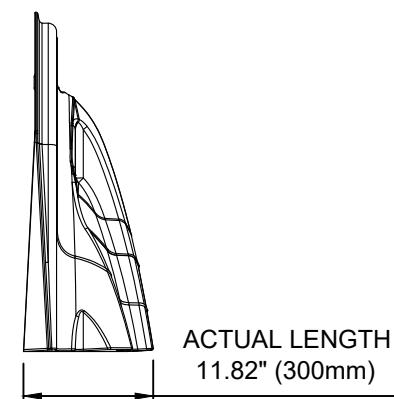
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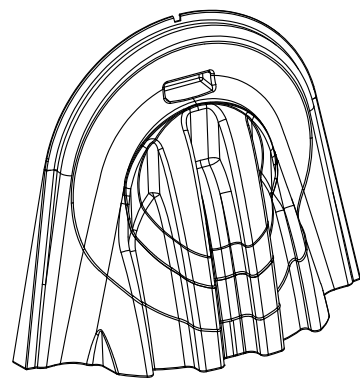
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VAULT END CAP: ALLOWED PIPE PLACEMENT AREA
SCALE: NTS



SIDE VIEW
SCALE: NTS



ISOMETRIC
SCALE: NTS

VAULT END CAP

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INSTALLATION

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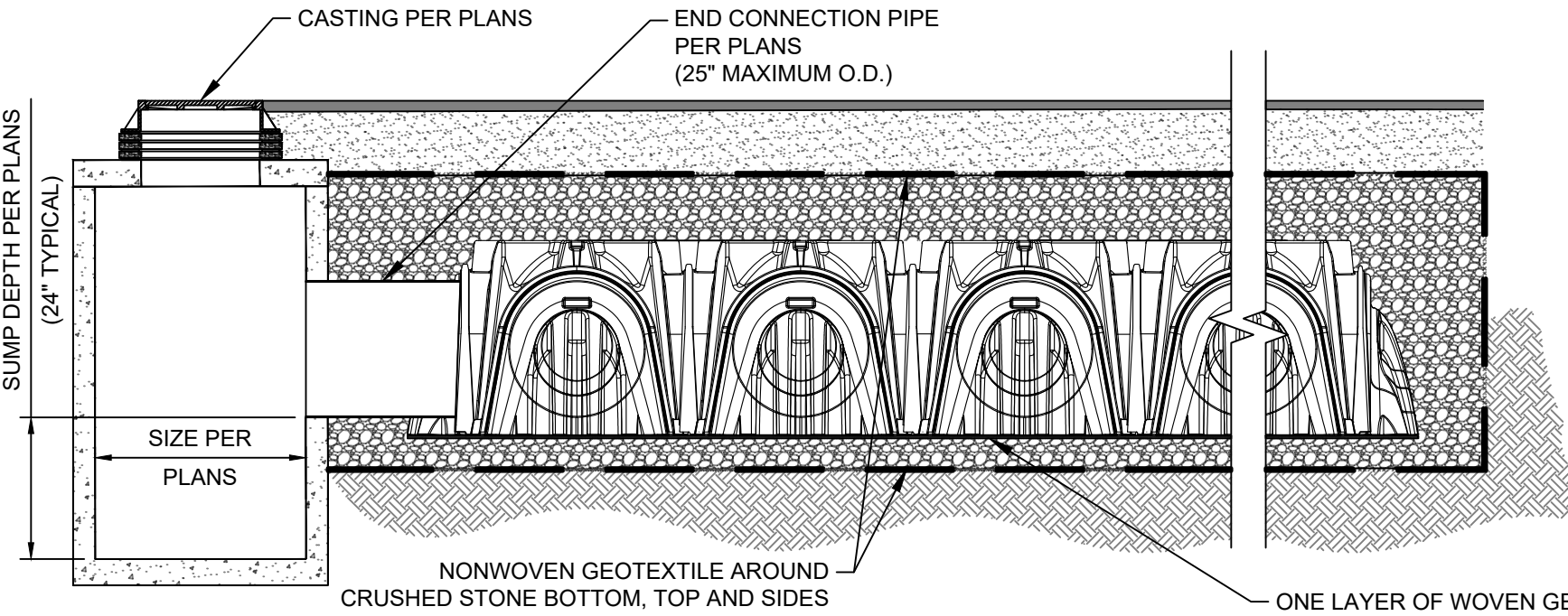
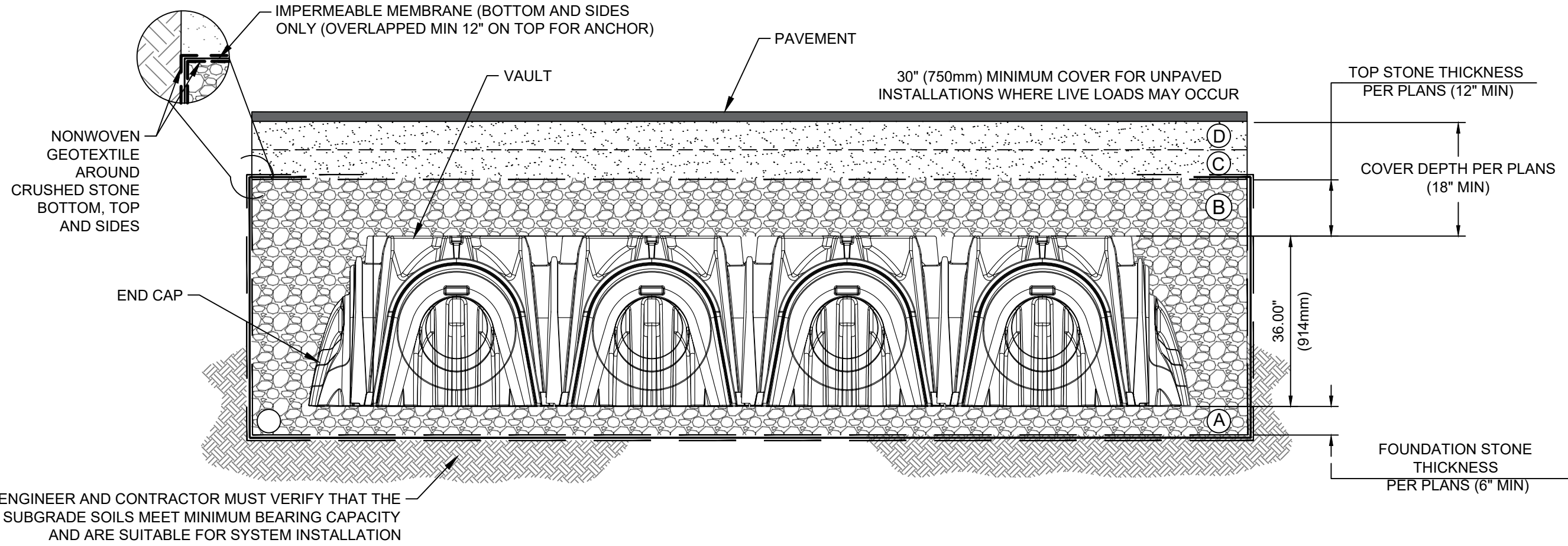


HYDROCHAIN™
VAULT
STANDARD DETAILS

STANDARD FILL MATERIALS				
	MATERIAL LOCATION	DESCRIPTION	AASHTO M43 DESIGNATION	COMPACT/DENSITY REQUIREMENT
D	FILL MATERIAL FROM 18" (450mm) ABOVE VAULT TO GRADE	ANY SOIL/ROCK MATERIALS, NATIVE SOILS OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	PER PLANS	PREPARE PER ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
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B	SIDE AND TOP STONE	3/8" - 1 1/2" (8-32mm) CLEAN, CRUSHED, ANGULAR STONE	5, 56, 57, 6	NO COMPACTION REQUIRED.
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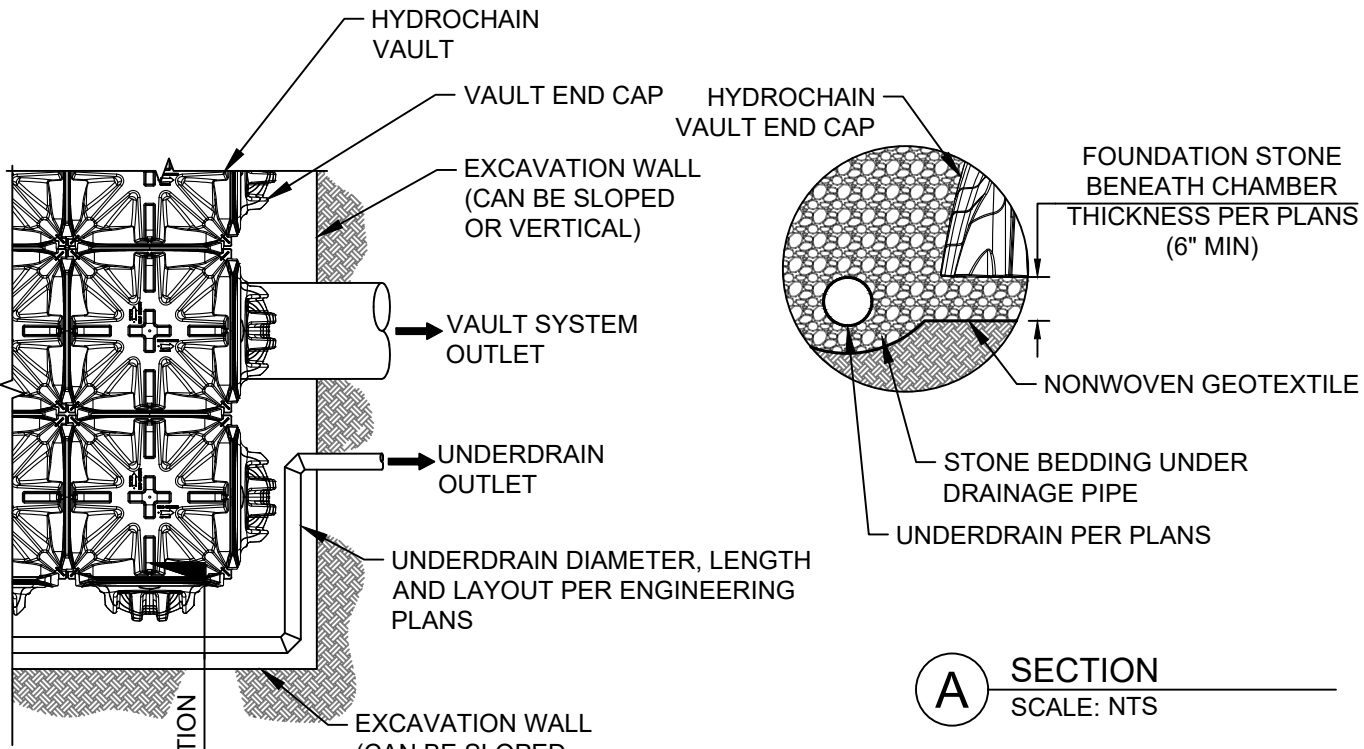


VAULT CROSS SECTION

- NOTES:
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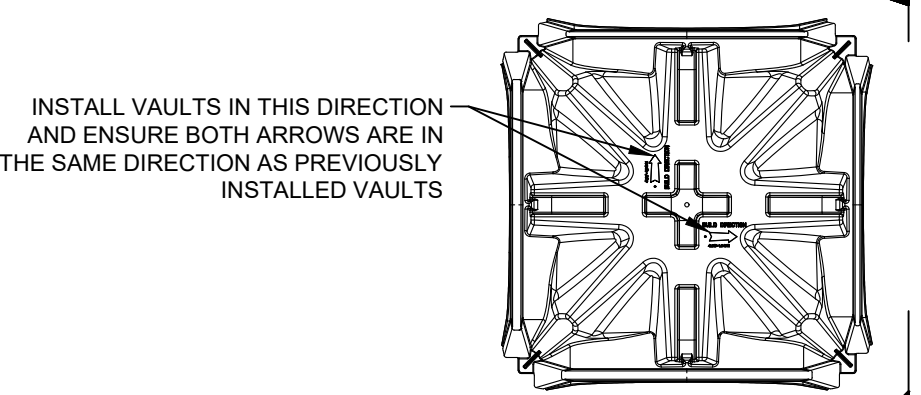


ISOMETRIC VIEW
NTS

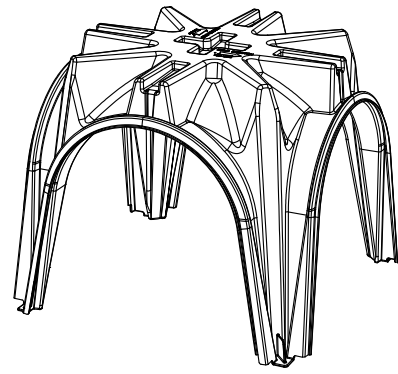


UNDERDRAIN DETAIL

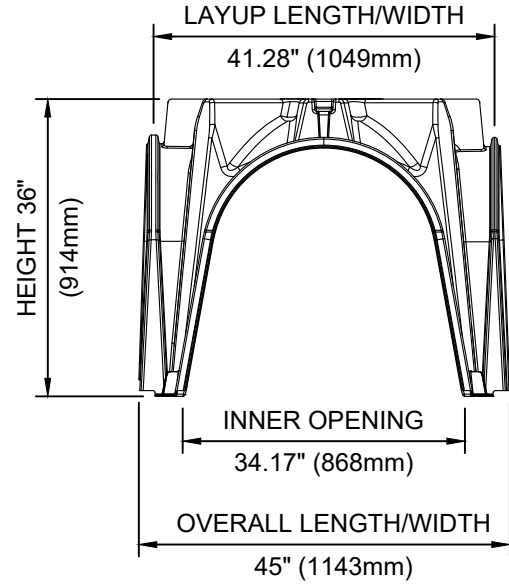
A SECTION
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PLAN VIEW
SCALE: NTS

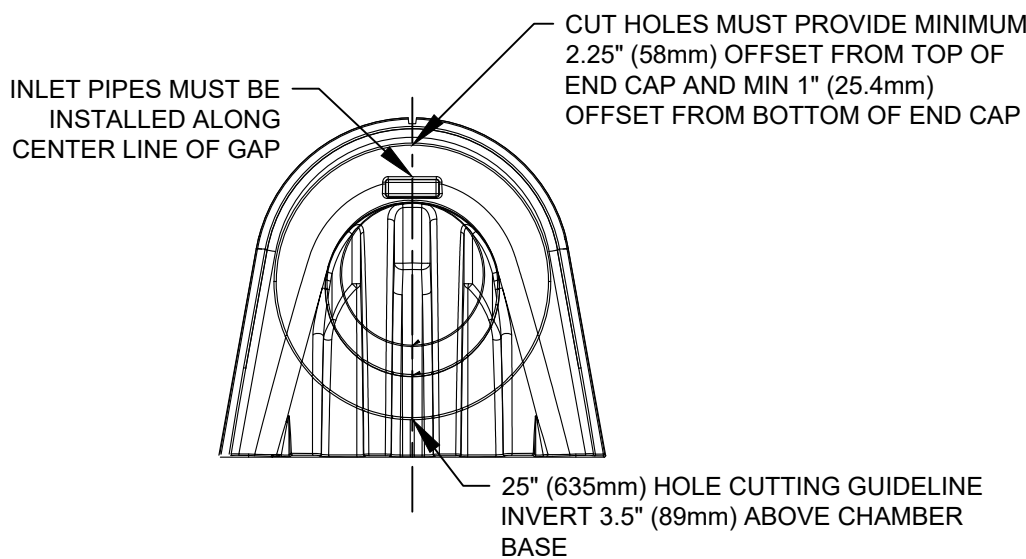


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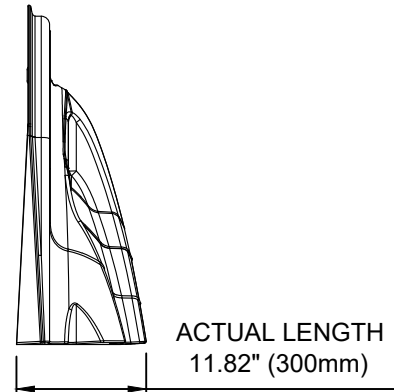


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SCALE: NTS

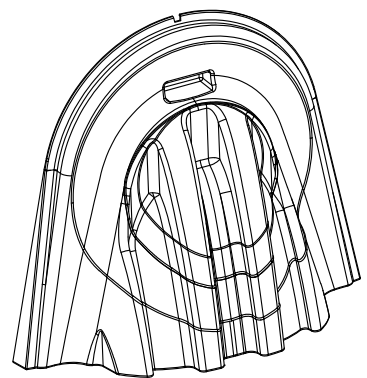
VAULT



VAULT END CAP: ALLOWED PIPE PLACEMENT AREA
SCALE: NTS



SIDE VIEW
SCALE: NTS



ISOMETRIC
SCALE: NTS

VAULT END CAP

GENERAL

1. CHAMBERS MUST BE XERXES® HYDROCHAIN™ VAULT. ONLY PRODUCTS APPROVED BY THE SITE DESIGN ENGINEER ARE PERMITTED.
2. CHAMBERS MUST BE MANUFACTURED BY COMPRESSION MOLDING OF FIBERGLASS REINFORCED COMPOSITE.
3. CHAMBERS MUST BE EVALUATED AND TESTED TO MEET OR EXCEED THE STANDARDS IN ASTM F2418 STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS.
4. CHAMBERS MUST HAVE AN OPEN BOTTOM. CHAMBERS MUST BE CONTINUOUS, UNOBSTRUCTED, AND WITHOUT INTERNAL SUPPORT THAT WOULD IMPEDE FLOW OR LIMIT ACCESS FOR INSPECTION AND MAINTENANCE.
5. THE INSTALLED CHAMBER SYSTEM MUST BE DESIGNED TO MEET THE LOAD REQUIREMENTS OF ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" FOR:
A. INSTANTANEOUS LIVE LOAD FROM AASHTO DESIGN TRUCK AT MINIMUM COVER
B. MAXIMUM DEAD LOAD (100-YEAR)
C. 1-WEEK AASHTO DESIGN TRUCK LOAD AT MINIMUM COVER
6. THE INSTALLED CHAMBER SYSTEM MUST BE DESIGNED TO MEET THE LOAD REQUIREMENTS OF AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, SPECIFICATION 12.12 FOR:
A. LONG-DURATION DEAD LOADS
B. SHORT-DURATION LIVE LOADS WITH IMPACT AND MULTIPLE VEHICLE PRESENCE
7. CHAMBERS MUST MAINTAIN STIFFNESS THROUGH TEMPERATURE RANGES OF -40 DEGREES FAHRENHEIT TO 180 DEGREES FAHRENHEIT.
8. THE CHAMBER MUST INTERCONNECT USING AN OVERLAPPING CORRUGATION JOINT.
9. THE STORMWATER CHAMBER SYSTEM SHALL INCORPORATE A MAIN HEADER FOREBAY FOR STORMWATER TREATMENT AND SYSTEM MAINTENANCE WHICH HAS BEEN TESTED TO A MINIMUM OF 80% OF TSS REMOVAL FOLLOWING NJCAT TESTING PROTOCOLS.
10. CHAMBERS AND END CAPS MUST BE PRODUCED AT AN ISO 9001 CERTIFIED MANUFACTURING FACILITY.

INSTALLATION

1. INSTALLATION MUST NOT START UNTIL A PRE-CONSTRUCTION MEETING HAS BEEN HELD WITH THE MANUFACTURER'S REPRESENTATIVE AND THE INSTALLERS.
2. INSTALLATION MUST BE IN ACCORDANCE WITH THE CONSTRUCTION PLANS AND HYDROCHAIN™ INSTALLATION MANUAL.
3. BACKFILLING OVER CHAMBERS MUST NOT BE DONE WITH A DOZER OR AN EXCAVATOR LOCATED OVER THE CHAMBERS. SEE THE INSTALLATION MANUAL FOR MAXIMUM EQUIPMENT LOADS BASED ON THE DEPTH OF COVER OVER THE CHAMBERS. RECOMMENDED BACKFILL METHODS INCLUDE:
A. USING A STONE SHOOTER LOCATED OFF THE CHAMBER BED.
B. BACKFILLING WHILE PLACING ROWS USING AN EXCAVATOR ON THE FOUNDATION STONE OR SUBGRADE.
C. BACKFILLING FROM OUTSIDE THE EXCAVATION USING A LONG BOOM EXCAVATOR.
4. THE FOUNDATION STONE MUST BE LEVELED AND COMPACTED BEFORE PLACING CHAMBERS.
5. JOINTS BETWEEN CHAMBERS MUST BE PROPERLY SEATED BEFORE PLACING STONE.
6. EMBEDMENT STONE SURROUNDING CHAMBERS MUST BE CLEAN, CRUSHED, ANGULAR STONE MEASURING 3/8 - 1 1/2 INCHES (20-50 MM).
7. ANY DISCREPANCIES WITH CHAMBER FOUNDATION BEARING CAPACITIES MUST BE REPORTED TO THE SITE ENGINEER.
8. IT IS RECOMMENDED TO INSTALL EROSION AND SEDIMENT CONTROL MEASURES TO PROTECT THE STORMWATER SYSTEM DURING ALL PHASES OF CONSTRUCTION.

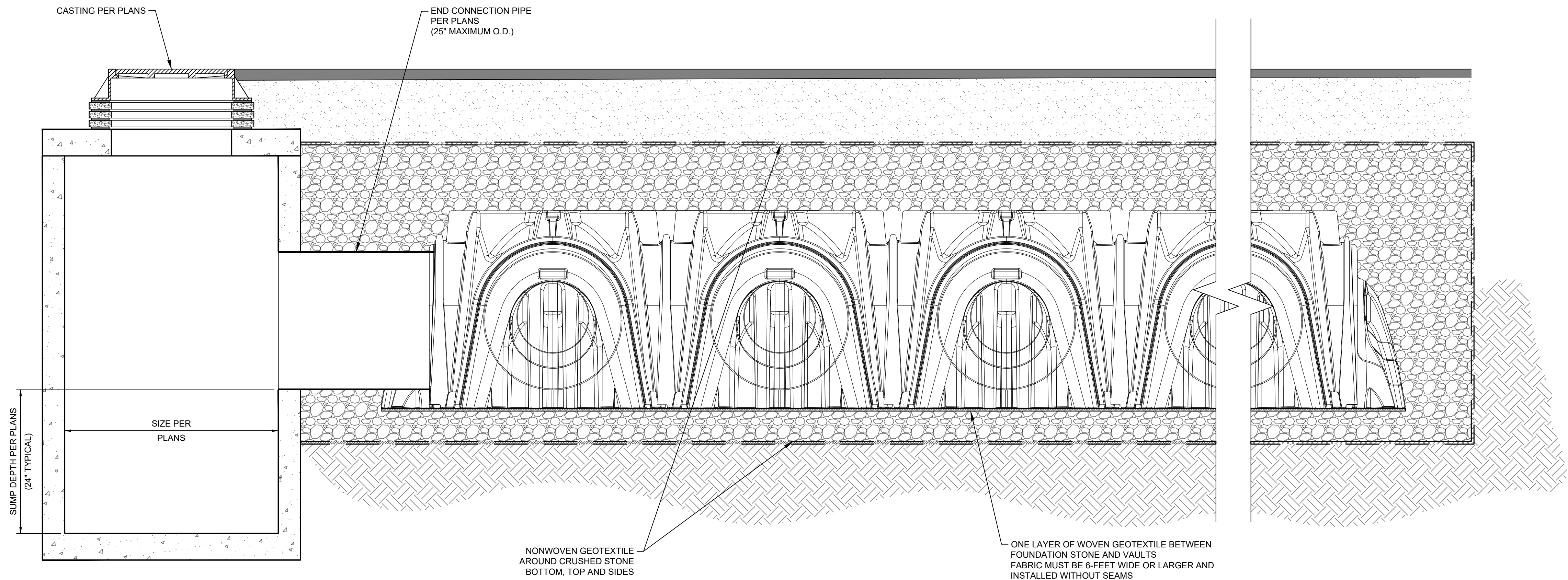


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HYDROCHAIN™
VAULT STANDARD DETAILS
WITH LINER

- NOTES:
1. INSTALL THE FOREBAY, VAULTS, AND END CAPS IN ACCORDANCE WITH THE SITE SPECIFIC PLANS, HYDROCHAIN INSTALLATION MANUAL AND SUPPLEMENTAL DOCUMENTS. REFERENCE THE QR CODE BELOW FOR PRODUCT DOCUMENTS.
 2. CONDUCT INSPECTION AND MAINTENANCE IN ACCORDANCE WITH HYDROCHAIN VAULT OPERATION AND MAINTENANCE MANUAL.

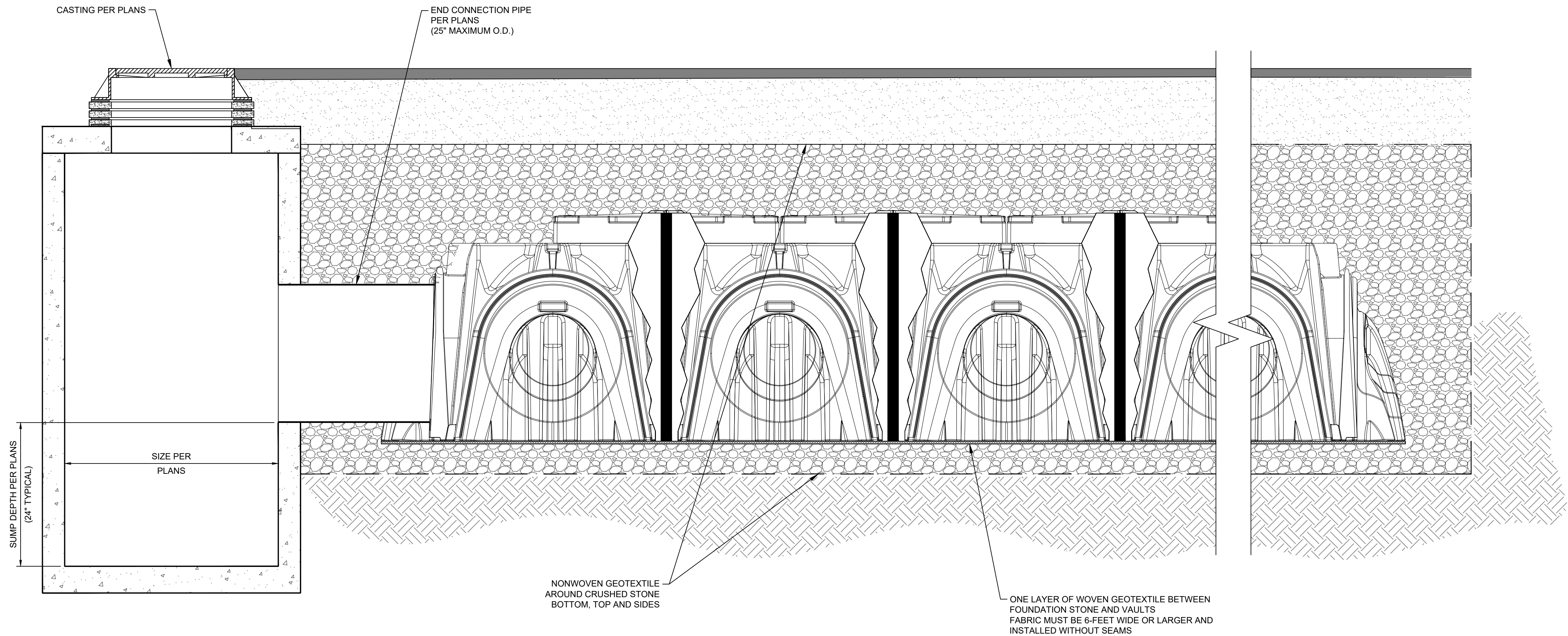


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HYDROCHAIN™
VAULT
FOREBAY DETAIL

- NOTES:
1. INSTALL THE FOREBAY, VAULTS, AND END CAPS IN ACCORDANCE WITH THE SITE SPECIFIC PLANS, HYDROCHAIN INSTALLATION MANUAL AND SUPPLEMENTAL DOCUMENTS. REFERENCE THE QR CODE BELOW FOR PRODUCT DOCUMENTS.
 2. CONDUCT INSPECTION AND MAINTENANCE IN ACCORDANCE WITH HYDROCHAIN VAULT OPERATION AND MAINTENANCE MANUAL.



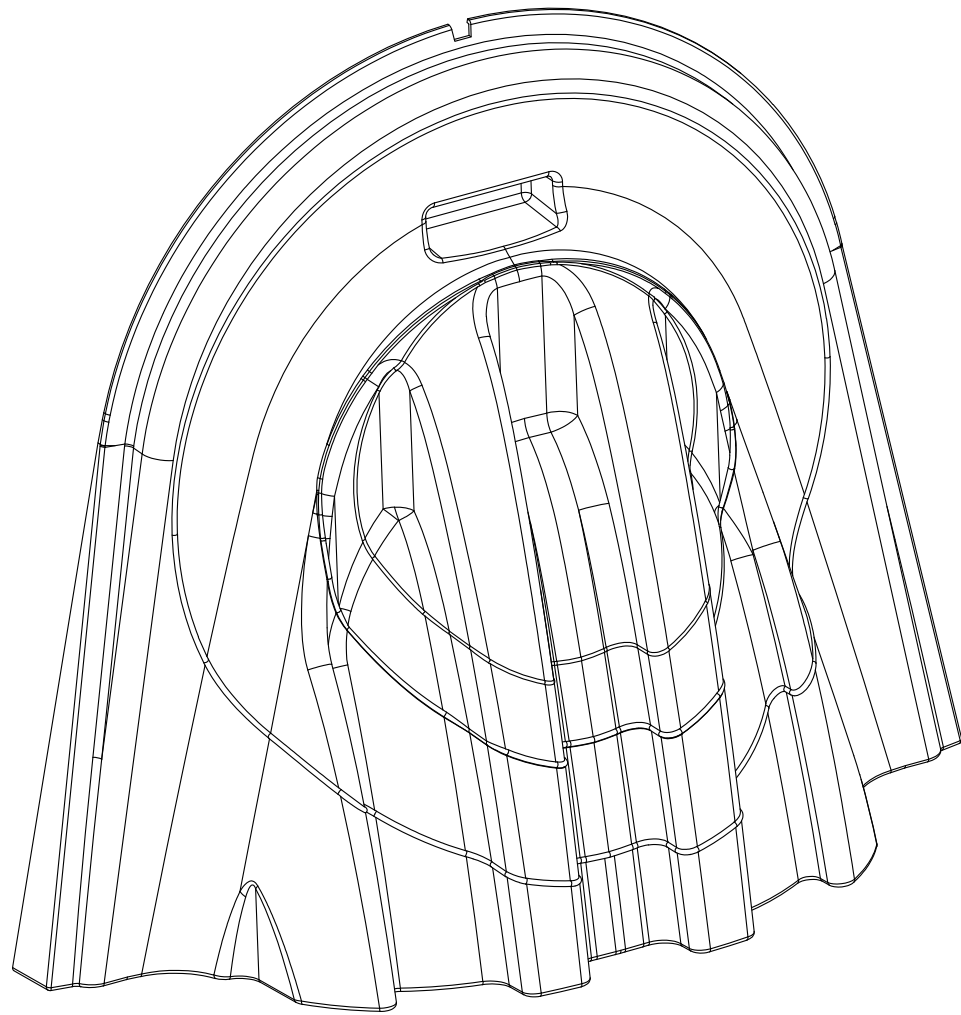
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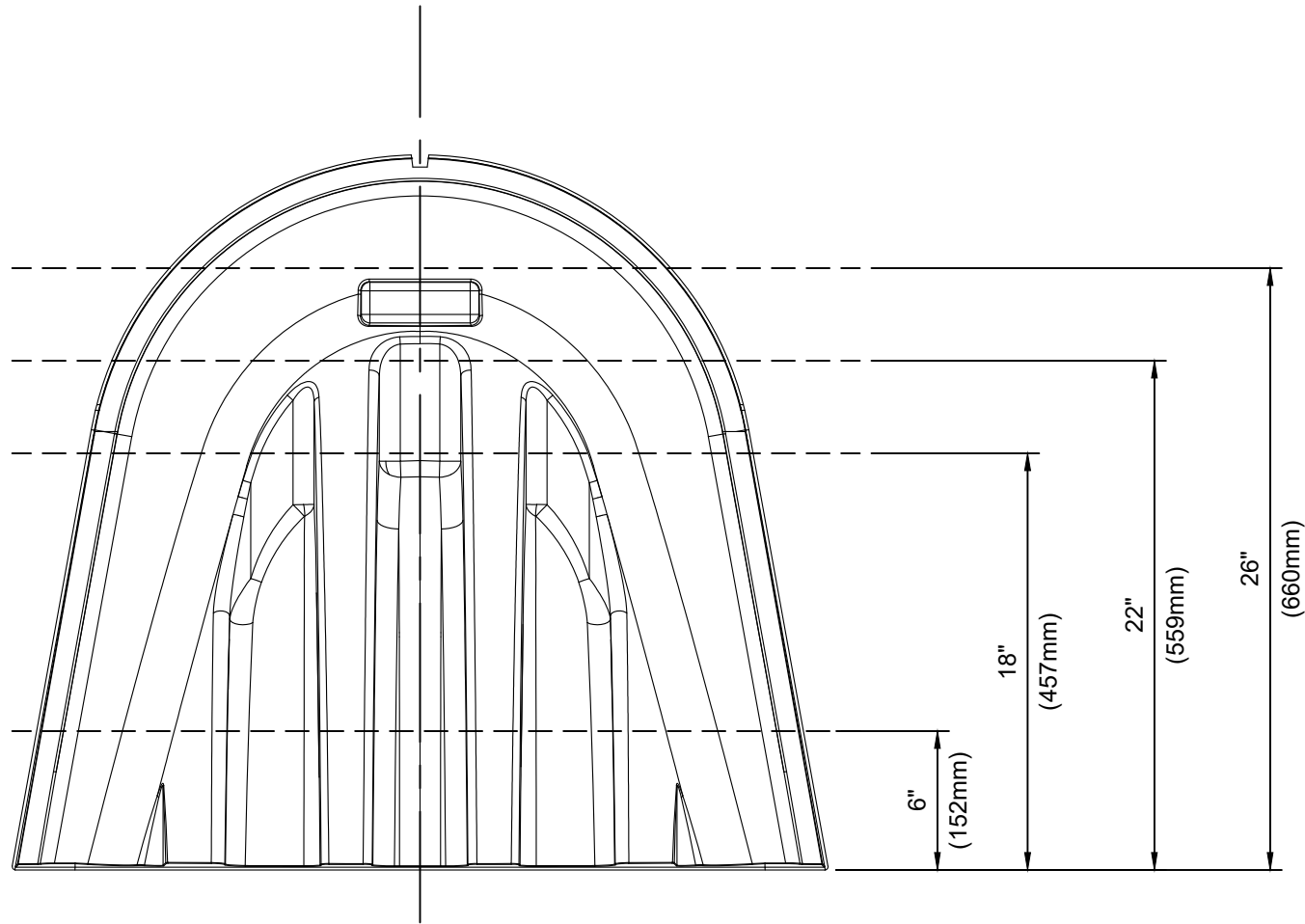
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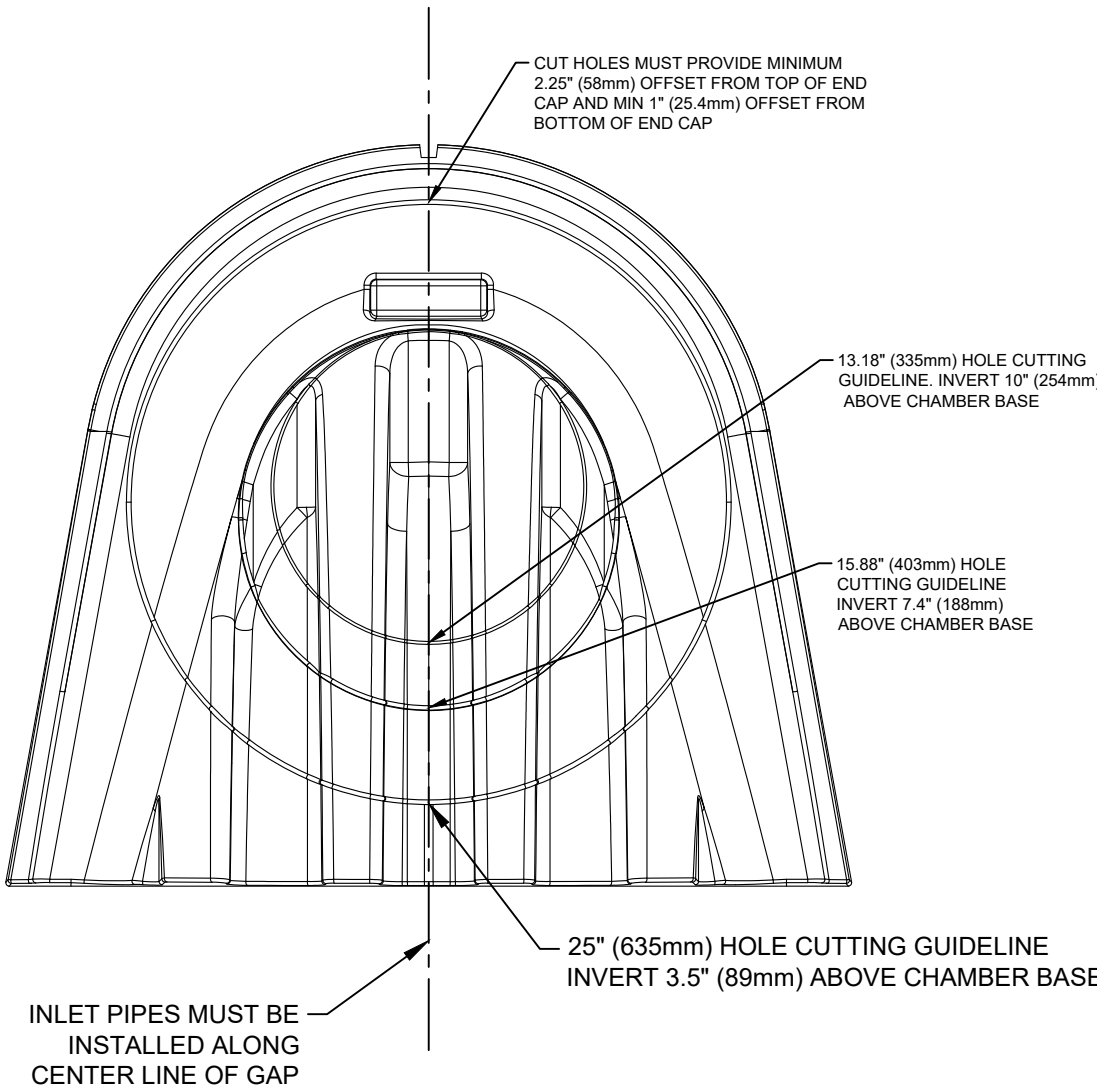
HYDROCHAIN™
VAULT WITH TRAY
FOREBAY DETAIL



ISOMETRIC VIEW
SCALE: NTS



A FLOW AREA
SCALE: NTS



B END CAP
SCALE: NTS

CONNECTION PIPE COMPATIBILITY TABLE			
PIPE SIZE	PIPE MATERIAL ¹	HOLE CUT ² MIN-MAX	END CAP
12"	PVC	12.75"-13.75" (324mm-349mm)	X
	HDPE/PP	14.5"-15.5" (368mm-394mm)	X
	RCP	17.5"-18.5" (445mm-470mm)	X
15"	PVC	16"-17" (406mm-431mm)	X
	HDPE/PP	22"-23" (559mm-584mm)	X
	RCP	23"-24" (584mm-610mm)	X
18"	PVC	18"-19" (457mm-483mm)	X
	HDPE/PP	22"-23" (559mm-584mm)	X
	RCP	23"-24" (584mm-610mm)	X
24"	PVC	24"-25" (610mm-635mm)	X
	HDPE/PP	28"-29" (711mm-737mm)	
	RCP	30"-31" (762mm-787mm)	

1. PVC HOLE CUT SIZES BASED ON SCH-40, SCH-80, SDR-35, AND SDR-26 PIPES. HDPE/PP HOLE CUT SIZES BASED ON INDUSTRY STANDARD PIPES CONFORMING TO ASTM F2881/F2306/F2648. RCP HOLE CUT SIZES BASED ON INDUSTRY STANDARD PIPES CONFORMING TO ASTM C76/C655.
2. CUT THE HOLE TO MINIMIZE GAPS BETWEEN THE CONNECTING PIPE O.D. AND CHAMBER HOLE I.D.



SCAN FOR STEP-BY-STEP VIDEO INSTRUCTIONS AND DEMONSTRATION OF CUTTING HOLES FOR PIPES
<https://www.youtube.com/watch?v=h3VjsUkOkIY>

- NOTES:
1. CUT CHAMBERS AND END CAPS IN ACCORDANCE WITH THE HYDROCHAIN CHAMBER SUPPLEMENTAL INSTRUCTIONS AND INSTALLATION MANUAL. REFERENCE THE QR CODE BELOW FOR PRODUCT DOCUMENTS.

- RECOMMENDED EQUIPMENT:
1. PERSONAL PROTECTION EQUIPMENT (PPE): GLOVES, SAFETY GLASSES, FACE SHIELD, LONG-SLEEVE SHIRT, RESPIRATOR MASK, HEARING PROTECTION, SAFETY-TOED SHOES, HARDHAT, HIGH-VISIBILITY CLOTHING.
2. HAND TOOLS: MARKER, RECIPROCATING SAW WITH BIMETAL TAPERED BLADES, DRILL WITH 0.5" BITS, ANGLE GRINDER, TAPE MEASURE.
3. EXPENDABLES: SPRAY FOAM GAP SEALER TO FILL GAPS BETWEEN PIPE O.D. AND HOLE.

CUT HEIGHT ABOVE END CAP BASE		FLOW AREA PER CUT	
in	mm	ft²	m²
6	152	4.161	0.387
7	178	3.943	0.367
8	203	3.728	0.347
9	229	3.517	0.327
10	254	3.307	0.308
11	279	3.101	0.289
12	305	2.897	0.270
13	330	2.695	0.251
14	356	2.496	0.232
15	381	2.299	0.214
16	406	2.105	0.196
17	432	1.913	0.178
18	457	1.724	0.161
19	483	1.537	0.143
20	508	1.354	0.126
21	533	1.174	0.109
22	559	0.998	0.093
23	584	0.829	0.078
24	610	0.668	0.063
25	635	0.516	0.048
26	660	0.375	0.035
27	686	0.248	0.024
28	711	0.139	0.013
29	737	0.052	0.005

TREATMENT VOLUME CAN BE ADJUSTED BY INCREASING OR DECREASING THE BYPASS ELEVATION OF THE INNER FOREBAY END CAP CUTS. IN ORDER TO MATCH ANY INCOMING FLOWRATE, MATCH THE TOTAL PIPE AREA OF INLET FLOW TO THE TOTAL FLOW AREA FROM THE HYDROCHAIN MAIN HEADER ROW TO THE STORAGE ROWS.

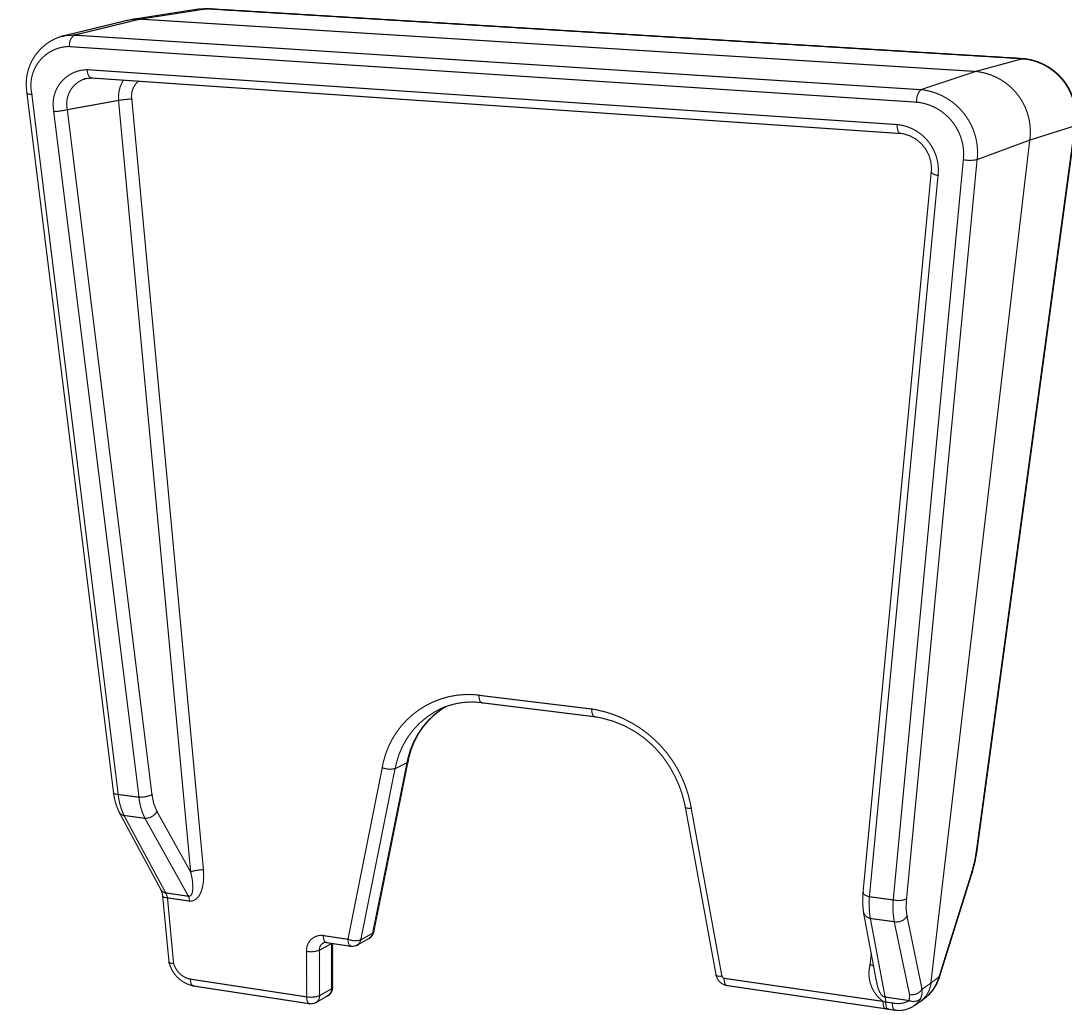
EXAMPLE: A 24" PIPE HAS AN AREA OF 3.14 FT². IF THE END CAPS ARE CUT AT 20" ABOVE THE END CAP BASE THE FLOW AREA PER CUT IS 1.354 FT². 3.14 FT² DIVIDED BY 1.354 FT² = 2.3. 3 INNER FOREBAY END CAPS MUST BE CUT IN ORDER TO ACCOMMODATE THAT FLOW.



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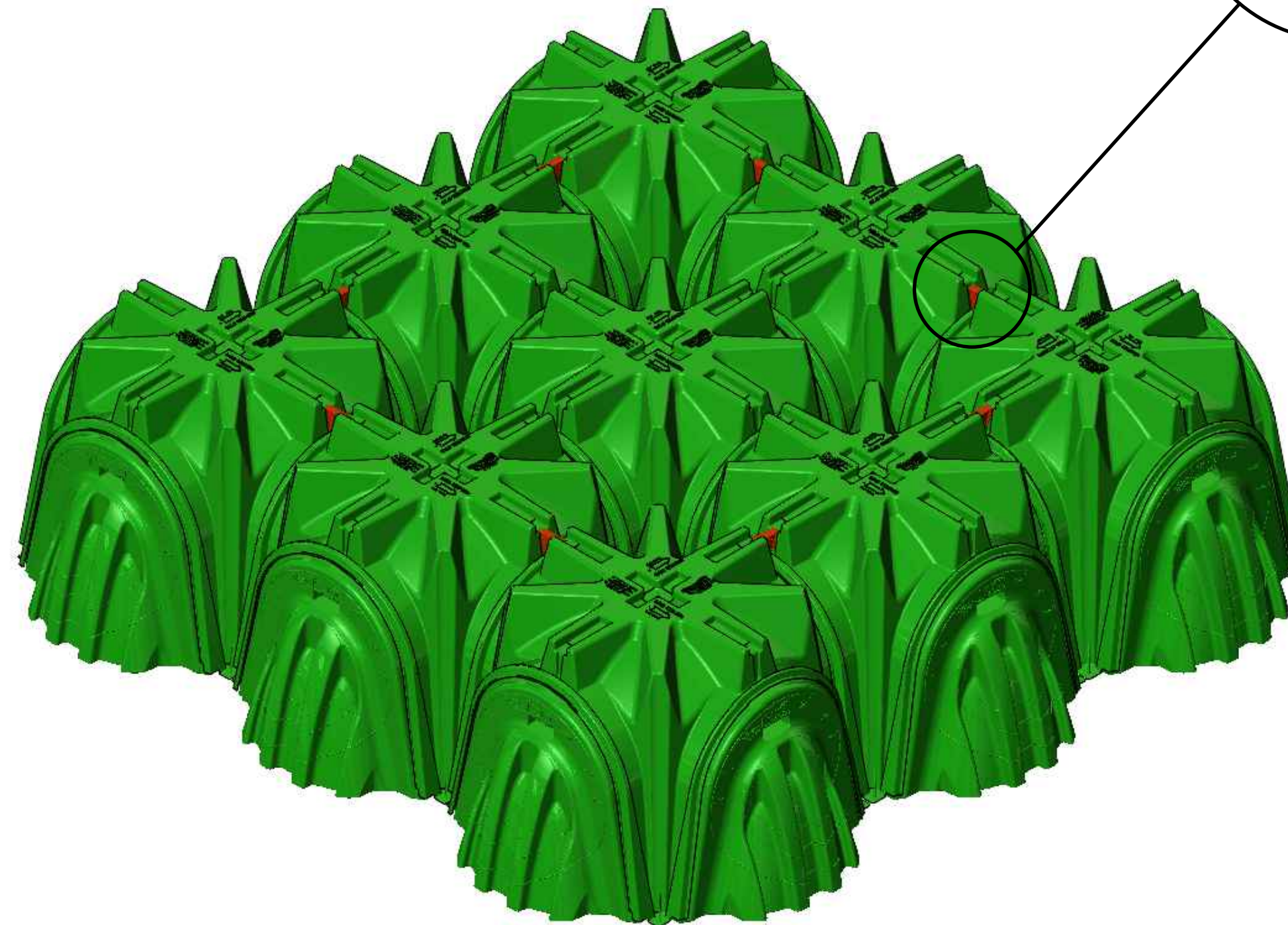
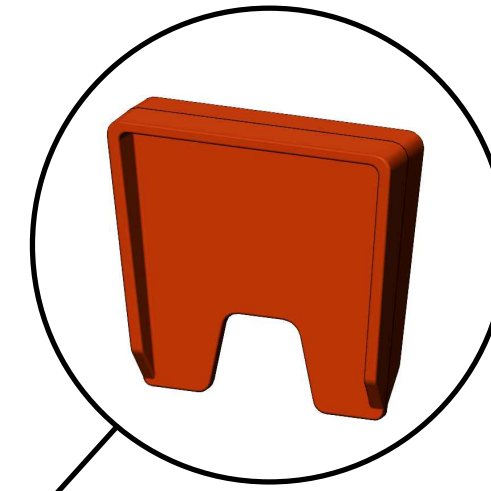


HYDROCHAIN™
END CAP
HOLE CUTTING DETAIL



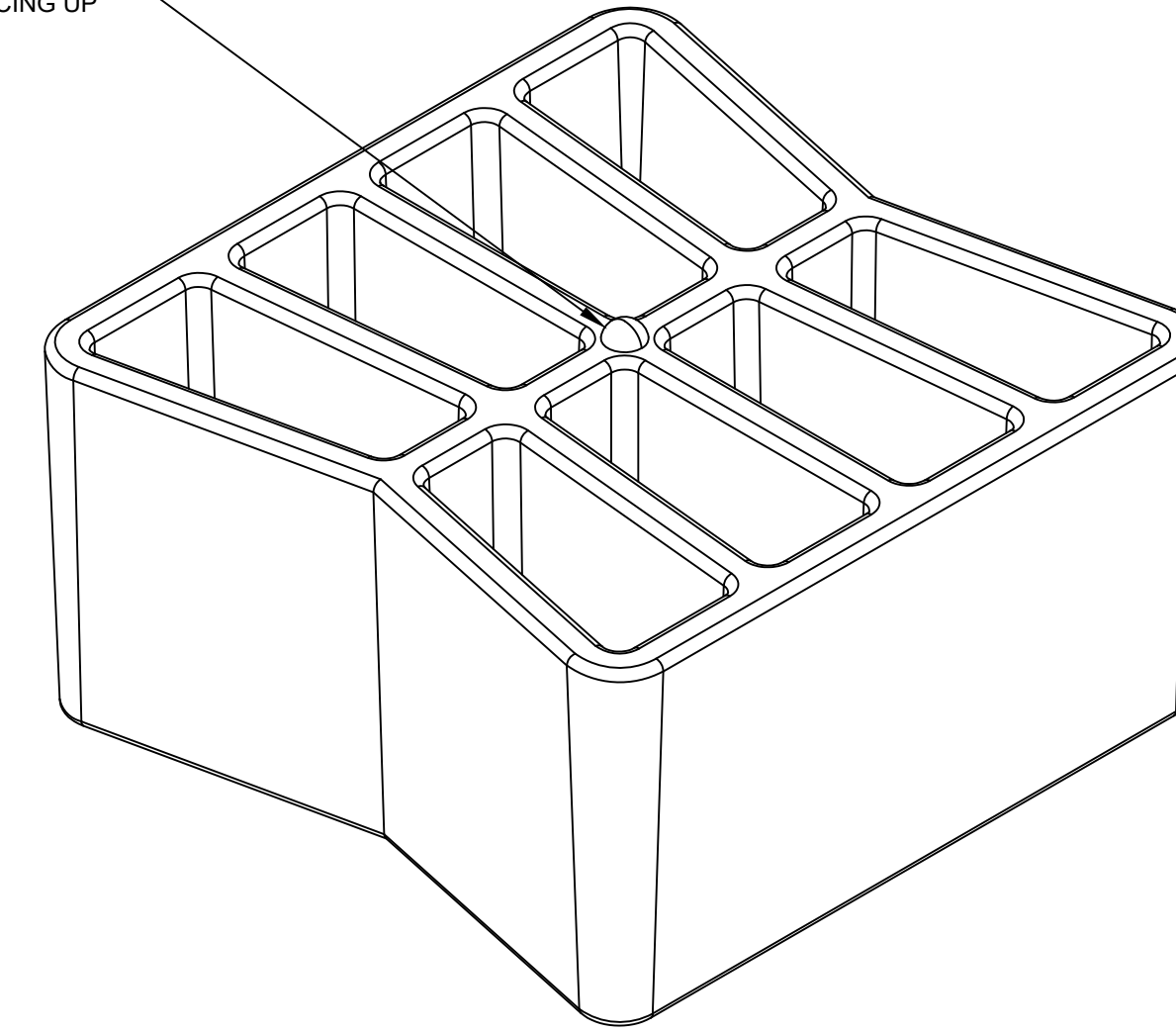
CLOSE-OFF PARTS ARE ONLY REQUIRED BETWEEN ALL THE PERIMETER (OUTSIDE) VAULTS AS SHOWN BELOW. NO CLOSE-OFFS ARE REQUIRED BETWEEN VAULTS THAT ARE ON INSIDE OF THE SYSTEM.

HYDROCHAIN VAULT CLOSE-OFF
SCALE: NTS



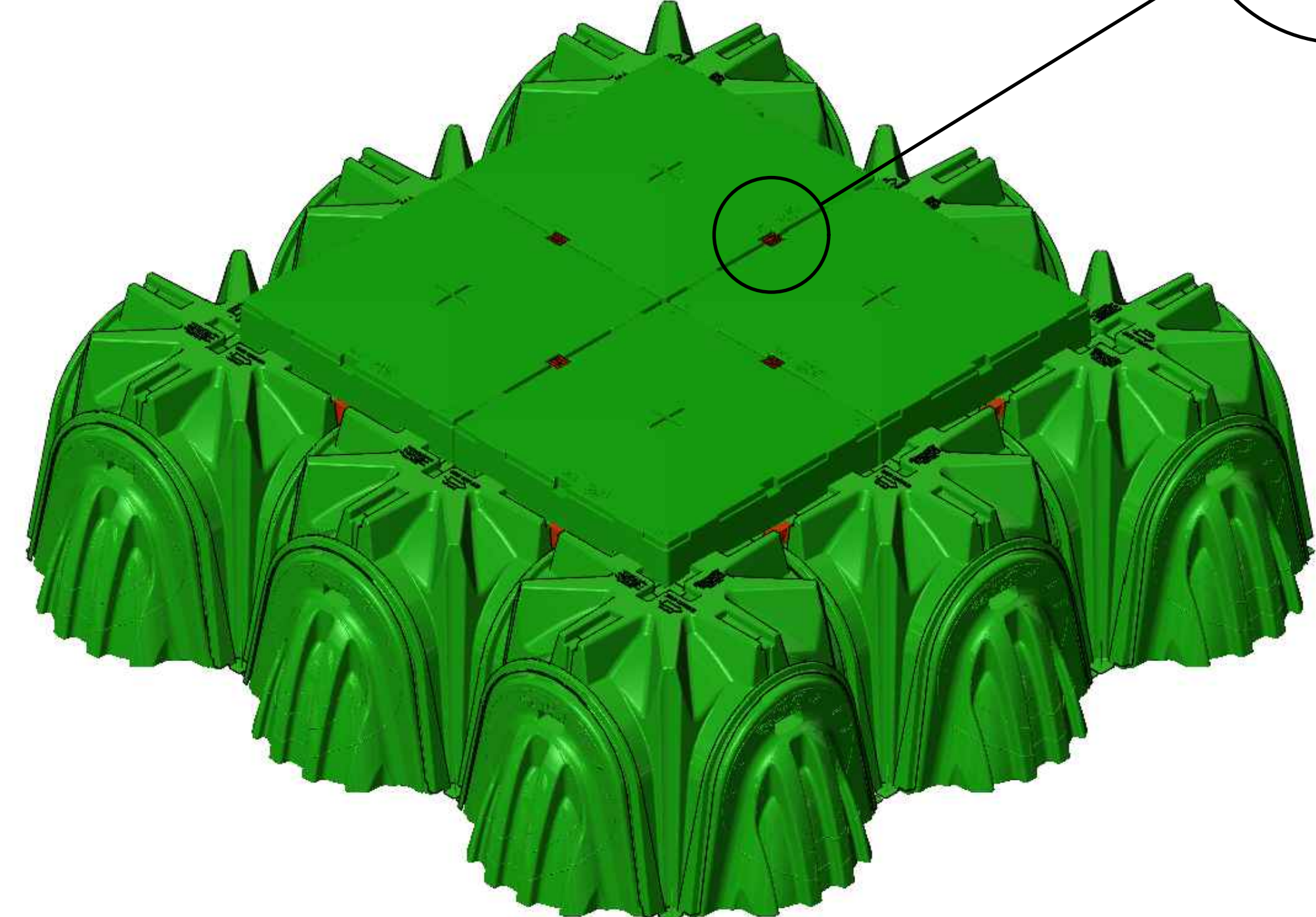
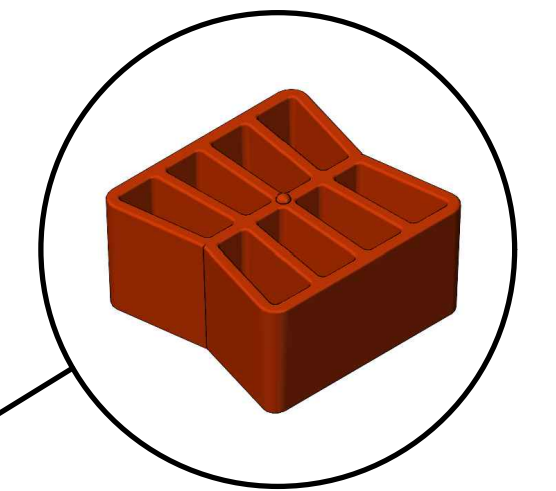
HYDROCHAIN VAULT CLOSE-OFF INSTALLATION LOCATION
SCALE: NTS

NOB SIDE
FACING UP



THE HYDROCHAIN VAULT LOCKS ARE USED TO LOCK TOGETHER ALL TRAYS AS SHOWN IN THE IMAGE BELOW WITH THE NOB FACING UPWARD

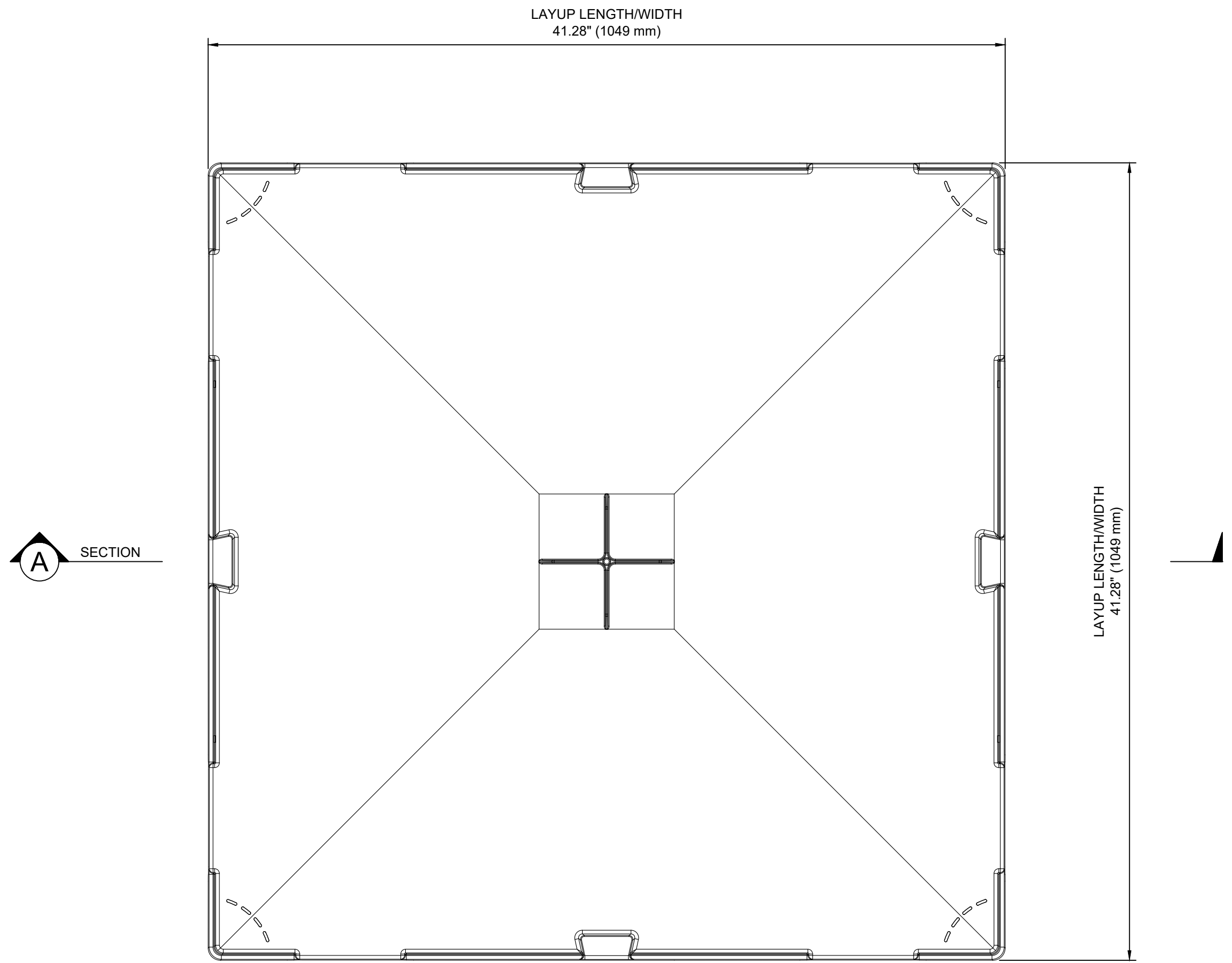
HYDROCHAIN VAULT BOW TIE LOCK
SCALE: NTS



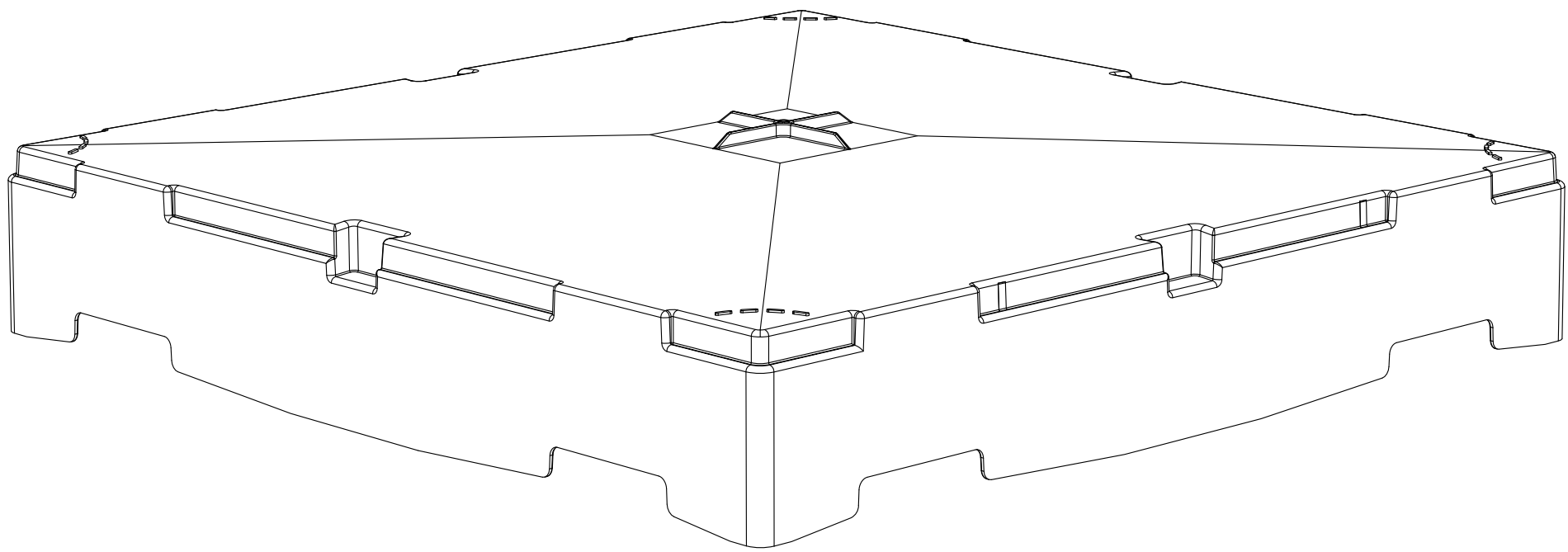
HYDROCHAIN VAULT BOW TIE LOCK INSTALLATION LOCATION
SCALE: NTS



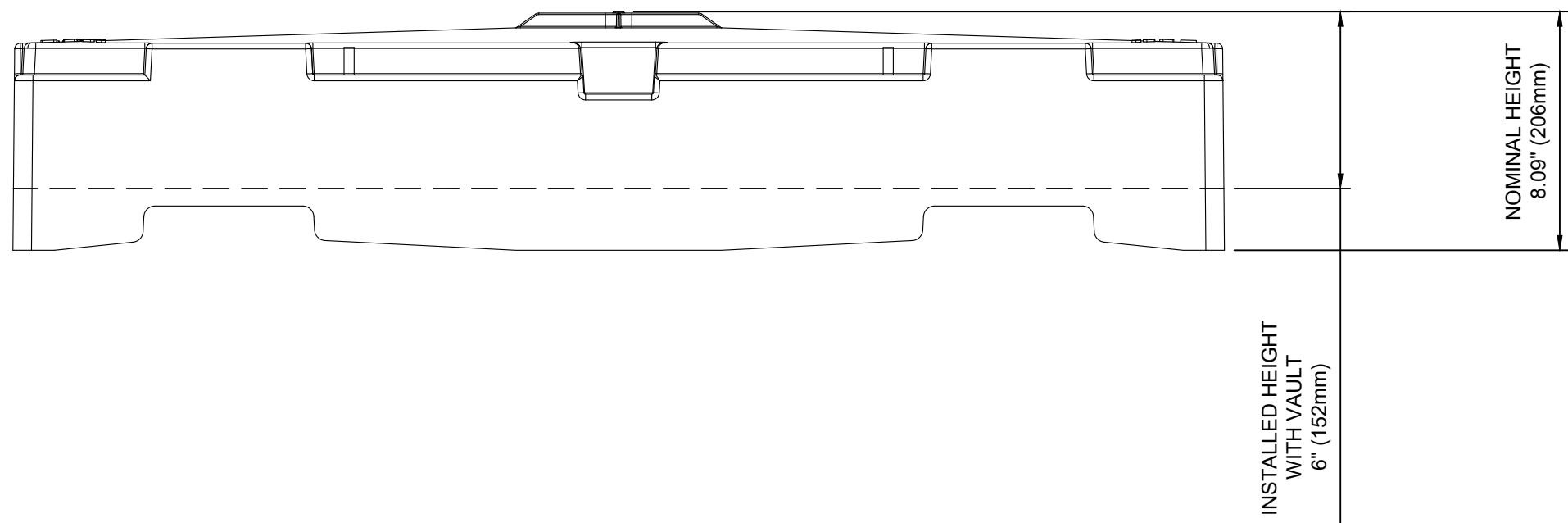
VAULT TRAY PROPERTIES	
NOMINAL DIMENSIONS (LAYUP LENGTH X LAYUP WIDTH X HEIGHT)	41.28" X 41.28" X 8.09" (1049mm X 1049mm X 206mm)
INSTALLED DIMENSIONS (WITH HYDROCHAIN VAULT) (LAYUP LENGTH X LAYUP WIDTH X HEIGHT)	41.28" X 41.28" X 6.00" (1049mm X 1049mm X 152mm)
BARE TRAY STORAGE	5.92 CUBIC FEET (0.168 CUBIC METERS)
TRAY WEIGHT	30 lbs (13.6 kg)



PLAN VIEW
SCALE: NTS



ISOMETRIC VIEW
SCALE: NTS



SECTION A
SCALE: NTS

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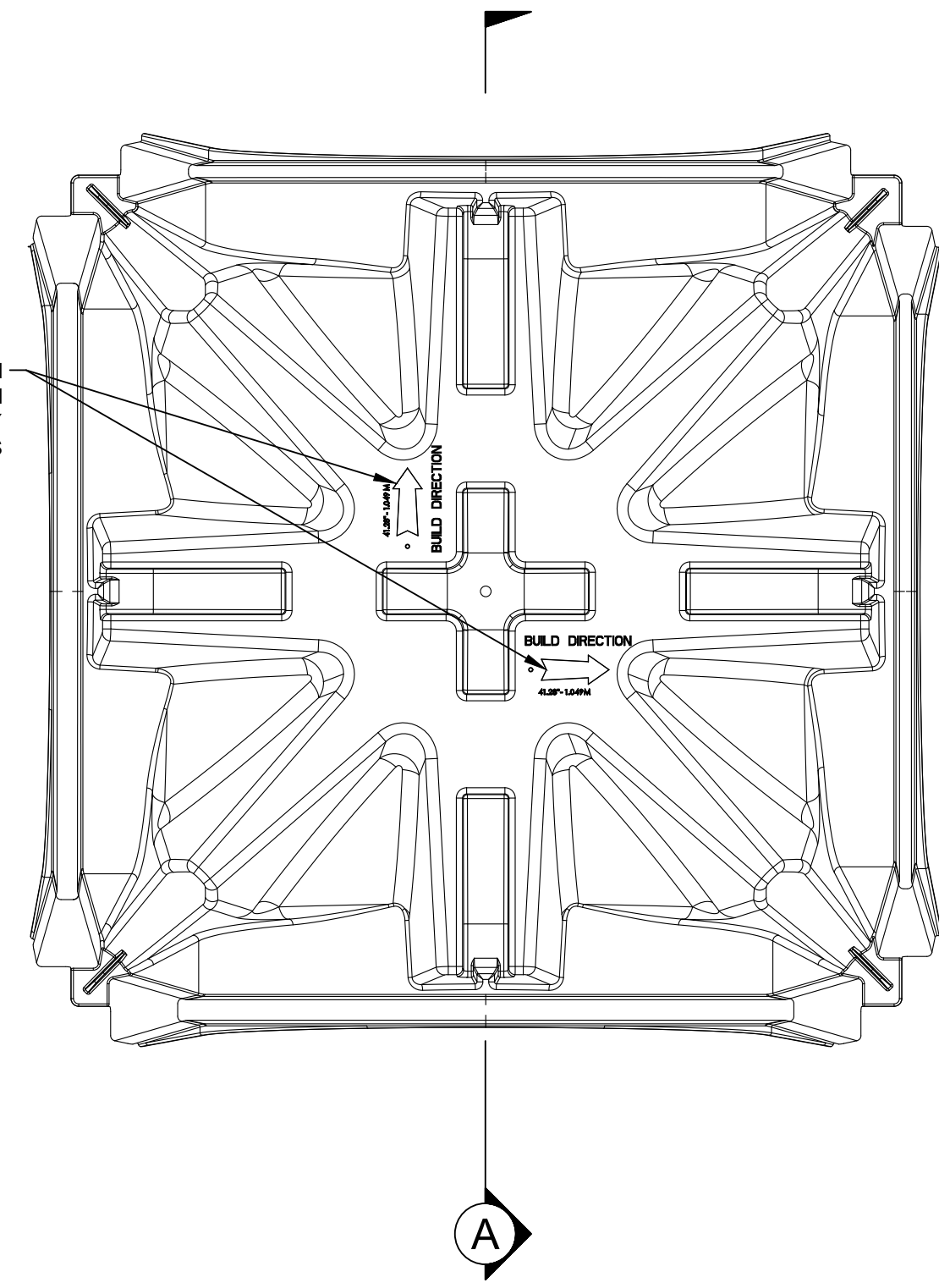


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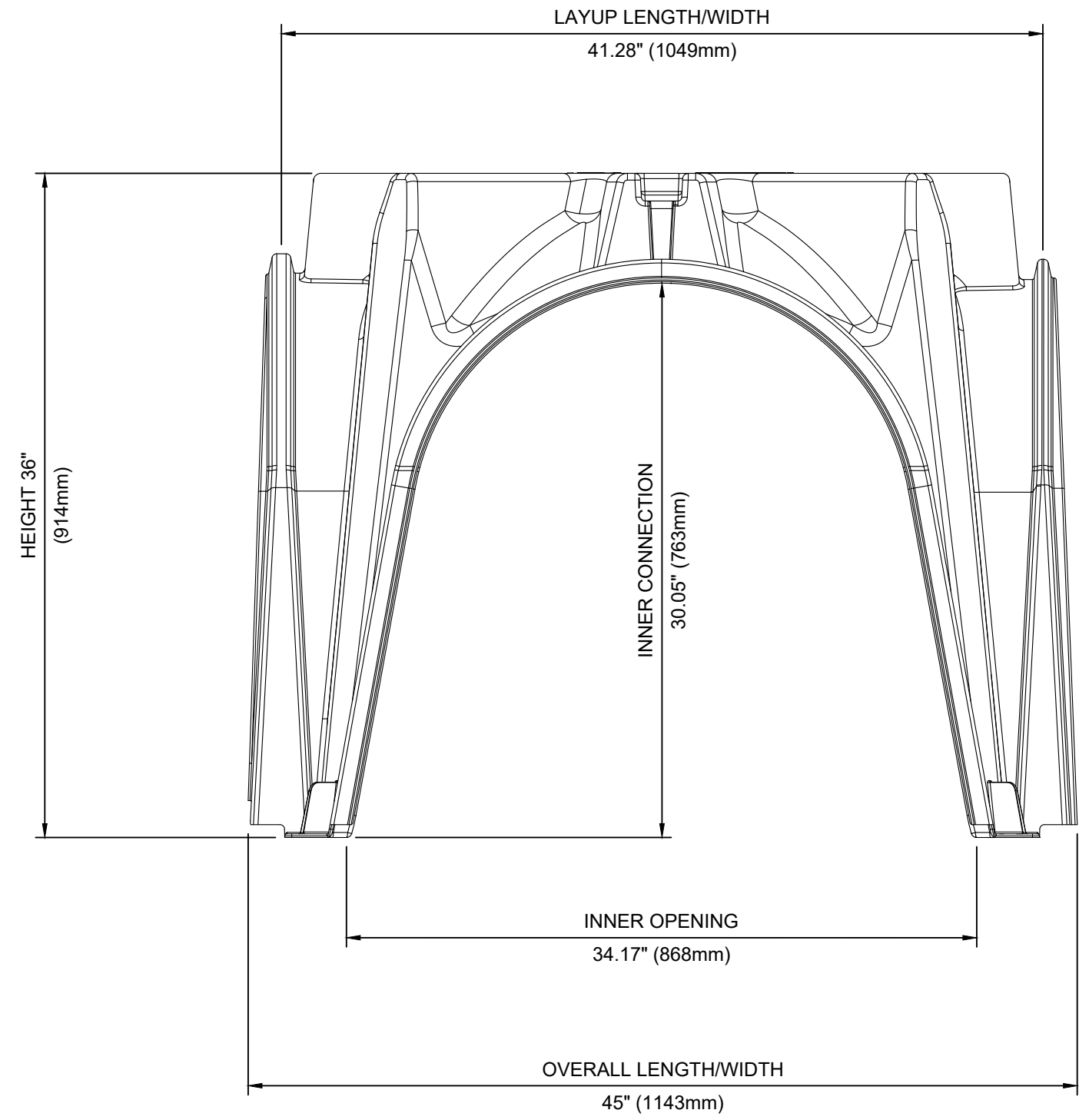


HYDROCHAIN™
VAULT TRAY

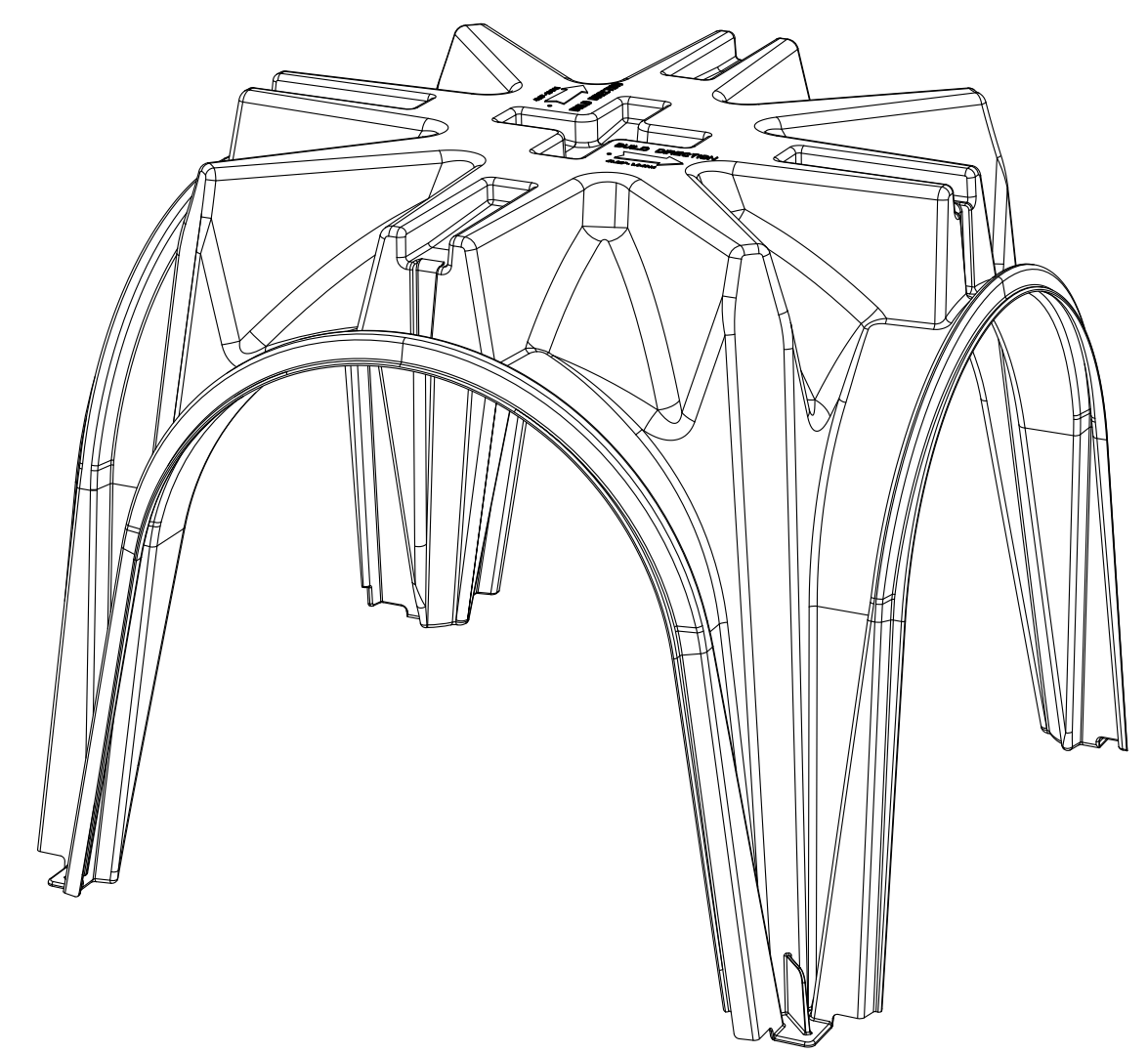
INSTALL VAULTS IN THIS DIRECTION
AND ENSURE BOTH ARROWS ARE IN
THE SAME DIRECTION AS PREVIOUSLY
INSTALLED VAULTS



PLAN VIEW
SCALE: NTS



SECTION
SCALE: NTS



ISOMETRIC
SCALE: NTS

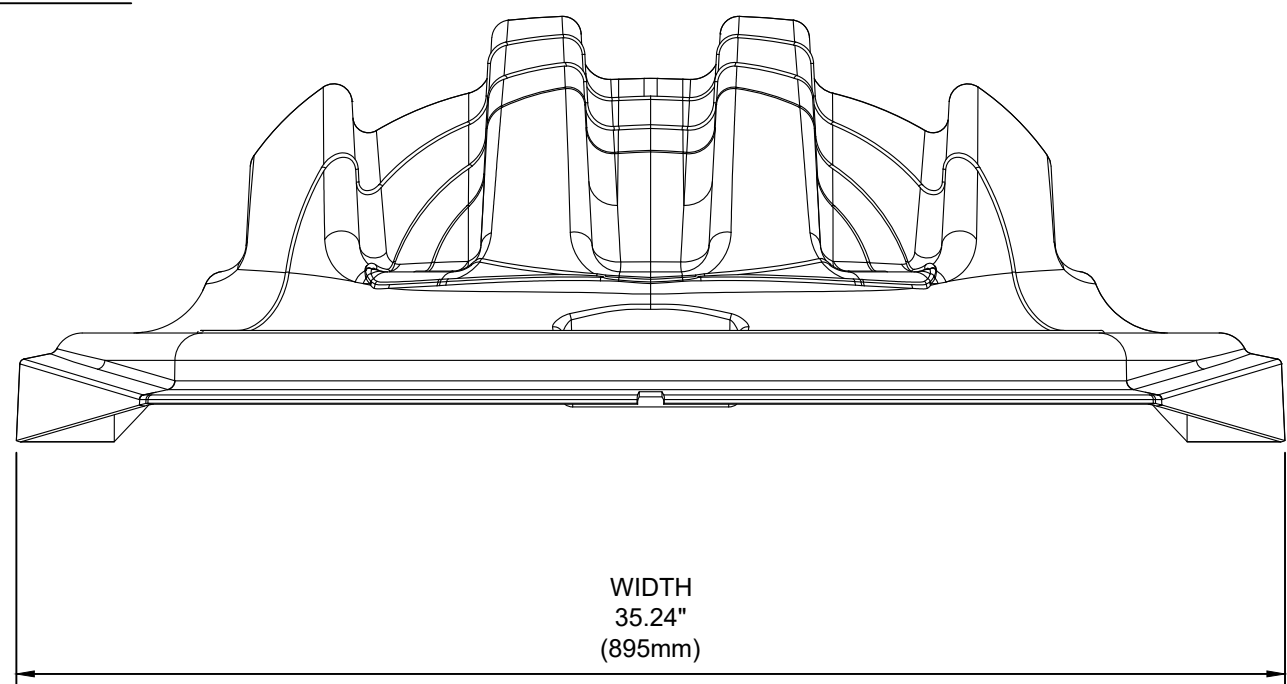
VAULT PROPERTIES	
NOMINAL DIMENSIONS (LAYUP LENGTH X LAYUP WIDTH X HEIGHT)	41.28" X 41.28" X 36.00" (1049mm X 1049mm X 914mm)
BARE CHAMBER STORAGE	28.79 CUBIC FEET (0.815 CUBIC METERS)
VAULT WEIGHT	50 lbs (22.7 kg)
INSTALLED STORAGE WITHOUT TRAY (6" BASE STONE, 12" TOP STONE)	42.13 CUBIC FEET (1.193 CUBIC METERS)
INSTALLED STORAGE WITH TRAY (6" BASE STONE, 12" TOP STONE)	49.70 CUBIC FEET (1.407 CUBIC METERS)

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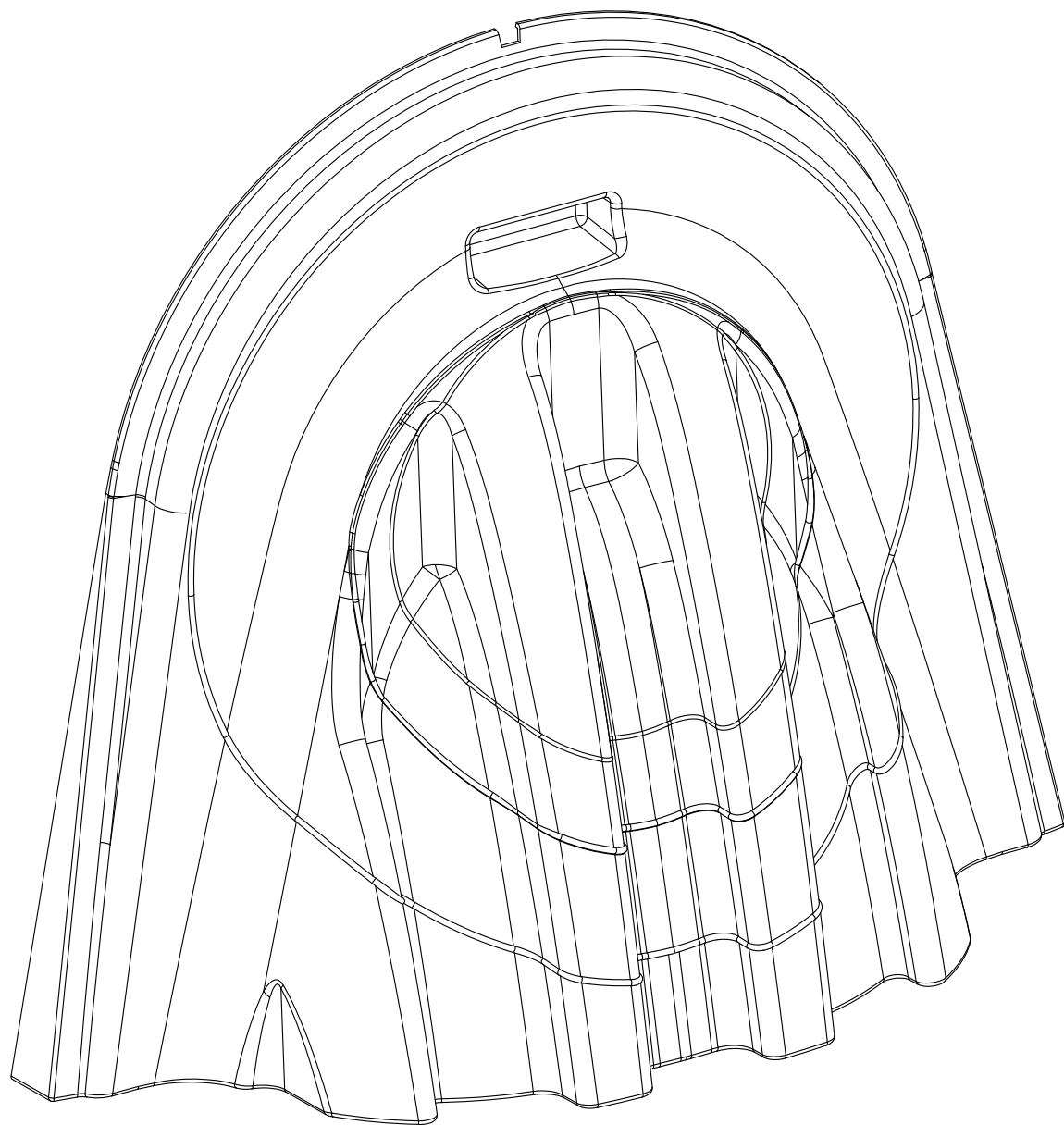


HYDROCHAIN™
VAULT

A SECTION

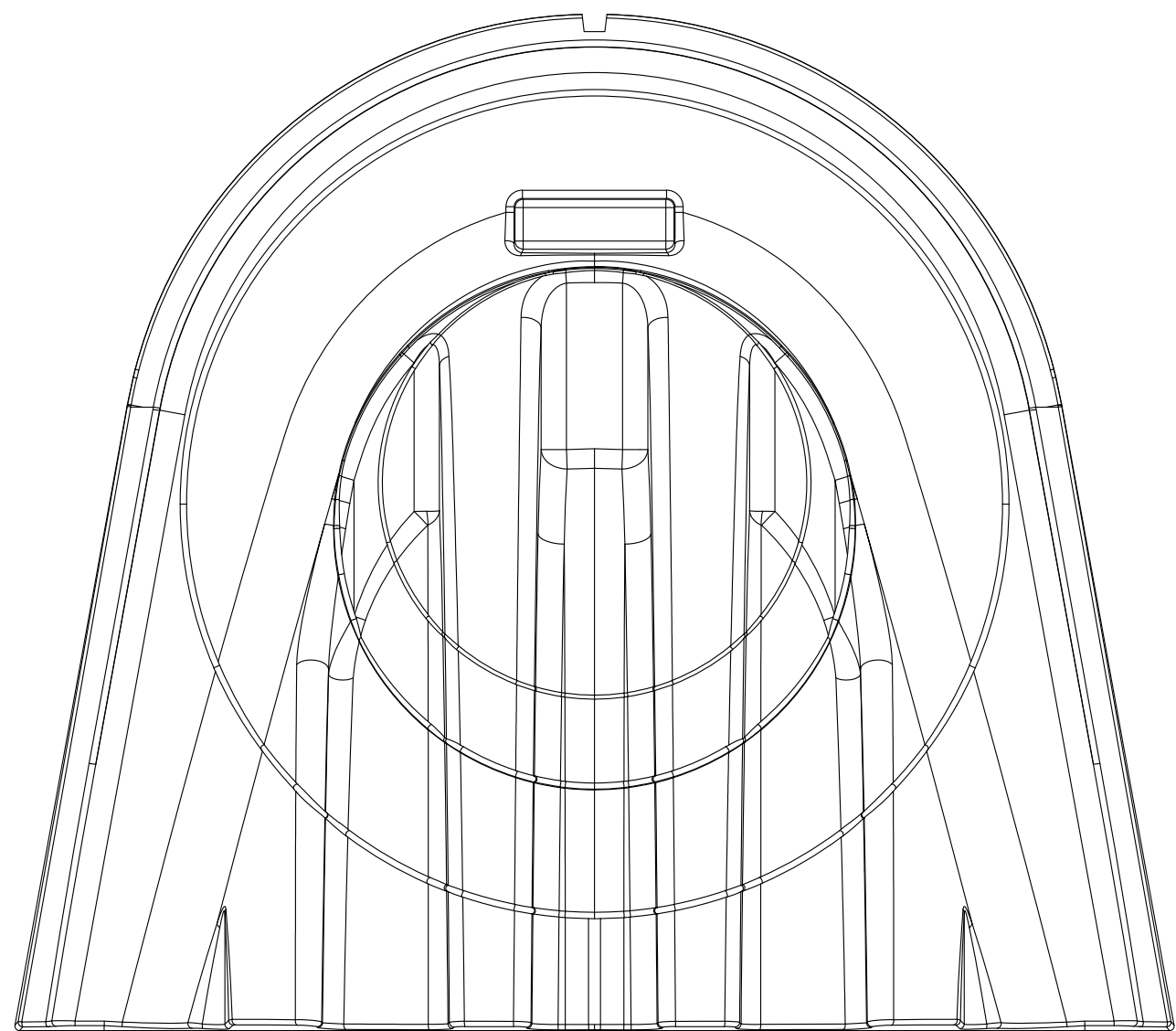


PLAN VIEW
SCALE: NTS

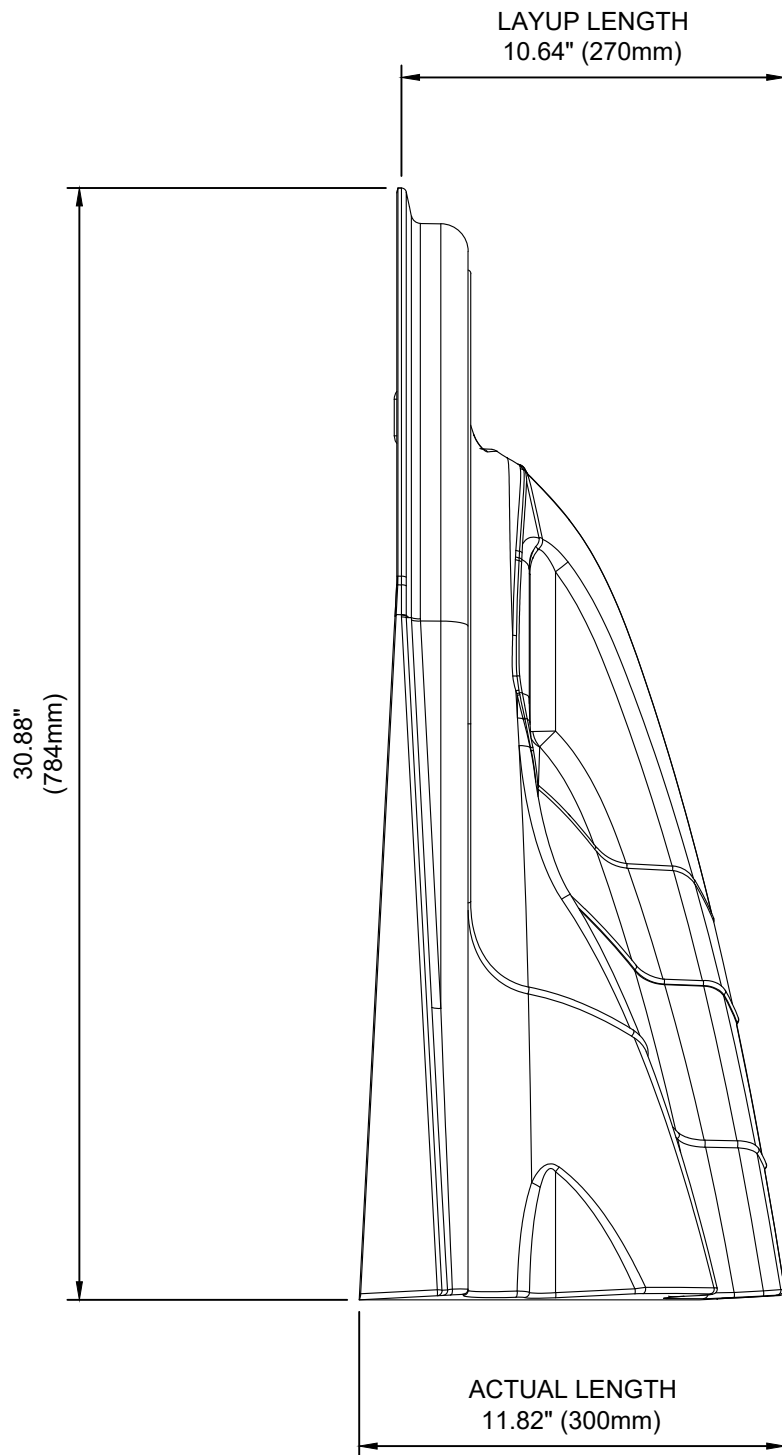


ISOMETRIC VIEW
SCALE: NTS

B SECTION



A SECTION
SCALE: NTS



B SECTION
SCALE: NTS

VAULT END CAP PROPERTIES

NOMINAL DIMENSIONS (LAYUP LENGTH X LAYUP WIDTH X HEIGHT)	10.64" X 35.24" X 30.88" (270mm X 895mm X 784mm)
BARE END CAP STORAGE	2.16 CUBIC FEET (0.061 CUBIC METERS)
END CAP WEIGHT	15 lbs (6.8 kg)



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HYDROCHAIN™
VAULT END CAP