LEGEND

D	PROPOSED DRAIN LINE
S	SEWER MANHOLE
W	EXISTING WATER LINE
G	EXISTING GAS LINE
	UTILITY POLE
GV	GAS VALVE
E	OVERHEAD ELECTRIC SERVICE
WV	WATER VALVE
	CATCH BASIN
	FENCE
205	CONTOUR LINE (MJR)
195	CONTOUR LINE (MNR)
195 X	SPOT GRADE
D	DRAIN MANHOLE
	HYDRANT
	TREE

REFER TO ARCHITECTURAL PLANS FOR ALL ZONING RELATED INFORMATION

ALL SURFACE WATER RUNOFF SHALL BE DIRECTED AWAY FROM BUILDING FOUNDATION AND AWAY FROM NEIGHBORING PROPERTY

DRAINAGE AREA SUMMARY

EXISTING ROOF AREA (HOUSE)= 1,395.19 S.F.
EXISTING PAVED AREA (DRIVEWAY & WALKWAY) = 872.85 S.F.
EXISTING IMPERVIOUS AREA (DECK/PORCH/RETAINING WALL/SHED/LANDING & STEPS)=664.32 S.F.
EXISTING LANDSCAPE AREA = 10,317.64 S.F.

EXISTING ROOF AREA TO REMAIN = 1,395.19 S.F.
PROPOSED PAVERS = 2,199.47 S.F.
PROPOSED IMPERVIOUS AREA (DECK/PORCH/RETAINING WALL/LANDING & STEPS) = 708.88 S.F.
EXISTING DRIVEWAY & WALKWAY TO REMAIN= 872.85 S.F.
PROPOSED POOL AREA = 925.00 S.F.
PROPOSED LANDSCAPE AREA = 7,148.64 S.F.

TOTAL EXISTING IMPERVIOUS AREA = 2,932.36 S.F.
TOTAL PROPOSED IMPERVIOUS AREA = 5,176.39 S.F.
TOTAL INCREASE IN IMPERVIOUS AREA = 2,244.03 S.F.

RUNOFF SUMMARY (HYDROCAD RESULTS)

Storm Event	Runoff rate		Volume of runoff	
	Existing	Proposed	Existing	Proposed
2-Year	0.43 cfs	0.26 cfs	1,461 cf	898 cf
10-Year	0.93 cfs	0.73 cfs	2,995 cf	2,303 cf
25-Year	1.28 cfs	1.14 cfs	4,063 cf	3,276 cf
100-Year	1.84 cfs	1.76 cfs	5,792 cf	4,862 cf

DEEP OBSERVATION HOLE LOG

DEEP OBSERVATION HOLE NUMBER: TP-1 — GROUND ELEVATION: --

Depth (in)	Horizon/ Layer	Matrix: Color-Moist	Redoximorphic Features: Depth (in)	Color	Percent	Texture (USDA)	Coarse Fragments (Percent by Volume): Gravel	Cobbles & Stones	Structure	Consistence (Moist)	Other
0-10	A	10YR 3/1	--	--	--	SANDY LOAM	<5	<5	MASSIVE	FRIABLE	--
10-38	FILL	--	--	--	--	--	--	--	--	--	MANY BOULDERS
38-44	A	10YR 3/1	--	--	--	SANDY LOAM	<5	<5	MASSIVE	FRIABLE	--
44-60	Bw	2.5Y 4/4	--	--	--	SANDY LOAM	<5	<5	MASSIVE	FRIABLE	--
60-96	C	2.5Y 5/3	60"			SANDY LOAM	15	<5	MASSIVE	FRIABLE	SOME GRAVEL

NOTES:
1. WEEPING @ 84". REDOX. OBSERVED @ 60".
2. NO REFUSAL.
3. LOGGED BY MATTHEW MUI, SE14259 ON 06/16/2023.

PETER NOLAN & ASSOCIATES LLC SHALL NOT BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, OR PROCEDURES UTILIZED BY THE CONTRACTOR, NOR FOR THE SAFETY OF PUBLIC OR CONTRACTOR'S EMPLOYEES, OR FOR THE FAILURE OF THE CONTRACTOR TO CARRY OUT THE WORKING ACCORDANCE WITH THE CONTRACT DOCUMENTS.
THE EXTENT OF PETER NOLAN & ASSOCIATES LIABILITY FOR THIS PLAN IS LIMITED TO THE EXTENT OF ITS FEE LESS THIRD PARTY COST

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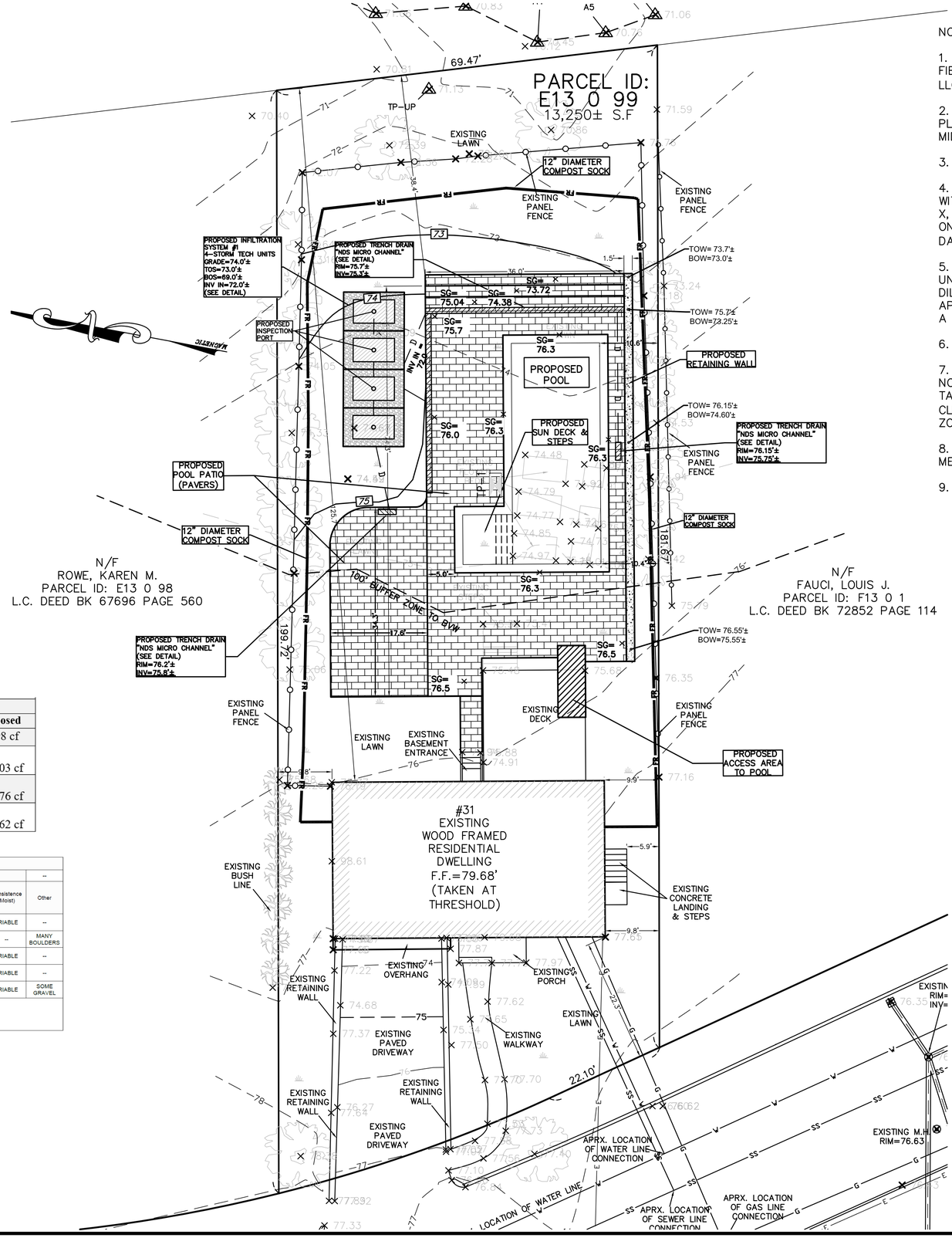

NOTES:

1. INFORMATION SHOWN ON THIS PLAN IS THE RESULT OF A FIELD SURVEY PERFORMED BY PETER NOLAN & ASSOCIATES LLC AS OF 6/8/2023.

2. DEED REFERENCE: BOOK 59813, PAGE 503
PLAN REFERENCE: PLAN 1687 OF 1956
MIDDLESEX SOUTH DISTRICT REGISTRY OF DEEDS

3. THIS PLAN IS NOT INTENDED TO BE RECORDED.

4. I CERTIFY THAT THE DWELLING SHOWN IS NOT LOCATED WITHIN A SPECIAL FLOOD HAZARD ZONE. IT IS LOCATED IN ZONE X, ON FLOOD HAZARD BOUNDARY MAP NUMBER 25017C0431E, ON PANEL NUMBER 0431E, IN COMMUNITY NUMBER: 250206, DATED 6/4/2010.

5. THIS PLAN DOES NOT SHOW ANY UNRECORDED OR UNWRITTEN EASEMENTS WHICH MAY EXIST. A REASONABLE AND DILIGENT ATTEMPT HAS BEEN MADE TO OBSERVE ANY APPARENT USES OF THE LAND; HOWEVER THIS NOT CONSTITUTE A GUARANTEE THAT NO SUCH EASEMENTS EXIST.

6. FIRST FLOOR ELEVATIONS ARE TAKEN AT THRESHOLD.

7. NO RESPONSIBILITY IS TAKEN FOR ZONING TABLE AS PETER NOLAN & ASSOCIATES LLC ARE NOT ZONING EXPERTS. TABLE IS TAKEN FROM TABLE PROVIDED BY LOCAL ZONING ORDINANCE. CLIENT AND/OR ARCHITECT TO VERIFY THE ACCURACY OF ZONING ANALYSIS.

8. THE ELEVATIONS SHOWN ARE BASED ON A CITY OF MELROSE DATUM.

9. ZONING DISTRICT: SR-B

GENERAL NOTES

1. THE CONTRACTOR SHALL REPORT TO THE OWNER AND ENGINEER OF ANY SIGNIFICANT VARIATIONS IN EXISTING SITE CONDITIONS FROM THOSE SHOWN ON THESE PLANS. ANY PROPOSED REVISIONS TO THE WORK, IF REQUIRED BY THESE SITE CONDITIONS, SHALL NOT BE UNDERTAKEN UNTIL REVIEWED AND APPROVED BY THE OWNER AND THE ENGINEER.
2. IN ORDER TO PROTECT THE PUBLIC SAFETY DURING CONSTRUCTION, THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING AND MAINTAINING AT ALL TIMES ALL NECESSARY SAFETY DEVICES AND PERSONNEL, WARNING LIGHTS, BARRICADES, AND POLICE OFFICERS.
3. ALL WORK SHALL CONFORM TO CITY OF MELROSE GENERAL CONSTRUCTION STANDARDS.
4. THE CONTRACTOR SHALL REGULARLY INSPECT THE PERIMETER OF THE PROPERTY TO CLEAN UP AND REMOVE LOOSE CONSTRUCTION DEBRIS BEFORE IT LEAVES THE SITE. ALL DEMOLITION DEBRIS SHALL BE PROMPTLY REMOVED FROM THE SITE TO A LEGAL DUMP SITE. ALL TRUCKS LEAVING THE SITE SHALL BE COVERED.
5. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO INSTITUTE EROSION CONTROL MEASURES ON AN AS NECESSARY BASIS, SUCH THAT EXCESSIVE SOIL EROSION DOES NOT OCCUR.
6. THE LOCATION OF UNDERGROUND UTILITIES AS REPRESENTED ON THESE PLANS IS BASED UPON PLANS AND INFORMATION PROVIDED BY THE RESPECTIVE UTILITY COMPANIES OR MUNICIPAL DEPARTMENTS SUPPLEMENTED BY FIELD IDENTIFICATION WHEREVER POSSIBLE. NO WARRANTY IS MADE AS TO THE ACCURACY OF THESE LOCATIONS OR THAT ALL UNDERGROUND UTILITIES ARE SHOWN. THE CONTRACTOR SHALL CONTRACT DIG SAFE AT LEAST 72 HOURS PRIOR TO THE START OF CONSTRUCTION. DIG SAFE TELEPHONE NUMBER IS 1-800-322-4844.
7. THE CONTRACTOR SHALL VERIFY THE LOCATION, SIZE AND DEPTH OF EXISTING UTILITIES PRIOR TO TAPPING INTO, CROSSING OR EXTENDING THEM. IF THE NEW WORK POSES A CONFLICT WITH EXISTING UTILITIES, THE ENGINEER SHALL BE NOTIFIED PRIOR TO THE CONTRACTOR CONTINUING.
8. NO LEDGE, BOULDERS, OR OTHER UNYIELDING MATERIALS ARE TO BE LEFT WITHIN 6" OF THE WATER IN THE TRENCH, NOR ARE THEY TO BE USED FOR BACKFILL FOR THE FIRST 12" ABOVE THE PIPES.
9. PAVEMENT AREA SHALL BE PAVED TO A THICKNESS AS SHOWN ON THE PLANS MEASURED AFTER COMPACTION, WITH A BINDER COURSE AND TOP COURSE OF CLASS I BITUMINOUS CONCRETE PAVEMENT, TYPE I-1.
10. BASE MATERIAL SHALL BE CLEAN BANK RUN GRAVEL, CONFORMING TO M.D.P.W. M1.03.1, WITH NO STONES LARGER THAN THREE (3) INCHES IN DIAMETER AND SHALL BE PLACED AND ROLLED WITH AT LEAST A TEN TON ROLLER. THE SURFACES SHALL BE WET DURING ROLLING TO BIND THE MATERIAL. ALL STONES OF 4" DIAMETER OR LARGER SHALL BE REMOVED FROM THE SUB-BASE PRIOR TO PLACING BASE MATERIAL.
11. ALL EXISTING PAVING TO BE DISTURBED SHALL BE CUT ALONG A STRAIGHT LINE THROUGH ITS ENTIRE THICKNESS. BUTT THE NEW PAVING INTO THE EXISTING PAVEMENT TO REMAIN.
12. ANY PAVEMENT REMOVED FOR UTILITY TRENCH EXCAVATION OR OTHERWISE DAMAGED DURING CONSTRUCTION SHALL BE REPLACED WITH A PAVEMENT SECTION CONSISTING OF 1 1/2" WEAR COURSE OVERLYING A 2 1/2" BINDER COURSE OVERLYING A 8" COMPACTED GRAVEL BASE COURSE.
13. THE CONTRACTOR SHALL APPLY FOR A STREET OPENING AND UTILITY CONNECTION PERMITS AND SIDEWALK CROSSING PERMIT WITH THE CITY OF MELROSE DPW.
14. CONTRACTOR TO ENSURE THAT ALL SURFACE WATER IS DIVERTED AWAY FROM BUILDING FOUNDATION DURING FINAL GRADING.

GRAPHIC SCALE

10 0 5 10 20 40
(IN FEET)
1 inch = 10 ft.

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DRAFT

31 CRANMORE LANE, MELROSE, MASSACHUSETTS

CIVIL PLAN

REVISION BLOCK

BY	DESCRIPTION	DATE
J.R.H	PATIO EXTENSION BY CLIENT REQUEST	10/24/2023

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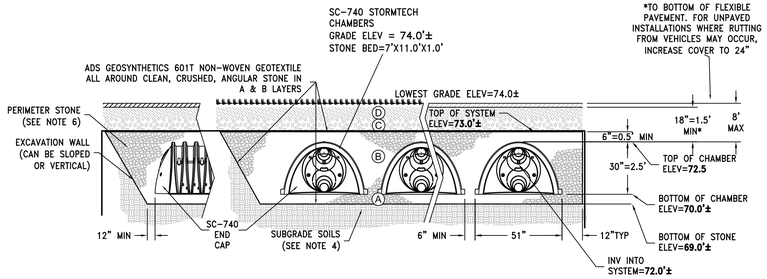
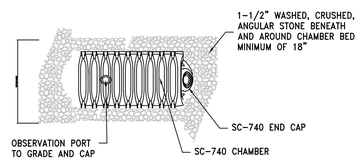
CHECKED BY:	E.S
APPROVED BY:	P.N

CIVIL PLAN

SHEET 1 OF 3

INFILTRATION SYSTEM





STORMTECH SC-740 CHAMBER SYSTEM
PLAN VIEW DETAIL
N.T.S.

ACCEPTABLE FILL MATERIALS: STORMTECH SC-740 CHAMBER SYSTEMS

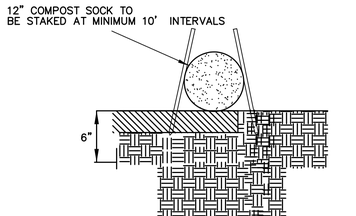
	MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	ANY 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' A-1, A-2-4, A-3 OR AASHTO M43' 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	AASHTO M43' 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	AASHTO M43' 3, 357, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. [1]

PLEASE NOTE:

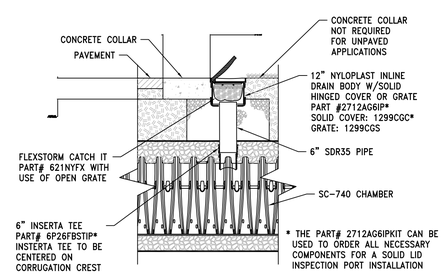
1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST ALSO BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND 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:

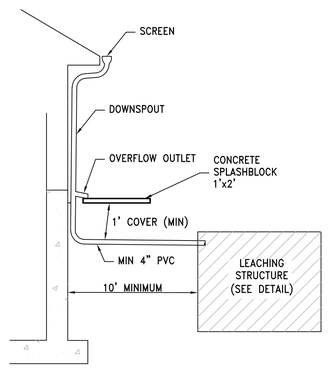
1. SC-740 CHAMBERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS", OR ASTM F2922 "STANDARD SPECIFICATION FOR POLYETHYLENE (PE) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
2. SC-740 CHAMBERS SHALL BE DESIGNED 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 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.
5. PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
6. 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.



COMPOST SOCK DETAIL
NOT TO SCALE

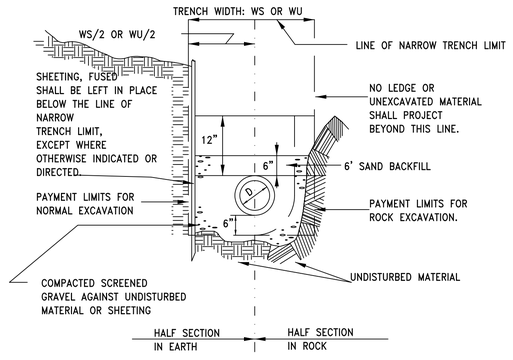


SC-740 6" INSPECTION PORT DETAIL
N.T.S.

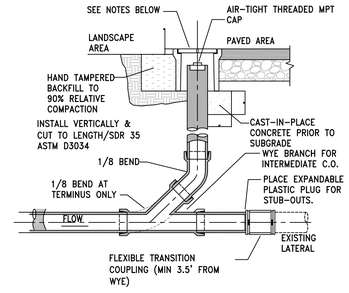


TYPICAL DOWNSPOUT DETAIL
N.T.S.

TRENCH WIDTH WS OR WU		
DIAM. OF PIPE	WU UNSHEETED	WS SHEETED
12" AND SMALLER	3'-0"	4'-2"
15" AND LARGER	O.D.+20"	O.D.+36"



WATER TRENCH SECTION
NOT TO SCALE



NOTES:

1. RECTANGULAR OR CIRCULAR BOXES ARE PERMITTED.
2. CONCRETE/FIBERLYTE LIDS ARE ACCEPTABLE IN NON-VEHICULAR AREAS. H-20 CAST IRON TRAFFIC LIDS AND BOXES IN VEHICULAR AREAS.
3. ALL CLEANOUT LIDS SHALL BE MARKED WITH AN "S" OR THE WORD "SEWER" FOR SANITARY SEWER CLEANOUTS
4. CLEANOUT PIPE SHALL BE THE SAME DIAMETER AS THE CONNECTED SITE PIPE.
5. TERMINATE C.O. AT CLOSEST JOINT TO SURFACE WITH TEMPORARY PLUG. AFTER ALL BACKFILL IS COMPLETE AND SUB-GRADE MADE IN AREAS TO BE PAVED, THE FINAL RISER PIPE AND BOX SHALL BE INSTALLED AS SHOWN.

CLEANOUT TO GRADE
NTS

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DRAFT

31 CRANMORE LANE,
MELROSE,
MASSACHUSETTS

CIVIL PLAN

REVISION BLOCK

BY	DESCRIPTION	DATE

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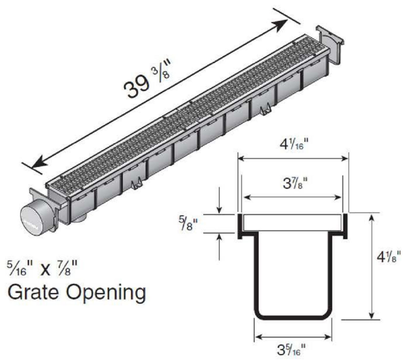
DATE:	11/30/2023
DRAWN BY:	J.R.H
CHECKED BY:	E.S
APPROVED BY:	P.N

DETAILS

NDS™ WE PUT WATER IN ITS PLACE

TECHNICAL SPECIFICATIONS

3” Pro Series Channel Drain Kit



Part #: 764 (3” x 1 Meter light Traffic Drain Kit)
Material: Channel PVC, Grate PVC , Cap/End Outlet PVC and End Cap PVC
Color: Light Gray (Grate)
Fits: End Outlet fits 3” Sewer/Drain Fitting
Grate Opening: 5/16”X 7/8”
Open Surface Area: 23.63 Sq. Inches Per Foot.
Head Pressure / Flow rate:
1” = 102.23 GPM per Foot
0.5” = 72.29 GPM per Foot
Weight Per Each: 4.61 lbs.
UV inhibitor

Class B
- Loads of 61-175 psi.
- Recommended for medium-duty pneumatic tire traffic, autos and light trucks at speeds less than 20 m.p.h.

ADA Compliant

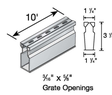
NDS®

CHANNEL & TRENCH DRAINS

PROFILE CHANNEL DRAINS

Micro Channel™ Drains

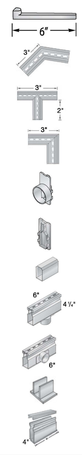
Excellent performance at lowest possible cost. Designed for residential applications including swimming pools, spas and patios. Unique design features grate openings parallel to channel length and recessed grate for strength and effective runoff capture.



¾" x ¾" Grate Openings

Part No.	Description	Color	Pkg. Qty.	Wt. Ea. (lbs.)	Product Class	Specifications
8001	10' Long Micro Channel	White	100 ft.	5.00	25PF	10 ft. Micro Channel with Recessed Reinforced Grate Area, Parallel Drain Slots with UV inhibitor. Open surface area 1.00 square inch per linear foot. 3.06 GPM per foot. PVC.
8002	10' Long Micro Channel	Sand	100 ft.	5.00	25PF	
8003	10' Long Micro Channel	Gray	100 ft.	5.00	25PF	
	Includes 1 coupling. (see page 79, ADA Compliant/Heel-proof.					

Micro Accessories



Part No.	Description	Color	Pkg. Qty.	Wt. Ea. (lbs.)	Product Class
230	6" Channel Installation Stake	Gray	24	0.04	25PF
8301	Micro Channel 45° Elbow	White	5	0.30	25PF
8302	Micro Channel 45° Elbow	Sand	5	0.30	25PF
8303	Micro Channel 45° Elbow	Gray	5	0.30	25PF
8371	Micro Channel Tee	White	5	0.40	25PF
8372	Micro Channel Tee	Sand	5	0.40	25PF
8373	Micro Channel Tee	Gray	5	0.40	25PF
8381	Micro Channel 90° Elbow	White	5	0.40	25PF
8382	Micro Channel 90° Elbow	Sand	5	0.40	25PF
8383	Micro Channel 90° Elbow	Gray	5	0.40	25PF
8461	Micro 1½" Sch. 40 Spigot End Outlet	White	10	0.10	25PF
8462	Micro 1½" Sch. 40 Spigot End Outlet	Sand	10	0.10	25PF
8463	Micro 1½" Sch. 40 Spigot End Outlet	Gray	10	0.10	25PF
8471	Micro End Plug	White	20	0.05	25PF
8472	Micro End Plug	Sand	20	0.05	25PF
8473	Micro End Plug	Gray	20	0.05	25PF
8481	Micro Channel Couplings only Fits inside channel	White	20	0.10	25PF
8501	Micro 1½" Sch. 40 Spigot Bottom Outlet	White	10	0.35	25PF
8502	Micro 1½" Sch. 40 Spigot Bottom Outlet	Sand	10	0.35	25PF
8503	Micro 1½" Sch. 40 Spigot Bottom Outlet	Gray	10	0.35	25PF
8511	Micro 1½" Sch. 40 Spigot Side Outlet	White	10	0.35	25PF
8512	Micro 1½" Sch. 40 Spigot Side Outlet	Sand	10	0.35	25PF
8513	Micro 1½" Sch. 40 Spigot Side Outlet	Gray	10	0.35	25PF
8601	Micro Hold-Down Clips Use with Channel Stakes to hold channel in place	White	20	0.10	25PF
8651	Micro Channel Cleanout	White	10	0.30	25PF
8652	Micro Channel Cleanout	Sand	10	0.30	25PF
8653	Micro Channel Cleanout	Gray	10	0.30	25PF

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DRAFT

31 CRANMORE LANE,
MELROSE,
MASSACHUSETTS

CIVIL PLAN

REVISION BLOCK

BY	DESCRIPTION	DATE

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DATE:	11/30/2023
DRAWN BY:	J.R.H
CHECKED BY:	E.S
APPROVED BY:	P.N

DETAILS