

RAIN GARDEN CONSTRUCTION NOTES:

1. REMOVE EXISTING TOPSOIL, SURFACE LEAF LITTER, ETC. FROM RAIN GARDEN AREA AND STOCKPILE FOR REUSE.
2. AVOID COMPACTION OF NATURAL SOILS WITHIN BOTTOM AREA OF RAIN GARDEN BASIN BY CONSTRUCTION EQUIPMENT.
3. SCARIFY NATURAL SOILS WITHIN THE BOTTOM OF BASIN PRIOR TO PLACING STOCKPILED TOPSOIL.
4. ALL DISTURBED AREAS SHALL BE FINE GRADED WITH 6" TOPSOIL, RAKED, SEEDED AND MULCHED IN A TIMELY MANNER. TOPSOIL SHALL BE PLACED IN THE BASIN USING LIGHT EQUIPMENT. ALLOW SOIL TO SETTLE NATURALLY THROUGH RAIN EVENTS OR PRESOAK AFTER PLACEMENT.
5. PLACE A 3-INCH LAYER OF WELL-AGED SHREDDED HARDWOOD FREE OF ROOTS, SOIL AND WEEDS.
6. SEED BOTTOM OF BASIN, SIDE SLOPES AND TOP OF BERM WITH CONSERVATION/WILDLIFE MIX AT 1 LB/1,750 S.F. OR EQUIVALENT. SEEDING SHALL BE QUICKLY ESTABLISHED AND MAINTAINED TO PREVENT ANY SILT ACCUMULATION ALONG THE BOTTOM OF THE RAIN GARDEN. MINIMUM VEGETATIVE COVERAGE OF 90% SHALL BE TARGETED AND MAINTAINED.
7. RAIN GARDEN SHALL NEVER BE USED FOR SEDIMENT CONTROL DURING AN ACTIVE CONSTRUCTION PERIOD.
8. THE AREA OF THE RAIN GARDEN SHALL BE MARKED OFF BY APPROPRIATE FENCING TO PREVENT THE MOVEMENT OF CONSTRUCTION VEHICLES OVER AND THE POSSIBLE COMPACTION OF THE NATURAL SOILS.
9. DURING CONSTRUCTION, SEDIMENT SHALL BE PREVENTED FROM ENTERING THE AREAS OF THE RAIN GARDEN. THE CONTRACTOR SHALL ENSURE THAT THE AREAS DRAINING TO THE RAIN GARDEN ARE STABILIZED IN A TIMELY MANNER AND MAINTAINED OVER THE ENTIRE AREA DRAINING TO THE RAIN GARDEN.

RAIN GARDEN MAINTENANCE PLAN:

1. PORTION OF BASIN FLOOR/SIDE SLOPES THAT ARE GRASSED SHALL BE MOWED 4" TO 6" AS NEEDED. GRASS CLIPPINGS, LEAVES AND ACCUMULATED SEDIMENT AND DEBRIS SHALL BE REMOVED.
2. NO PESTICIDES OR NON-ORGANIC FERTILIZERS SHALL BE USED IN AREAS DRAINING TO THE RAIN GARDEN.
3. IF THERE IS AN ACCUMULATION OF ORGANIC DEBRIS OR SEDIMENT ON THE FLOOR OF THE BASIN OR IF PONDING WATER IS REGULARLY OBSERVED MORE THAN 48 HOURS AFTER A RAINFALL EVENT, THE TOP 6" SHALL BE REMOVED AND THE EXPOSED SOIL SURFACE ROTOTILLED TO A DEPTH OF 12". SEDIMENTATION SHOULD BE REMOVED WHEN IT IS VISIBLY DRY AND READILY SEPARATES FROM THE BASIN FLOOR TO MINIMIZE SMEARING. AFTER THIS WORK HAS BEEN DONE, THE BOTTOM OF THE RAIN GARDEN SHALL BE RESTORED TO ITS ORIGINAL CONDITION.

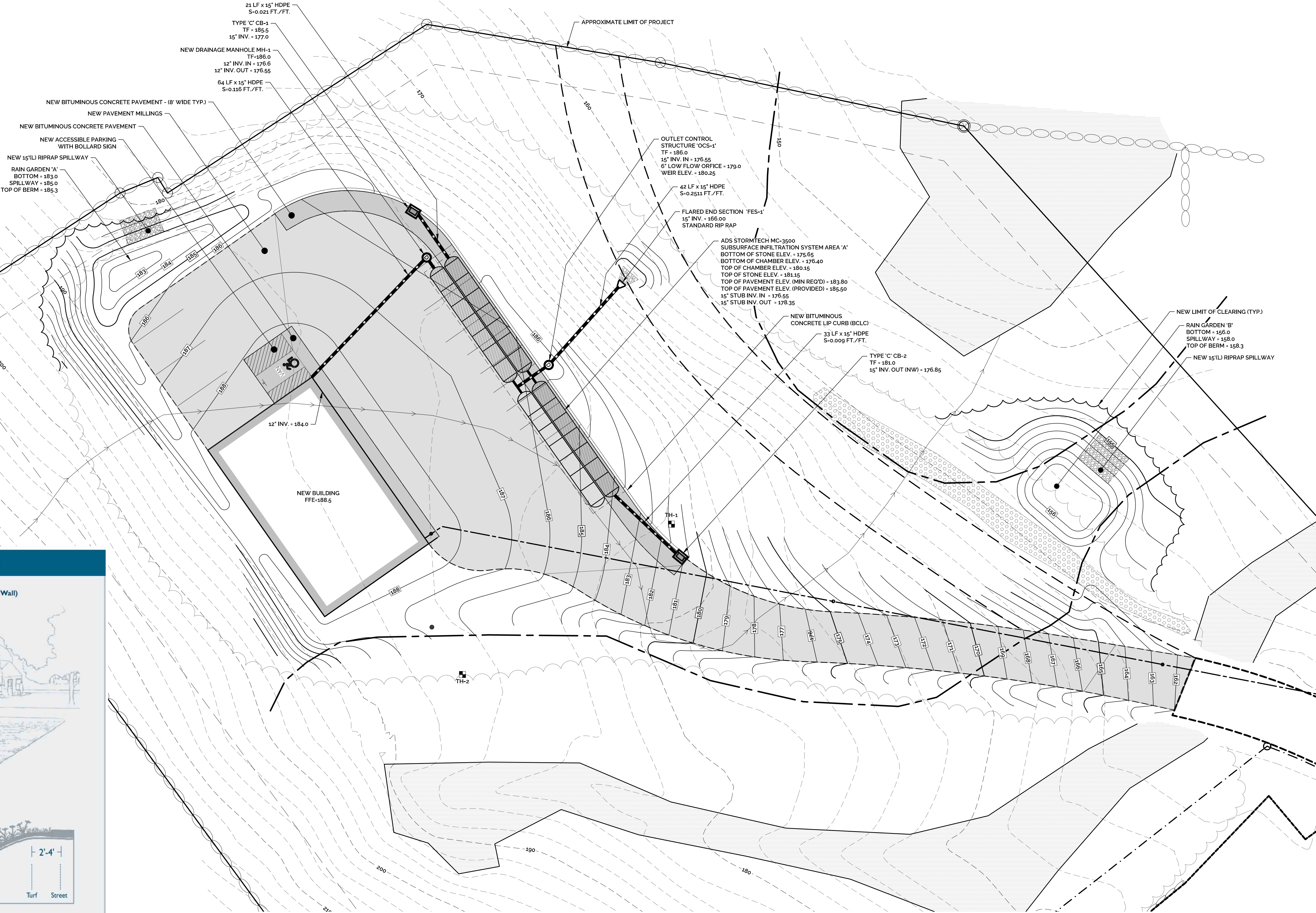
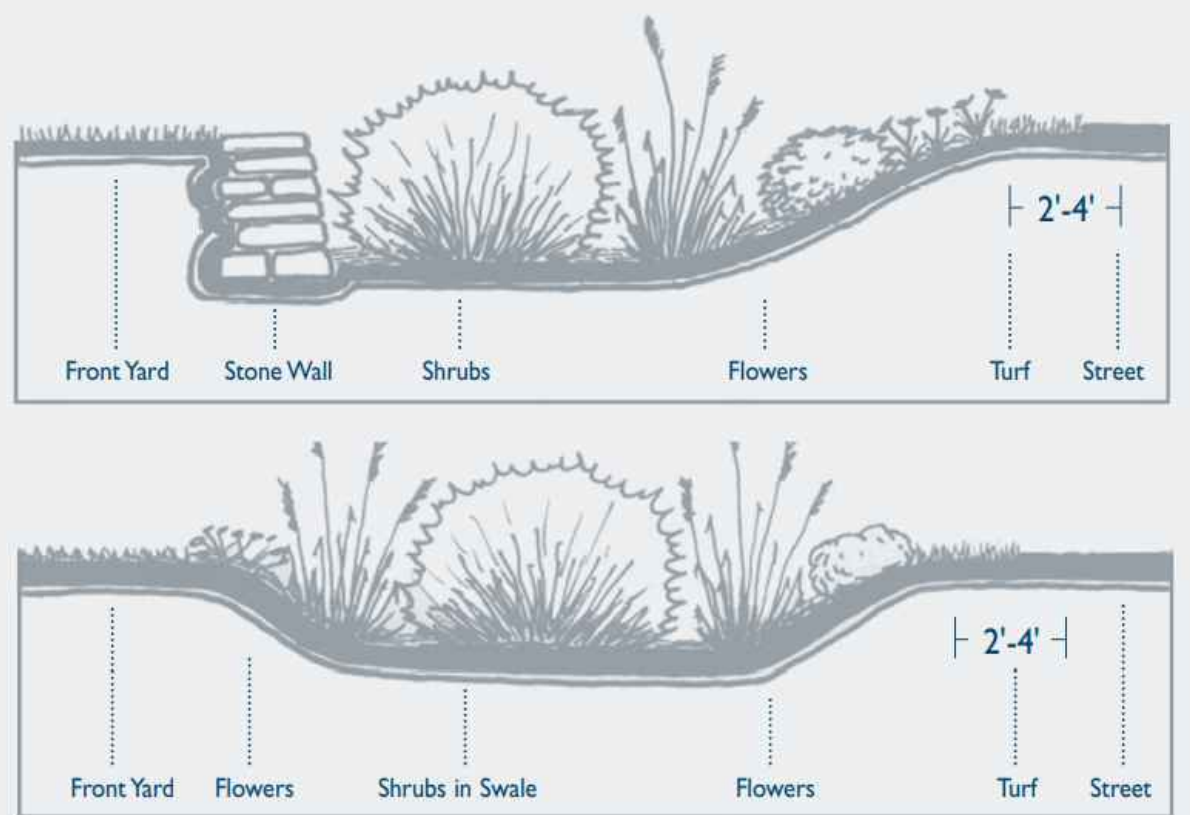
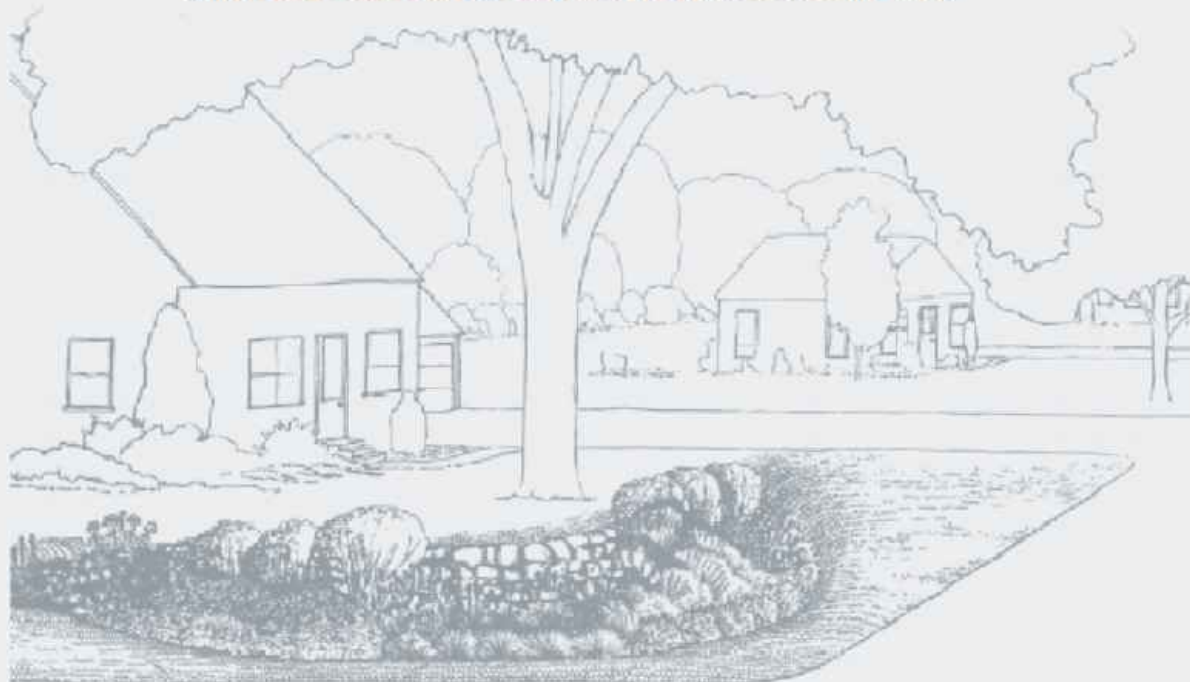


Figure 4-6 Residential Rain Gardens

Typical Residential Rain Garden (With and Without Masonry Wall)



Source: Metropolitan Council, 2001 (Adapted from Nassauer et al., 1997) and Low Impact Development Center (www.lowimpactdevelopment.org), 2001.

SOURCE: 2004 CONNECTICUT STORMWATER QUALITY MANUAL, PREPARED BY THE CONNECTICUT DEPARTMENT OF ENVIRONMENTAL PROTECTION

RAIN GARDEN DETAIL
NOT TO SCALE

RAIN GARDEN PLANT LIST

BOTANICAL NAME	COMMON NAME	QUANTITIES		SIZE
		RAIN GARDEN 'A'	RAIN GARDEN 'B'	
CEPHALANTHUS OCCIDENTALIS	BUTTON BUSH	4	4	3'-4'
CLETHRA ALNIFOLIA	SWEET PEPPERBUSH	4	4	3'-4'
LLEX VERTICILLATA	FEMALE WINTERBERRY	10	10	3'-4'
LLEX VERTICILLATA	MALE WINTERBERRY	2	2	3'-4'

NOTE: ALL PLANTINGS SHALL BE NON-INVASIVE AND NATIVE SPECIES.

TEST PIT RESULTS

DATE: SEPTEMBER 22, 2022
RECORDED BY: RICHARD SNARSKI, CPSS
(NEW ENGLAND ENVIRONMENTAL SERVICES)
WITNESSED BY: SEAMUS MORAN, P.E.
(H+H ENGINEERING)

TEST HOLE 1

0'-46" FILL
46"-122" OLIVE GRAVELLY SANDY LOAM WITH WEATHERED ROCK (FIRM)

MOTTLING @ 98"
NO GROUNDWATER
NO REFUSAL

TEST HOLE 2

0'-10" FILL
10'-31" DARK YELLOWISH BROWN FINE SANDY LOAM (FRIABLE)
31'-89" OLIVE GRAVELLY SANDY LOAM WITH WEATHERED ROCK

MOTTLING @ 87"
NO GROUNDWATER
NO REFUSAL

PERMEABILITY RESULTS

CONDUCTED BY: RICHARD SNARSKI, CPSS
(NEW ENGLAND ENVIRONMENTAL SERVICES)
SAMPLE COLLECTION DATE: SEPTEMBER 22, 2022
TESTING METHOD: THE FALLING HEAD METHOD

TEST HOLE	SAMPLE DEPTH (INCHES)	PERMEABILITY (FT./DAY)
1	87	9.6

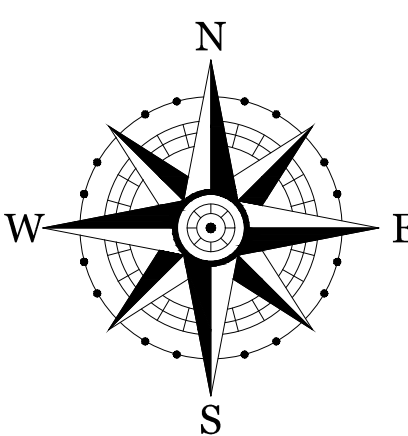
STAMP

REV	DATE	DESCRIPTION OF REVISION
1	12/6/2022	STORMWATER SYSTEM LENGTH REVISED

STORMWATER MANAGEMENT PLAN

NEW INDUSTRIAL DEVELOPMENT
PROPERTY ADDRESS:
412 MAPLE AVENUE, UNCASVILLE-MONTVILLE, CT 06382

PREPARED FOR:
ADVANCED ASSOCIATES, LLC
P.O. BOX 464, UNCASVILLE-MONTVILLE, CT 06382



SCALE IN FEET
20 10 0 10 20

PROJECT NO. 2022-0019	SCALE 1" = 20'
DRAWN BY: SMM	DATE: 11/1/2022
CHECKED BY: SMM	DATE: 11/1/2022

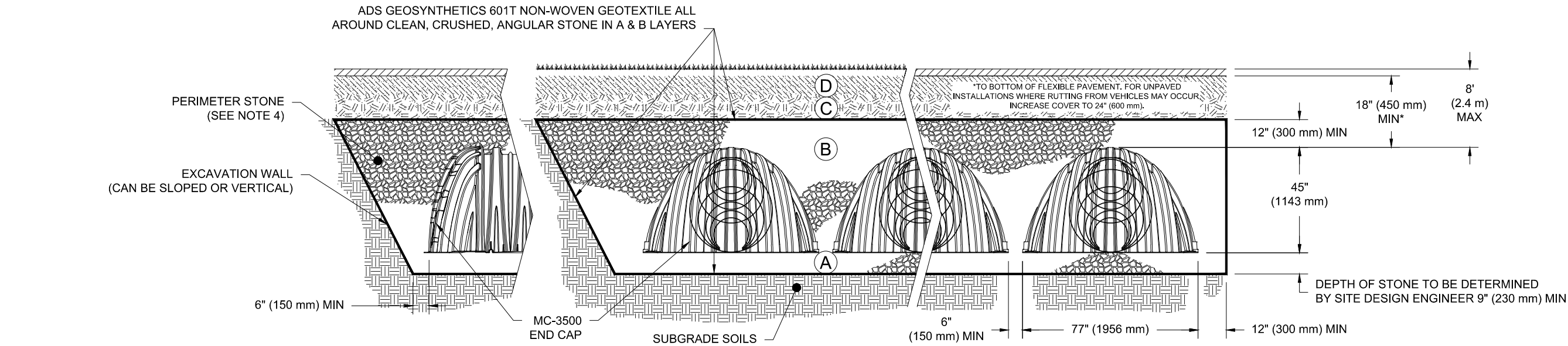
DRAWING
SMP-1

SHEET NUMBER: 1 OF 2

ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 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	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 24" (600 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' 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 24" (600 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE (A' LAYER) TO THE 'C' LAYER ABOVE.	AASHTO M43 ¹ 3, 4	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	AASHTO M43 ¹ 3, 4	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 9" (230 mm) MAX LIFTS USING TWO FULL COVERS 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.
4. 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.



NOTES:

- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS"
- CHAMBER CLASSIFICATION 45479 DESIGNATION SS.
- MC-3500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS"
- 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.
- PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
- REQUIREMENTS FOR HANDLING AND INSTALLATION:
 - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, a) THE ARCH STIFFNESS CONSTANT AS DEFINED IN SECTION 6.2.8 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 530 LBS/FT² IN. AND b) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 73° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

MC-3500 CROSS SECTION DETAIL
NOT TO SCALE

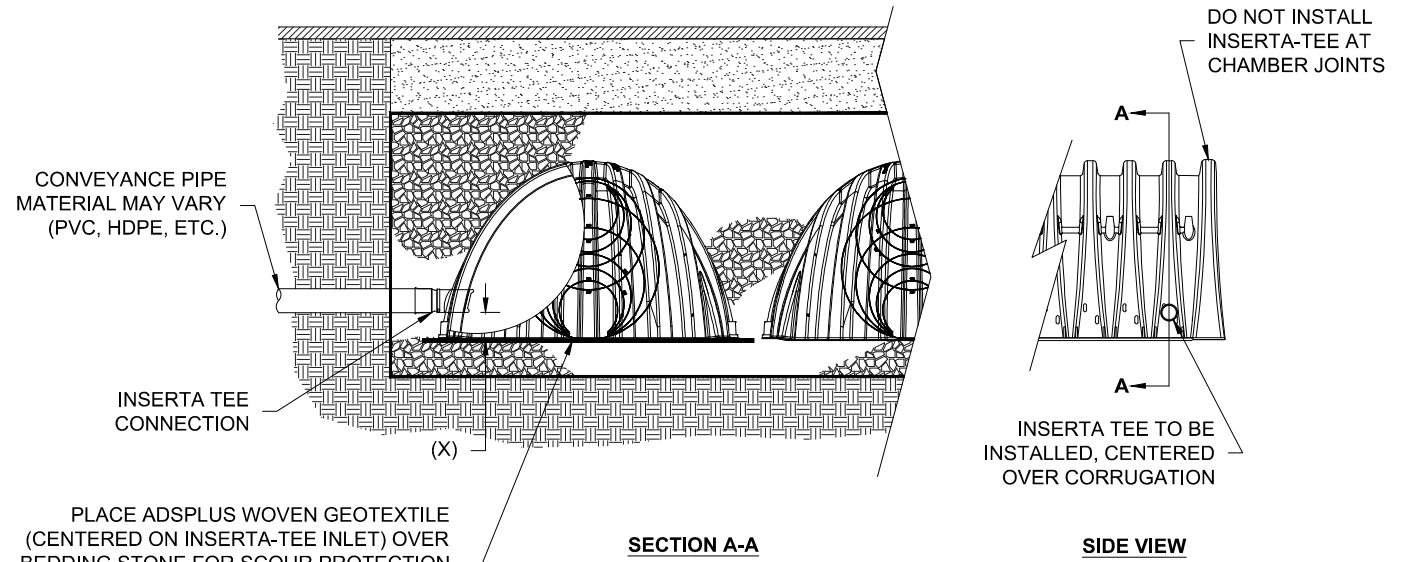
INSPECTION & MAINTENANCE

- STEP 1) INSPECT ISOLATOR ROW PLUS FOR SEDIMENT
- INSPECTION PORTS (IF PRESENT)
 - REMOVE/OPEN LID ON NYLOPLAST INLINE DRAIN
 - REMOVE AND CLEAN FLEXSTORM FILTER IF INSTALLED
 - USING A FLASHLIGHT AND STADIUM ROD, MEASURE DEPTH OF SEDIMENT AND RECORD ON MAINTENANCE LOG
 - LOWER A CAMERA INTO ISOLATOR ROW PLUS FOR VISUAL INSPECTION OF SEDIMENT LEVELS (OPTIONAL)
 - IF SEDIMENT IS AT, OR ABOVE, 3" (80 mm) PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
 - ALL ISOLATOR PLUS ROWS
 - REMOVE COVER FROM STRUCTURE AT UPSTREAM END OF ISOLATOR ROW PLUS
 - USING A FLASHLIGHT, INSPECT DOWN THE ISOLATOR ROW PLUS THROUGH OUTLET PIPE
 - MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
 - FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
 - 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 PLUS USING THE JETVAC PROCESS
- A FIXED CULVERT CLEANING NOZZLE WITH REAR FACING SPREAD OF 45° (1.1 m) OR MORE IS PREFERRED
 - APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
 - 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

- 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.
- CONDUCT JETTING AND VACTORING ANNUALLY OR WHEN INSPECTION SHOWS THAT MAINTENANCE IS NECESSARY.

MC-3500 ISOLATOR ROW PLUS DETAIL
NOT TO SCALE

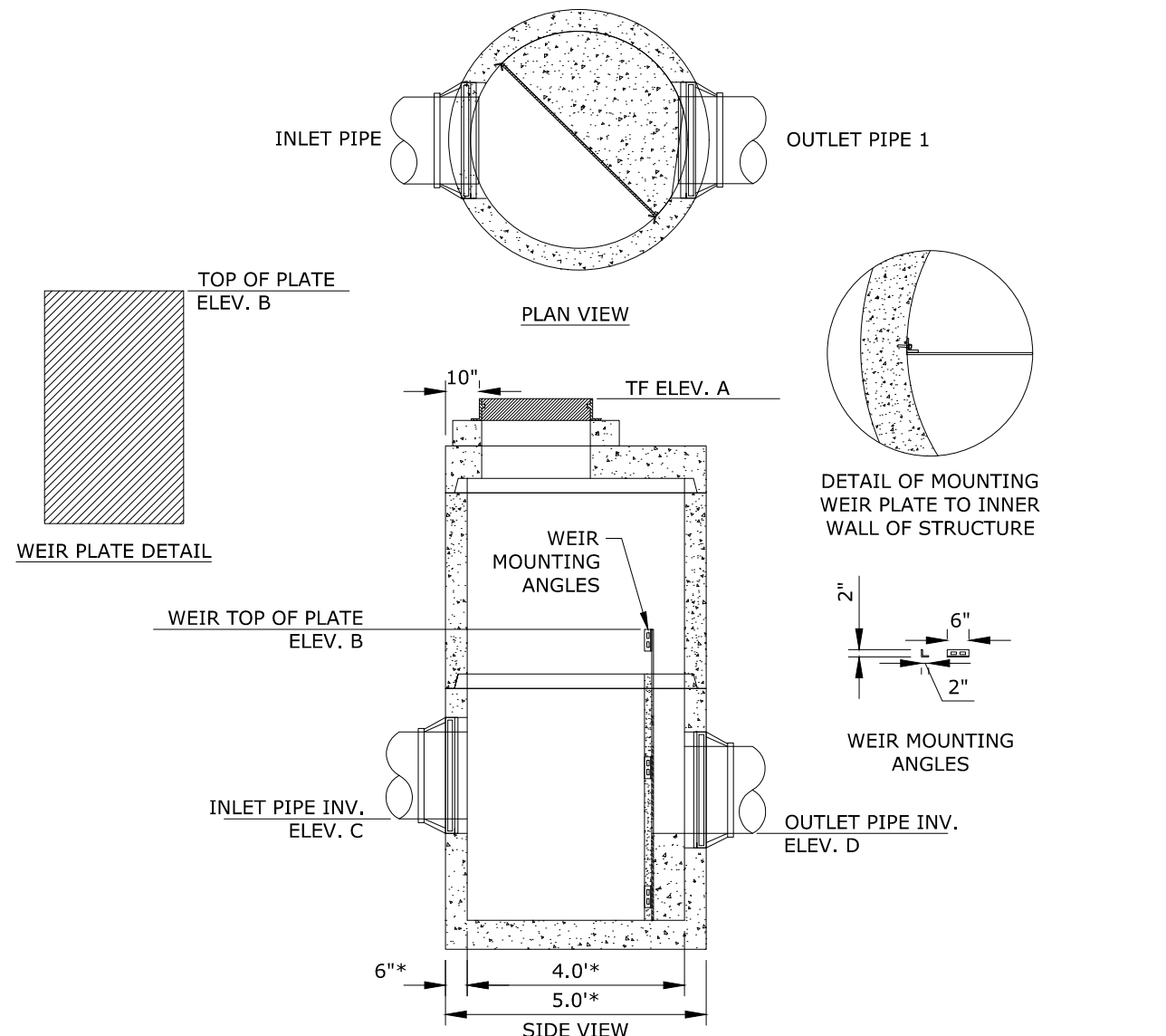


CHAMBER	MAX DIAMETER OF INSERTA-TEE	HEIGHT FROM BASE OF CHAMBER (X)
SC-310	6" (150 mm)	4" (100 mm)
SC-740	10" (250 mm)	4" (100 mm)
DC-780	10" (250 mm)	4" (100 mm)
MC-3500	12" (300 mm)	6" (150 mm)
MC-4500	12" (300 mm)	6" (150 mm)
MC-7200	12" (300 mm)	8" (200 mm)

INSERTA-TEE FITTINGS AVAILABLE FOR SDR 26, SDR 35, SCH 40 IPS GASKETED & SOLVENT WELD, N-12, HP STORM, C-900 OR DUCTILE IRON

- NOTES:
- PART NUMBERS WILL VARY BASED ON INLET PIPE MATERIALS; CONTACT STORMTECH FOR MORE INFORMATION.
 - CONTACT ADS ENGINEERING SERVICES IF INSERTA-TEE INLET MUST BE RAISED AS NOT ALL INVERTS ARE POSSIBLE.

INSERTA-TEE SIDE INLET DETAIL
NOT TO SCALE

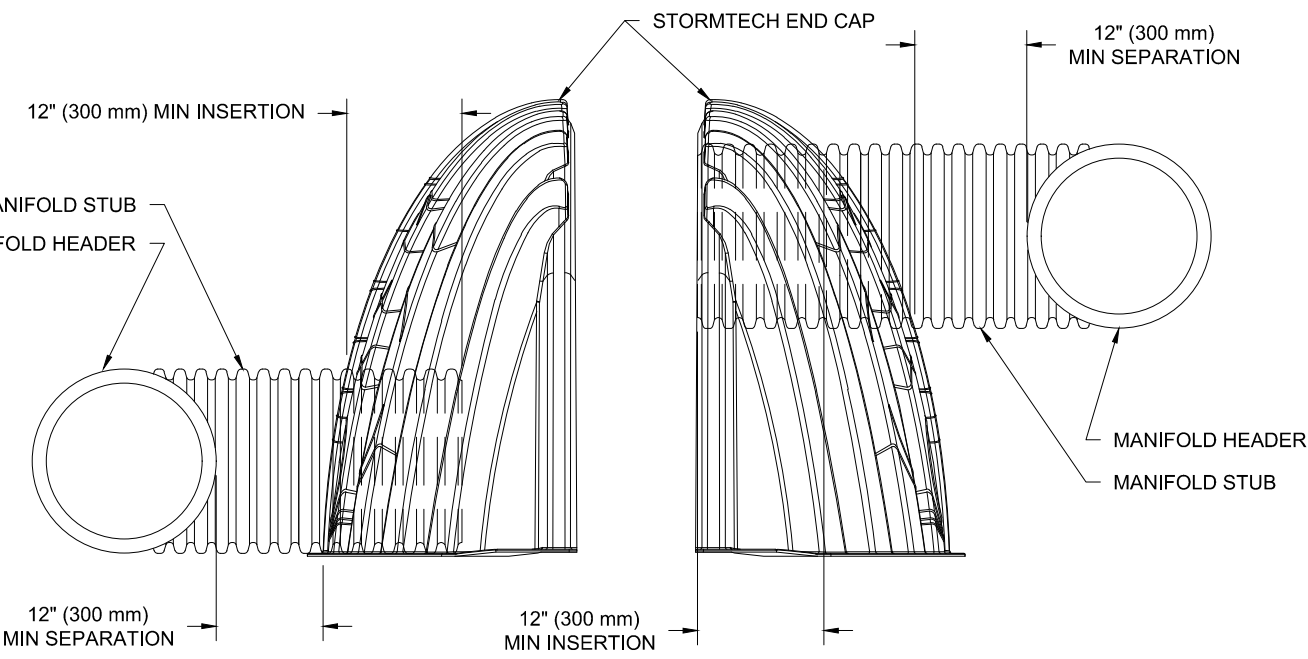


NOTE:
*5" OR 6" DIA. PRECAST BASES MAY BE USED WHEN REQUIRED DUE TO SIZE OR NUMBER OF PIPES AT THE MANHOLE. PRECAST REDUCERS WILL BE PLACED ABOVE THE 5" AND 6" BASES. WALL THICKNESS TO INCREASE 1" FOR EACH 1" OF INSIDE DIAMETER INCREASE.

OUTLET CONTROL STRUCTURE DETAIL
NOT TO SCALE

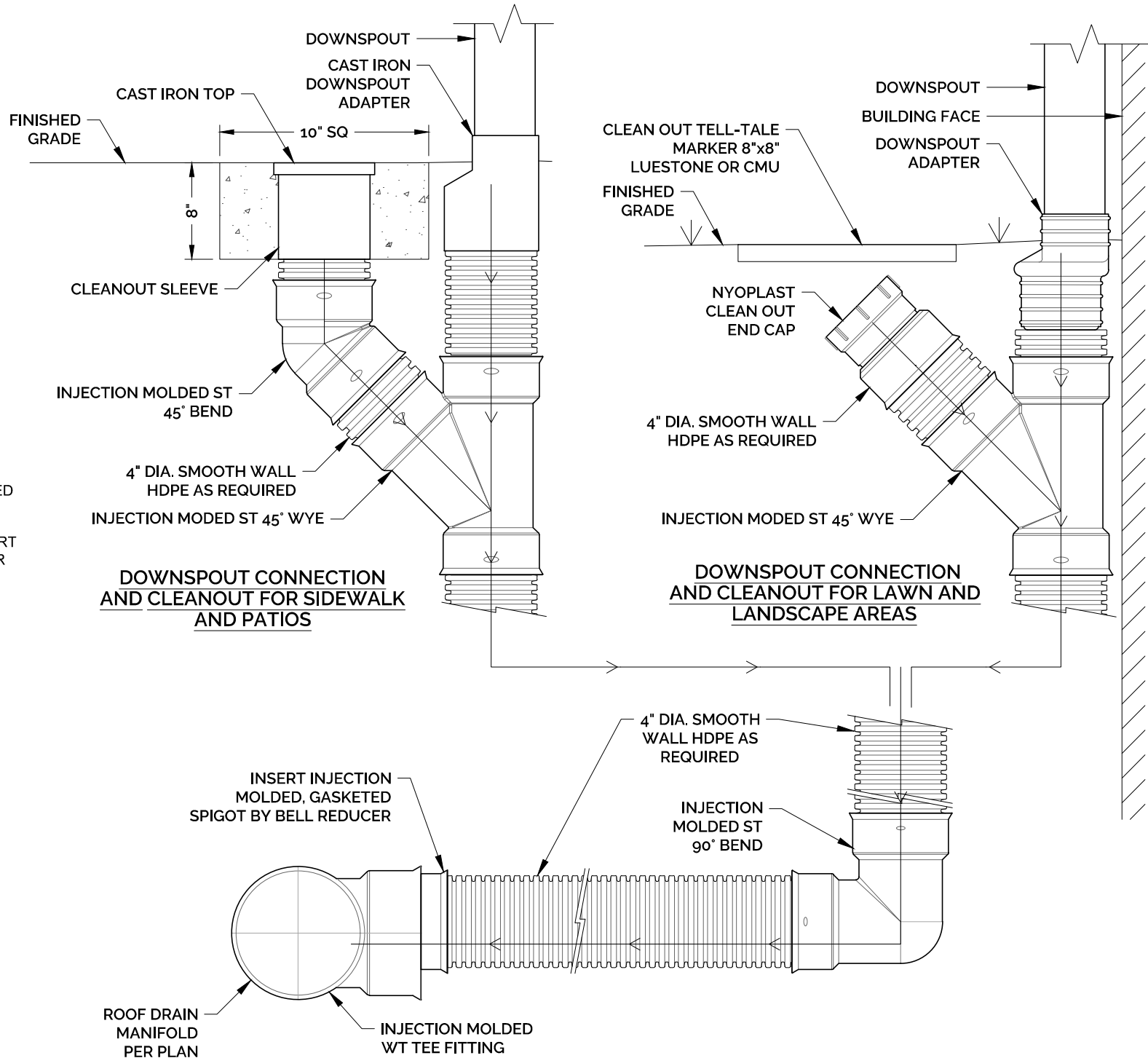
STRUCTURE ID	TOP OF FRAME ELEV. A	TOP OF WEIR PLATE ELEV. B	INLET PIPE INVERT ELEV. C	OUTLET PIPE INVERT ELEV. D
OCS-1	186.0	180.25	176.55 (15')	179.0 (6')

OUTLET CONTROL STRUCTURE (OCS)
NOT TO SCALE



4" PVC INSPECTION PORT DETAIL
(MC SERIES CHAMBER)

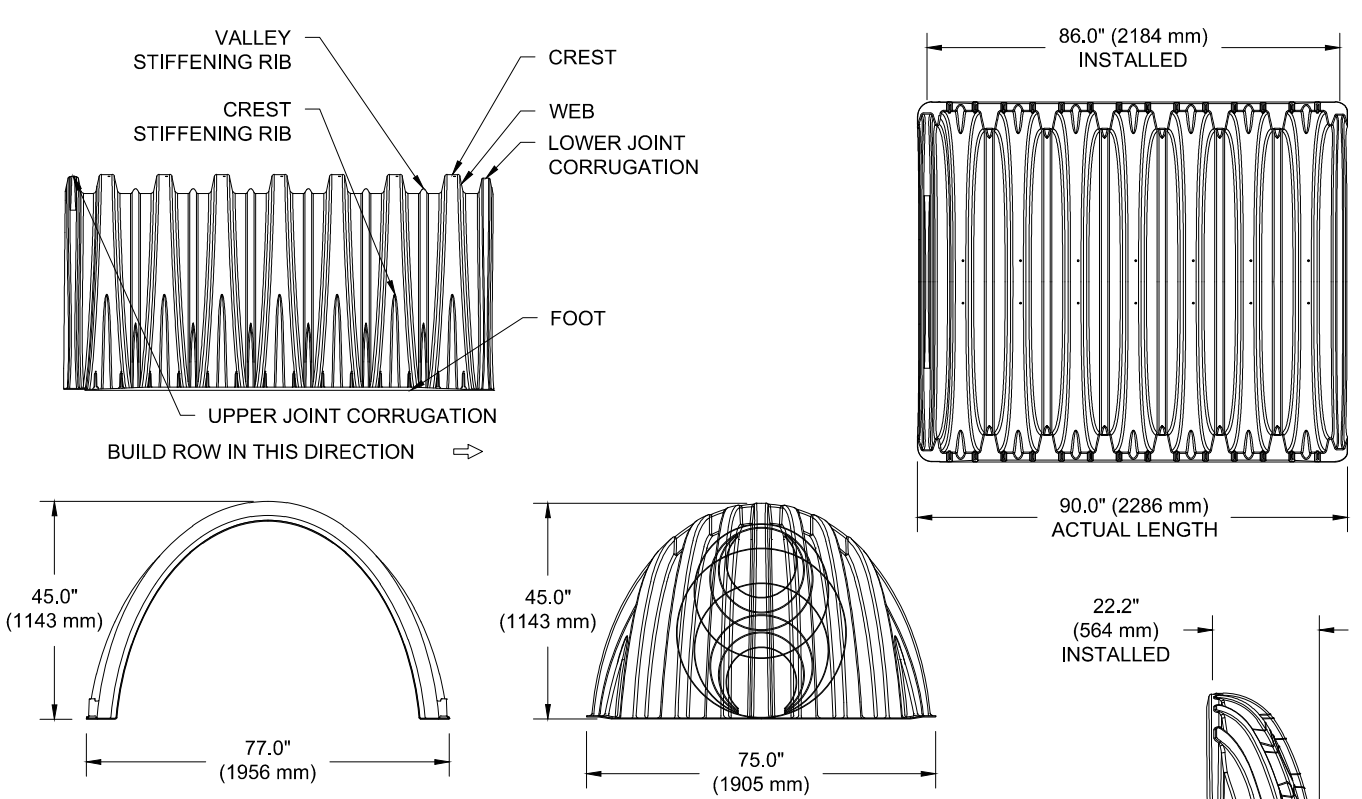
NOTE: MANIFOLD STUB MUST BE LAID HORIZONTAL FOR A PROPER FIT IN END CAP OPENING.



DOWNSPOUT CONNECTION AND CLEANOUT FOR SIDEWALK AND PATIOS
NOT TO SCALE



ROOF DRAIN DOWNSPOUT CONNECTION
NOT TO SCALE



NOMINAL CHAMBER SPECIFICATIONS	SIZE (W X H X INSTALLED LENGTH)	CHAMBER STORAGE	MINIMUM INSTALLED STORAGE*	WEIGHT
77.0" X 45.0" X 86.0"	109.9 CUBIC FEET	175.0 CUBIC FEET	134 lbs.	(3.11 m ³) (4.86 m ³) (60.8 kg)
NOMINAL END CAP SPECIFICATIONS	SIZE (W X H X INSTALLED LENGTH)	END CAP STORAGE	MINIMUM INSTALLED STORAGE*	WEIGHT
75.0" X 45.0" X 22.2"	14.9 CUBIC FEET	45.1 CUBIC FEET	49 lbs.	(0.42 m ³) (1.28 m ³) (22.2 kg)

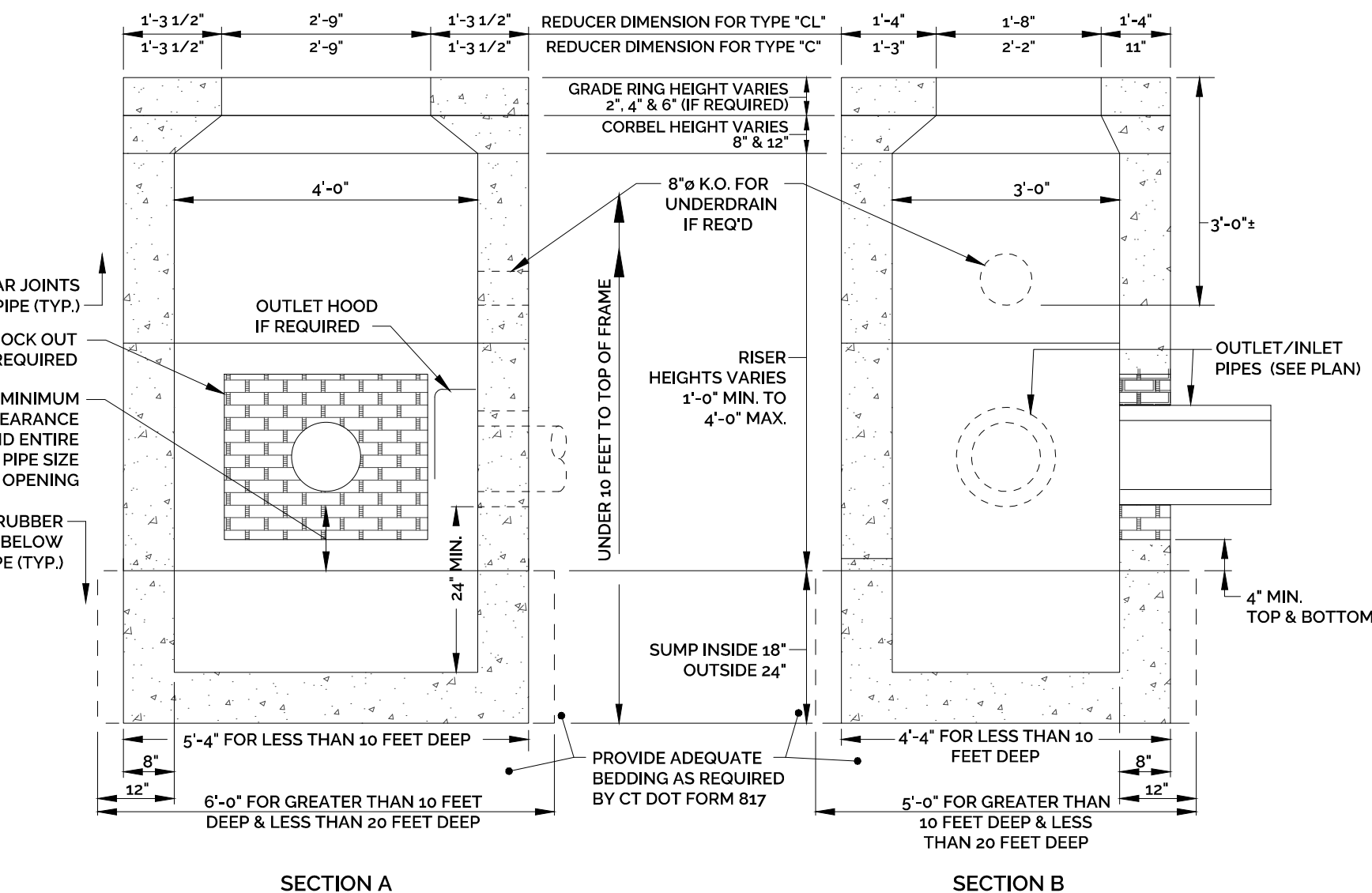
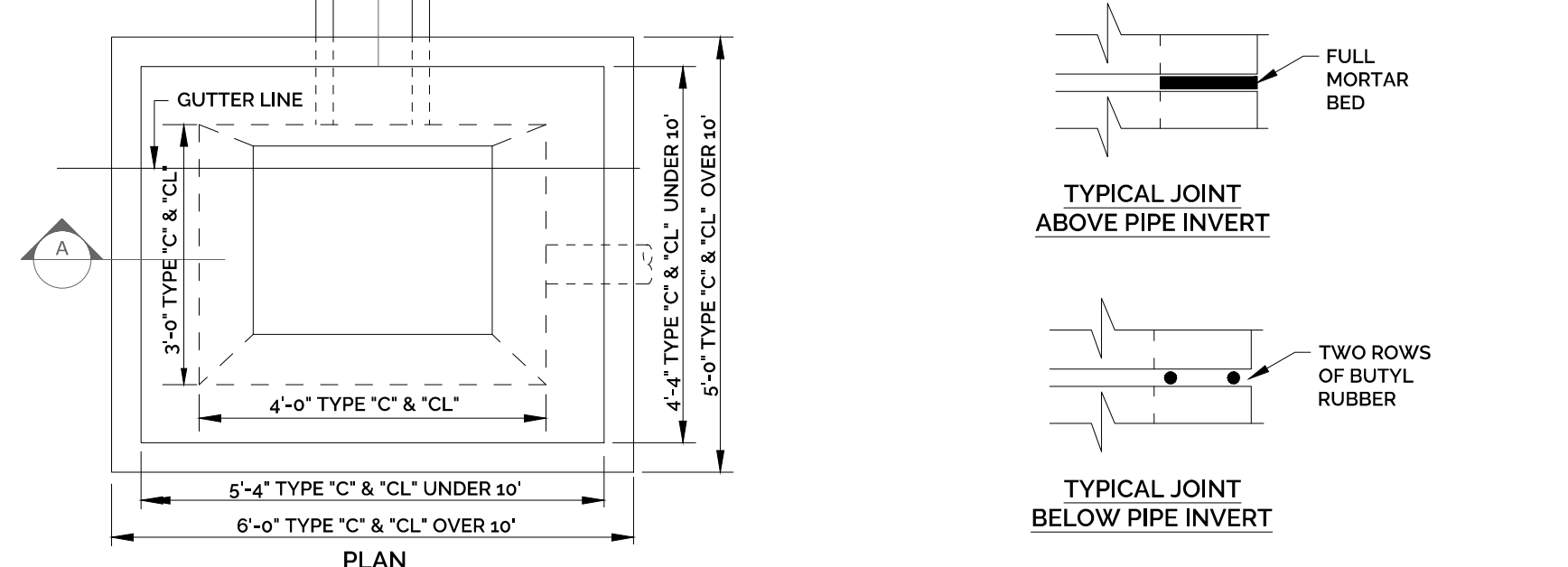
*ASSUMES 12" (305 mm) STONE ABOVE, 9" (229 mm) STONE FOUNDATION, 6" (152 mm) STONE PERIMETER IN FRONT OF END CAPS AND 40% STONE POROSITY.

PARTIAL CUT HOLES AT BOTTOM OF END CAP FOR PART NUMBERS ENDING WITH "B"
PARTIAL CUT HOLES AT TOP OF END CAP FOR PART NUMBERS ENDING WITH "T"
END CAPS WITH A PREFABRICATED WELDED STUB END WITH "W"
END CAPS WITH A WELDED CROWN PLATE END WITH "C"

PART #	STUB	B	C
MC3500IEPP06T	6" (150 mm)	33.21" (844 mm)	---
MC3500IEPP06B	---	---	0.66" (17 mm)
MC3500IEPP08T	8" (200 mm)	31.16" (791 mm)	---
MC3500IEPP08B	---	---	0.81" (21 mm)
MC3500IEPP10T	10" (250 mm)	29.04" (738 mm)	---
MC3500IEPP10B	---	---	0.93" (24 mm)
MC3500IEPP12T	12" (300 mm)	26.36" (670 mm)	---
MC3500IEPP12B	---	---	1.35" (34 mm)
MC3500IEPP15T	15" (375 mm)	23.39" (594 mm)	---
MC3500IEPP15B	---	---	1.50" (38 mm)
MC3500IEPP18TC	---	20.03" (509 mm)	---
MC3500IEPP18TW	---	---	1.77" (45 mm)
MC3500IEPP18BC	18" (450 mm)	---	---
MC3500IEPP18BW	---	---	---
MC3500IEPP24TC	---	14.48" (368 mm)	---
MC3500IEPP24TW	24" (600 mm)	---	---
MC3500IEPP24BC	---	---	2.06" (52 mm)
MC3500IEPP24BW	---	---	2.75" (70 mm)
MC3500IEPP30BC	30" (750 mm)	---	---

NOTE: ALL DIMENSIONS ARE NOMINAL

MC-3500 TECHNICAL SPECIFICATIONS
NOT TO SCALE



- NOTES:
- PRECAST CONCRETE CATCH BASIN COMPONENTS SHALL CONFORM TO CTDOT FORM 817 STANDARD SPECIFICATION FOR ROADS, BRIDGES AND INCIDENTAL CONSTRUCTION AND CTDOT HIGHWAY STANDARD SHEETS HW-507.04, HW-507.07 & HW-507.08, AS AMENDED.
 - THIS DETAIL IS BASED ON CTDOT PRECAST CONCRETE TYPE "C" & "CL" CATCH BASIN COMPONENTS. (UNDER 10' DEEP SHOWN).
 - REINFORCING STEEL, DEFORMED BARS ARE NOT SHOWN AND SHALL CONFORM TO LATEST CTDOT STANDARDS & SUPPLEMENTALS AND ASTM SPECIFICATION A615, GRADE 60. MINIMUM COVER 2" UNLESS OTHERWISE NOTED.
 - METHOD OF MANUFACTURE SHALL BE WET CAST.
 - SUMP SECTION SHALL BE MONOLITHIC.
 - DESIGN LOAD SHALL BE AASHTO H-20.
- REFERENCE: CT DOT HIGHWAY STANDARDS, SHEET HW-507.04, HW-507.07 & HW-507.08, CT DOT FORM 817, AND UNITED CONCRETE PRODUCTS, AUGUST 2015

TYPE "C" AND "CL" PRECAST CONCRETE CATCH BASIN DETAILS
NOT TO SCALE

H+H
ENGINEERING
ASSOCIATES

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Mystic, CT 06355
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www.hh-engineers.com

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