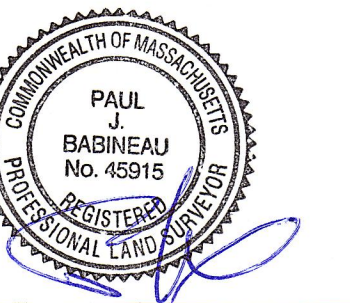


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APPROVED SUBJECT TO TERMS AND
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DECISION, AS AUTHORIZED BY CHAPTER
40B OF THE MASSACHUSETTS GENERAL
LAWS, SECTIONS 20-23.

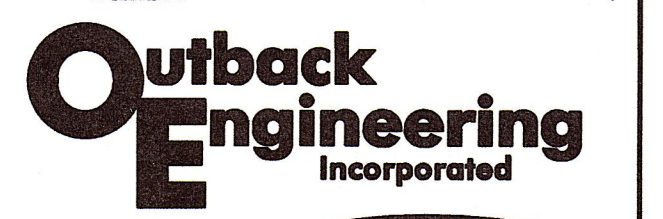
DATE: _____

MEDWAY ZONING BOARD OF APPEALS

I CERTIFY THAT 20 DAYS HAVE ELAPSED SINCE ZONING BOARD APPROVAL, AND THAT NO APPEAL HAS BEEN FILED AT THIS OFFICE.

TOWN CLERK—TOWN OF MEDWAY

PROFILE
KINGSBURY DRIVE
STA 0+00 TO 21+50
"KINGSBURY VILLAGE"
OFF
IN
MEDWAY
MASSACHUSETTS

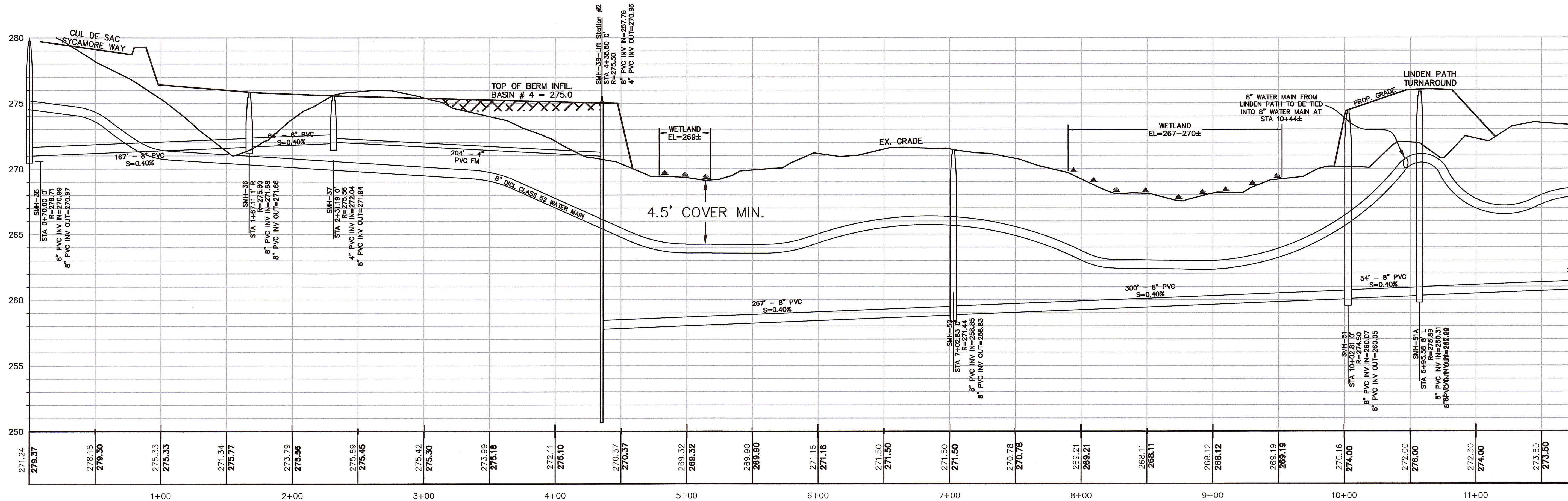


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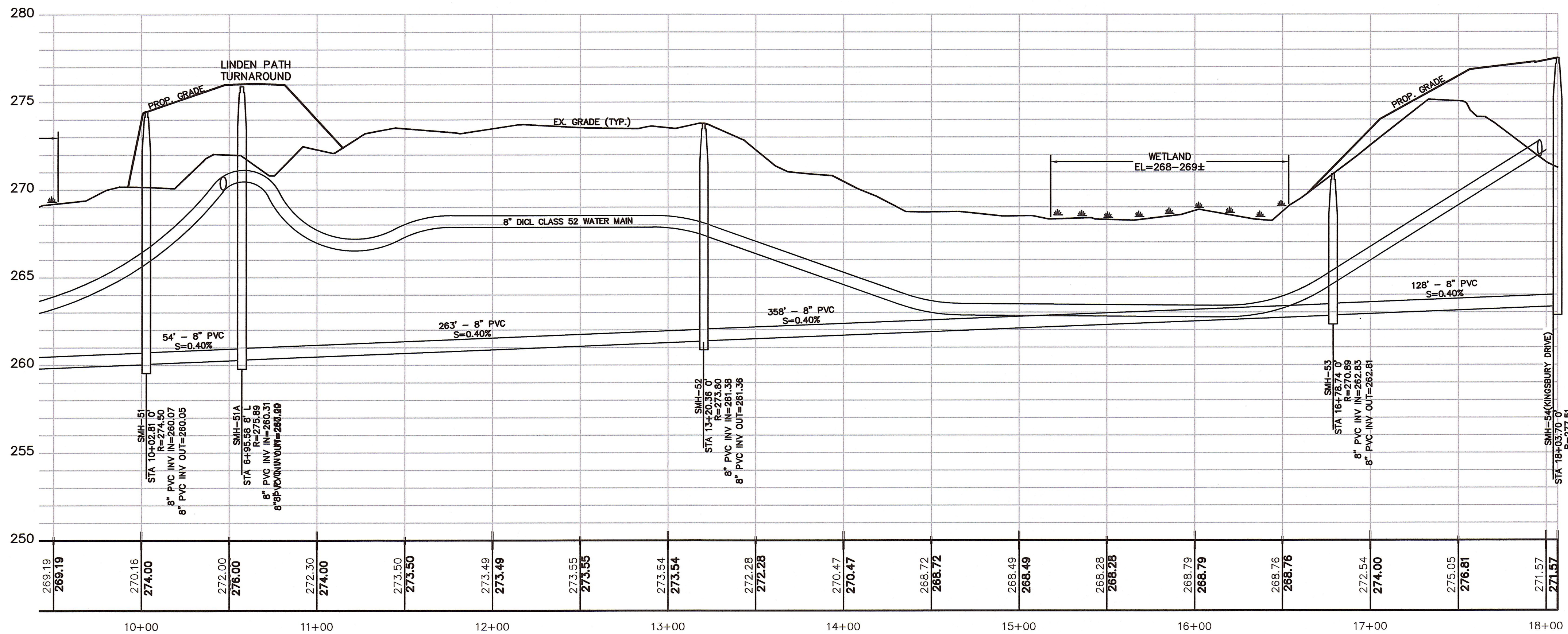
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| DATE: AUGUST 6, 2019 | | |
| DRAWN BY: CJV | CHECKED BY: JAP | |
| SCALE: 1"=40' | SHEET 49 OF 62 | |
| 40' | 80' | 120' |

OE-2765

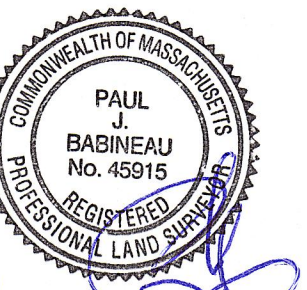
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EAST-WEST UTILITY PROFILE
HORIZONTAL: 1"=40'
VERTICAL: 1"=4'



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10-16-19
DATE PROFESSIONAL LAND SURVEYOR

APPROVED SUBJECT TO TERMS AND CONDITIONS OF A COMPREHENSIVE PERMIT PER ZONING BOARD OF APPEALS DECISION, AS AUTHORIZED BY CHAPTER 40B OF THE MASSACHUSETTS GENERAL LAWS, SECTIONS 20-23.

DATE:

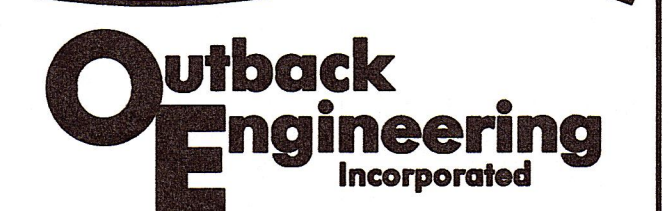
MEDWAY ZONING BOARD OF APPEALS

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TOWN CLERK-TOWN OF MEDWAY

PROFILE
EAST-WEST UTILITY
CONNECTION

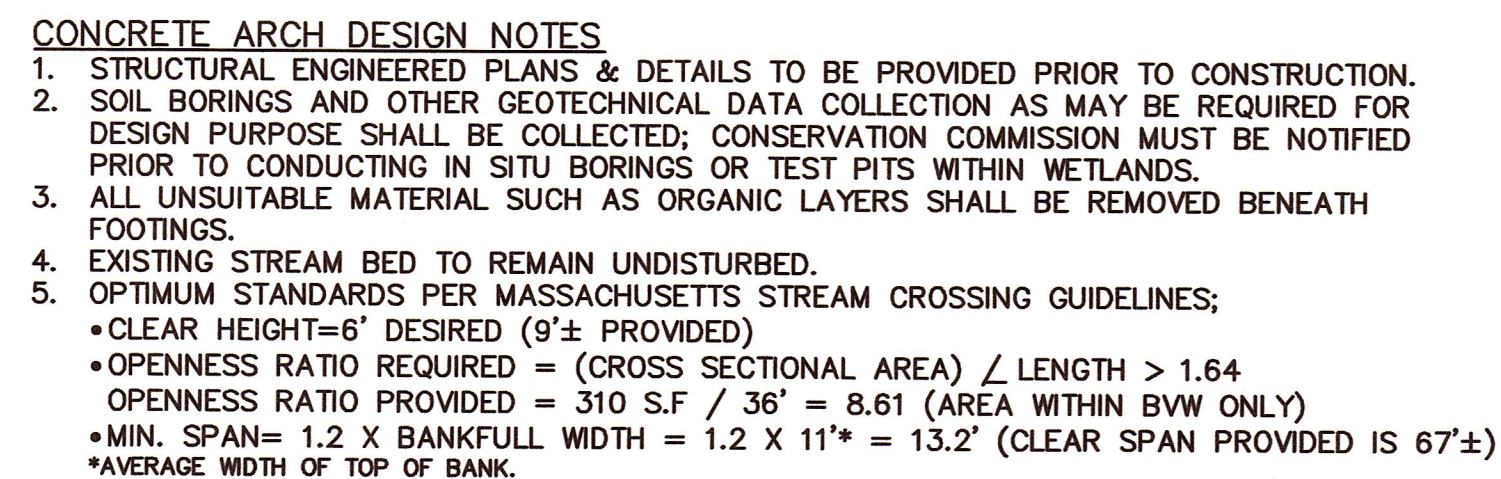
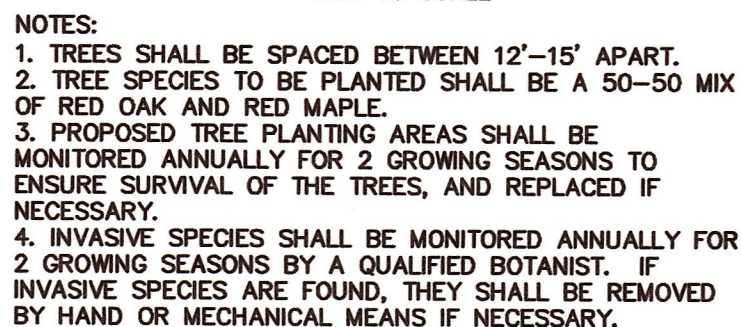
"TIMBER CREST
ESTATES
&
KINGSBURY VILLAGE"
IN
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MASSACHUSETTS



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DATE: AUGUST 6, 2019
DRAWN BY: CJV CHECKED BY: JAP
SCALE: 1"=40' SHEET 51 OF 62
0' 40' 80' 120'

OE-2765



BRIDGE CONSTRUCTION SEQUENCE

AS ROAD CONSTRUCTION PROGRESSES TOWARD BOTH SIDES OF WETLAND CROSSING #3 FROM HOLLISTON STREET AND 13 FAIRWAY LANE, BRIDGE CONSTRUCTION SHALL COMMENCE. THE BRIDGE ABUTMENTS SHOULD BE INSTALLED DURING THE LOW FLOW PERIOD (APPROXIMATELY JUNE TO OCTOBER). OWNER/CONTRACTOR MUST NOTIFY CONSERVATION COMMISSION 1 WEEK IN ADVANCE OF PROPOSED COMMENCEMENT TO ENSURE SUITABLE CONDITIONS ARE PRESENT AND SHALL FOLLOW THIS CONSTRUCTION SEQUENCE AS CLOSELY AS POSSIBLE.

1. LIMITS OF CLEARING TO BE MARKED ACROSS WETLANDS & STREAM
2. BETWEEN CLEARING WORK LIMITS, TREES SHALL BE CUT MANUALLY USING CHAIN SAWS (NO HEAVY EQUIPMENT ALLOWED). BRANCHES TO BE LIMBED AND LOGS TO BE CUT TO SHORT LENGTHS FOR REMOVAL BY HAND OR WINCH TO UPLAND.
3. INSTALL EROSION CONTROL BARRIER PER PLANS. NO HEAVY EQUIPMENT IS ALLOWED TO WORK IN UNPROTECTED BORDERING VEGETATED WETLANDS OR TO CROSS THE STREAM.
4. CLEAR AND GRUB STUMPS & UNSUITABLE SOILS. NO STOCKPILES ALLOWED WITHIN 50' OF WETLANDS.
5. EXCAVATE AND CONSTRUCT FOUNDATION AND POURED CONCRETE FOOTINGS PER STRUCTURAL DESIGN PLANS. WORK TO BE CONDUCTED FROM UPLAND SIDES OF WORK LIMITS, TO PROTECT BVW AND STREAM.
6. CONCRETE ARCHES AND RETAINING WALLS TO BE INSTALLED WITH CRANES SET IN UPLAND AREAS, PER STRUCTURAL DESIGN PLANS AND MANUFACTURERS REQUIREMENTS.
7. BACKFILL ARCH AND RETAINING WALLS.
8. INSTALL UTILITIES AND ROADWAY WITH GUARDRAIL.
9. EXISTING GRADE AND VEGETATION WITHIN DISTURBED BORDERING VEGETATED WETLAND TO BE RESTORED POST-CONSTRUCTION. (REFER TO RESTORATION PLAN BY GODDARD CONSULTING)

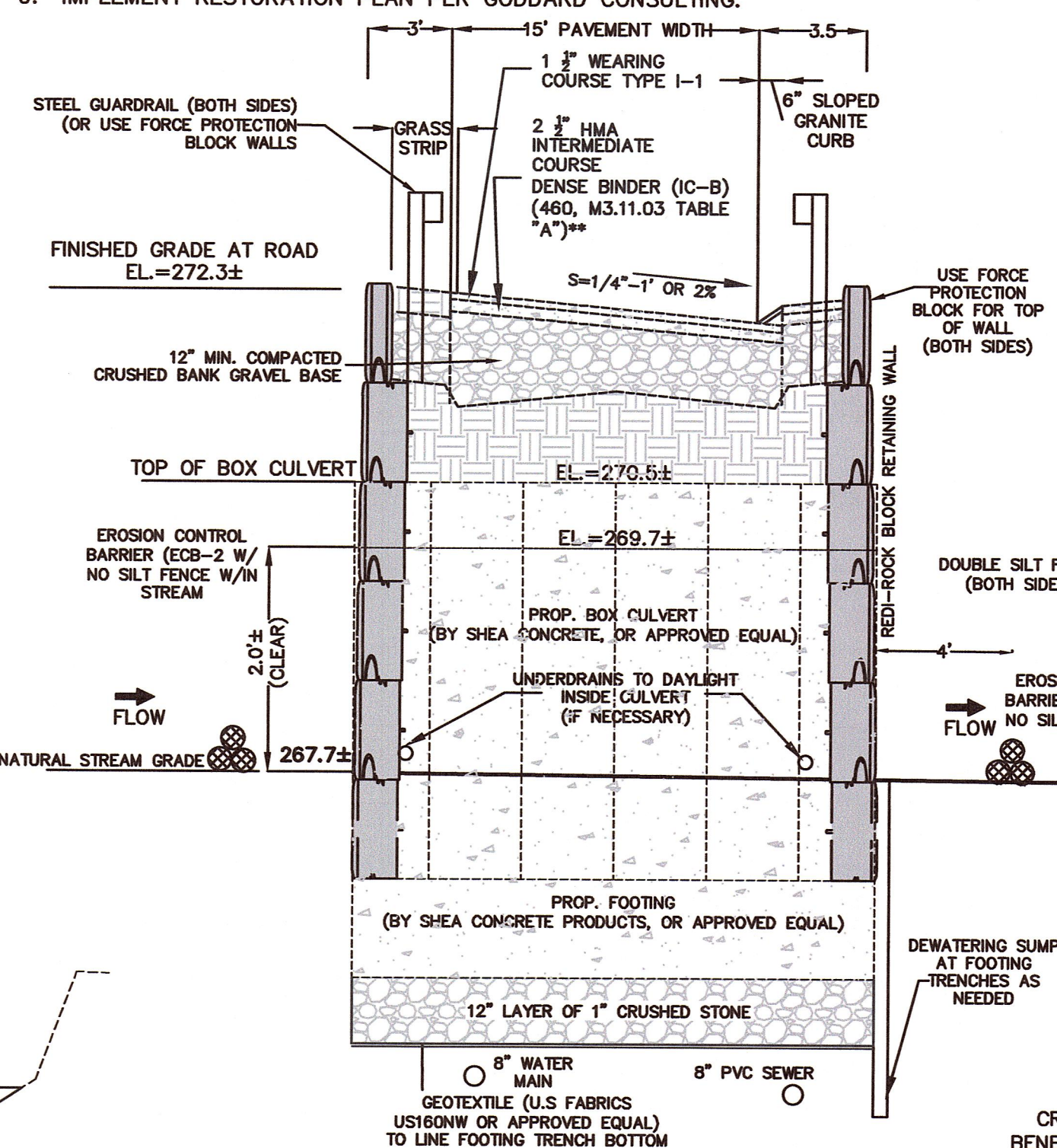


BOX CULVERT CONSTRUCTION SEQUENCE

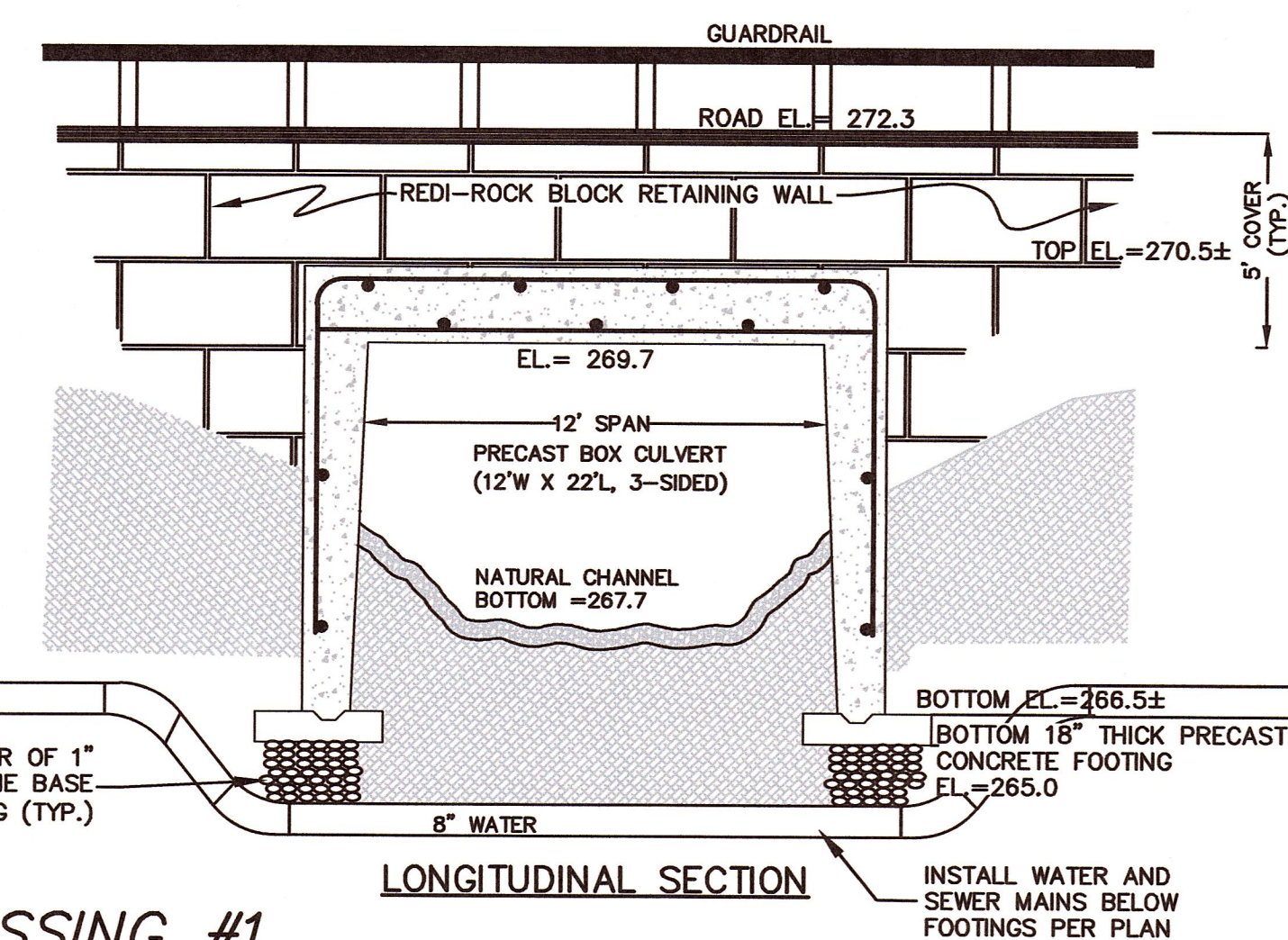
BOX CULVERT CONSTRUCTION SEQUENCE

THE CULVERT SHOULD BE INSTALLED DURING THE LOW FLOW PERIOD (APPROXIMATELY JUNE TO OCTOBER). OWNER/CONTRACTOR MUST NOTIFY CONSERVATION COMMISSION 1 WEEK IN ADVANCE OF PROPOSED COMMENCEMENT TO ENSURE SUITABLE CONDITIONS ARE PRESENT AND SHALL FOLLOW THIS CONSTRUCTION SEQUENCE AS CLOSELY AS POSSIBLE. THE CULVERT INSTALLATION IS EXPECTED TO TAKE 1 WEEK, AND SHOULD BE DONE IN CONJUNCTION WITH THE RETAINING WALLS TO MINIMIZE POTENTIAL DISTURBANCE TO THE WETLANDS.

2. INSTALL SILT FENCE PER PLANS.
3. CLEAR AND GRUB UNSUITABLE SOILS.
3. INSTALL WATER AND SEWER LINES PER PLANS, AND RESTORE STREAM CHANNEL LINES AND GRADES.
4. EXCAVATE FOR NEW CULVERT AND WALL FOOTINGS PER STRUCTURAL PLANS.
 - 4.1. EXCAVATED AREA SHOULD EXTEND 24" HORIZONTALLY BEYOND THE EDGE OF THE PROPOSED CULVERT AND WALL FOUNDATIONS.
 - 4.2. SCRAPE BOTTOM OF FOOTING TRENCH WITH NON-TOOTHED MACHINE, IMMEDIATELY FOLLOWED BY PLACEMENT OF A REINFORCING GEOTEXTILE AND A 12" LAYER OF 1" SIZE CRUSHED STONE, IF REQUIRED.
 - 4.3. CONTRACTOR SHALL UTILIZE THE STONE FOOTING TRENCH FOR GROUNDWATER CONTROL IF NECESSARY. A SUMP MAY BE DUG ADJACENT TO THE UPSTREAM END OF FOOTING TRENCHES WHERE A PUMP MAY BE INSTALLED TO MAINTAIN WATER LEVELS BELOW THE FOOTINGS. THE PUMP DISCHARGE SHALL BE ROUTED TO A TEMPORARY STRAW-BALE FILTER AT DOWNGRADIENT END.
 - 4.4. WHERE WORK IS TO BE DONE DURING NO FLOW/DRY CONDITIONS, IT IS NOT ANTICIPATED THAT TEMPORARY BY-PASS PIPING OR PUMPS SHALL BE NECESSARY. HOWEVER, CONTRACTOR SHALL BE PREPARED TO IMPLEMENT A CONTINGENCY PLAN IF WEATHER CONDITIONS ARISE (SUCH AS A HURRICANE FORECAST) TO PROVIDE AN OPEN STREAM CHANNEL WITH A CRUSHED STONE CHECK DAM AND STRAW BALES/SILT FENCE AT OUTLET END OF STREAM.
5. INSTALL FOOTINGS PER STRUCTURAL CULVERT PLANS.
6. INSTALL BOX CULVERT AND BACKFILL INTERIOR AS SECTIONS ARE PLACED.
 - 6.1. COMPACT BED MATERIAL.
 - 6.2. WASH BED MATERIAL TO ENSURE THAT FINE MATERIALS FILL VOIDS.
 - 6.3. BY-PASS PIPING MAY BE REMOVED, IF ANY.
7. INSTALL RETAINING WALLS PER PLANS.
8. BACKFILL WALLS AND RESTORE/CONSTRUCT WELL-GRADED BANKS FOR ROUGHNESS AND PASSAGE BY SMALL WILDLIFE AND IN-STREAM BANK-EDGE HABITAT. USING NATIVE SUBSOIL OVERLAID WITH 6" LAYER OF COMPOST SAND AND LOAM MIXTURE (EQUAL PARTS) BLEND CONSTRUCTED BANKS INTO EXISTING BANKS.
9. IMPLEMENT RESTORATION PLAN PER GODDARD CONSULTING.

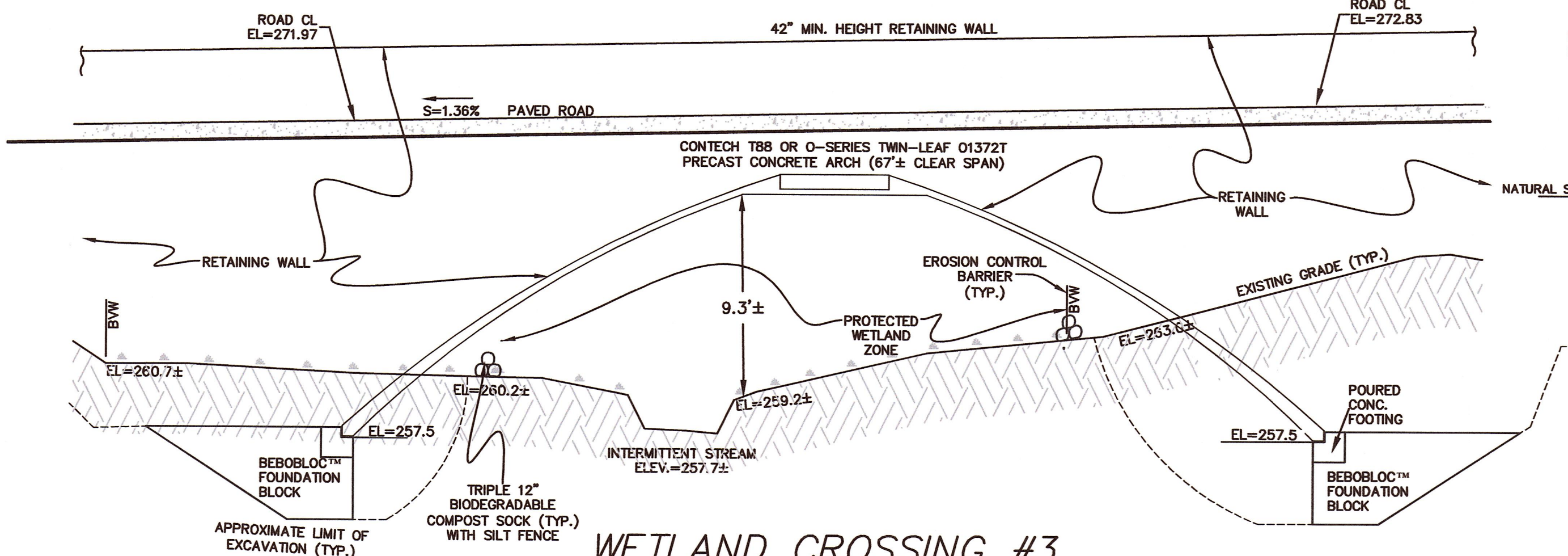


CROSS SECTION



LONGITUDINAL SECTION

FOOTINGS PER PLAN



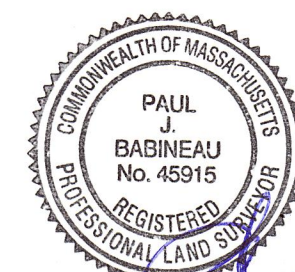
COMPOST SOIL (TYP.)
WITH SILT FENCE

WETLAND CROSSING #3
KINGSBURY DRIVE BRIDGE CROSS SECTION

HORIZONTAL SCALE: 1"=10'
VERTICAL SCALE: 1"=5'

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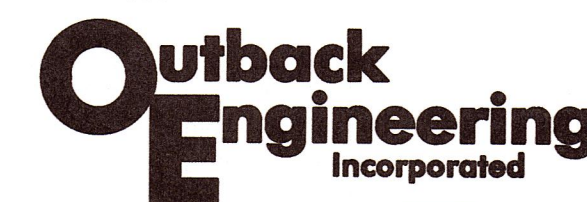
MEDWAY ZONING BOARD OF APPEALS

I CERTIFY THAT 20 DAYS HAVE ELAPSED SINCE ZONING BOARD APPROVAL, AND THAT NO APPEAL HAS BEEN FILED AT THIS OFFICE.

TOWN CLERK—TOWN OF MEDWAY

DETAIL SHEET

*TIMBER CREST
ESTATES
&
KINGSBURY VILLAGE
OFF
WINTHROP STREET,
OHLSON CIRCLE
FAIRWAY LANE &
FERN PATH
IN
MEDWAY
MASSACHUSETTS*

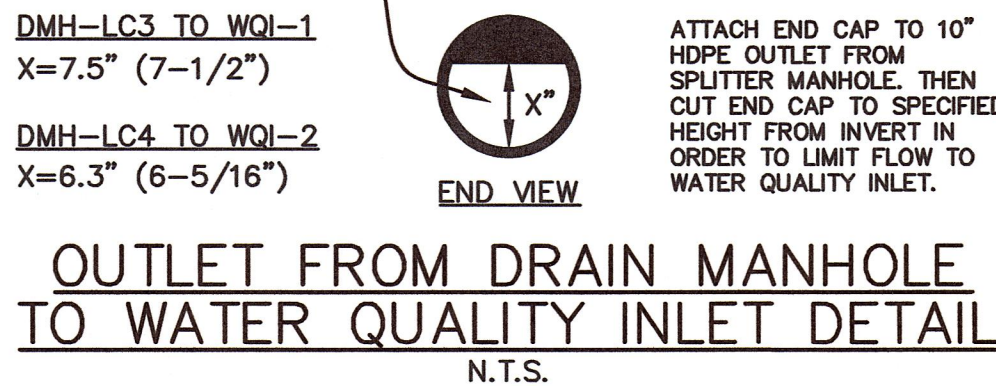
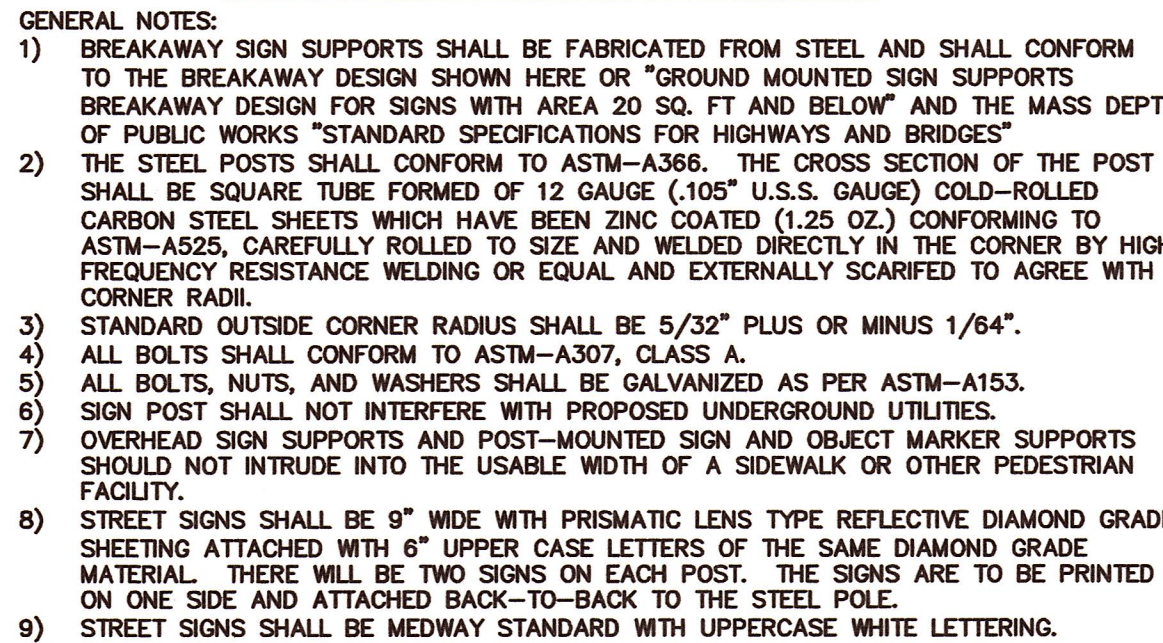


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DATE: AUGUST 6, 2019

| | |
|---------------|-----------------|
| DRAWN BY: CJV | CHECKED BY: JAP |
| NOT TO SCALE | SHEET 54 OF 62 |

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BED CONFIGURATION
2 ROWS OF 24 CHAMBERS WITH 18" STONE SURROUND
OVERALL DIMENSIONS: 11.33'W X 172'L X 3.21'H
(SEE PLANS FOR INLETS & OUTLETS)



LEACHING CHAMBER BED 3 DETAIL

NOT TO SCALE



BED CONFIGURATION
6 ROWS OF 3 CHAMBERS WITH 12" STONE SURROUND
OVERALL DIMENSIONS: 21' W X 33.5' L X 2.54'H
(SEE PLANS FOR INLETS AND OUTLETS)



GENERAL NOTES
RECHARGER 150XLHD BY CULTEC, INC. OF BROOKFIELD, CT.
STORAGE PROVIDED = 4.89 CF/FT (0.45 m³/m) PER DESIGN UNIT.
REFER TO CULTEC, INC.'S CURRENT RECOMMENDED INSTALLATION
GUIDELINES.
MAXIMUM ALLOWED COVER OVER TOP OF UNIT SHALL BE 12' (3.65m)
THE CHAMBER WILL BE DESIGNED TO WITHSTAND TRAFFIC LOADS
WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED
INSTALLATION INSTRUCTIONS.

ALL RECHARGER 150XLHD HEAVY DUTY UNITS ARE MARKED WITH A COLORED STRIPE FORMED INTO THE PART ALONG THE LENGTH OF THE CHAMBER.

ALL RECHARGER 150XLHD CHAMBERS MUST BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL REGULATIONS.

LEACHING CHAMBER BED 4 DETAIL

NOT TO SCALE



NOTE: ALL FLARED ENDS MUST BE RCP (ADS FLARED END ARE NOT ALLOWED)

REINFORCED CONCRETE PIPE FLARED ENDS

FOR BELL AND SPIGOT PIPE

NOT TO SCALE



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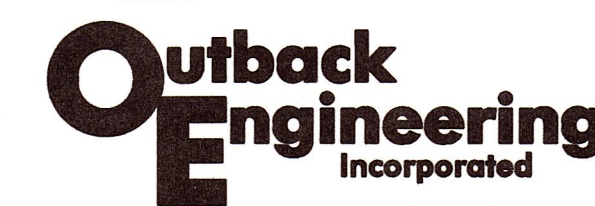
MIDWAY ZONING BOARD OF APPEALS

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TOWN CLERK—TOWN OF MEDWAY

DETAIL SHEET

*TIMBER CREST
ESTATES
&
KINGSBURY VILLAGE
IN
MEDWAY
MASSACHUSETTS*



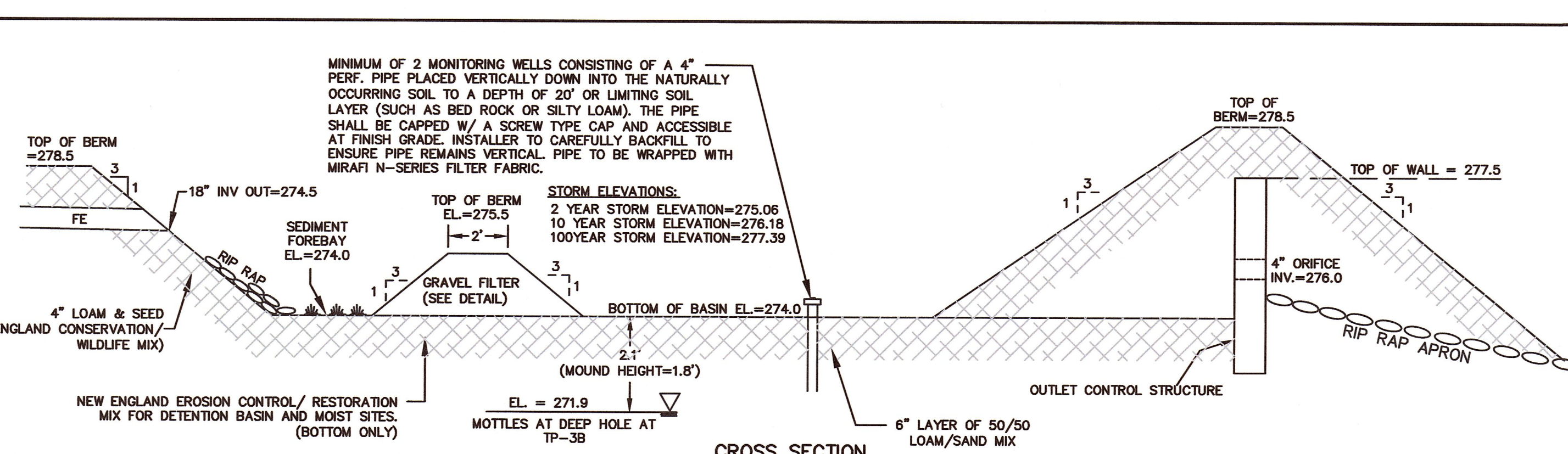
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DATE: AUGUST 6, 2019

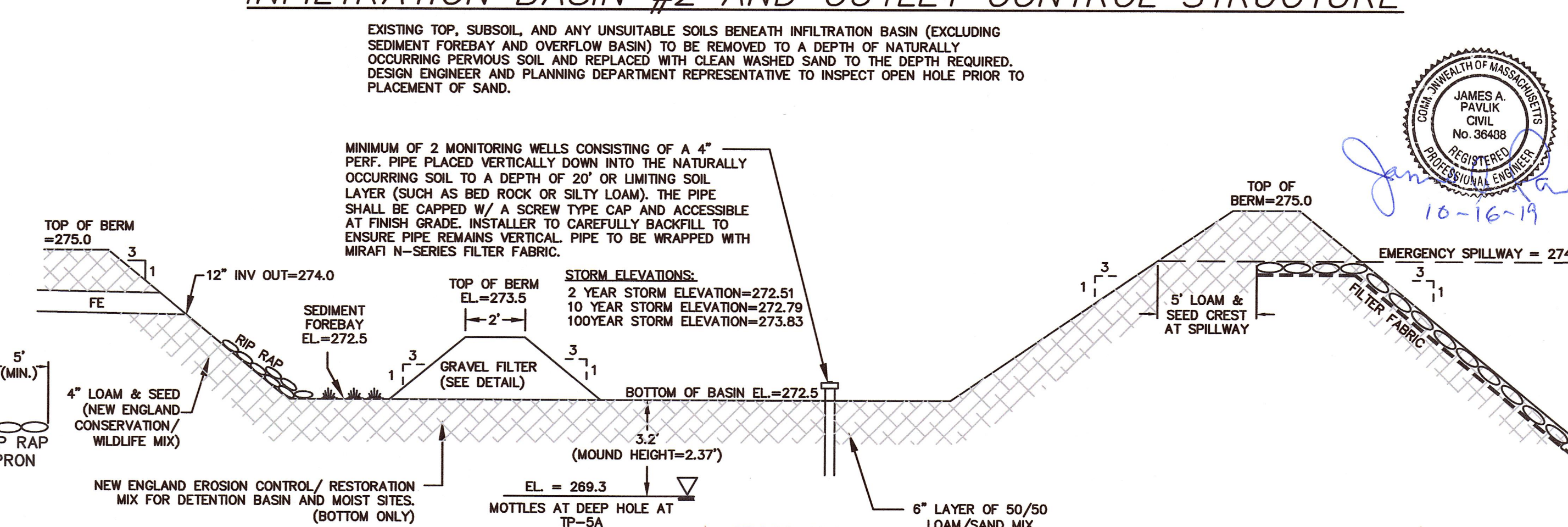
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| NOT TO SCALE | SHEET 55 OF 62 |
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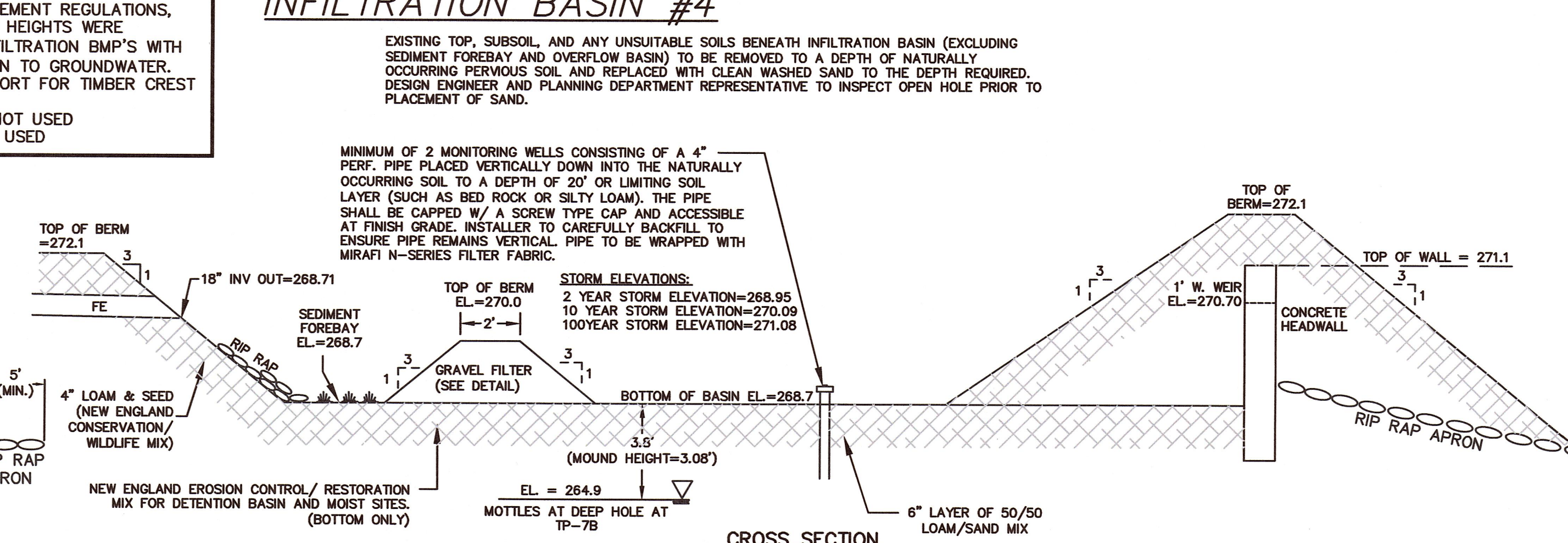
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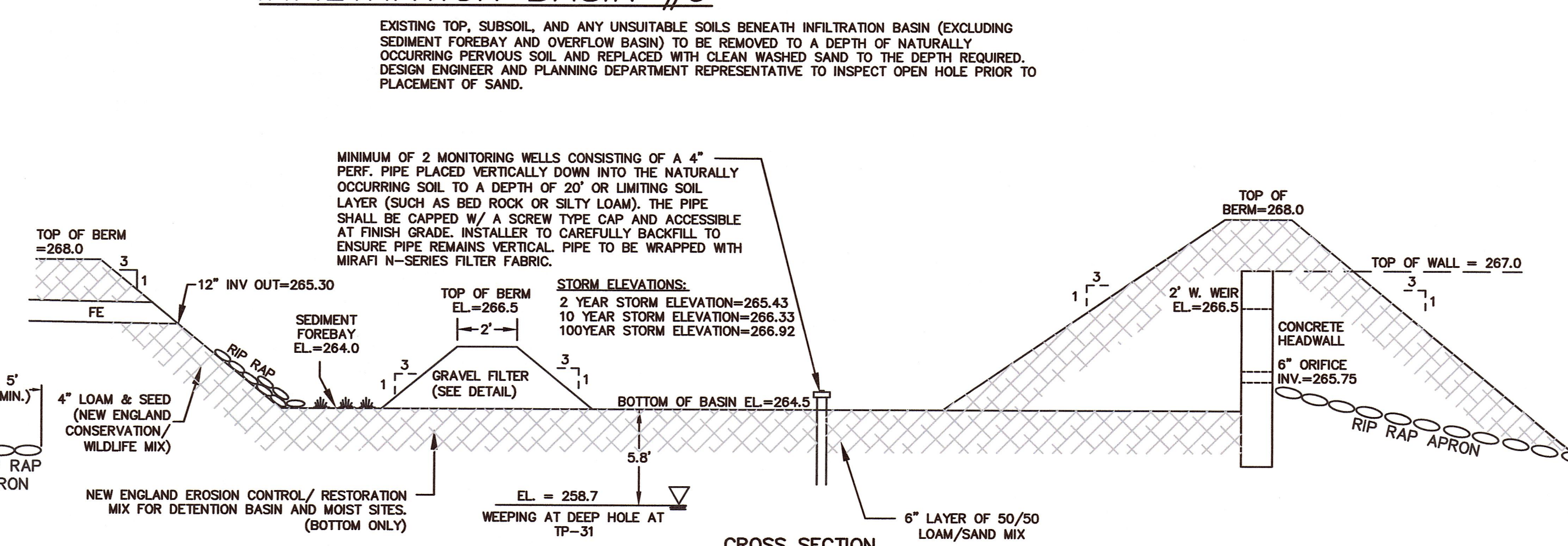
INFILTRATION BASIN #2 AND OUTLET CONTROL STRUCTURE



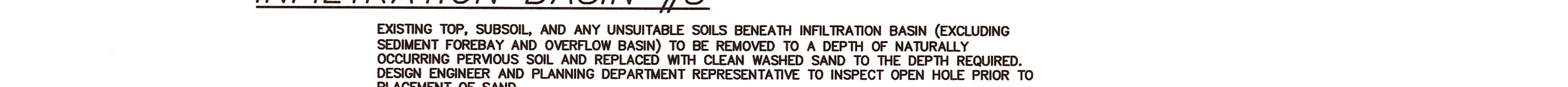
INFILTRATION BASIN #4



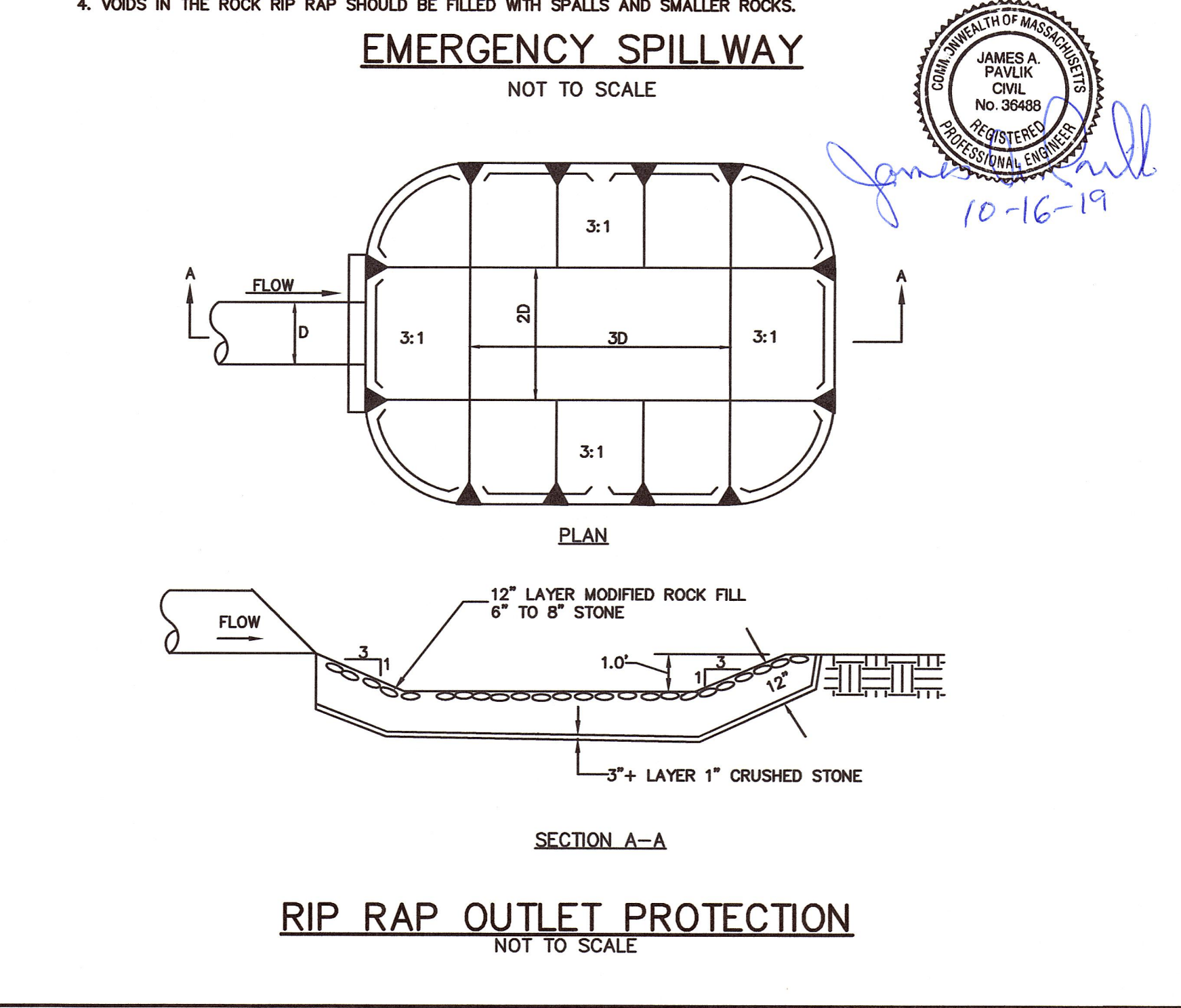
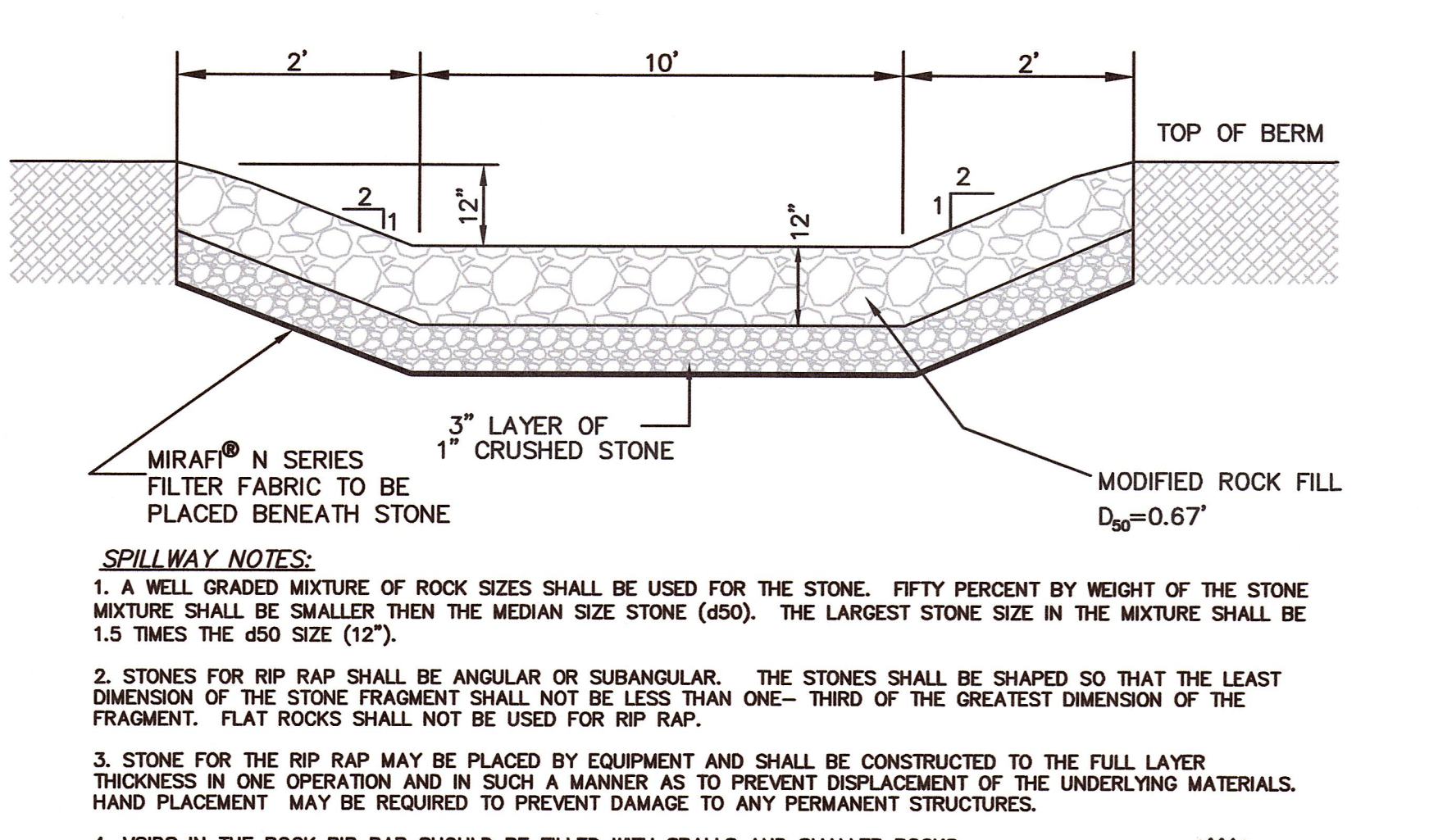
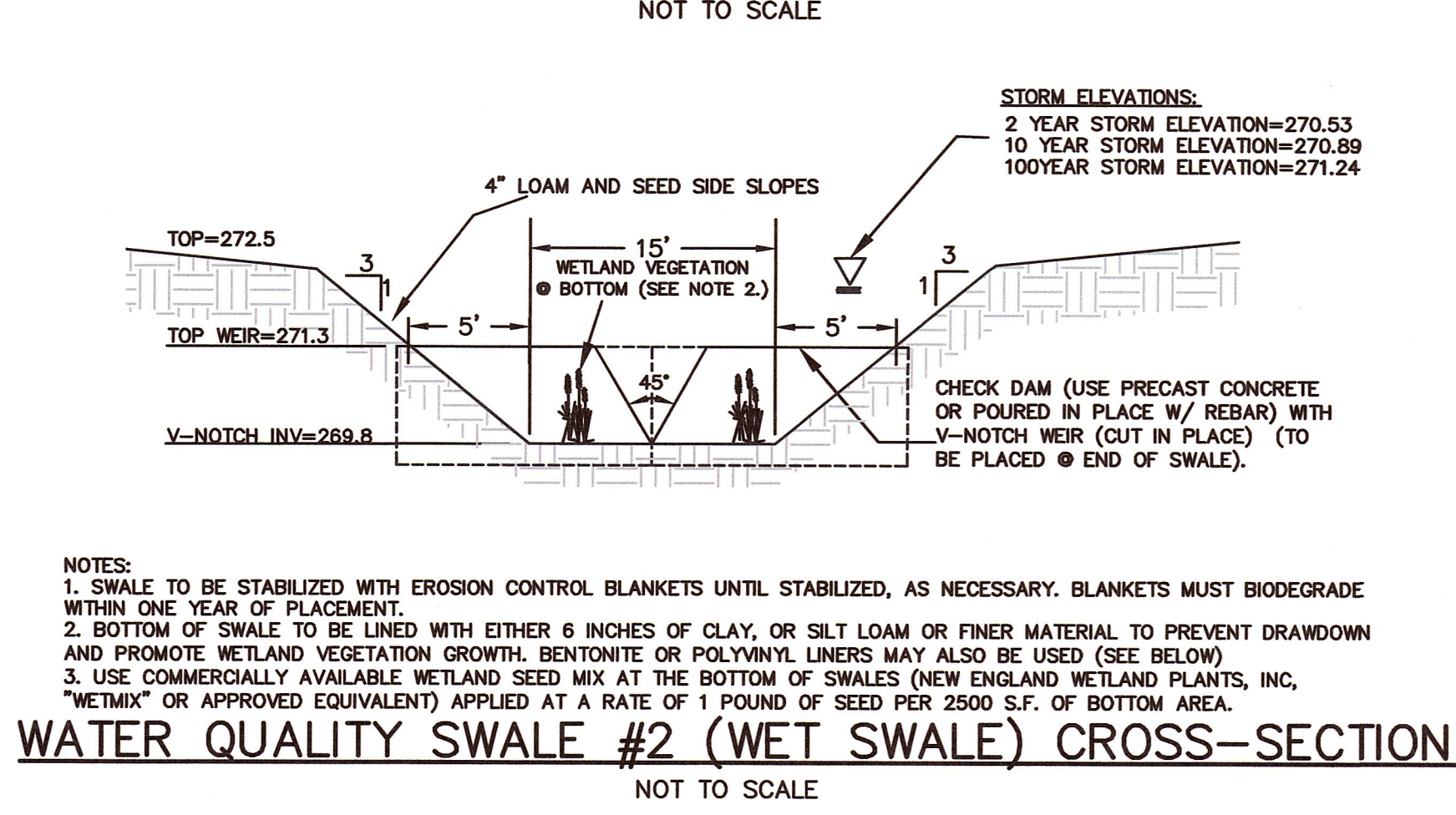
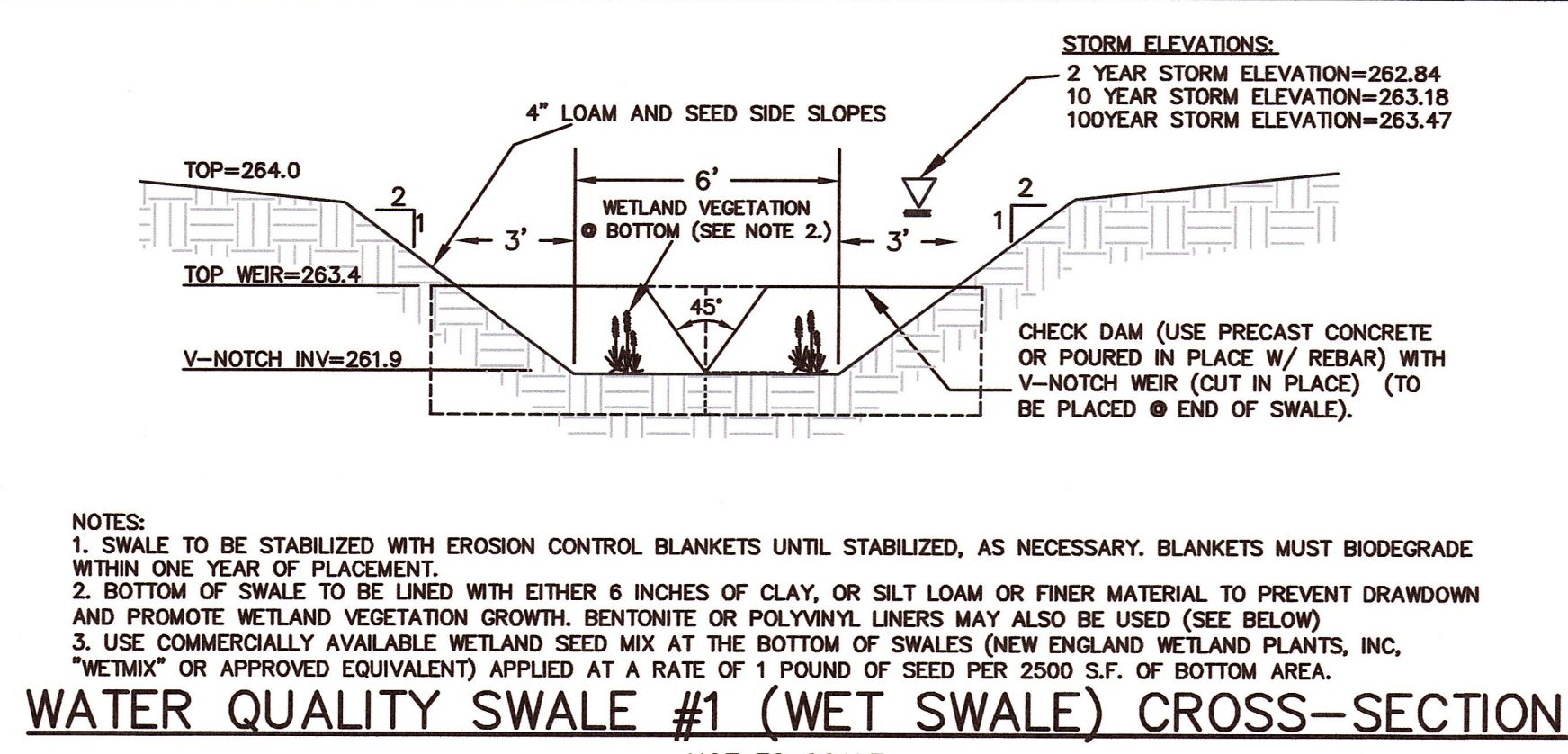
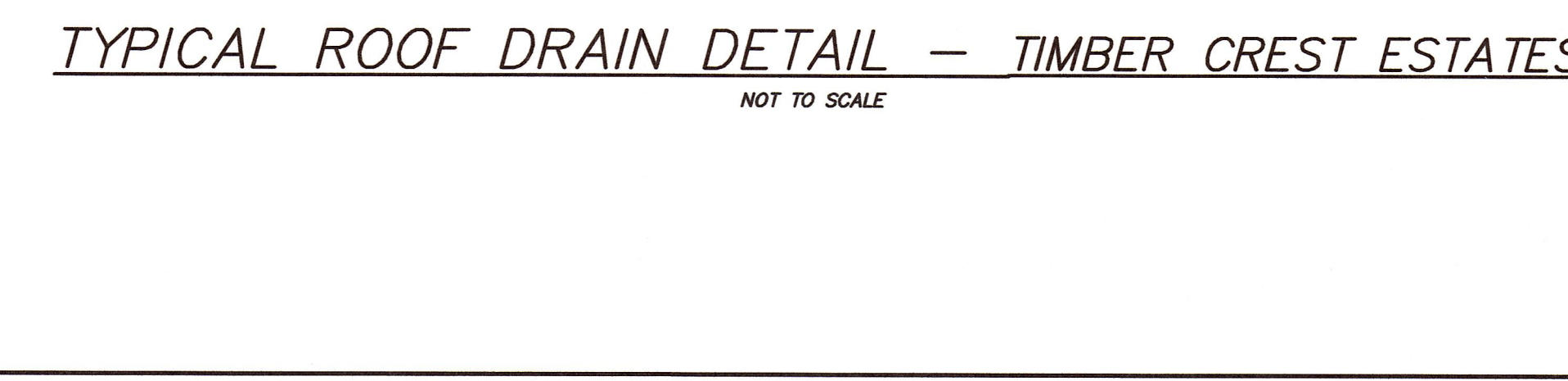
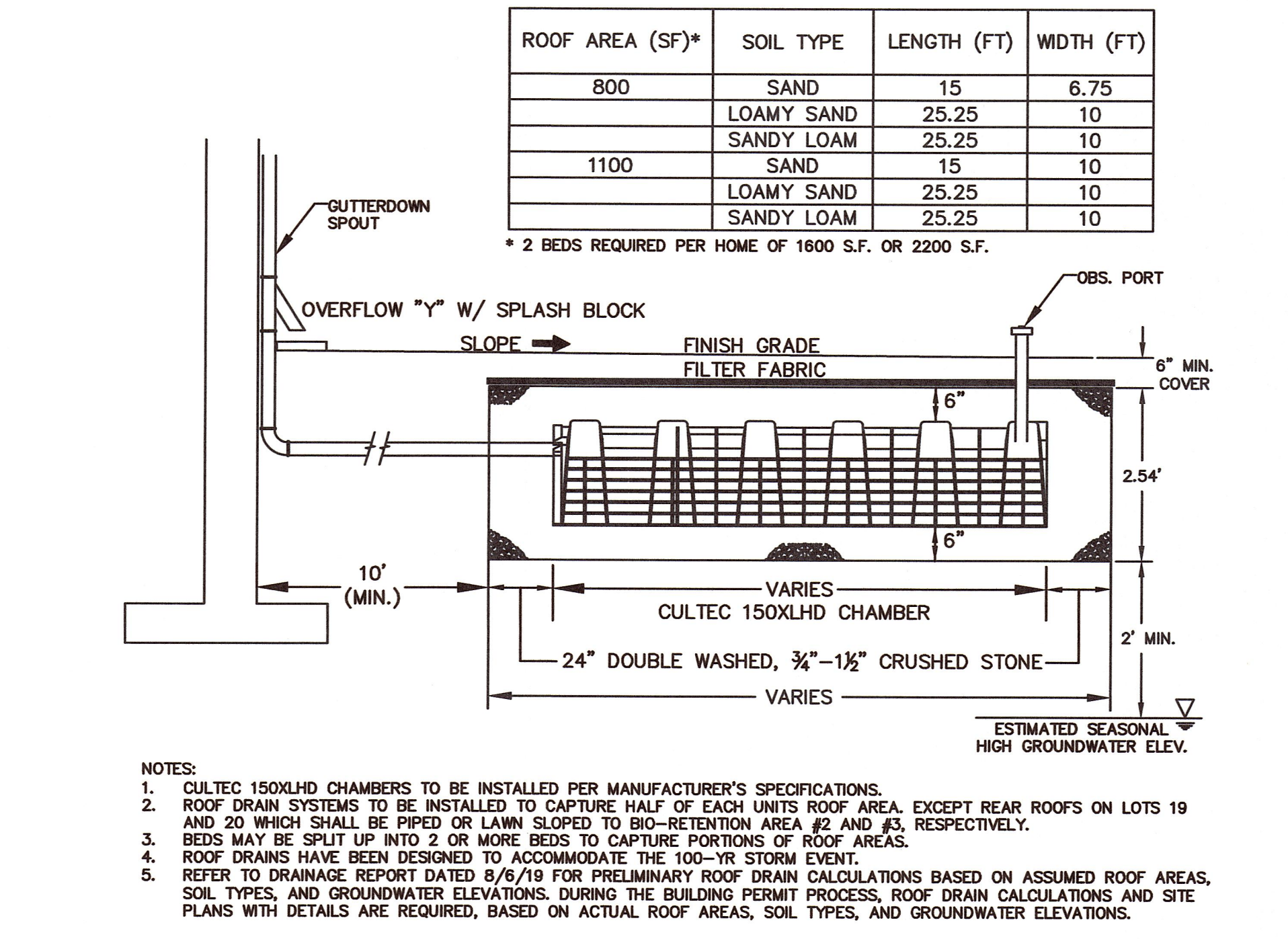
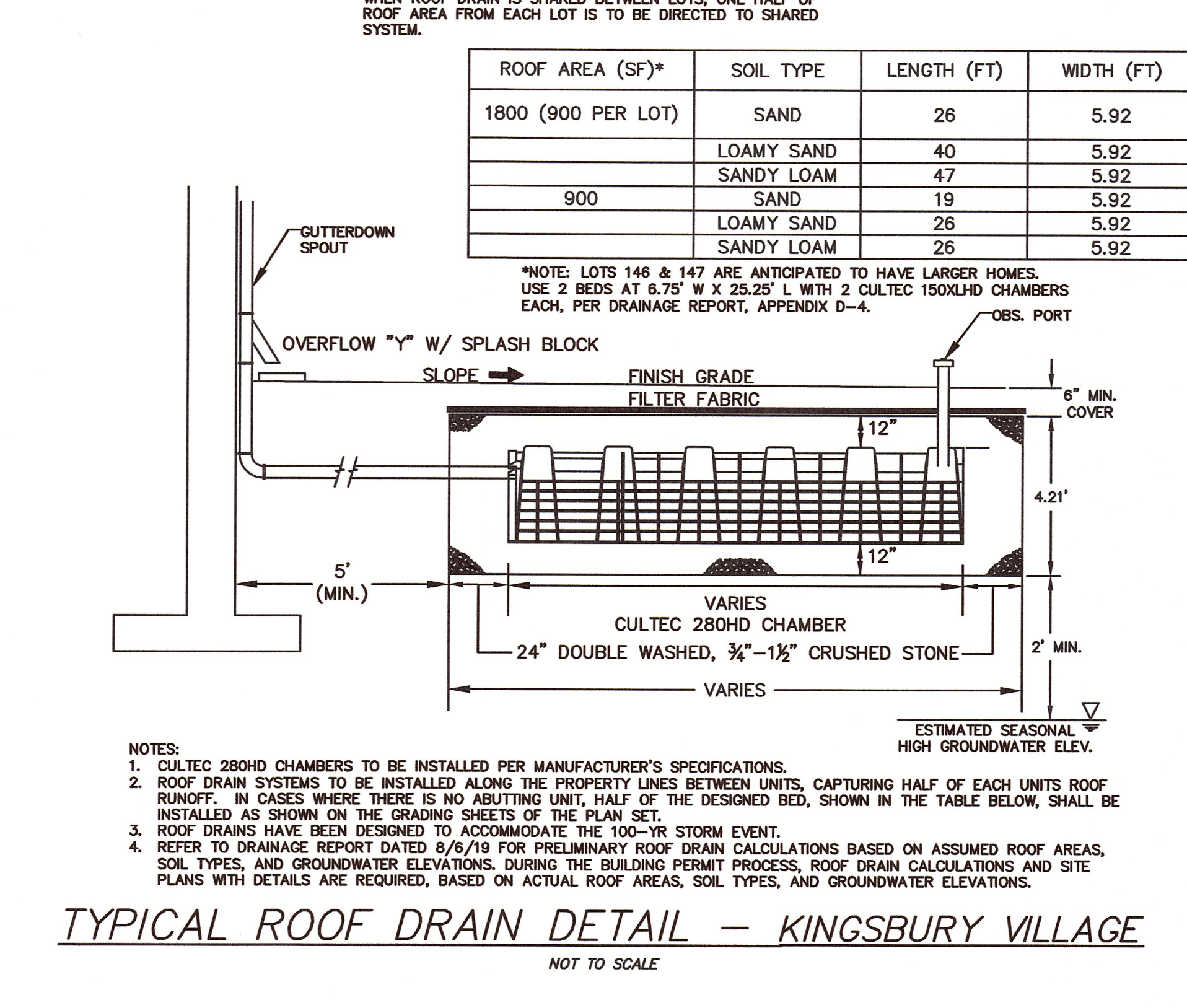
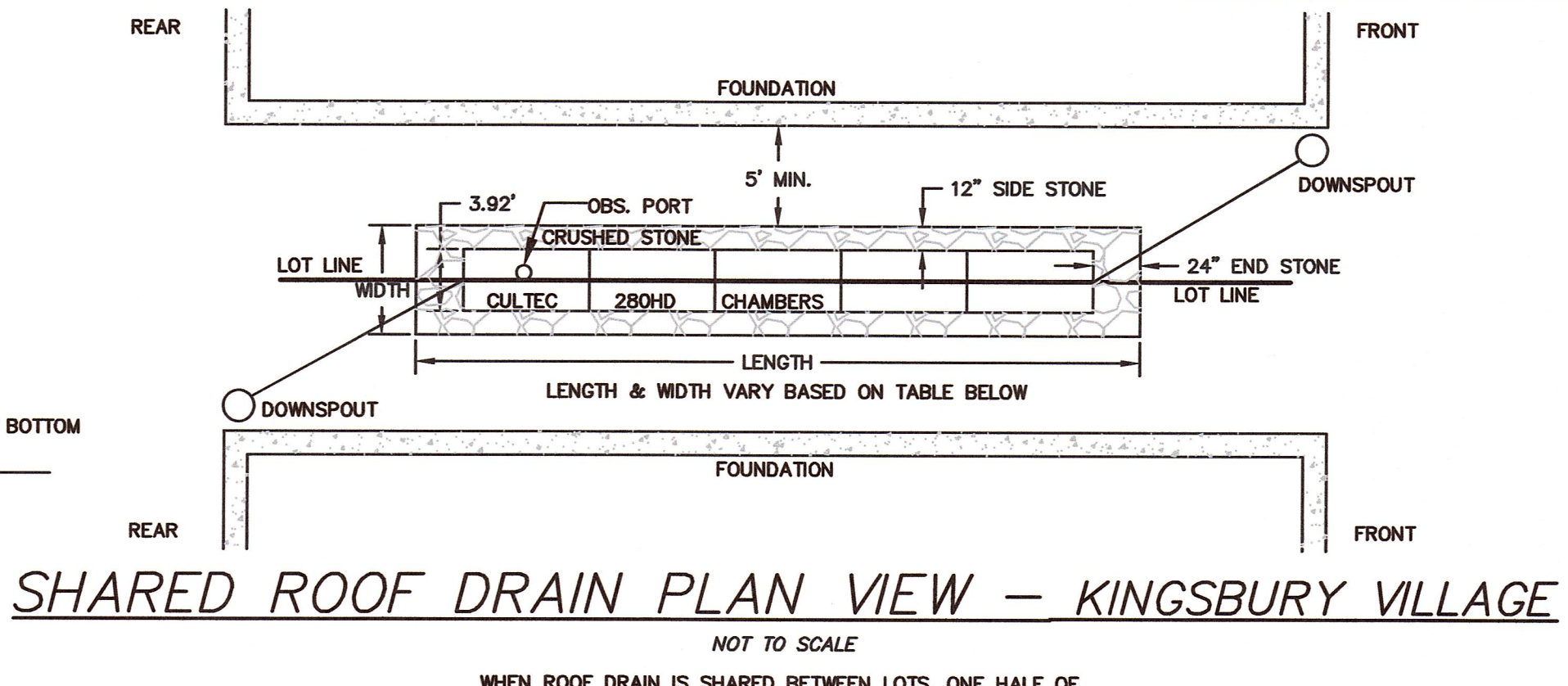
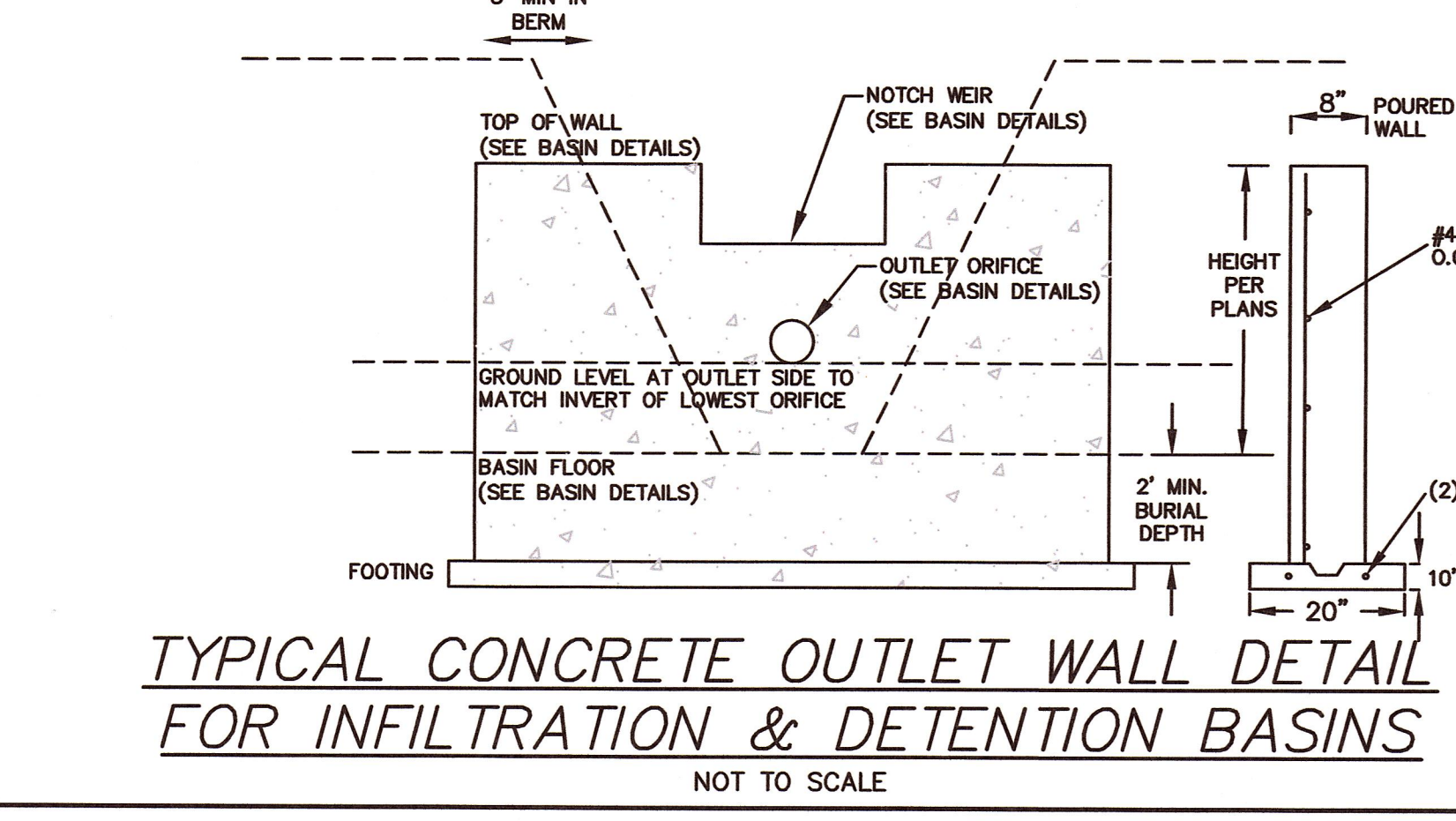
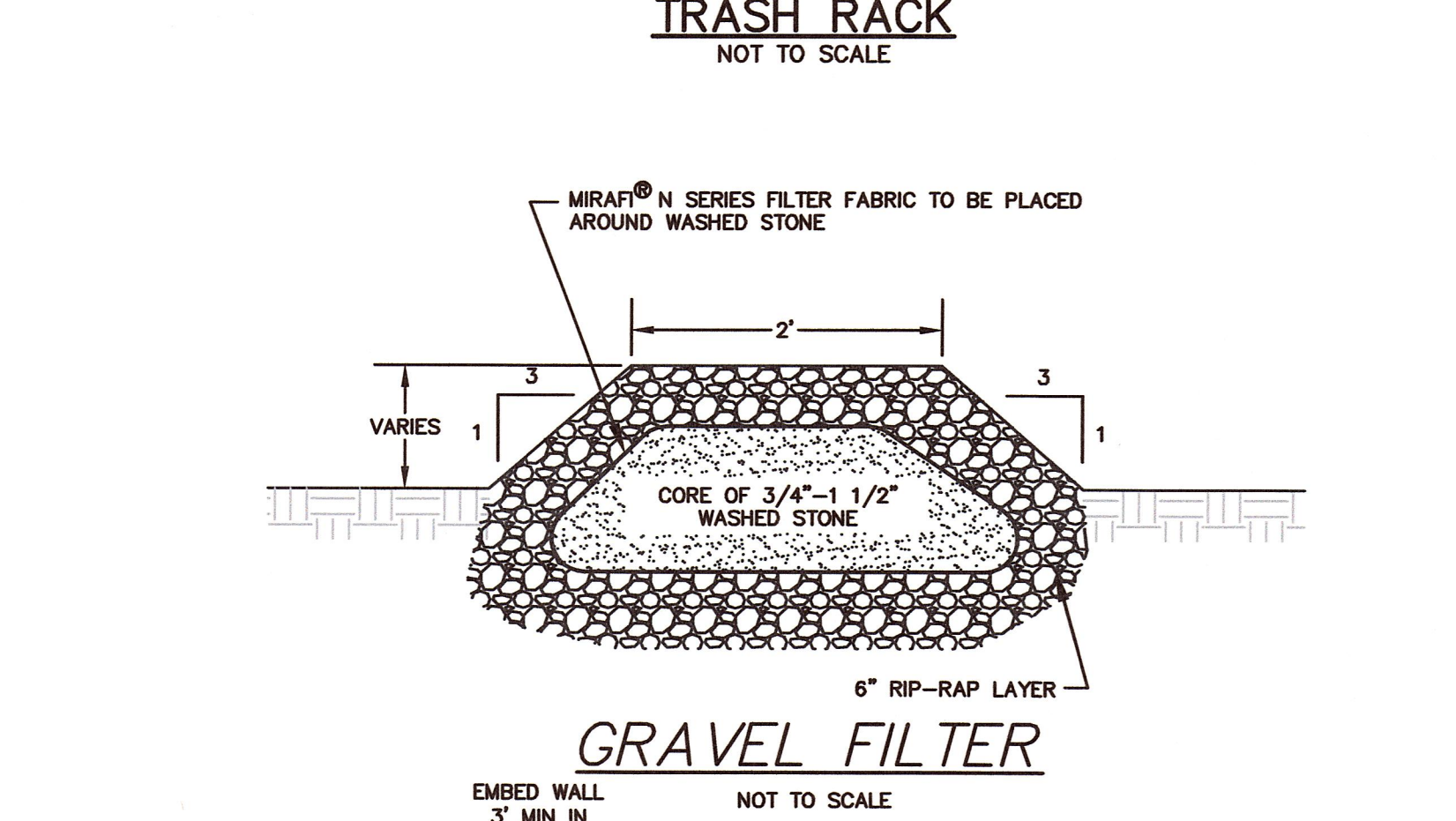
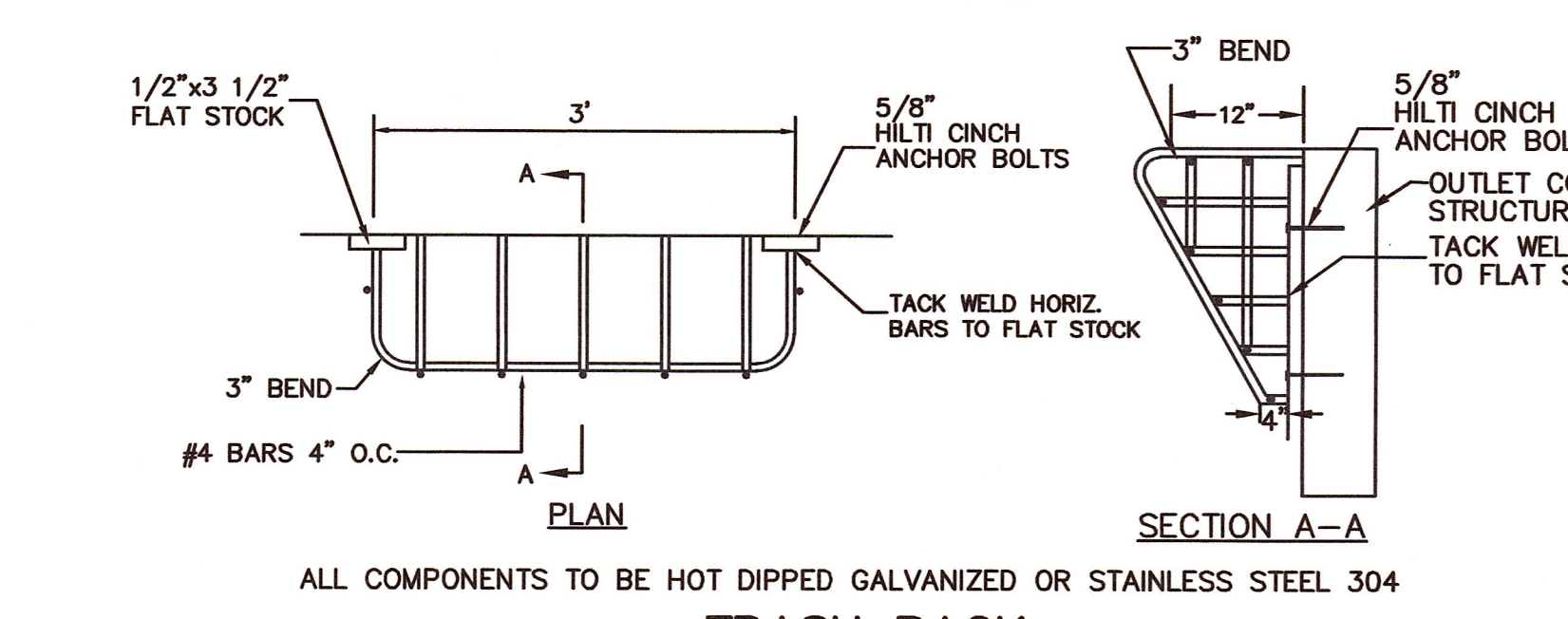
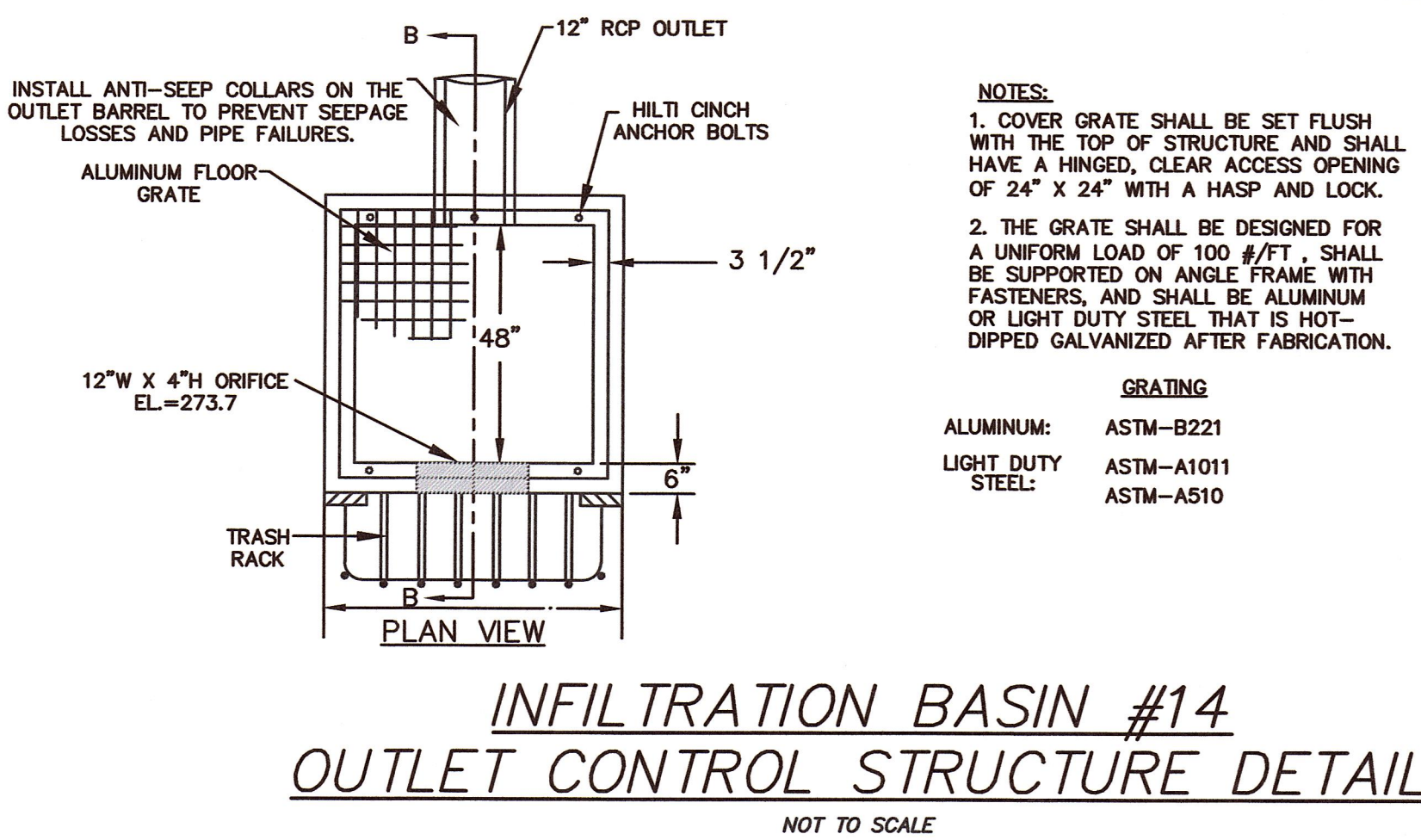
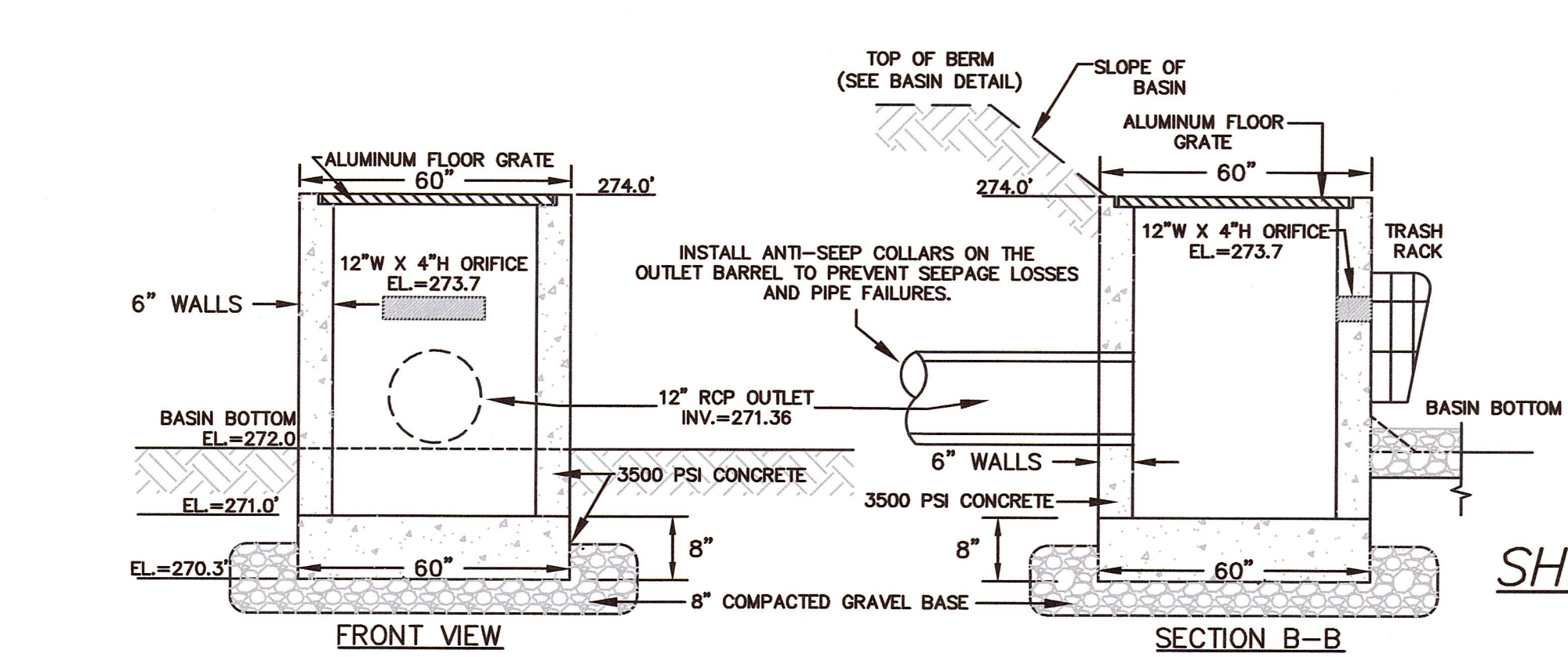
INFILTRATION BASIN #6



INFILTRATION BASIN #8



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DATE: 10-16-19
PROFESSIONAL LAND SURVEYOR

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DATE: _____
MEDWAY ZONING BOARD OF APPEALS

I CERTIFY THAT 20 DAYS HAVE ELAPSED SINCE ZONING BOARD APPROVAL, AND THAT NO APPEAL HAS BEEN FILED AT THIS OFFICE.

TOWN CLERK-TOWN OF MEDWAY

DETAIL SHEET
TIMBER CREST ESTATES & KINGSBURY VILLAGE IN MEDWAY MASSACHUSETTS

Outback Engineering Incorporated
165 EAST GROVE STREET
MIDDLEBOROUGH, MA 02346
TEL: (508)-946-9231
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www.outback-eng.com
DATE: AUGUST 6, 2019
DRAWN BY: CJV CHECKED BY: JAP
NOT TO SCALE SHEET 58 OF 62
OE-2765

CONSTRUCTION SPECIFICATIONS FOR BIORETENTION SYSTEMS

1. MATERIAL SPECIFICATIONS
THE ALLOWABLE MATERIALS TO BE USED IN BIORETENTION AREAS ARE DETAILED IN TABLE 1.

| PARAMETER | SPECIFICATION | NOTES |
|----------------|--------------------------|-------------------------------------------|
| PLANTING SOILS | SAND 80% | USDA SOIL TYPES LOAMY SANDS OR SANDY LOAM |
| | SILT 15-20% | |
| | CLAY 0-5% | |
| COMPOST | APPROVED NATURAL COMPOST | |
| MULCH | DOUBLE SHREDDED HARDWOOD | AGED SIX (6) MONTHS MINIMUM |
| FILTER FABRIC | MIRAFI 140N | OR APPROVED EQUIVALENT |

2. PLANTING SOILS
THE SOIL SHOULD BE A UNIFORM MIX, FREE OF STONES, STUMPS, ROOTS OR OTHER SIMILAR OBJECTS LARGER THAN 2 INCHES. NO OTHER MATERIALS OR SUBSTANCES SHOULD BE MIXED OR DUMPED WITHIN THE BIORETENTION AREA THAT MAY BE HARMFUL TO PLANT GROWTH, OR PROVE A HINDRANCE TO THE PLANTING OR MAINTENANCE OPERATIONS. THE PLANTING SOIL SHOULD BE FREE OF NOXIOUS WEEDS.

THE BIORETENTION SYSTEM SHALL UTILIZE PLANTING SOIL HAVING A COMPOSITION AS SHOWN IN TABLE 1. THE BIORETENTION APPLICATIONS WITH A PLANTING SOIL DEPTH OF 12 INCHES, OR LESS, ADD 20% (BY VOLUME) OF WELL AGED (6-12 MONTHS), WELL AERATED, LEAF COMPOST (OR APPROVED EQUIVALENT) TO THE ABOVE PLANTING SOIL MIXTURE.

THE PLANTING SOIL SHOULD BE TESTED AND SHOULD MEET THE FOLLOWING CRITERIA:

PH RANGE 5.2-7.0
ORGANIC MATTER 1.5-4%
MAGNESIUM 35 LB/AC
PHOSPHORUS P205 75 LB/AC
POTASSIUM K2O 85 LB/AC
SOLUBLE SALTS NOT TO EXCEED 500 PPM

ALL BIORETENTION AREAS SHOULD HAVE A MINIMUM OF ONE TEST. EACH TEST SHOULD CONSIST OF BOTH THE STANDARD SOIL TEST FOR PH, PHOSPHORUS, AND POTASSIUM AND ADDITIONAL TESTS OF ORGANIC MATTER, AND SOLUBLE SALTS. A TEXTURAL ANALYSIS IS REQUIRED FROM THE SITE'S STOCKPILED TOPSOIL. IF TOPSOIL IS IMPORTED, THEN A TEXTURE ANALYSIS SHOULD BE PERFORMED FOR EACH LOCATION WHERE THE TOP SOIL IS EXCAVATED.

SINCE DIFFERENT LABS CALIBRATE THEIR EXISTING EQUIPMENT DIFFERENTLY, ALL TESTING RESULTS SHOULD COME FROM THE SAME TESTING FACILITY.

SHOULD THE PH FALL OUT OF THE ACCEPTABLE RANGE, IT MAY BE MODIFIED (HIGHER) WITH LIME OR (LOWER) WITH IRON SULFATE PLUS SULFUR.

3. MULCH LAYER SPECIFICATIONS

MULCH AROUND INDIVIDUAL PLANTS ONLY. SHREDDED HARDWOOD MULCH IS THE ONLY ACCEPTED MULCH. PINE MULCH AND WOOD CHIPS WILL FLOAT AND MOVE TO PERIMETER OF THE BIORETENTION AREA DURING A STORM EVENT AND ARE NOT ACCEPTABLE.

DOUBLE SHREDDED MULCH MUST BE WELL AGED (6-12 MONTHS) FOR ACCEPTANCE.

MIX APPROPRIATELY HALF OF THE SPECIFIED MULCH LAYER INTO THE PLANTING SOIL TO A DEPTH OF APPROXIMATELY 4 INCHES TO HELP FOSTER A HIGHLY ORGANIC SURFACE LAYER.

4. COMPACTION

IT IS VERY IMPORTANT TO MINIMIZE COMPACTION OF BOTH THE BASE OF THE BIORETENTION AREA AND THE REQUIRED BACKFILL. WHEN POSSIBLE, USE EXCAVATION HOES TO REMOVE ORIGINAL SOIL IF BIORETENTION AREA IS EXCAVATED USING A LOADER, THE CONTRACTOR SHOULD USE WIDE TRACK OR MARSH TRACK EQUIPMENT, OR LIGHT EQUIPMENT WITH TURF TYPE TIRES. USE OF EQUIPMENT WITH NARROW TRACKS OR NARROW TIRES, RUBBER TIRES WITH LARGE LUGS, OR HIGH PRESSURE TIRES WILL CAUSE EXCESSIVE COMPACTION RESULTING IN REDUCED INFILTRATION RATES AND STORAGE VOLUMES AND IS NOT ACCEPTABLE. COMPACTION WILL SIGNIFICANTLY CONTRIBUTE TO DESIGN FAILURE.

COMPACTION CAN BE ALLEVIATED AT THE BASE OF THE BIORETENTION FACILITY BY USING A PRIMARY TILLING OPERATION SUCH AS A CHISEL PLOW, RIPPER, OR SUBSOILER. THESE TILLING OPERATIONS ARE TO REFRACATURE THE SOIL PROFILE THROUGH THE 12 INCH COMPACTION ZONE. SUBSTITUTE METHODS MUST BE APPROVED BY THE ENGINEER, ROTOTILLERS TYPICALLY DO NOT TILL DEEP ENOUGH TO REDUCE THE EFFECTS OF COMPACTION FROM HEAVY EQUIPMENT.

WHEN BACKFILLING THE BIORETENTION FACILITY, PLACE SOIL IN LIFTS OF 12 INCHES OR GREATER. DO NOT USE HEAVY EQUIPMENT WITHIN THE BIORETENTION AREA. HEAVY EQUIPMENT CAN BE USED AROUND THE PERIMETER OF THE BASIN TO SUPPLY SOILS AND SANDS. GRADE BIORETENTION MATERIALS WITH LIGHT EQUIPMENT SUCH AS A COMPACT LOADER OR A DOZER/LOADER WITH MARSH TRACKS.

5. PLANT INSTALLATION

THE PLANT ROOT BALL SHOULD BE PLANTED SO 1/8TH OF THE BALL IS ABOVE FINAL GRADE SURFACE. ROOT STOCK OF THE PLANT MATERIAL SHOULD BE KEPT MOIST DURING TRANSPORT AND ON-SITE STORAGE. THE DIAMETER OF THE PLANTING PIT SHOULD BE AT LEAST 6 INCHES LARGER THAN THE DIAMETER OF THE PLANTING BALL. SET AND MAINTAIN THE PLANT STRAIGHT DURING THE ENTIRE PLANTING PROCESS. THOROUGHLY WATER GROUND BED COVER AFTER INSTALLATION.

GRASSES AND LEGUME SEED SHOULD BE TILLED INTO THE SOIL TO A DEPTH OF AT LEAST ONE INCH. GRASS AND LEGUME PLUGS SHOULD BE PLANTED FOLLOWING THE NON-GRASS GROUND COVER PLANTING SPECIFICATIONS.

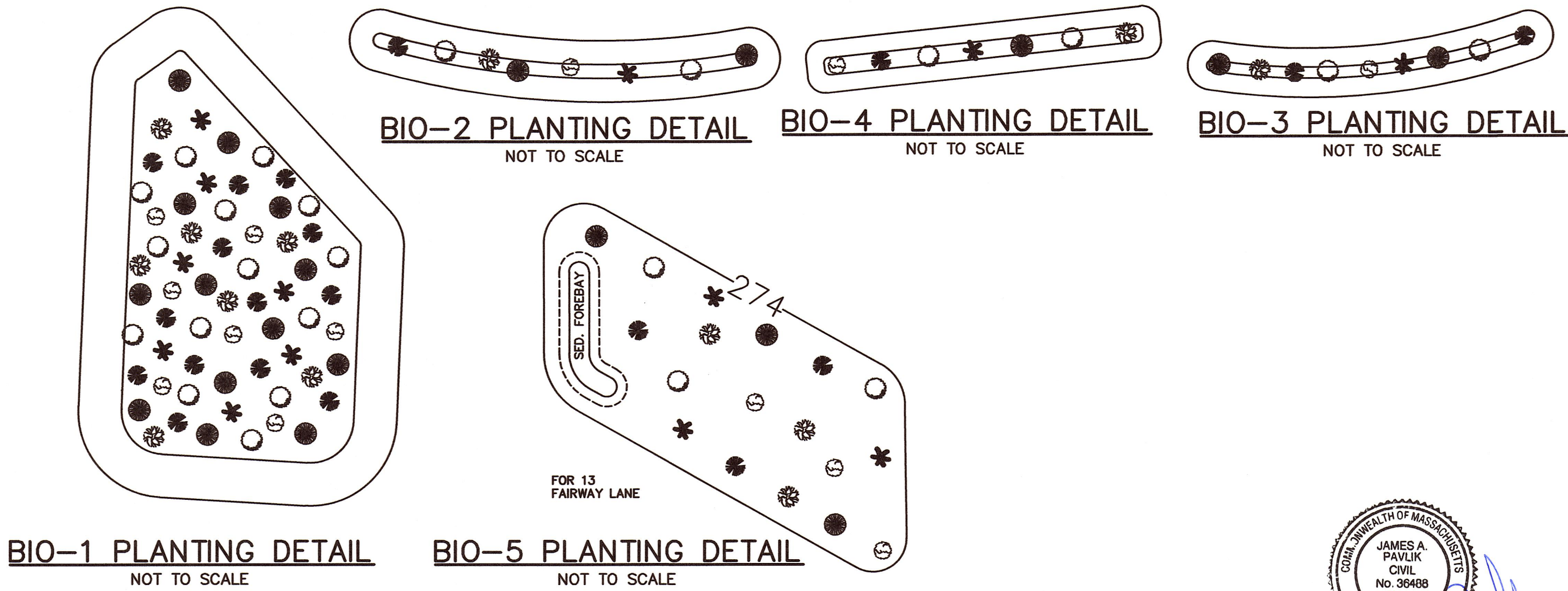
THE PLANTING SOIL SPECIFICATIONS PROVIDE ENOUGH ORGANIC MATERIAL TO ADEQUATELY SUPPLY NUTRIENTS FROM THE NATURAL CYCLING. THE PRIMARY FUNCTION OF THE BIORETENTION STRUCTURE IS TO IMPROVE WATER QUALITY. ADDING FERTILIZERS DEFEATS, OR AT A MINIMUM, IMPEDES THIS GOAL. ONLY ADD FERTILIZER IF COMPOST OR MULCH IS USED TO AMEND THE SOIL. ROTOTILL AREA FERTILIZER AT A RATE OF 2 LB/ 1,000 S.F..

6. MISCELLANEOUS

A. THE BIORETENTION FACILITY SHALL BE PROTECTED WITH SEDIMENT CONTROL DEVICES AS SHOWN IN THE EROSION & SEDIMENT CONTROL PLANS AND SHALL REMAIN OFFLINE AND INOPERATIONAL UNTIL ALL VEGETATION IS ESTABLISHED WITHIN THE BIORETENTION AREA AND THE CONTRIBUTING DRAINAGE AREA IS STABILIZED.

B. THE PURPOSE OF THESE BIORETENTION AREAS IS TO PROVIDE SOME INCREASED RUNOFF WATER QUALITY AND INFILTRATION OF ROOF RUNOFF (FROM UNITS SHOWN) AND LIMITED LAWN AREAS; THESE RAIN GARDENS ARE DESIGNED TO OVERFLOW. THEY ARE NOT DESIGNED TO CONTROL RUNOFF RATES OR VOLUMES, OR FOR TSS REMOVAL CREDIT.

| BIORETENTION AREA | BIORETENTION SURFACE ELEVATION | BIORETENTION SURFACE AREA | BOTTOM OF PLANTING SOIL ELEVATION | BOTTOM OF GRAVEL BASE/UNDERDRAIN ELEV. | TREES OR SHRUBS REQ'D (1/50 S.F.) |
|-------------------|--------------------------------|---------------------------|-----------------------------------|----------------------------------------|-----------------------------------|
| BIO-1 | 269.5 | 1998 S.F. | 266.25 | 265.75 | 40 |
| BIO-2 | 275.0 | 247 S.F. | 271.75 | 271.25 | 5 |
| BIO-3 | 275.0 | 266 S.F. | 271.75 | 271.25 | 6 |
| BIO-4 | 265.5 | 164 S.F. | 262.25 | 261.75 | 4 |
| BIO-5 | 273.0 | 421 S.F. | 271.0 | 270.5 | 9 |

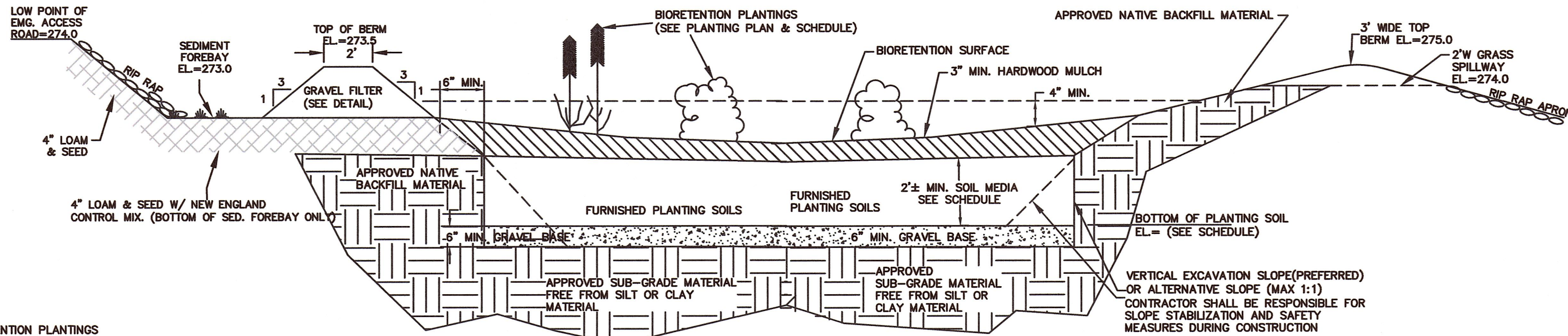


SHRUB SPECIES

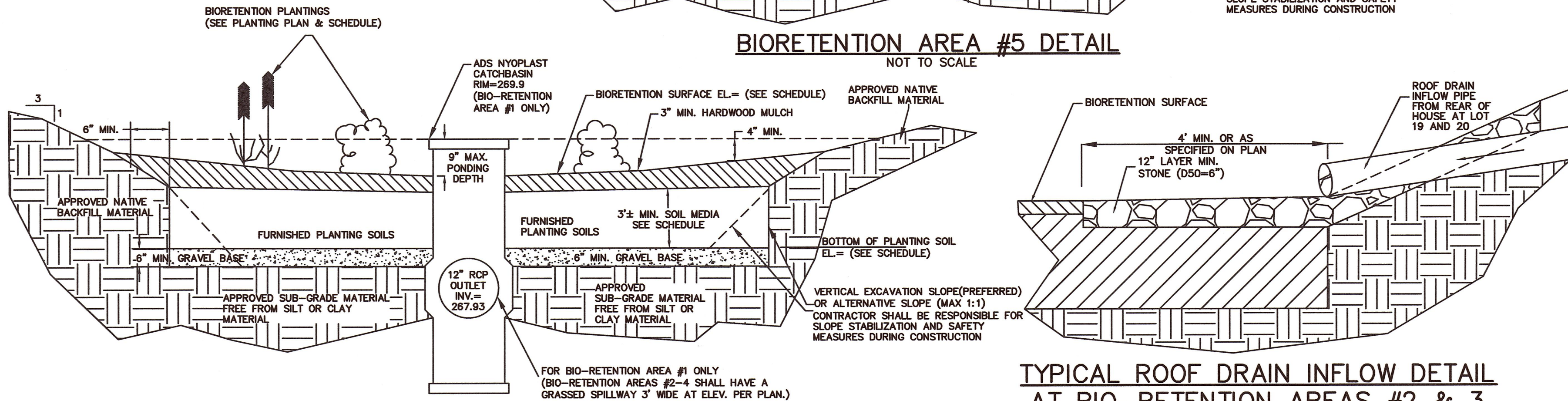
| PLAN SYMBOL | COMMON NAME (SCIENTIFIC NAME) | SIZE & FORM | IND. STATUS | SIZE @ PURCHASE | QUANTITY | | | | |
|-------------|-------------------------------------------|-------------------------|-------------|-----------------|----------|-------|-------|-------|-------|
| | | | | | BIO-1 | BIO-2 | BIO-3 | BIO-4 | BIO-5 |
| | HIGHBUSH BLUEBERRY (VACCINIUM CORYMBOSUM) | MED-SIZED SHRUB (6-10') | FACW- | 2-3 FEET | 14 | 2 | 2 | 2 | 3 |
| | SPICE BUSH (LINDERA BEZOIN) | MED-SIZED SHRUB (6-10') | FAC- | 2-3 FEET | 13 | 2 | 2 | 1 | 3 |
| | SILKY DOGWOOD (CORMUS AMOMUM) | MED-SIZED SHRUB | FACW | 2-3 FEET | 13 | 1 | 2 | 1 | 3 |

HERBACEOUS SPECIES

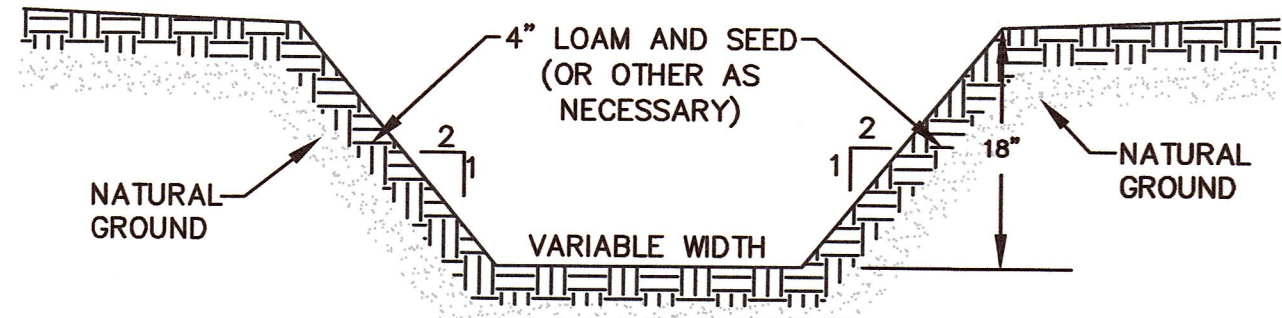
| PLAN SYMBOL | COMMON NAME (SCIENTIFIC NAME) | SIZE & FORM | IND. STATUS | SIZE @ PURCHASE | QUANTITY | | | | |
|-------------|--------------------------------------------|---------------|-------------|-----------------|----------|-------|-------|-------|-------|
| | | | | | BIO-1 | BIO-2 | BIO-3 | BIO-4 | BIO-5 |
| | NEW YORK FERN (THELYPTERIS NOVEBORACENSIS) | FLOWER (1-3') | FAC | | 7 | 1 | 1 | 1 | 3 |
| | THREE-SQUARE BULRUSH (SCIRPUS PUNGENS) | FLOWER (1-3') | FACW+ | | 7 | 1 | 1 | 1 | 3 |
| | BLACK-EYED SUSAN (RUDBECKIA HIRTA) | FLOWER (1-3') | FAC | | 7 | 1 | 1 | 1 | 3 |



BIORETENTION AREA #5 DETAIL
NOT TO SCALE

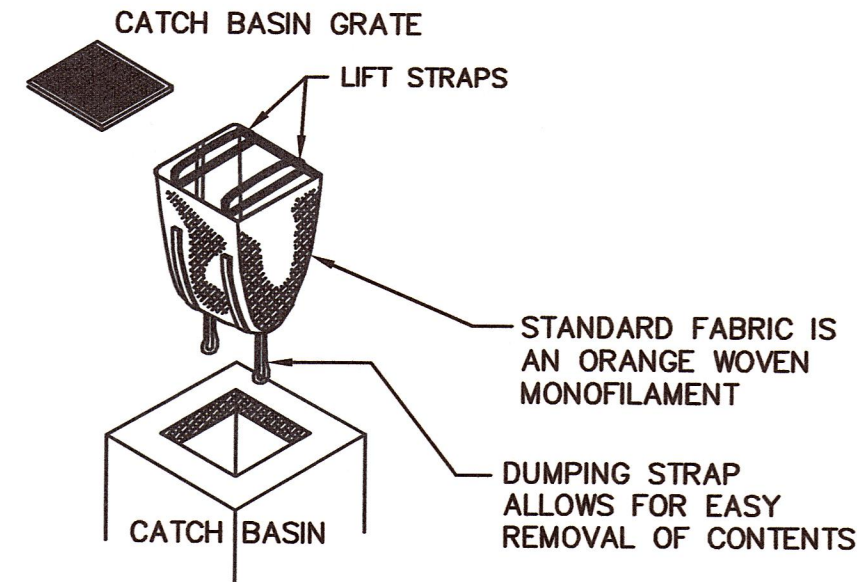


2. Ward Projects 2001/06-2706-Medway/01/01-23-Planning Permit/13 to R-22706 - Detail Sheet/eng



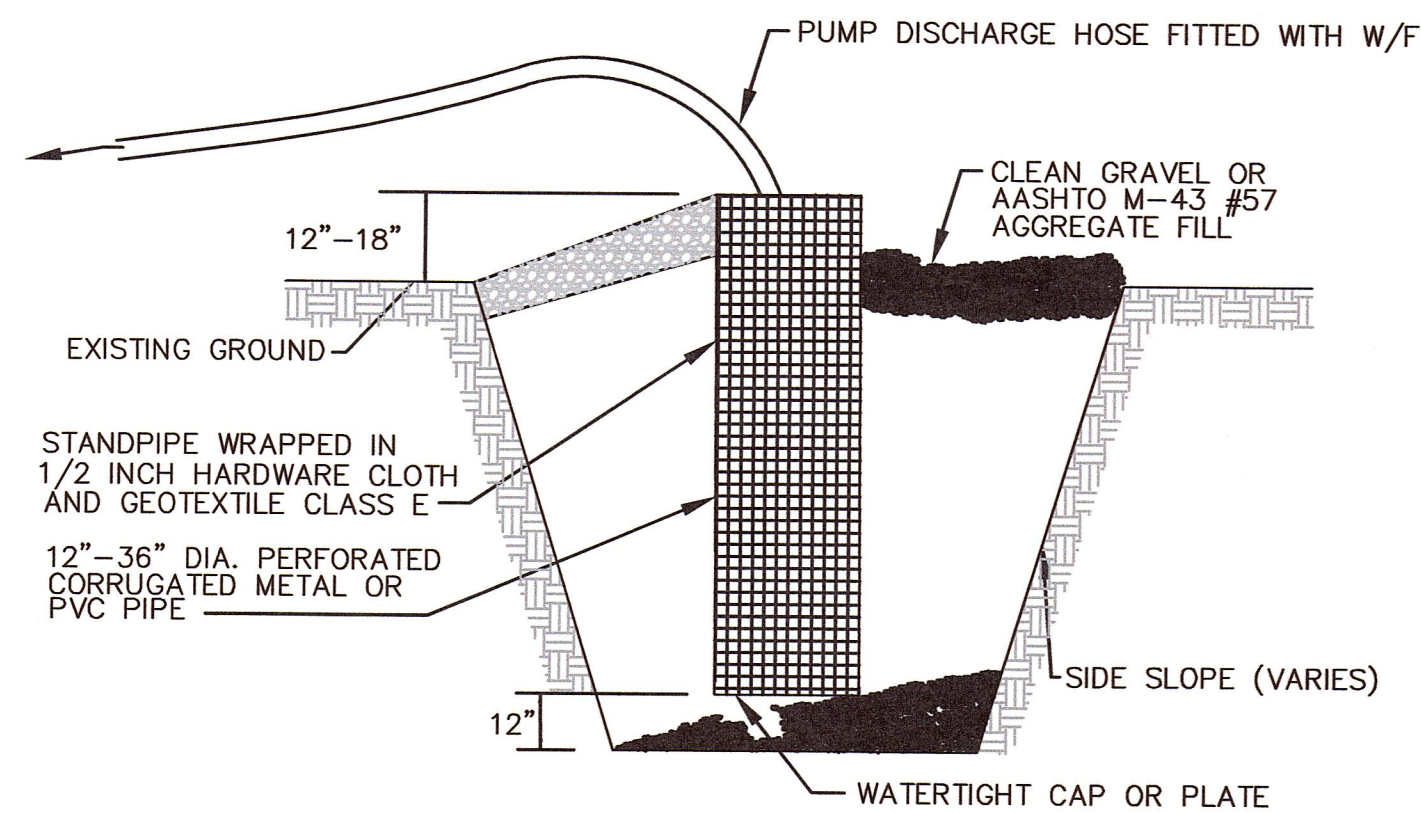
TEMPORARY DIVERSION BERM/SWALE DETAIL

CONTRACTOR SHALL STABILIZE AS NECESSARY USING RIP RAP, CRUSHED STONE, EROSION CONTROL BLANKETS, AND/OR LOAM & SEED



DANDY SACK® SILT SACK BY MIRAFI

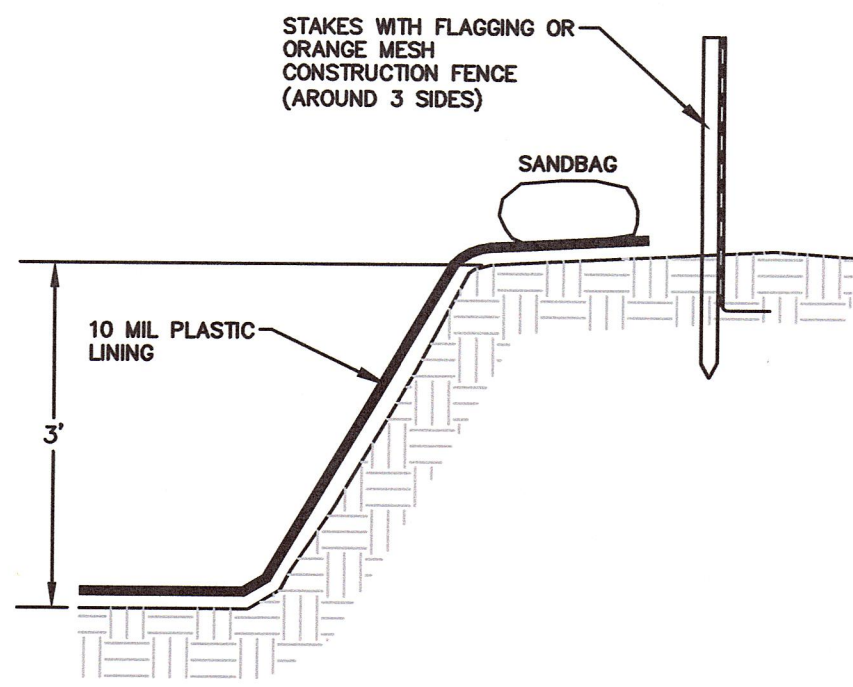
NOTE: SILT SACKS TO BE INSTALLED AT CATCH BASINS ONLY AFTER PAVED AREA IS CONSTRUCTED TO BASE COURSE PAVEMENT



CONSTRUCTION DEWATERING SUMP PIT DETAIL

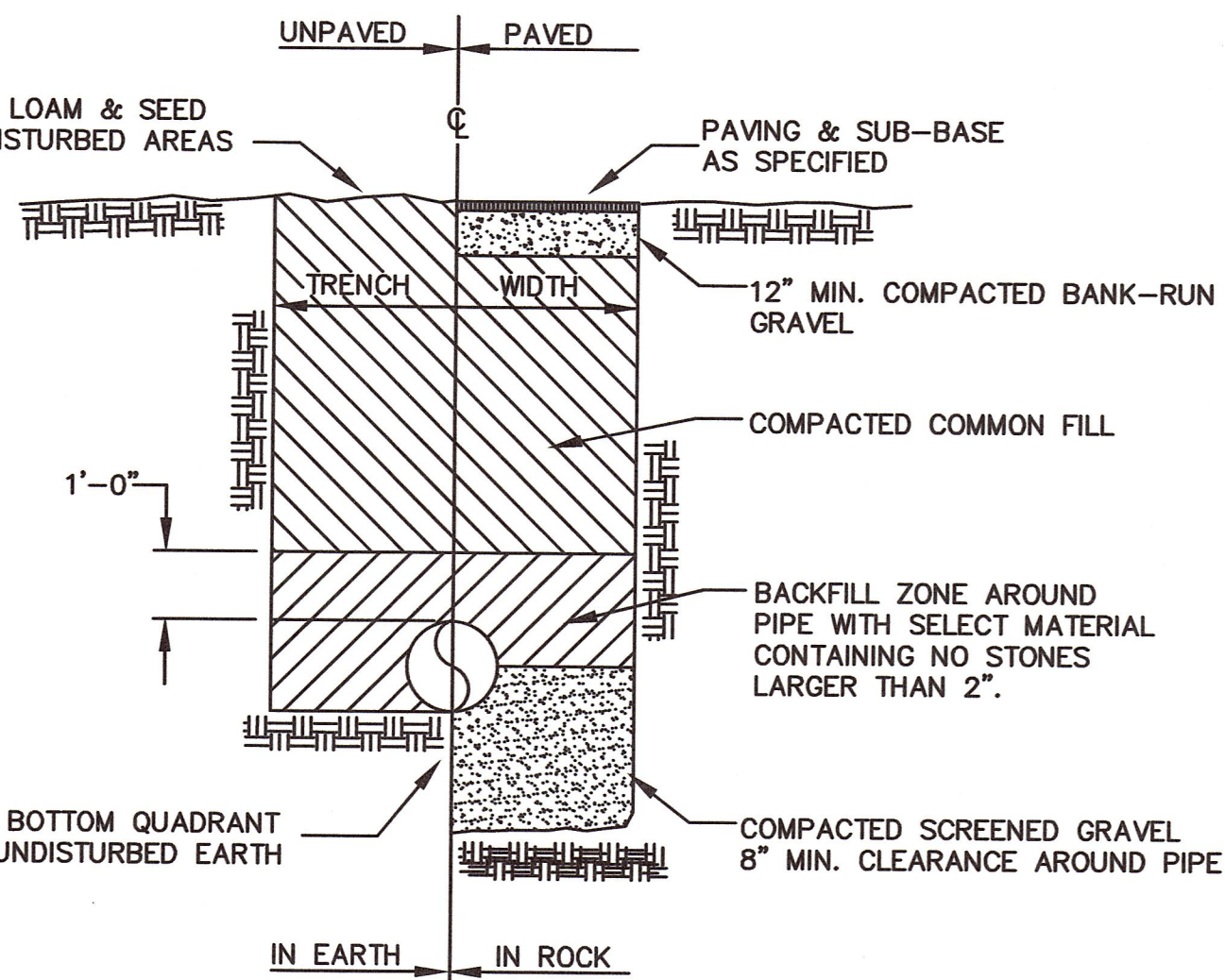
NOTE: IN LOCATIONS WHERE DEWATERING IS REQUIRED, THE CONTRACTOR SHALL CONSTRUCT A DEWATERING SUMP PIT IN ACCORDANCE WITH THE DETAIL PROVIDED. TO PREVENT THE MIGRATION OF SILT AND SEDIMENT, THE CONTRACTOR SHALL FIT THE DISCHARGE END OF THE PUMP HOSE WITH A COMPOSITE SOCK AND ALL FLOW SHALL BE DISCHARGED INTO A SEDIMENT CONTROL TRAP PRIOR TO CONVEYANCE INTO THE STORM DRAIN SYSTEM. THE SEDIMENT CONTROL TRAP SHALL BE CONSTRUCTED UTILIZING AN ENCLOSED AREA OF SILT FENCE AND/OR FILTERMATT IN ACCORDANCE WITH THE DETAIL SHOWN. SEDIMENT TRAPS SHALL BE PLACED IN UPLAND AREAS ONLY AWAY FROM WETLANDS.

DEWATERING PIT TO BE LOCATED OUTSIDE 100' BUFFER AND DISCHARGE, TO A SEDIMENT TRAP OR TEMPORARY DEATERING PIT WHERE FEASIBLE.



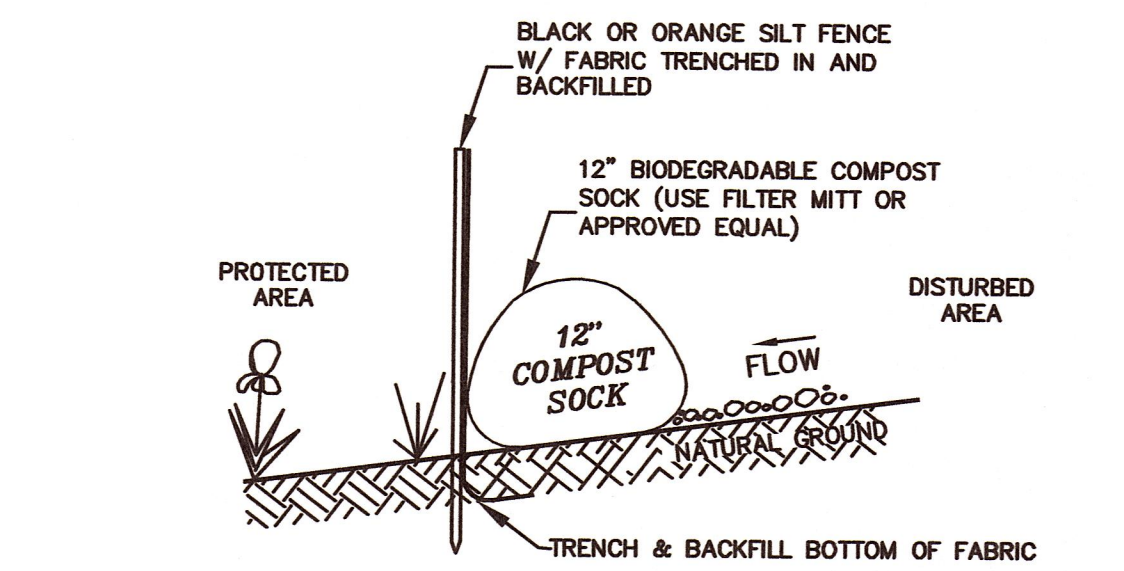
CROSS-SECTION A-A

NOTE:
1). TRENCH SHALL BE A MIN. OF 3' IN WIDTH PER TOWN OF MEDWAY STANDARDS.
2). TRENCH SHALL BE 5' MAX. DEPTH FOR STEEP SIDED SECTION
3). TRENCH SHALL BE PROVIDED WITH 6" MIN. CRUSHED STONE BEDDING PER TOWN OF MEDWAY.



WATER TRENCH

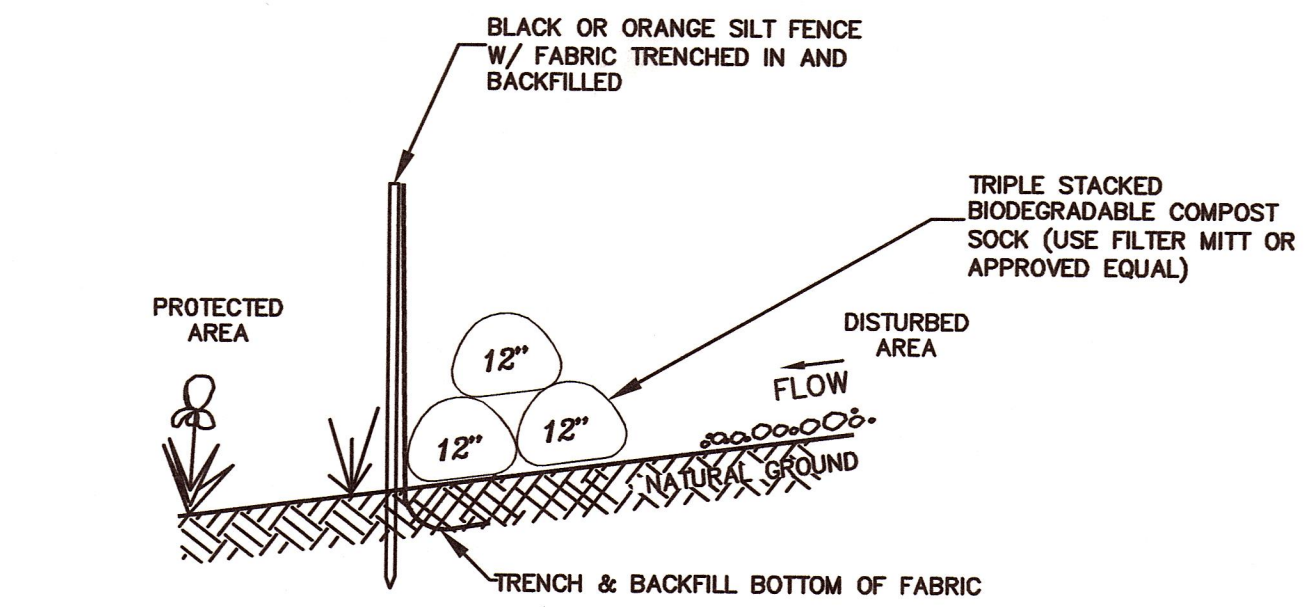
NOT TO SCALE



EROSION CONTROL BARRIER-TYPE 1 (ECB-1)

REQUIRED AT 50'-100' OF BORDERING VEGETATED WETLANDS, SEE NOTE 1.

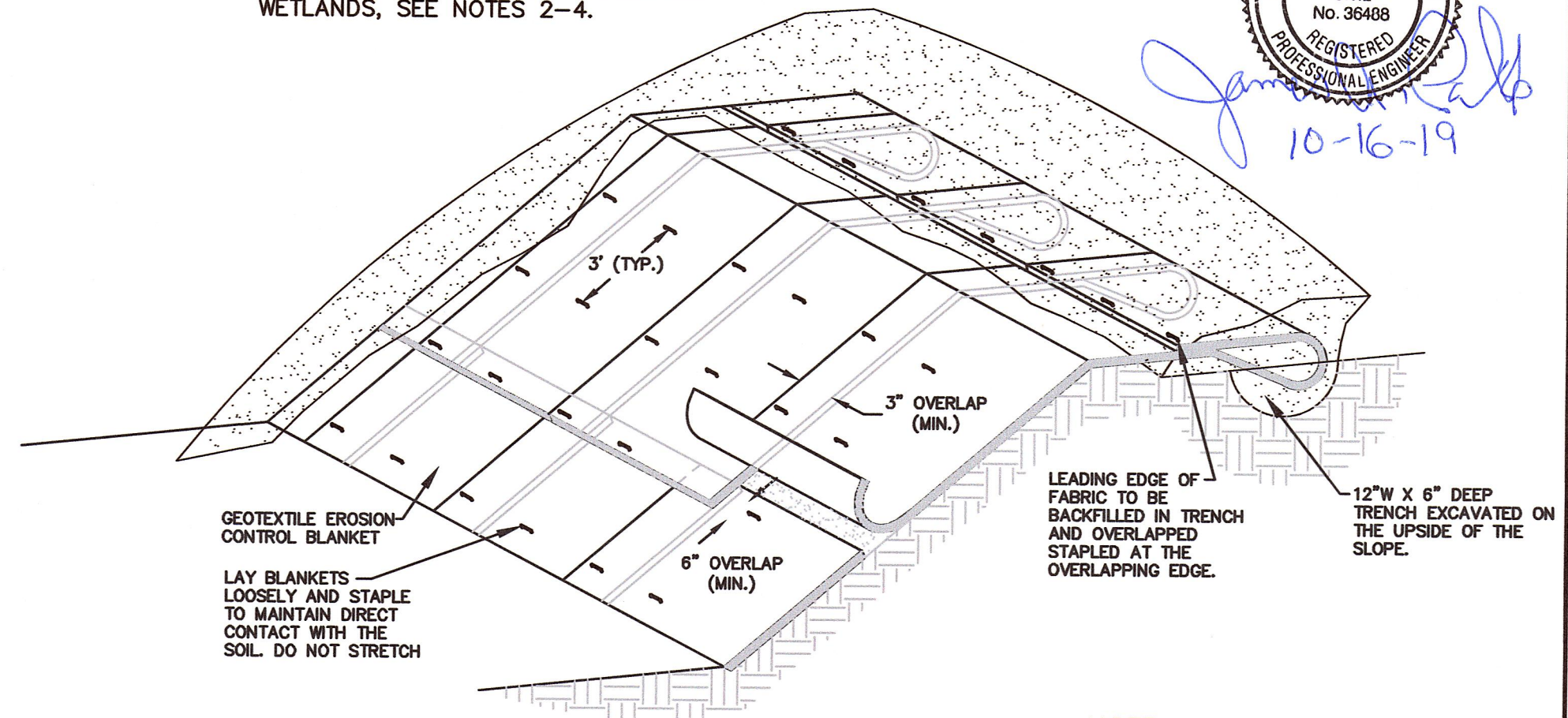
- EROSION CONTROL BARRIER NOTES**
1. WHEN WORKING WITHIN 50'-100' OF A BORDERING VEGETATED WETLAND USE ECB-1.
 2. BETWEEN 0'-50' OF A BORDERING VEGETATED WETLAND, USE ECB-2. (USE TRIPLE STACKED 12" BIODEGRADABLE COMPOST SOCK).
 3. WITHIN WETLAND AT WETLAND CROSSINGS #1 AND #3 (EMG. ACCESS ROAD & KINGSBURY DRIVE BRIDGE), AND AT THE BVW WETLAND REPLICATION AREA USE ECB-2, EXCEPT, NO SILT FENCE SHALL BE USED. SET TRIPLE COMPOST SOCKS ONLY.
 4. IF WORKING WITHIN 10 FEET TO BORDERING VEGETATED WETLAND RESOURCE AREA, 7-DAY SITE STABILIZATION IS REQUIRED IN ADDITION TO ECB-2.
•UPON COMPLETION OF WORK, OR IF SITE IS TO HAVE WORK STOPPAGE FOR MORE THAN 7-DAYS, THE SITE MUST BE STABILIZED TEMPORARILY WITH JUTE MESH, MULCH, HYDROSEED, OR PERMANENT GROUND COVER PER PLANS.



EROSION CONTROL BARRIER-TYPE 2 (ECB-2)

NOT TO SCALE

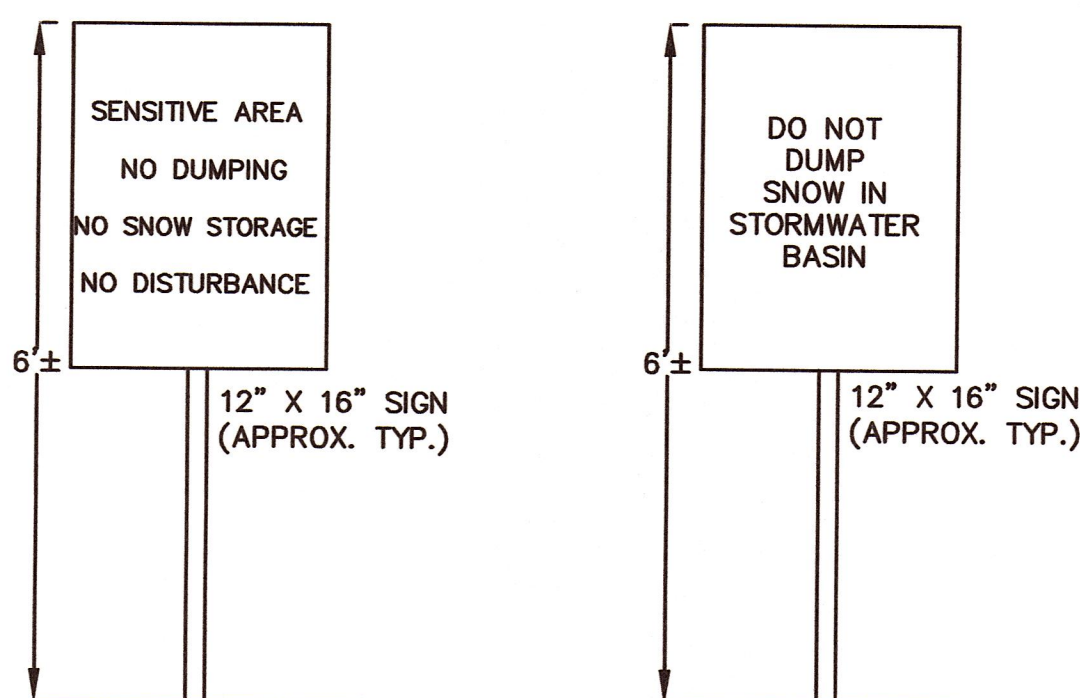
REQUIRED AT 0'-50' OF BORDERING VEGETATED WETLANDS, SEE NOTES 2-4.



GEOTEXTILE EROSION CONTROL BLANKET

NOT TO SCALE

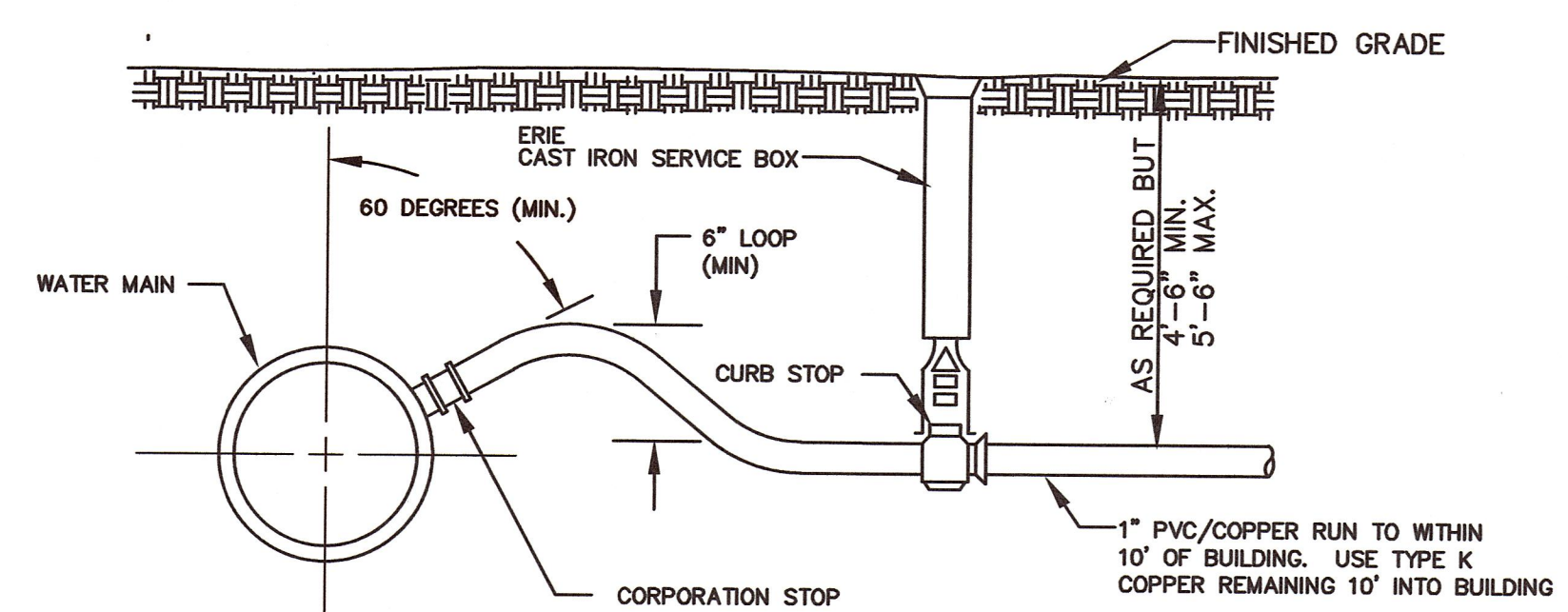
NOTE
USE ON 2:1 SLOPES AND WHERE NECESSARY TO PREVENT EROSION.



SIGN 1 SIGN 2

STORMWATER SIGN DETAIL

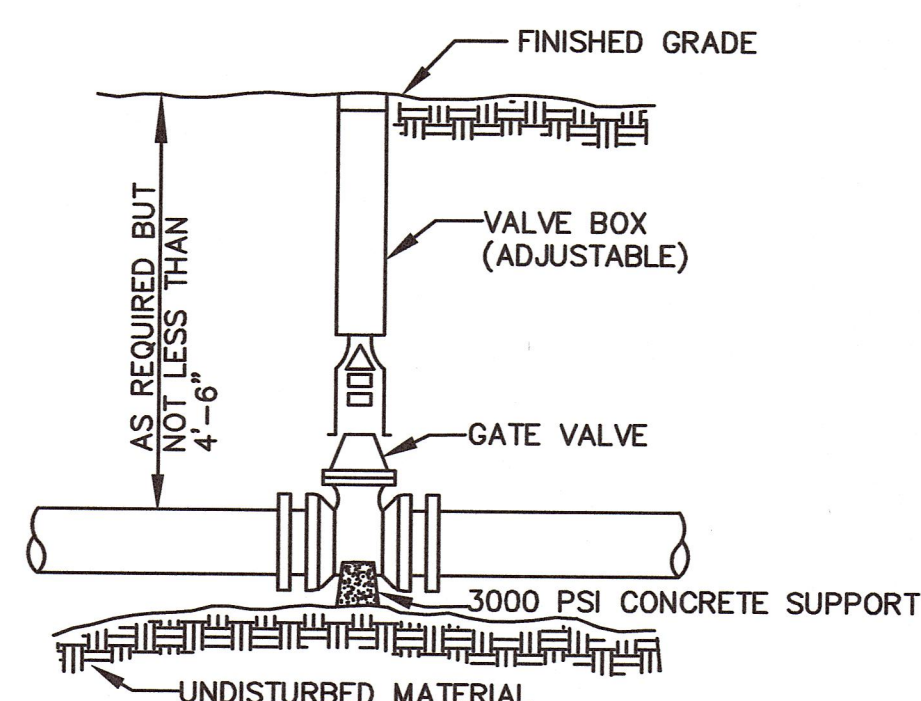
NOT TO SCALE



TYPICAL PERMANENT WATER SERVICE CONNECTION

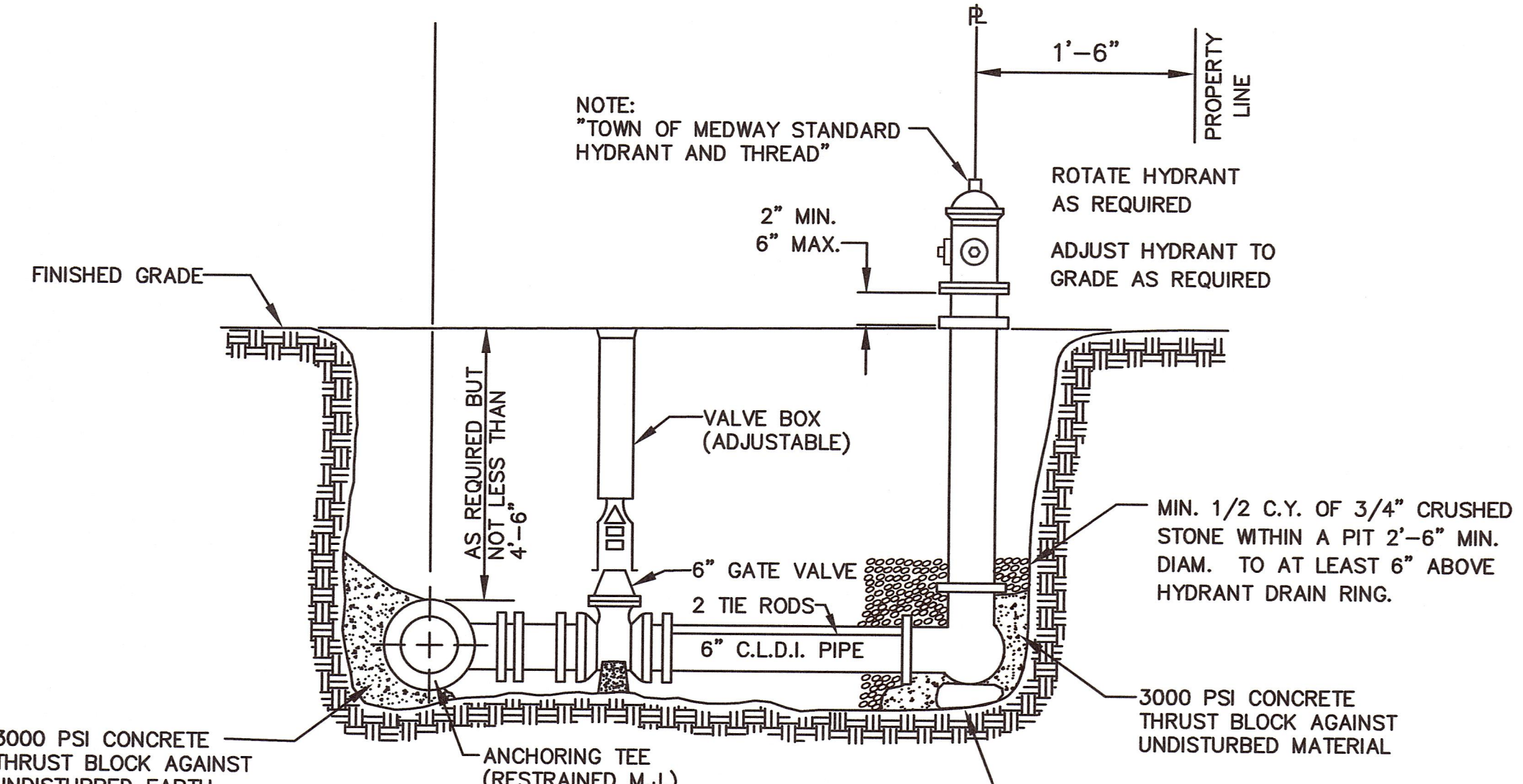
NOT TO SCALE

NOTE: SADDLES ARE REQUIRED FOR TAPS LARGER THAN 1 INCH.



TYPICAL GATE VALVE

NOT TO SCALE

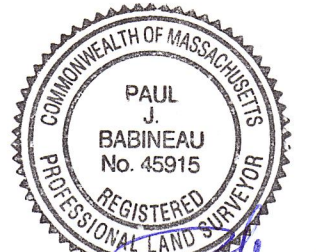


TYPICAL HYDRANT & VALVE

NOT TO SCALE

FOR REGISTRY USE ONLY

I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS.



DATE 10-16-19 PROFESSIONAL LAND SURVEYOR

APPROVED SUBJECT TO TERMS AND CONDITIONS OF A COMPREHENSIVE PERMIT PER ZONING BOARD OF APPEALS DECISION, AS AUTHORIZED BY CHAPTER 40B OF THE MASSACHUSETTS GENERAL LAWS, SECTIONS 20-23.

DATE: _____

MEDWAY ZONING BOARD OF APPEALS

I CERTIFY THAT 20 DAYS HAVE ELAPSED SINCE ZONING BOARD APPROVAL, AND THAT NO APPEAL HAS BEEN FILED AT THIS OFFICE.

TOWN CLERK-TOWN OF MEDWAY

DETAIL SHEET
TIMBER CREST
ESTATES
&
KINGSBURY VILLAGE
IN
MEDWAY
MASSACHUSETTS

Outback Engineering
Incorporated

165 EAST GROVE STREET
MIDDLEBOROUGH, MA 02346
TEL: (508)-946-9231
FAX: (508)-947-8873
www.outback-eng.com

DATE: AUGUST 6, 2019
DRAWN BY: CJV CHECKED BY: JAP
NOT TO SCALE SHEET 60 OF 62

OE-2765

BUOYANCY CALCULATIONS (LIFT STATION 1)

PUMP TANK (H-20)

MAX. GROUNDWATER ELEV. = 268.0 (ASSUMED AT EXISTING GROUND SURFACE)

PROPOSED CONCRETE SLAB BOTTOM ELEV.= 257.0

1. BUOYANCY FORCE ON CONCRETE SLAB (USE 8' X 8'):

VOLUME DISPLACED = 64 FT³ X (268.0 - 257.0)
= 704 C.F.
WT. OF DISPLACED WATER = 704 C.F. X 62.4 #/C.F.
= 43929 # ↑

2. WEIGHT OF EMPTY TANK:

WT. OF EMPTY TANK = 750± # ↓

3. WEIGHT OF CONCRETE SLAB BASE & COLLAR:

VOLUME = 2' DEEP X 64.0 FT² + 35.7 FT² X 1.5' = 178.35 C.F.
WEIGHT = 178.35 C.F. X 150 #/C.F. = 26752 # ↓

4. WEIGHT OF SOIL ATOP SLAB:

VOLUME = 10.5' DEEP X 35.7 FT² = 375 C.F.
WEIGHT = 375 C.F. X 120 #/C.F. = 44982 # ↓

4a. BUOYANCY FORCE OF SOIL ATOP SLAB:

VOLUME = 10' DEEP X 35.7 FT² = 357 C.F.
WEIGHT = 357 C.F. X 62.4 #/C.F. = 22276 # ↑
SUM OF FORCES: 42840 ↓ - 22276 ↑ = 20564 # ↓

5. SUM OF FORCES:

F.S. = (750 # + 26752 # + 20564 #) ÷ 43929 # = 1.1 FACTOR OF SAFETY
WT. OF SLAB AND TANK + SOIL IS GREATER THAN WT. OF DISPLACED WATER
∴ OK

BUOYANCY CALCULATIONS (LIFT STATION 2)

MAX. GROUNDWATER ELEV. = 270.7 (ASSUMED AT EXISTING GROUND SURFACE)

PUMP TANK (H-20)

PROPOSED TANK BOTTOM ELEV.= 250.0

1. BUOYANCY FORCE ON EMPTY TANK:

VOLUME DISPLACED = 81.25 FT³ X (270.7 - 250.0)
= 1682 C.F.
WT. OF DISPLACED WATER = 1682 C.F. X 62.4 #/C.F.
= 104949 # ↑

2. WEIGHT OF EMPTY TANK:

WT. OF EMPTY TANK = 69000 # ↓

3. WEIGHT OF SOIL ATOP BASE:

VOLUME = 24.3' DEEP X 29 FT² = 705 C.F.
WEIGHT = 705 C.F. X 120 #/C.F. = 84564 # ↓

3a. BUOYANCY FORCE OF SOIL ATOP SLAB:

VOLUME = (270.7-250.7)' DEEP X 29 FT² = 580 C.F.
WEIGHT = 580 C.F. X 62.4 #/C.F. = 36192 # ↑
SUM OF FORCES: 84564 ↓ - 36192 ↑ = 48372 # ↓

4. SUM OF FORCES:

F.S. = (69000 # + 48372 #) ÷ 104949 # = 1.1 FACTOR OF SAFETY
WT. OF TANK + SOIL IS GREATER THAN WT. OF DISPLACED WATER
∴ OK

BUOYANCY CALCULATIONS (LIFT STATION 3)

MAX. GROUNDWATER ELEV. = 262.0 (ASSUMED AT EXISTING GROUND SURFACE)

PUMP TANK (H-20)

PROPOSED CONCRETE SLAB BOTTOM ELEV.= 254.0

1. BUOYANCY FORCE ON CONCRETE SLAB (USE 8' X 8'):

VOLUME DISPLACED = 64.0 FT³ X (262.0 - 254.0)
= 512 C.F.
WT. OF DISPLACED WATER = 512 C.F. X 62.4 #/C.F.
= 31948 # ↑

2. WEIGHT OF EMPTY TANK:

WT. OF EMPTY TANK = 750± # ↓

3. WEIGHT OF CONCRETE SLAB BASE & COLLAR:

VOLUME = 2' DEEP X 64.0 FT² + 35.7 FT² X 1.5' = 178.35 C.F.
WEIGHT = 178.35 C.F. X 150 #/C.F. = 26752 # ↓

4. WEIGHT OF SOIL ATOP SLAB:

VOLUME = 10.5' DEEP X 35.7 FT² = 375 C.F.
WEIGHT = 375 C.F. X 120 #/C.F. = 44982 # ↓

4a. BUOYANCY FORCE OF SOIL ATOP SLAB:

VOLUME = (262-255)' DEEP X 35.7 FT² = 250 C.F.
WEIGHT = 250 C.F. X 62.4 #/C.F. = 15593 # ↑
SUM OF FORCES: 44982 ↓ - 15593 ↑ = 29388 # ↓

5. SUM OF FORCES:

F.S. = (750 # + 26752 # + 29388 #) ÷ 31948 # = 1.8 FACTOR OF SAFETY
WT. OF TANK + CONCRETE BALLAST IS GREATER THAN WT. OF DISPLACED WATER
∴ OK

BUOYANCY CALCULATIONS (SMH 51)

MAX. GROUNDWATER ELEV. = 268.6 (BASED ON MOTTLES @ 18" IN TP-9B)

PUMP TANK (H-20)

PROPOSED SMH 51 BOTTOM ELEV.= 259.3

1. BUOYANCY FORCE ON STRUCTURE:

VOLUME DISPLACED = 18.3 FT³ X (268.6 - 259.3)
= 170.19 C.F.
WT. OF DISPLACED WATER = 170.19 C.F. X 62.4 #/C.F.
= 10619.9 # ↑

2. WEIGHT OF SMH STRUCTURE:

VOLUME = 15.2' DEEP X 5.76 FT² = 87.6 C.F.
WEIGHT = 87.6 C.F. X 150 #/C.F. = 13,132.8 # ↓

3. SUM OF FORCES:

F.S. = (13,132.8 #) ÷ 10,619.9 # = 1.24 FACTOR OF SAFETY
WT. OF SMH IS GREATER THAN WT. OF DISPLACED WATER
∴ OK

BUOYANCY CALCULATIONS (SMH 54)

MAX. GROUNDWATER ELEV. = 269.2 (BASED ON MOTTLES @ 24" IN TP-12A)

PUMP TANK (H-20)

PROPOSED SMH 54 BOTTOM ELEV.= 262.9

1. BUOYANCY FORCE ON STRUCTURE:

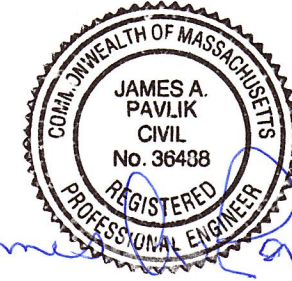
VOLUME DISPLACED = 18.3 FT³ X (269.2 - 262.9)
= 115.29 C.F.
WT. OF DISPLACED WATER = 115.29 C.F. X 62.4 #/C.F.
= 7294.1 # ↑

2. WEIGHT OF SMH STRUCTURE:

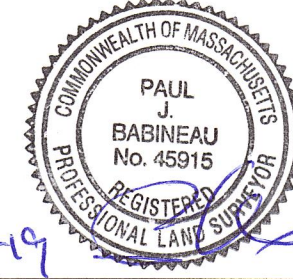
VOLUME = 14.6' DEEP X 5.76 FT² = 84.1 C.F.
WEIGHT = 84.1 C.F. X 150 #/C.F. = 12,614.4 # ↓

3. SUM OF FORCES:

F.S. = (12,614.4 #) ÷ 7294.1 # = 1.73 FACTOR OF SAFETY
WT. OF SMH IS GREATER THAN WT. OF DISPLACED WATER
∴ OK

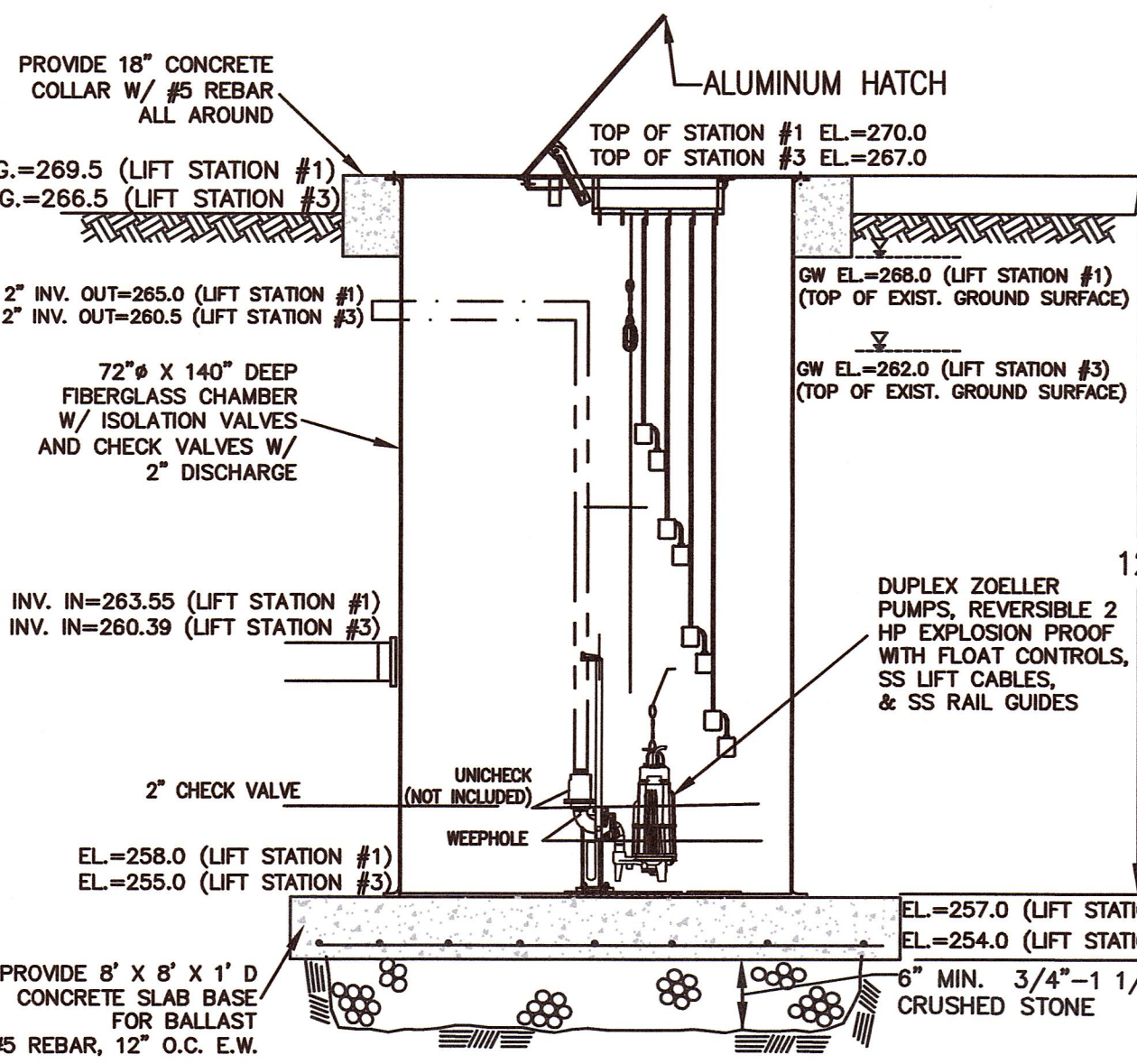
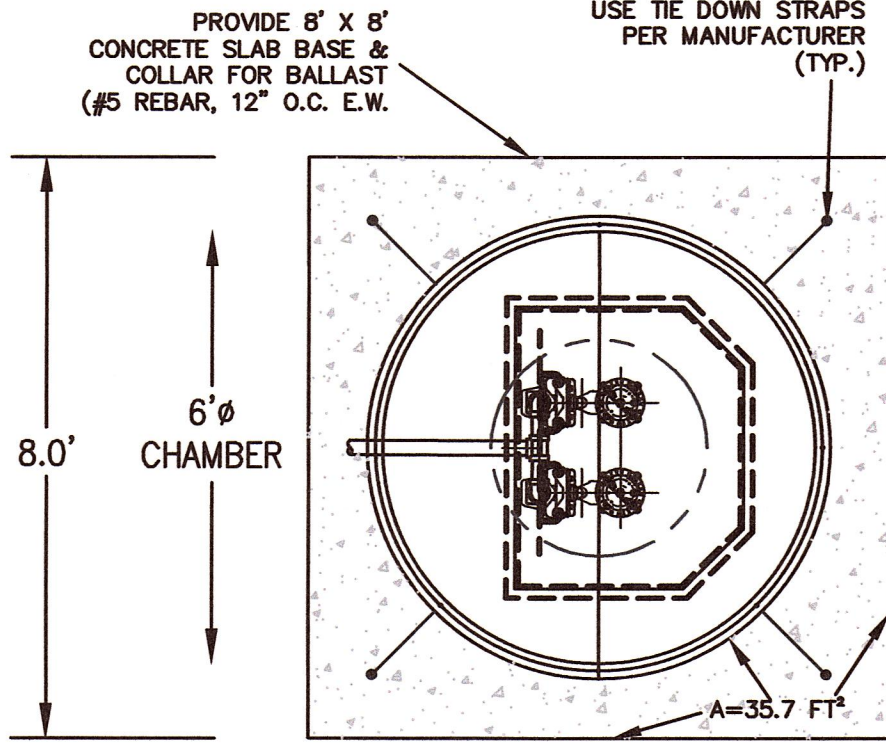


10-16-19



10-16-19

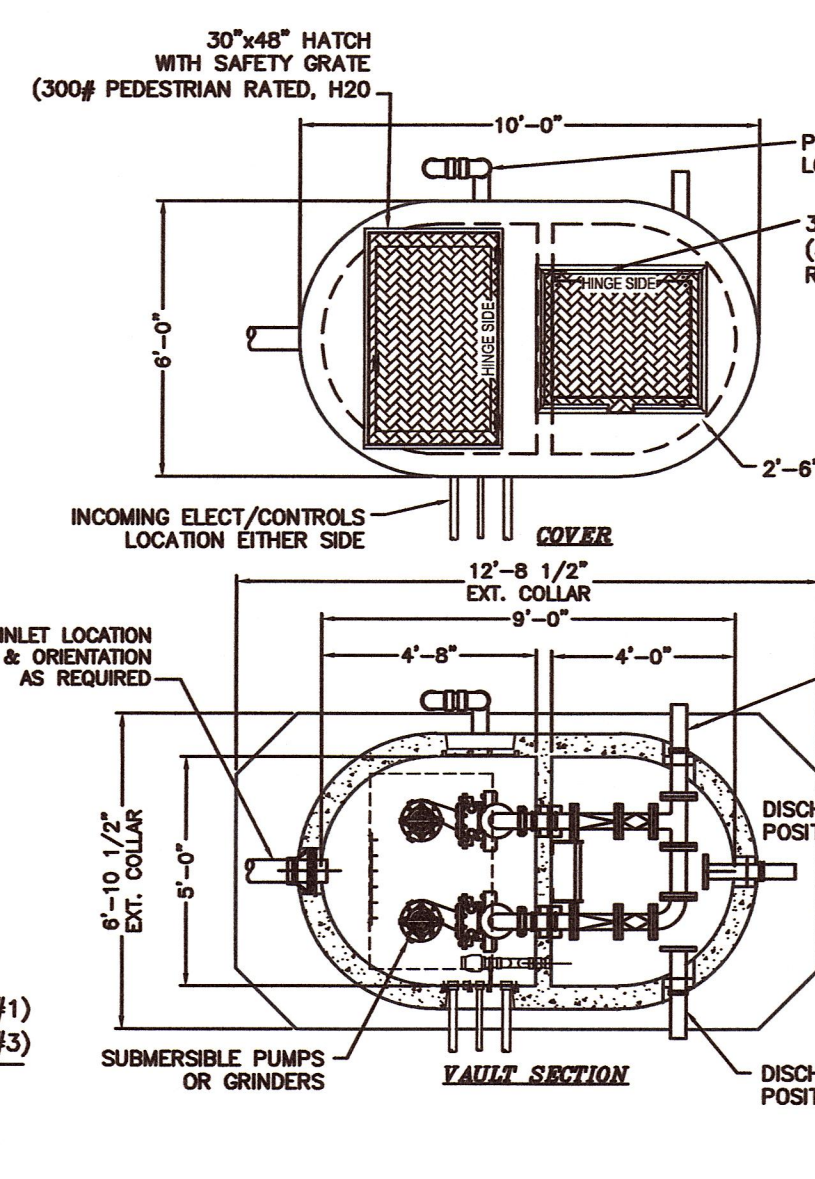
LIFT STATION BUOYANCY CALCULATIONS



LIFT STATIONS #1 AND #3

NOTES:

- PUMP CORDS NOT SHOWN FOR CLARITY.
- CONTRACTOR TO PROVIDE ALL EQUIPMENT, MATERIALS & LABOR NECESSARY FOR A COMPLETE INSTALLATION FOR A DUPLEX ZOELLER PUMP STATION (SEE HAYES PUMP, INC. BUDGET QUOTATION LETTER DATED NOVEMBER 12, 2018 FOR SPECIFICATIONS.) CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR REVIEW BY DESIGN ENGINEER PRIOR TO ORDERING AND INSTALLATION.



NOTES:

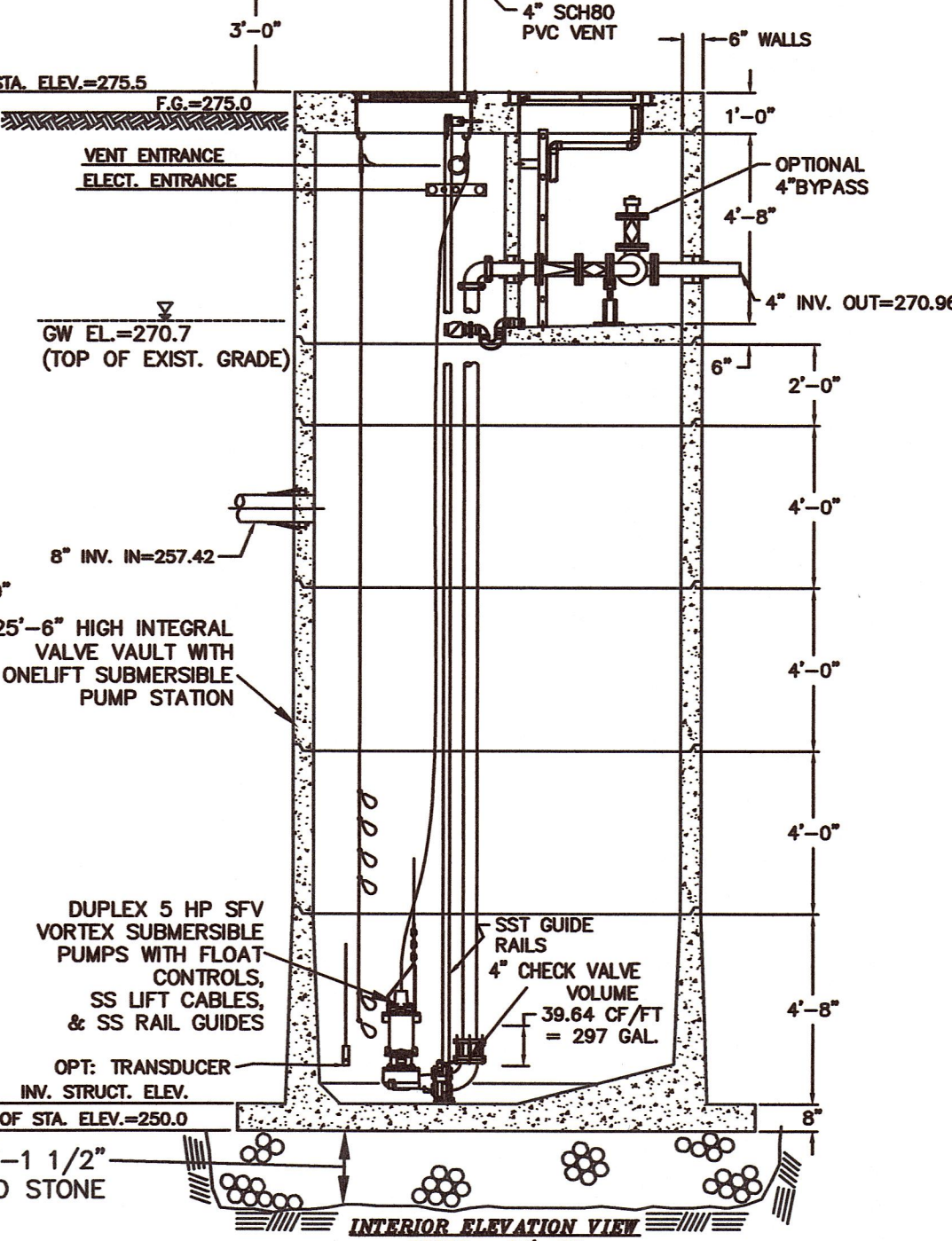
- PUMP CORDS NOT SHOWN FOR CLARITY.
- CONTRACTOR TO PROVIDE ALL EQUIPMENT, MATERIALS & LABOR NECESSARY FOR A COMPLETE INSTALLATION FOR ONELIFT MODEL RC509 (SEE HAYES PUMP, INC. BUDGET QUOTATION LETTER DATED NOVEMBER 12, 2018 FOR SPECIFICATIONS.) CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR REVIEW BY DESIGN ENGINEER PRIOR TO ORDERING AND INSTALLATION.

LIFT STATION #2

NOT TO SCALE

APPROX. WEIGHTS:

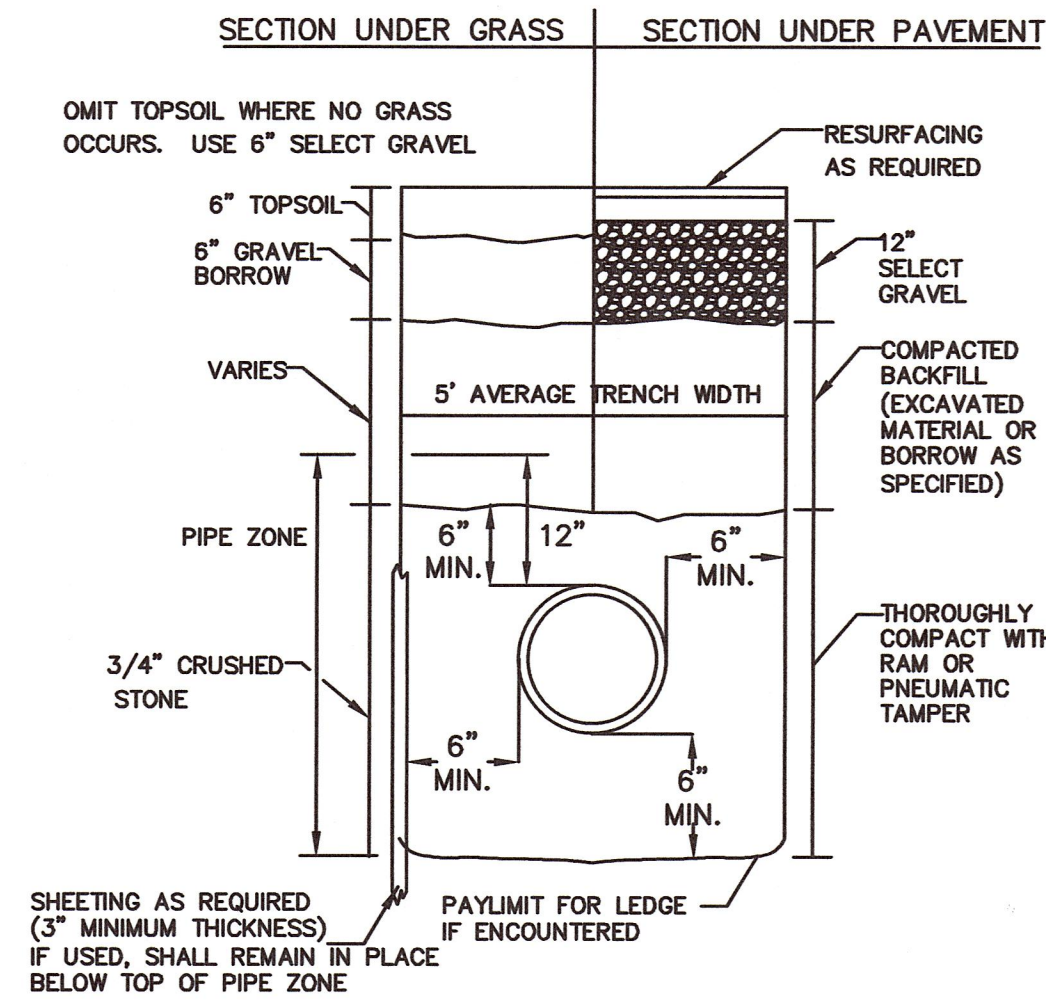
- BASE SECTION W/FLOAT COLLAR & FILLETS = 11.0 TONS
- TOP SLAB & VALVE VAULT ARE FACTORY SEALED, AND SHIP AS 1-PIECE = 9.5 TONS
- 2' RISER SECTION = 2.0 TONS
- 4' RISER SECTION = 4.0 TONS



LIFT STATION #2

NOT TO SCALE

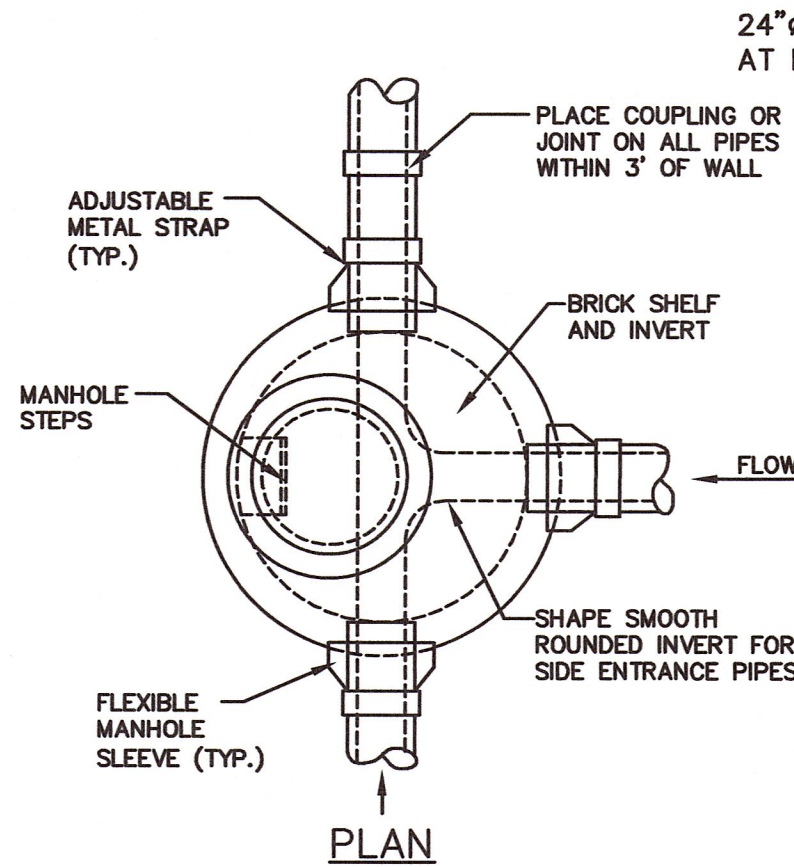
TYPICAL BUOYANCY CALCULATION FOR SEWER MANHOLES



TYPICAL SEWER TRENCH DETAIL

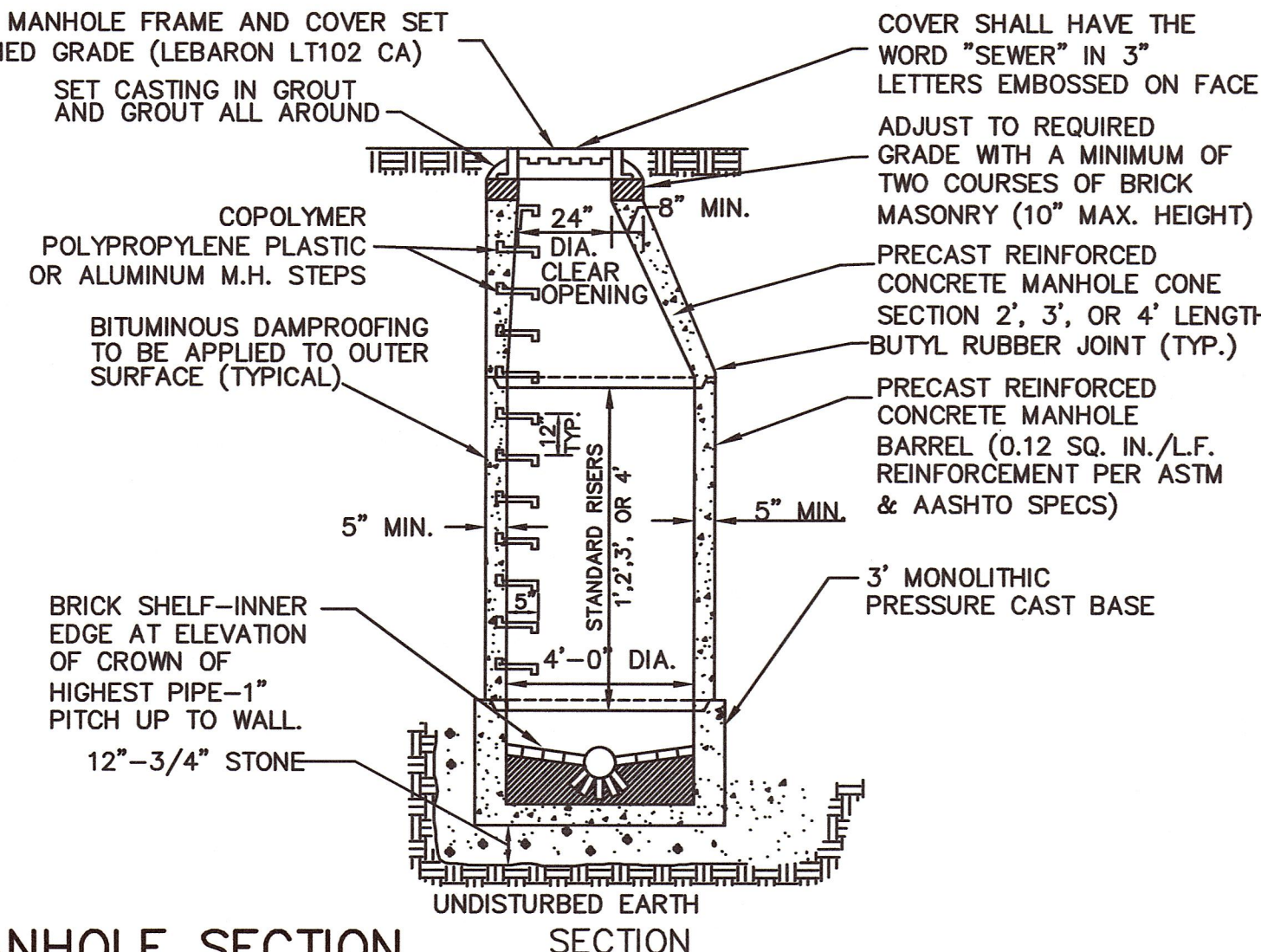
NOT TO SCALE

- NOTES:
- INCLUDES HOUSE SERVICES
 - EXISTING PAVEMENT SHALL BE SAW CUT BEFORE TRENCH EXCAVATION
 - PAY WIDTH EQUALS 5 FEET



STANDARD SEWER MANHOLE SECTION

NOT TO SCALE



| LIFT Station # & Location | # of homes | Avg Flow(GPD) (170 GPD/home) | Peak flow (5X) (GPD) | GPH (peak hour) | GPM (peak hour) | Rim El. | 8" Inv. In to Lift station | Inv. Out (of wet well) | FM length | Connecting inv. El. |
|---------------------------|------------|---------------------------------|-------------------------|-----------------|-----------------|---------|-------------------------------|---------------------------|-----------|------------------------|
| #1 / Rosewood Dr. | 11 | 1870 | 9350 | 390 | 6 | 270 | 263.55 | (2") 265 | *264' | 273.40 |
| #2/ Infil. Bas. 4 | 71 | 12070 | 60350 | 2515 | 42 | 276 | 257.42 | (4") 270.96 | *204' | 272.04 |
| #3/ Kingsbury Dr. | 11 | 1870 | 9350 | 390 | 6 | 267 | 260.39 | (2") 260.5 | *544' | 266.77 |

LIFT STATION DESIGN FLOW CALCULATIONS & ELEVATIONS

*NOTE: FROM LIFT STATION TO MANHOLE WITH GRAVITY SEWER

DETAIL SHEET

TIMBER CREST
ESTATES
&
KINGSBURY VILLAGE
IN
MEDWAY
MASSACHUSETTS



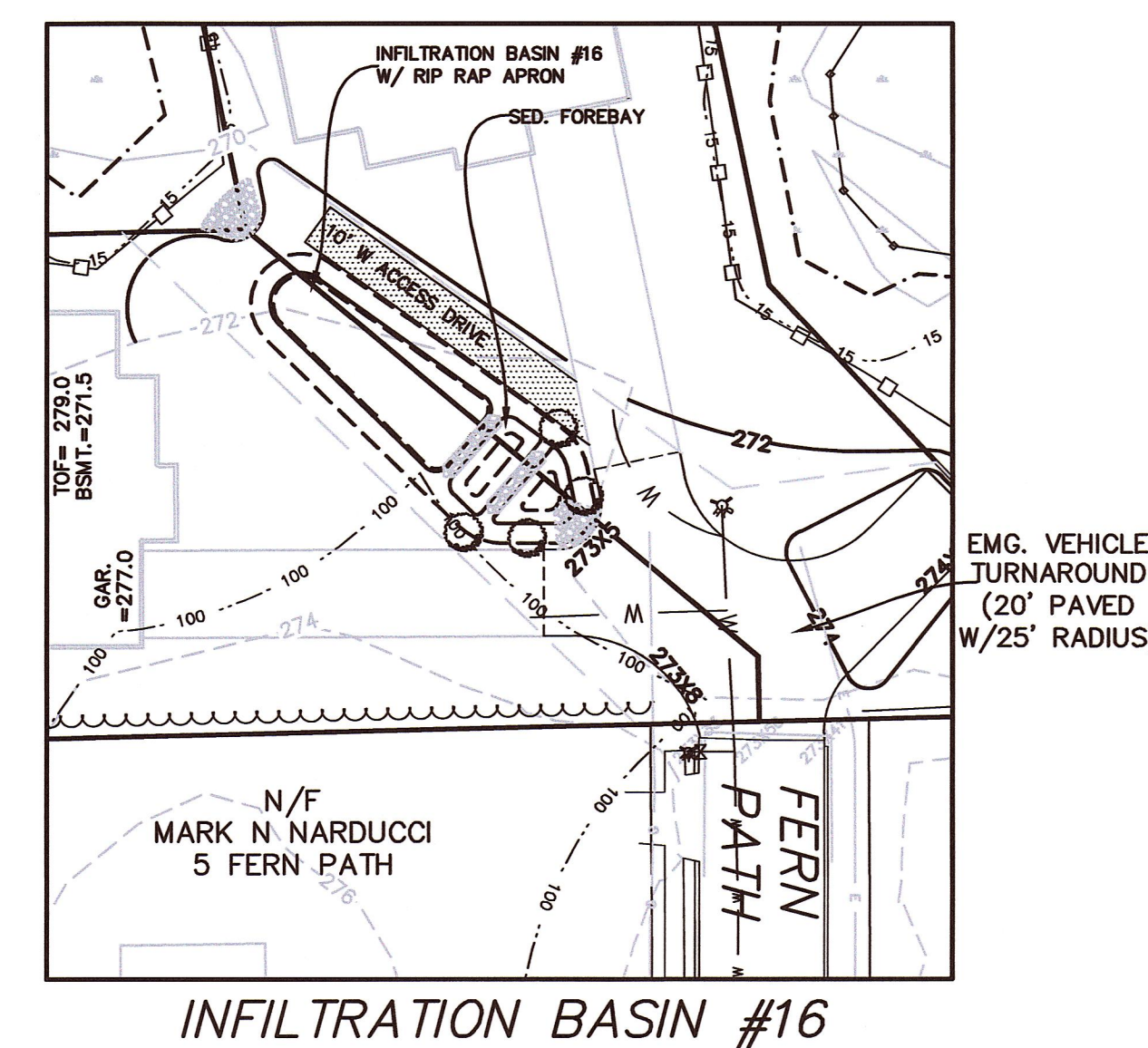
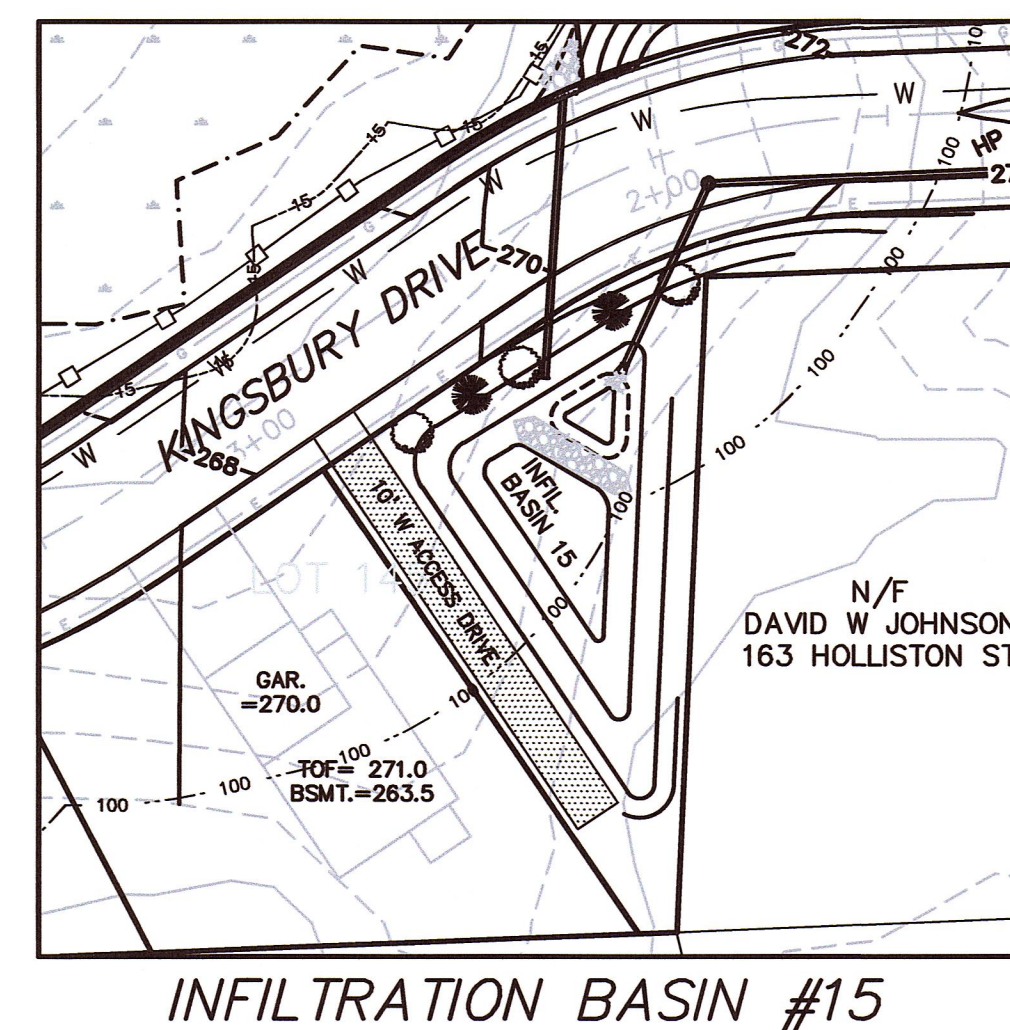
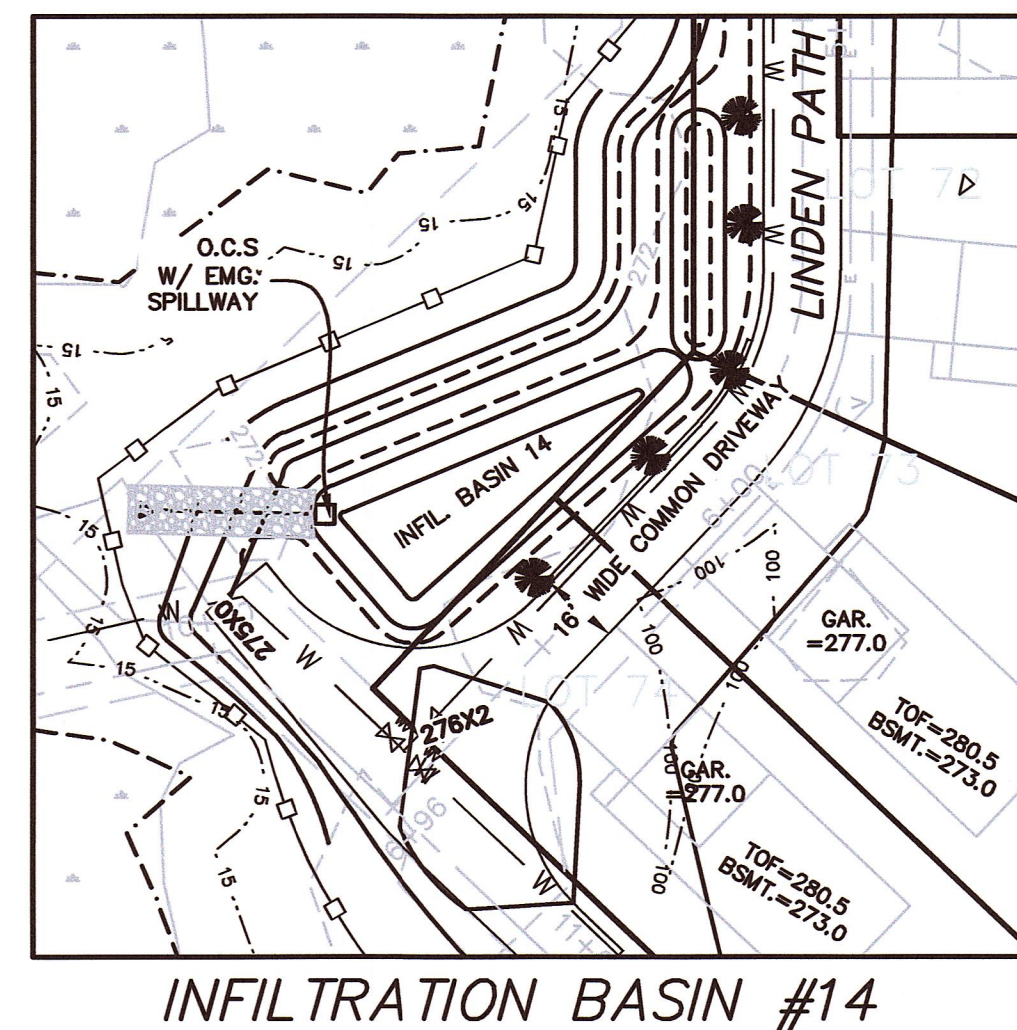
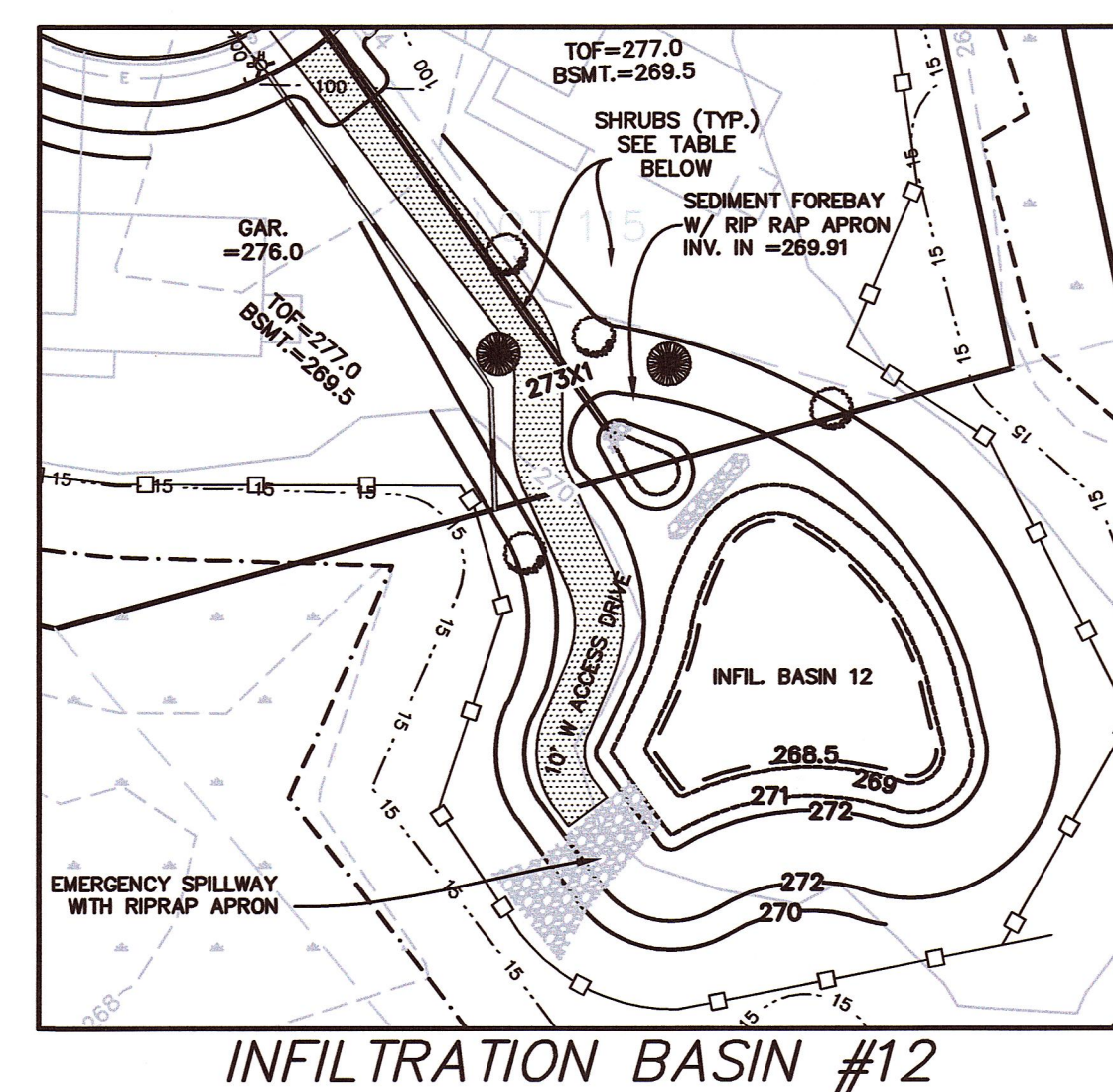
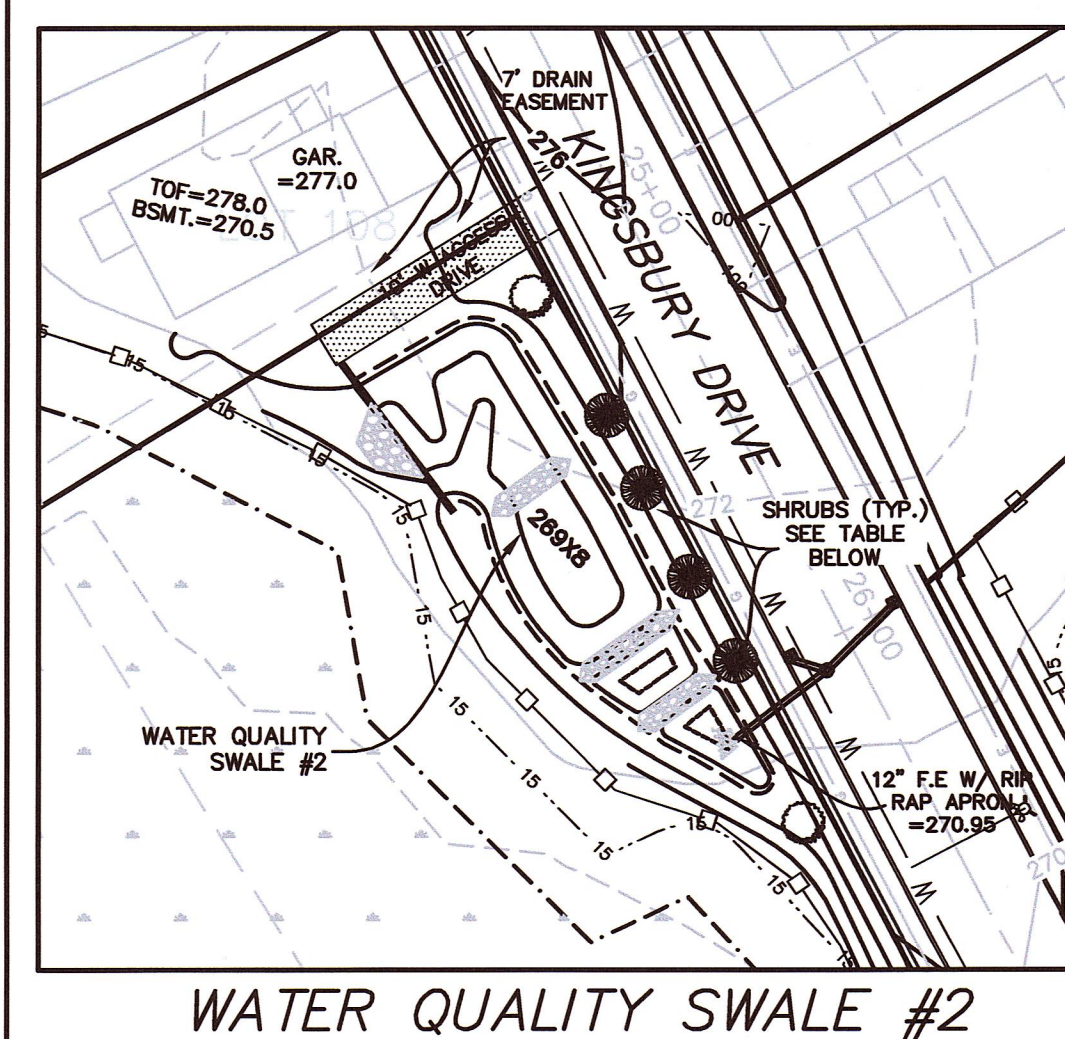
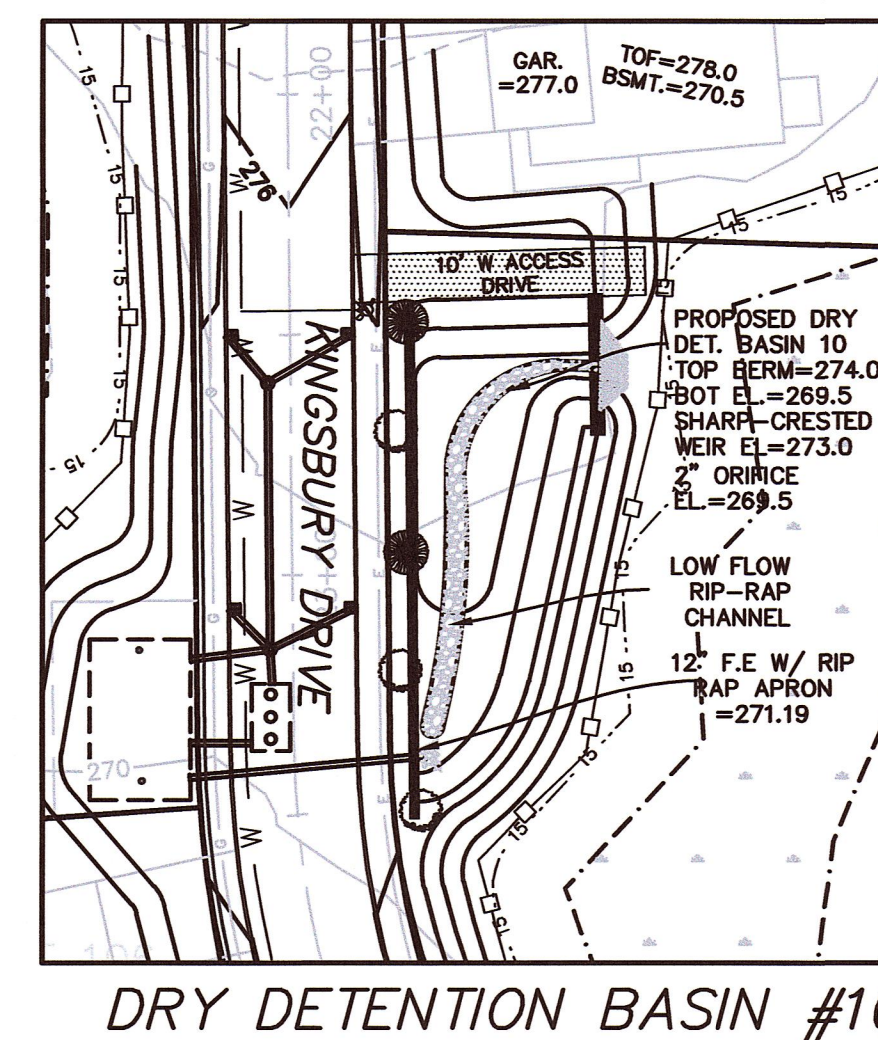
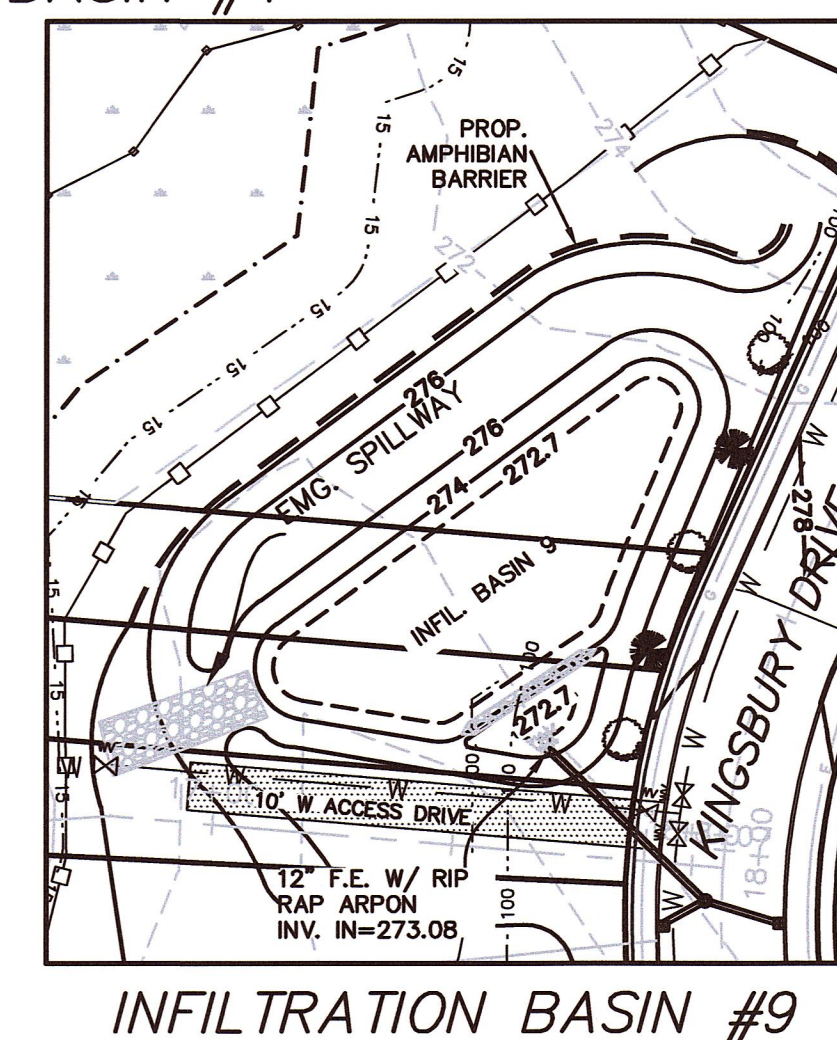
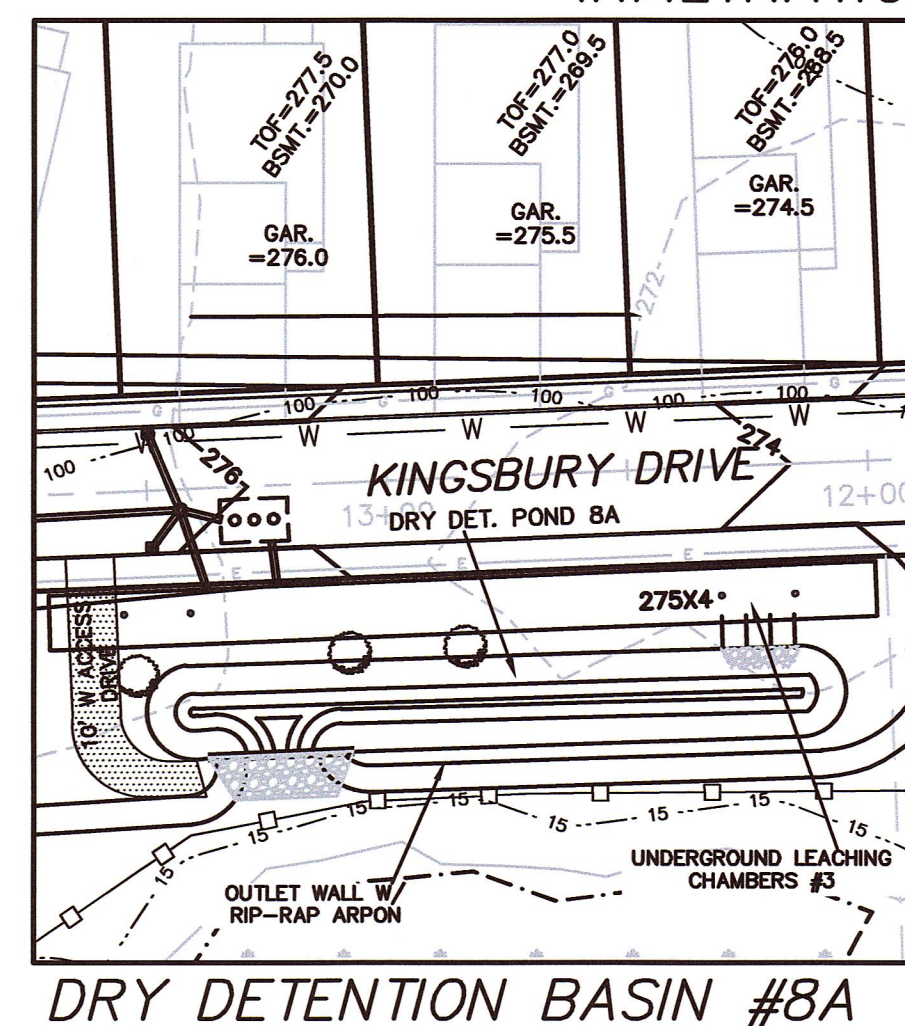
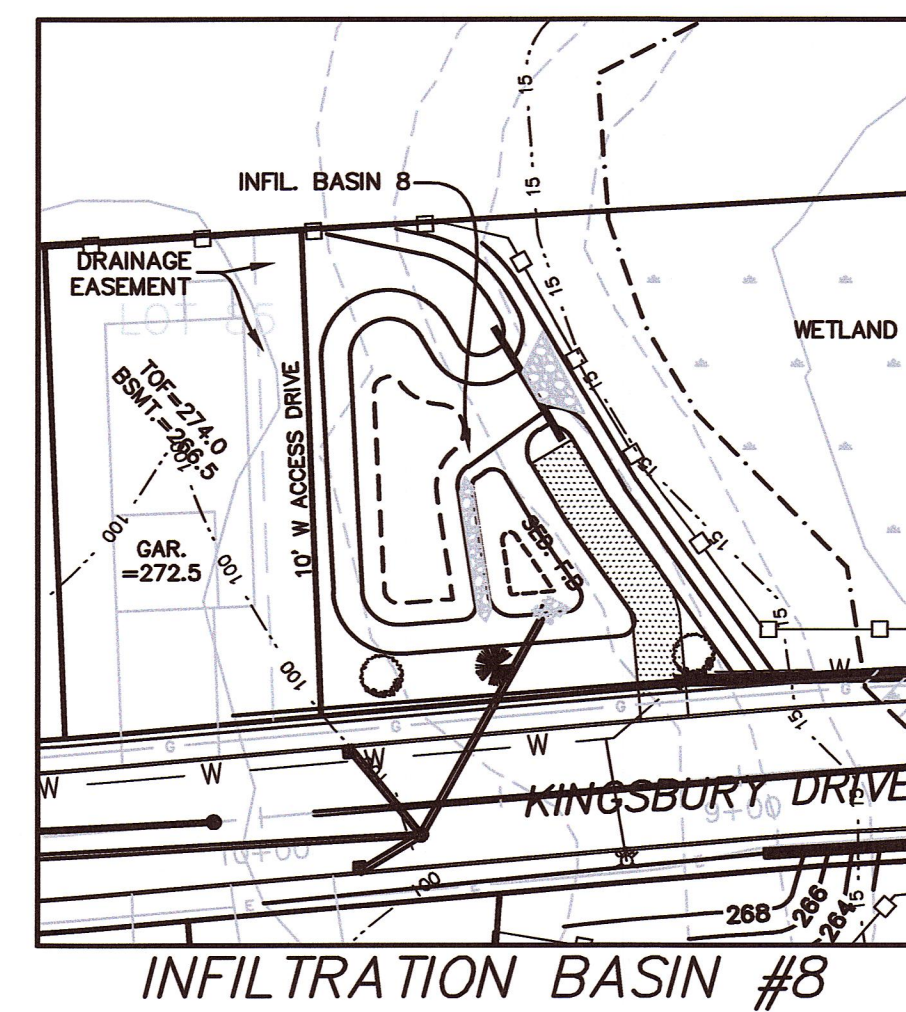
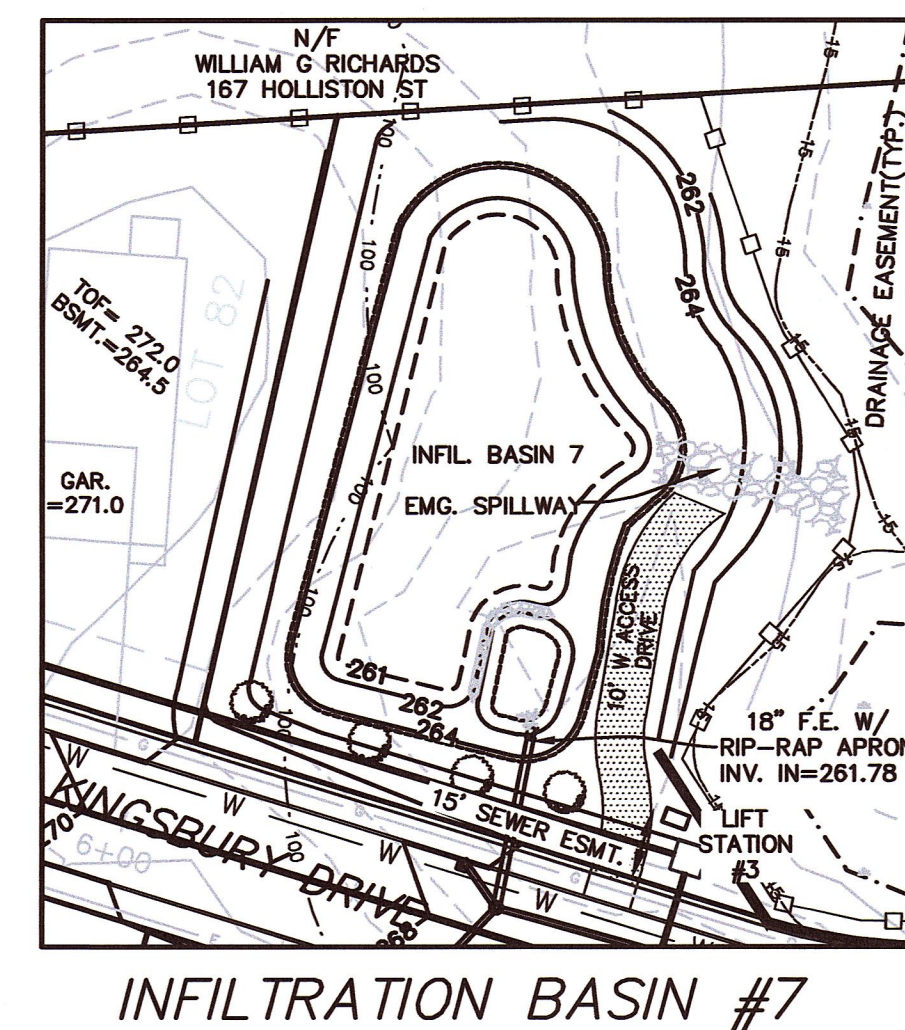
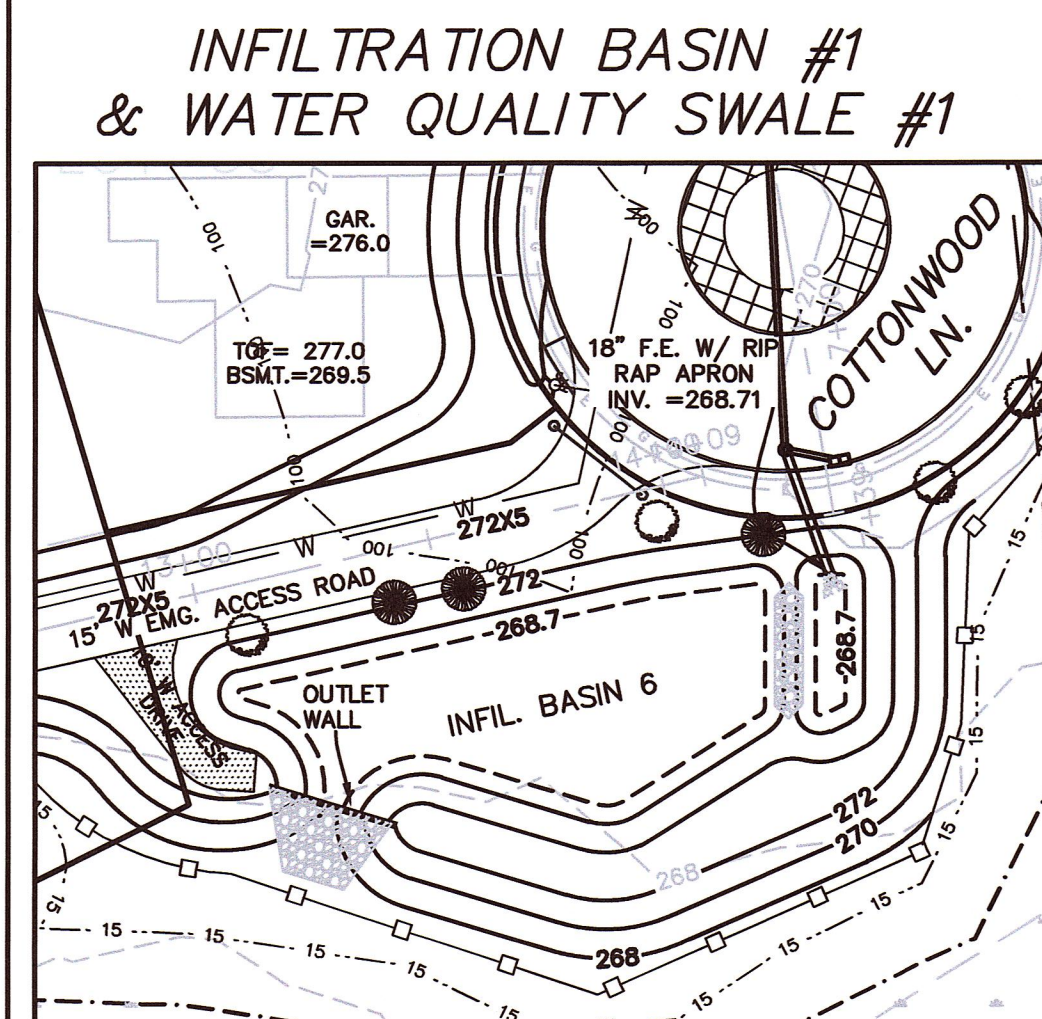
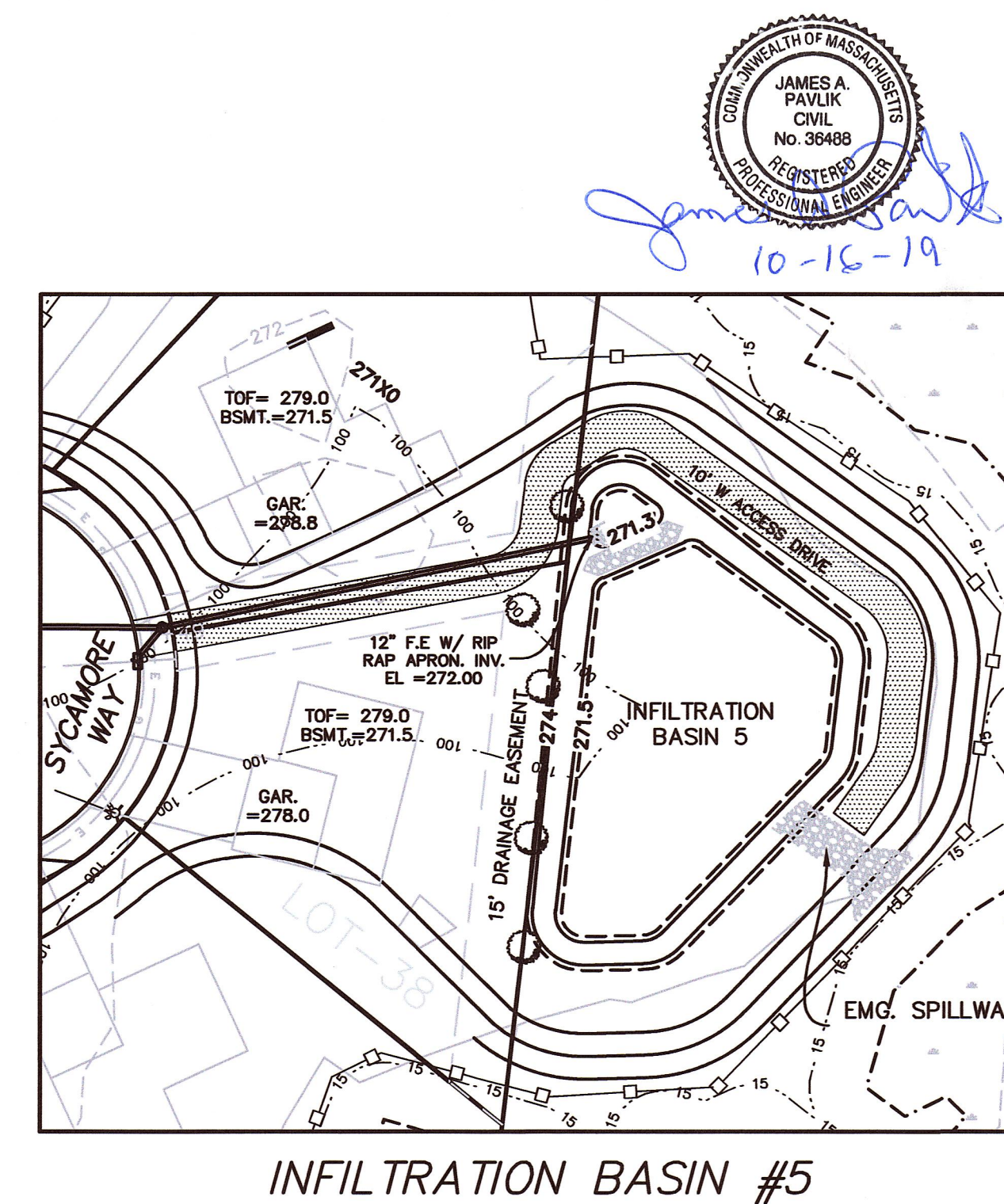
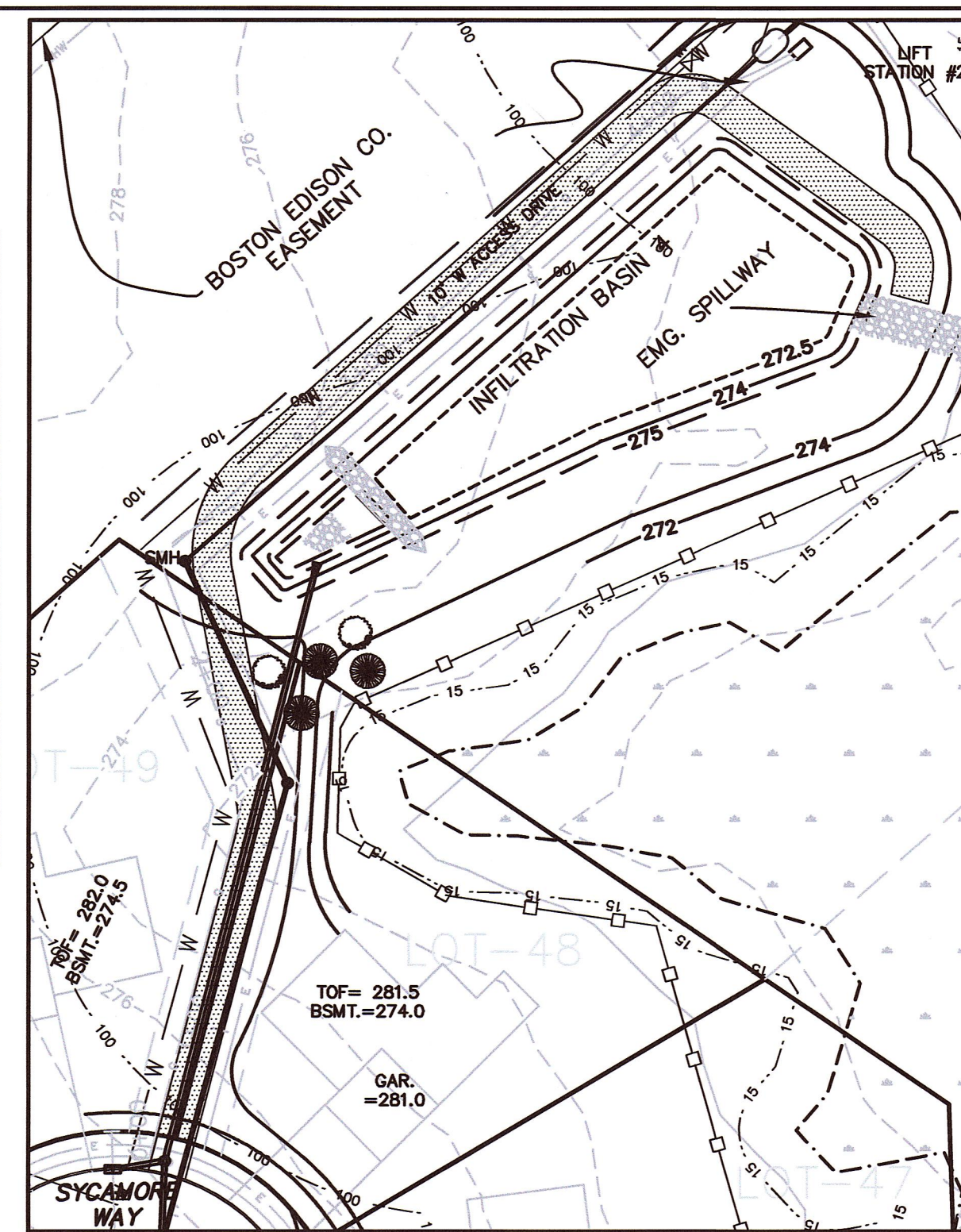
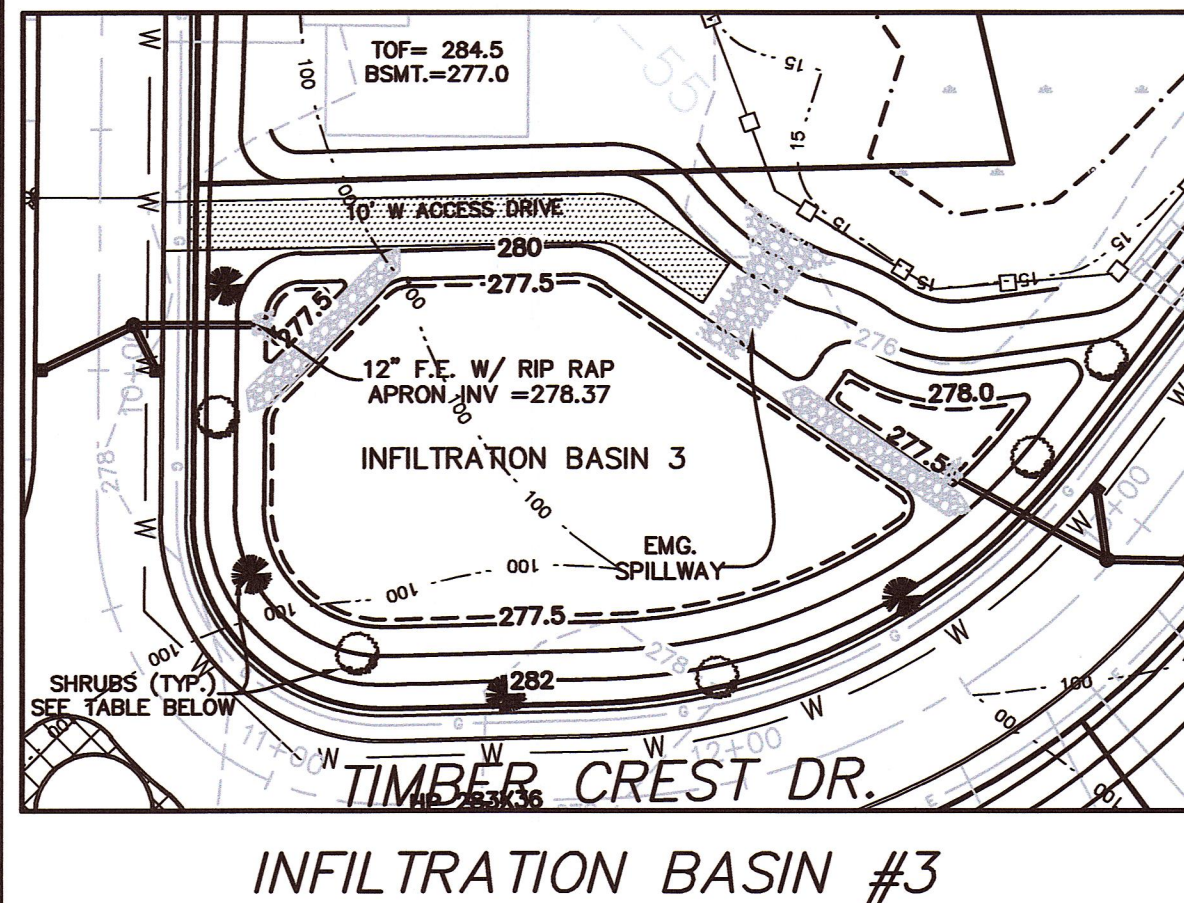
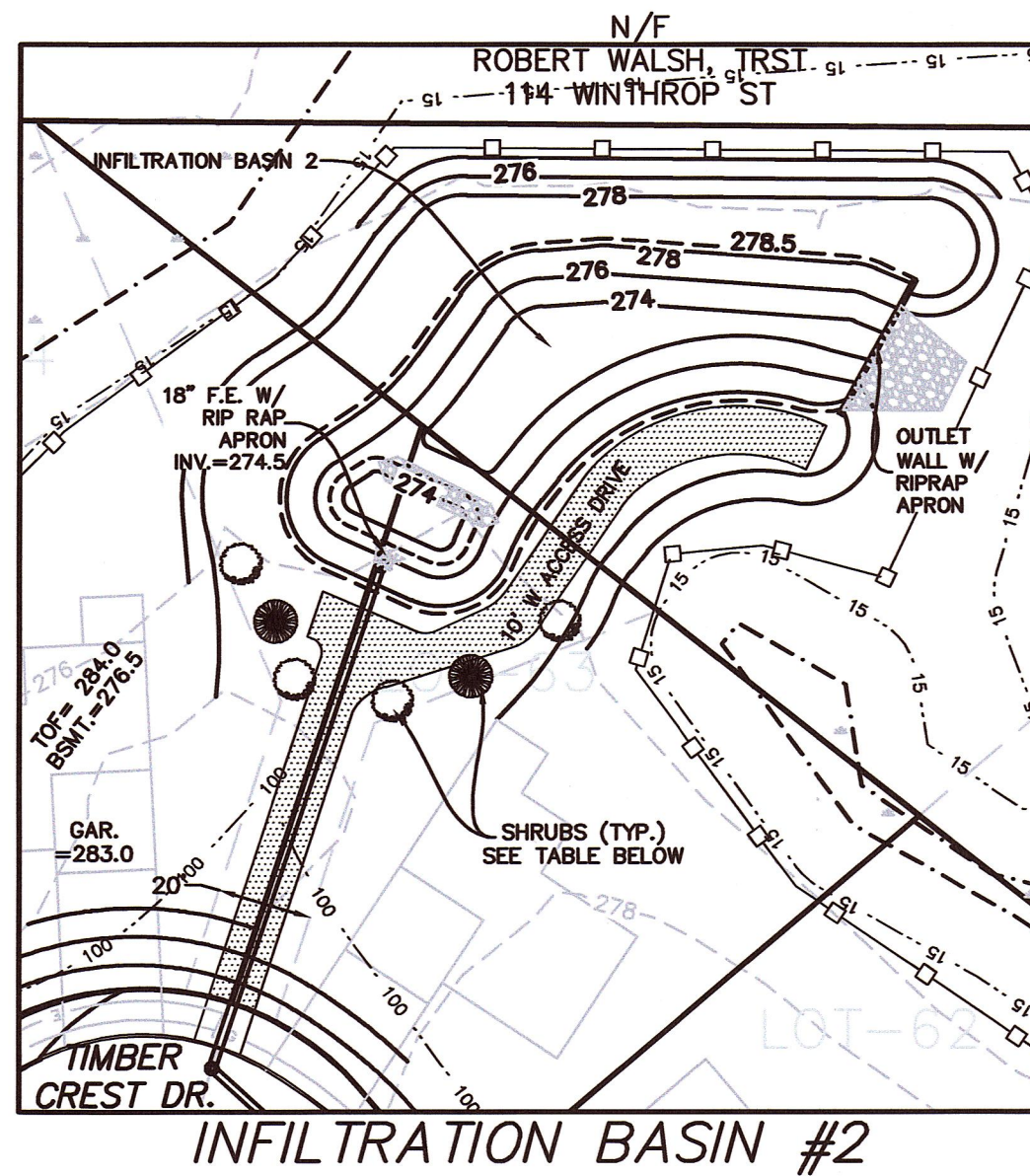
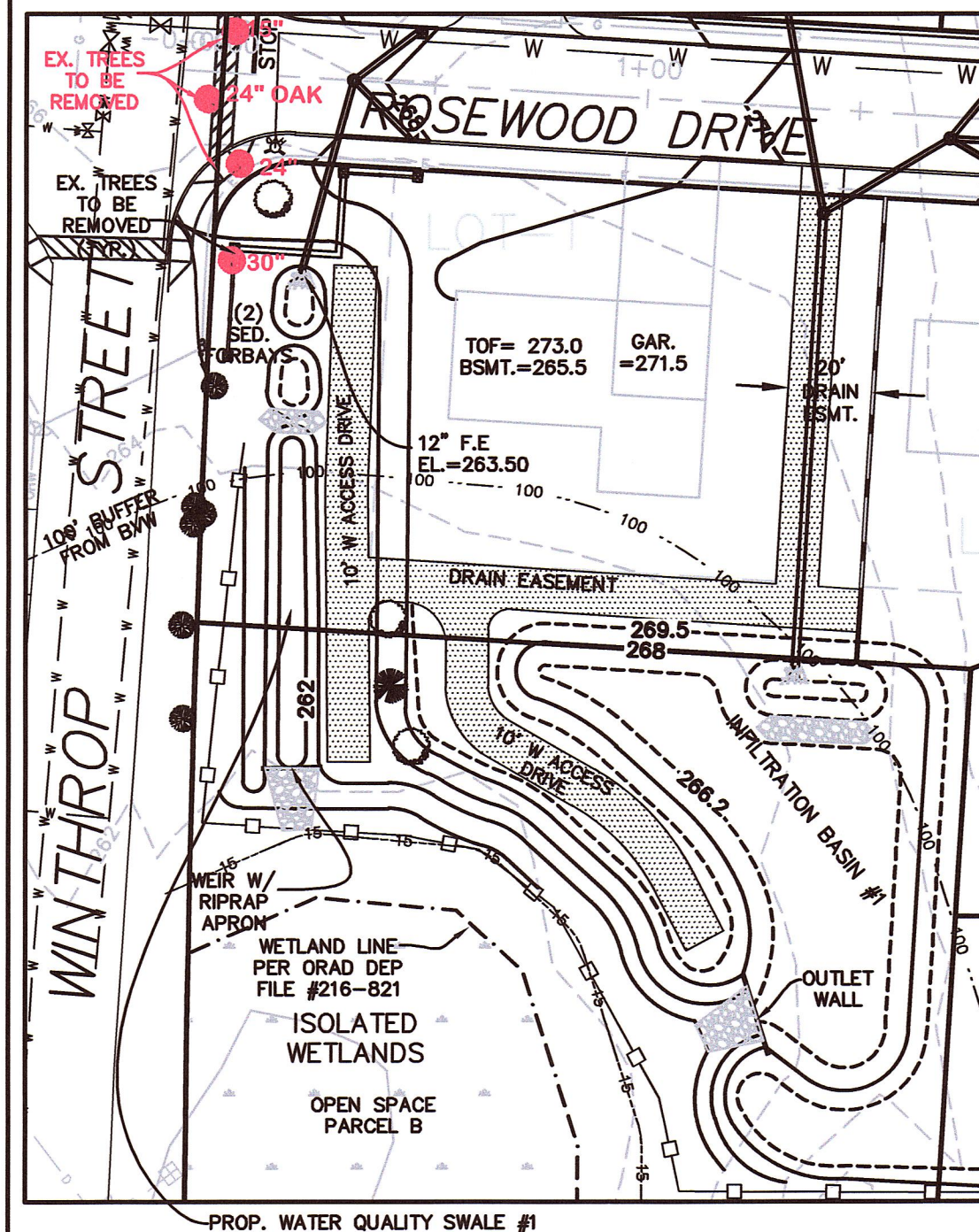
165 EAST GROVE STREET
MIDDLEBOROUGH, MA 02346
TEL: (508)-946-9231
FAX: (508)-947-8873
www.outback-eng.com

DATE: AUGUST 6, 2019




DRAWN BY: CJV CHECKED BY: JAP

NOT TO SCALE SHEET 61 OF 62

OE-2765



SHRUB SPECIES

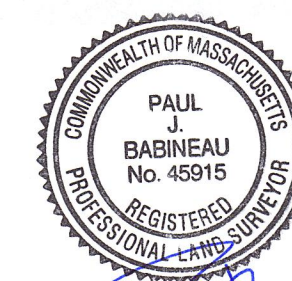
| SHRUB SPECIES | | | | | QUANTITY | | | | | | | | | | | | | | | | | |
|-------------------------------------------------------------------------------------|-----------------------------------------------------|--------------------------------|-------------|--------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|----------------|------------------|------------------|------------------|------------------|------------------|--------------------|--------|--------|
| PLAN SYMBOL | COMMON NAME (SCIENTIFIC NAME) | SIZE & FORM | IND. STATUS | SIZE @ PURCHASE | INFIL. BASIN #1 | INFIL. BASIN #2 | INFIL. BASIN #3 | INFIL. BASIN #4 | INFIL. BASIN #5 | INFIL. BASIN #6 | INFIL. BASIN #7 | INFIL. BASIN #8 | INFIL. BASIN #9 | DET. BASIN #10 | INFIL. BASIN #12 | INFIL. BASIN #14 | INFIL. BASIN #15 | INFIL. BASIN #16 | INFIL. BASIN #18 | DRY DET. BASIN #8A | WOS #1 | WOS #2 |
|  | EMERALD SENTINEL REDCEDAR (JUNIPERUS VIRGINIANA) | LARGE-SIZED SHRUB (10'-15') | FACU- | 4-6 FEET | 2 | 4 | 5 | 2 | 5 | 4 | 3 | 2 | 3 | 3 | 4 | 0 | 3 | 4 | 5 | 1 | 2 | |
|  | BLACK CHOKECHERRY (PRUNUS VIRGINIANA) | SMALL-SIZED SHRUB (3-6') | FAC-- | 2-3 FEET | 0 | 2 | 0 | 3 | 0 | 4 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 4 | |
|  | SILKY DOGWOOD (CORMUS ANOMUM) | MED-SIZED SHRUB (6-10') | FACW | 2-3 FEET | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 1 | 2 | 0 | 1 | 5 | 2 | 0 | 0 | 0 | 0 | |

NOTE: ALL DRAIN BASINS TO BE SEEDED AS FOLLOWS: (NEW ENGLAND WETLAND PLANS, INC.)

- NEW ENGLAND CONSERVATION/ WILDLIFE MIX ON SIDE SLOPES AND TOPS OF ALL BASINS.
- NEW ENGLAND EROSION CONTROL/ RESTORATION MIX FOR DETENTION BASIN AND MOIST SITES ON BOTTOMS OF ALL BASINS AND WATER QUALITY SWALES.
- 10' WIDE ACCESS ROADS SHOWN SHALL HAVE AN 8" THICK GRAVEL LAYER WITH 4" LOAM AND SEED

FOR REGISTRY USE ONLY

I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS.



10-16-19 

DATE PROFESSIONAL LAND SURVEYOR

APPROVED SUBJECT TO TERMS AND
CONDITIONS OF A COMPREHENSIVE
PERMIT PER ZONING BOARD OF APPEALS
DECISION, AS AUTHORIZED BY CHAPTER
40B OF THE MASSACHUSETTS GENERAL
LAWS, SECTIONS 20-23.

DATE: _____

MIDWAY ZONING BOARD OF APPEALS

I CERTIFY THAT 20 DAYS HAVE ELAPSED SINCE ZONING BOARD APPROVAL, AND THAT NO APPEAL HAS BEEN FILED AT THIS OFFICE.

TOWN CLERK—TOWN OF MEDWAY

DETAILS

*LANDSCAPING PLAN
FOR STORMWATER
BASINS
TIMBER CREST
ESTATES
&
KINGSBURY VILLAGE
IN
MEDWAY
MASSACHUSETTS*

Outback Engineering Incorporated

165 EAST GROVE STREET
MIDDLEBOROUGH, MA 02346
TEL: (508)-946-9231
FAX: (508)-947-8873
www.outback-eng.com

DATE: AUGUST 6 2010

| | |
|----------------------|-----------------|
| DATE: AUGUST 6, 2019 | |
| DRAWN BY: C.IV | CHECKED BY: JAD |

| | |
|---------------|----------------|
| SCALE: 1"=40' | SHEET 62 OF 62 |
|---------------|----------------|

0' 40' 80' 120'

OE-2765