

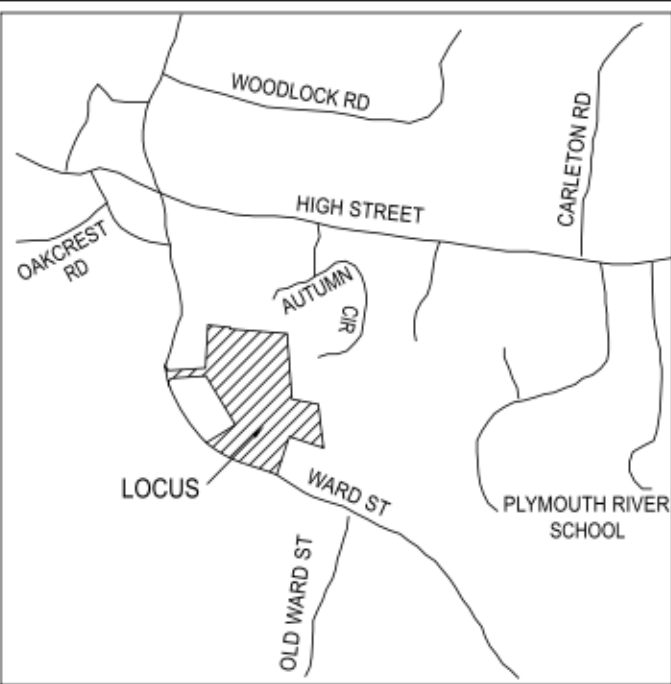
COMPREHENSIVE PERMIT PLAN

KNOWN AS

RIVER STONE

OF

HINGHAM, MA



Locus Map
Not to Scale



SCALE: 1" = 80'

Issued Date: October 7, 2015

Revised:

1/8/2018

1/19/2018

2/2/2018

3/9/2018

4/25/2018

10/26/2018

12/19/2018

6/8/2026

• McKenzie Engineering Group, Inc. Consulting Engineers •
150 Longwater Drive, Suite 101, Norwell, Massachusetts 02061

REV	DATE	DESCRIPTION	BY	APP
1	1/8/18	RECONFIGURATION	SBS	BCI
2	1/19/18	REVIEW COMMENTS	SBS	BCI
3	2/2/18	REVIEW COMMENTS	SBS	BCI
4	3/9/18	REVIEW COMMENTS	SBS	BCI
5	4/25/18	REVIEW COMMENTS	SBS	BCI
6	5/1/18	REVIEW COMMENTS	SBS	BCI
7	10/26/18	RECONFIGURATION	SBS	BCI
8	12/19/18	RECONFIGURATION	SBS	BCI
9	6/8/26	C.C. NOT SUBMISSION	SBS	BCI

MEG
MCKENZIE
ENGINEERING GROUP
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150 Longwater Drive, Suite 101
Norwell, MA 02061
Ph: 781-792-3900
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COMPREHENSIVE PERMIT PLAN
KNOWN AS
RIVER STONE
(ASSESSORS MAP 124, LOTS 70-75 & LOT 26)
VIKING LANE & WARD STREET
HINGHAM, MASSACHUSETTS

PROFESSIONAL ENGINEER:

BRADLEY C. MCKENZIE
CIVIL
No. 30917
REGISTERED
PROFESSIONAL ENGINEER
STATE OF MASSACHUSETTS

APPLICANT:
RIVER STONE, LLC
293R WASHINGTON STREET
NORWELL, MASSACHUSETTS 02061

DRAWN BY: JLS
DESIGNED BY: -
CHECKED BY: -
APPROVED BY: -
DATE: 10/7/2015
SCALE: AS NOTED
PROJECT NO.: 27-135

DWG. TITLE:
Cover Sheet

DWG. NO.:
CS-1

Abbreviations

ABAN	ABANDONED
ACP	ASBESTOS CEMENT PIPE
ACR	ACCESSIBLE CURB RAMP
ADJ	ADJUST
APPROX	APPROXIMATE
ASPH	ASPHALT
ACOMP	ASPHALT COATED CORRUGATED METAL PIPE
B	BOLLARD
BD	BOUND
BLDG	BUILDING
BIT CONC	BITUMINOUS CONCRETE
BM	BENCHMARK
BS	BOTTOM OF SLOPE
CAP	CORRUGATED ALUMINUM PIPE
CB	CATCH BASIN
C&C	CUT AND CAPPED
CB/DH	CONC. BOUND/DRILL HOLE
CB/EPL	CB/ESCUTCHEON
SCG	CAPE COD BERM
CIP	CAST IRON PIPE
CIT	CHANGE IN TYPE
C	CENTERLINE
CLF	CHAIN LINK FENCE
CO	CLEAN OUT
CONC	CONCRETE
COND	CONDUIT
CMP	CORRUGATED METAL PIPE
CPP	CORRUGATED POLYETHYLENE PIPE
CS	COMBINED SEWER
CSMH	COMBINED SEWER MANHOLE
CULV	CULVERT
Δ	DELTA ANGLE
D	DRAIN
DCB	DOUBLE CATCH BASIN
DIP	DUCTILE IRON PIPE
DMH	DRAIN MANHOLE
E	ELECTRIC
ECC	EXTRUDED CONCRETE CURB
ELEV	ELEVATION
EMH	ELECTRIC MANHOLE
E/T/C	ELECTRIC, TELEPHONE, & CABLE TV
EW	END WALL
EXIST	EXISTING
FAB	FIRE ALARM BOX
FES	FLARED END SECTION
FND	FOUND
F&C	FOUNDATION
F&G	FRAME AND COVER
F&G	FRAME AND GRATE
G	GAS
GD	GROUND
GG	GAS GATE
GIP	GALVANIZED IRON PIPE
GP	GUARD POST
GS	GAS SERVICE
GR	GUARD RAIL
GRAN.	GRANITE
HH	HANDHOLE
HOR	HORIZONTAL
HP	HIGH PRESSURE
HWL	HEADWALL
HYD	HYDRANT
INV	INVERT
I.P.	IRON PIN
I.R.	IRON ROD
L	LEAD
LP	LIGHT POLE
MAX	MAXIMUM
MC	METAL COVER
MH	MANHOLE
MHB	MASS. HIGHWAY BOUND
MIN	MINIMUM
MLP	METAL LIGHT POLE
NC	NOT IN CONTRACT
NTS	NOT TO SCALE
OHW	OVERHEAD WIRE
PB	PULL BOX
PE	POLYETHYLENE PIPE
P	PROPERTY LINE
PROP	PROPOSED
PVC	POLYVINYL CHLORIDE PIPE
PVMT	PAVEMENT
PWW	PAVED WATER WAY
RCP	REINFORCED CONCRETE PIPE
REM	REMOVE
REMOD	REMODEL
RET	RETAIN
ROW	RIGHT OF WAY
RR	RAILROAD
R&R	REMOVE AND RESET
R&S	REMOVE AND STACK
S	SEWER
SB	STONE BOUND
SB/DH	STONE BOUND/DRILL HOLE
SCG	SLOPED GRANITE CURB
SMH	SEWER MANHOLE
STA	STATION
SS	SEWER SERVICE
STL	STEEL
SW	SIDEWALK
T	TELEPHONE
TGB	TRAFFIC CONTROL BOX
TL	TRAFFIC LIGHT
TMH	TELEPHONE MANHOLE
Tr	TREE
TRANS	TRANSFORMER
TS	TOP OF SLOPE
TSV	TAPPING SLEEVE, VALVE AND BOX
TYP	TYPICAL
UP	UTILITY POLE
VCP	VITRIFIED CLAY PIPE
VERT	VERTICAL
VGC	VERTICAL GRANITE CURB
W	WATER MAIN
WG	WATER GATE

Legend

EXISTING	PROPOSED	
—55—	—100—	CONTOUR ELEVATION
X 100.2	+ 100.00	SPOT GRADE
27.21 TCx 27.15 BC	27.21TC 27.15BC	TOP & BOTTOM ELEVATION
21.25	21.25	SPOT ELEVATION w/LEADER
Ⓢ	Ⓢ	SEWER MANHOLE (SMH)
Ⓣ	Ⓣ	DRAIN MANHOLE (DMH)
□	Ⓢ	CATCH BASIN (CB)
▢	Ⓢ	DOUBLE CATCH BASIN (DCB)
⊕	Ⓢ	HYDRANT (HYD)
⊕	Ⓢ	UTILITY POLE (UP)
☆	☆	LIGHT
⋈	⋈	WATER GATE (WG)
⋈	⋈	GAS GATE (GG)
⌞	⌞	SIGN
EP	EP	EDGE OF PAVEMENT (NO CURB)
⦿ TP	⦿ TP	TEST PIT AND/OR PERC TEST LOCATION
☼	☼	EXISTING TREE
◻	◻	BOLLARD
◻	◻	DUMPSTER PAD
◻	⑩	PARKING COUNT
◻	♿	HANDICAP RAMP
◻	♿ VAN	HANDICAP PARKING
⊙	⊙	VAN-ACCESSIBLE HANDICAP PARKING
⊙	⊙	UTILITY POLE
⊙	⊙	GUY POLE
HH	HH	HAND HOLE
PB	PB	PULL BOX
①	①	TELEPHONE MANHOLE
T	T	TRANSFORMER PAD
~ ~ ~	~ ~ ~	TREE LINE
-x-x-x-	-x-x-x-	CHAIN LINK FENCE
⦶	⦶	STONE WALL
⦶	⦶	RETAINING WALL
Δ A1		WETLAND FLAG LOCATION
A1—Δ A2		WETLAND LINE

General Notes

1. LOCUS OWNER: ASSESSOR'S MAP 124, LOTS 70-75 & LOT 26 (6.67 ACRES)
- LOT 124-26
N/F PAULA J. LANGLOIS
BK 36484, PG 93
- LOT 124-70
Viking Lane, LLC
BK 42466, PG 22
- LOTS 124-(71-75)
XERXES REALTY TRUST
BK 11092, PG 60
2. THE PROPERTY LINES, EXISTING SINGLE FAMILY HOMES AND SITE TOPOGRAPHIC INFORMATION SHOWN ON THIS PLAN ARE BASED ON THOSE SHOWN ON THE PLAN ENTITLED "DEFINITIVE SUBDIVISION VIKING LAND AT WARD STREET IN HINGHAM, MA," DATED MARCH 20, 1995 BY RH COLE ASSOCIATES AND DAYLOR CONSULTING GROUP, INC. RECORDED IN PLAN BOOK 45, PAGE 803.
3. EXISTING CONDITIONS INFORMATION RELATING TO THE EXISTING VIKING LANE ROADWAY AND ASSOCIATED STORMWATER FACILITIES WERE FIELD LOCATED BY MCKENZIE ENGINEERING GROUP, INC. IN JUNE OF 2015 AND UPDATED IN JANUARY OF 2026.
4. THE PROPERTY SHOWN HEREON IS LOCATED IN THE ZONING DISTRICT RESIDENCE B.
4. WETLAND FLAGS NUMBERED A1 - A8 AND B1 - B17 WERE FLAGGED IN THE FIELD BY ENVIRONMENTAL CONSULTING & RESTORATION, LLC AND FIELD LOCATED BY MCKENZIE ENGINEERING GROUP, INC. IN JANUARY OF 2026.
5. ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988.
6. THE PROPERTY SHOWN HEREON IS LOCATED IN ZONE X OF THE FLOOD INSURANCE RATE MAP COMMUNITY PANEL No. 25023C0089K, WHICH BEARS AN EFFECTIVE DATE OF JULY 3, 2024.
7. THE PROPERTY SHOWN HEREON IS NOT LOCATED IN A DEP ZONE 2 AND TOWN OF HINGHAM AQUIFER PROTECTION DISTRICT ZONE.
8. THE PROPERTY SHOWN HEREON IS NOT LOCATED IN THE NATURAL HERITAGE & ENDANGERED SPECIES AS SHOWN ON THE NHESP ATLAS DATED 2014.
9. UTILITY INFORMATION FROM ABOVE GROUND OBSERVED EVIDENCE IN CONJUNCTION WITH DIG SAFE MARKINGS AND RECORD PLANS. THE LAND SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN HEREON COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE LAND SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM AVAILABLE INFORMATION AND CONSTRUCTION AS THE LAND SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. BEFORE CONSTRUCTION CALL DIG SAFE SYSTEMS, INC. AT 1-888-344-7233.
10. ANY CHANGE IN THE FIELD CONDITIONS SHOULD BE REPORTED TO THE ENGINEER TO INSURE THAT ANY MODIFICATIONS TO THE ORIGINAL DESIGN ARE PROPER AND ADEQUATE TO SERVE THE PROJECT'S NEEDS, AND COMPLY WITH THE APPLICABLE STANDARDS AND REGULATIONS.
11. THE IRRIGATION WELL SHOWN ON LOT 7 OF ASSESSOR'S MAP 123 IS BELIEVED TO HAVE BEEN REMOVED BASED ON RECORD INFORMATION FROM THE HINGHAM BOARD OF HEALTH, SEE PLAN TITLED "SEPTIC SYSTEM AS-BUILT PLAN" BY VERTEX ENGINEERING SERVICES, INC. DATED FEBRUARY 2, 1999.

Utility Notes

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AND STRUCTURES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF VARIOUS UTILITY COMPANIES AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THIS INFORMATION IS NOT TO BE RELIED UPON AS BEING EXACT OR COMPLETE. THE LOCATION OF ALL UNDERGROUND UTILITIES AND STRUCTURES SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR MUST CONTACT THE APPROPRIATE UTILITY COMPANY, ANY GOVERNING PERMITTING AUTHORITY, AND "DIGSAFE" AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION WORK TO REQUEST EXACT FIELD LOCATION OF UTILITIES AND THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION TAKEN BEFORE PROCEEDING WITH THE WORK. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLAN.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING ALL CONTROL POINTS AND BENCHMARKS NECESSARY FOR THE WORK.
3. ALL WATER SERVICES SHALL BE INSTALLED WITH 5' OF COVER EXCEPT AS NOTED OR DETAILED OTHERWISE.
4. ALL WATER MAIN INSTALLATION SHALL BE IN ACCORDANCE WITH THE AQUARION WATER COMPANY'S REQUIREMENTS. ALL DOMESTIC WATER SERVICE CONNECTIONS SHALL CONSIST OF P.E. TUBING, STAINLESS STEEL INSERTS, AN APPROPRIATELY SIZED CORPORATION STOP, APPROVED SADDLE, CURB STOP, GATE AND BOX AND METALLIC INDICATOR TAPE.
5. THE CONTRACTOR SHALL PROVIDE INLET PROTECTION, SUCH AS SILT SACKS, AT ALL CATCH BASINS TO PREVENT SEDIMENT FROM ENTERING THE EXTENDED DETENTION WETLAND AREA. INLET PROTECTION WILL ALLOW THE STORM DRAIN INLETS TO BE USED BEFORE FINAL STABILIZATION.

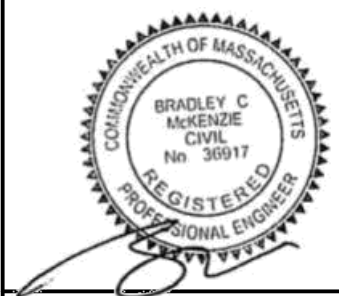


REV	DATE	DESCRIPTION	BY
1	1/8/18	RECONFIGURATION	SBS
2	1/19/18	NO CHANGES	BCM
3	2/2/18	REVIEW COMMENTS	SBS
4	3/9/18	NO CHANGES	BCM
5	4/25/18	NO CHANGES	SBS
6	5/1/18	NO CHANGES	BCM
7	10/26/18	NO CHANGES	SBS
8	12/19/18	NO CHANGES	BCM
9	6/8/26	C.C. NO. SUBMISSION	SBS

MCKENZIE ENGINEERING GROUP
Assinippi Office Park
150 Longwater Drive, Suite 101
Norwell, MA 02061
Ph: 781-792-3900
www.mckeng.com

COMPREHENSIVE PERMIT PLAN
KNOWN AS
RIVER STONE
(ASSESSORS MAP 124, LOTS 70-75 & LOT 26)
VIKING LANE & WARD STREET
HINGHAM, MASSACHUSETTS

PROFESSIONAL ENGINEER:



APPLICANT:
RIVER STONE, LLC
293R WASHINGTON STREET
NORWELL, MASSACHUSETTS 02061

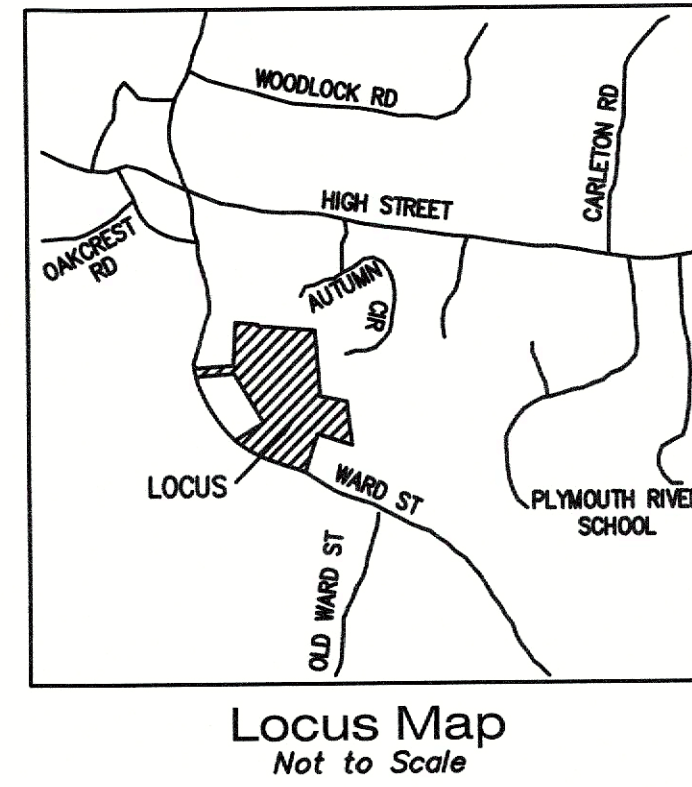
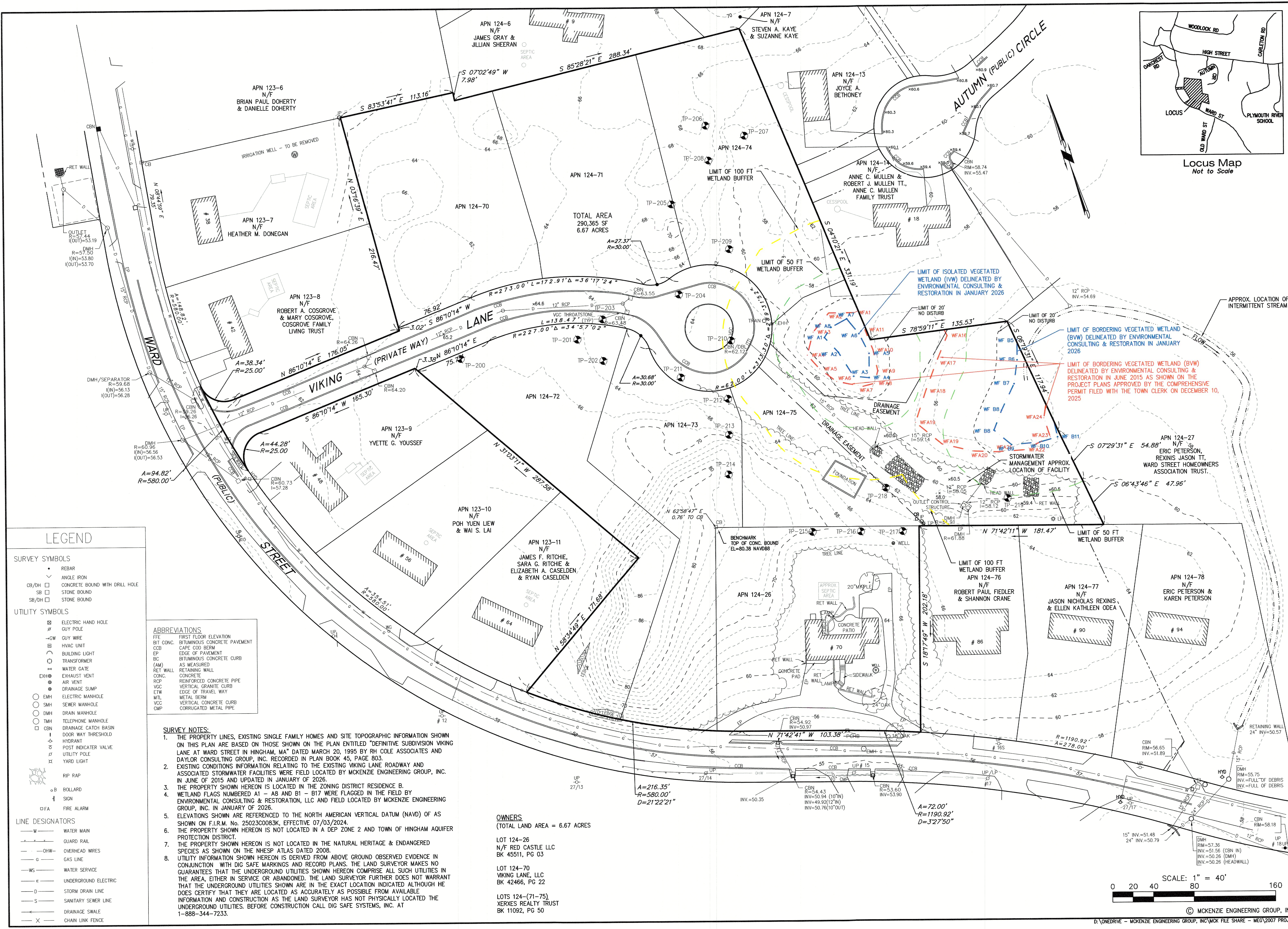
ZBA PERMIT PLAN

DRAWN BY:	JLS
DESIGNED BY:	-
CHECKED BY:	-
APPROVED BY:	-
DATE:	10/7/2015
SCALE:	NOT TO SCALE
PROJECT NO.:	27-135
DWG. TITLE:	

General Notes

DWG. NO:

G-1



LEGEND

SURVEY SYMBOLS

- REBAR
- ANGLE IRON
- CONCRETE BOUND WITH DRILL HOLE
- STONE BOUND
- STONE BOUND

UTILITY SYMBOLS

- ELECTRIC HAND HOLE
- GUY POLE
- GUY WIRE
- HVAC UNIT
- BUILDING LIGHT
- TRANSFORMER
- WATER GATE
- EXHAUST VENT
- AIR VENT
- DRAINAGE SUMP
- ELECTRIC MANHOLE
- SEWER MANHOLE
- DRAIN MANHOLE
- TELEPHONE MANHOLE
- DRAINAGE CATCH BASIN
- DOOR WAY THRESHOLD
- HYDRANT
- POST INDICATOR VALVE
- UTILITY POLE
- YARD LIGHT
- RIP RAP
- BOLLARD
- SIGN
- FIRE ALARM

LINE DESIGNATORS

- WATER MAIN
- GUARD RAIL
- OVERHEAD WIRES
- GAS LINE
- WATER SERVICE
- UNDERGROUND ELECTRIC
- STORM DRAIN LINE
- SANITARY SEWER LINE
- DRAINAGE SWALE
- CHAIN LINK FENCE

ABBREVIATIONS

FFE	FIRST FLOOR ELEVATION
BIT CONC.	BITUMINOUS CONCRETE PAVEMENT
CB	CAPE COO BERM
EP	EDGE OF PAVEMENT
BC	BITUMINOUS CONCRETE CURB
(AM)	AS MEASURED
RET WALL	RETAINING WALL
CONC.	CONCRETE
RCP	REINFORCED CONCRETE PIPE
VGC	VERTICAL GRANITE CURB
ETW	EDGE OF TRAVEL WAY
MTL	METAL BERM
VCC	VERTICAL CONCRETE CURB
CMP	CORRUGATED METAL PIPE

SURVEY NOTES:

- THE PROPERTY LINES, EXISTING SINGLE FAMILY HOMES AND SITE TOPOGRAPHIC INFORMATION SHOWN ON THIS PLAN ARE BASED ON THOSE SHOWN ON THE PLAN ENTITLED "DEFINITIVE SUBDIVISION VIKING LANE AT WARD STREET IN HINGHAM, MA" DATED MARCH 20, 1995 BY RH COLE ASSOCIATES AND DAYLOR CONSULTING GROUP, INC. RECORDED IN PLAN BOOK 45, PAGE 803.
- EXISTING CONDITIONS INFORMATION RELATING TO THE EXISTING VIKING LANE ROADWAY AND ASSOCIATED STORMWATER FACILITIES WERE FIELD LOCATED BY MCKENZIE ENGINEERING GROUP, INC. IN JUNE OF 2015 AND UPDATED IN JANUARY OF 2026.
- THE PROPERTY SHOWN HEREON IS LOCATED IN THE ZONING DISTRICT RESIDENCE B. WETLAND FLAGS NUMBERED A1 - A8 AND B1 - B17 WERE FLAGGED IN THE FIELD BY ENVIRONMENTAL CONSULTING & RESTORATION, LLC AND FIELD LOCATED BY MCKENZIE ENGINEERING GROUP, INC. IN JANUARY OF 2026.
- ELEVATIONS SHOWN ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF AS SHOWN ON F.I.R.M. No. 25023CO083K, EFFECTIVE 07/03/2024.
- THE PROPERTY SHOWN HEREON IS NOT LOCATED IN A DEP ZONE 2 AND TOWN OF HINGHAM AQUIFER PROTECTION DISTRICT.
- THE PROPERTY SHOWN HEREON IS NOT LOCATED IN THE NATURAL HERITAGE & ENDANGERED SPECIES AS SHOWN ON THE NHESP ATLAS DATED 2008.
- UTILITY INFORMATION SHOWN HEREON IS DERIVED FROM ABOVE GROUND OBSERVED EVIDENCE IN CONJUNCTION WITH DIG SAFE MARKINGS AND RECORD PLANS. THE LAND SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN HEREON COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE LAND SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM AVAILABLE INFORMATION AND CONSTRUCTION AS THE LAND SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES. BEFORE CONSTRUCTION CALL DIG SAFE SYSTEMS, INC. AT 1-888-344-7233.

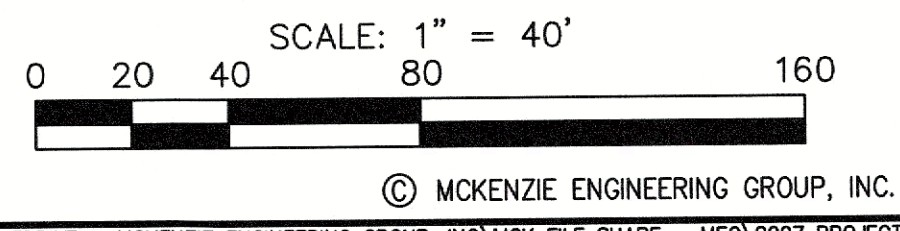
OWNERS

(TOTAL LAND AREA = 6.67 ACRES)

LOT 124-26
N/F RED CASTLE LLC
BK 45511, PG 03

LOT 124-70
VIKING LANE, LLC
BK 42466, PG 22

LOTS 124-(71-75)
XERXES REALTY TRUST
BK 11092, PG 50



COMPREHENSIVE PERMIT PLAN
KNOWN AS
RIVER STONE
(ASSESSORS MAP 124, LOTS 70-75 & LOT 26)
VIKING LANE & WARD STREET
HINGHAM, MASSACHUSETTS

ZBA PERMIT PLAN

APPLICANT:
RIVER STONE, LLC
293R WASHINGTON STREET
NORWELL, MASSACHUSETTS 02061

PROFESSIONAL LAND SURVEYOR:
RICHARD J. DODD
No. 35031
PROFESSIONAL LAND SURVEYOR

DRAWN BY: JLS
DESIGNED BY: -
CHECKED BY: RTLS
APPROVED BY: RJH
DATE: 10/07/2015
SCALE: 1"=40'
PROJECT NO.: 27-135
DWG. TITLE: Existing Conditions Plan

DWG. NO: EX-1

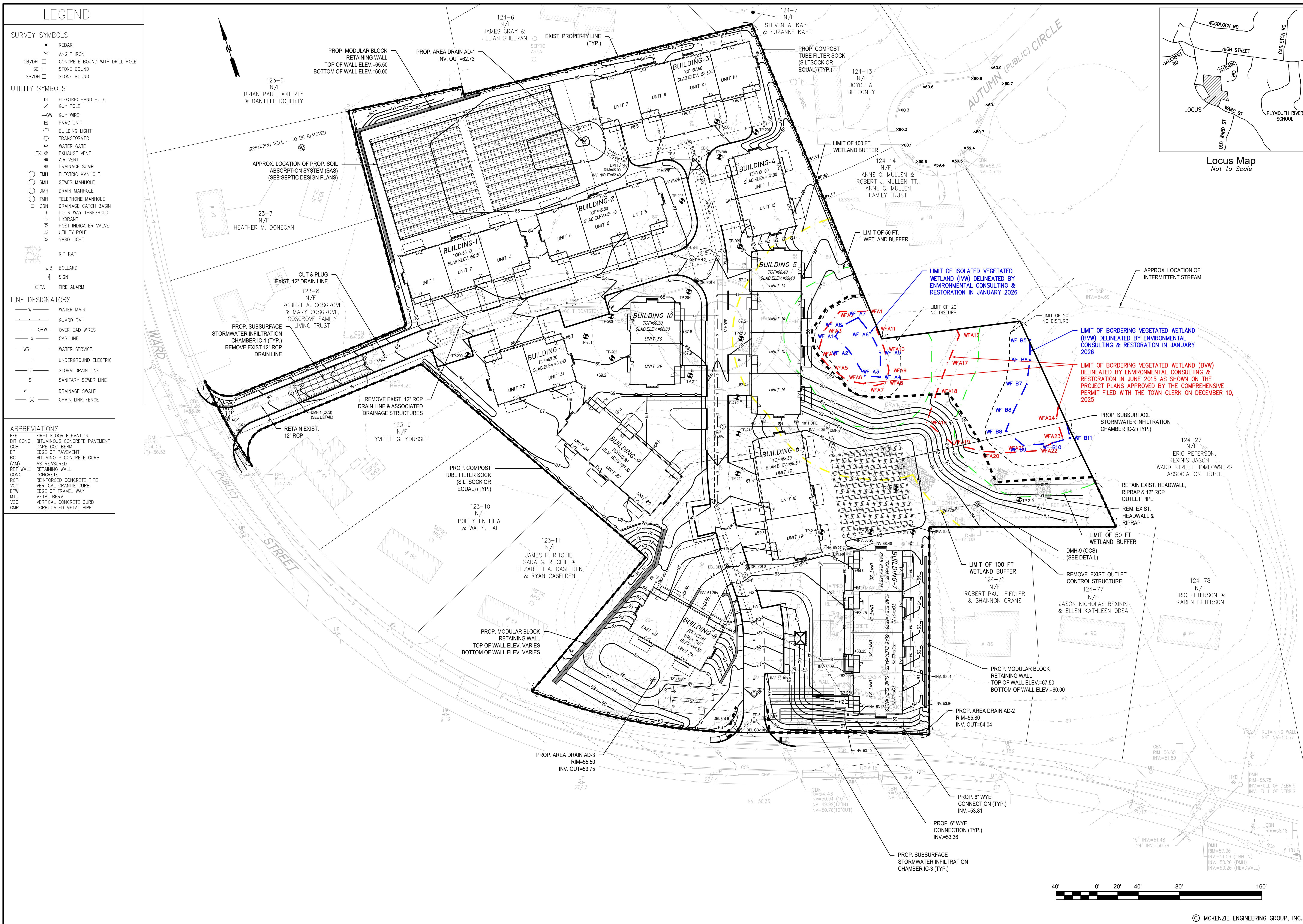
BY **APP**
1 1/6/18 SSS BCM
2 1/19/18 SSS BCM
3 2/12/18 SSS BCM
4 3/19/18 SSS BCM
5 4/25/18 SSS BCM
6 5/17/18 SSS BCM
7 10/26/18 SSS BCM
8 12/19/18 SSS BCM
9 6/18/26 SSS BCM

DESCRIPTION
1 RECONFIGURATION
2 REVIEW COMMENTS
3 REVIEW COMMENTS
4 REVIEW COMMENTS
5 REVIEW COMMENTS
6 REVIEW COMMENTS
7 RECONFIGURATION
8 RECONFIGURATION
9 C.C. NO. SUBMISSION

DATE
1/6/18
1/19/18
2/12/18
3/19/18
4/25/18
5/17/18
10/26/18
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6/18/26

REV
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MCKENZIE ENGINEERING GROUP
Assinippi Office Park
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P: 781.792.3900
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www.mckeng.com



APP	BY	DESCRIPTION	DATE	REV
SBS BOM	RECONFIGURATION	1/8/18	1	
SBS BOM	REVIEW COMMENTS	2/1/18	2	
SBS BOM	REVIEW COMMENTS	2/2/18	3	
SBS BOM	REVIEW COMMENTS	4/3/18	4	
SBS BOM	REVIEW COMMENTS	4/25/18	5	
SBS BOM	REVIEW COMMENTS	5/1/18	6	
SBS BOM	RECONFIGURATION	10/26/18	7	
SBS BOM	RECONFIGURATION	12/18/18	8	
SBS BOM	C.C. NOI SUBMISSION	6/8/26	9	



COMPREHENSIVE PERMIT PLAN

KNOWN AS

RIVER STONE

(ASSESSORS MAP 124, LOTS 70-75 & LOT 26)

VIKING LANE & WARD STREET
HINGHAM, MASSACHUSETTS

PROFESSIONAL ENGINEER:	
------------------------	--



APPLICANT:
RIVER STONE, LLC
233R WASHINGTON STREET
NORWELL, MASSACHUSETTS 02061

DRAWN BY:	JLS
DESIGNED BY:	--
CHECKED BY:	--
APPROVED BY:	--
DATE:	10/7/2015
SCALE:	1"=40'
PROJECT NO.:	27-135
DWG. TITLE:	

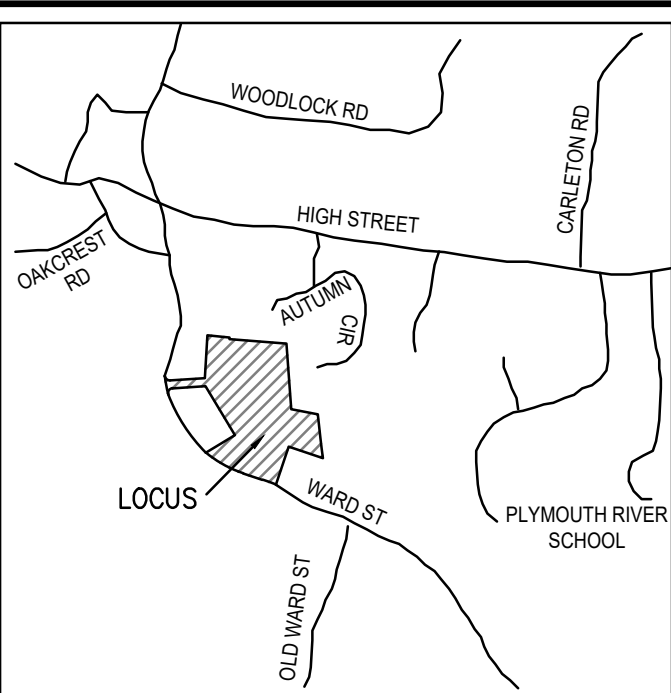
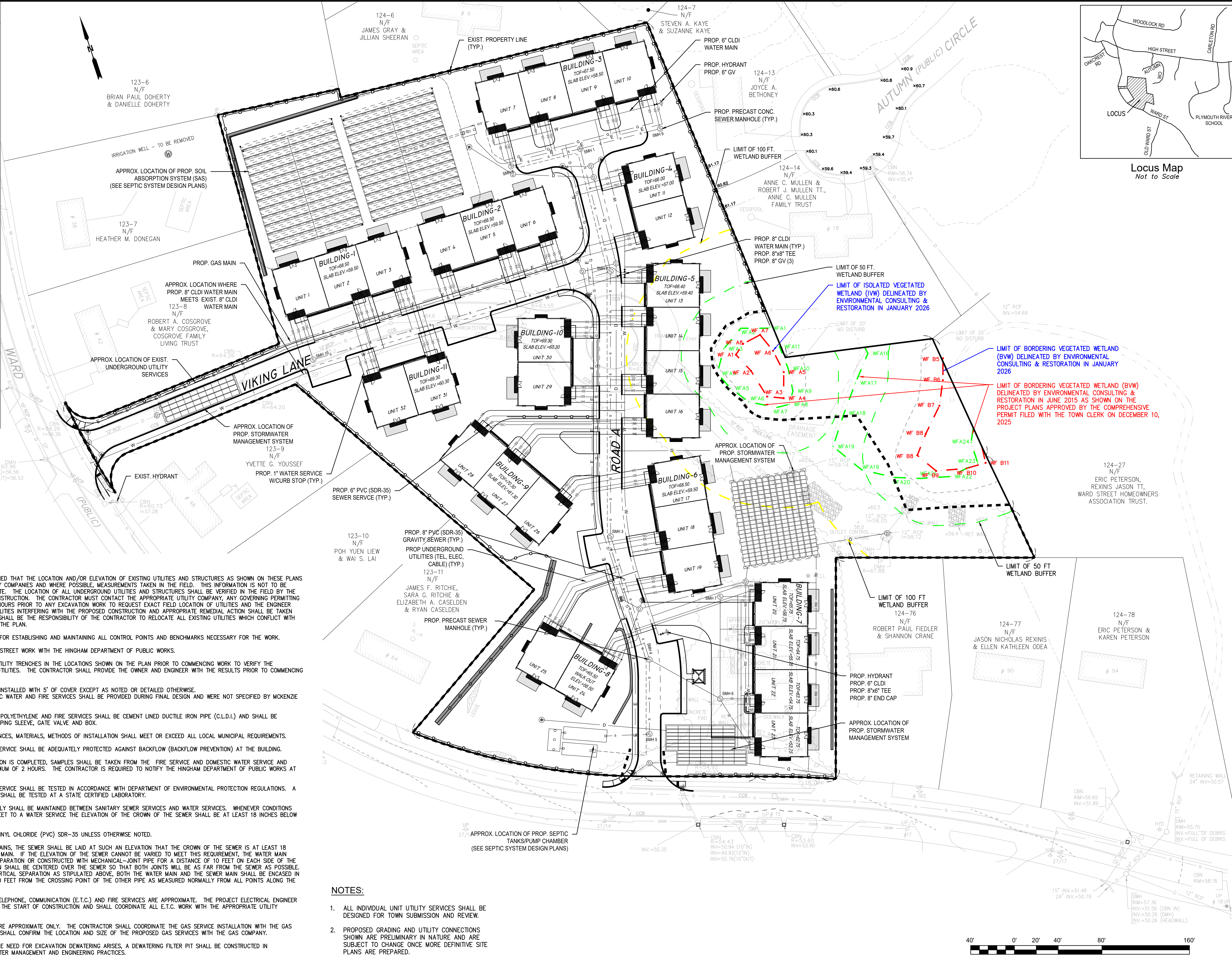
Grading & Drainage Plan

DWG. NO:

LEGEND	
SURVEY SYMBOLS	
•	REBAR
✓	ANGLE IRON
CB/DH	CONCRETE BOUND WITH DRILL HOLE
SB	STONE BOUND
SB/DH	STONE BOUND
UTILITY SYMBOLS	
⌘	ELECTRIC HAND HOLE
⌘	GUY POLE
—GW	GUY WIRE
⌘	HVAC UNIT
⌘	BUILDING LIGHT
⌘	TRANSFORMER
⌘	WATER GATE
EXH⌘	EXHAUST VENT
⌘	AIR VENT
⌘	DRAINAGE SUMP
○	EMH
○	SMH
○	DMH
○	TMH
□	CBN
	TELEPHONE MANHOLE
	DRAINAGE CATCH BASIN
	DOOR WAY THRESHOLD
	HYDRANT
⌘	POST INDICATOR VALVE
⌘	UTILITY POLE
⌘	YARD LIGHT
	RIP RAP
○	BOLLARD
⌘	SIGN
□ FA	FIRE ALARM
LINE DESIGNATORS	
— W —	WATER MAIN
— + + + —	GUARD RAIL
— · —	OHW— OVERHEAD WIRES
— G —	GAS LINE
— WS —	WATER SERVICE
— E —	UNDERGROUND ELECTRIC
— D —	STORM DRAIN LINE
— S —	SANITARY SEWER LINE
— ← —	DRAINAGE SWALE
— X —	CHAIN LINK FENCE
ABBREVIATIONS	
FIE	FIRST FLOOR ELEVATION
BIT CONC.	BITUMINOUS CONCRETE PAVEMENT
CCB	CAPE COD BERM
EP	EDGE OF PAVEMENT
BC (AM)	BITUMINOUS CONCRETE CURB
AS MEASURED	AS MEASURED
RET WALL	RETAINING WALL
RCP	CONCRETE
VCC	REINFORCED CONCRETE PIPE
ETW	VERTICAL GRANITE CURB
MTL	EDGE OF TRAVEL WAY
VCC	METAL BERM
CMP	VERTICAL CONCRETE CURB
	CORRUGATED METAL PIPE

1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AND STRUCTURES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF VARIOUS UTILITY COMPANIES AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THIS INFORMATION IS NOT TO BE RELIED UPON AS BEING EXACT OR COMPLETE. THE LOCATION OF ALL UNDERGROUND UTILITIES AND STRUCTURES SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR MUST CONTACT THE APPROPRIATE UTILITY COMPANY, ANY COVERING PERMITTING AGENCY AND "DUGSAFE" AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION WORK TO REQUEST EXACT FIELD LOCATION OF UTILITIES AND THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION SHALL BE TAKEN BEFORE PROCEEDING WITH THE WORK. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLAN.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING ALL CONTROL POINTS AND BENCHMARKS NECESSARY FOR THE WORK.
3. THE CONTRACTOR SHALL COORDINATE ALL STREET WORK WITH THE HINGHAM DEPARTMENT OF PUBLIC WORKS.
4. THE CONTRACTOR SHALL EXCAVATE THE UTILITY TRENCHES IN THE LOCATIONS SHOWN ON THE PLAN PRIOR TO COMMENCING WORK TO VERIFY THE ELEVATIONS AND LOCATIONS OF EXISTING UTILITIES. THE CONTRACTOR SHALL PROVIDE THE OWNER AND ENGINEER WITH THE RESULTS PRIOR TO COMMENCING ANY WORK.
5. ALL WATER AND FIRE SERVICES SHALL BE INSTALLED WITH 5' OF COVER EXCEPT AS NOTED OR DETAILED OTHERWISE.
6. THE LOCATION AND SIZES OF THE DOMESTIC WATER AND FIRE SERVICES SHALL BE PROVIDED DURING FINAL DESIGN AND WERE NOT SPECIFIED BY MCKENZIE ENGINEERING GROUP, INC.
7. THE DOMESTIC WATER SERVICES SHALL BE POLYETHYLENE AND FIRE SERVICES SHALL BE CEMENT LINED DUCTILE IRON PIPE (C.L.D.I.) AND SHALL BE INSTALLED WITH APPROPRIATELY SIZED TAPPING SLEEVE, GATE VALVE AND BOX.
8. ALL WATER AND FIRE SERVICE APPURTENANCES, MATERIALS, METHODS OF INSTALLATION SHALL MEET OR EXCEED ALL LOCAL MUNICIPAL REQUIREMENTS.
9. THE FIRE SERVICE AND DOMESTIC WATER SERVICE SHALL BE ADEQUATELY PROTECTED AGAINST BACKFLOW (BACKFLOW PREVENTION) AT THE BUILDING.
10. AFTER PRESSURE TESTING AND CHLORINATION IS COMPLETED, SAMPLES SHALL BE TAKEN FROM THE FIRE SERVICE AND DOMESTIC WATER SERVICE AND SHALL BE TESTED AT 200 PSI FOR A MINIMUM OF 2 HOURS. THE CONTRACTOR IS REQUIRED TO NOTIFY THE HINGHAM DEPARTMENT OF PUBLIC WORKS AT LEAST 24 HOURS PRIOR TO THE TESTING.
11. THE FIRE SERVICE AND DOMESTIC WATER SERVICE SHALL BE TESTED IN ACCORDANCE WITH DEPARTMENT OF ENVIRONMENTAL PROTECTION REGULATIONS. A MINIMUM OF 2 SEPARATE WATER SAMPLES SHALL BE TESTED AT A STATE CERTIFIED LABORATORY.
12. A MINIMUM OF 10 FEET CLEAR HORIZONTALLY SHALL BE MAINTAINED BETWEEN SANITARY SEWER SERVICES AND WATER SERVICES. WHENEVER CONDITIONS PREVENT A LATERAL SEPARATION OF 10 FEET TO A WATER SERVICE THE ELEVATION OF THE CROWN OF THE SEWER SHALL BE AT LEAST 18 INCHES BELOW THE INVERT OF THE WATER SERVICE.
13. ALL GRAVITY SEWER PIPE SHALL BE POLYVINYL CHLORIDE (PVC) SDR-35 UNLESS OTHERWISE NOTED.
14. WHERE SANITARY SEWERS CROSS WATER MAINS, THE SEWER SHALL BE LAID AT SUCH AN ELEVATION THAT THE CROWN OF THE SEWER IS AT LEAST 18 INCHES BELOW THE INVERT OF THE WATER MAIN. IF THE ELEVATION OF THE SEWER CANNOT BE VARIED TO MEET THIS REQUIREMENT, THE WATER MAIN SHALL BE RELOCATED TO PROVIDE THIS SEPARATION OR CONSTRUCTED WITH MECHANICAL JOINT PIPE FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE SEWER. THE FULL LENGTH OF WATER MAIN SHALL BE CENTERED OVER THE SEWER SO THAT BOTH JOINTS WILL BE AS FAR FROM THE SEWER AS POSSIBLE. WHENEVER IT IS POSSIBLE TO OBTAIN VERTICAL SEPARATION AS STIPULATED ABOVE, BOTH THE WATER MAIN AND THE SEWER MAIN SHALL BE ENCASED IN CONCRETE FOR A MINIMUM DISTANCE OF 10 FEET FROM THE CROSSING POINT OF THE OTHER PIPE AS MEASURED NORMALLY FROM ALL POINTS ALONG THE PIPE.
15. THE LOCATIONS OF PROPOSED ELECTRIC, TELEPHONE, COMMUNICATION (E.T.C.) AND FIRE SERVICES ARE APPROXIMATE. THE PROJECT ELECTRICAL ENGINEER SHALL VERIFY THESE LOCATIONS PRIOR TO THE START OF CONSTRUCTION AND SHALL COORDINATE ALL E.T.C. WORK WITH THE APPROPRIATE UTILITY COMPANIES.
16. THE PROPOSED GAS SERVICE LOCATIONS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL COORDINATE THE GAS SERVICE INSTALLATION WITH THE GAS COMPANY. THE CLIENT AND CONTRACTOR SHALL CONFIRM THE LOCATION AND SIZE OF THE PROPOSED GAS SERVICES WITH THE GAS COMPANY.
17. IF DURING THE CONSTRUCTION PROCESS THE NEED FOR EXCAVATION DEWATERING ARISES, A DEWATERING FILTER PIT SHALL BE CONSTRUCTED IN ACCORDANCE WITH APPROPRIATE STORMWATER MANAGEMENT AND ENGINEERING PRACTICES.

1. ALL INDIVIDUAL UNIT UTILITY SERVICES SHALL BE DESIGNED FOR TOWN SUBMISSION AND REVIEW.
2. PROPOSED GRADING AND UTILITY CONNECTIONS SHOWN ARE PRELIMINARY IN NATURE AND ARE SUBJECT TO CHANGE ONCE MORE DEFINITIVE SITE PLANS ARE PREPARED.



Locus Map
Not to Scale

COMPREHENSIVE PERMIT PLAN

KNOWN AS
RIVER STONE
(ASSESSORS MAP 124, LOTS 70-75 & LOT
VIKING LANE & WARD STREET
HINGHAM, MASSACHUSETTS

ZBA PERMIT PLAN

PROFESSIONAL ENGINEER:



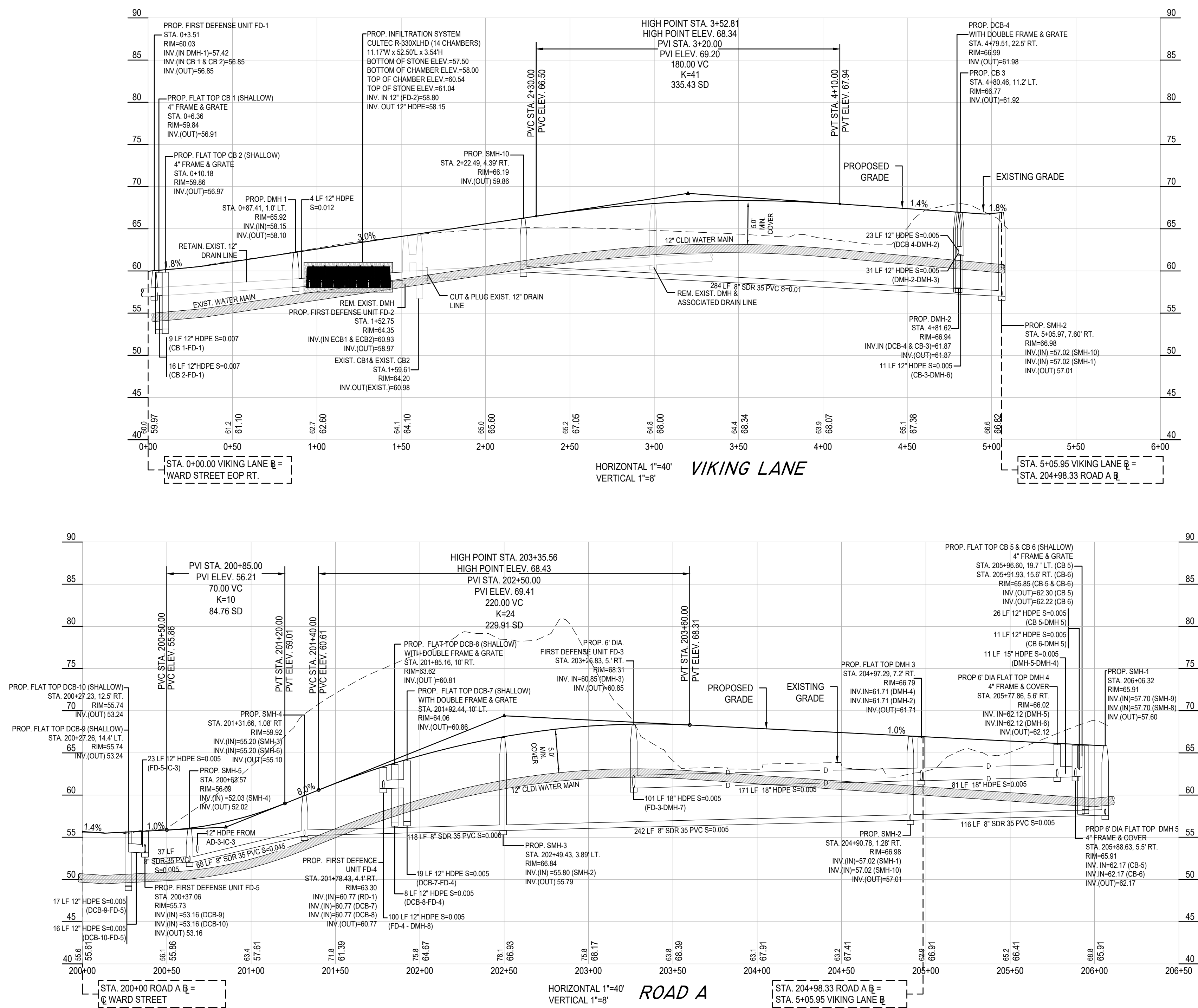
APPLICANT:
RIVER STONE, LLC
293R WASHINGTON STREET
NORWELL, MASSACHUSETTS 02061

DRAWN BY:	JLS
DESIGNED BY:	- -
CHECKED BY:	- -
APPROVED BY:	- -
DATE:	10/7/2015
SCALE:	1"=40'
PROJECT NO.:	27-135
DWG. TITLE:	

Utility Plan

DWG. NO:

C-3



REV	DATE	DESCRIPTION	BY
1	1/9/18	RECONFIGURATION	APF
2	1/19/18	NO CHANGES	BCM
3	2/2/18	REVIEW COMMENTS	BCM
4	3/9/18	REVIEW COMMENTS	BCM
5	4/25/18	REVIEW COMMENTS	BCM
6	5/1/18	NO CHANGES	BCM
7	10/26/18	RECONFIGURATION	BCM
8	12/19/18	RECONFIGURATION	BCM
9	6/9/26	C.C. NO. SUBMISSION	BCM

MCKENZIE ENGINEERING GROUP
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COMPREHENSIVE PERMIT PLAN
KNOWN AS
RIVER STONE
(ASSESSORS MAP 124, LOTS 70-75 & LOT 26)
VIKING LANE & WARD STREET
HINGHAM, MASSACHUSETTS

PROFESSIONAL ENGINEER:

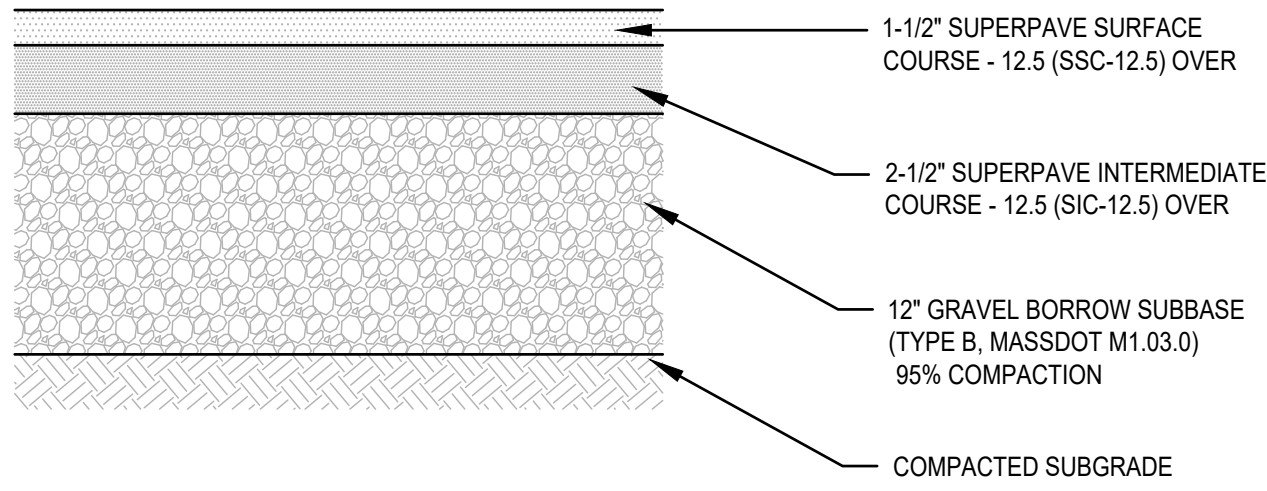
BRADLEY MCKENZIE
No. 020917
REGISTERED PROFESSIONAL ENGINEER
STATE OF MASSACHUSETTS

APPLICANT:
RIVER STONE, LLC
293R WASHINGTON STREET
NORWELL, MASSACHUSETTS 02061

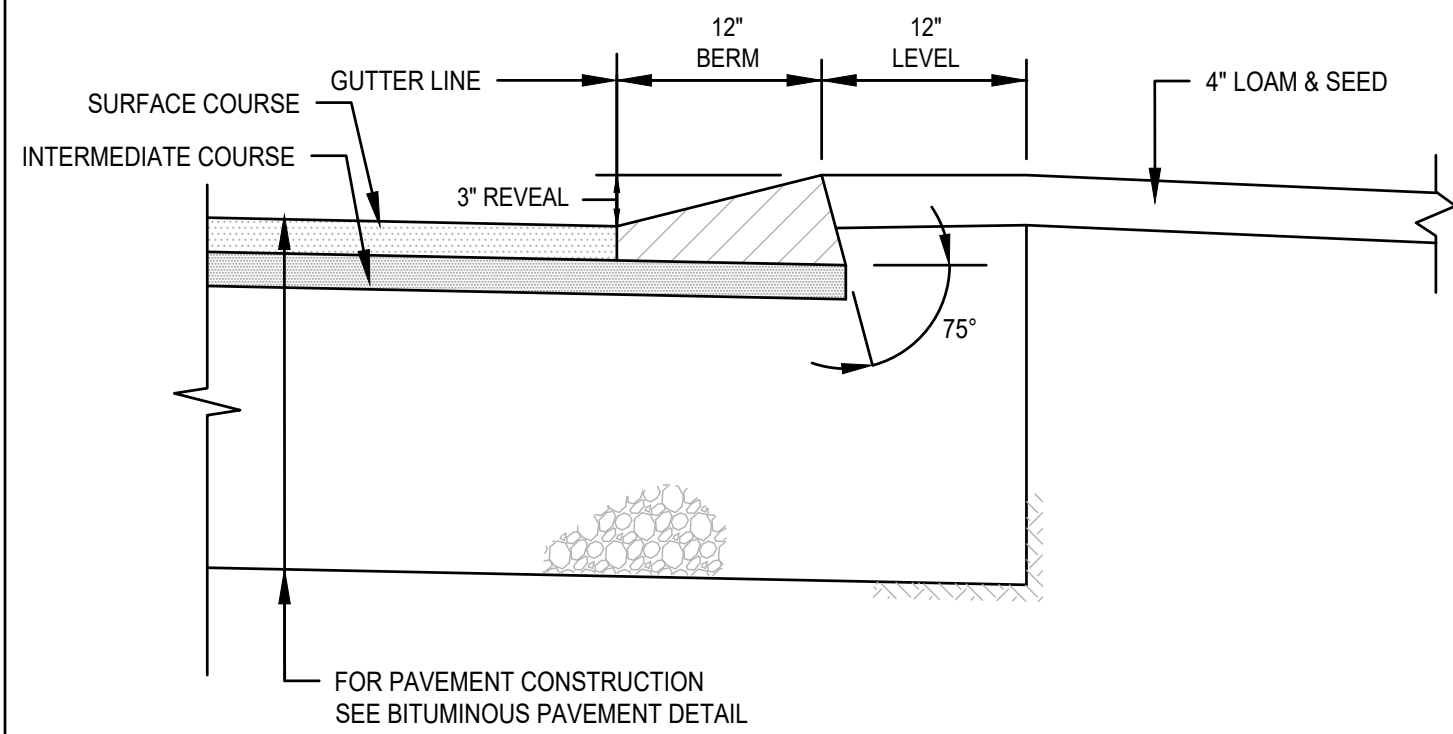
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CHECKED BY: -
APPROVED BY: -
DATE: 10/7/2015
SCALE: 1"=40'
PROJECT NO.: 27-135
DWG. TITLE:

**Roadway
Profiles**

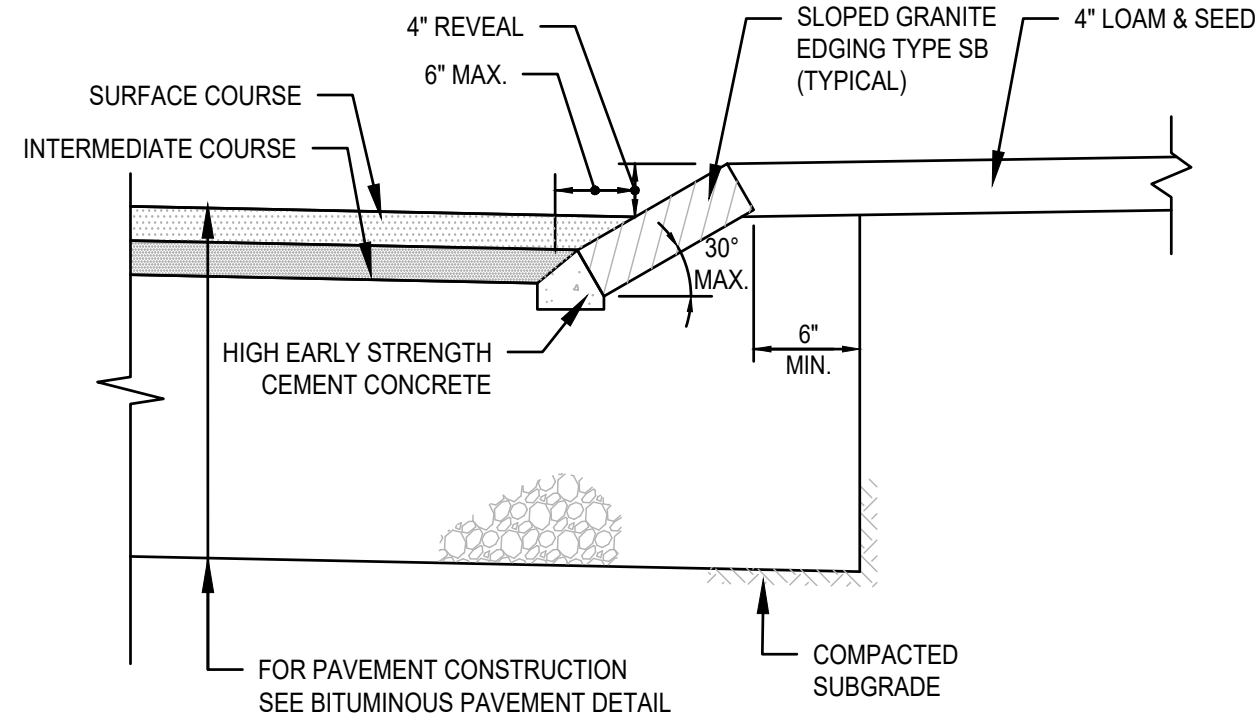
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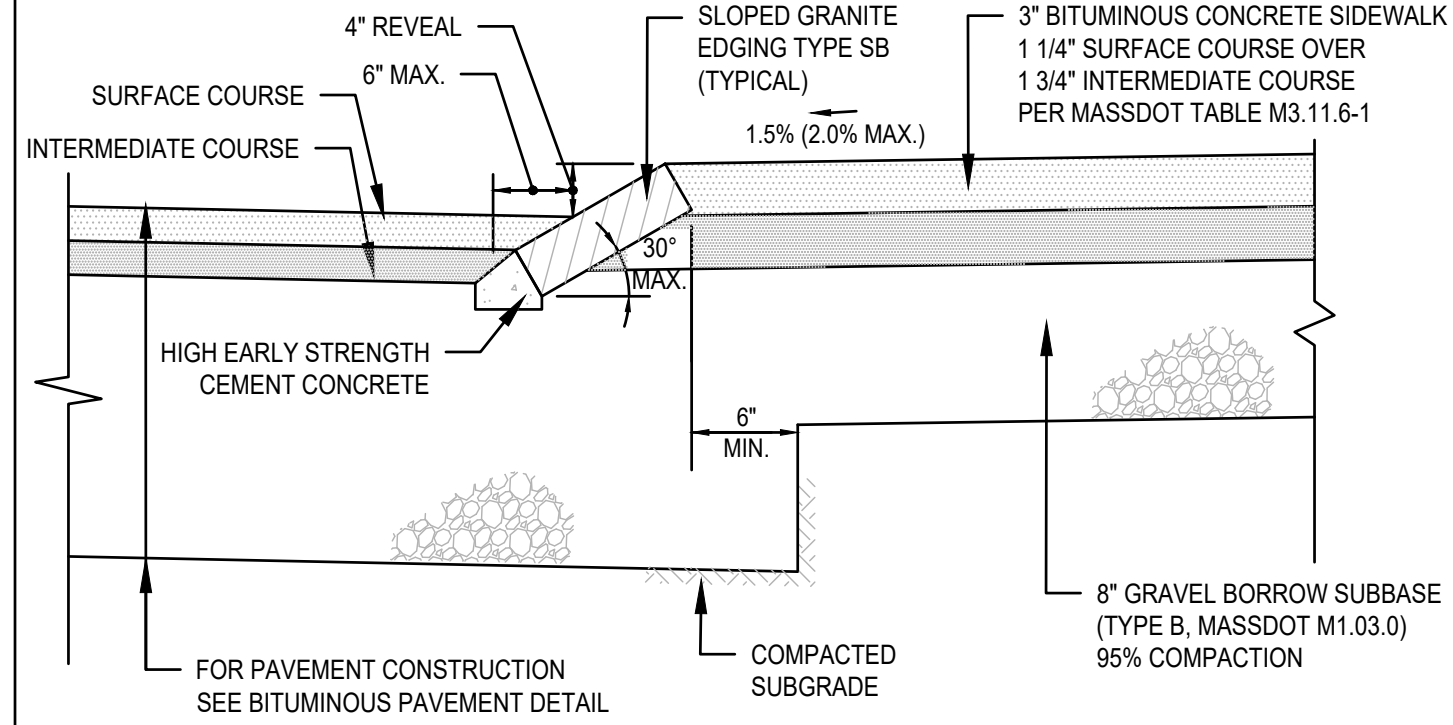
BITUMINOUS PAVEMENT DETAIL
SCALE: N.T.S.



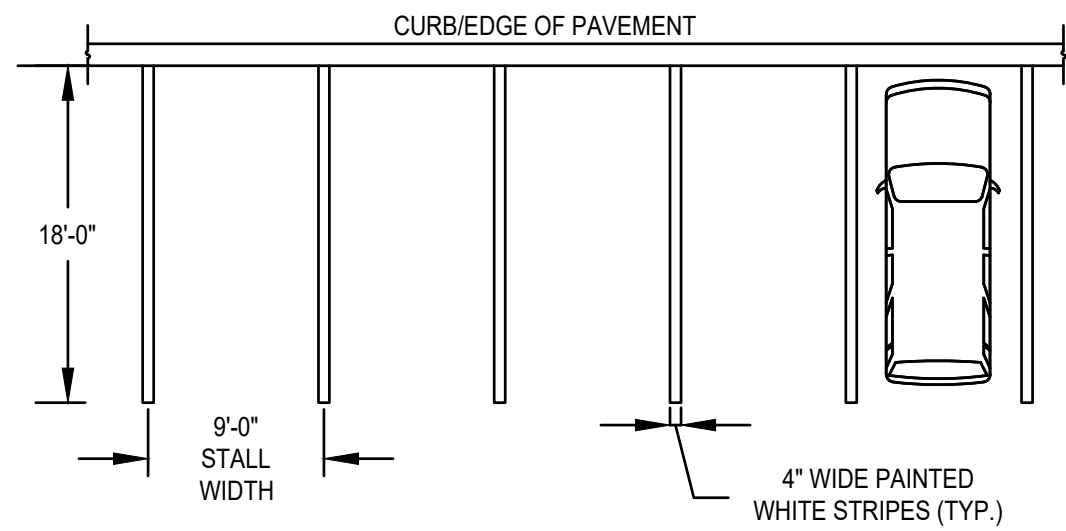
MONOLITHIC BITUMINOUS CONCRETE BERM (CAPE COD BERM) DETAIL
SCALE: N.T.S.



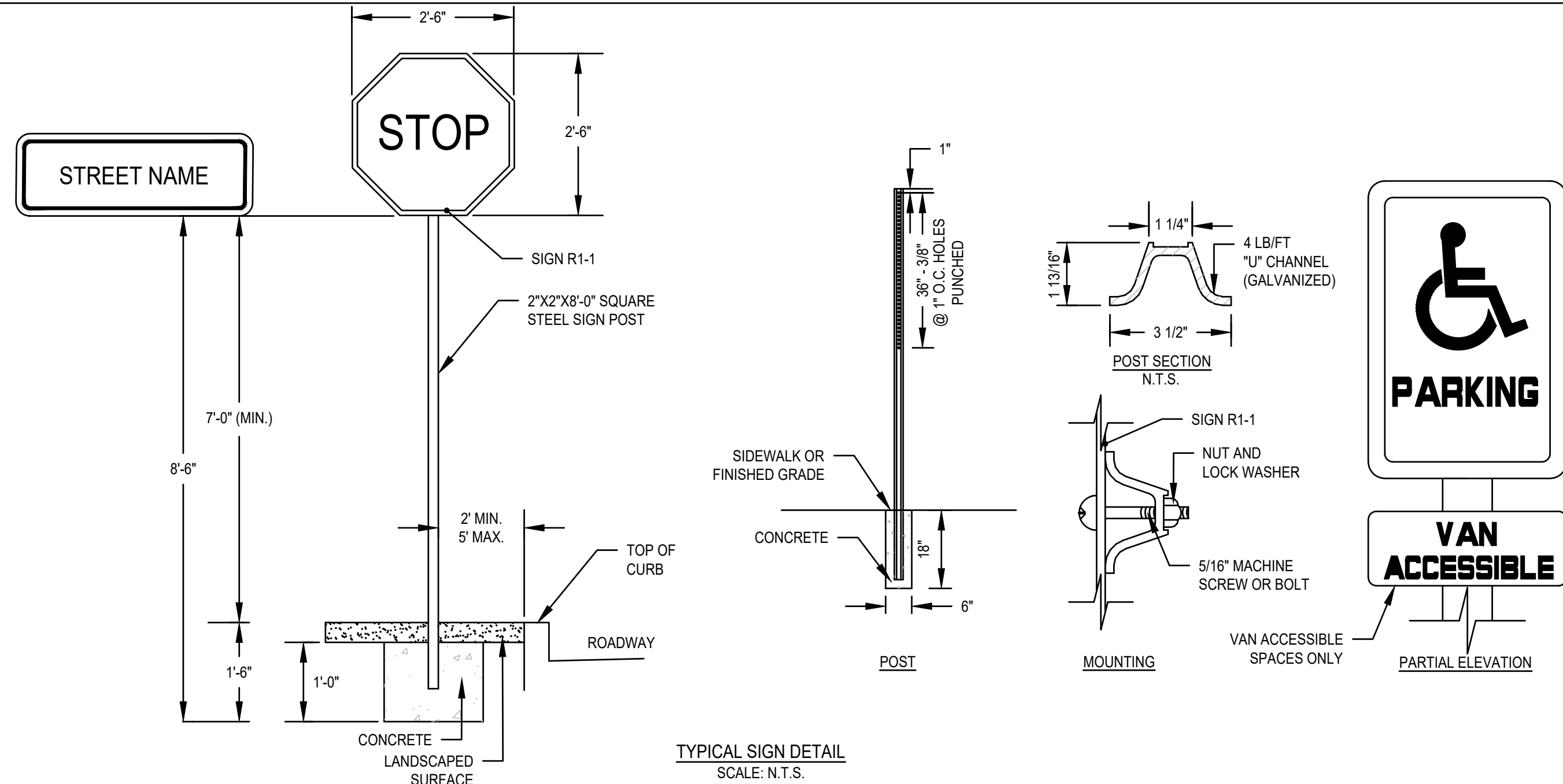
SLOPED GRANITE CURB DETAIL
SCALE: N.T.S.



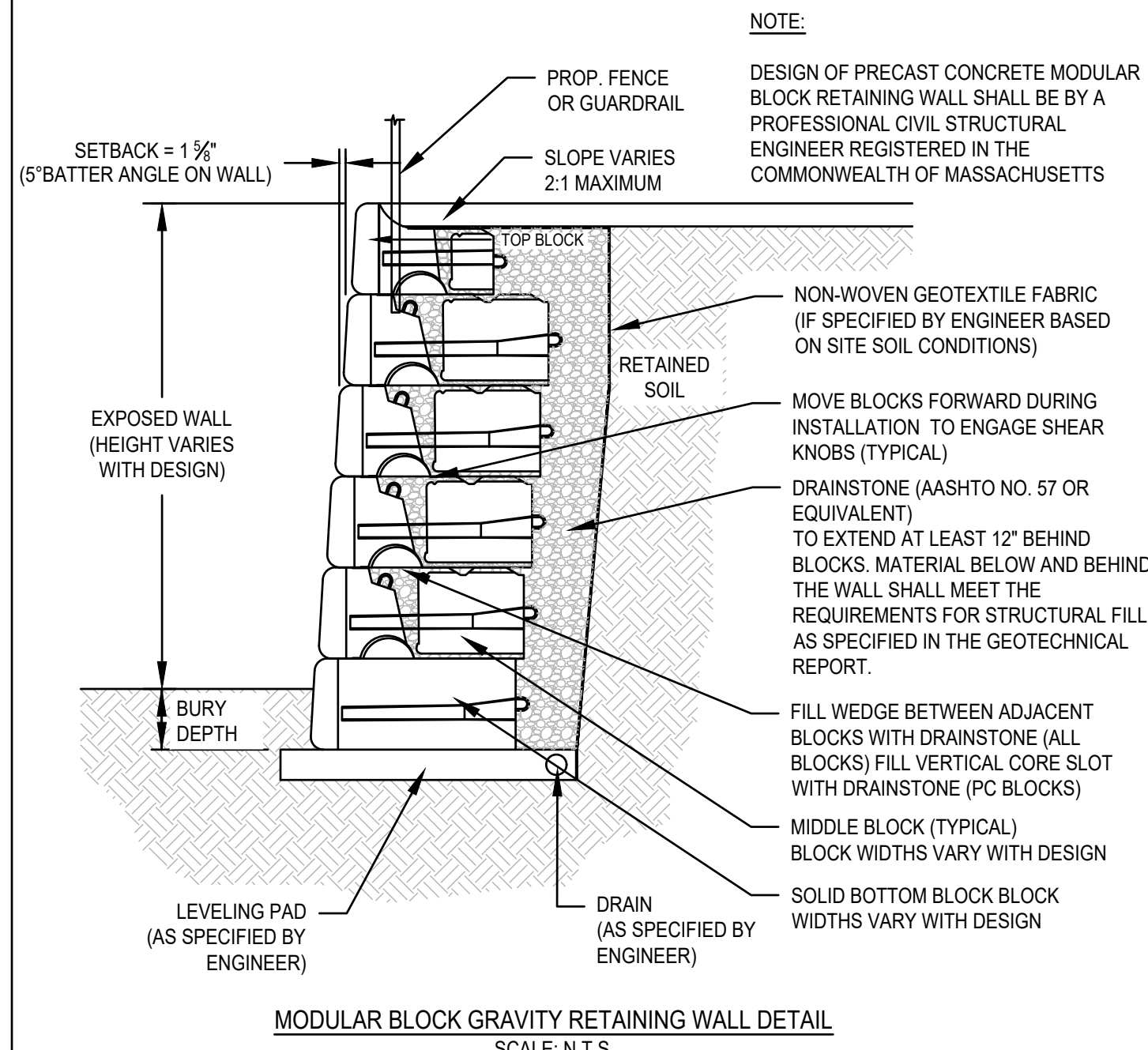
SLOPED GRANITE CURB WITH BITUMINOUS CONC. SIDEWALK
SCALE: N.T.S.



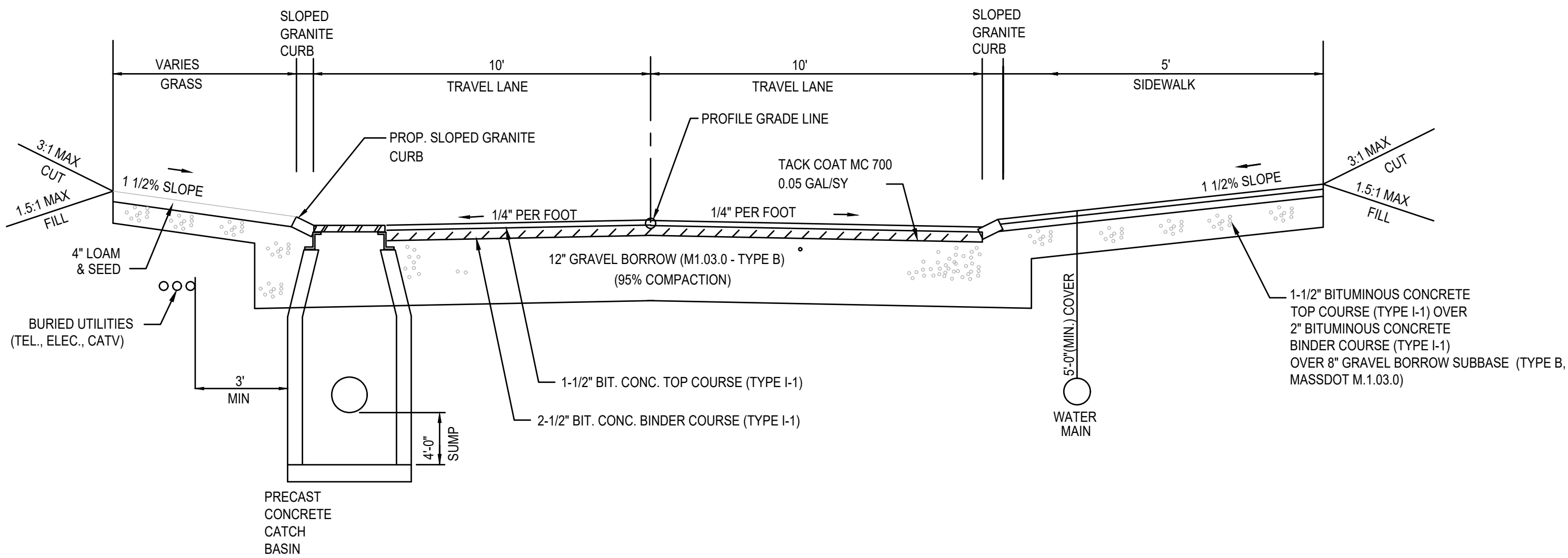
TYPICAL STRIPING DETAILS
SCALE: N.T.S.



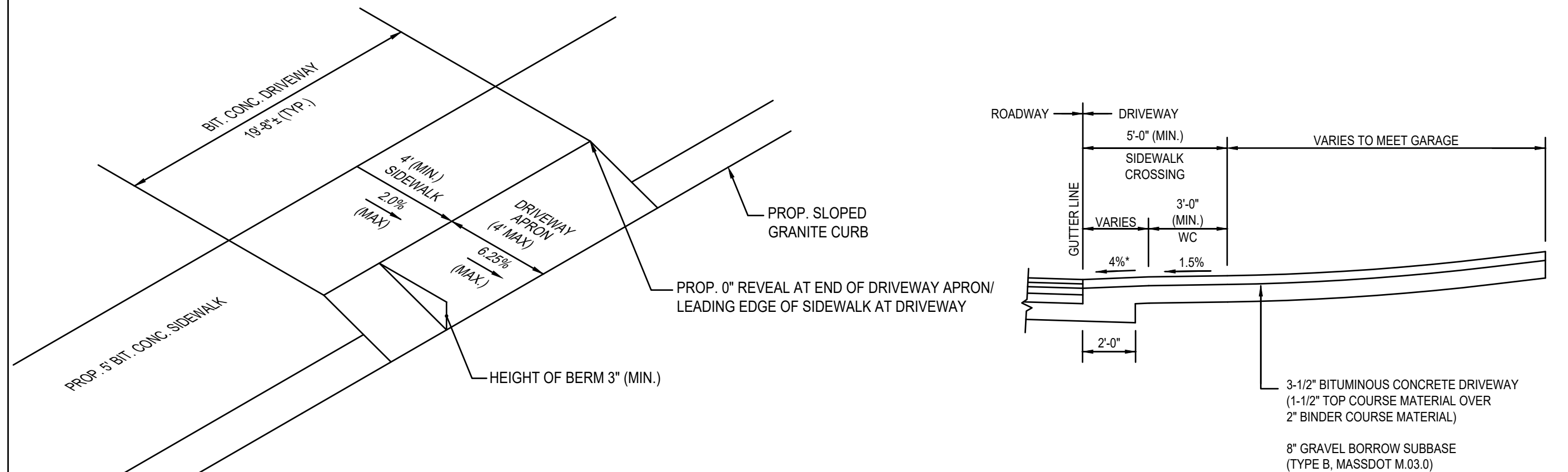
TYPICAL SIGN DETAIL
SCALE: N.T.S.



MODULAR BLOCK GRAVITY RETAINING WALL DETAIL
SCALE: N.T.S.



TYPICAL ROADWAY SECTION
SCALE: N.T.S.



DRIVEWAY DETAIL
SCALE: N.T.S.

REV	DATE	DESCRIPTION	BY	APP
1	1/9/18	RECONFIGURATION	SBS	BCM
2	1/9/18	REVIEW COMMENTS	SBS	BCM
3	2/2/18	NO CHANGES	SBS	BCM
4	3/9/18	REVIEW COMMENTS	SBS	BCM
5	4/25/18	NO CHANGES	SBS	BCM
6	5/1/18	NO CHANGES	SBS	BCM
7	10/26/18	REMOVED SPEED HUMP	SBS	BCM
8	12/19/18	DRIVEWAY DETAIL	SBS	BCM
9	6/9/26	C.C. NO. SUBMISSION	SBS	BCM

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COMPREHENSIVE PERMIT PLAN

KNOWN AS
RIVER STONE
(ASSESSORS MAP 124, LOTS 70-75 & LOT 26)
VIKING LANE & WARD STREET
HINGHAM, MASSACHUSETTS

PROFESSIONAL ENGINEER:



APPLICANT:
RIVER STONE, LLC
293R WASHINGTON STREET
NORWELL, MASSACHUSETTS 02061

DRAWN BY: JLS
DESIGNED BY: -
CHECKED BY: -
APPROVED BY: -
DATE: 10/7/2015
SCALE:
PROJECT NO.: 27-135
DWG. TITLE:

Construction Details
Sheet 1 of 10

DWG. NO:

C-5

ZBA PERMIT PLAN

SEEDING SPECIFICATIONS

SEEDING RECOMMENDATIONS

1. SEEDBED PREPARATION

- A. SURFACE AND SEEPAGE WATER SHOULD BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS.
- B. STONES LARGER THAN FOUR INCHES AND TRASH SHOULD BE REMOVED BECAUSE THEY INTERFERE WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA. WHERE FEASIBLE, THE SOIL SHOULD BE TILLED TO A DEPTH OF ABOUT FOUR INCHES TO PREPARE A SEEDBED AND MIX FERTILIZER AND LIME INTO THE SOIL. THE SEEDBED SHOULD BE LEFT IN A REASONABLY FIRM AND SMOOTH CONDITION. THE LAST TILLAGE OPERATION SHOULD BE PERFORMED ACROSS THE SLOPE WHEREVER PRACTICAL.

2. ESTABLISHING A STAND

- A. LIME AND FERTILIZER SHOULD BE APPLIED PRIOR TO OR AT THE TIME OF SEEDING AND INCORPORATED INTO THE SOIL. KINDS AND AMOUNTS OF LIME AND FERTILIZER SHOULD BE BASED ON EVALUATION OF SOIL TESTS. WHEN A SOIL TEST IS NOT AVAILABLE, THE FOLLOWING MINIMUM AMOUNTS SHOULD BE APPLIED:

AGRICULTURAL LIMESTONE:	2 TONS PER ACRE OR 100 LBS. PER SQ. FT.
NITROGEN (N):	50 LBS. PER ACRE OR 1.1 LBS. PER 1000 SQ. FT.
PHOSPHATE (P O):	100 LBS. PER ACRE OR 2.2 LBS. PER 1000 SQ. FT.
POTASH (K O):	100 LBS. PER ACRE OR 2.2 LBS. PER 1000 SQ. FT.

(NOTE: THIS IS THE EQUIVALENT OF 500 LBS. PER ACRE OF 10-20-20 FERTILIZER OR 1,000 LBS. PER ACRE OF 5-10-10 FERTILIZER)

- B. SEED SHOULD BE SPREAD UNIFORMLY BY THE METHOD MOST APPROPRIATE. FOR THE SITE, METHODS INCLUDE BROADCASTING, DRILLING, AND HYDROSEEDING. WHERE BROADCASTING IS USED, COVER SEED WITH 0.25 INCH OF SOIL OR LESS, BY CULTIVATING OR RAKING.

- C. REFER TO SEEDING RATES AND SEEDING GUIDES FOR APPROPRIATE SEED MIXTURES AND RATES OF SEEDING.

- D. WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO EARLY OCTOBER. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20 OR FROM AUGUST 10 TO SEPTEMBER 1.

3. MULCH

- A. STRAW, STRAW, OR OTHER MULCH, WHEN NEEDED, SHOULD BE APPLIED IMMEDIATELY AFTER SEEDING.

- B. MULCH WILL BE HELD IN PLACE USING TECHNIQUES AS SPECIFIED IN THE "BEST MANAGEMENT PRACTICES OPERATION AND MAINTENANCE PLAN"

4. MAINTENANCE TO ESTABLISH A STAND

- A. PLANTED AREAS SHOULD BE PROTECTED FROM DAMAGE BY FIRE, GRAZING, TRAFFIC, AND DENSE WEED GROWTH.

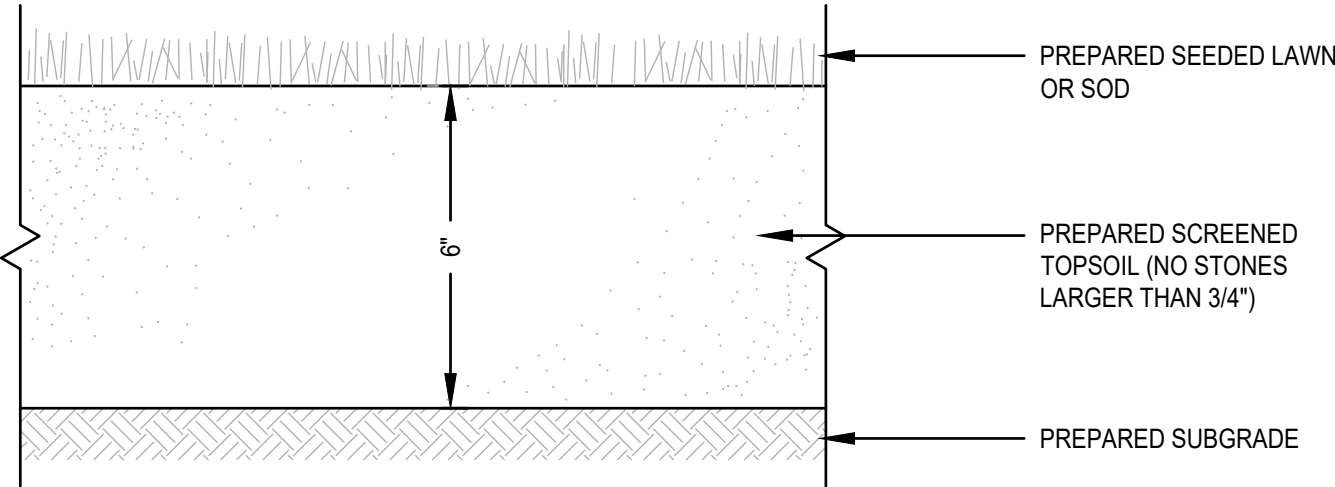
- B. FERTILIZATION NEEDS SHOULD BE DETERMINED BY ONSITE INSPECTIONS. SUPPLEMENTAL FERTILIZER IS USUALLY THE KEY TO FULLY COMPLETE THE ESTABLISHMENT OF THE STAND BECAUSE MOST PERENNIALS TAKE 2 TO 3 YEARS TO BECOME ESTABLISHED.

- C. IN WATERWAYS, CHANNELS, OR SWALES WHERE UNIFORM FLOW CONDITIONS ARE ANTICIPATED OCCASIONAL MOWING MAY BE NECESSARY TO CONTROL GROWTH OF WOODY VEGETATION.

NOTES:

1. TOP OF LOAM (TOPSOIL) IS FINISHED GRADE.
2. TOPSOIL SHALL CONTAIN BETWEEN 5% AND 12% ORGANIC MATTER AND SHALL HAVE A MAXIMUM STONE SIZE OF 3/4" AND SHALL CONFORM TO THE FOLLOWING GRADATION:

SIEVE	% PASSING
1 1/4 INCH	100
No.4	85-100
No.40	60-85
No.100	38-60
No.200	28-40



SEEDED OR SODDED LAWN DETAIL
SCALE: N.T.S.

SEEDING RATES

POUND / ACRE POUNDS / 1,000 S.F.

A. TALL FESCUE	20	0.45
CREeping RED FESCUE	20	0.45
REDTOP	2	0.05
TOTAL	42	0.95

B. TALL FESCUE	15	0.35
CREeping RED FESCUE	10	0.25
BIRDSFOOT TREFOIL	15	0.35
TOTAL	40	0.95

C. TALL FESCUE	20	0.45
CREeping RED FESCUE	20	0.45
BIRDSFOOT TREFOIL	8	0.20
TOTAL	48	1.10

D. BIRDSFOOT TREFOIL	10	0.25
REDTOP	5	0.10
REED CANARY GRASS	15	0.35
TOTAL	30	0.70

E. TALL FESCUE	20	0.45
FLATPEA	30	0.75
TOTAL	50	1.20

F. CREeping RED FESCUE 1/	85	2.00
KENTUCKY BLUEGRASS 1/	85	2.00
TOTAL	170	4.00

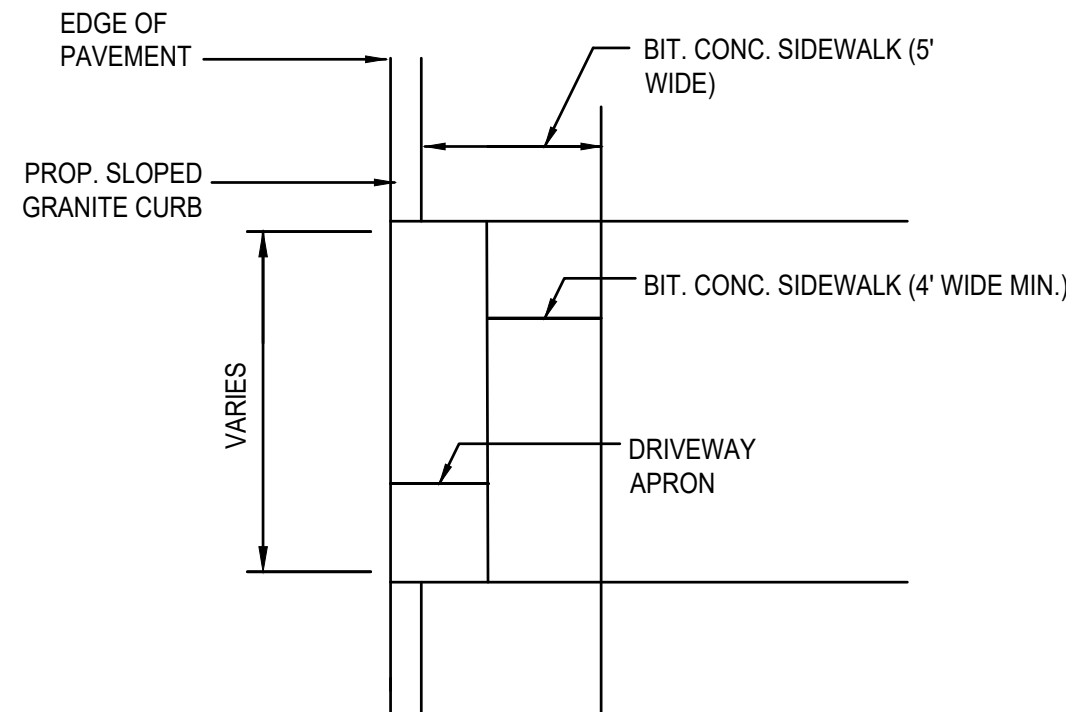
G. TALL FESCUE 1/	150	3.60
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H. WINTER RYE	112	2.50	(BEST FOR FALL SEEDING, AUG 15 TO SEPT. 5)
OATS	80	2.00	(BEST FOR SPRING SEEDING, BEFORE MAY 15)
ANNUAL RYEGRASS	40	1.00	(BEST FOR FALL SEEDING, AUG 15 TO SEPT. 15)
TOTAL	232	5.50	(MAY BE USED EARLY SPRING ALSO)

1/ FOR HEAVY USE ATHLETIC FIELDS CONSULT THE UNIVERSITY OF NEW HAMPSHIRE COOPERATIVE EXTENSION TURF SPECIALIST FOR CURRENT VARIETIES AND SEEDING RATES.

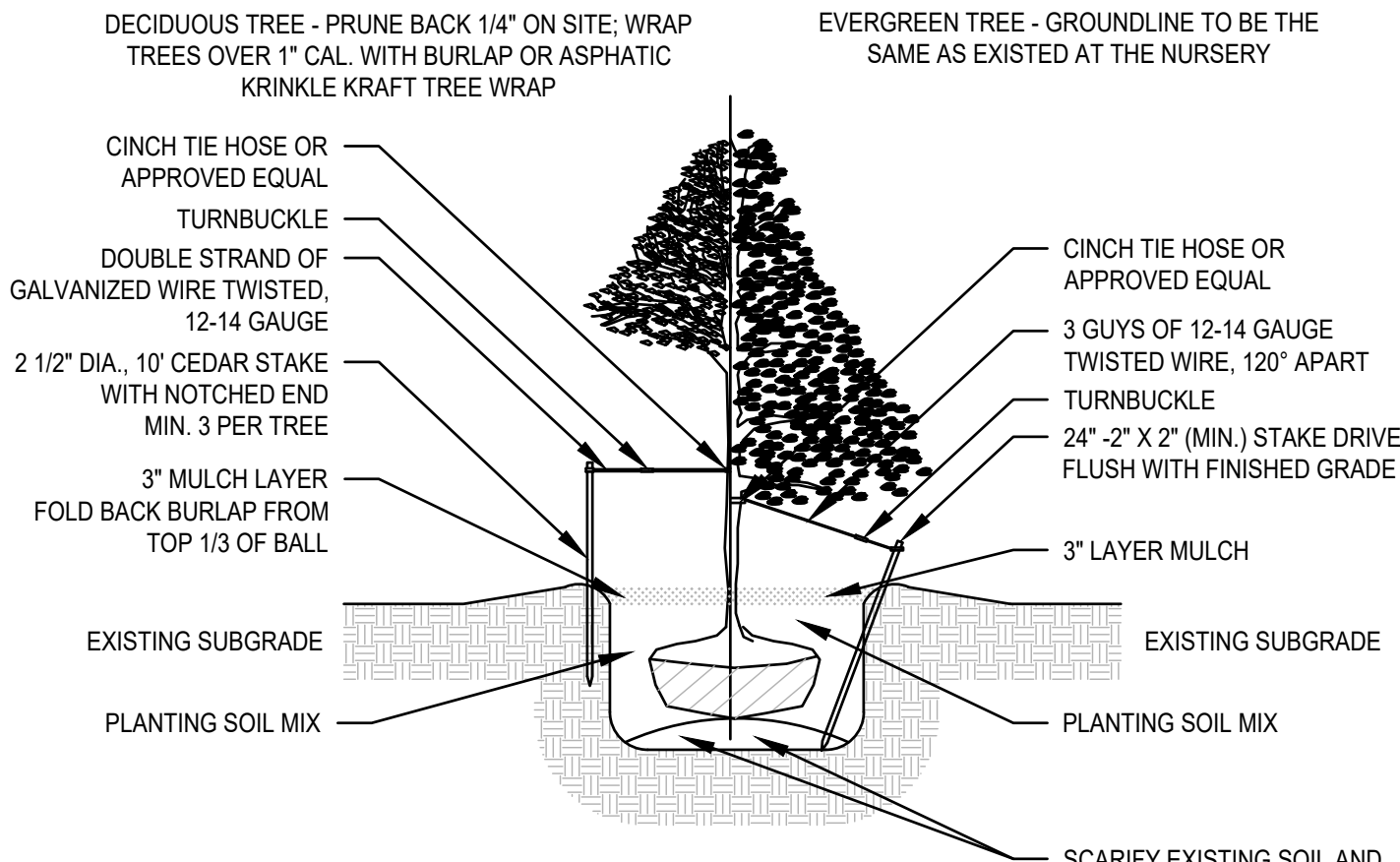
SEEDING GUIDE

USE	SEEDING MIXTURE 1/
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	E
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER	D
LAWN AREAS	F



PLAN VIEW

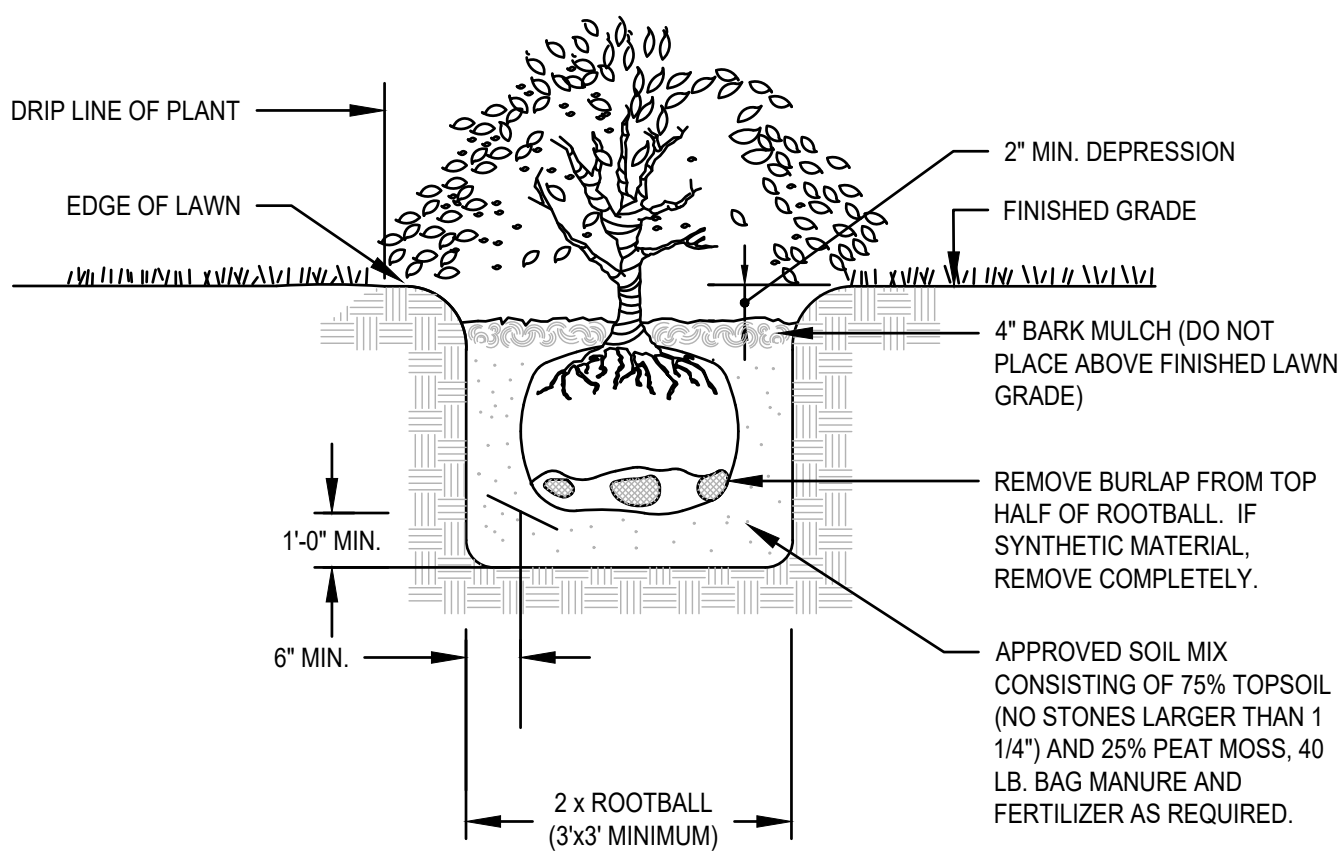
DRIVEWAY DETAIL W/SIDEWALK
SCALE: N.T.S.



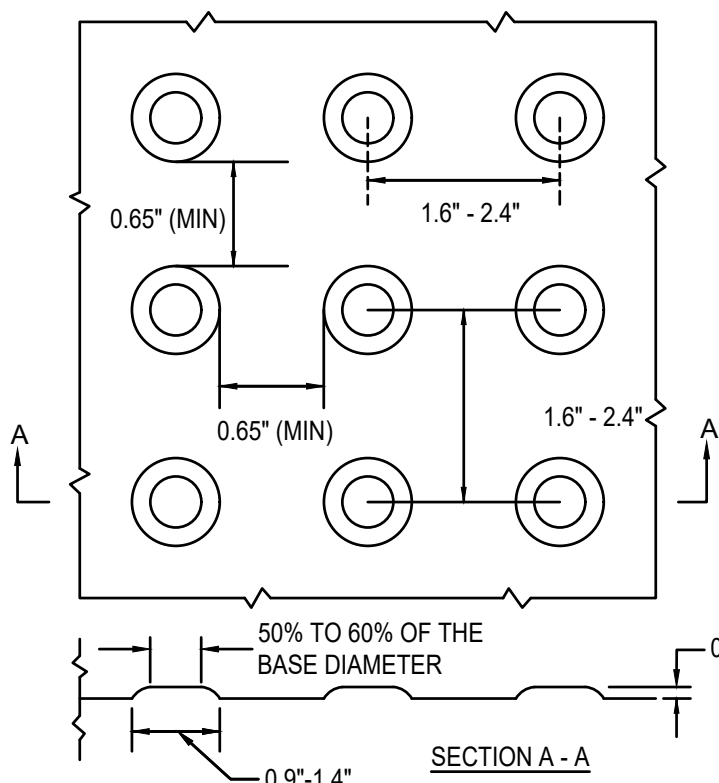
DECIDUOUS AND EVERGREEN TREE
PLANTING DETAIL
SCALE: N.T.S.

STREET TREE NOTES:

1. NEW TREES SHALL BE NURSERY GROWN AND COMPLY WITH THE ASSOCIATION OF AMERICAN NURSRIES SPECIFICATIONS AND BE AT LEAST 3 INCHES IN CALIPER.
2. THE PRESERVATION OF EXISTING TREES AND THE VARIETIES OF NEW TREES FOR PLANTING SHALL BE SUBJECT TO THE APPROVAL OF THE PLANNING BOARD WHICH SHALL BE GUIDED BY THE RECOMMENDATION OF THE TOWN'S DIRECTOR OF LANDS AND NATURAL RESOURCES AS TO THE NUMBER, LOCATION, CONDITION AND SPECIES OF SUCH TREES AND UNDER APPENDIX III 0 DETAIL B.

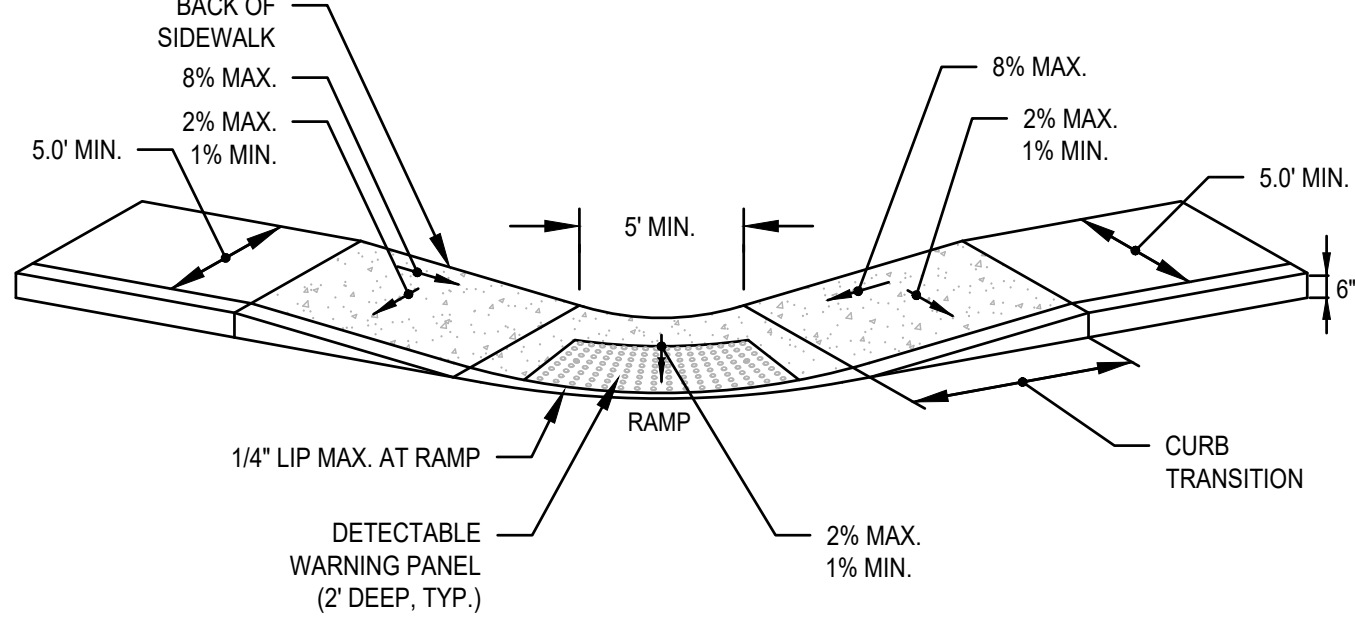
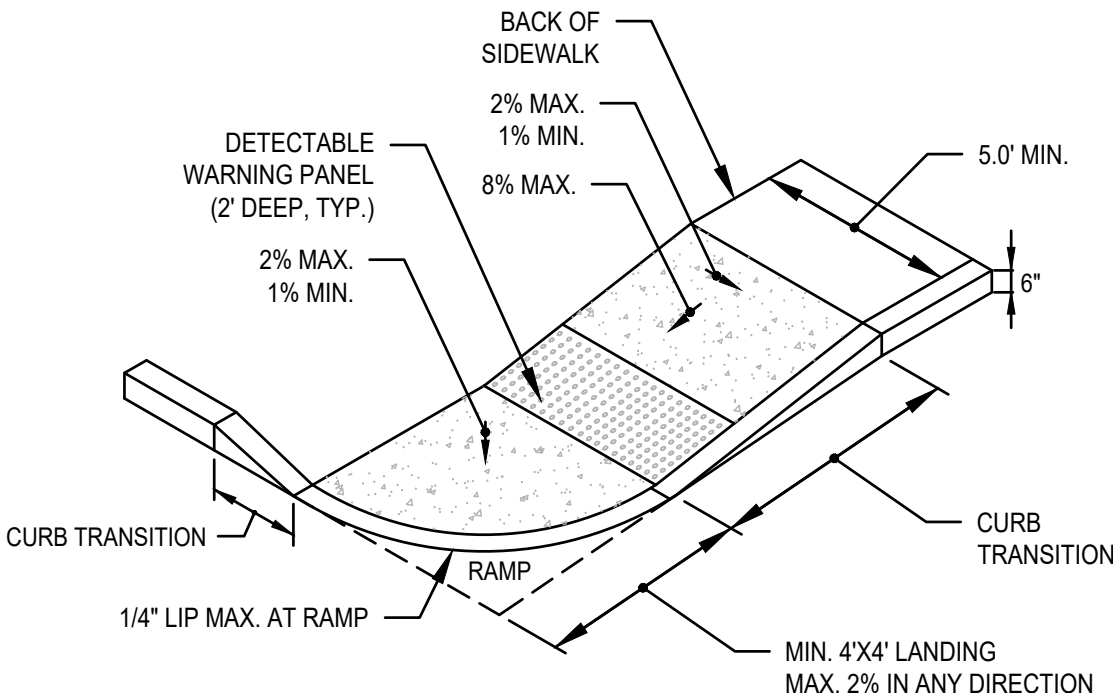
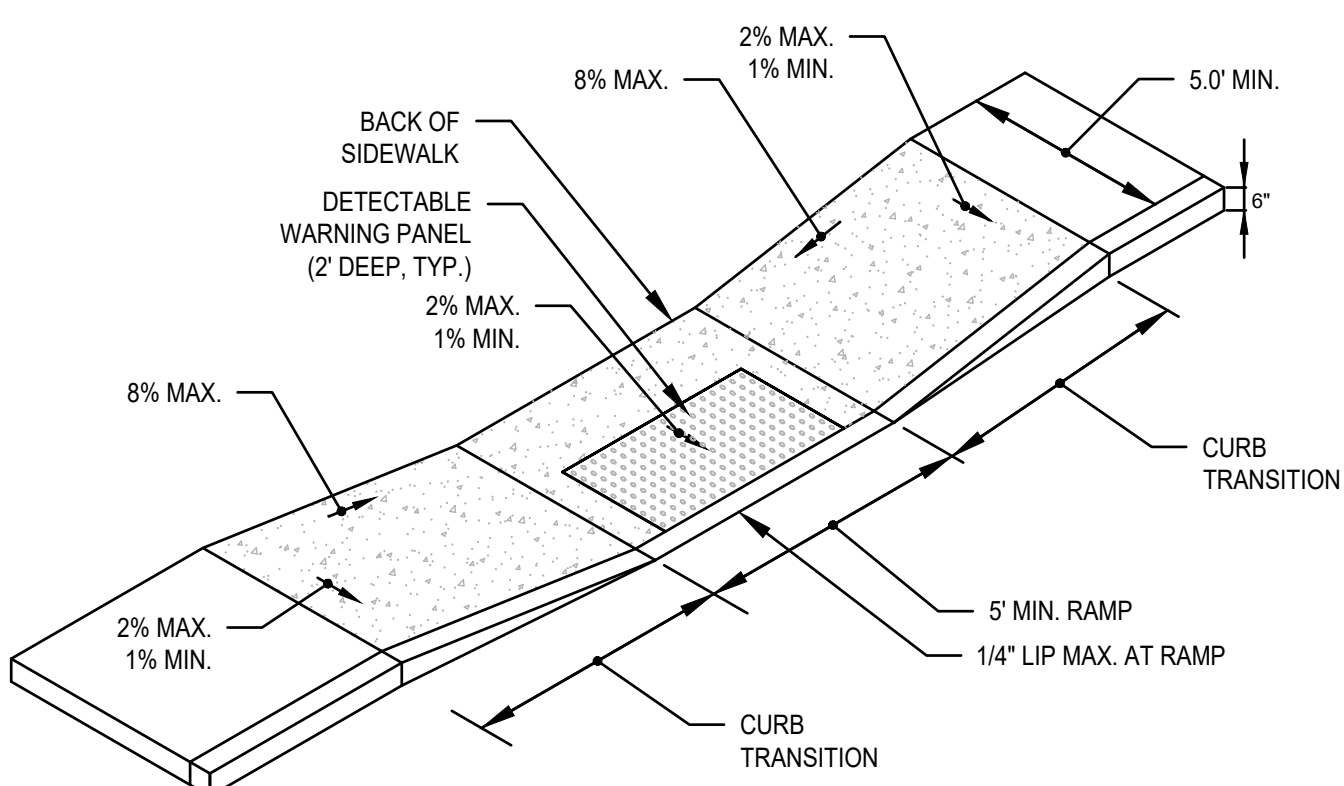


TYPICAL SHRUB PLANTING DETAIL
SCALE: N.T.S.



PANELS MAY BE CONCRETE PRECAST OR CAST IN PLACE OR OTHER SUITABLE MATERIAL PERMANENTLY APPLIED TO THE RAMP. DETECTABLE WARNING SURFACES SHALL CONTRAST VISUALLY WITH ADJACENT WALKING SURFACES EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT.

DETECTABLE WARNING PANEL DETAIL
SCALE: N.T.S.



CEM. CONC. ACCESSIBLE CURB RAMPS
SCALE: N.T.S.

NOTES:

1. CURBS AND WALKS ALONG ACCESSIBLE ROUTES SHALL MEET OR EXCEED THE APPLICABLE REGULATIONS OF THE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD, FAIR HOUSING ACT AND ADA.
2. THE MAXIMUM ALLOWABLE SIDEWALK AND CURB RAMP CROSS SLOPES SHALL BE 2%.
3. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB RAMPS SHALL BE 5%.
4. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE CURB RAMPS SHALL BE 7.5%..
5. MAINTAIN A MINIMUM OF 3 FEET CLEAR AT ANY PERMANENT OBSTACLE IN ACCESSIBLE ROUTE (I.E., HYDRANTS, UTILITY POLES, TREE WELLS, SIGNS ETC.).
6. GRADE BASE OF RAMP TO PREVENT PONDING.
7. RAMP CONSTRUCTION SHALL CONFORM TO TYPICAL SIDEWALK SECTION.
8. WHERE ACCESSIBLE ROUTES ARE LESS THAN 5' IN WIDTH (EXCLUDING CURBING) A 5'X5' PASSING AREA SHALL BE PROVIDED AT INTERVALS NOT TO EXCEED 200 FEET.
9. ALL CURBING AT RAMPS SHALL BE VERTICAL CURBING SET FLUSH WHERE IT ABUTS ROADWAY.
10. ALL RAMPS SHALL BE CEMENT CONCRETE WITH ROUGHENED NON-SLIP SURFACE.
11. ALL DETECTABLE WARNING PANELS SHALL BE CAST IN PLACE WITH A STAINLESS STEEL ANCHORING SYSTEM. MINIMUM DIMENSIONS SHALL BE 2-FEET WIDE BY 5-FEET LONG, OR AS APPROVED.
12. THE MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE. DETECTABLE WARNINGS USED ON INTERIOR SURFACES SHALL DIFFER FROM ADJOINING WALKING SURFACES IN RESILIENCY OR SOUND-ON-CANE-CONTACT.
13. CEMENT CONCRETE TO BE 4000 PSI, 3/4", 610, TYPE II.

REV	DATE	DESCRIPTION	BY	APP
1	1/8/18	RECONFIGURATION	SBS	BCM
2	1/9/18	REVIEW COMMENTS	SBS	BCM
3	2/2/18	REVIEW COMMENTS	SBS	BCM
4	3/9/18	REVIEW COMMENTS	SBS	BCM
5	4/25/18	REVIEW COMMENTS	SBS	BCM
6	5/1/18	NO CHANGES	SBS	BCM
7	10/26/18	NO CHANGES	SBS	BCM
8	12/19/18	ADDED SEWER MANHOLES	SBS	BCM
9	6/9/26	C.C. NO. SUBMISSION	SBS	BCM

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PROFESSIONAL ENGINEER:



APPLICANT:
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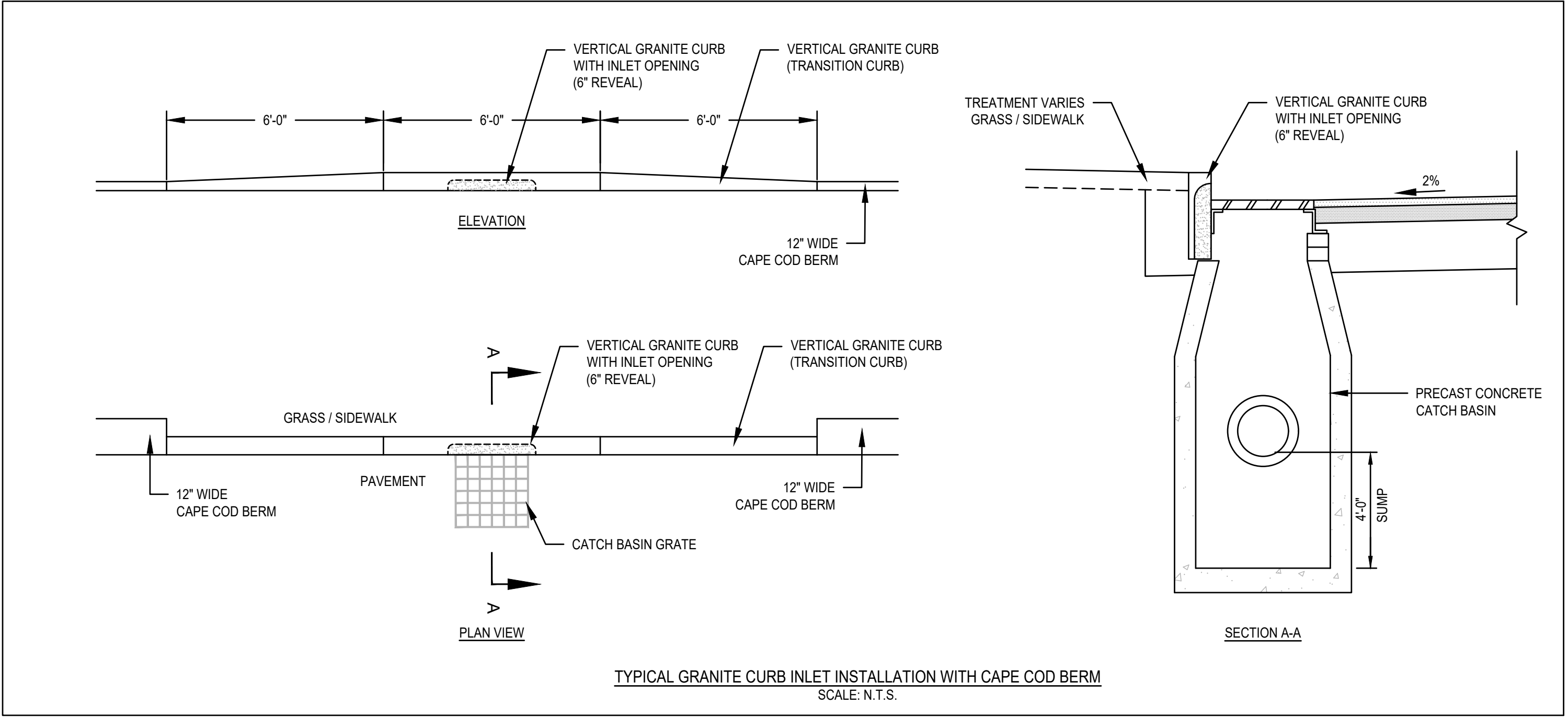
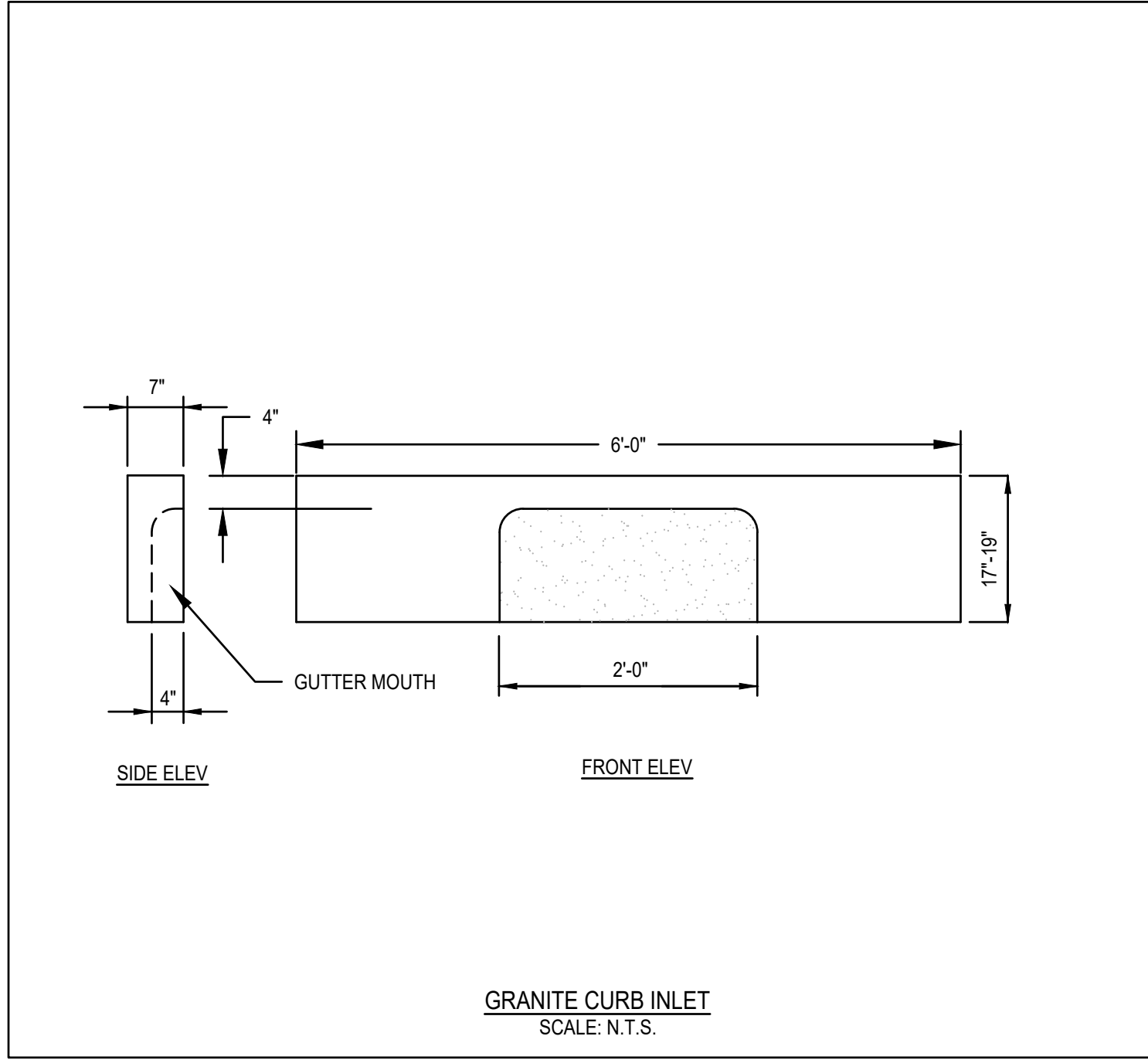
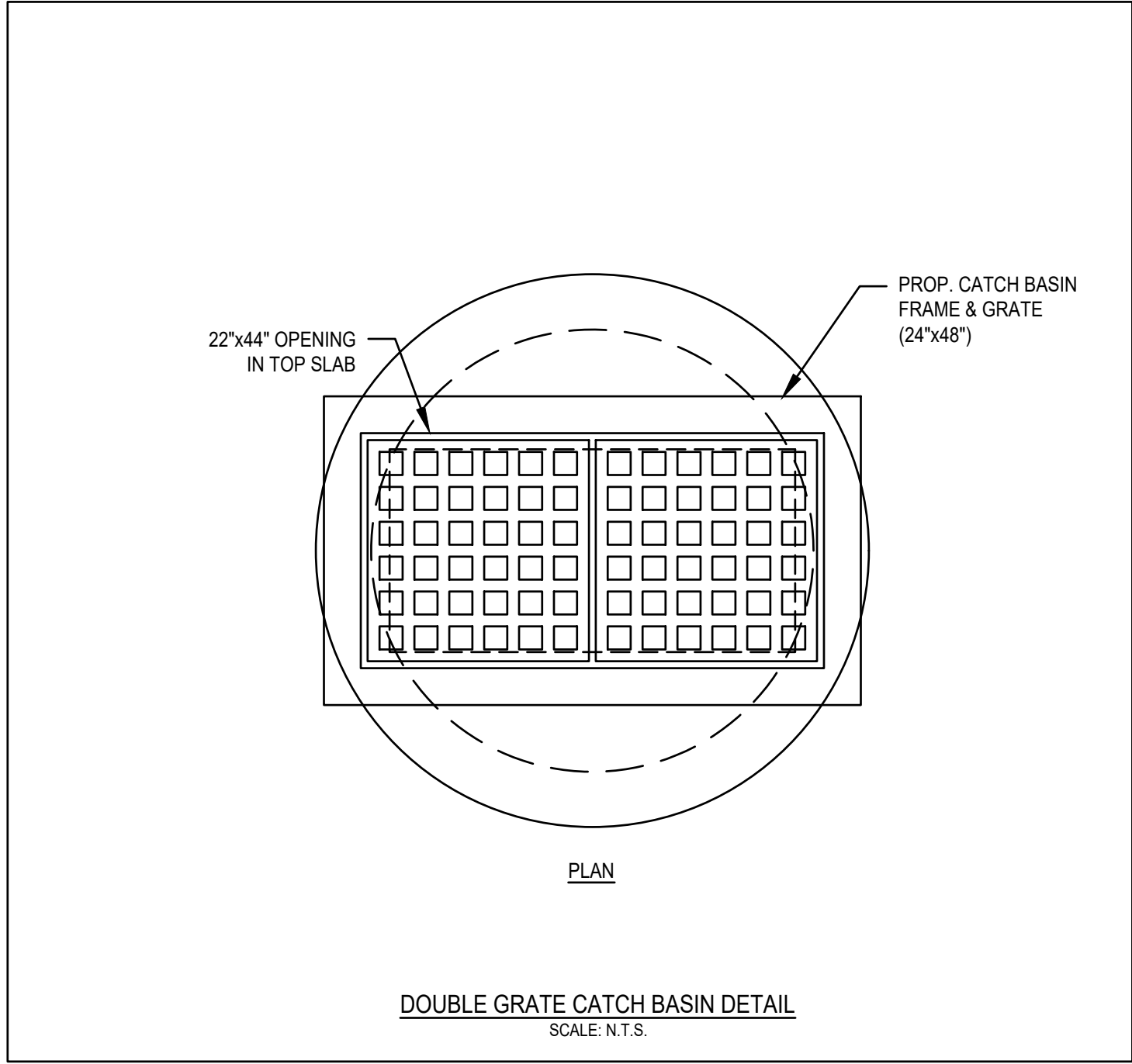
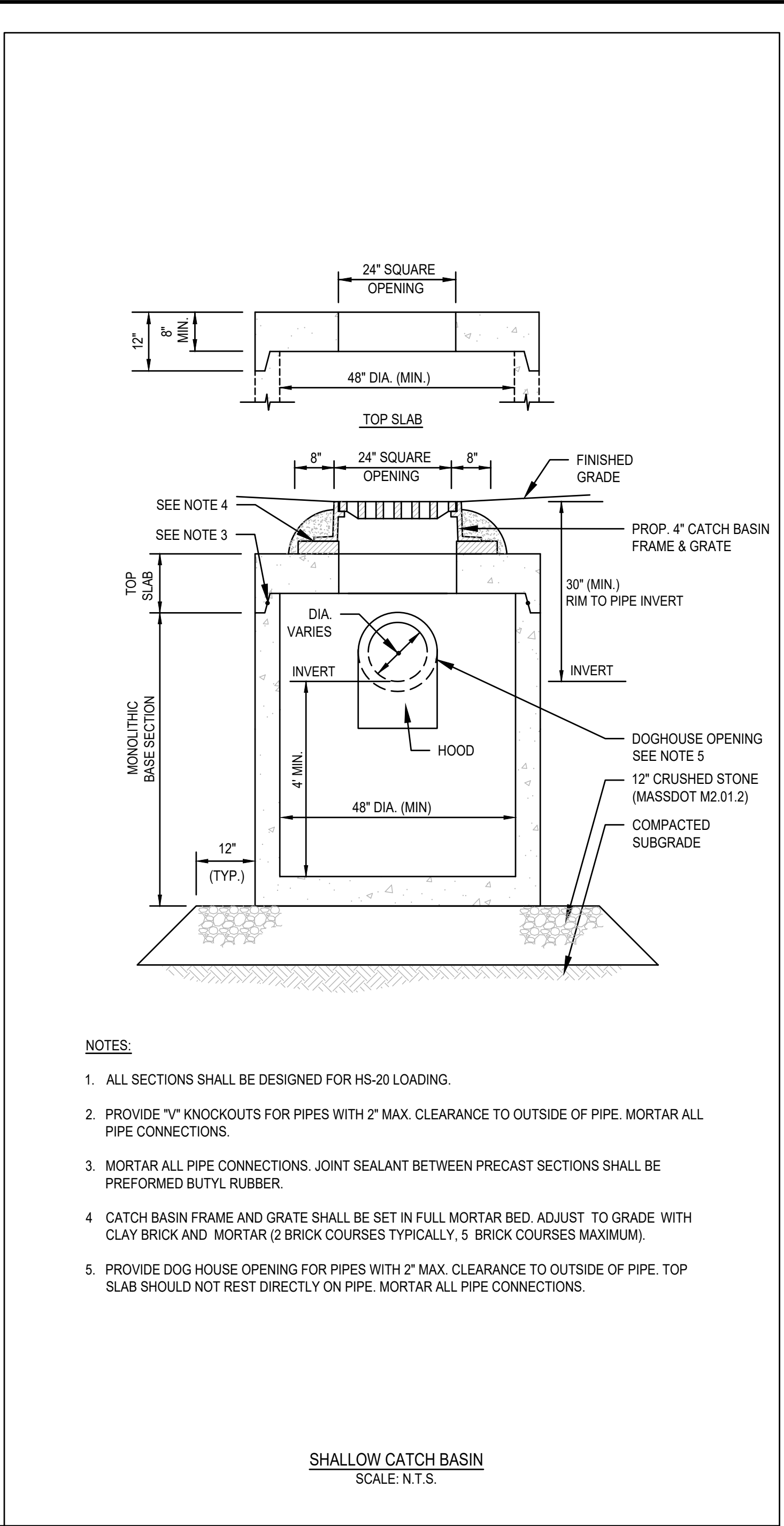
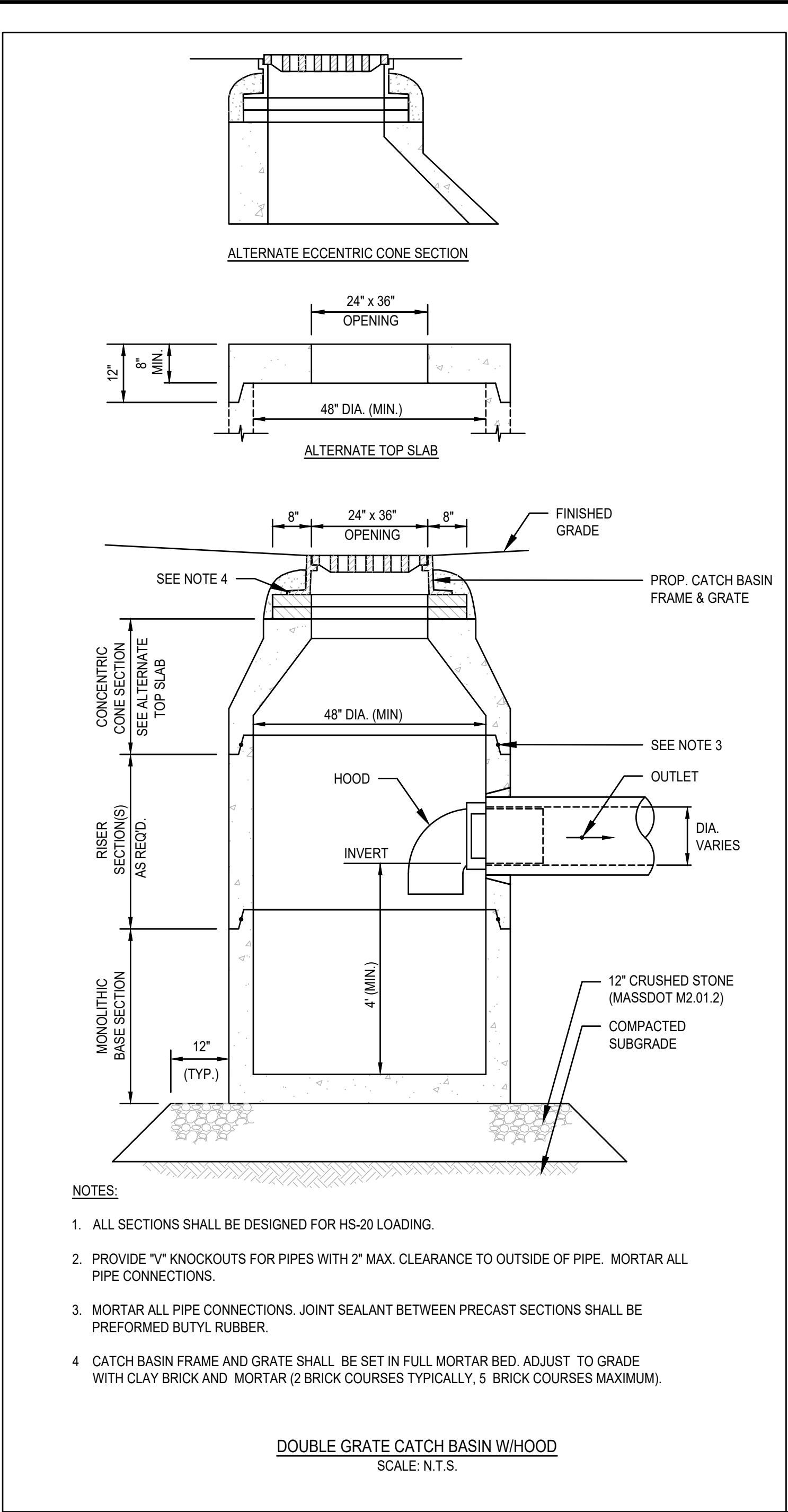
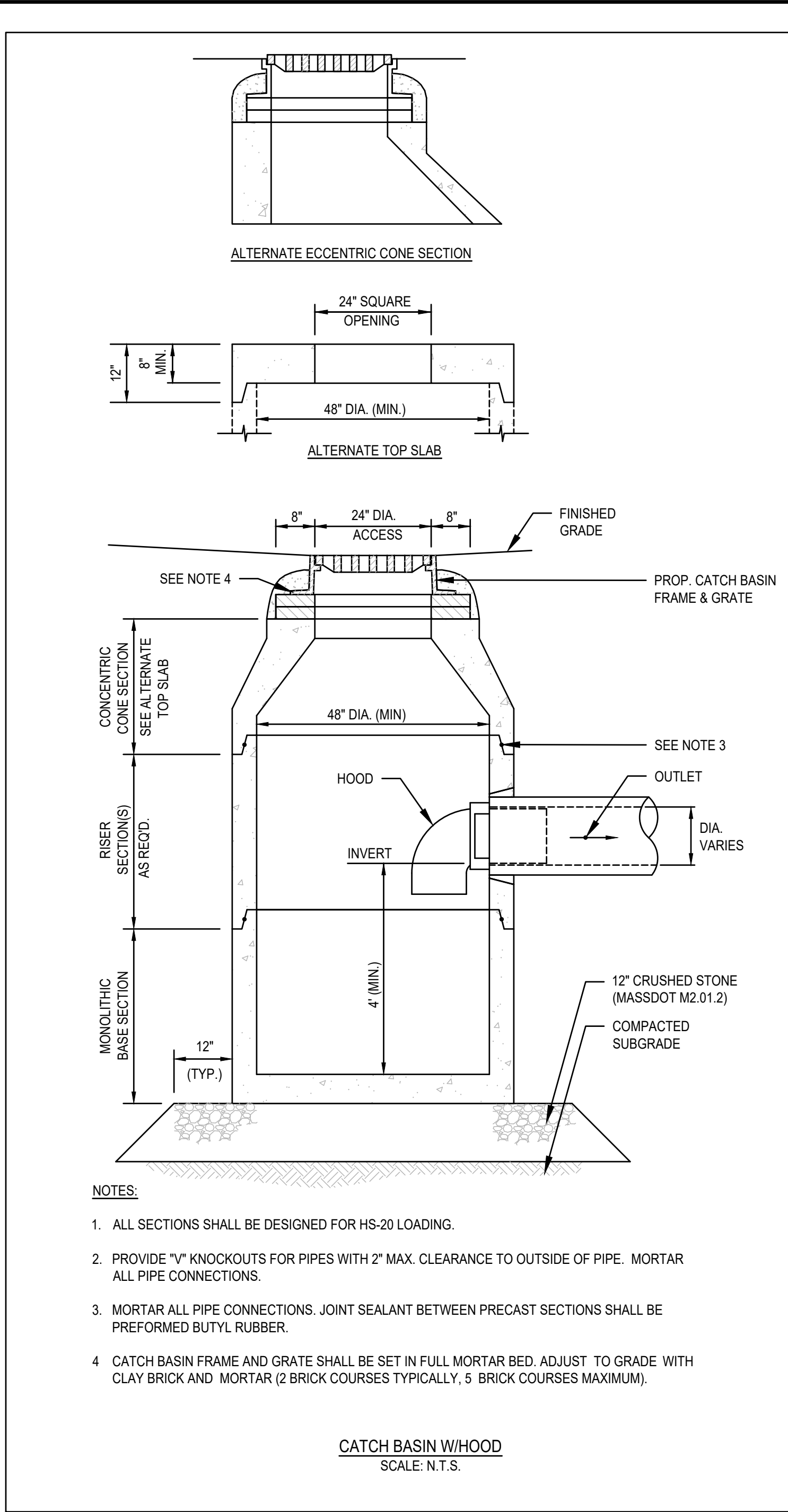
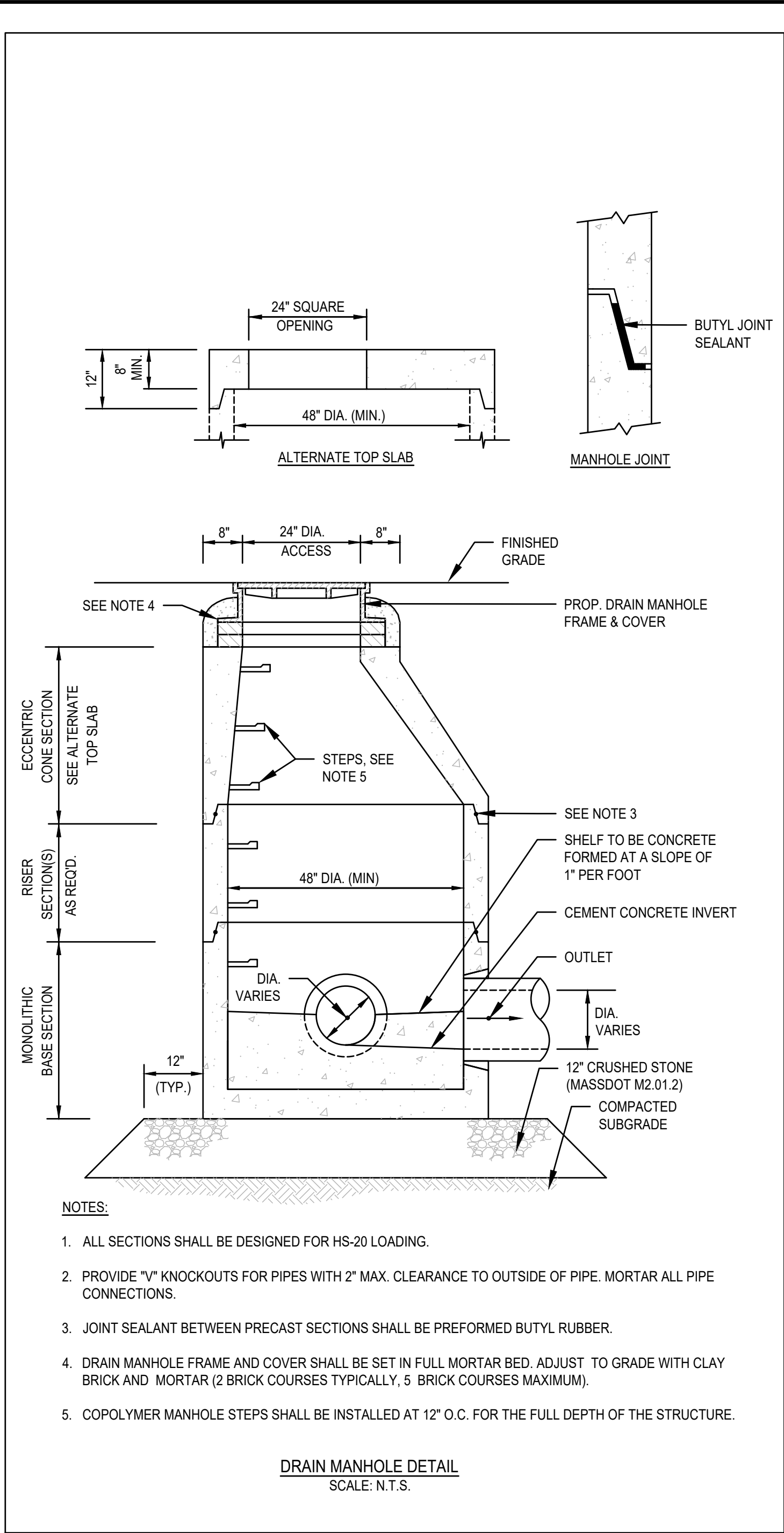
ZBA PERMIT PLAN

DRAWN BY:	JLS
DESIGNED BY:	-
CHECKED BY:	-
APPROVED BY:	-
DATE:	10/7/2015
SCALE:	
PROJECT NO.:	27-135
DWG. TITLE:	

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DWG. NO:

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REV	DATE	DESCRIPTION	BY	APP
1	1/8/18	RECONFIGURATION	SBS	BCM
2	1/9/18	REVIEW COMMENTS	SBS	BCM
3	2/2/18	REVIEW COMMENTS	SBS	BCM
4	3/9/18	REVIEW COMMENTS	SBS	BCM
5	4/25/18	REVIEW COMMENTS	SBS	BCM
6	5/1/18	NO CHANGES	SBS	BCM
7	10/26/18	RECONFIGURATION	SBS	BCM
8	12/19/18	RECONFIGURATION	SBS	BCM
9	6/9/26	C.C. NO. SUBMISSION	SBS	BCM

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Assinippi Office Park
150 Longwater Drive, Suite 101
Norwell, MA 02061
Ph: 781-792-3900
www.mckeng.com

COMPREHENSIVE PERMIT PLAN

KNOWN AS

RIVER STONE

(ASSESSORS MAP 124, LOTS 70-75 & LOT 26)
VIKING LANE & WARD STREET
HINGHAM, MASSACHUSETTS

PROFESSIONAL ENGINEER:

APPLICANT:

RIVER STONE, LLC
293R WASHINGTON STREET
NORWELL, MASSACHUSETTS 02061

DESIGNED BY: JLS

CHECKED BY: JLS

APPROVED BY: JLS

DATE: 10/7/2015

SCALE:

PROJECT NO.: 27-135

DWG. TITLE:

Construction Details

Sheet 3 of 10

DWG. NO: **C-7**

NOTES:

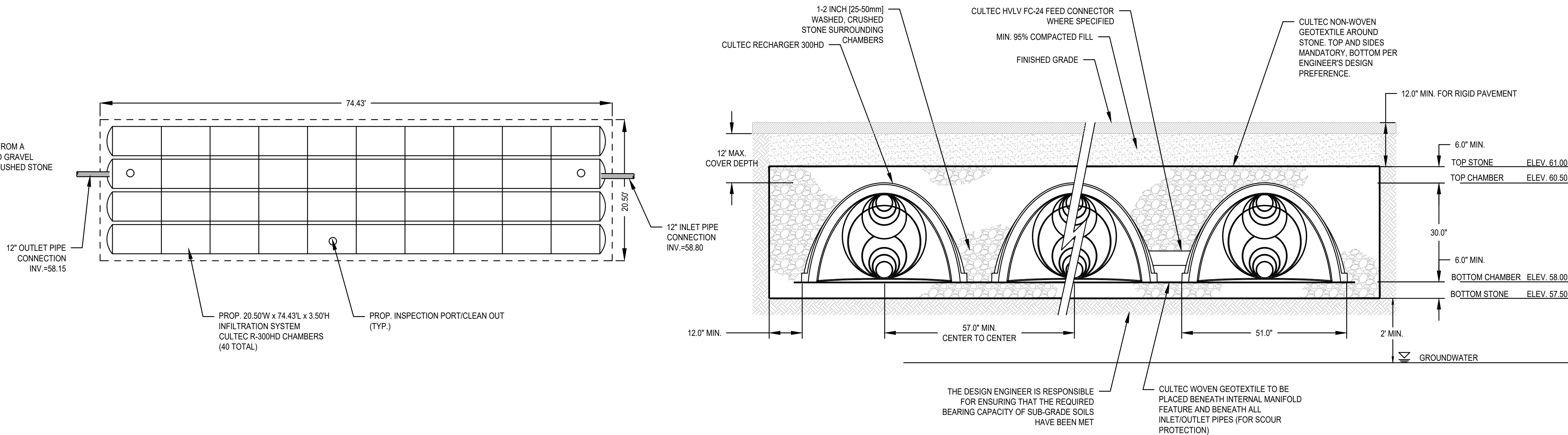
- EXCAVATE BELOW BOTTOM OF CRUSHED STONE BASE AND BACKFILL WITH CLEAN GRAVEL BORROW (MASS. HIGHWAY M1.03.0 TYPE B) TO NATURALLY OCCURRING PERVIOUS MATERIAL. (REFER TO TEST PIT SOIL LOGS SUBMITTED HERewith).
- INSTALLATION AND INSPECTION OF ALL SUBSURFACE INFILTRATION AND DETENTION SYSTEMS SHALL BE PERFORMED AND WRITTEN APPROVAL OBTAINED BEFORE CONSTRUCTION OF THE ROADS BASE COURSE BEGINS.

CRUSHED STONE:

SHALL BE DURABLE CRUSHED ROCK CONSISTING OF ANGULAR FRAGMENTS, FREE FROM A DETRIMENTAL QUANTITY OF THIN, FLAT, ELONGATED PIECES OR DURABLE CRUSHED GRAVEL STONE OBTAINED BY ARTIFICIAL CRUSHING OF BOULDERS OR FIELDSTONE. THE CRUSHED STONE MUST BE FREE FROM CLAY, LOAM, OR DELETERIOUS MATERIAL.

CRUSHED STONE TO CONFORM TO THE FOLLOWING GRADATIONS:

SIEVE SIZE	PERCENT PASSING			
	STONE SIZE			
	1 1/4 INCH	3/4 INCH	1/2 INCH	3/8 INCH
2"	100			
1 1/2"	85-100			
1 1/4"		100		
1"	10-40	90-100		
3/4"			100	
5/8"				100
1/2"	0-8	10-50	85-100	
3/8"		0-20	14-45	85-100
#4		0-5	0-15	20-20
#8			0-5	0-15
#16				0-5



SUBSURFACE INFILTRATION SYSTEM IC-1
SCALE: N.T.S.

NOTES:

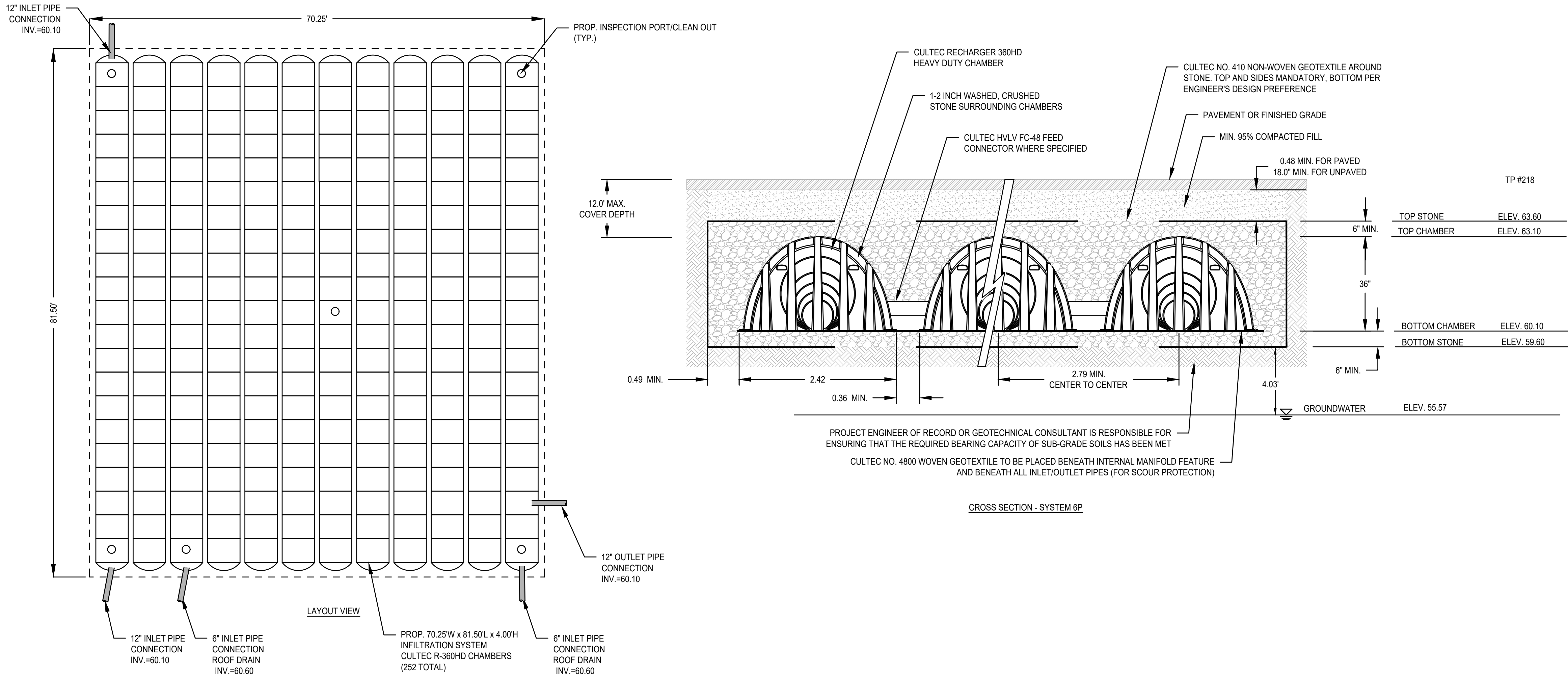
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1 1/4"		100		
1"	10-40	90-100		
3/4"			100	
5/8"				100
1/2"	0-8	10-50	85-100	
3/8"		0-20	14-45	85-100
#4		0-5	0-15	20-20
#8			0-5	0-15
#16				0-5



SUBSURFACE INFILTRATION SYSTEM IC-2
SCALE: N.T.S.

BY	APP	DESCRIPTION	DATE	REV
SES	BCM	NEW SHEET	6/8/26	9
C.C. NO. SUBMISSION				

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VIKING LANE & WARD STREET
HINGHAM, MASSACHUSETTS

PROFESSIONAL ENGINEER:



APPLICANT:
RIVER STONE, LLC
293R WASHINGTON STREET
NORWELL, MASSACHUSETTS 02061

DRAWN BY:	JLS
DESIGNED BY:	
CHECKED BY:	
APPROVED BY:	
DATE:	10/7/2015
SCALE:	
PROJECT NO.:	27-135
DWG. TITLE:	

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Details
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DWG. NO:

C-8

NOTES:

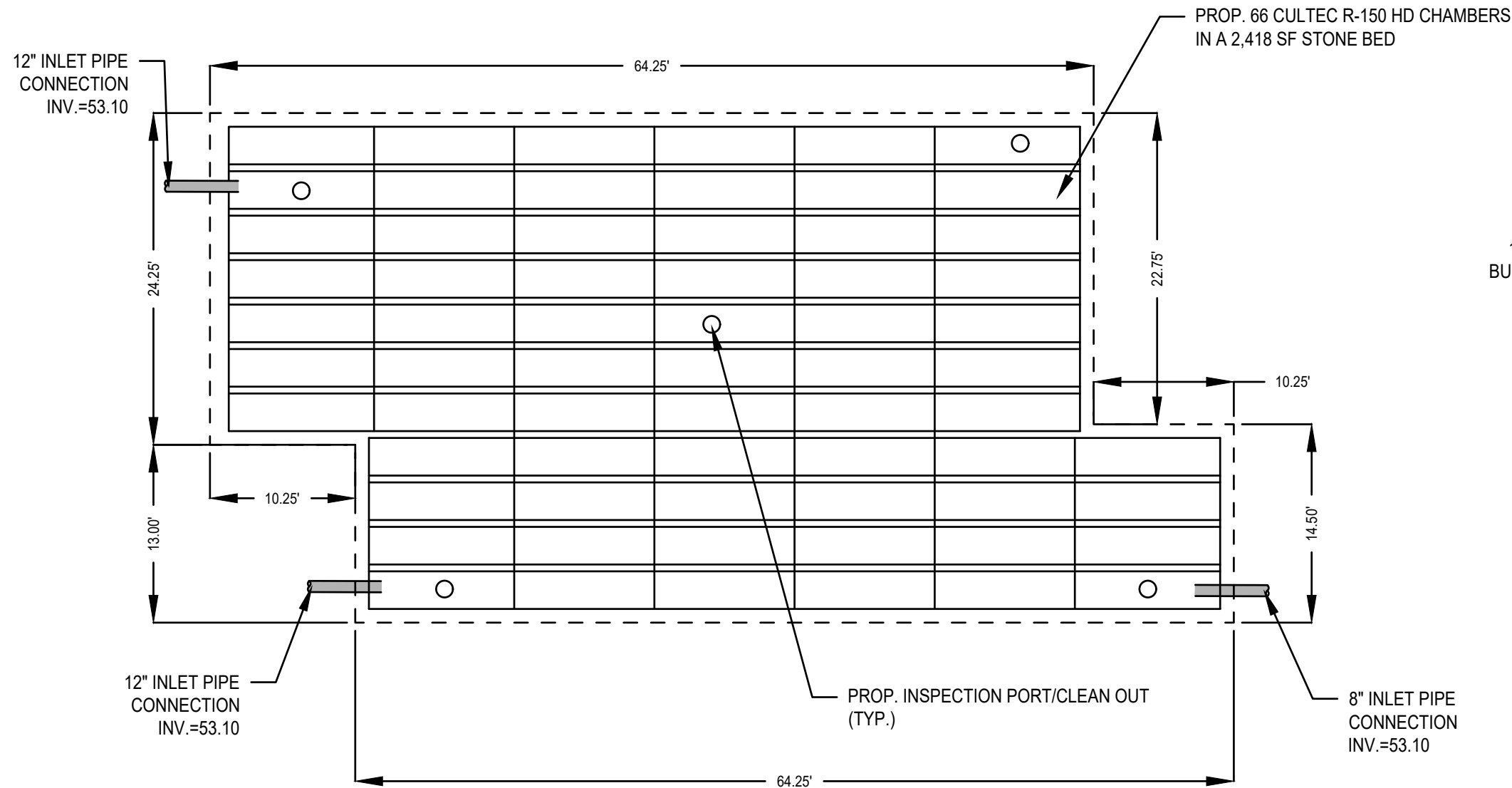
- EXCAVATE BELOW BOTTOM OF CRUSHED STONE BASE AND BACKFILL WITH CLEAN GRAVEL BORROW (MASS. HIGHWAY M1.03.0 TYPE B) TO NATURALLY OCCURRING PERVIOUS MATERIAL. (REFER TO TEST PIT SOIL LOGS SUBMITTED HEREWITH).
- INSTALLATION AND INSPECTION OF ALL SUBSURFACE INFILTRATION AND DETENTION SYSTEMS SHALL BE PERFORMED AND WRITTEN APPROVAL OBTAINED BEFORE CONSTRUCTION OF THE ROADS BASE COURSE BEGINS.

CRUSHED STONE:

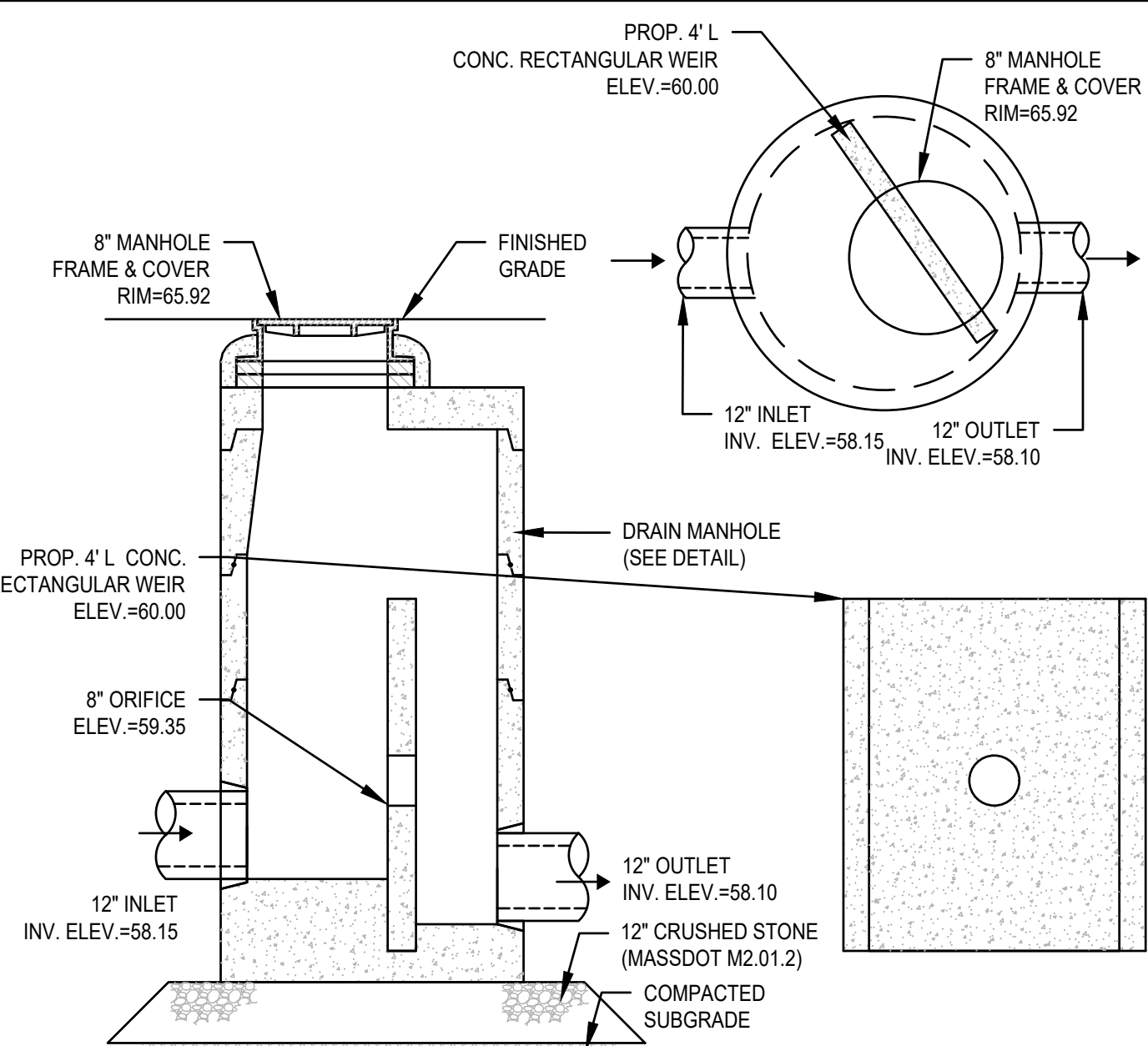
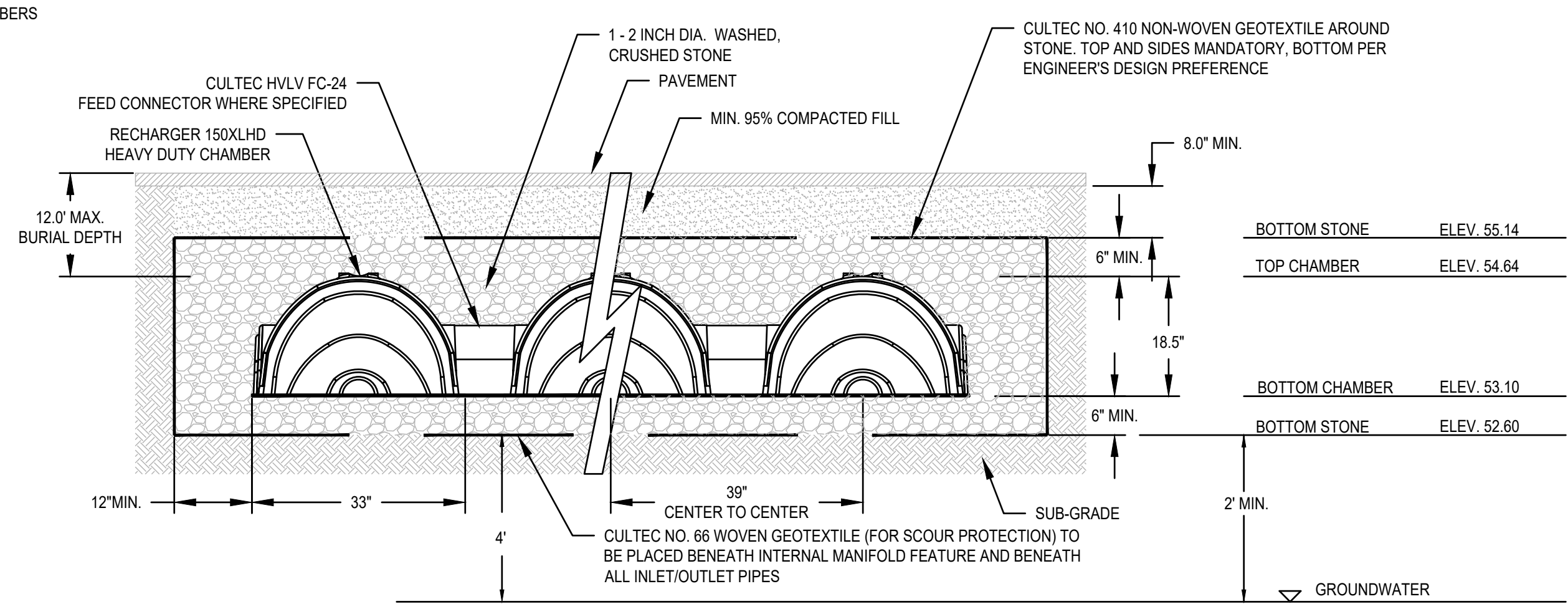
SHALL BE DURABLE CRUSHED ROCK CONSISTING OF ANGULAR FRAGMENTS, FREE FROM A DETRIMENTAL QUANTITY OF THIN, FLAT, ELONGATED PIECES OR DURABLE CRUSHED GRAVEL STONE OBTAINED BY ARTIFICIAL CRUSHING OF BOULDERS OR FIELDSTONE. THE CRUSHED STONE MUST BE FREE FROM CLAY, LOAM, OR DELETERIOUS MATERIAL.

CRUSHED STONE TO CONFORM TO THE FOLLOWING GRADATIONS:

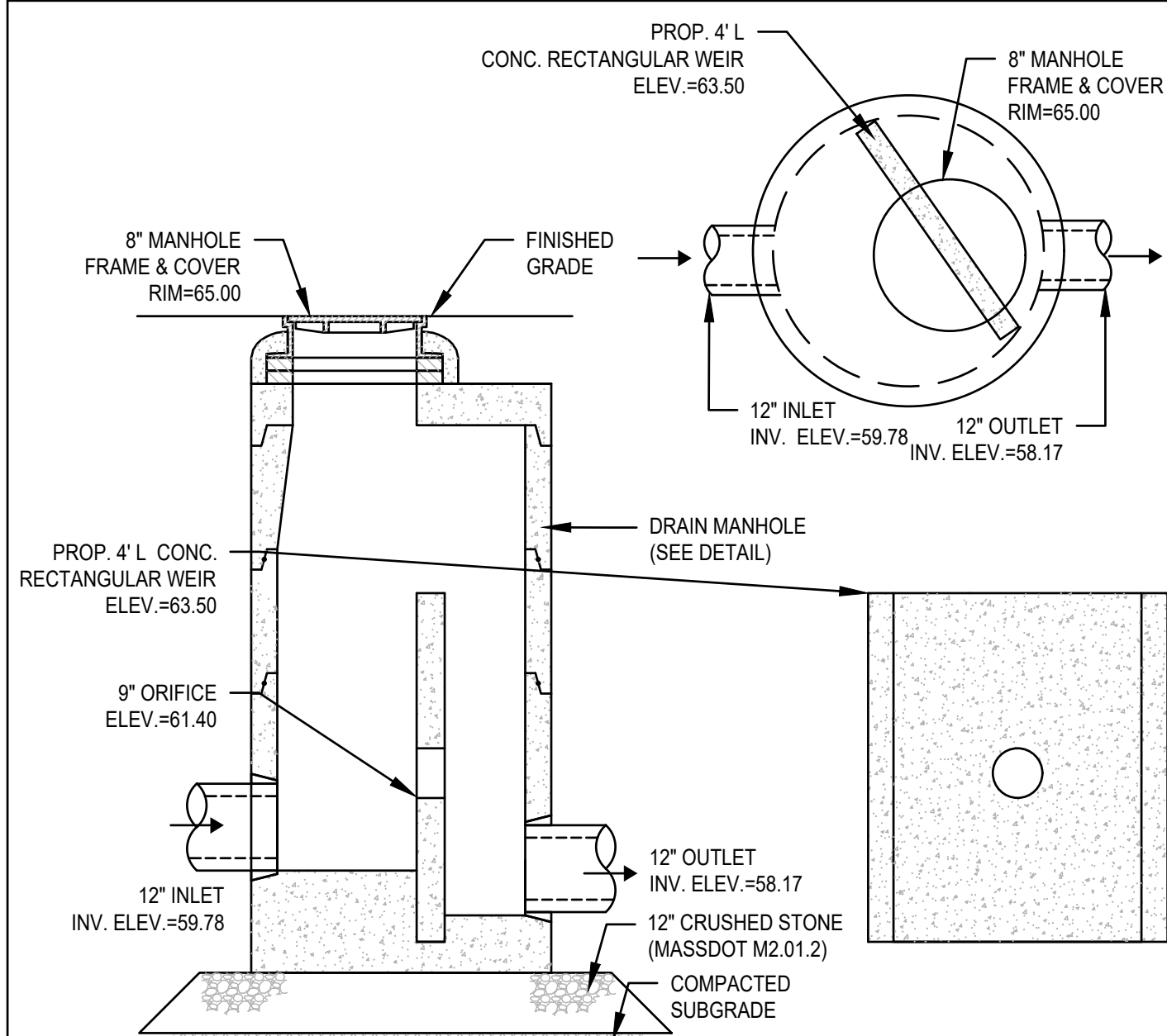
SIEVE SIZE	PERCENT PASSING			
	STONE SIZE			
	1 1/4" INCH	3/4" INCH	1/2" INCH	3/8" INCH
2"				
1 1/2"	100			
1 1/4"	85-100			
1"		100		
3/4"	10-40	90-100		
5/8"			100	
1/2"	0-8	10-50	85-100	100
3/8"		0-20	14-45	85-100
#4		0-5	0-15	20-20
#8			0-5	0-15
#16				0-5



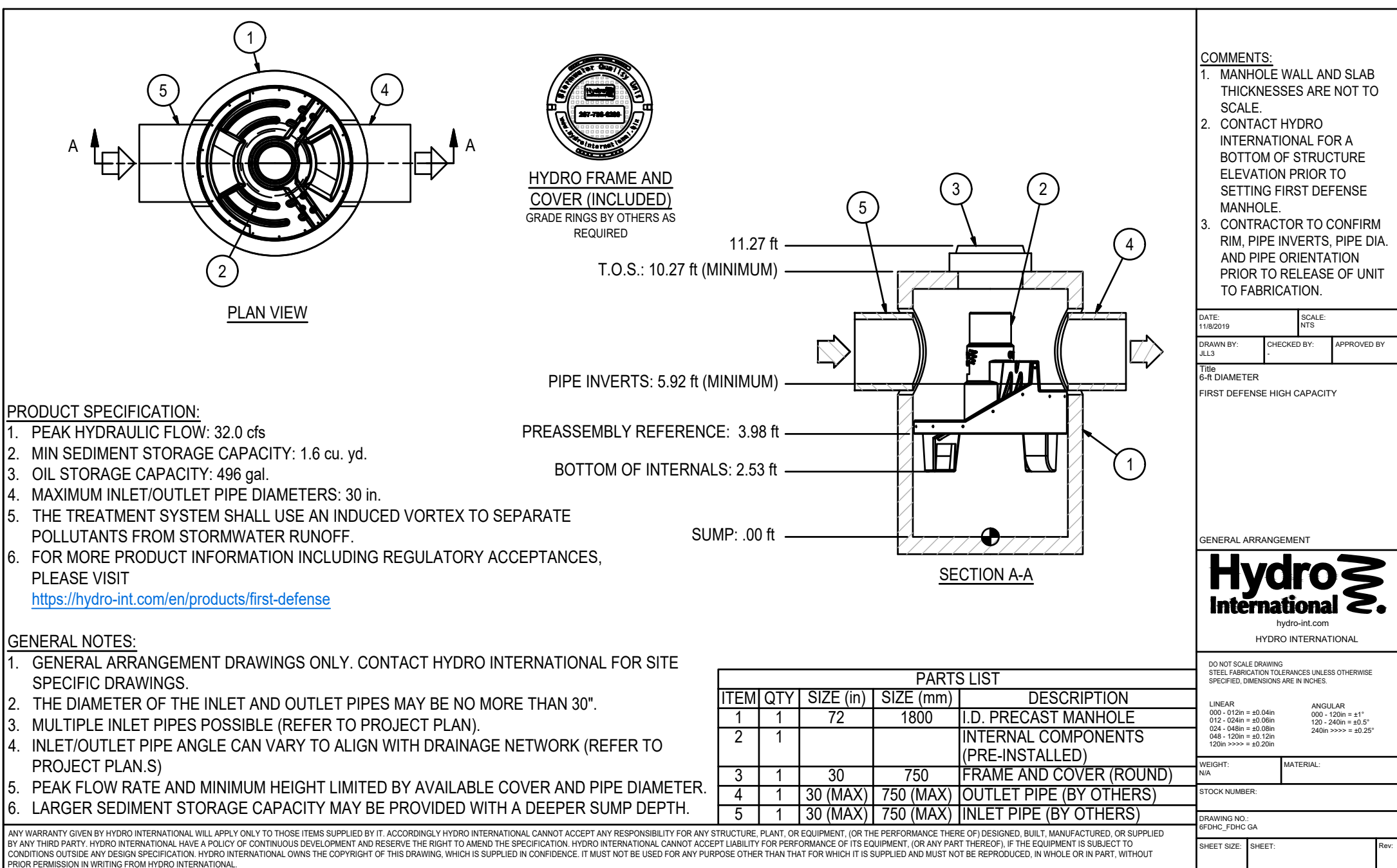
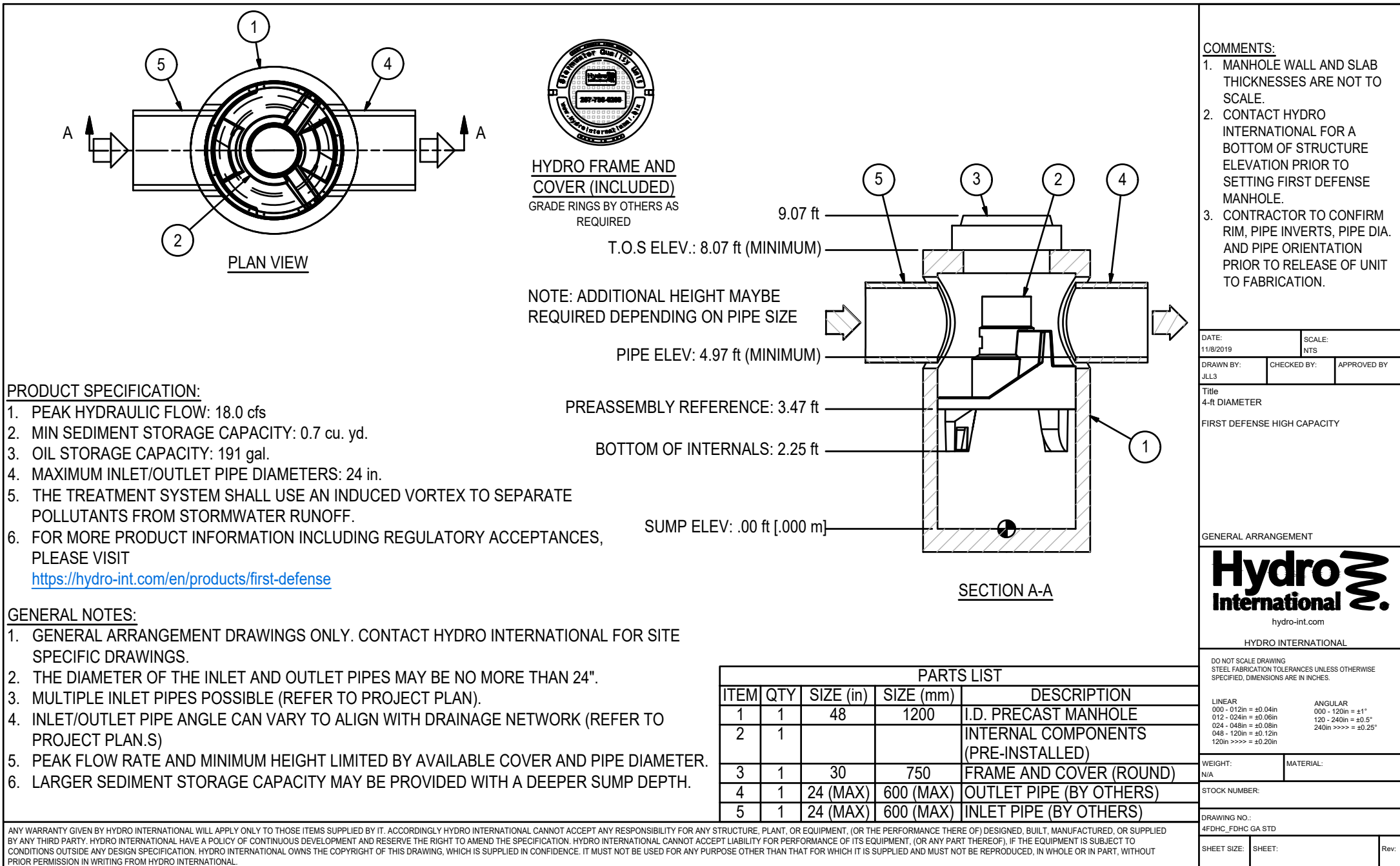
SUBSURFACE INFILTRATION SYSTEM IC-3
SCALE: N.T.S.



DRAINAGE MANHOLE DMH-1 (OCS) WEIR DETAIL
SCALE: N.T.S.



DRAINAGE MANHOLE DMH-9 (OCS) WEIR DETAIL
SCALE: N.T.S.



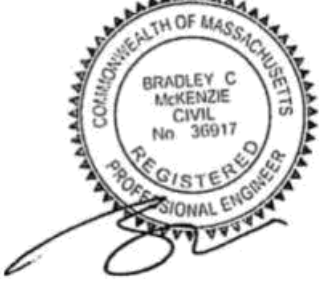
REV	DATE	DESCRIPTION	BY	APP
9	6/8/26	NEW SHEET C.C. NOI SUBMISSION	SES	BCM

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COMPREHENSIVE PERMIT PLAN

KNOWN AS
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(ASSESSORS MAP 124, LOTS 70-75 & LOT 26)
Viking Lane & Ward Street
HINGHAM, MASSACHUSETTS

PROFESSIONAL ENGINEER:



APPLICANT:
RIVER STONE, LLC
293R WASHINGTON STREET
NORWELL, MASSACHUSETTS 02061

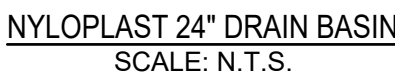
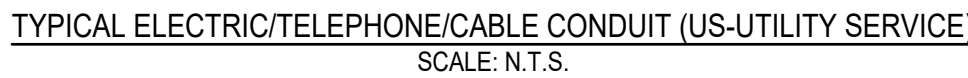
DRAWN BY: JLS
DESIGNED BY: JLS
CHECKED BY: JLS
APPROVED BY: JLS
DATE: 10/7/2015
SCALE:
PROJECT NO.: 27-135
DWG. TITLE:

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Details
Sheet 5 of 10

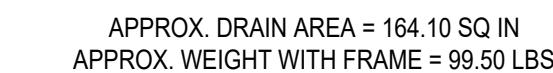
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C-9

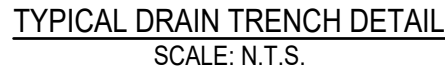
1. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AND STRUCTURES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF VARIOUS UTILITY COMPANIES AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THIS INFORMATION IS NOT TO BE RELIED UPON AS BEING EXACT OR COMPLETE. THE LOCATION OF ALL UNDERGROUND UTILITIES AND STRUCTURES SHALL BE VERIFIED IN THE FIELD BY THE CONTRACTOR PRIOR TO THE START OF CONSTRUCTION. THE CONTRACTOR MUST CONTACT THE APPROPRIATE UTILITY COMPANY, ANY GOVERNING PERMITTING AUTHORITY, AND DISSEMINATE AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION WORK TO REQUEST EXACT FIELD LOCATION OF UTILITIES AND THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION TAKEN BEFORE PROCEEDING WITH THE WORK. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLAN.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING ALL CONTROL POINTS AND BENCHMARKS NECESSARY FOR THE WORK.
3. THE CONTRACTOR SHALL EXCAVATE THE TEST PITS IN THE LOCATIONS SHOWN ON THE PLAN PRIOR TO COMMENCING WORK TO VERIFY THE ELEVATIONS AND LOCATIONS OF EXISTING UTILITIES. THE CONTRACTOR SHALL PROVIDE THE OWNER AND ENGINEER WITH THE RESULTS PRIOR TO COMMENCING ANY WORK.
4. ALL WATER SERVICES SHALL BE INSTALLED WITH 5' OF COVER EXCEPT AS NOTED OR DETAILED OTHERWISE.
5. DOMESTIC WATER SERVICES 2 INCHES AND SMALLER SHALL BE TYPE K COPPER TUBING AND SHALL BE INSTALLED WITH APPROPRIATELY SIZED CORPORATION STOP WITH APPROVED SADDLE, CURB STOP, GATE AND BOX.
6. SEE SHEET XX FOR XX WATER DEPT. CONSTRUCTION DETAILS.
7. THE CONTRACTOR SHALL PROVIDE INLET PROTECTION, SUCH AS SILT SACKS, AT ALL CATCH BASINS TO PREVENT SEDIMENT FROM ENTERING THE EXTENDED DETENTION WETLAND AREA. INLET PROTECTION WILL ALLOW THE STORM DRAIN INLETS TO BE USED BEFORE FINAL STABILIZATION.
8. THE CONTRACTOR SHALL PROVIDE SIEVE ANALYSIS SUBMITTALS TO THE ENGINEER FOR APPROVAL PRIOR TO INSTALLATION OF THE SAND/SILT MATERIAL TO BE USED.



1. GRATES/SOLID COVER SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
2. FRAMES SHALL BE DUCTILE IRON PER ASTM A536 GRADE 70-50-05.
3. DRAIN BASIN TO BE CUSTOM MANUFACTURED ACCORDING TO PLAN DETAILS. RISERS ARE NEEDED FOR BASINS OVER 84" DUE TO SHIPPING RESTRICTIONS.
4. DRAINAGE CONNECTION STUB JOINT TIGHTNESS SHALL CONFORM TO ASTM D3212 FOR CORRUGATED HDPE (ADS-N12HANCOR DUAL WALL), N-12 HP & PVC SEWER.
5. ADAPTERS CAN BE MOUNTED ON ANY ANGLE 0° TO 360° TO DETERMINE MINIMUM ANGLE BETWEEN ADAPTERS



NYLOPLAST 24" DRAIN BASIN FRAME & GRATE
SCALE: N.T.S.



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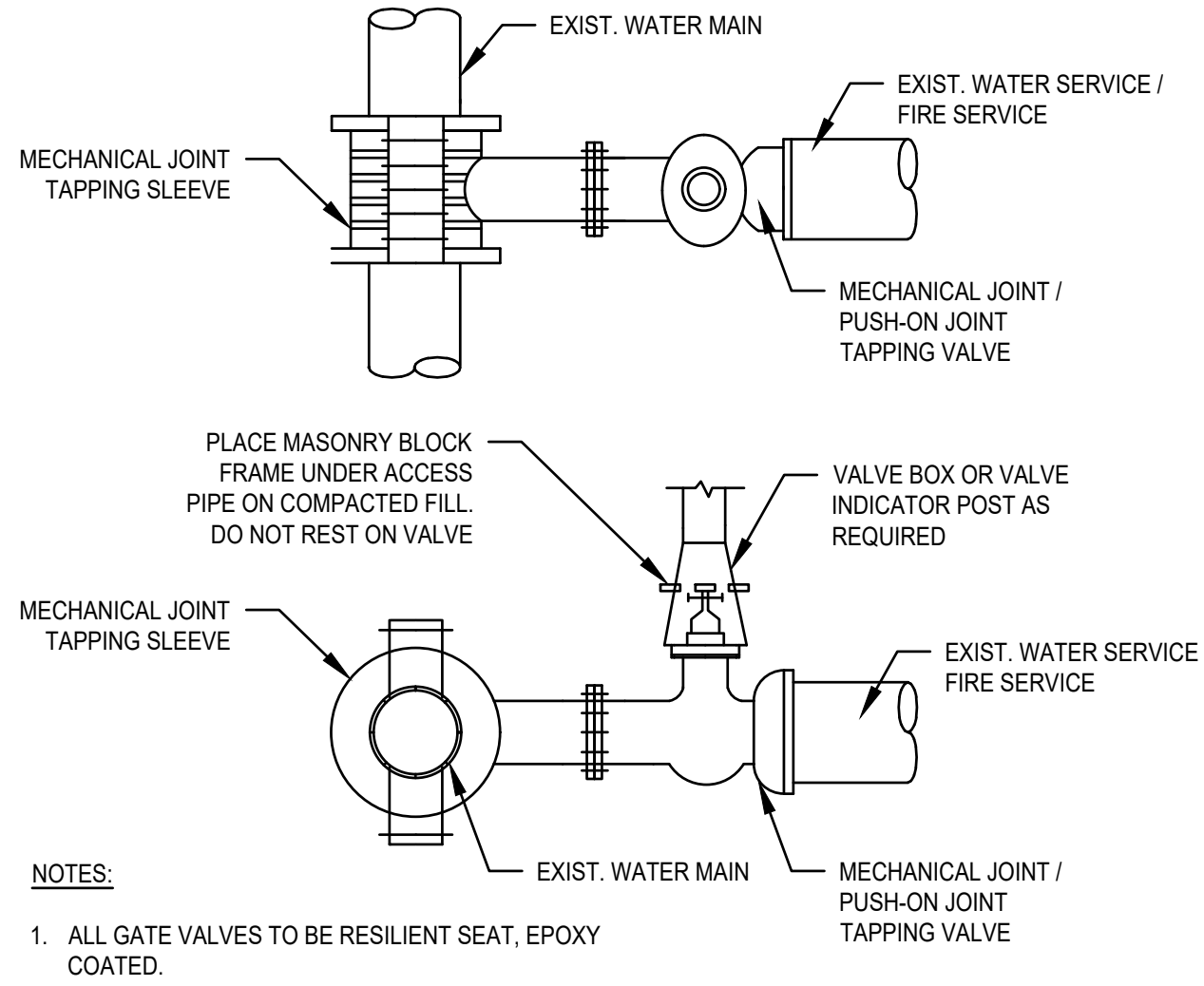
DRAWN BY:	JLS
DESIGNED BY:	- -
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PROJECT NO.:	27-135
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DWG. NO: **C-10**

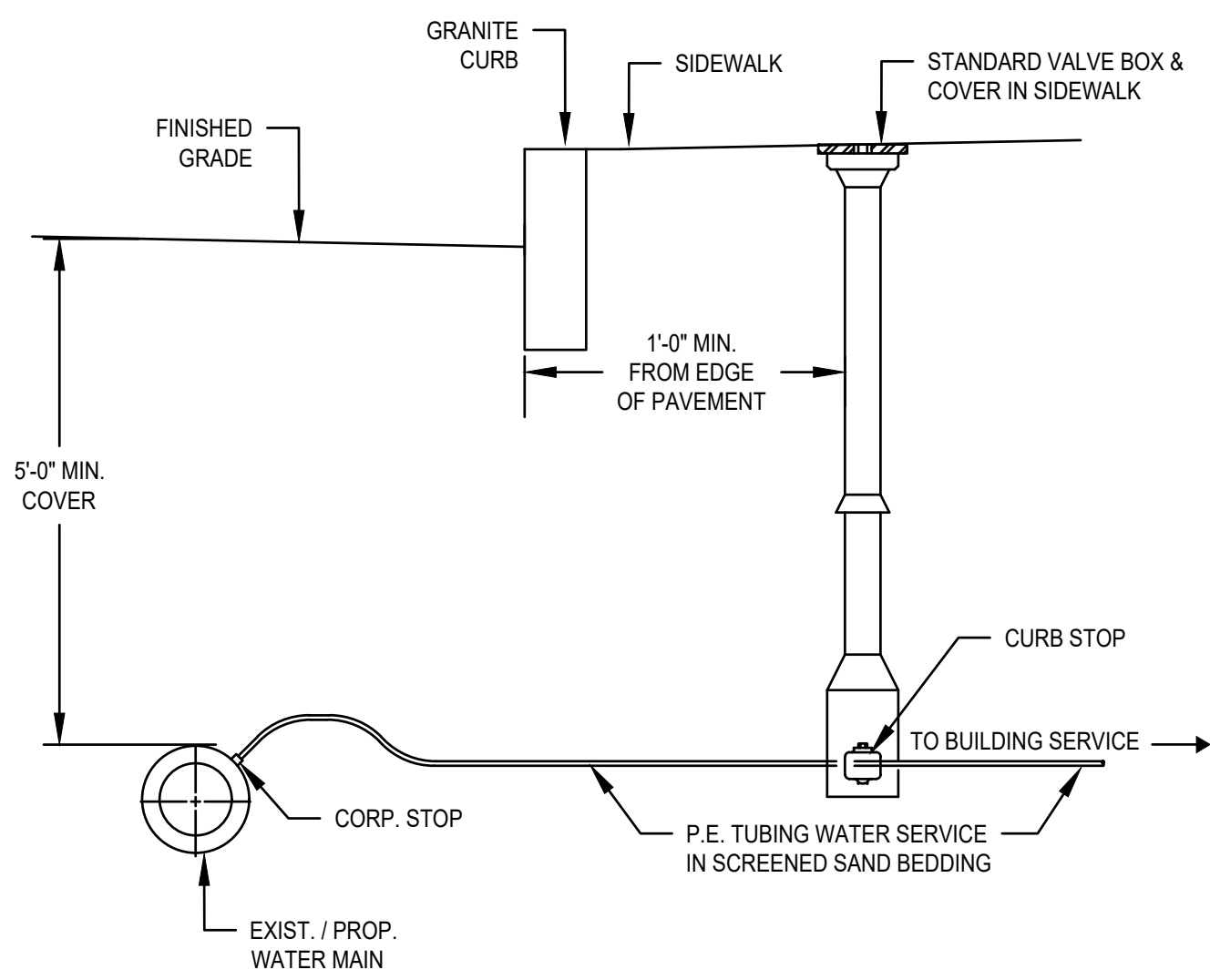
GENERAL NOTES

ALL WATER MAIN MATERIALS AND INSTALLATION SHALL BE IN ACCORDANCE WITH THE AQUARION WATER COMPANY RULES AND REGULATIONS.

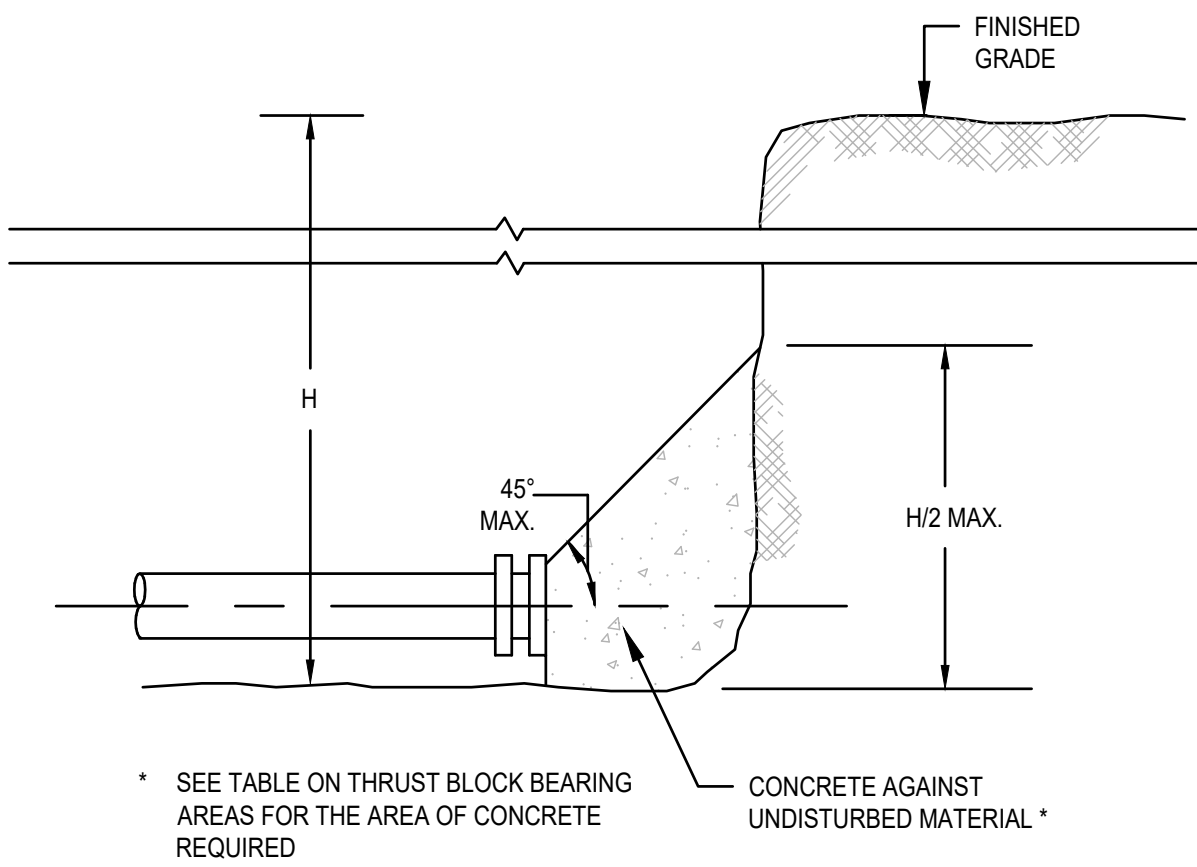
- IF SHEETING IS USED, IT SHALL BE CUT OFF NO MORE THAN 12" ABOVE TOP OF PIPE.
- ALL PIPES SHALL BE PRESSURE TESTED AT 200 PSI WORKING PRESSURE FOR A MINIMUM DURATION OF TWO HOUR.
- WATER SYSTEM IS TO BE DISINFECTED TO 50 P.P.M. AVAILABLE CHLORINE AND AFTER 24 HOURS TO 25 P.P.M. OR AS REQUIRED BY THE WEIR RIVER WATER SYSTEM.
- WATER PIPE IS TO BE CEMENT LINED DUCTILE IRON "TYTON" OR EQUAL TYPE JOINT, CONFORMING TO A.N.S.I./A.W.W.A. C150/A21.50, CLASS 52, AS APPROVED BY THE WEIR RIVER WATER SYSTEM.
- ALL PIPING SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH A.W.W.A. STANDARDS PRIOR TO PAVING IF PAVING ABOVE TRENCH IS REQUIRED.
- BACKFILL IS TO BE COMPACTED TO 90% MAXIMUM DRY DENSITY BY AASHTO T-180 D.
- ALL WATER PIPE SHALL BE LAID WITH A MINIMUM OF 5 FEET OF COVER OF APPROVED MATERIALS.
- ALL HYDRANT LOCATIONS ARE TO BE APPROVED BY FIRE DEPARTMENT.
- RESULTS FROM PRESSURE TESTING AND DISINFECTION SHALL BE FURNISHED TO THE DIRECTOR OF PUBLIC WORKS FOR APPROVAL PRIOR TO WATER BEING TURNED ON
- ALL WORK SHALL BE IN CONFORMANCE WITH THE WEIR RIVER WATER SYSTEM STANDARDS.
- ALL PERMITS REQUIRED FOR STREET OPENINGS AND WATER MAIN TAPPING MUST BE OBTAINED.
- NO WATER WILL BE TURNED ON IN THE PROJECT WITHOUT WEIR RIVER WATER SYSTEM APPROVAL.



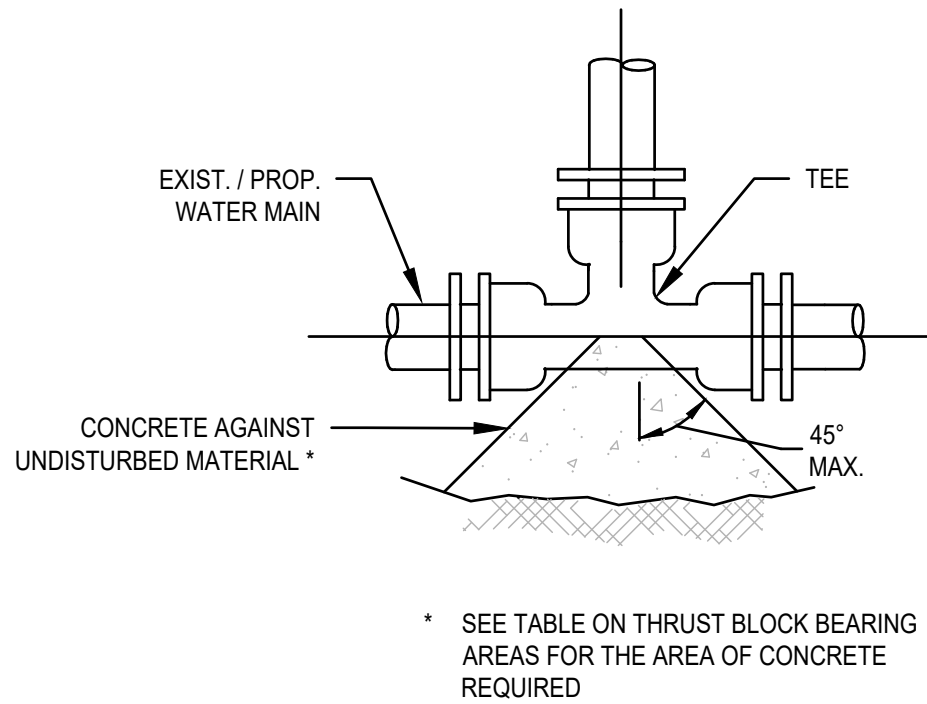
TYPICAL TAPPING SLEEVE AND VALVE DETAIL
SCALE: N.T.S.



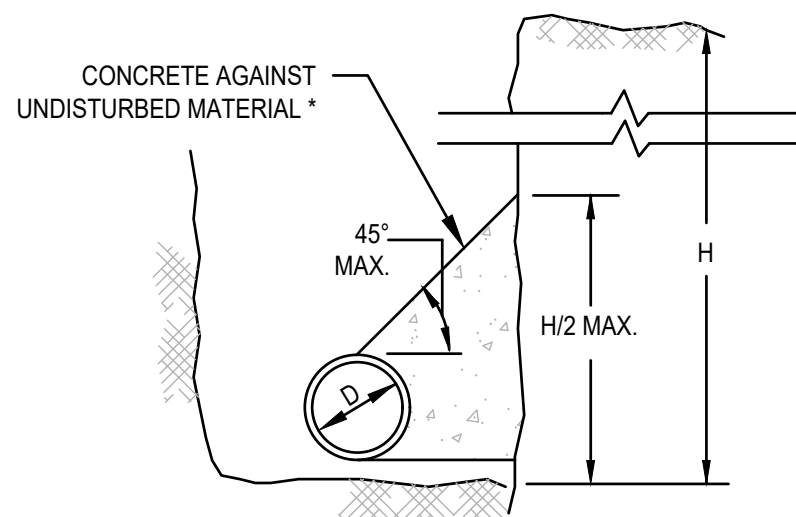
SERVICE CONNECTION DETAIL
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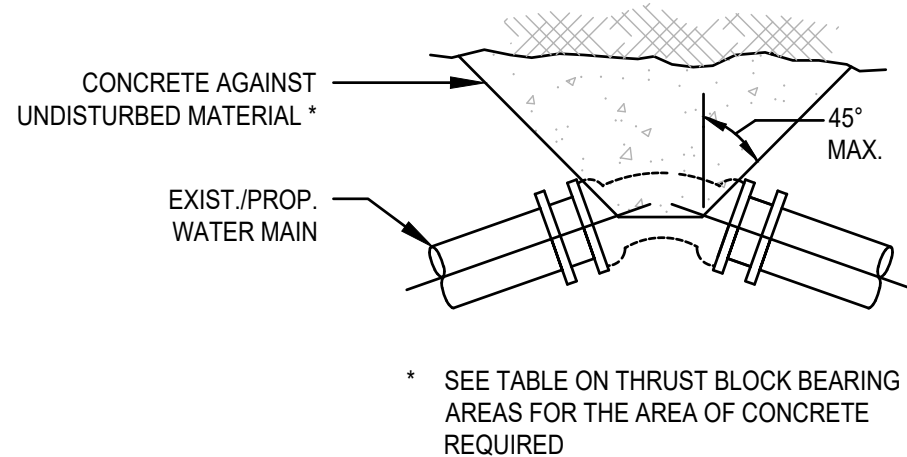
THRUST WATER MAIN PLUG
SCALE: N.T.S.



TYPICAL WATER MAIN TEE THRUST BLOCK DETAIL
SCALE: N.T.S.



THRUST WATER MAIN THRUST BLOCK SECTION DETAIL
SCALE: N.T.S.



THRUST WATER MAIN BEND THRUST BLOCK DETAIL
SCALE: N.T.S.

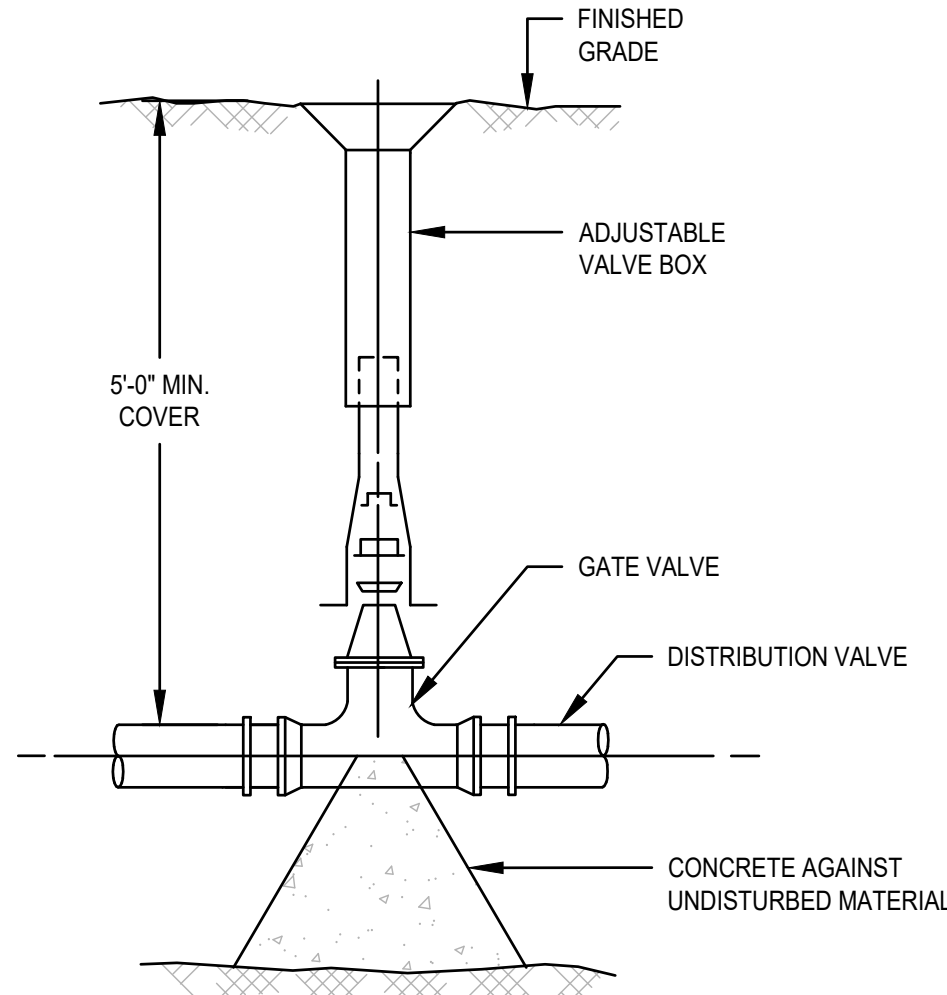
NOTES:

- FOR FITTINGS WITH LESS THAN 45° DEFLECTION, USE BEARING AREAS FOR 45° BEND.
- BEARING AREAS BASED ON HORIZONTAL PASSIVE SOIL PRESSURE OF 2000 P.S.F. AND INTERNAL WATER PRESSURE OF 150 P.S.I.G. JOINTS SHALL NOT BE ENCASED IN CONCRETE. BEARING AREAS MAY BE DREGARDED FOR TRENCHES IN ROCK WHERE THE TOP OF THE ROCK FACE IS AT OR ABOVE THE CROWN OF THE PIPE. HOWEVER, CONCRETE BACKING SHALL BE PLACED BETWEEN THE PIPE AND THE ROCK FACE.
- THE CONTRACTOR SHALL SUBMIT 2 WEEKS IN ADVANCE OF PLACEMENT, WORKING DRAWINGS FOR EACH THRUST BLOCK TO THE ENGINEER FOR APPROVAL PRIOR TO INSTALLATION.
- ALL VALVES AND FITTINGS SHALL BE RODDED TOGETHER.

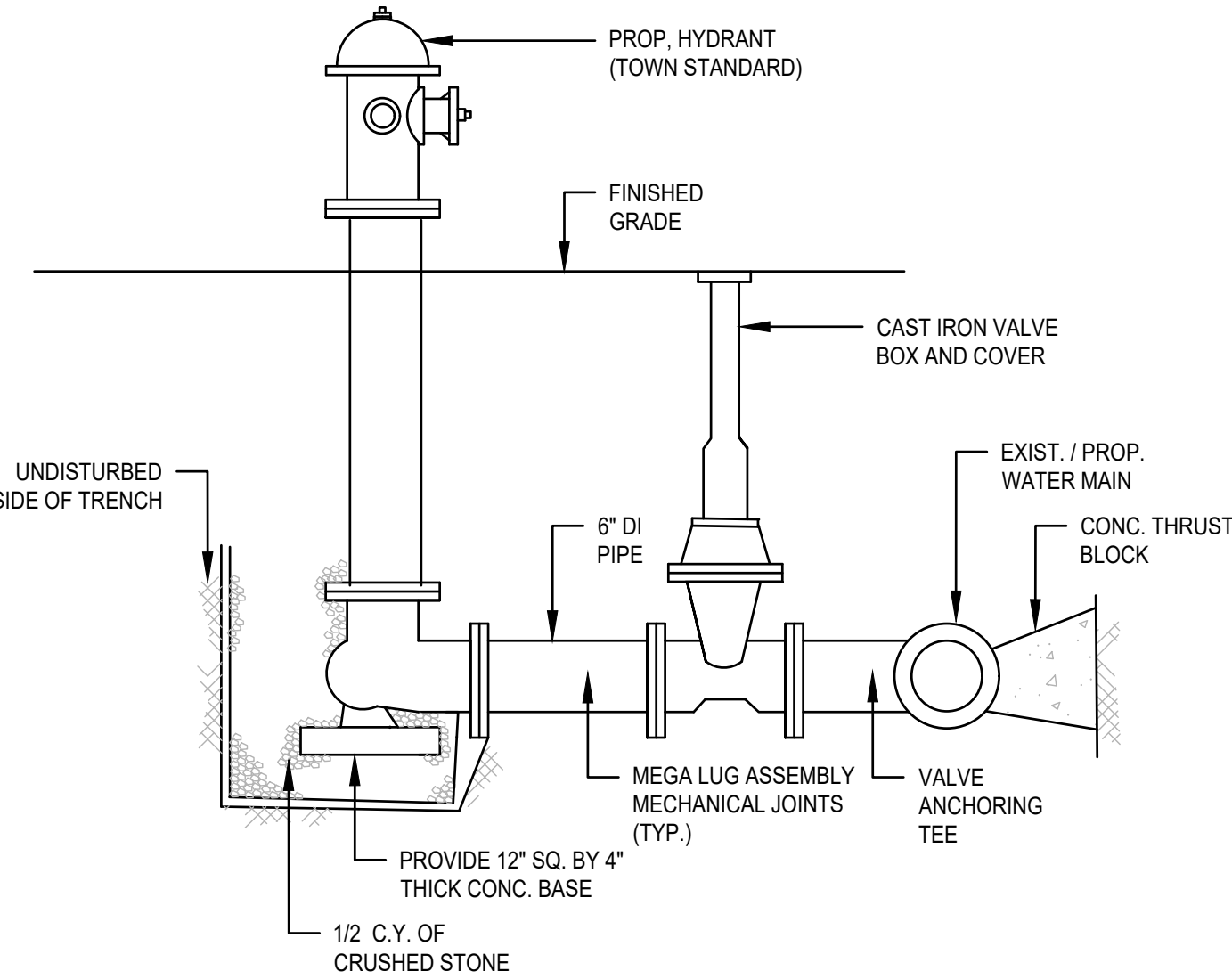
ASSUMPTIONS:

* TYPE OF SOIL IS MEDIUM CLAYEY, 6 OR MORE BLOWS PER FOOT, OR LOOSE GRANULAR, 9 OR MORE BLOWS PER FOOT. SOIL CONDITIONS OTHER THAN THOSE GIVEN WILL REQUIRE LARGER BEARING AREAS.

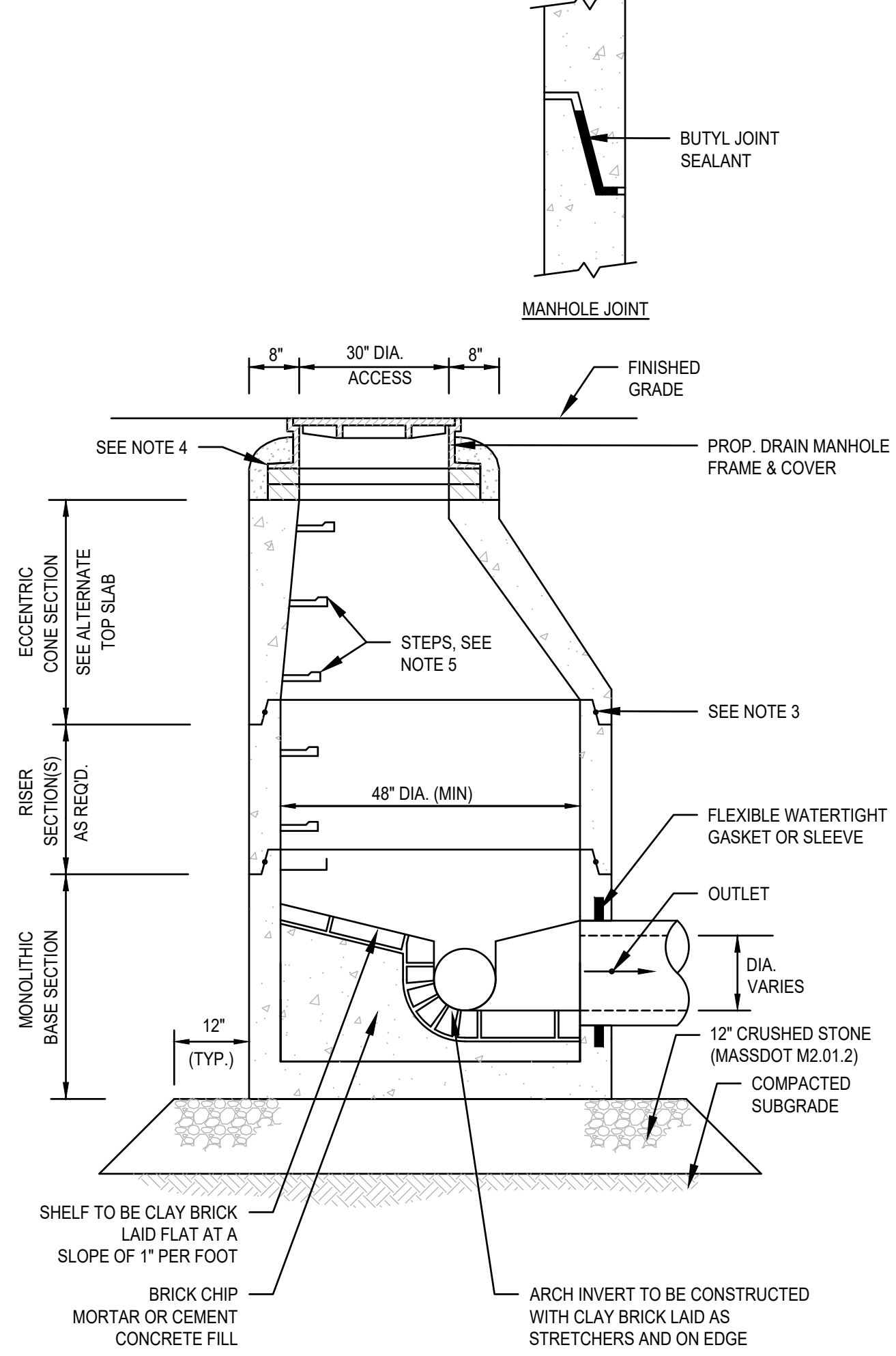
THRUST BLOCK DETAILS
SCALE: N.T.S.



WATER GATE DETAIL
SCALE: N.T.S.



HYDRANT DETAIL
SCALE: N.T.S.



NOTES:

- ALL SECTIONS SHALL BE DESIGNED FOR HS-20 LOADING.
- PROVIDE "V" KNOCKOUTS FOR PIPES WITH 2" MAX. CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.
- ALL EXTERIOR SURFACES SHALL BE GIVEN TWO COATS OF BITUMINOUS WATER-PROOFING MATERIAL. JOINT SEALANT BETWEEN PRECAST SECTIONS SHALL BE PERFORMED BUTYL RUBBER.
- SEWER MANHOLE FRAME AND COVER SHALL BE SET IN FULL MORTAR BED. ADJUST TO GRADE WITH CLAY BRICK AND MORTAR (2 BRICK COURSES TYPICALLY, 5 BRICK COURSES MAXIMUM).
- COPOLYMER MANHOLE STEPS SHALL BE INSTALLED AT 12" O.C. FOR THE FULL DEPTH OF THE STRUCTURE.

TYPICAL SEWER MANHOLE
SCALE: N.T.S.

BY	APP	DESCRIPTION	DATE	REV
SEB	BCM	NEW SHEET	6/8/26	9
		C.C. NO. SUBMISSION		

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PROFESSIONAL ENGINEER:



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Sheet 7 of 10

DWG. NO:
C-11

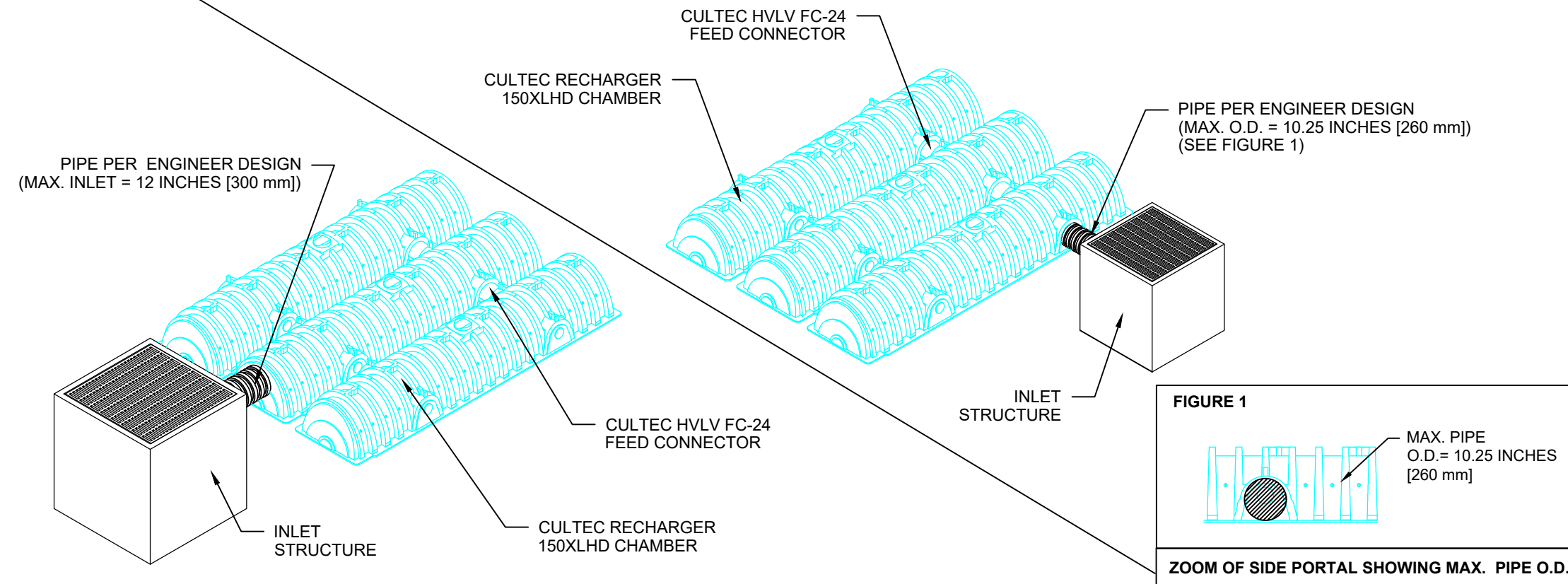
CULTEC RECHARGER® 150XLHD SPECIFICATIONS

GENERAL
CULTEC RECHARGER® 150XLHD CHAMBERS ARE DESIGNED FOR UNDERGROUND STORMWATER MANAGEMENT. THE CHAMBERS MAY BE USED FOR RETENTION, RECHARGING, DETENTION OR CONTROLLING THE FLOW OF ON-SITE STORMWATER RUNOFF.

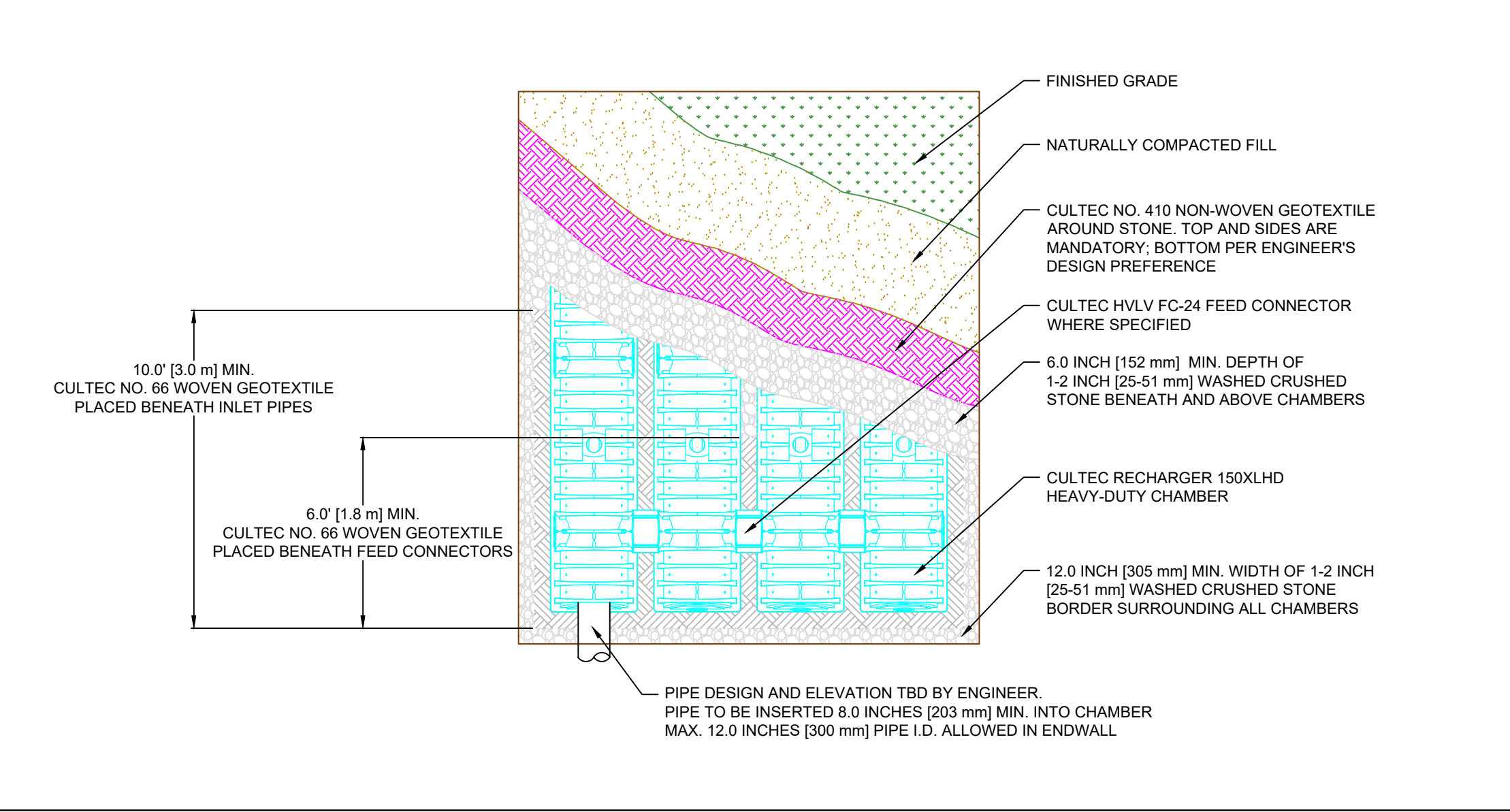
CHAMBER PARAMETERS

1. THE CHAMBERS WILL BE MANUFACTURED IN THE U.S.A. BY CULTEC, INC. OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
2. THE CHAMBER WILL BE VACUUM THERMOFORMED OF BLACK HIGH MOLECULAR WEIGHT HIGH DENSITY POLYETHYLENE (HMWHDPE.)
3. THE CHAMBER WILL BE ARCHED IN SHAPE.
4. THE CHAMBER WILL BE OPEN-BOTTOMED.
5. THE CHAMBER WILL BE JOINED USING AN INTERLOCKING OVERLAPPING RIB METHOD. CONNECTIONS MUST BE FULLY SHOULDERED OVERLAPPING RIBS, HAVING NO SEPARATE COUPLINGS OR SEPARATE END WALLS.
6. THE NOMINAL CHAMBER DIMENSIONS OF THE CULTEC RECHARGER 150XLHD SHALL BE 18.5 INCHES (470 mm) TALL, 33 INCHES (838 mm) WIDE AND 11 FEET (3.35 m) LONG. THE INSTALLED LENGTH OF A JOINED RECHARGER 150XLHD SHALL BE 10.25 FEET (3.12 m).
7. MAXIMUM INLET OPENING ON THE CHAMBER ENDWALL IS 12 INCHES (305 mm).
8. THE CHAMBER WILL HAVE TWO SIDE PORTALS TO ACCEPT CULTEC HVLV® FC-24 FEED CONNECTORS TO CREATE AN INTERNAL MANIFOLD. THE NOMINAL INSIDE DIMENSIONS OF EACH SIDE PORTAL WILL BE 8.5 INCHES (216 mm) HIGH BY 12 INCHES (304 mm) WIDE. MAXIMUM ALLOWABLE OUTER DIAMETER (O.D.) PIPE SIZE IN THE SIDE PORTAL IS 10.25 INCHES (260 mm).
9. THE NOMINAL CHAMBER DIMENSIONS OF THE CULTEC HVLV® FC-24 FEED CONNECTOR SHALL BE 12 INCHES (305 mm) TALL, 16 INCHES (406 mm) WIDE AND 24.2 INCHES (615 mm) LONG.
10. THE NOMINAL STORAGE VOLUME OF THE RECHARGER 150XLHD CHAMBER WILL BE 2.650 FT³ / FT (0.246 m³ / m) - WITHOUT STONE. THE NOMINAL STORAGE VOLUME OF A JOINED RECHARGER 150XLHD SHALL BE 27.16 FT³ / UNIT (0.77 m³ / UNIT) - WITHOUT STONE.
11. THE NOMINAL STORAGE VOLUME OF THE HVLV® FC-24 FEED CONNECTOR WILL BE 0.913 FT³ / FT (0.085 m³ / m) - WITHOUT STONE.
12. THE RECHARGER 150XLHD CHAMBER WILL HAVE THIRTY DISCHARGE HOLES BORED INTO THE SIDEWALLS OF THE UNITS CORE TO PROMOTE LATERAL CONVEYANCE OF WATER.
13. THE RECHARGER 150XLHD CHAMBER SHALL HAVE 20 CORRUGATIONS.
14. THE ENDWALL OF THE CHAMBER, WHEN PRESENT, WILL BE AN INTEGRAL PART OF THE CONTINUOUSLY FORMED UNIT. SEPARATE END PLATES CANNOT BE USED WITH THIS UNIT.
15. THE RECHARGER 150XLHD STAND ALONE UNIT MUST BE FORMED AS A WHOLE CHAMBER HAVING TWO FULLY FORMED INTEGRAL ENDWALLS AND HAVING NO SEPARATE END PLATES OR SEPARATE END WALLS.
16. THE RECHARGER 150XLHD STARTER UNIT MUST BE FORMED AS A WHOLE CHAMBER HAVING ONE FULLY FORMED INTEGRAL ENDWALL AND ONE PARTIALLY FORMED INTEGRAL ENDWALL WITH A LOWER TRANSFER OPENING OF 10 INCHES (254 mm) HIGH X 20.5 INCHES (521 mm) WIDE.
17. THE RECHARGER 150XLHD INTERMEDIATE UNIT MUST BE FORMED AS A WHOLE CHAMBER HAVING ONE FULLY OPEN ENDWALL AND ONE PARTIALLY FORMED INTEGRAL ENDWALL WITH A LOWER TRANSFER OPENING OF 10 INCHES (254 mm) HIGH X 20.5 INCHES (521 mm) WIDE.
18. THE HVLV® FC-24 FEED CONNECTOR MUST BE FORMED AS A WHOLE CHAMBER HAVING TWO OPEN END WALLS AND HAVING NO SEPARATE END PLATES OR SEPARATE END WALLS. THE UNIT WILL FIT INTO THE SIDE PORTALS OF THE RECHARGER 150XLHD AND ACT AS CROSS FEED CONNECTIONS.
19. THE CHAMBERS MUST HAVE HORIZONTAL STIFFENING FLEX REDUCTION STEPS BETWEEN THE RIBS.
20. CHAMBERS MUST HAVE HORIZONTAL STIFFENING FLEX REDUCTION STEPS BETWEEN THE RIBS.
21. HEAVY DUTY UNITS ARE DESIGNATED BY A COLORED STRIPE FORMED INTO THE PART ALONG THE LENGTH OF THE CHAMBER.
22. THE CHAMBER WILL HAVE A RAISED INTEGRAL CAP AT THE TOP OF THE ARCH IN THE CENTER OF EACH UNIT TO BE USED AS AN OPTIONAL INSPECTION PORT OR CLEAN-OUT.
23. THE UNITS MAY BE TRIMMED TO CUSTOM LENGTHS BY CUTTING BACK TO ANY CORRUGATION.
24. THE CHAMBER SHALL BE MANUFACTURED IN AN ISO 9001:2008 CERTIFIED FACILITY.
25. THE CHAMBER WILL BE DESIGNED TO WITHSTAND TRAFFIC LOADS WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS.
26. MAXIMUM ALLOWED COVER OVER TOP OF UNIT SHALL BE 12 FEET (3.65 m).

GENERAL NOTES



CULTEC TYPICAL INLET CONNECTION



CULTEC RECHARGER 150XLHD HEAVY DUTY PLAN VIEW

CULTEC HVLV® FC-24 FEED CONNECTOR PRODUCT SPECIFICATIONS

GENERAL
CULTEC HVLV® FC-24 FEED CONNECTORS ARE DESIGNED TO CREATE AN INTERNAL MANIFOLD FOR CULTEC RECHARGER 150XLHD STORMWATER CHAMBERS.

CHAMBER PARAMETERS

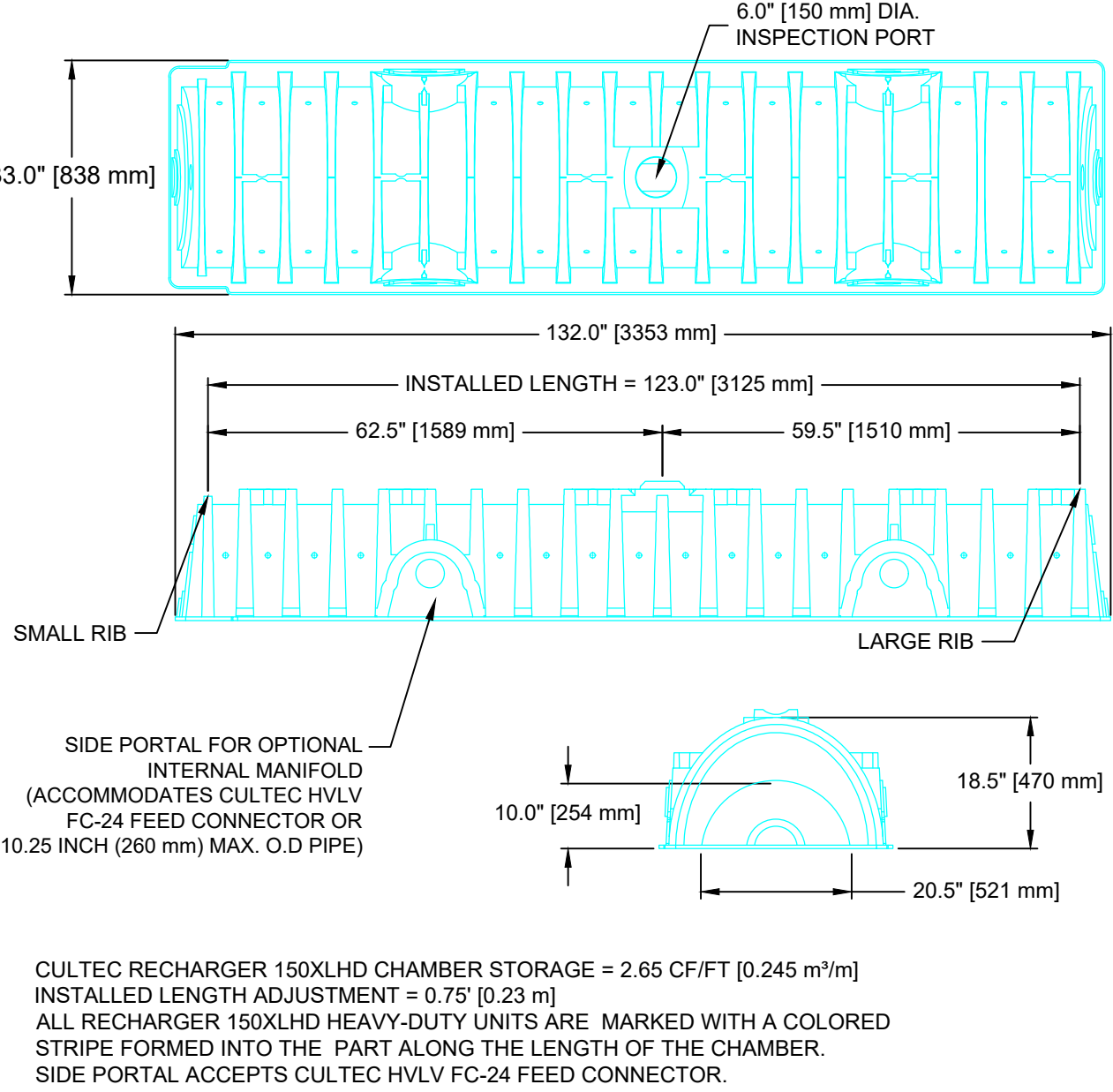
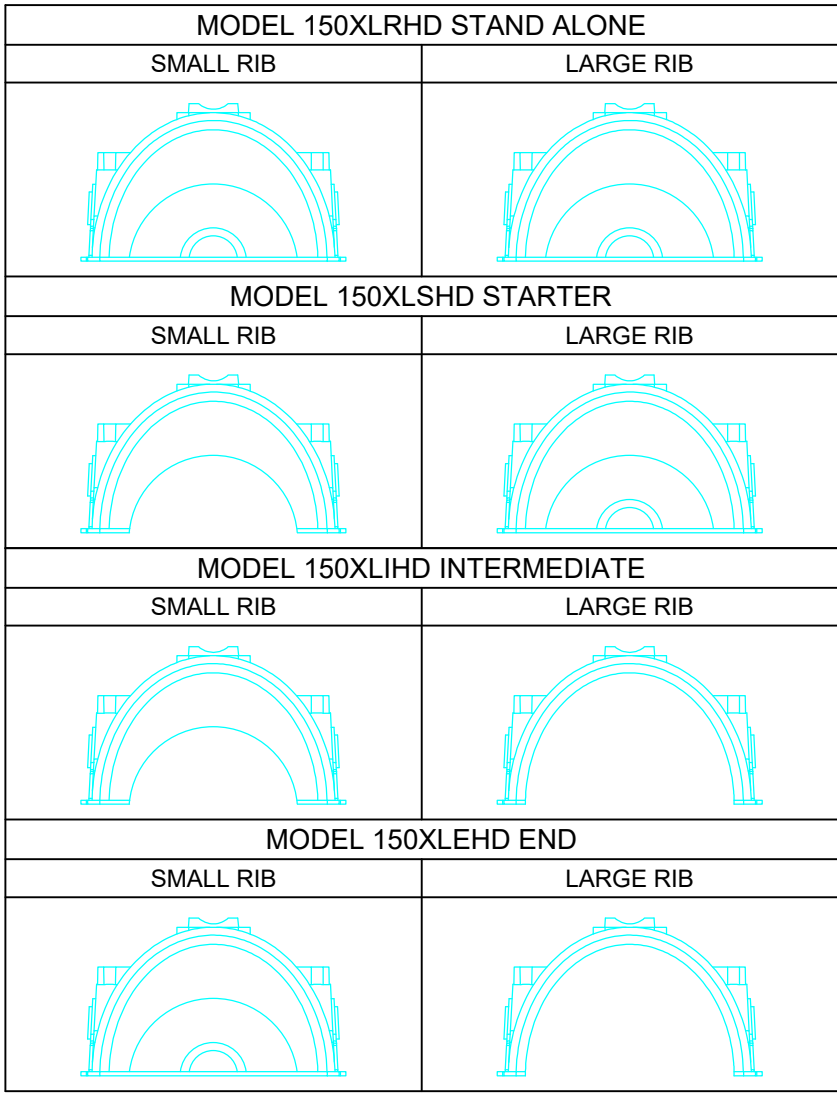
1. THE CHAMBERS WILL BE MANUFACTURED BY CULTEC, INC. OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
2. THE CHAMBER WILL BE VACUUM THERMOFORMED OF BLACK HIGH MOLECULAR WEIGHT HIGH DENSITY POLYETHYLENE (HMWHDPE).
3. THE CHAMBER WILL BE ARCHED IN SHAPE.
4. THE CHAMBER WILL BE OPEN-BOTTOMED.
5. THE NOMINAL CHAMBER DIMENSIONS OF THE CULTEC HVLV® FC-24 FEED CONNECTOR SHALL BE 12 INCHES (305 mm) TALL, 16 INCHES (406 mm) WIDE AND 24.2 INCHES (615 mm) LONG.
6. THE NOMINAL STORAGE VOLUME OF THE HVLV® FC-24 FEED CONNECTOR WILL BE 0.913 FT³ / FT (0.085 m³ / m) - WITHOUT STONE.
7. THE HVLV® FC-24 FEED CONNECTOR CHAMBER SHALL HAVE 2 CORRUGATIONS.
8. THE HVLV® FC-24 FEED CONNECTOR MUST BE FORMED AS A WHOLE CHAMBER HAVING TWO OPEN END WALLS AND HAVING NO SEPARATE END PLATES OR SEPARATE END WALLS. THE UNIT WILL FIT INTO THE SIDE PORTALS OF THE CULTEC RECHARGER STORMWATER CHAMBER AND ACT AS CROSS FEED CONNECTIONS CREATING AN INTERNAL MANIFOLD.
9. THE CHAMBER WILL BE DESIGNED TO WITHSTAND TRAFFIC LOADS WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS.
10. THE CHAMBER SHALL BE MANUFACTURED IN AN ISO 9001:2008 CERTIFIED FACILITY.

CULTEC NO. 66™ WOVEN GEOTEXTILE

GENERAL

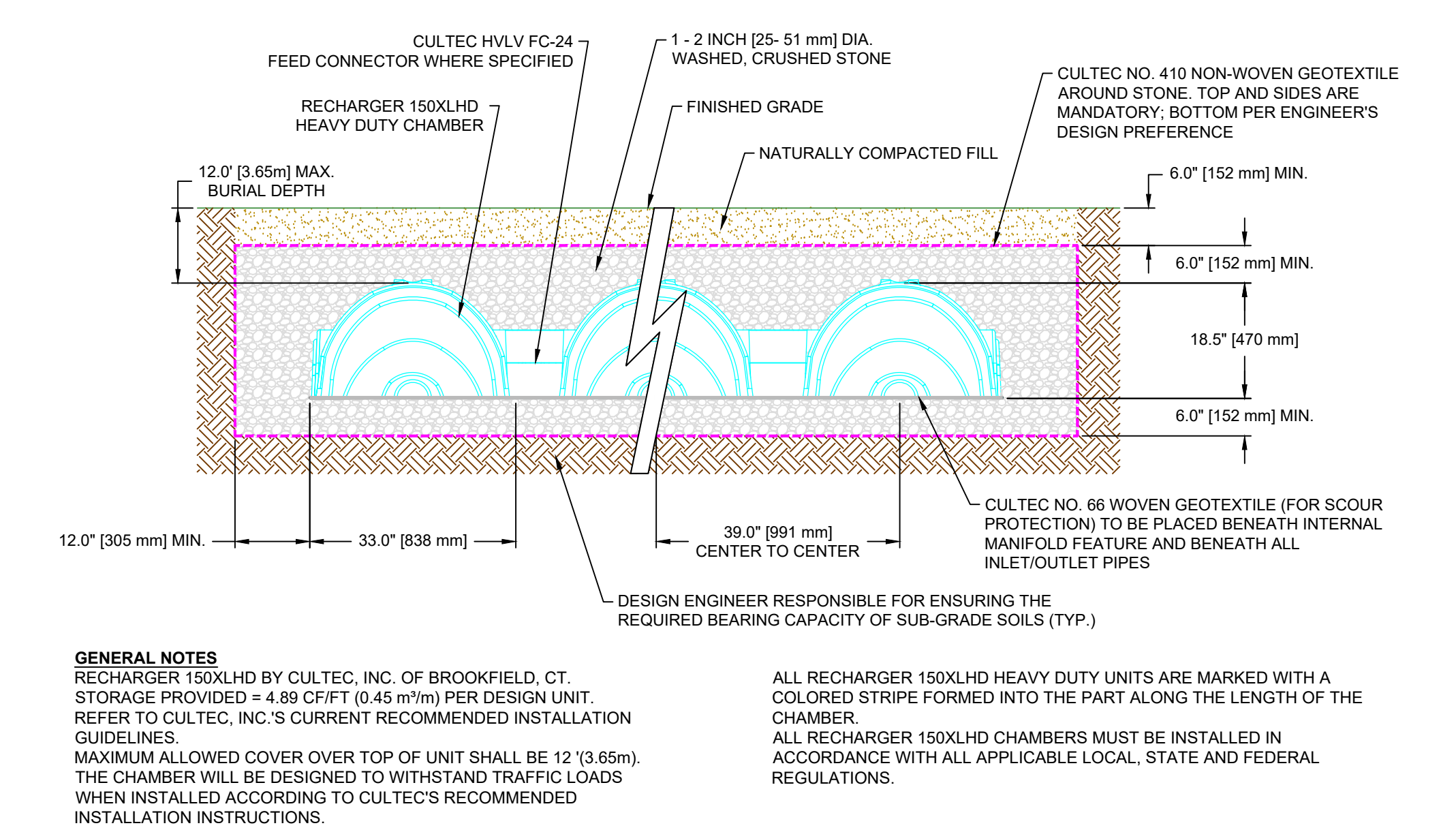
1. THE WOVEN GEOTEXTILE IS UTILIZED AS AN UNDERLAYMENT TO PREVENT SCOURING CAUSED BY WATER MOVEMENT WITHIN THE CULTEC CHAMBERS AND FEED CONNECTORS UTILIZING THE CULTEC MANIFOLD FEATURE.
2. THE GEOTEXTILE SHALL BE PROVIDED BY CULTEC, INC. OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
3. THE GEOTEXTILE SHALL BE BLACK IN APPEARANCE.
4. THE GEOTEXTILE SHALL HAVE A TENSILE STRENGTH OF 315 LBS (1.40kN) PER ASTM D4832 TESTING METHOD.
5. THE GEOTEXTILE SHALL HAVE A TENSILE ELONGATION RESISTANCE OF 15% PER ASTM D4832 TESTING METHOD.
6. THE GEOTEXTILE SHALL HAVE A MULLEN BURST RESISTANCE OF 600PSI (4138 KPA) PER ASTM D3786 TESTING METHOD.
7. THE GEOTEXTILE SHALL HAVE A TEAR RESISTANCE OF 115 LBS (0.51 kN) PER ASTM D4832 TESTING METHOD.
8. THE GEOTEXTILE SHALL HAVE A PUNCTURE RESISTANCE OF 150 LBS (0.66 kN) PER ASTM D4832 TESTING METHOD.
9. THE GEOTEXTILE SHALL HAVE A CBR PUNCTURE RESISTANCE OF 900 LBS (4.00 kN) PER ASTM D6241 TESTING METHOD.
10. THE GEOTEXTILE SHALL HAVE A UV RESISTANCE OF 70% @ 500 HRS. PER ASTM D4355 TESTING METHOD.
11. THE GEOTEXTILE SHALL HAVE A PERMITTIVITY RATING OF 0.05 SEC-1 PER ASTM D4491 TESTING METHOD.
12. THE GEOTEXTILE SHALL HAVE A WATER FLOW RATING OF 4 GPM/FT² (160 LPM/M²) PER ASTM D4491 TESTING METHOD.
13. THE GEOTEXTILE SHALL HAVE A PERCENT OPEN AREA OF <1% PER CW-02215 TESTING METHOD.
14. THE GEOTEXTILE SHALL HAVE AN APPARENT OPENING SIZE OF 40 US STD. SIEVE (0.425 mm) PER ASTM D4751 TESTING METHOD.
15. THE GEOTEXTILE SHALL CONSIST OF A 100% HIGH-TENACITY, SLT-FILM POLYPROPYLENE YARN.

GEOTEKSTILE PARAMETERS



CULTEC RECHARGER 150XLHD CHAMBER STORAGE = 2.65 CF/FT [0.245 m³/m]
INSTALLED LENGTH ADJUSTMENT = 0.75' [0.23 m]
ALL RECHARGER 150XLHD HEAVY-DUTY UNITS ARE MARKED WITH A COLORED STRIPE FORMED INTO THE PART ALONG THE LENGTH OF THE CHAMBER.
SIDE PORTAL ACCEPTS CULTEC HVLV FC-24 FEED CONNECTOR.

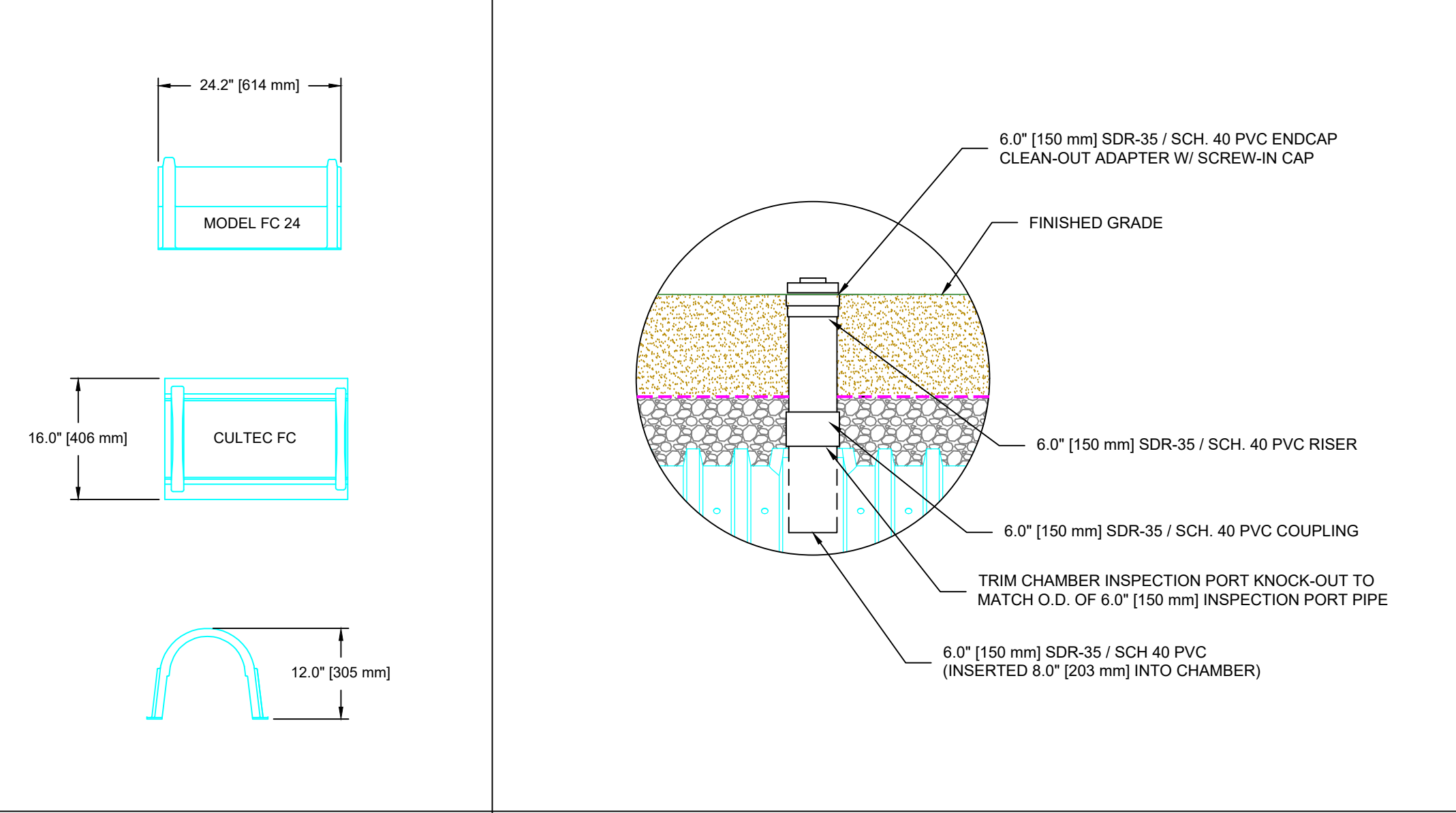
CULTEC RECHARGER 150XLHD HEAVY DUTY THREE VIEW



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.

CULTEC RECHARGER 150XLHD HEAVY DUTY TYPICAL CROSS SECTION



CULTEC HVLV FC-24 FEED CONNECTOR THREE VIEW

OPTIONAL INSPECTION PORT - ZOOM DETAIL

LARGE RIB END DETAIL

SMALL RIB END DETAIL

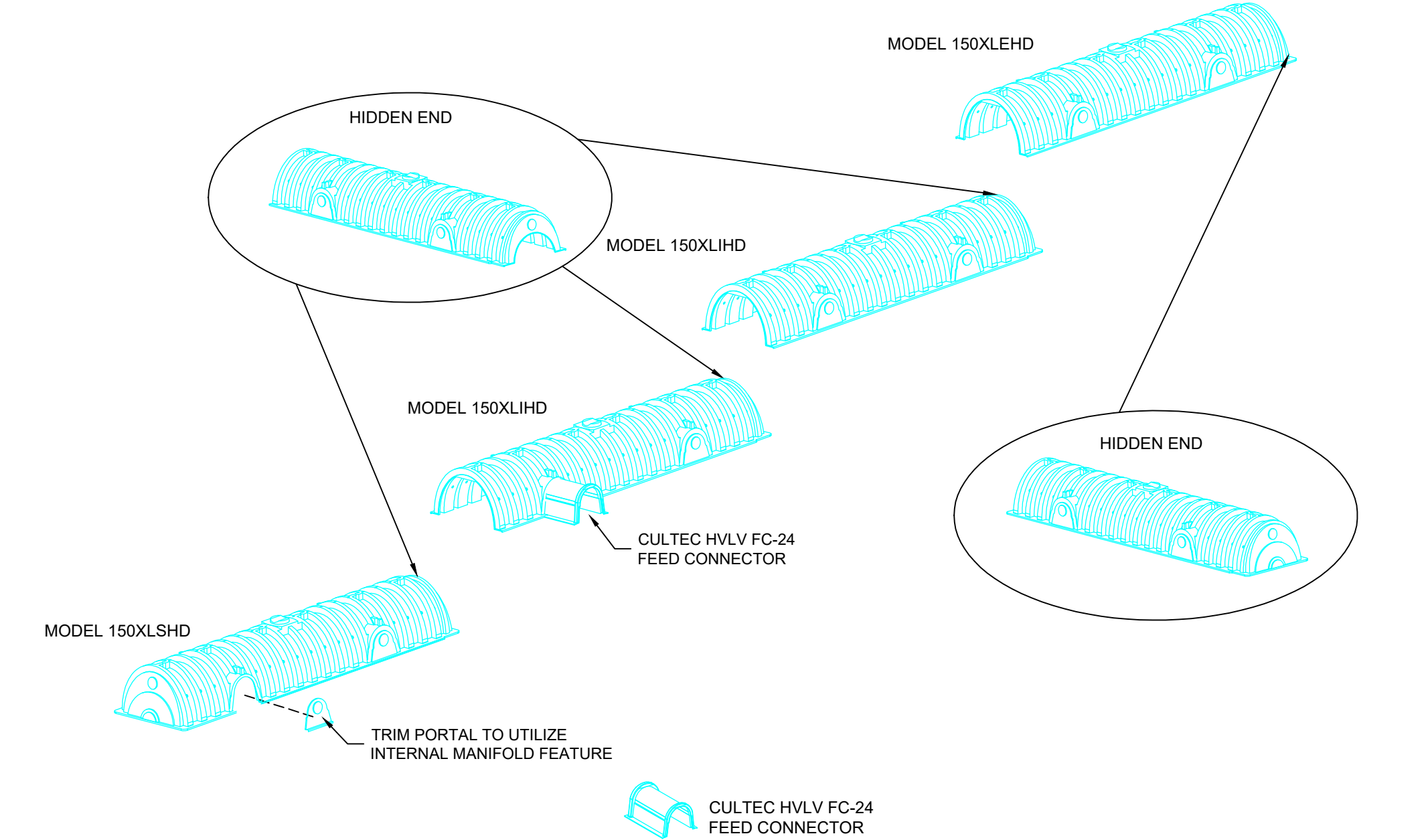
MODEL 150XLRHD STAND ALONE UNITS ARE USED AS SINGLE STAND ALONE SECTIONS.

MODEL 150XLHD STARTER UNITS ARE USED TO BEGIN A LINE.

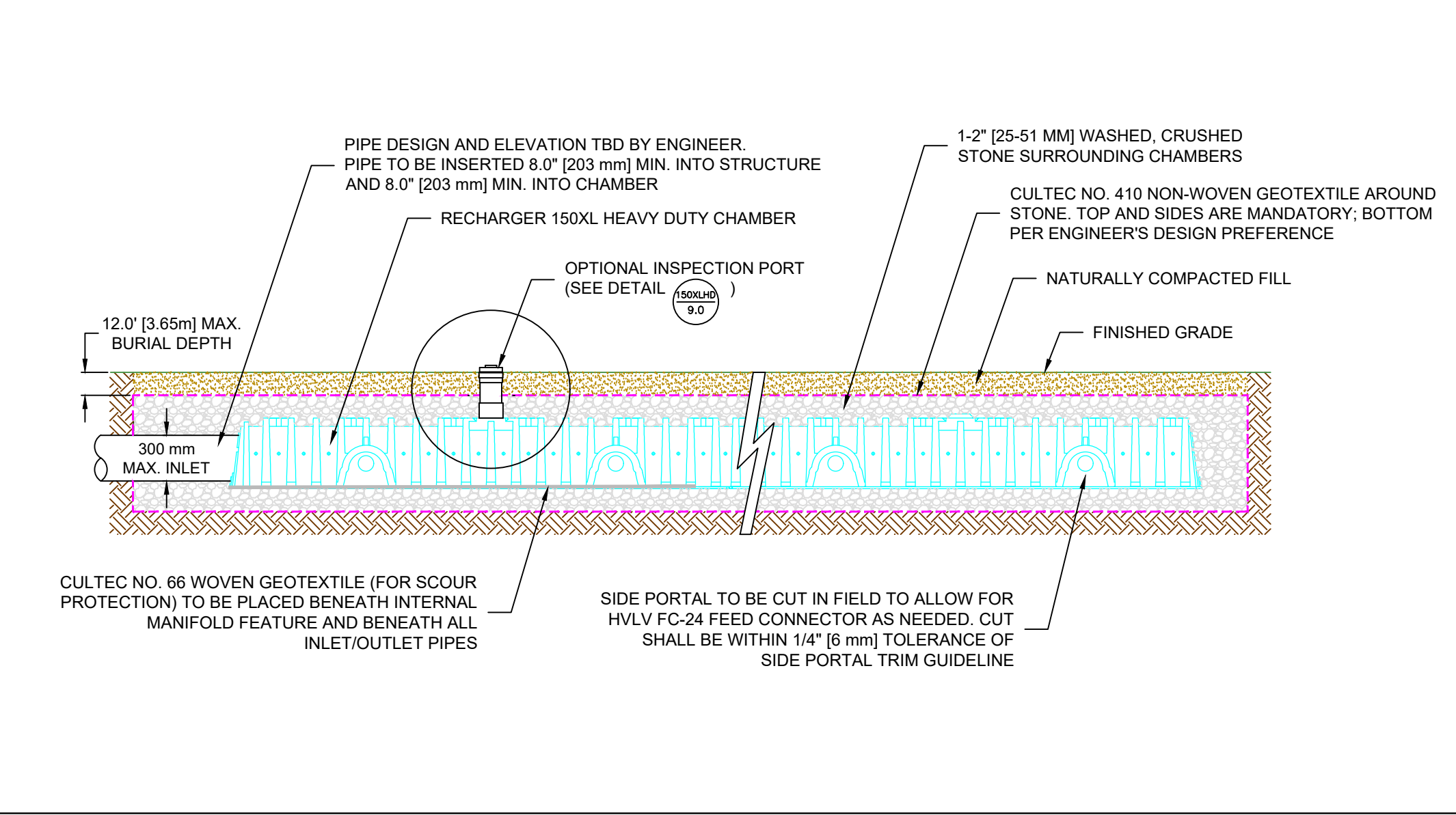
MODEL 150XLHD INTERMEDIATE UNITS ARE USED AS MIDDLE SECTIONS TO EXTEND THE LENGTH OF A LINE.

MODEL 150XLEHD UNITS ARE USED TO END THE LENGTH OF A LINE.

CULTEC RECHARGER 150XLHD HEAVY DUTY END DETAIL INFORMATION



CULTEC RECHARGER 150XLHD HEAVY DUTY TYPICAL INTERLOCK



CULTEC INTERNAL MANIFOLD - OPTIONAL INSPECTION PORT DETAIL



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tech@cultec.com

THIS DRAWING WAS PREPARED TO SUPPORT THE DESIGN ENGINEER FOR THE PROPOSED SYSTEM. IT IS THE ULTIMATE RESPONSIBILITY OF THE DESIGN ENGINEER TO ASSURE THAT THE STORMWATER SYSTEM'S DESIGN IS IN FULL COMPLIANCE WITH ALL APPLICABLE LAWS AND REGULATIONS. IT IS THE DESIGN ENGINEER'S RESPONSIBILITY TO ENSURE THAT THE CULTEC PRODUCTS ARE DESIGNED IN ACCORDANCE WITH CULTEC'S MINIMUM REQUIREMENTS. CULTEC INC. DOES NOT APPROVE PLANS, SIZING, OR SYSTEM DESIGNS. THE DESIGNING ENGINEER IS RESPONSIBLE FOR ALL DESIGN DECISIONS.

RECHARGER 150XLHD
DETAIL SHEET
NON-TRAFFIC APPLICATION

CULTEC RECHARGER® 150XLHD

PROJECT NO:	DATE:	02/2016
DESIGNED BY: CULTEC, INC	DRAWN BY:	TECH
SCALE: N.T.S.	SHEET NO:	C-12

CULTEC RECHARGER® 300HD SPECIFICATIONS GENERAL CULTEC RECHARGER® 300HD CHAMBERS ARE DESIGNED FOR UNDERGROUND STORMWATER MANAGEMENT. THE CHAMBERS MAY BE USED FOR RETENTION, RECHARGING, DETENTION OR CONTROLLING THE FLOW OF ON-SITE STORMWATER RUNOFF.			CULTEC HVLV FC-24 FEED CONNECTOR PRODUCT SPECIFICATIONS GENERAL CULTEC HVLV FC-24 FEED CONNECTORS ARE DESIGNED TO CREATE AN INTERNAL MANIFOLD FOR CULTEC RECHARGER MODEL 300HD STORMWATER CHAMBERS.			CULTEC RECHARGER 300HD HEAVY DUTY THREE VIEW CULTEC RECHARGER 300HD HEAVY DUTY END CAP THREE VIEW					
CHAMBER PARAMETERS 1. THE CHAMBERS SHALL BE MANUFACTURED IN THE U.S.A. BY CULTEC, OF BROOKFIELD, CT (CULTEC.COM, 203-775-4416). 2. THE CHAMBERS SHALL BE DESIGNED AND TESTED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". THE LOAD CONFIGURATION SHALL INCLUDE: A. INSTANTANEOUS AASHTO DESIGN TRUCK LIVE LOAD AT MINIMUM COVER B. MAXIMUM PERMANENT (50-YEAR) COVER LOAD C. 1-WEEK PARKED AASHTO DESIGN TRUCK LOAD 3. THE CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418 "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS". 4. THE INSTALLED CHAMBER SYSTEM SHALL PROVIDE RESISTANCE TO THE LOADS AND LOAD FACTORS AS DEFINED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12, WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS. THE STRUCTURAL DESIGN OF THE CHAMBERS SHALL INCLUDE THE FOLLOWING: A. THE CREEP MODULUS SHALL BE 50-YEAR AS SPECIFIED IN ASTM F2418 B. THE MINIMUM SAFETY FACTOR FOR LIVE LOADS SHALL BE 1.75 C. THE MINIMUM SAFETY FACTOR FOR DEAD LOADS SHALL BE 1.95 5. THE INSTALLED CHAMBER SYSTEM SHALL BE STRUCTURALLY DESIGNED TO PROVIDE RESISTANCE TO LIVE LOADS AS DEFINED BY THE AASHTO H-20/HL-93 SPECIFICATION WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS. 6. THE CHAMBER SHALL BE INJECTION MOLDED OF BLUE VIRGIN IMPACT-MODIFIED POLYPROPYLENE. 7. THE CHAMBER SHALL BE ARCHED IN SHAPE. 8. THE CHAMBER SHALL BE OPEN-BOTTOMED. 9. THE CHAMBER SHALL BE JOINED USING AN INTERLOCKING OVERLAPPING RIB METHOD. CONNECTIONS MUST BE FULLY SHOULDERED OVERLAPPING RIBS, HAVING NO SEPARATE COUPLINGS. 10. THE NOMINAL CHAMBER DIMENSIONS OF THE CULTEC RECHARGER® 300HD SHALL BE 30 INCHES (762 MM) TALL, 51 INCHES (1295 MM) WIDE AND 90.5 INCHES (2299 MM) LONG. THE INSTALLED LENGTH OF A JOINED RECHARGER® 300HD SHALL BE 7.08 FEET (2.159 M). 11. MULTIPLE CHAMBERS MAY BE CONNECTED TO FORM DIFFERENT LENGTH ROWS. EACH ROW SHALL BEGIN AND END WITH A SEPARATELY FORMED CULTEC RECHARGER® 300HD END CAP. MAXIMUM INLET OPENING ON THE END CAP IS 24 INCHES (600 MM) HDPE. 12. THE CHAMBER SHALL HAVE TWO SIDE PORTALS TO ACCEPT CULTEC HVLV™ FC-24 FEED CONNECTORS TO CREATE AN INTERNAL MANIFOLD. MAXIMUM ALLOWABLE PIPE SIZE IN THE SIDE PORTAL IS 10 INCHES (250 MM) HDPE AND 12 INCHES (300 MM) PVC. 13. THE NOMINAL CHAMBER DIMENSIONS OF THE CULTEC HVLV™ FC-24 FEED CONNECTOR SHALL BE 12 INCHES (305 MM) TALL, 16 INCHES (406 MM) WIDE AND 24.2 INCHES (615 MM) LONG. 14. THE NOMINAL STORAGE VOLUME OF THE RECHARGER® 300HD CHAMBER SHALL BE 6.53 FT³ / FT (607 M³ / M) - WITHOUT STONE. THE NOMINAL STORAGE VOLUME OF A JOINED RECHARGER® 300HD SHALL BE 46.27 FT³ / UNIT (1,310 M³ / UNIT) - WITHOUT STONE. 15. THE RECHARGER 300HD CHAMBER SHALL HAVE 14 CORRUGATIONS. 16. THE CHAMBER SHALL BE CAPABLE OF ACCEPTING A 6 INCH (150 MM) INSPECTION PORT OPENING AT THE TOP CENTER OF EACH CHAMBER, CENTERED ON THE CORRUGATION CREST. 17. THE CHAMBER SHALL BE MANUFACTURED IN A FACILITY EMPLOYING CULTEC'S QUALITY CONTROL AND ASSURANCE PROCEDURES. 18. MAXIMUM ALLOWABLE COVER OVER THE TOP OF THE CHAMBER SHALL BE 12.0 FEET (3.66 M).			CHAMBER PARAMETERS 1. THE CHAMBERS SHALL BE MANUFACTURED IN THE U.S.A. BY CULTEC, OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832) 2. THE CHAMBER SHALL BE VACUUM THERMOFORMED OF HIGH MOLECULAR WEIGHT HIGH DENSITY POLYETHYLENE (HMWHDPE) WITH A BLACK INTERIOR AND BLUE EXTERIOR. 3. THE CHAMBER SHALL BE ARCHED IN SHAPE. 4. THE CHAMBER SHALL BE OPEN-BOTTOMED. 5. THE NOMINAL CHAMBER DIMENSIONS OF THE CULTEC HVLV FC-24 FEED CONNECTOR SHALL BE 12 INCHES (305 mm) TALL, 16 INCHES (406 mm) WIDE AND 24.2 INCHES (614 mm) LONG. 6. THE NOMINAL STORAGE VOLUME OF THE HVLV FC-24 FEED CONNECTOR SHALL BE 0.913 FT³ / FT (0.085 m³ / m) - WITHOUT STONE. 7. THE HVLV FC-24 FEED CONNECTOR CHAMBER SHALL HAVE 2 CORRUGATIONS. 8. THE HVLV FC-24 FEED CONNECTOR MUST BE FORMED AS A WHOLE CHAMBER HAVING TWO OPEN END WALLS AND HAVING NO SEPARATE END PLATES OR SEPARATE END WALLS. THE UNIT SHALL FIT INTO THE SIDE PORTALS OF THE CULTEC RECHARGER STORMWATER CHAMBER AND ACT AS CROSS FEED CONNECTIONS CREATING AN INTERNAL MANIFOLD. 9. THE CHAMBER SHALL BE DESIGNED TO WITHSTAND TRAFFIC LOADS WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS. 10. THE CHAMBER SHALL BE MANUFACTURED IN AN ISO 9001:2015 CERTIFIED FACILITY.			CULTEC NO. 410™ NON-WOVEN GEOTEXTILE CULTEC NO. 410™ NON-WOVEN GEOTEXTILE MAY BE USED WITH CULTEC CONTACTOR® AND RECHARGER® STORMWATER INSTALLATIONS TO PROVIDE A BARRIER THAT PREVENTS SOIL INTRUSION INTO THE STONE. GEOTEXTILE PARAMETERS 1. THE GEOTEXTILE SHALL BE PROVIDED BY CULTEC, OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832) 2. THE GEOTEXTILE SHALL BE BLACK IN APPEARANCE. 3. THE GEOTEXTILE SHALL HAVE A TYPICAL WEIGHT OF 4.5 OZ/SY (142 G/M). 4. THE GEOTEXTILE SHALL HAVE A TENSILE STRENGTH VALUE OF 120 LBS (533 N) PER ASTM D4632 TESTING METHOD. 5. THE GEOTEXTILE SHALL HAVE AN ELONGATION @ BREAK VALUE OF 50% PER ASTM D4632 TESTING METHOD. 6. THE GEOTEXTILE SHALL HAVE A MULLEN BURST VALUE OF 225 PSI (1551 KPA) PER ASTM D3786 TESTING METHOD. 7. THE GEOTEXTILE SHALL HAVE A PUNCTURE STRENGTH VALUE OF 65 LBS (289 N) PER ASTM D4833 TESTING METHOD. 8. THE GEOTEXTILE SHALL HAVE A CBR PUNCTURE VALUE OF 340 LBS (1513 N) PER ASTM D6241 TESTING METHOD. 9. THE GEOTEXTILE SHALL HAVE A TRAPEZOID TEAR VALUE OF 50 LBS (222 N) PER ASTM D4533 TESTING METHOD. 10. THE GEOTEXTILE SHALL HAVE A AOS VALUE OF 70 U.S. SIEVE (0.212 MM) PER ASTM D4751 TESTING METHOD. 11. THE GEOTEXTILE SHALL HAVE A PERMITTIVITY VALUE OF 1.7 SEC-1 PER ASTM D4491 TESTING METHOD. 12. THE GEOTEXTILE SHALL HAVE A WATER FLOW RATE VALUE OF 135 GAL/MIN/SF (5500 L/MIN/SM) PER ASTM D4491 TESTING METHOD. 13. THE GEOTEXTILE SHALL HAVE A UV STABILITY @ 500 HOURS VALUE OF 70% PER ASTM D4355 TESTING METHOD.			CULTEC RECHARGER 300HD HEAVY DUTY CROSS SECTION CULTEC RECHARGER 300HD HEAVY DUTY TYPICAL INTERLOCK		
END CAP PARAMETERS 1. THE CULTEC RECHARGER® 300HD END CAP (REFERRED TO AS 'END CAP') SHALL BE MANUFACTURED IN THE U.S.A. BY CULTEC, OF BROOKFIELD, CT (CULTEC.COM, 203-775-4416). 2. THE END CAP SHALL BE INJECTION MOLDED OF BLUE VIRGIN IMPACT-MODIFIED POLYETHYLENE COPOLYMERS. 3. THE END CAP SHALL BE ARCHED IN SHAPE. 4. THE END CAP SHALL BE JOINED AT THE BEGINNING AND END OF EACH ROW OF CHAMBERS USING AN INTERLOCKING OVERLAPPING RIB METHOD. CONNECTIONS MUST BE FULLY SHOULDERED OVERLAPPING RIBS, HAVING NO SEPARATE COUPLINGS. 5. THE NOMINAL DIMENSIONS OF THE END CAP SHALL BE 29.3 INCHES (744 MM) TALL, 45.9 INCHES (1166 MM) WIDE AND 12.2 INCHES (310 MM) LONG. WHEN JOINED WITH A RECHARGER 300HD CHAMBER, THE INSTALLED LENGTH OF THE END CAP SHALL BE 9.6 INCHES (244 MM). THE NOMINAL STORAGE VOLUME OF THE END CAP SHALL BE 3.32 FT³ / FT (0.31 M³ / M) - WITHOUT STONE. THE NOMINAL STORAGE VOLUME OF AN INTERLOCKED END CAP SHALL BE 2.66 FT³ / UNIT (0.08 M³ / UNIT) - WITHOUT STONE. 6. MAXIMUM INLET OPENING ON THE END CAP IS 24 INCHES (600 MM) HDPE. 7. THE CHAMBER SHALL BE MANUFACTURED IN A FACILITY EMPLOYING CULTEC'S QUALITY CONTROL AND ASSURANCE PROCEDURES. 8. THE END CAP SHALL PROVIDE RESISTANCE TO THE LOADS AND LOAD FACTORS AS DEFINED IN THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SECTION 12.12.			CULTEC RECHARGER 300HD HEAVY DUTY CROSS SECTION CULTEC RECHARGER 300HD HEAVY DUTY TYPICAL INTERLOCK			CULTEC RECHARGER 300HD HEAVY DUTY CROSS SECTION CULTEC RECHARGER 300HD HEAVY DUTY TYPICAL INTERLOCK					
GENERAL NOTES 1. THE TYPICAL INVERT TABLE ABOVE IS BASED ON THE INSIDE DIAMETER OF STANDARD CORRUGATED PLASTIC PIPE. THE HEAVY DUTY END CAP HAS PRE-MARKED TRIM LINES FOR PIPE DIAMETERS 6" (150mm), 8" (200mm), 10" (250mm), 12" (300mm), 15" (375mm), 18" (450mm) AND 24" (600mm). PIPES OF ANY SIZE AND MATERIAL UP TO 24" (600mm) MAY BE PLACED AT CUSTOM LOCATIONS AND CUSTOM INVERTS. THE CROWN OF THE PIPE MUST REMAIN A MINIMUM OF 3" (75mm) FROM THE EDGE OF THE HEAVY DUTY END CAP.			CULTEC HVLV FC-24 FEED CONNECTOR THREE VIEW OPTIONAL CULTEC INSPECTION PORT - ZOOM DETAIL			CULTEC RECHARGER 300HD HEAVY DUTY CROSS SECTION CULTEC RECHARGER 300HD HEAVY DUTY TYPICAL INTERLOCK					
CULTEC RECHARGER 300HD TYPICAL PIPE INVERTS CULTEC HVLV FC-24 FEED CONNECTOR THREE VIEW OPTIONAL CULTEC INSPECTION PORT - ZOOM DETAIL			CULTEC RECHARGER 300HD HEAVY DUTY CROSS SECTION CULTEC RECHARGER 300HD HEAVY DUTY TYPICAL INTERLOCK			CULTEC RECHARGER 300HD HEAVY DUTY CROSS SECTION CULTEC RECHARGER 300HD HEAVY DUTY TYPICAL INTERLOCK					

SCALE:	N.T.S.	SHEET NO:	C-14
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CONSTRUCTION SEQUENCE

TO PREVENT EXCESSIVE EROSION AND SILTING, THE FOLLOWING CONSTRUCTION SEQUENCE COUPLED WITH OTHER WIDELY ACCEPTED PRINCIPALS FOR REDUCING EROSION AND SEDIMENTATION SHALL BE IMPLEMENTED IN THE DEVELOPMENT OF THE SITE.

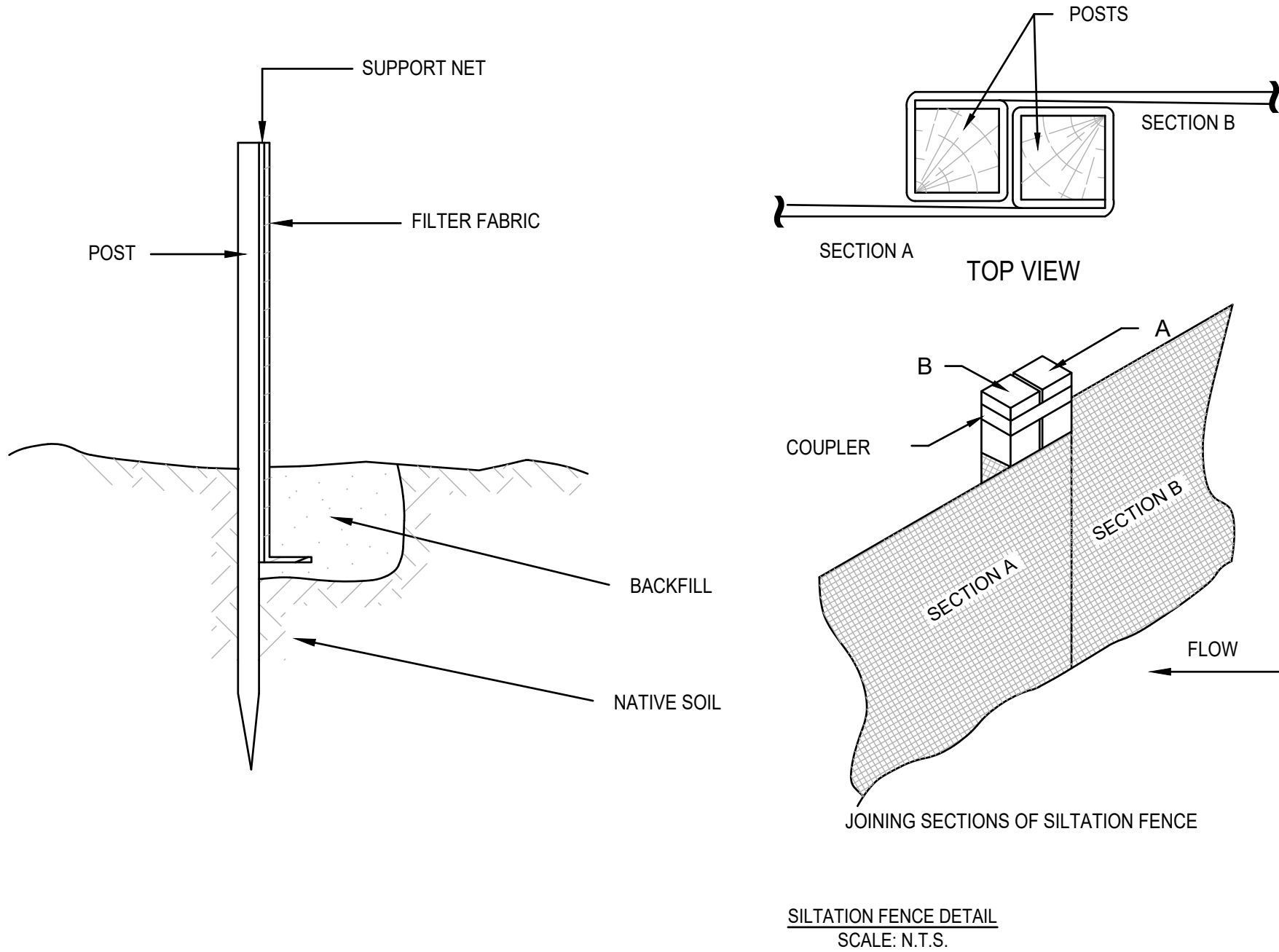
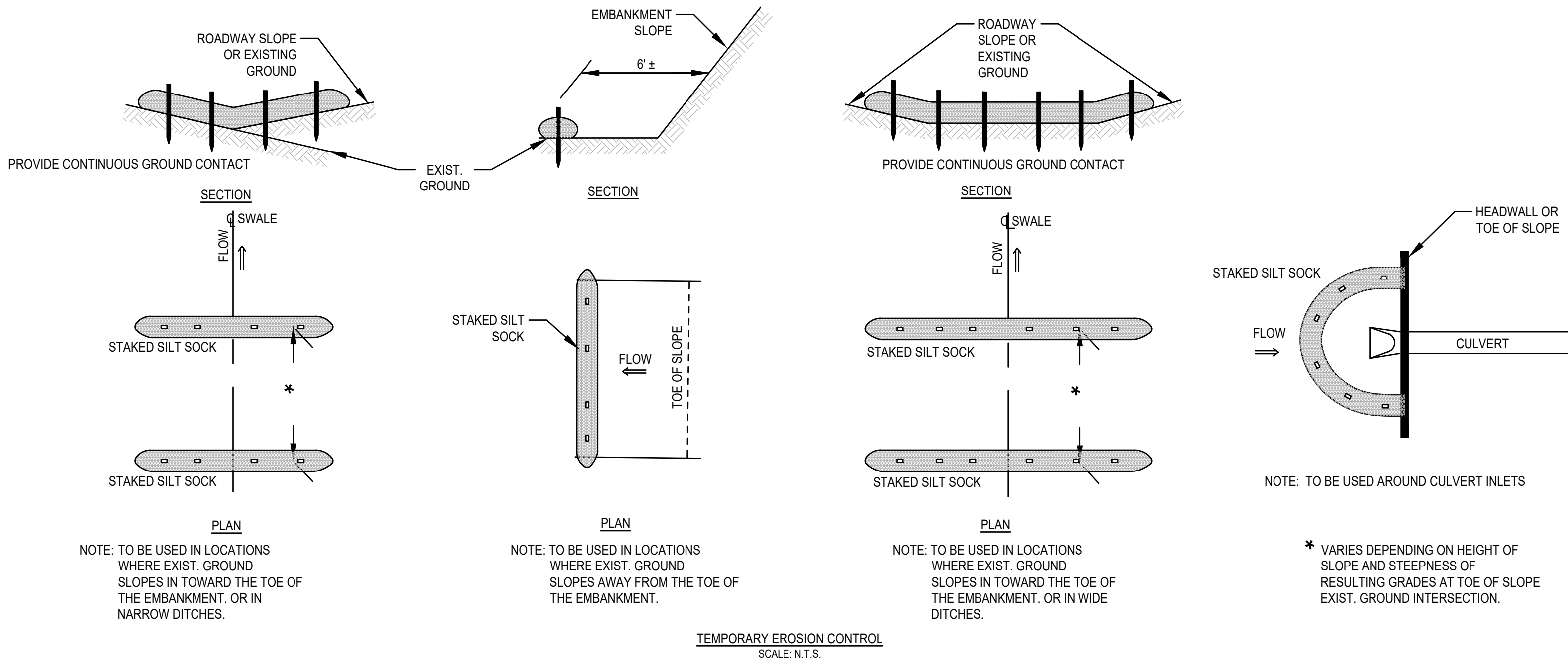
1. THE CONTRACTOR SHALL COORDINATE A PRE-CONSTRUCTION MEETING PRIOR TO ANY CONSTRUCTION ACTIVITY.
2. STABILIZATION PRACTICES FOR EROSION AND SEDIMENT CONTROL SHALL BE INSTALLED PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES. REFER TO "EROSION AND SEDIMENTATION CONTROL" SECTION OF THIS PLAN. PLACE SILTATION FENCE AND STRAWBALE BARRIERS AT LOCATIONS INDICATED ON THE SITE PLANS.
3. CLEAR AND GRUB UP AS REQUIRED FOR THE CONSTRUCTION OF THE ROADWAY AND RELATED INFRASTRUCTURE.
4. CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE AT WARD STREET.
5. EXCAVATE TOPSOIL AND SUBSOIL FROM CUT AND FILL AREAS AND STOCKPILE ON SITE IN LOCATIONS SHOWN ON THE PLAN. CONSIDERATION SHOULD BE GIVEN TO LOCATING STOCKPILES ON THE UPHILL SIDE OF DISTURBED AREAS, WHERE POSSIBLE, TO ACT AS TEMPORARY DIVERSIONS.
6. CONSTRUCT CUT AND FILL AREAS, INSTALLING STRAWBALE CHECK DAMS AT TOES OF ALL 3:1 OR GREATER SLOPES, AND AT ENDS OF ALL CUT AREAS. ALL FILL WILL BE INSTALLED USING 12" MAXIMUM COMPACTION LIFTS. PLACE ALL SLOPE PROTECTION WHERE INDICATED ON THE PLAN.
7. INSTALL CLOSED DRAINAGE SYSTEM AND OTHER UTILITIES. ALL CATCH BASINS SHALL BE COVERED WITH SILTSACK OR EQUIVALENT INLET PROTECTION.
8. GRADE ROADWAY TO SUBGRADE ELEVATION AND CONSTRUCT SIDE SLOPES. APPLY TEMPORARY STABILIZATION MEASURES WHERE WARRANTED. REFER TO "EROSION AND SEDIMENT CONTROL" SECTION OF THIS PLAN.
9. PLACE GRAVEL SUBBASE PER CONSTRUCTION DRAWINGS.
10. PLACE THE BITUMINOUS CONCRETE BINDER COURSE ON ROADWAYS.
11. GRADE SLOPES AND STABILIZE CUT AREAS AT TOE OF SLOPES. BLEND ALL SLOPES INTO EXISTING TOPOGRAPHY AND LOAM AND SEED ALL DISTURBED AREAS. SLOPES GREATER THAN 3:1 SHALL BE STABILIZED WITH JUTE MESH.
12. PLACE THE FINAL WEARING COURSE OF PAVEMENT.
13. COMPLETE FINE GRADING OF SHOULDERS AND PLACE PAVEMENT IN MISCELLANEOUS AREAS.
14. REMOVE TEMPORARY EROSION CONTROL DEVICES ONCE ADEQUATE GROWTH IS ESTABLISHED. ADEQUATE GROWTH IS DEFINED AS VEGETATION COVERING 75% OR MORE OF THE GROUND SURFACE.

EROSION AND SEDIMENTATION CONTROL

1. REFER TO CONSTRUCTION PHASE BEST MANAGEMENT PRACTICES AS SPECIFIED IN "BEST MANAGEMENT PRACTICES OPERATION AND MAINTENANCE PLAN" PREPARED BY MCKENZIE ENGINEERING GROUP, INC. FOR STRUCTURAL STABILIZATION AND DUST CONTROL EROSION AND SEDIMENTATION CONTROL MEASURES.
2. STRUCTURAL PRACTICES UTILIZED FOR THE PROJECT WILL INCLUDE SEDIMENT FENCE/STRAWBALE BARRIER CONTROLS, STABILIZED CONSTRUCTION ENTRANCE, TEMPORARY DIVERSION SWALES WITH STONE CHECK DAMS, SEDIMENT BASINS, AND INLET PROTECTION SUBJECT TO THE TOWN OF HINGHAM CONSERVATION COMMISSION APPROVAL.
3. STABILIZATION PRACTICES UTILIZED FOR THE PROJECT WILL INCLUDE TEMPORARY SEEDING, GEOTEXTILES (JUTE MESH), MULCHING, AND PERMANENT SEEDING.
4. IN GENERAL, THE SMALLEST POSSIBLE AREA OF LAND SHALL BE EXPOSED AT ONE TIME. WHEN LAND IS EXPOSED DURING DEVELOPMENT, THE EXPOSURE SHALL BE CONFINED TO A MAXIMUM PERIOD OF 3 MONTHS. LAND SHALL NOT BE EXPOSED DURING THE WINTER MONTHS. ANY DISTURBED AREAS WHICH ARE TO BE LEFT TEMPORARILY AND THAT WILL BE REGRADED AT A LATER DATE SHALL BE MACHINE STRAW MULCHED AND SEEDED WITH WINTER RYE TO PREVENT EROSION.

CONSTRUCTION PHASE BMP OPERATION AND MAINTENANCE NOTES:

1. REFER TO THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PREPARED UNDER THE E.P.A. GENERAL CONSTRUCTION PERMIT PROVISIONS FOR FURTHER DETAIL OF STRUCTURAL, STABILIZATION, DUST CONTROL AND EROSION AND SEDIMENTATION CONTROL MEASURES.
2. STRUCTURAL PRACTICES UTILIZED FOR THE PROJECT WILL INCLUDE EROSION CONTROL BARRIERS, STABILIZED CONSTRUCTION ENTRANCES, TEMPORARY DIVERSION SWALES WITH CHECK DAMS, SEDIMENT BASINS, AND INLET PROTECTION.
3. STABILIZATION PRACTICES UTILIZED FOR THE PROJECT WILL INCLUDE TEMPORARY SEEDING, GEOTEXTILES (JUTE MESH), MULCHING, AND PERMANENT SEEDING.
4. OPERATOR PERSONNEL MUST INSPECT THE CONSTRUCTION SITE AT LEAST ONCE EVERY 14 CALENDAR DAYS AND WITHIN 24 HOURS OF A STORM EVENT OF 1/2 INCH OR GREATER. THE INSPECTOR SHOULD REVIEW THE EROSION AND SEDIMENT CONTROLS WITH RESPECT TO THE FOLLOWING:
 - A. WHETHER OR NOT THE MEASURE WAS INSTALLED/PERFORMED CORRECTLY.
 - B. WHETHER OR NOT THERE HAS BEEN DAMAGE TO THE MEASURE SINCE IT INSTALLED OR PERFORMED.
 - C. WHAT SHOULD BE DONE TO CORRECT ANY PROBLEMS WITH THE MEASURE.
5. THE INSPECTOR SHALL COMPLETE THE INSPECTION SCHEDULE AND EVALUATION CHECKLIST FOR FINDINGS AND SHOULD REQUEST THE REQUIRED MAINTENANCE OR REPAIR. THE CHECKLIST IS PROVIDED WITHIN THE OPERATION AND MAINTENANCE PLAN.
6. THE TEMPORARY BASINS SHALL BE INSPECTED AND CLEANED IF REQUIRED PRIOR TO ANY PREDICTED LARGE STORM EVENT.

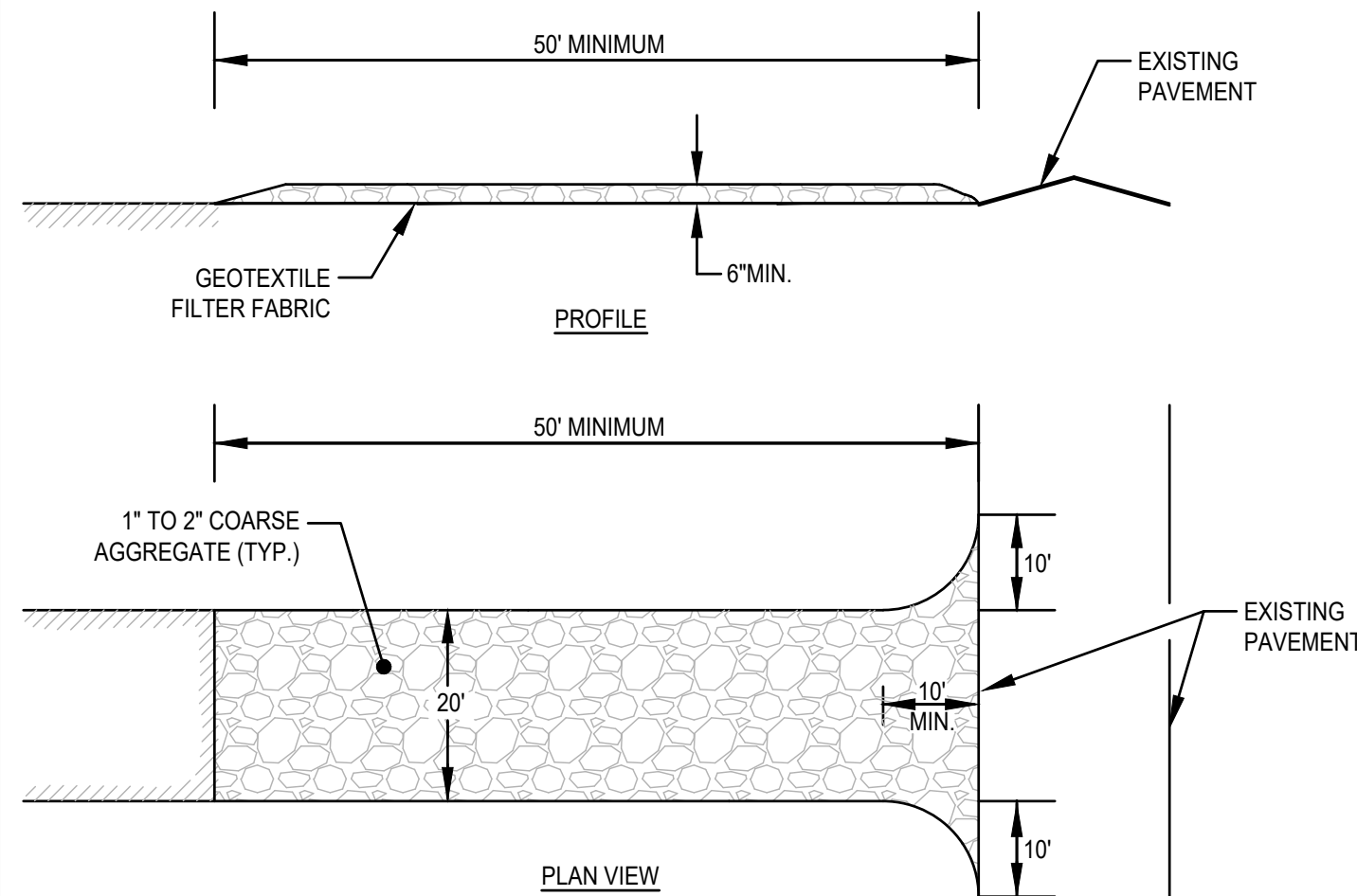


CONSTRUCTION NOTES:

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES.
2. FILTER CLOTH TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6 INCHES AND FOLDED.
4. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

CONSTRUCTION NOTES:

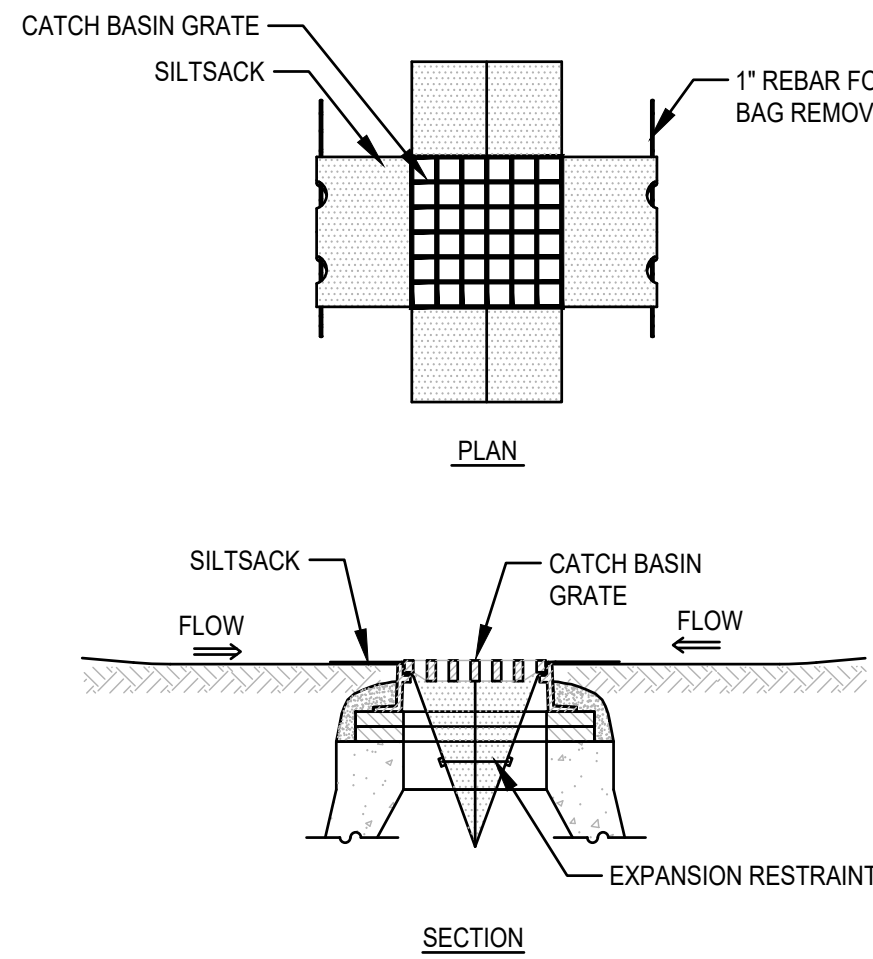
1. BALES SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
2. EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM DEPTH OF 4".
3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY STAKES OR RE-BARS DRIVEN THROUGH THE BALES. THE FIRST STAKE IN EACH BALE SHALL BE ANGLED TOWARD PREVIOUSLY LAID BALE TO FORCE BALES TOGETHER.
4. INSPECTION SHALL BE FREQUENT, AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS REQUIRED.
5. BALES SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS, SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.



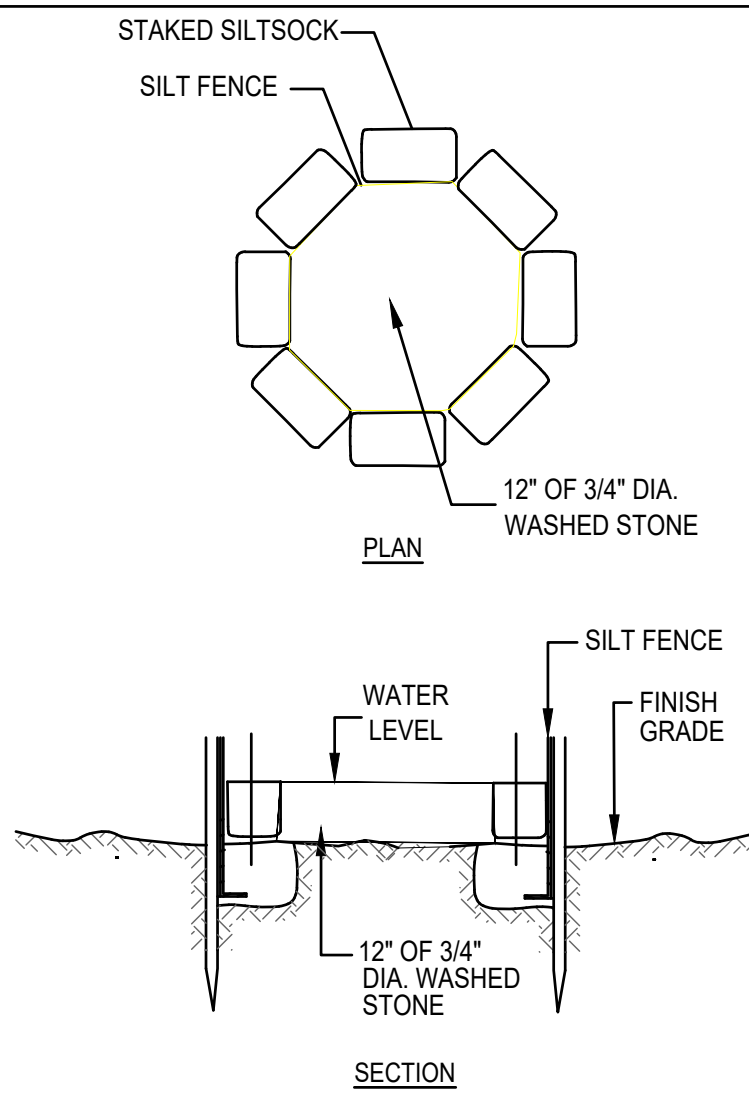
(SCE) CONSTRUCTION SPECIFICATIONS:

1. STONE FOR A STABILIZATION CONSTRUCTION ENTRANCE SHALL BE 1 TO 2 INCH STONE. RECLAIMED STONE.
2. THE LENGTH OF THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 50 FEET, EXCEPT FOR A SINGLE RESIDENTIAL LOT A 30 FOOT MINIMUM LENGTH WOULD APPLY.
3. THE THICKNESS OF THE STONE FOR THE STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
4. THE WIDTH OF THE ENTRANCE SHALL NOT BE LESS THAN A FULL WIDTH OF THE ENTRANCE WHERE INGRESS OR EGRESS OCCURS OR 10 FEET, WHICHEVER IS GREATER.
5. GEOTEXTILE FILTER CLOTH SHALL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE.
6. ALL SURFACE WATER THAT IS FLOWING TO OR DEVERTED TOWARDS THE CONSTRUCTION ENTRANCE SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 5:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOPDRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. SEDIMENT SPILLED, WASHED, OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED PROMPTLY.

STABILIZED CONSTRUCTION ENTRANCE (SCE) DETAIL
SCALE: N.T.S.

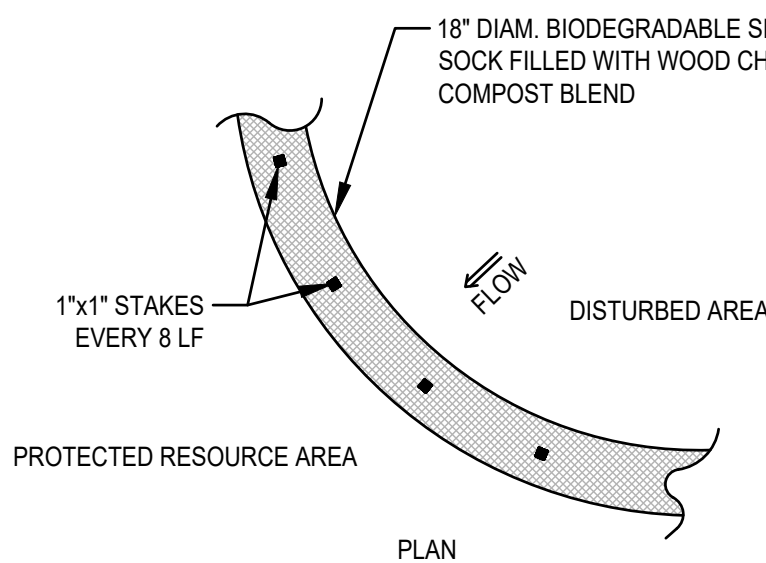


SILTSACK SEDIMENT TRAP
SCALE: N.T.S.



DEWATERING METHODS SHALL BE EMPLOYED IN ANY AREA WHERE PUMPING OF GROUNDWATER IS NECESSARY TO CONSTRUCT THE PROPOSED PARKING LOT AND UTILITIES. DETAILS SHOWN ON THIS PLAN SHALL BE USED AND ANY MODIFICATION SHALL BE APPROVED BY THE TOWN OF PEMBROKE.

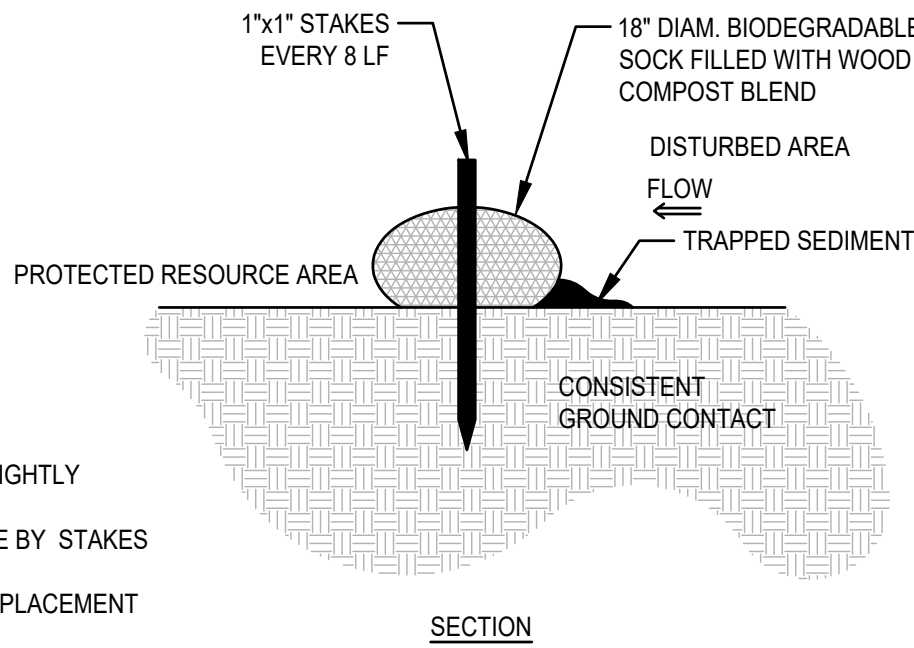
DEWATERING FILTER DETAIL
SCALE: N.T.S.



CONSTRUCTION NOTES:

1. SILT SOCKS SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING OR LAPPING THE ADJACENT SECTIONS.
2. SILT SOCKS SHALL BE SECURELY ANCHORED IN PLACE BY STAKES OR RE-BARS DRIVEN EVERY 8 LF.
3. INSPECTION SHALL BE FREQUENT, AND REPAIR OR REPLACEMENT SHALL BE MADE PROMPTLY AS REQUIRED.
4. SILT SOCKS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFULNESS, SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

SILTSOCK EROSION CONTROL BARRIER DETAIL
SCALE: N.T.S.



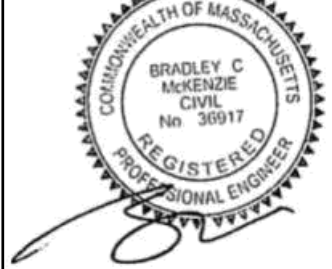
BY	APP	DESCRIPTION	DATE	REV
		NEW SHEET	6/8/26	9
		C.C. NO. SUBMISSION		

MCKENZIE
ENGINEERING GROUP
Assinippi Office Park
150 Longwater Drive, Suite 101
Norwell, MA 02061
Ph: 781-792-3900
www.mckeng.com

COMPREHENSIVE PERMIT PLAN

KNOWN AS
RIVER STONE
(ASSESSORS MAP 124, LOTS 70-75 & LOT 26)
VIKING LANE & WARD STREET
HINGHAM, MASSACHUSETTS

PROFESSIONAL ENGINEER:



APPLICANT:
RIVER STONE, LLC
293R WASHINGTON STREET
NORWELL, MASSACHUSETTS 02061

DRAWN BY: JLS
DESIGNED BY: JLS
CHECKED BY: JLS
APPROVED BY: JLS
DATE: 10/7/2015
SCALE:
PROJECT NO.: 27-135
DWG. TITLE:

Erosion &
Sedimentation
Control Details

DWG. NO:

C-16