

# RIVER MARSH VILLAGE

(Map E-15, LOT 17)

## Comprehensive Permit Plan

in

## Pembroke, Massachusetts



SCALE: 1" = 100'

### Drawing Index:

| No.     | Drawing Title                                  |
|---------|--|
| CS-1    | COVER SHEET                                    |
| CS-2    | GENERAL NOTES, LEGEND, SYMBOLS & ABBREVIATIONS |
| EX-1    | EXISTING CONDITIONS PLANS                      |
| C-1     | PRELIMINARY SITE LAYOUT PLAN                   |
| C-2     | PRELIMINARY GRADING & DRAINAGE PLAN            |
| C-3     | PRELIMINARY UTILITY PLAN                       |
| C-4     | PRELIMINARY PROFILES                           |
| C-5-C-6 | FIRE TRUCK ACCESS PLAN                         |
| C-7-C-8 | DELIVERY TRUCK ACCESS PLAN                     |
| C-9     | PRELIMINARY SIGHT TRIANGLES                    |
| L-1     | PRELIMINARY LANDSCAPE PLAN                     |
| D1-D7   | CONSTRUCTION DETAILS                           |
| ES-1    | EROSION CONTROL DETAILS                        |

September 22, 2016  
Revised May 12, 2017  
Revised July 14, 2017  
Revised November 27, 2018  
Revised January 27, 2021  
Revised April 5, 2021  
Revised June 7, 2021  
Revised June 9, 2021  
Revised August 31, 2021

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

### Applicant:

River Marsh, LLC  
293 R Washington Street  
Norwell, MA 02061

### Engineer/Surveyor:

McKenzie Engineering Group, Inc.  
150 Longwater Drive  
Suite 101  
Norwell, MA 02061

## RIVER MARSH VILLAGE COMPREHENSIVE PERMIT PLAN

(ASSESSOR'S MAP E-15, LOT 17)  
WATER STREET  
PEMBROKE, MASSACHUSETTS



OWNER/APPLICANT:  
RIVER MARSH, LLC  
293 R WASHINGTON STREET  
NORWELL, MASSACHUSETTS 02061

DRAWN BY: SBS  
DESIGNED BY: SBS  
CHECKED BY: BCM  
APPROVED BY: BCM  
DATE: SEPTEMBER 22, 2016  
SCALE: AS NOTED  
PROJECT NO.: 215-181  
DWG. TITLE:

Cover Sheet

DWG. NO:  
**CS-1**

| REV | DATE      | DESCRIPTION  | BY  | APP |
|-----|-----------|--|-----|-----|
| 1   | 5/12/2017 | COMMENTS PER MASSHOUSING                               | SBS | BCM |
| 2   | 7/14/2017 | COMMENTS PER MASSHOUSING                               | SBS | BCM |
| 3   | 1/27/2018 | ZBA APPLICATION  | AJC | BCM |
| 4   | 1/27/2021 | REVISIONS TO WTPP COMPONENT                            | SBS | BCM |
| 5   | 4/5/2021  | MERRILL ENGINEERS PEER REVIEW COMMENTS                 | SBS | BCM |
| 6   | 6/7/2021  | RECONFIGURED WWT, STORMWATER SYSTEM AND BUILDINGS      | SBS | BCM |
| 7   | 6/9/2021  | NO CHANGES THIS SHEET                                  | SBS | BCM |
| 8   | 8/31/2021 | ADDED SIDEWALK, MERRILL ENGINEERS PEER REVIEW COMMENTS | SBS | BCM |

**McKENZIE**  
ENGINEERING GROUP  
Assinippi Office Park  
150 Longwater Drive, Suite 101  
Norwell, MA 02061  
P: 781.792.3900  
F: 781.792.0333  
www.mckeng.com



ABAN ABANDONED  
 ACP ASBESTOS CEMENT PIPE  
 ACCR ACCESSIBLE CURB RAMP  
 AGU ADJUST  
 APPROXIMATE  
 ASPH ASPHALT  
 ACOMP ASPHALT COATED CORRUGATED METAL PIPE  
 B BO  
 BLD BUILDING  
 T CONC BITUMINOUS CONCRETE  
 BM BENCHMARK  
 BDC BOTTOM OF SLOPE  
 CAP CORRUGATED ALUMINUM PIPE  
 CCB CAST BASIN  
 CSC CUT AND CAPPED  
 CBHD CONC. BOUND/DRILL HOLE  
 CBEP/C CRESO/CUTCHEN  
 CIP CAPE CEMENT  
 CIT CAST IRON PIPE  
 CIP CHANGE IN TYPE  
 C C  
 C/C CENTERLINE  
 C/F CHAIN FENCE  
 C/C CLEAN OUT  
 CONC CONCRETE  
 CONC CONDUIT  
 COND CORRUGATED METAL PIPE  
 CPP CORRUGATED POLYETHYLENE PIPE  
 CS COMBINED SEWER  
 CS COMBINED SEWER MANHOLE  
 CSMH CURVERT  
 CLV DELTA ANGLE  
 D DRAIN  
 DCB DOUBLE CATCH BASIN  
 DDC DUCTILE IRON PIPE  
 DMH DRAIN MANHOLE  
 E ELECTRIC  
 ECC EXTRUDED CONCRETE CURB  
 ELEV ELEVATION  
 EMH ELECTRIC MANHOLE  
 EMT ELECTRIC, TELEPHONE, & CABLE T  
 EW END OF WALL  
 EXIST EXISTING  
 FAB FIRE ALARM BOX  
 FES FLEED END SECTION  
 FND FOUNDED  
 FND FOUNDATION  
 FRM FRAME AND COVER  
 FG FIRST DEFENSE UNIT  
 FD GAS  
 G GAS  
 GS GROUND  
 GS GAS VALVE  
 GIP GALVANIZED IRON PIPE  
 GP GUARD POST  
 GS GAS SERVICE  
 GR GUARD RAIL  
 GRAN GRANITE  
 HH HANDHOLE  
 H HORIZONTAL  
 HP HIGH PRESSURE  
 HD HEADWALL  
 INV INVERT  
 IP IRON PIPE  
 I.R. IRON ROD  
 L LEAD  
 LP LIGHT POLE  
 MAX MAXIMUM  
 MC METAL COVER  
 MH MANHOLE  
 MIN MINIMUM  
 MIN MASS. HIGHWAY BOUND  
 M/LP METAL LIGHT POLE  
 N/C NOT IN CONTRACT  
 NTS NOT TO SCALE  
 OHW OVERHEAD WIRE  
 PB PULL BOX  
 P POLYETHYLENE PIPE  
 P PROPOSED  
 PROP PROPANED  
 P/PVCL POLYVINYL CHLORIDE PIPE  
 PWT PAVED WATER  
 PWC PAVEMENT  
 RCM REINFORCED CONCRETE PIPE  
 REM REMOVE  
 REMOD REMODEL  
 RET RETAIN  
 ROW RIGHT OF WAY  
 RR RAILROAD  
 RSR REMOVE AND RESET  
 RS REMOVE AND STACK  
 S SEWER  
 SB STONE BOUND  
 SBH STONE BOUND/DRILL HOLE  
 SGR SLOPED GRANITE CURB  
 SMH SEWER MANHOLE  
 STA STATION  
 SS SEWER SERVICE  
 ST STEEL  
 T SIDEWALK  
 T TELEPHONE  
 TCB TRAFFIC CONTROL BOX  
 TMH TRAFFIC LIGHT  
 TMH TELEPHONE MANHOLE  
 T TREE  
 TRANS TRANSFORMER  
 TS TOP OF SLOPE  
 TSV TAPPING SLEEVE, VALVE AND BOX  
 TYP UTILITY PIPE  
 VCP VITRIFIED CLAY PIPE  
 VERT VERTICAL  
 VCC VERTICAL GRANITE CURB  
 W WATER MAIN  
 WG WATER/GATE

| EXISTING           |                    | PROPOSED |  |  |
|--------------------|--------------------|----------|--|--|
| 55                 | 100                |          |  | CONTOUR ELEVATION  |
| X 100.2            | + 100.00           |          |  | SPOT GRADE   |
| 27.21TC<br>27.158C | 27.21TC<br>27.158C |          |  | TOP & BOTTOM ELEVATION                                       |
| 21.25              | 21.25              |          |  | SPOT ELEVATION w/LEADER                                      |
|                    |                    |          |  | SEWER MANHOLE (SMH)  |
|                    |                    |          |  | FIRST DEFENSE UNIT (FD)                                      |
|                    |                    |          |  | 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)                                   |
|                    |                    |          |  | TEST PIT AND/OR<br>PERC TEST LOCATION                        |
|                    |                    |          |  | EXISTING TREE  |
|                    |                    |          |  | BOLLARD  |
|                    |                    |          |  | DUMPSTER PAD   |
|                    |                    |          |  | PARKING COUNT  |
|                    |                    |          |  | HANDICAP RAMP  |
|                    |                    |          |  | HANDICAP PARKING   |
|                    |                    |          |  | VAN-ACCESSIBLE HANDICAP PARKING                              |
|                    |                    |          |  | UTILITY POLE   |
|                    |                    |          |  | GUY POLE   |
|                    |                    |          |  | HAND HOLE  |
|                    |                    |          |  | PULL BOX   |
|                    |                    |          |  | TELEPHONE MANHOLE  |
|                    |                    |          |  | TRANSFORMER PAD  |
|                    |                    |          |  | TREE LINE  |
|                    |                    |          |  | CHAIN LINK FENCE   |
|                    |                    |          |  | STONE WALL   |
|                    |                    |          |  | RETAINING WALL   |
|                    |                    |          |  | TOWN AQUIFER LINE  |
|                    |                    |          |  | FLOODPLAIN, WATERSHED, AND<br>WETLAND OVERLAY DISTRICT       |
|                    |                    |          |  | DEP ZONE C   |
|                    |                    |          |  | WETLAND FLAG LOCATION  |
|                    |                    |          |  | WETLAND LINE   |
|                    |                    |          |  | WETLAND FLAG INDICATING AN OFFSITE TREND<br>LINE (OS-OFFSET) |
|                    |                    |          |  | OFFSITE WETLAND TREND LINE                                   |
|                    |                    |          |  | 100' WETLAND BUFFER  |
|                    |                    |          |  | BORDERING LAND SUBJECT TO FLOODING (BSLF)                    |
|                    |                    |          |  | LIMIT OF WORK/EROSION CONTROL                                |
|                    |                    |          |  | SNOW STORAGE AREA  |

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 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 PEMBORKE 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 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 UNDUC TILED 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 PEMBORKE 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 LATER SEPARATION OF 10 FEET TO A WATER SERVICE THE ELEVATION OF THE CROWN OF THE SEWER SHALL BE AT LEAST 16 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. THE ELEVATION OF THE SEWER CAN BE VARIED TO 10 FEET BELOW THIS REQUIREMENT. THE WATER MAIN SHALL BE RELOCATED TO PROVIDE THIS SEPARATION OR CONSTRUCTED IN A DEEPER MAIN DRAINAGE. IN EITHER CASE, THE SEWER SHALL BE ENCASED IN CONCRETE. ONE 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 DESCRIBED ABOVE, BOTH SEWERS 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 DEVIATION ARISES, A DEVIATING WORK ORDER 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.



**McKENZIE**  
ENGINEERING GROUP

Assinippi Office Park  
150 Longwater Drive, Suite 101  
Norwell, MA 02061  
P: 781.792.3900  
F: 781.792.0333  
[www.mckeng.com](http://www.mckeng.com)

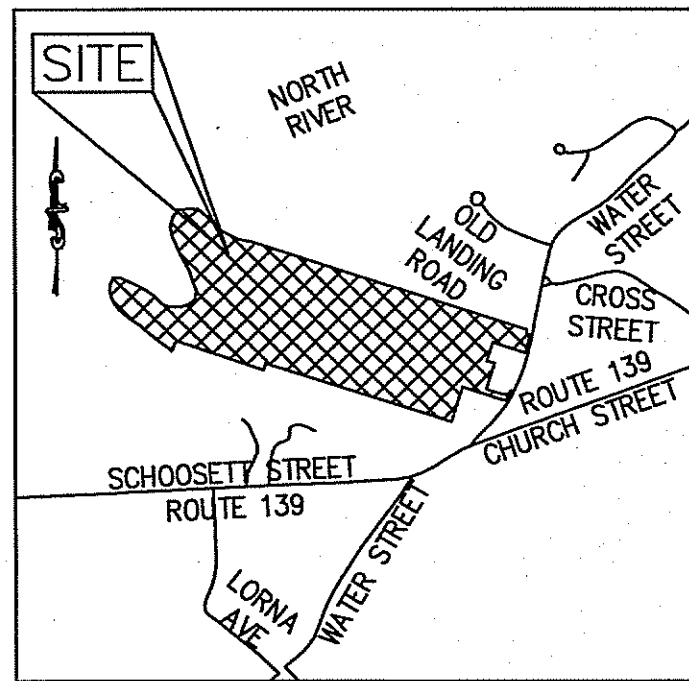
## PEMBROKE, MASSACHUSETTS

PERMIT PLAN SET

## General Notes, Legend, & Abbreviations

# CS-2



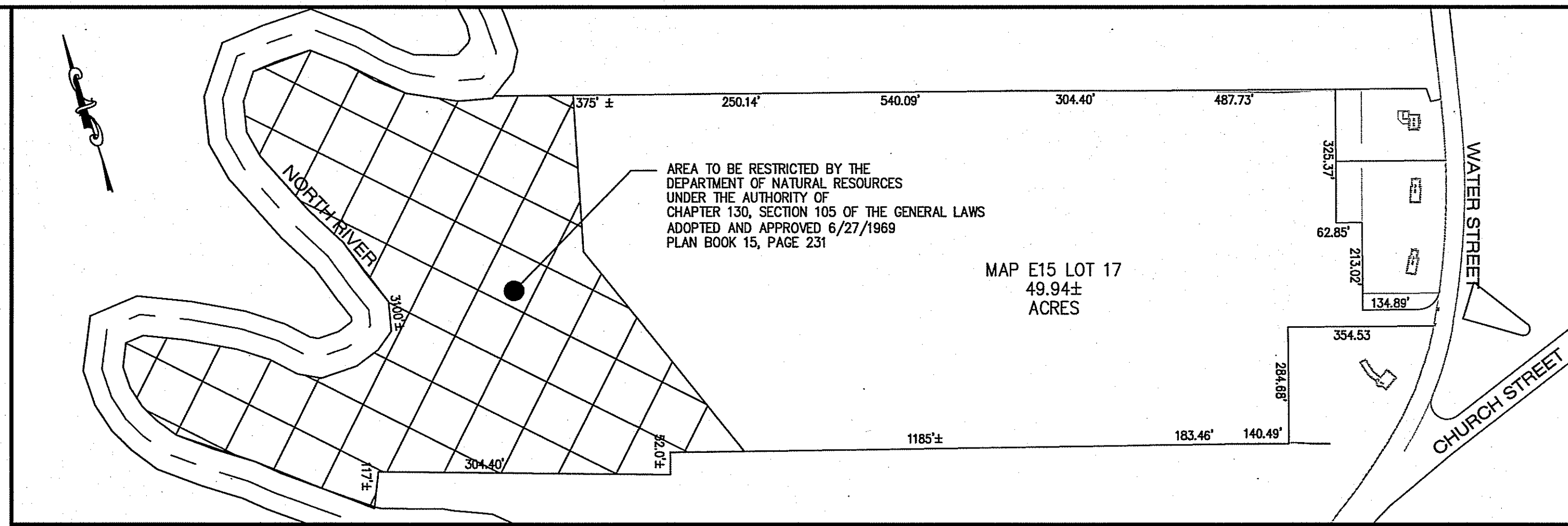


LOCUS MAP  
Not to Scale

PLAN REFERENCES:  
PLAN # 554 OF 1SP986

SURVEY NOTES:

1. PROPERTY LINE, DETAIL AND TOPOGRAPHIC INFORMATION WAS COMPILED FROM A PLAN PREPARED BY LAND PLANNING, INC. IN MAY OF 2002.
2. AN ON THE GROUND SURVEY WAS PERFORMED BY MCKENZIE ENGINEERING GROUP, INC. IN MARCH OF 2017 TO LOCATE THE BORDERING AND ISOLATED VEGETATED WETLANDS. AN ON THE GROUND SURVEY WAS DONE IN JANUARY OF 2018 TO LOCATE THE NATURAL BANK FLATS. AN ON THE GROUND SURVEY WAS DONE IN MARCH OF 2021 TO LOCATE EXISTING CONDITIONS AT 274 WATER STREET AND ALONG WATER STREET.
3. BORDERING VEGETATED WETLANDS DELINEATED BY ENVIRONMENTAL CONSULTING & RESTORATION, LLC ON JANUARY 31, 2017. DELINEATED BY METHODOLOGY ESTABLISHED BY THE MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION (MASSDEP) REGULATIONS FOUND AT 310 CMR 10.55, SORAD (SESS-89) ISSUED ON FEBRUARY 22, 2018 AND EXTENDED UNTIL FEBRUARY 22, 2024.
4. THE NATURAL BANK WAS DELINEATED BY ENVIRONMENTAL CONSULTING & RESTORATION, LLC ON DECEMBER 20, 2017.
5. A PORTION OF THE PROPERTY SHOWN HEREON IS LOCATED IN ZONE AE (ELEVATION 8) AND ZONE X AS SHOWN ON F.I.R.M. No. 25023C0206J & 25023C0207J, EFFECTIVE JULY 17, 2012.
6. THE PROPERTY SHOWN HEREON IS NOT LOCATED WITHIN AN AREA MAPPED AS PRIORITY HABITAT & ESTIMATED HABITAT FOR RARE SPECIES ACCORDING TO THE MASSACHUSETTS NATURAL HERITAGE & ENDANGERED SPECIES PROGRAM (NHESP).
7. THE PROPERTY SHOWN HEREON DOES NOT CONTAIN A CERTIFIED VERNAL POOL ACCORDING TO THE NHESP.
8. THE PROPERTY SHOWN HEREON IS NOT LOCATED WITHIN AN AREA OF CRITICAL ENVIRONMENTAL CONCERN.
9. THE PROPERTY SHOWN HEREON IS NOT LOCATED IN A DEP ZONE II AND TOWN OF PEMBRIDGE AQUIFER PROTECTION DISTRICT ZONE.
10. 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.
11. OFFSITE AREAS SUPPLEMENTED BY MASSGIS LIDAR.



OVERALL MAP  
1"=250'

ABBREVIATIONS  
FTE FIRST FLOOR ELEVATION  
BFC BUT CONC.  
C/CB CONCRETE CURB  
EP EDGE OF PAVEMENT  
BC BITUMINOUS CONCRETE CURB  
BC (AM) AS MEASURED  
RET WALL RETAINING WALL  
CONC CONCRETE  
RCP REINFORCED CONCRETE PIPE  
VCC VERTICAL CONCRETE CURB  
ETW EDGE OF TRAVEL WAY  
MIL METAL BEAM  
VCC VERTICAL CONCRETE CURB  
CMP CORRUGATED METAL PIPE

LEGEND

SURVEY SYMBOLS  
CHB PLYMOUTH COUNTY BOUND  
C/LP CONCRETE BOUND WITH LEAD PLUG  
DH DRILL HOLE FOUND

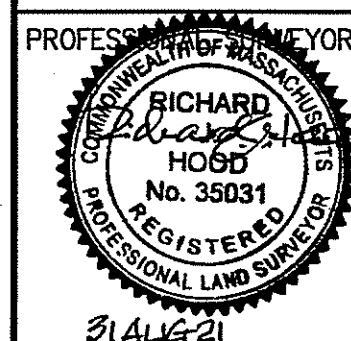
UTILITY SYMBOLS

EH ELECTRIC HAND HOLE  
GP GUY POLE  
GW GUY WIRE  
HVAC HVAC UNIT  
TR TRANSFORMER  
WG WATER GATE  
EMH ELECTRIC MANHOLE  
SMH SEWER MANHOLE  
DMH DRAIN MANHOLE  
TMH TELEPHONE MANHOLE  
GBN DRAINAGE CATCH BASIN  
HYDRANT  
PIV POST INDICATOR VALVE  
UP UTILITY POLE  
SIGN

LINE DESIGNATORS

WM WATER MAIN  
GR GUARD RAIL  
OHW OVERHEAD WIRES  
GL GAS LINE  
WS WATER SERVICE  
UE UNDERGROUND ELECTRIC  
DL DRAIN LINE  
SL SANITARY SEWER LINE  
DS DRAINAGE SWALE  
CL CHAIN LINK FENCE

RIVER MARSH VILLAGE  
COMPREHENSIVE PERMIT PLAN  
(ASSESSOR'S MAP E-15, LOT 17)  
PEMBROKE, MASSACHUSETTS



OWNER/APPLICANT:  
RIVER MARSH, LLC  
283R WASHINGTON STREET  
NORWELL, MASSACHUSETTS 02061

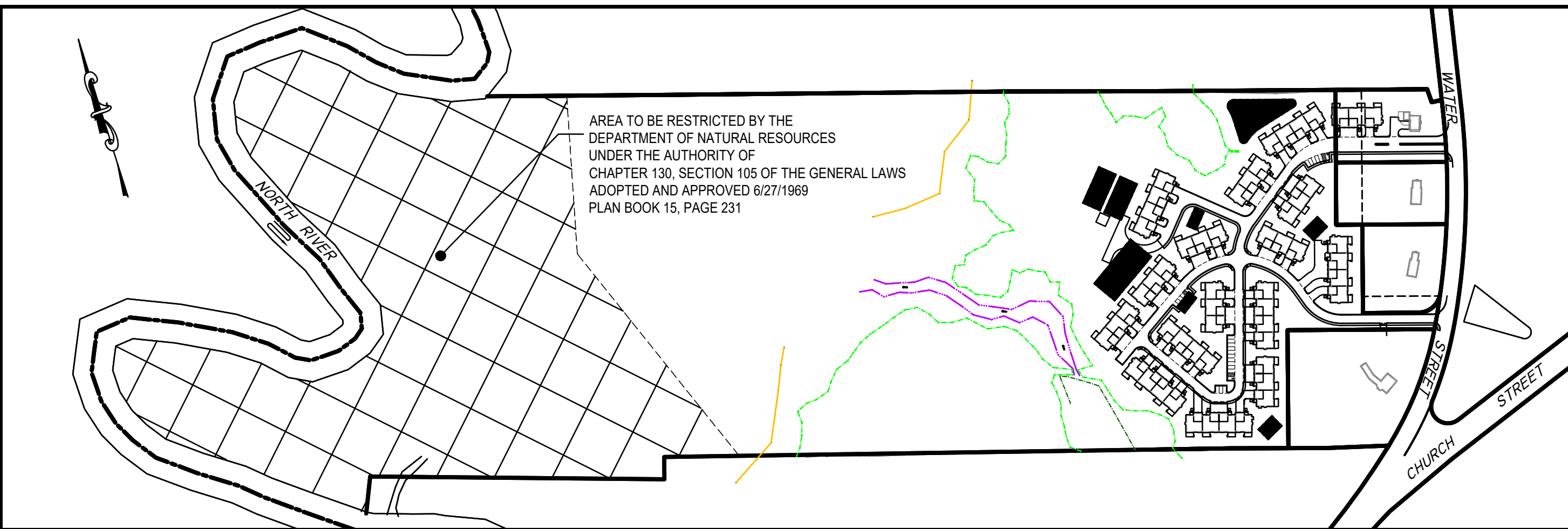
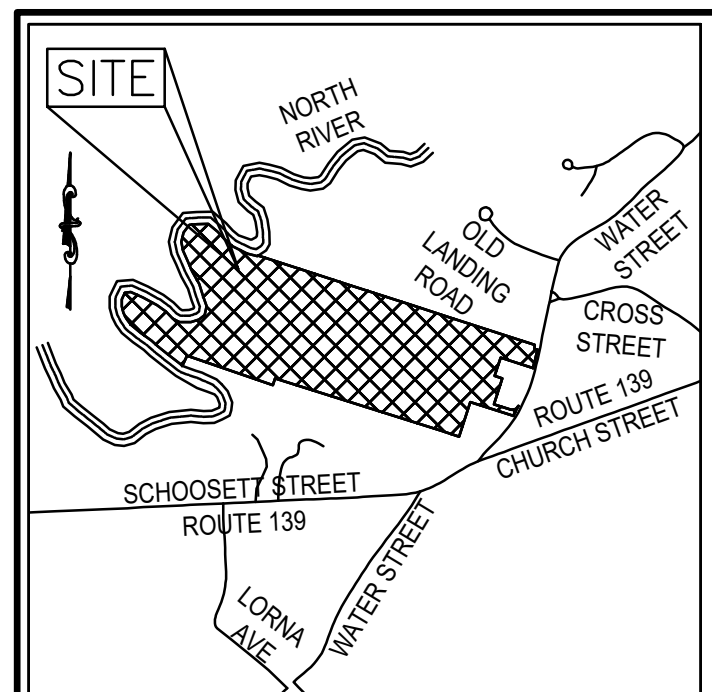
DRAWN BY: SBS  
DESIGNED BY: SBS  
CHECKED BY: RLS  
APPROVED BY: RLS  
DATE: NOVEMBER 27, 2016  
SCALE: 1"=60'  
PROJECT NO.: 215-181  
DWG. TITLE:

Existing  
Conditions  
Plan

DWG. NO.: EX-1

© MCKENZIE ENGINEERING GROUP, INC.





#### ABBREVIATIONS

|         |                          |
|---------|--------------------------|
| APPROX. | APPROXIMATE              |
| ASPH.   | ASPHALT                  |
| BIT.    | BITUMINOUS               |
| CCB     | BITUMINOUS CAPE COD BERM |
| CB      | CATCH BASIN              |
| CONC.   | CONCRETE                 |
| DMH EL. | DRAIN MANHOLE ELEVATION  |
| F.F.    | FIRST FLOOR              |
| GG      | GAS GATE                 |
| HYD     | HYDRANT                  |
| L       | LENGTH                   |
| LP      | LIGHT POLE               |
| N/F No. | NOW OR FORMERLY NUMBER   |
| PROP    | PROPOSED                 |
| PVC     | POLYVINYL CHLORIDE       |
| R       | REINFORCED CONCRETE PIPE |
| RCP     | REINFORCED CONCRETE PIPE |
| RD      | ROOF DRAIN               |
| REM     | REMOVE                   |
| SMH     | SEWER MANHOLE            |
| TYP.    | TYPICAL                  |
| M       | VERTICAL GRANITE CURB    |
| VGC     | VERTICAL GRANITE CURB    |
| WG      | WATER GATE               |

#### BUILDING INDEX

|     |                                    |
|-----|------------------------------------|
| (1) | P1-UNIT BUILDING = 1 UNIT          |
| (9) | 3-UNIT BUILDINGS = 27 UNITS        |
| (7) | 4-UNIT BUILDINGS = 28 UNITS        |
|     | 56 TOTAL UNITS                     |
|     | (UNIT LAYOUT AND FLOOR AREAS VARY) |
|     | PARKING SUMMARY                    |
|     | 56 UNITS X 4 SPACES = 224 SPACES   |
|     | VISITOR SPACES = 27 SPACES         |
|     | PARKING PROVIDED = 251 SPACES      |

#### OPEN SPACE AND DENSITY CALCULATIONS

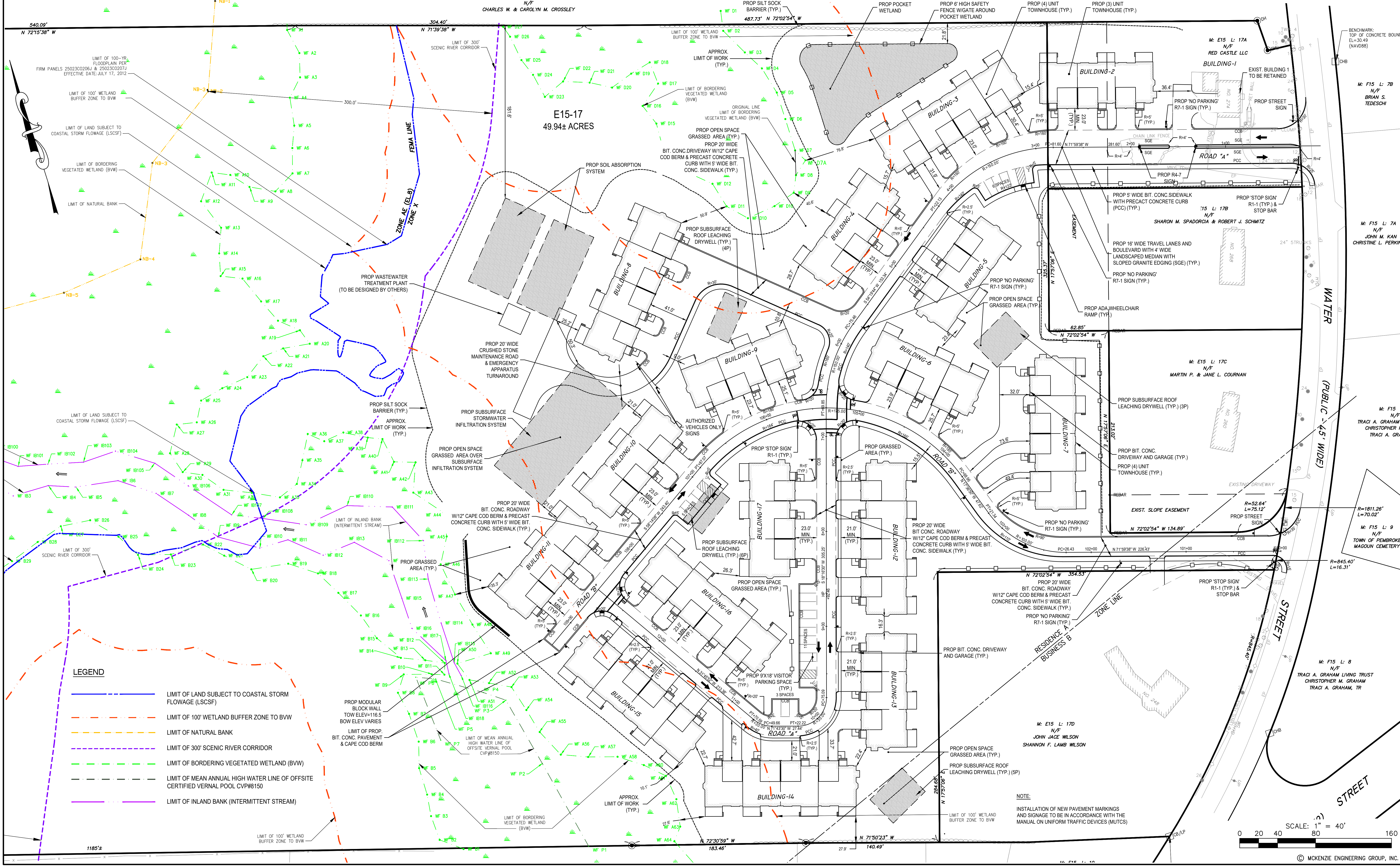
|                                       |
|---------------------------------------|
| TOTAL LAND AREA = 49.94 AC.           |
| UPLAND LAND AREA = 22.53 AC.          |
| SIDEWALK/ROAD/PARKING AREA = 2.46 AC. |
| BUILDING AREA = 2.64 AC.              |
| EXISTING IMPERVIOUS = 0.11 AC.        |
| TOTAL NEW IMPERVIOUS = 4.99 AC.       |
| UPLAND OPEN SPACE = 17.54 AC.         |
| UNIT DENSITY = 2.49 UNITS/UPLAND AC.  |

#### ROAD INDEX

|                               |
|-------------------------------|
| ROAD A = 1,284 LF             |
| ROAD B = 930 LF               |
| 2,214 LF TOTAL LENGTH OF ROAD |

#### SYMBOL LEGEND

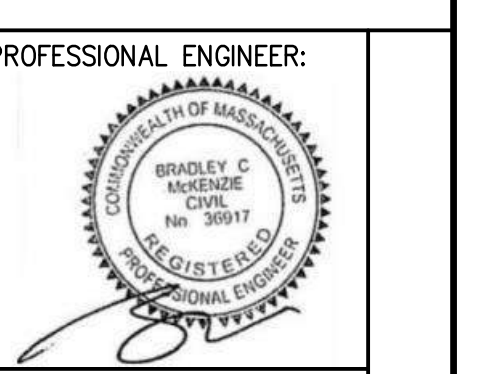
|   |                      |
|---|----------------------|
| ■ | CATCH BASIN          |
| ○ | UTILITY POLE         |
| ○ | SEWER MANHOLE        |
| ○ | DRAIN MANHOLE        |
| ○ | WATER GATE           |
| ○ | HYDRANT              |
| ○ | GAS GATE             |
| ○ | LIGHT POLE           |
| ○ | BOLLARD              |
| ○ | ROOF DRAIN           |
| ○ | DRAIN LINE           |
| ○ | SEWER LINE           |
| ○ | GAS MAIN             |
| ○ | UNDERGROUND ELECTRIC |
| ○ | WATER LINE           |



| BY  | DATE       | REV | DESCRIPTION  |
|-----|------------|-----|--|
| SBS | 5/12/2017  | 1   | COMMENTS PER WASHINGTON                                |
| SBS | 7/14/2017  | 2   | COMMENTS PER WASHINGTON                                |
| ACB | 11/27/2018 | 3   | ZBA APPLICATION  |
| SBS | 1/27/2021  | 4   | REVISIONS TO WTP COMPONENT                             |
| SBS | 4/5/2021   | 5   | MERRILL ENGINEERS PEER REVIEW COMMENTS                 |
| SBS | 6/7/2021   | 6   | RECONFIGURED WMT, STORMWATER SYSTEM AND BUILDINGS      |
| SBS | 6/9/2021   | 7   | COLOR CODED LINE WORK                                  |
| SBS | 8/31/2021  | 8   | ADDED SIDEWALK, MERRILL ENGINEERS PEER REVIEW COMMENTS |

PREPARED BY:  
**MG**  
MCKENZIE  
ENGINEERING GROUP  
Assessors Office Park  
150 Longwater Drive, Suite 101  
Norwell, MA 02061  
P: 781.792.3900  
F: 781.792.0333  
www.mckeng.com

## RIVER MARSH VILLAGE COMPREHENSIVE PERMIT PLAN (ASSESSOR'S MAP E-17, LOT 0 & E-17A, LOT 274) WATER STREET PEMBROKE, MASSACHUSETTS

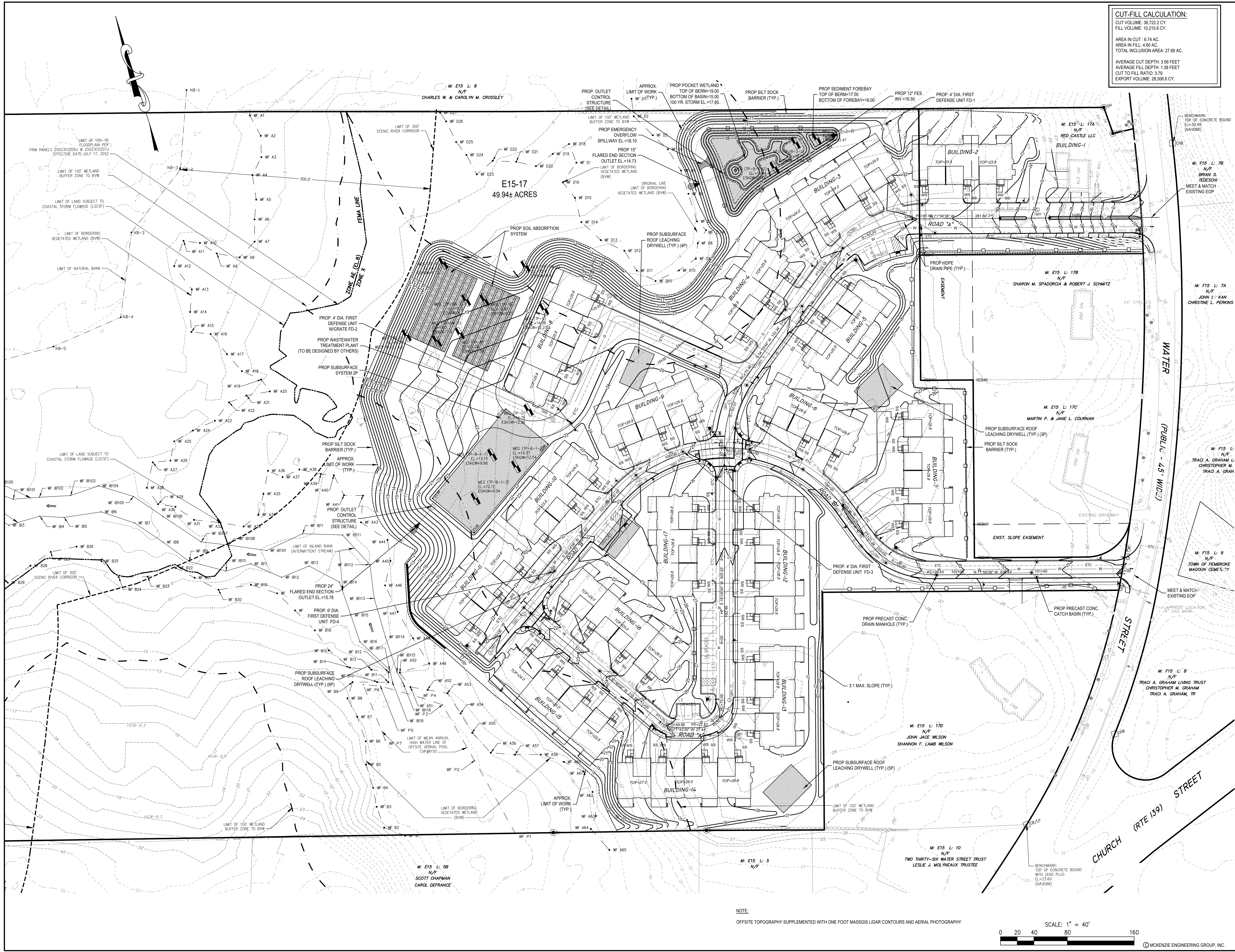


PROFESSIONAL ENGINEER:  
JOHN M. KAN  
N/F  
TRACI A. GRAHAM  
CHRISTOPHER M. GRAHAM  
TRACI A. GRAHAM

OWNER/APPLICANT:  
RIVER MARSH, LLC  
2808 WASHINGTON STREET  
NORWELL, MASSACHUSETTS 02061

DESIGNED BY: SBS  
CHECKED BY: BCM  
APPROVED BY: BCM  
DATE: SEPTEMBER 22, 2016  
SCALE: 1"=40'  
PROJECT NO.: 215-181  
DWG. TITLE: Preliminary Site Layout Plan  
DWG. NO.: C-1





CUT-FILL CALCULATION:  
CUT VOLUME: 38,722.2 CY  
FILL VOLUME: 10,215.6 CY  
  
AREA IN CUT: 6.74 AC.  
AREA IN FILL: 4.60 AC.  
TOTAL INCLUSION AREA: 27.89 AC.  
  
AVERAGE CUT DEPTH: 3.58 FEET  
AVERAGE FILL DEPTH: 1.38 FEET  
CUT TO FILL RATIO: 3.79  
EXPORT VOLUME: 28,506.6 CY.

RIVER MARSH VILLAGE  
COMPREHENSIVE PERMIT PLAN  
(ASSESSOR'S MAP E-15, LOT 17)  
PEMBROKE, MASSACHUSETTS



OWNER/APPLICANT:  
RIVER MARSH, LLC  
283R WASHINGTON STREET  
NORWELL, MASSACHUSETTS 02061

DRAWN BY: SBS  
DESIGNED BY: SBS  
CHECKED BY: BCM  
APPROVED BY: BCM  
DATE: SEPTEMBER 22, 2016  
SCALE: 1"=40'  
PROJECT NO.: 215-181  
DWG. TITLE:

Preliminary  
Grading &  
Drainage Plan

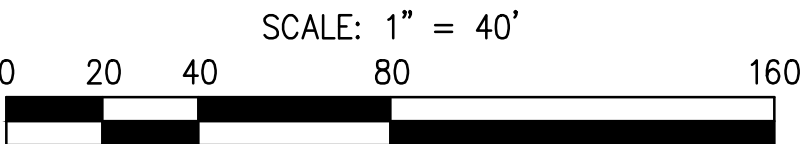
DWG. NO.: C-2

| NO. | DATE       | REV. | DESCRIPTION  |
|-----|------------|------|--|
| 1   | 5/12/2017  |      | COMMENTS PER MASSHUSING                                |
| 2   | 7/14/2017  |      | COMMENTS PER MASSHUSING                                |
| 3   | 11/02/2018 |      | 25% APPLICATION  |
| 4   | 1/07/2021  |      | REVISIONS TO WMP COMPONENT                             |
| 5   | 4/20/2021  |      | MERRILL ENGINEERS PEER REVIEW COMMENTS                 |
| 6   | 6/7/2021   |      | RECONFIGURED WMT, STORMWATER SYSTEM AND BUILDINGS      |
| 7   | 6/9/2021   |      | NO CHANGES THIS SHEET                                  |
| 8   | 8/1/2021   |      | ADDED SIDEWALK, MERRILL ENGINEERS PEER REVIEW COMMENTS |

PREPARED BY:  
**MG**  
MCKENZIE  
ENGINEERING GROUP  
Assessing Office Park  
150 Longwater Drive, Suite 101  
Norwell, MA 02061  
P: 781.792.3900  
F: 781.792.0333  
www.mckeng.com

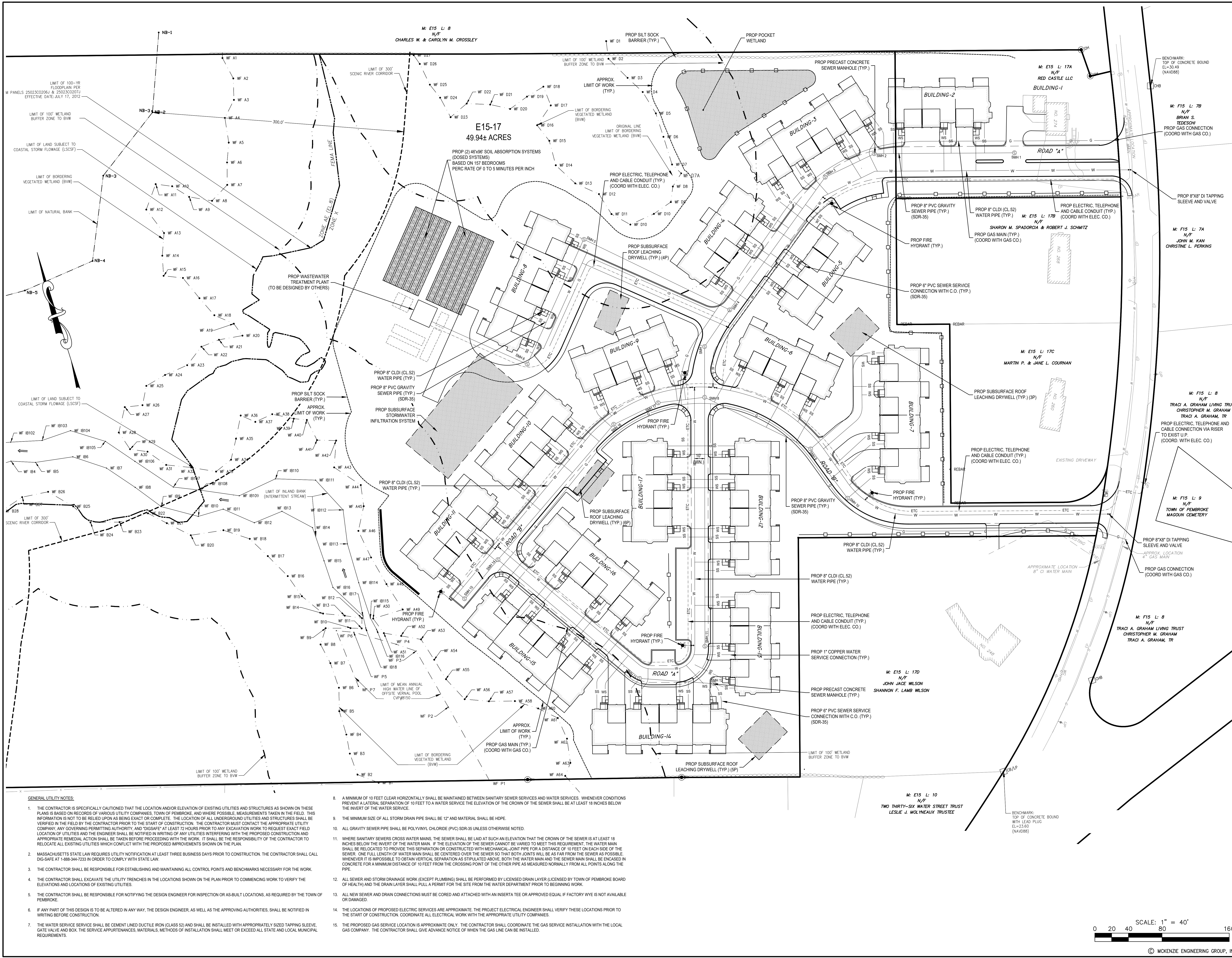
PERMIT PLAN SET

NOTE:  
OFFSITE TOPOGRAPHY SUPPLEMENTED WITH ONE FOOT MASSGIS LIDAR CONTOURS AND AERIAL PHOTOGRAPHY



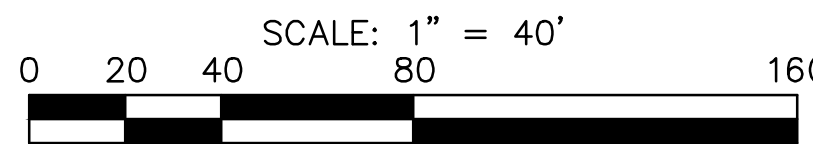
© MCKENZIE ENGINEERING GROUP, INC.





GENERAL UTILITY NOTES:

- 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, TOWN OF PEMBROKE, 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 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.
- MASSACHUSETTS STATE LAW REQUIRES UTILITY NOTIFICATION AT LEAST THREE BUSINESS DAYS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CALL DIG-SAFE AT 1-888-344-7233 IN ORDER TO COMPLY WITH STATE LAW.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING AND MAINTAINING ALL CONTROL POINTS AND BENCHMARKS NECESSARY FOR THE WORK.
- 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 BE RESPONSIBLE FOR NOTIFYING THE DESIGN ENGINEER FOR INSPECTION OR AS-BUILT LOCATIONS, AS REQUIRED BY THE TOWN OF PEMBROKE.
- IF ANY PART OF THIS DESIGN IS TO BE ALTERED IN ANY WAY, THE DESIGN ENGINEER, AS WELL AS THE APPROVING AUTHORITIES, SHALL BE NOTIFIED IN WRITING BEFORE CONSTRUCTION.
- THE WATER SERVICE SERVICE SHALL BE CEMENT LINED DUCTILE IRON (CLASS 52) AND SHALL BE INSTALLED WITH APPROPRIATELY SIZED TAPPING SLEEVE, GATE VALVE AND BOX. THE SERVICE APPURTENANCES, MATERIALS, METHODS OF INSTALLATION SHALL MEET OR EXCEED ALL STATE AND LOCAL MUNICIPAL REQUIREMENTS.
- 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.
- THE MINIMUM SIZE OF ALL STORM DRAIN PIPE SHALL BE 12" AND MATERIAL SHALL BE HDPE.
- ALL GRAVITY SEWER PIPE SHALL BE POLYVINYL CHLORIDE (PVC) SDR-35 UNLESS OTHERWISE NOTED.
- 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. ONE 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 IMPOSSIBLE 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.
- ALL SEWER AND STORM DRAINAGE WORK (EXCEPT PLUMBING) SHALL BE PERFORMED BY LICENSED DRAIN LAYER (LICENSED BY TOWN OF PEMBROKE BOARD OF HEALTH) AND THE DRAIN LAYER SHALL PULL A PERMIT FOR THE SITE FROM THE WATER DEPARTMENT PRIOR TO BEGINNING WORK.
- ALL NEW SEWER AND DRAIN CONNECTIONS MUST BE CORED AND ATTACHED WITH AN INSERTA TEE OR APPROVED EQUAL IF FACTORY WYE IS NOT AVAILABLE OR DAMAGED.
- THE LOCATIONS OF PROPOSED ELECTRIC SERVICES ARE APPROXIMATE. THE PROJECT ELECTRICAL ENGINEER SHALL VERIFY THESE LOCATIONS PRIOR TO THE START OF CONSTRUCTION. COORDINATE ALL ELECTRICAL WORK WITH THE APPROPRIATE UTILITY COMPANIES.
- THE PROPOSED GAS SERVICE LOCATION IS APPROXIMATE ONLY. THE CONTRACTOR SHALL COORDINATE THE GAS SERVICE INSTALLATION WITH THE LOCAL GAS COMPANY. THE CONTRACTOR SHALL GIVE ADVANCE NOTICE OF WHEN THE GAS LINE CAN BE INSTALLED.



© MCKENZIE ENGINEERING GROUP, INC.

| BY  | APP | DESCRIPTION  | DATE       | REV |
|-----|-----|--|------------|-----|
| SBS | BOA | COMMENTS PER WASHINGTON                                | 5/12/2017  | 1   |
| SBS | BOA | COMMENTS PER WASHINGTON                                | 7/14/2018  | 2   |
| SBS | BOA | ZBA APPLICATION  | 11/27/2018 | 3   |
| SBS | BOA | REVISIONS TO WMP COMPONENT                             | 1/27/2021  | 4   |
| SBS | BOA | MERRILL ENGINEERS PEER REVIEW COMMENTS                 | 4/5/2021   | 5   |
| SBS | BOA | RECONFIGURED WMT, STORMWATER SYSTEM AND BUILDINGS      | 6/7/2021   | 6   |
| SBS | BOA | NO CHANGES THIS SHEET                                  | 6/9/2021   | 7   |
| SBS | BOA | ADDED SIDEWALK, MERRILL ENGINEERS PEER REVIEW COMMENTS | 8/23/2021  | 8   |

PREPARED BY:

MCKENZIE ENGINEERING GROUP  
Assinippi Office Park  
150 Longwater Drive, Suite 101  
Norwell, MA 02061  
P: 781.792.3900  
F: 781.792.0333  
www.mckeng.com

PROFESSIONAL ENGINEER:

TRACI A. GRAHAM, TR

OWNER/APPLICANT:

RIVER MARSH, LLC  
230R WASHINGTON STREET  
NORWELL, MASSACHUSETTS 02061

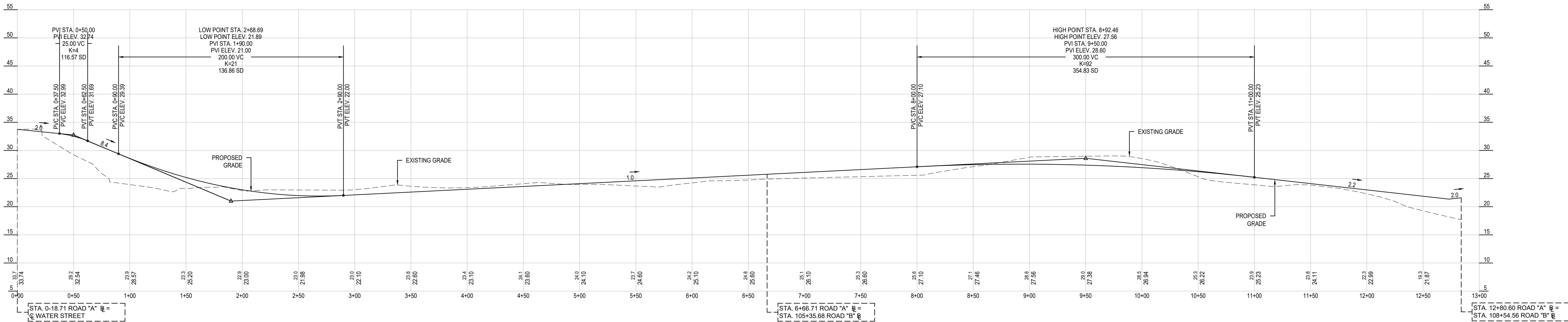
DRAWN BY: SBS  
DESIGNED BY: SBS  
CHECKED BY: BCM  
APPROVED BY: BCM  
DATE: SEPTEMBER 22, 2016  
SCALE: 1"=40'  
PROJECT NO.: 215-181  
DWG. TITLE: Preliminary Utility Plan

DWG. NO: C-3

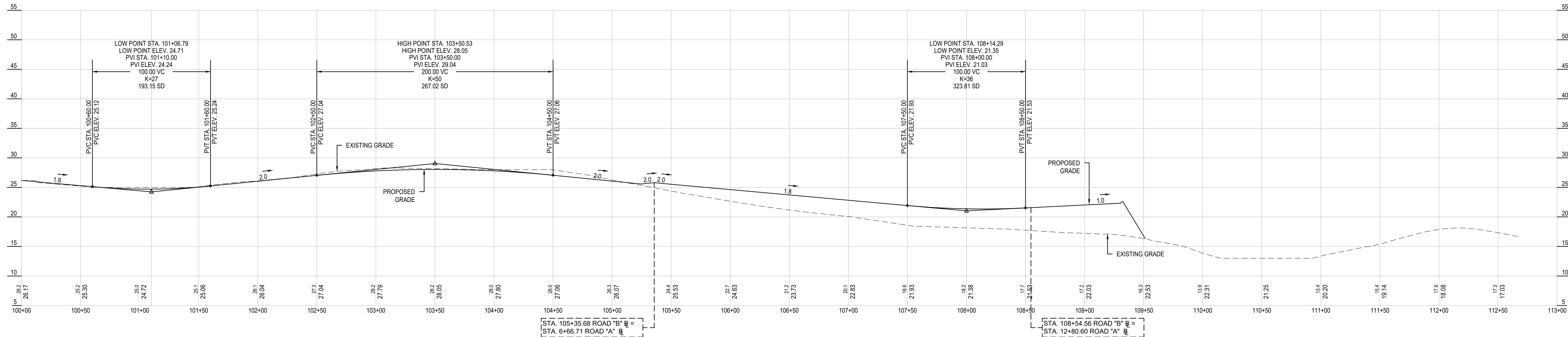
RIVER MARSH VILLAGE  
COMPREHENSIVE PERMIT PLAN  
(ASSESSOR'S MAP E-15, LOT 17)  
PEMBROKE, MASSACHUSETTS

PERMIT PLAN SET

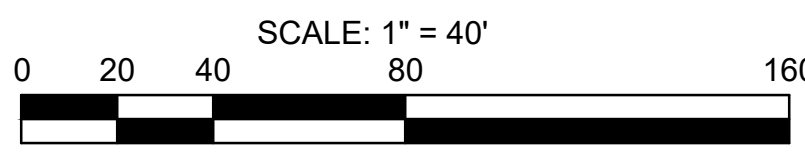




ROAD "A"



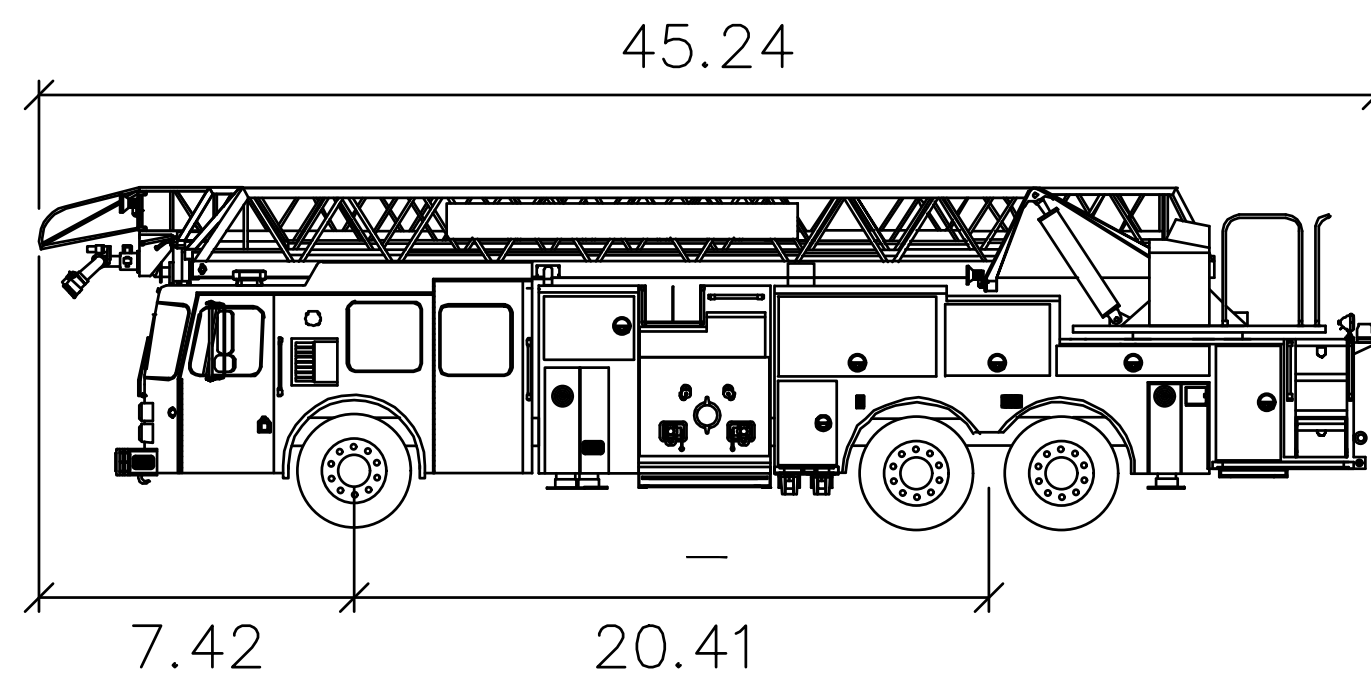
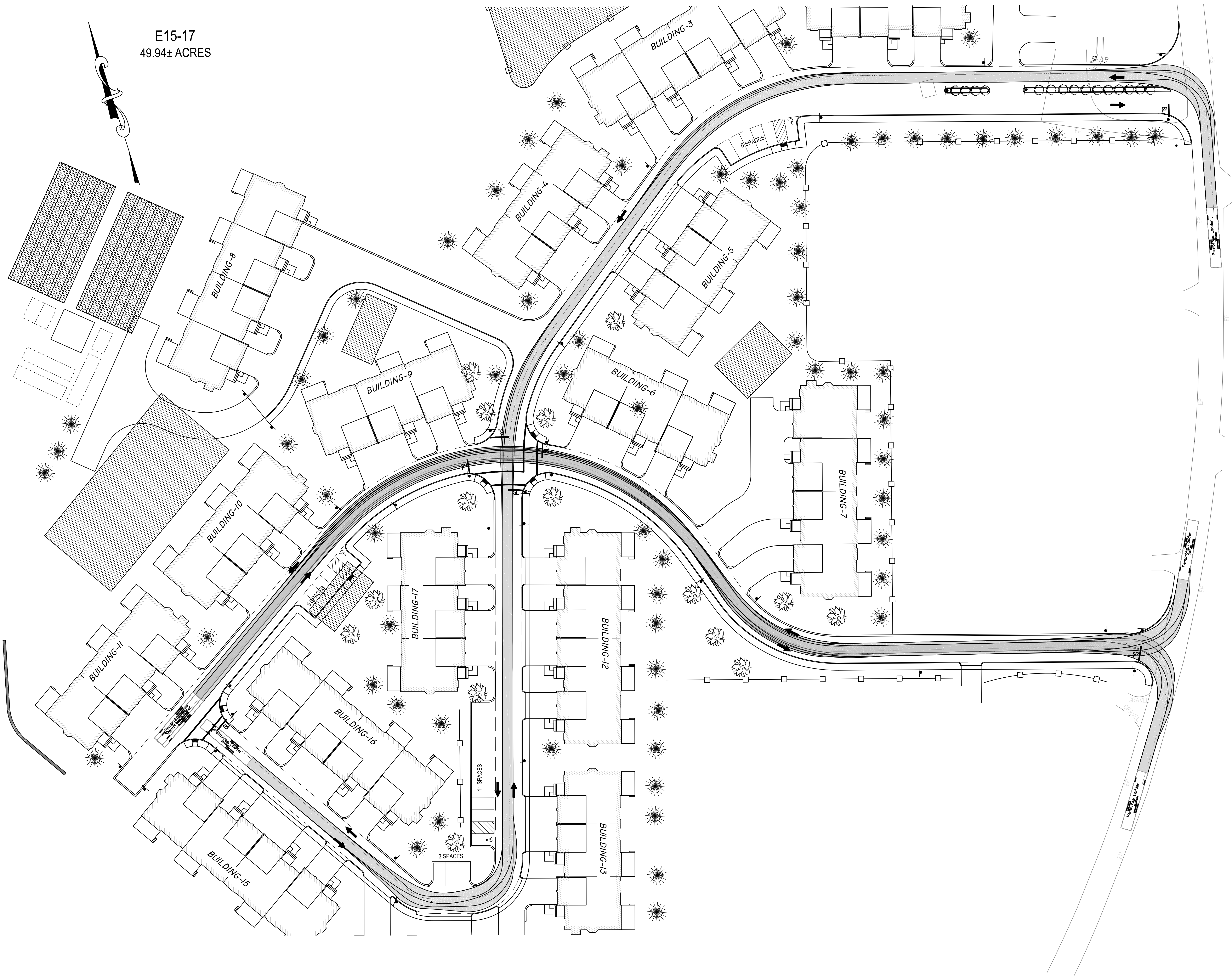
ROAD "B"



© MCKENZIE ENGINEERING GROUP, INC.

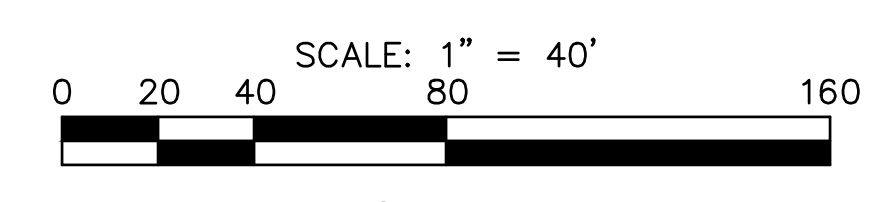
|  |                                |  |  |   |  |     |
|--|--------------------------------|--|--|---|--|-----|
| OWNER/APPLICANT:<br><br>RIVER MARSH, LLC<br>288R WASHINGTON STREET<br>NORWELL, MASSACHUSETTS 02061   | PROFESSIONAL ENGINEER:<br><br> | DATE   |  | DESCRIPTION                                       |  | BY  |
|  |                                | 1 5/12/2017  |  | COMMENTS PER WASHINGTON                           |  | SBS |
|  |                                | 2 7/14/2017  |  | COMMENTS PER WASHINGTON                           |  | SBS |
|  |                                | 3 11/27/2018   |  | ZBA APPLICATION                                   |  | BCM |
|  |                                | 4 1/27/2021  |  | REVISIONS TO WMP COMPONENT                        |  | SBS |
|  |                                | 5 4/5/2021   |  | MERRILL ENGINEERS PEER REVIEW COMMENTS            |  | SBS |
|  |                                | 6 6/7/2021   |  | RECONFIGURED WMT, STORMWATER SYSTEM AND BUILDINGS |  | SBS |
|  |                                | 7 6/9/2021   |  | NO CHANGES THIS SHEET                             |  | SBS |
| 8 8/23/2021  |                                | ADDED SIDEWALK, MERRILL ENGINEERS PEER REVIEW COMMENTS |  | SBS   |  |     |
| PREPARED BY:   |                                |  |  |   |  |     |
| ASSINIPPI OFFICE PARK<br>150 LONGWATER DRIVE, SUITE 101<br>NORWELL, MA 02061<br>P: 781.792.3900<br>F: 781.792.0333<br>WWW.MCKENZIE.COM     |                                |  |  |   |  |     |
| <b>RIVER MARSH VILLAGE</b><br><b>COMPREHENSIVE PERMIT PLAN</b><br>(ASSESSOR'S MAP E-15, LOT 17)<br>WATER STREET<br>PEMBROKE, MASSACHUSETTS |                                |  |  |   |  |     |
| PERMIT PLAN SET  |                                |  |  |   |  |     |
| DRAWN BY: SBS  |                                |  |  |   |  |     |
| DESIGNED BY: SBS   |                                |  |  |   |  |     |
| CHECKED BY: BCM  |                                |  |  |   |  |     |
| APPROVED BY: BCM   |                                |  |  |   |  |     |
| DATE: SEPTEMBER 22, 2016   |                                |  |  |   |  |     |
| SCALE: 1"=40'  |                                |  |  |   |  |     |
| PROJECT NO.: 215-181   |                                |  |  |   |  |     |
| DWG. TITLE: Preliminary Profiles   |                                |  |  |   |  |     |
| DWG. NO.: C-4  |                                |  |  |   |  |     |





Pembroke Ladder

|                   |        |
|-------------------|--------|
| Width             | : 8.00 |
| Track             | : 8.00 |
| Lock to Lock Time | : 6.0  |
| Steering Angle    | : 45.0 |



BY APP: SBS BOM

COMMENTS PER WASHOUSING

DATE: 5/12/2017

REV: 1

BY APP: SBS BOM

COMMENTS PER WASHOUSING

DATE: 7/14/2017

REV: 2

BY APP: ALC BOM

COMMENTS PER WASHOUSING

DATE: 11/27/2018

REV: 3

BY APP: SBS BOM

REVISIONS TO WMP COMPONENT

DATE: 1/27/2021

REV: 4

BY APP: SBS BOM

MERRILL ENGINEERS PEER REVIEW COMMENTS

DATE: 4/5/2021

REV: 5

BY APP: SBS BOM

MERRILL ENGINEERS PEER REVIEW COMMENTS

DATE: 6/7/2021

REV: 6

BY APP: SBS BOM

RECONFIGURED WMT, STORMWATER SYSTEM AND BUILDINGS

DATE: 6/9/2021

REV: 7

BY APP: SBS BOM

NO CHANGES THIS SHEET

DATE: 8/23/2021

REV: 8

BY APP: SBS BOM

ADDED SIDEWALK, MERRILL ENGINEERS PEER REVIEW COMMENTS

DATE: 8/23/2021

REV: 8

PREPARED BY:

MCKENZIE ENGINEERING GROUP  
Mississippi Office Park  
150 Longwater Drive, Suite 101  
Norwell, MA 02061  
P: 781.792.3900  
F: 781.792.0333  
www.mckeng.com

**RIVER MARSH VILLAGE**

**COMPREHENSIVE PERMIT PLAN**

(ASSESSOR'S MAP E-15, LOT 17)

WATER STREET

PEMBROKE, MASSACHUSETTS

PROFESSIONAL ENGINEER:

OWNER/APPLICANT:

RIVER MARSH, LLC  
280R WASHINGTON STREET  
NORWELL, MASSACHUSETTS 02061

PERMIT PLAN SET

DRAWN BY: SBS

DESIGNED BY: SBS

CHECKED BY: BCM

APPROVED BY: BCM

DATE: SEPTEMBER 22, 2016

SCALE: 1"=30'

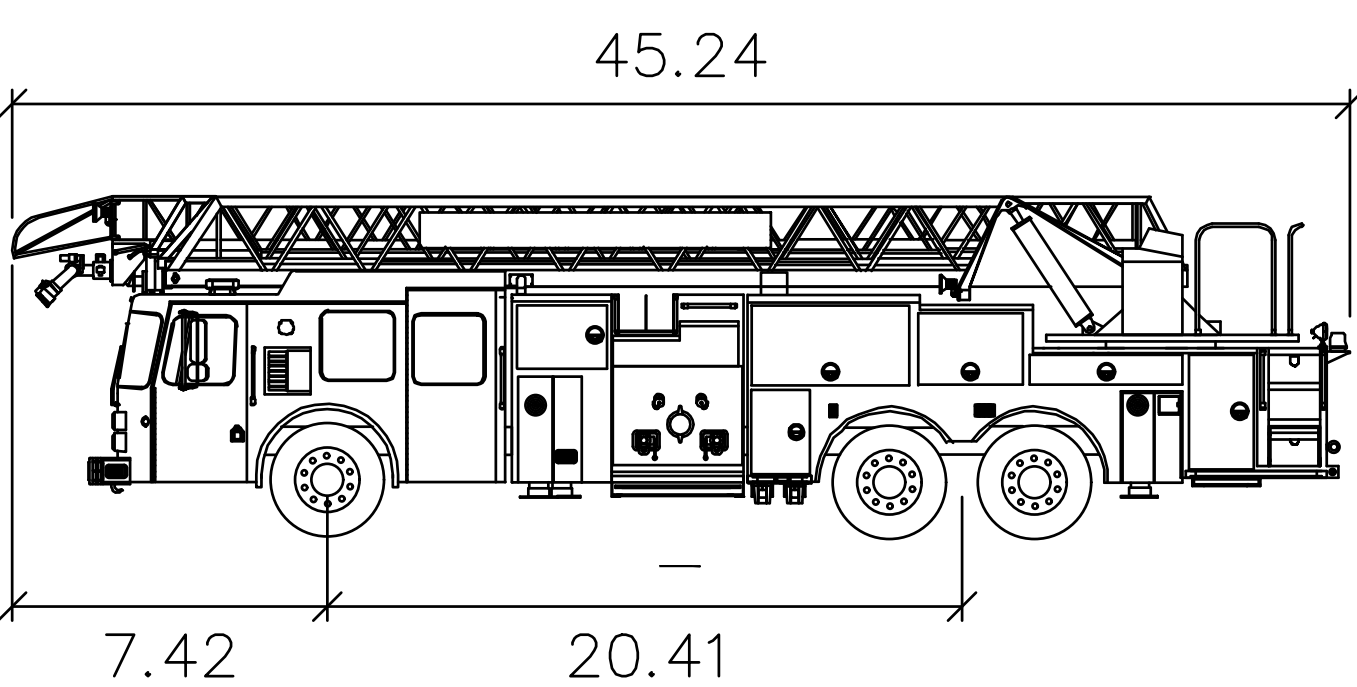
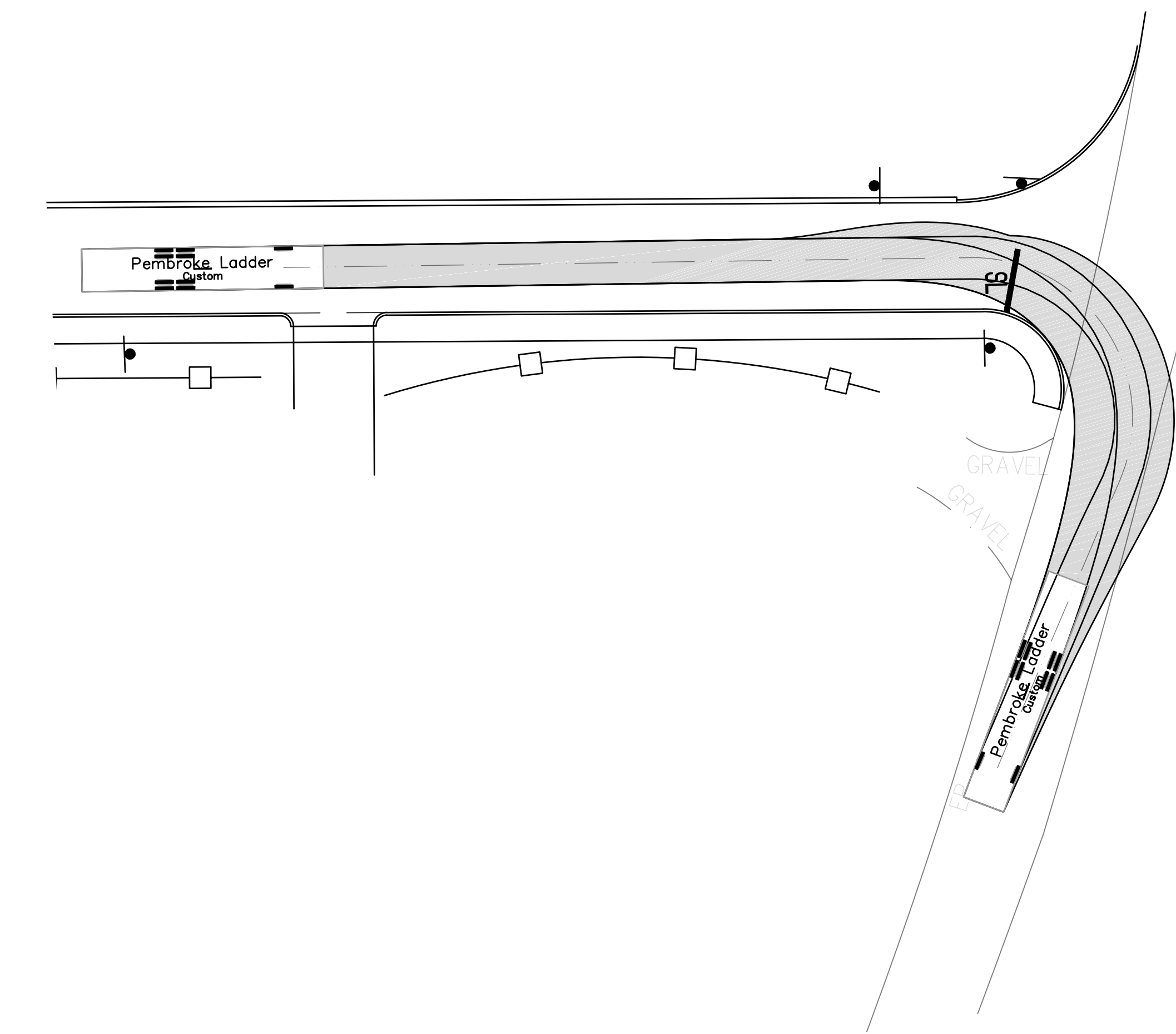
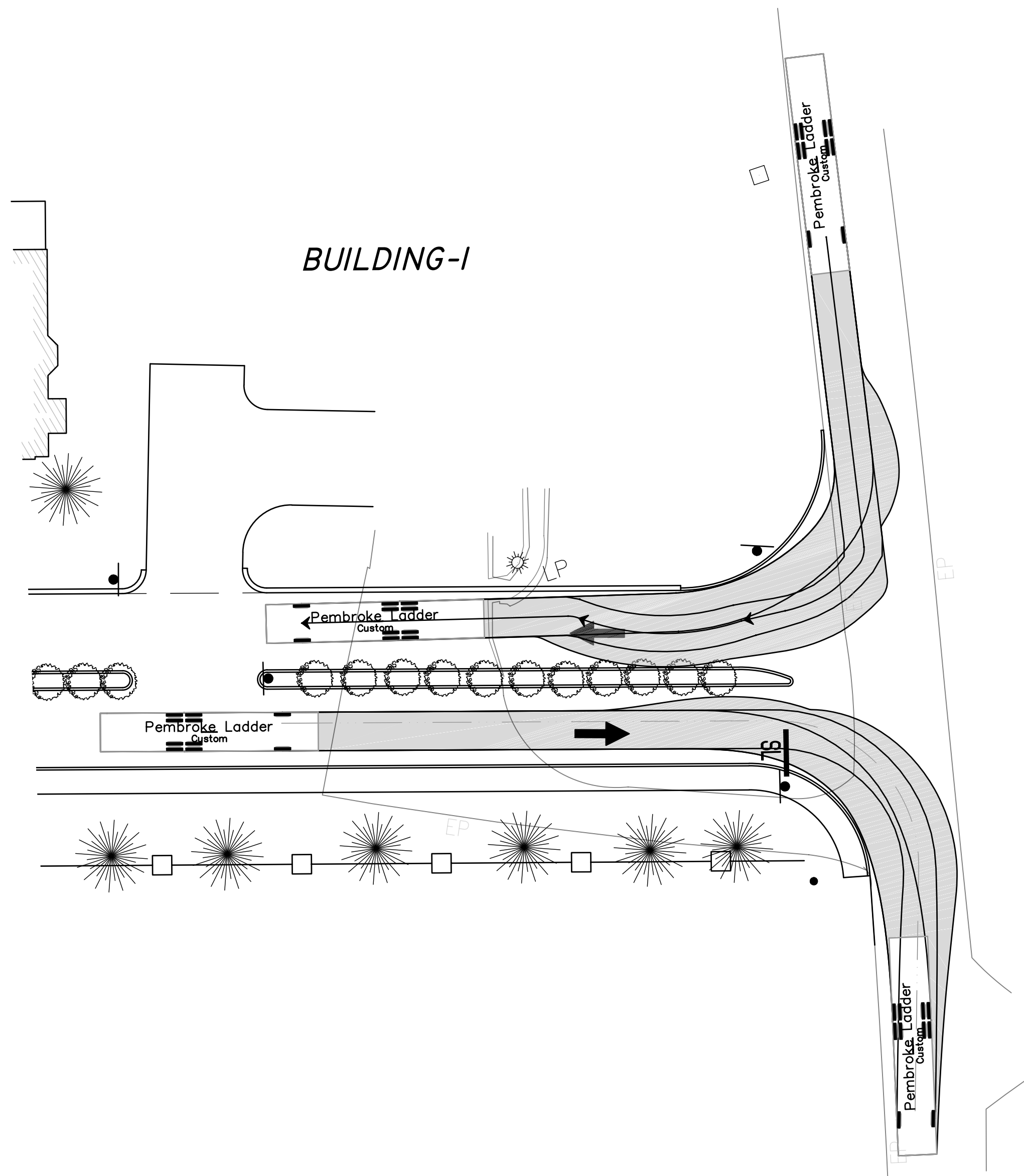
PROJECT NO.: 215-181

DWG. TITLE:

Fire Truck Access Plan

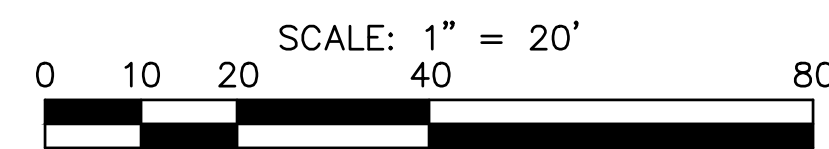
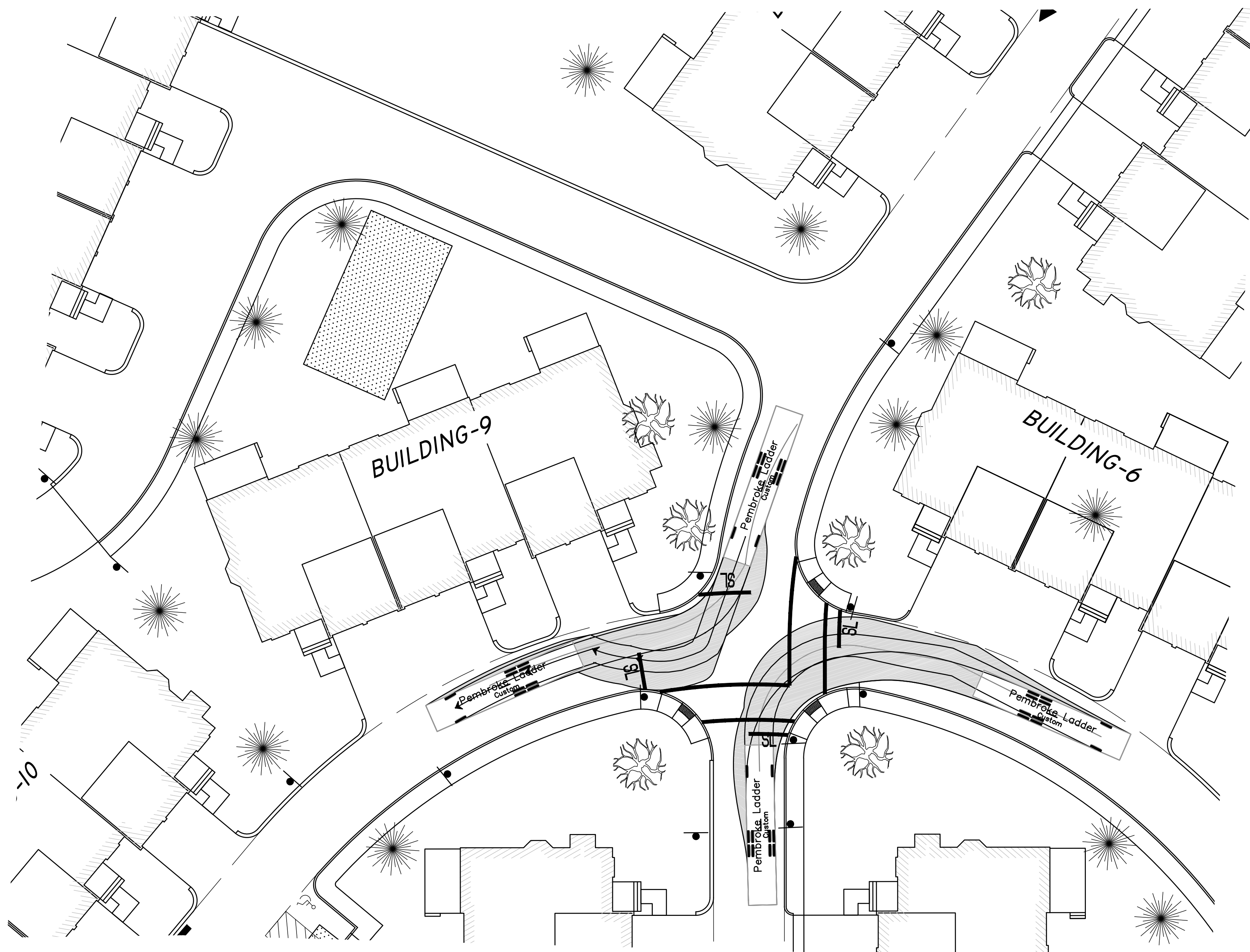
DWG. NO: C-5



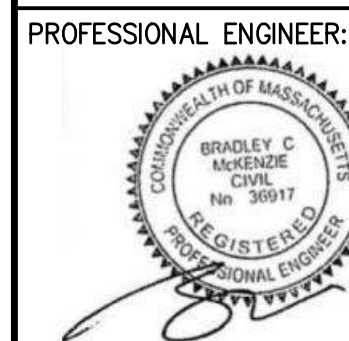


Pembroke Ladder

|                   |        |
|-------------------|--------|
|                   | feet   |
| Width             | : 8.00 |
| Track             | : 8.00 |
| Lock to Lock Time | : 6.0  |
| Steering Angle    | : 45.0 |



**RIVER MARSH VILLAGE**  
**COMPREHENSIVE PERMIT PLAN**  
(ASSESSOR'S MAP E-15, LOT 17)  
WATER STREET  
PEMBROKE, MASSACHUSETTS



OWNER/APPLICANT:  
RIVER MARSH, LLC  
238R WASHINGTON STREET  
NORWELL, MASSACHUSETTS 02061

DRAWN BY: SBS  
DESIGNED BY: SBS  
CHECKED BY: BCM  
APPROVED BY: BCM  
DATE: SEPTEMBER 22, 2016  
SCALE: 1"=20'  
PROJECT NO.: 215-181

Fire Truck  
Access  
Plan

DWG. NO:

**C-6**

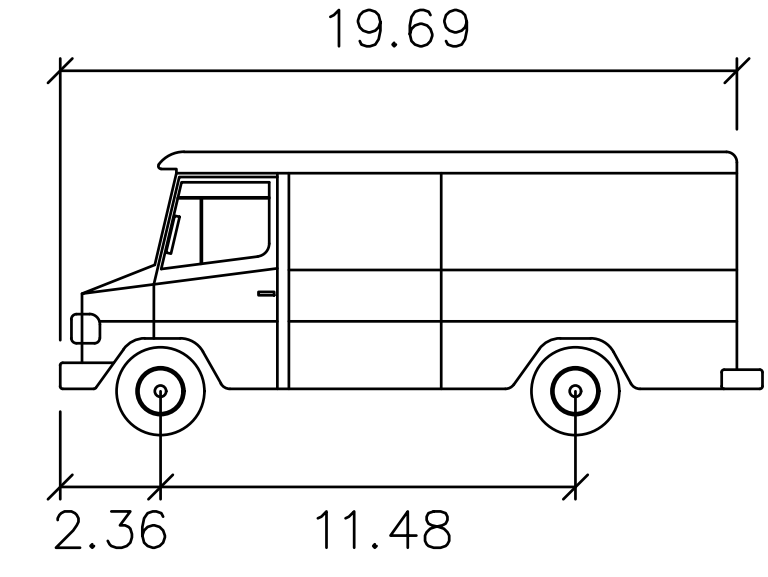
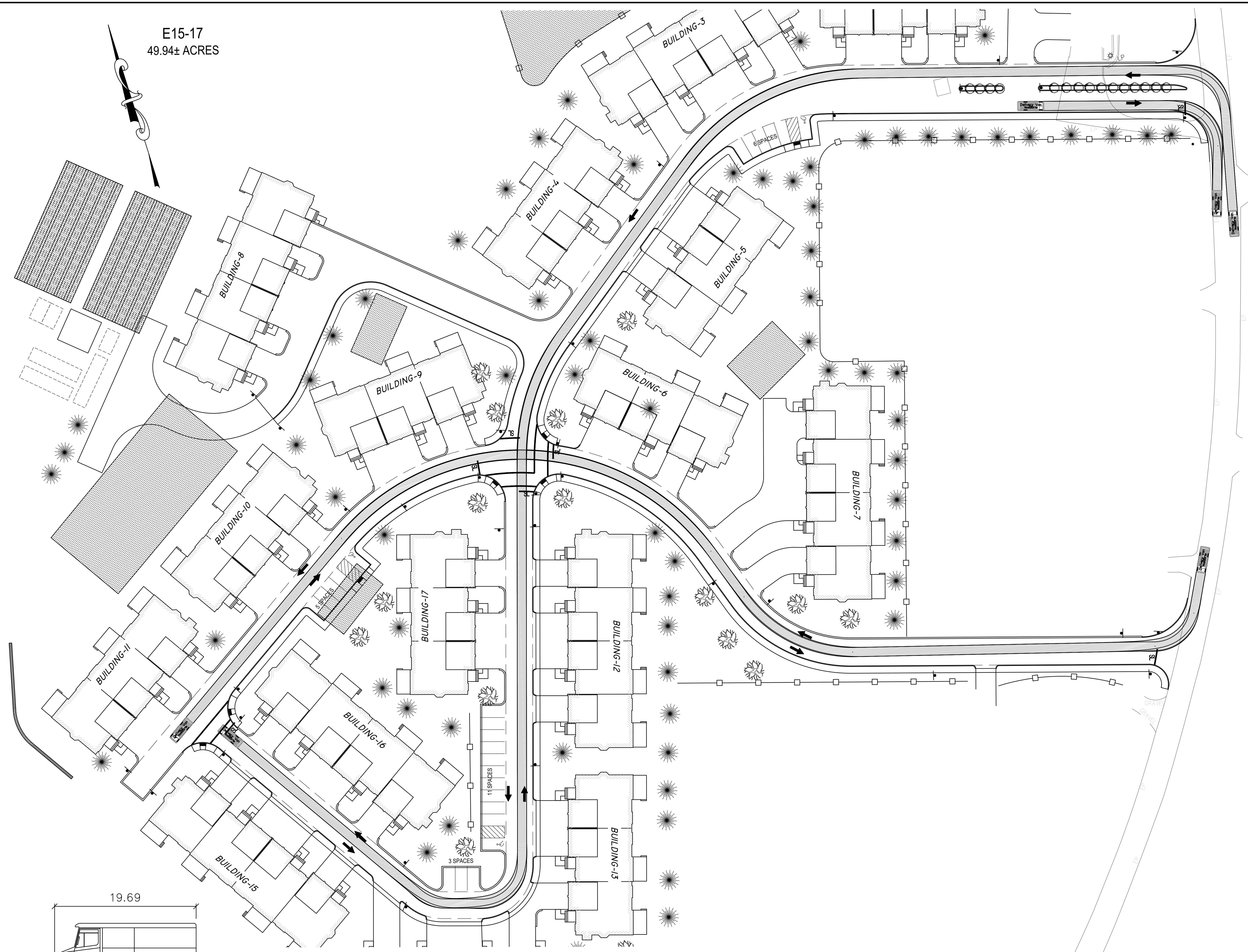
| REV | DATE       | DESCRIPTION  | BY  | APP |
|-----|------------|--|-----|-----|
| 1   | 5/22/2017  | COMMENTS PER WASHOUSING                                | SBS | BCM |
| 2   | 7/14/2018  | COMMENTS PER WASHOUSING                                | SBS | BCM |
| 3   | 11/27/2018 | ZBA APPLICATION  | SBS | BCM |
| 4   | 1/27/2021  | REVISIONS TO WMP COMPONENT                             | SBS | BCM |
| 5   | 4/5/2021   | MERRILL ENGINEERS PEER REVIEW COMMENTS                 | SBS | BCM |
| 6   | 6/7/2021   | RECONFIGURED WWT, STORMWATER SYSTEM AND BUILDINGS      | SBS | BCM |
| 7   | 6/9/2021   | NO CHANGES THIS SHEET                                  | SBS | BCM |
| 8   | 8/23/2021  | ADDED SIDEWALK, MERRILL ENGINEERS PEER REVIEW COMMENTS | SBS | BCM |

PREPARED BY:  
**MG**  
MCKENZIE  
ENGINEERING GROUP  
Assinippi Office Park  
150 Longwater Drive, Suite 101  
Norwell, MA 02061  
P: 781.792.3900  
F: 781.792.0333  
www.mckeng.com

PERMIT PLAN SET

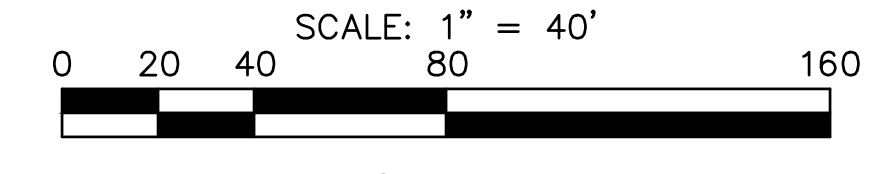


E15-17  
49.94± ACRES



Delivery Van

Width : 6.89 feet  
Track : 6.89 feet  
Lock to Lock Time : 6.0 feet  
Steering Angle : 46.2 degrees



|         |  |            |     |
|---------|--|------------|-----|
| BY APP. | DESCRIPTION  | DATE       | REV |
| SBS BOM | COMMENTS PER WASHOUSING                                | 5/12/2017  | 1   |
| SBS BOM | COMMENTS PER WASHOUSING                                | 7/14/2017  | 2   |
| AAC BOM | ZBA APPLICATION  | 11/27/2018 | 3   |
| SBS BOM | REVISIONS TO WMP COMPONENT                             | 1/27/2021  | 4   |
| SBS BOM | MERRILL ENGINEERS PEER REVIEW COMMENTS                 | 4/5/2021   | 5   |
| SBS BOM | RECONFIGURED WMT, STORMWATER SYSTEM AND BUILDINGS      | 6/7/2021   | 6   |
| SBS BOM | NO CHANGES THIS SHEET                                  | 6/9/2021   | 7   |
| SBS BOM | ADDED SIDEWALK, MERRILL ENGINEERS PEER REVIEW COMMENTS | 8/31/2021  | 8   |

PREPARED BY:

**MG**  
MCKENZIE  
ENGINEERING GROUP

Assinippi Office Park  
150 Longwater Drive, Suite 101  
Norwell, MA 02061  
P: 781.792.3900  
F: 781.792.0333  
www.mckeng.com

**RIVER MARSH VILLAGE  
COMPREHENSIVE PERMIT PLAN**  
(ASSESSOR'S MAP E-15, LOT 17)  
WATER STREET  
PEMBROKE, MASSACHUSETTS

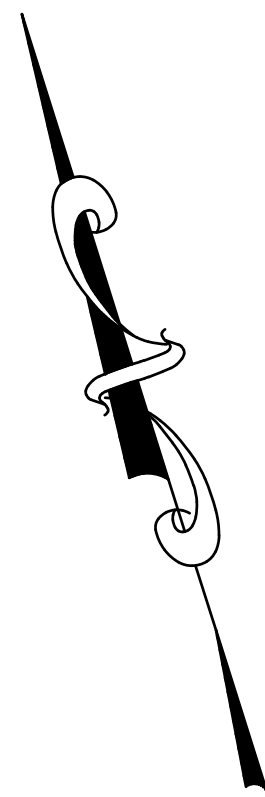
PROFESSIONAL ENGINEER:

OWNER/APPLICANT:  
RIVER MARSH, LLC  
2383 WASHINGTON STREET  
NORWELL, MASSACHUSETTS 02061

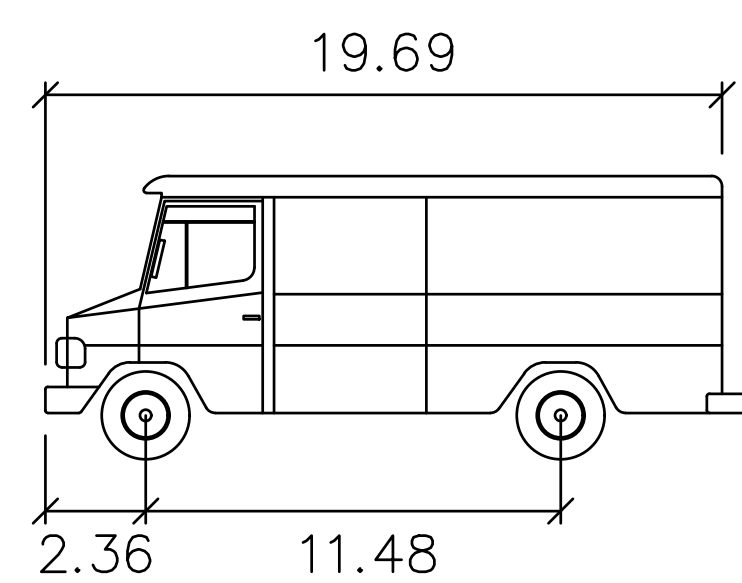
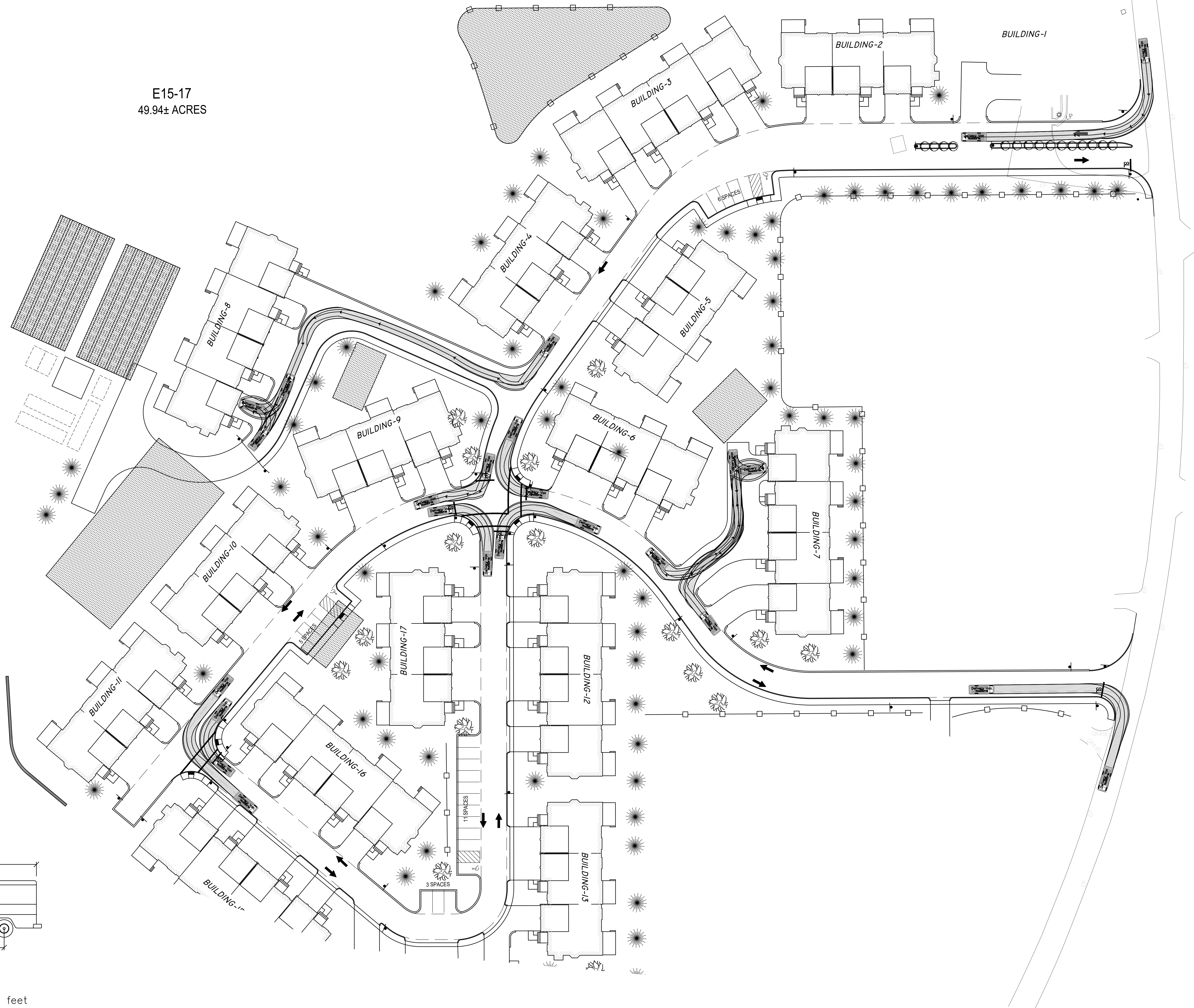
PERMIT PLAN SET

DRAWN BY: SBS  
DESIGNED BY: SBS  
CHECKED BY: BCM  
APPROVED BY: BCM  
DATE: SEPTEMBER 22, 2016  
SCALE: 1"=40'  
PROJECT NO.: 215-181  
DWG. TITLE: Delivery Truck Access Plan  
DWG. No: C-7



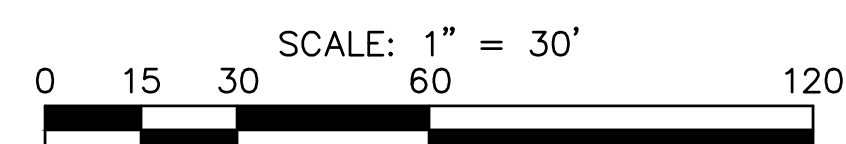


E15-17  
49.94± ACRES



Delivery Van

Width : 6.89 feet  
Track : 6.89  
Lock to Lock Time : 6.0  
Steering Angle : 46.2



© MCKENZIE ENGINEERING GROUP, INC.

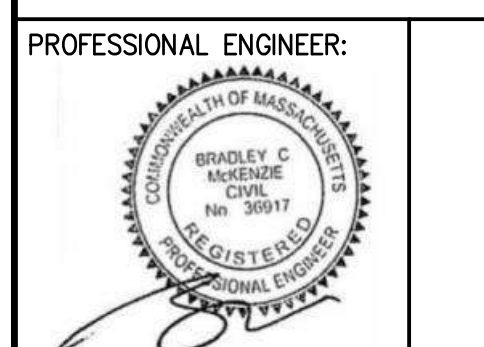
| REV | DATE       | DESCRIPTION  | BY  |
|-----|------------|--|-----|
| 1   | 5/22/2017  | COMMENTS PER WASHOUSING                                | SBS |
| 2   | 7/14/2017  | COMMENTS PER WASHOUSING                                | SBS |
| 3   | 11/27/2018 | ZBA APPLICATION  | ACM |
| 4   | 1/27/2021  | REVISIONS TO WMP COMPONENT                             | SBS |
| 5   | 4/5/2021   | MERRILL ENGINEERS PEER REVIEW COMMENTS                 | SBS |
| 6   | 6/7/2021   | RECONFIGURED WMT, STORMWATER SYSTEM AND BUILDINGS      | SBS |
| 7   | 6/9/2021   | NO CHANGES THIS SHEET                                  | SBS |
| 8   | 8/23/2021  | ADDED SIDEWALK, MERRILL ENGINEERS PEER REVIEW COMMENTS | SBS |

PREPARED BY:

**MG**  
MCKENZIE  
ENGINEERING GROUP

Assinippi Office Park  
150 Longwater Drive, Suite 101  
Norwell, MA 02061  
P: 781.792.3900  
F: 781.792.0333  
www.mckeng.com

**RIVER MARSH VILLAGE  
COMPREHENSIVE PERMIT PLAN**  
(ASSESSOR'S MAP E-15, LOT 17)  
WATER STREET  
PEMBROKE, MASSACHUSETTS



OWNER/APPLICANT:  
RIVER MARSH, LLC  
283R WASHINGTON STREET  
NORWELL, MASSACHUSETTS 02061

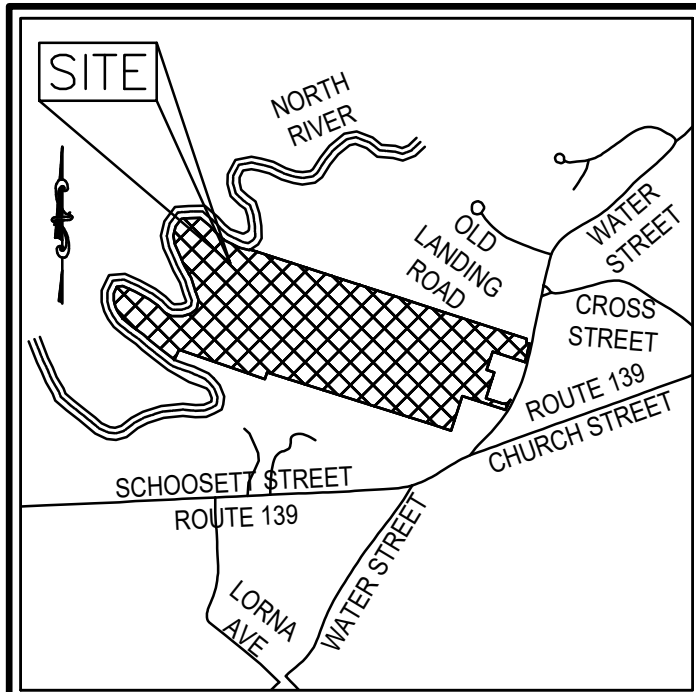
DRAWN BY: SBS  
DESIGNED BY: SBS  
CHECKED BY: BCM  
APPROVED BY: BCM  
DATE: SEPTEMBER 22, 2016  
SCALE: 1"=30'  
PROJECT NO.: 215-181

DWG. TITLE:  
**Delivery Truck  
Access  
Plan**

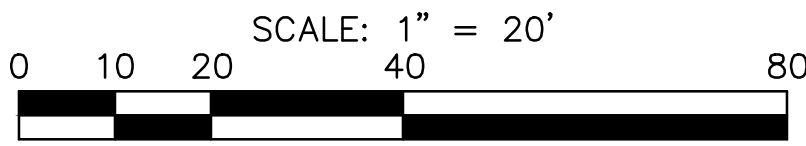
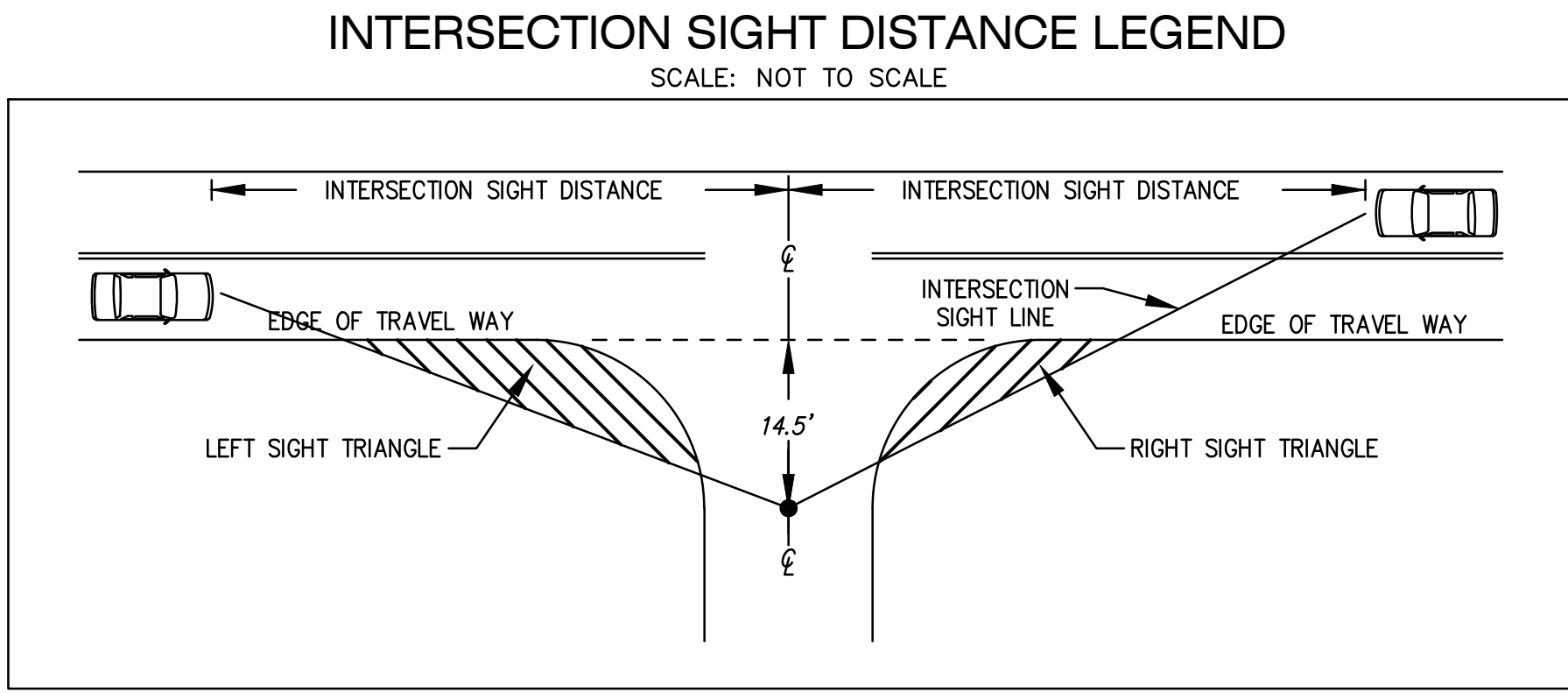
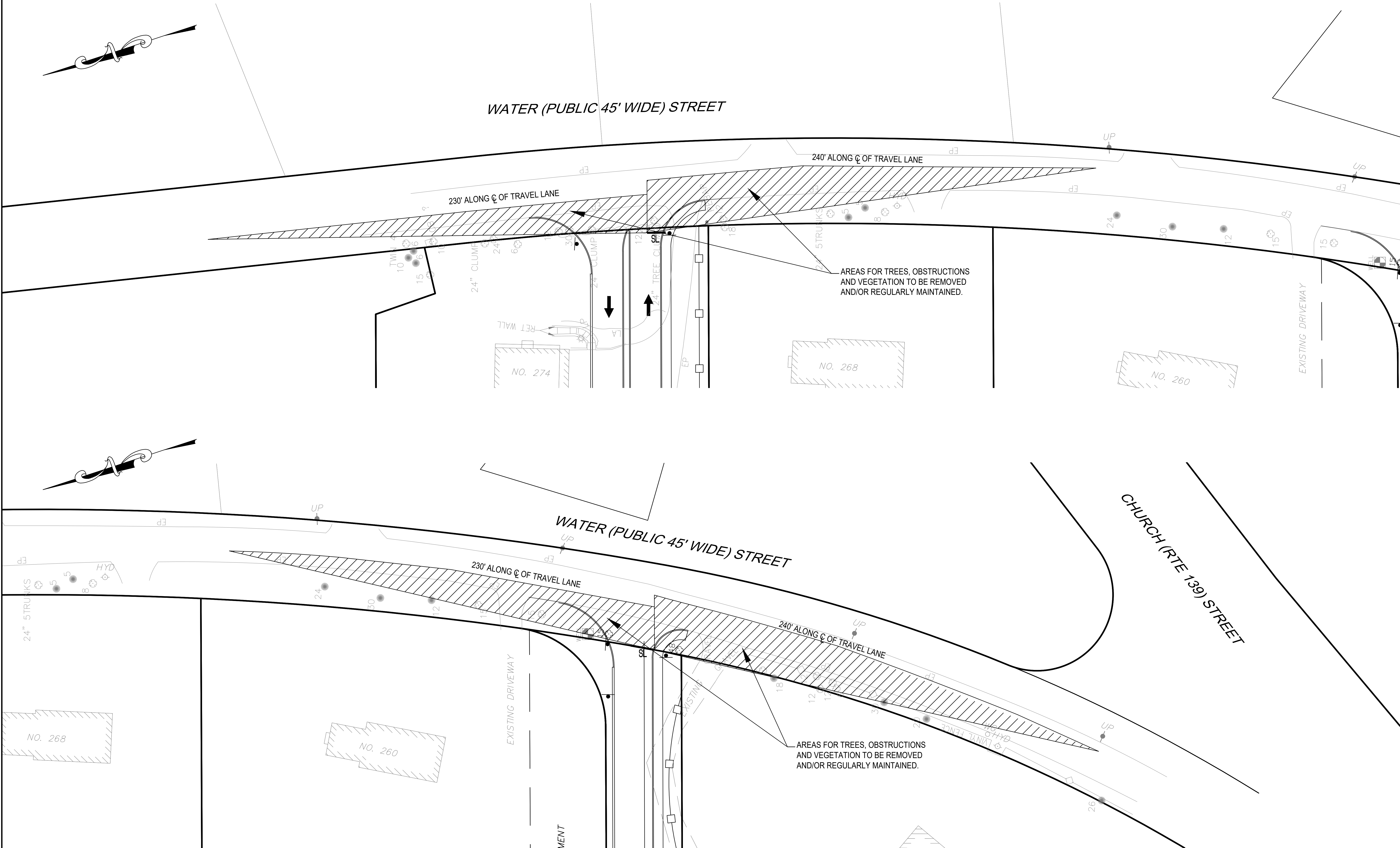
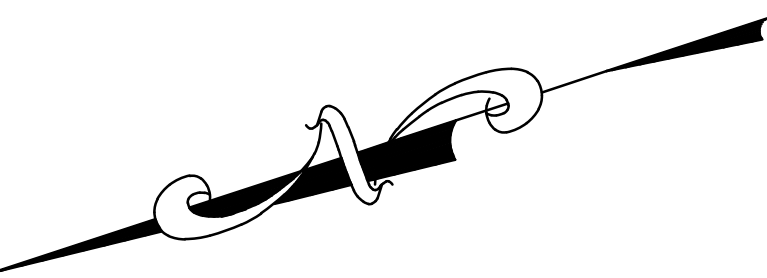
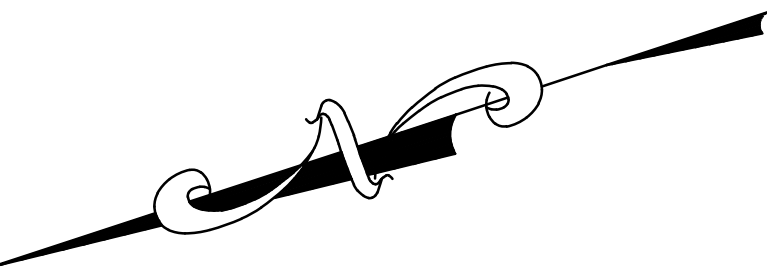
DWG. NO.: **C-8**

PERMIT PLAN SET





LOCUS MAP  
Not to Scale



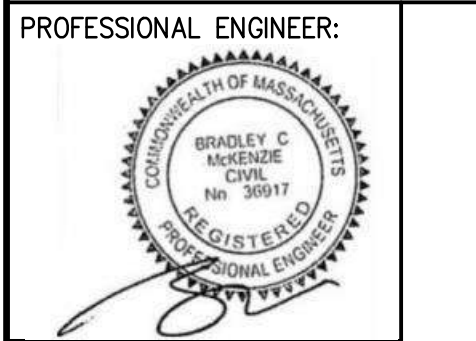
© MCKENZIE ENGINEERING GROUP, INC.

| REV | DATE       | DESCRIPTION  |
|-----|------------|--|
| 1   | 5/12/2017  | COMMENTS PER WASHINGTON                                |
| 2   | 7/14/2017  | COMMENTS PER WASHINGTON                                |
| 3   | 11/27/2018 | ZBA APPLICATION  |
| 4   | 1/27/2021  | REVISIONS TO WMP COMPONENT                             |
| 5   | 4/5/2021   | MERRILL ENGINEERS PEER REVIEW COMMENTS                 |
| 6   | 6/7/2021   | RECONFIGURED WMT, STORMWATER SYSTEM AND BUILDINGS      |
| 7   | 6/9/2021   | NO CHANGES THIS SHEET                                  |
| 8   | 8/31/2021  | ADDED SIDEWALK, MERRILL ENGINEERS PEER REVIEW COMMENTS |

**MG**  
MCKENZIE  
ENGINEERING GROUP

Assinippi Office Park  
150 Longwater Drive, Suite 101  
Norwell, MA 02061  
P: 781.792.3900  
F: 781.792.0333  
www.mckeng.com

**RIVER MARSH VILLAGE  
COMPREHENSIVE PERMIT PLAN**  
(ASSESSOR'S MAP E-15, LOT 17)  
WATER STREET  
PEMBROKE, MASSACHUSETTS



OWNER/APPLICANT:  
RIVER MARSH, LLC  
288R WASHINGTON STREET  
NORWELL, MASSACHUSETTS 02061

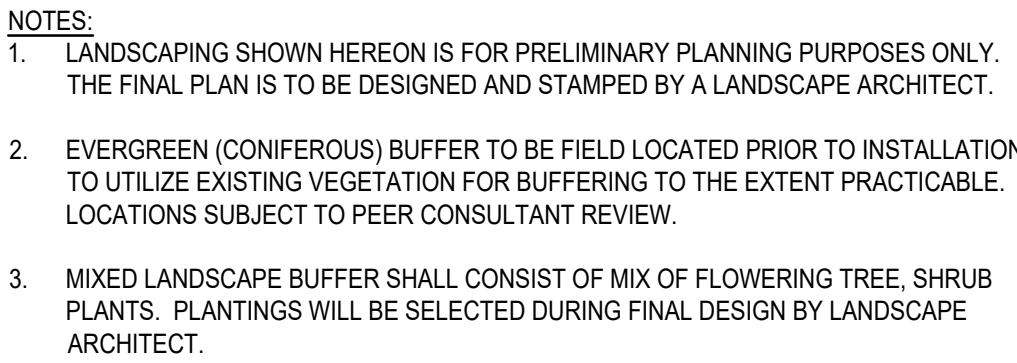
DRAWN BY: SBS  
DESIGNED BY: SBS  
CHECKED BY: BCM  
APPROVED BY: BCM  
DATE: SEPTEMBER 22, 2016  
SCALE: 1"=20'  
PROJECT NO.: 215-181

DWG. TITLE:  
**Preliminary  
Sight  
Triangles**

DWG. NO.:  
**C-9**

PERMIT PLAN SET

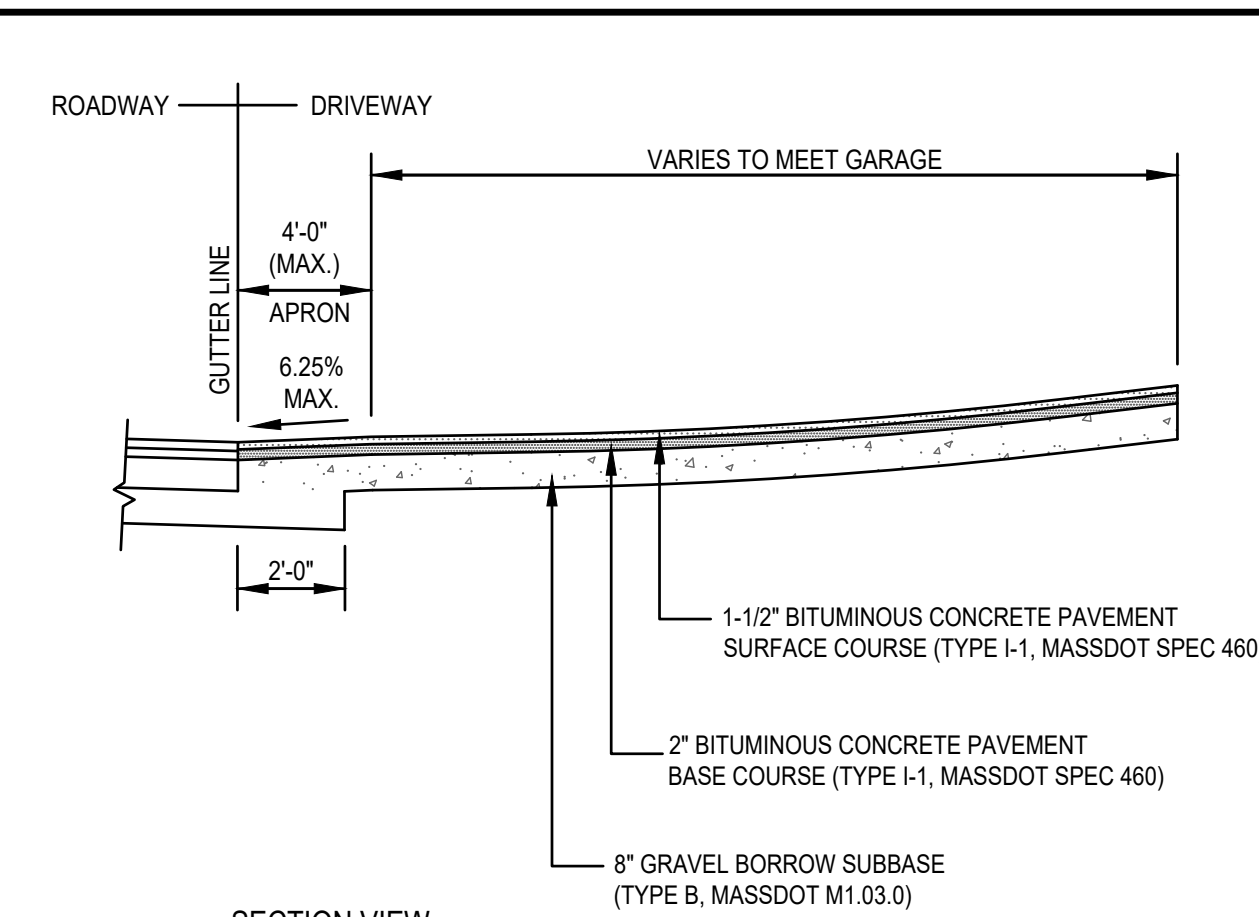
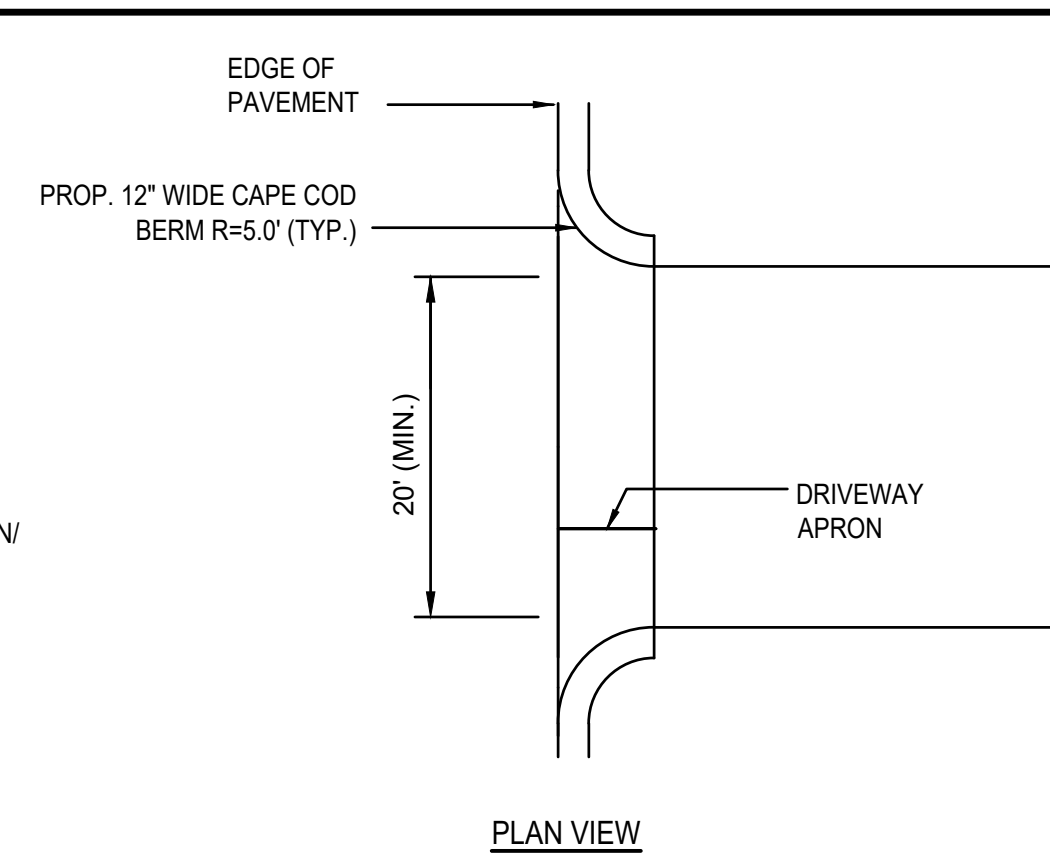
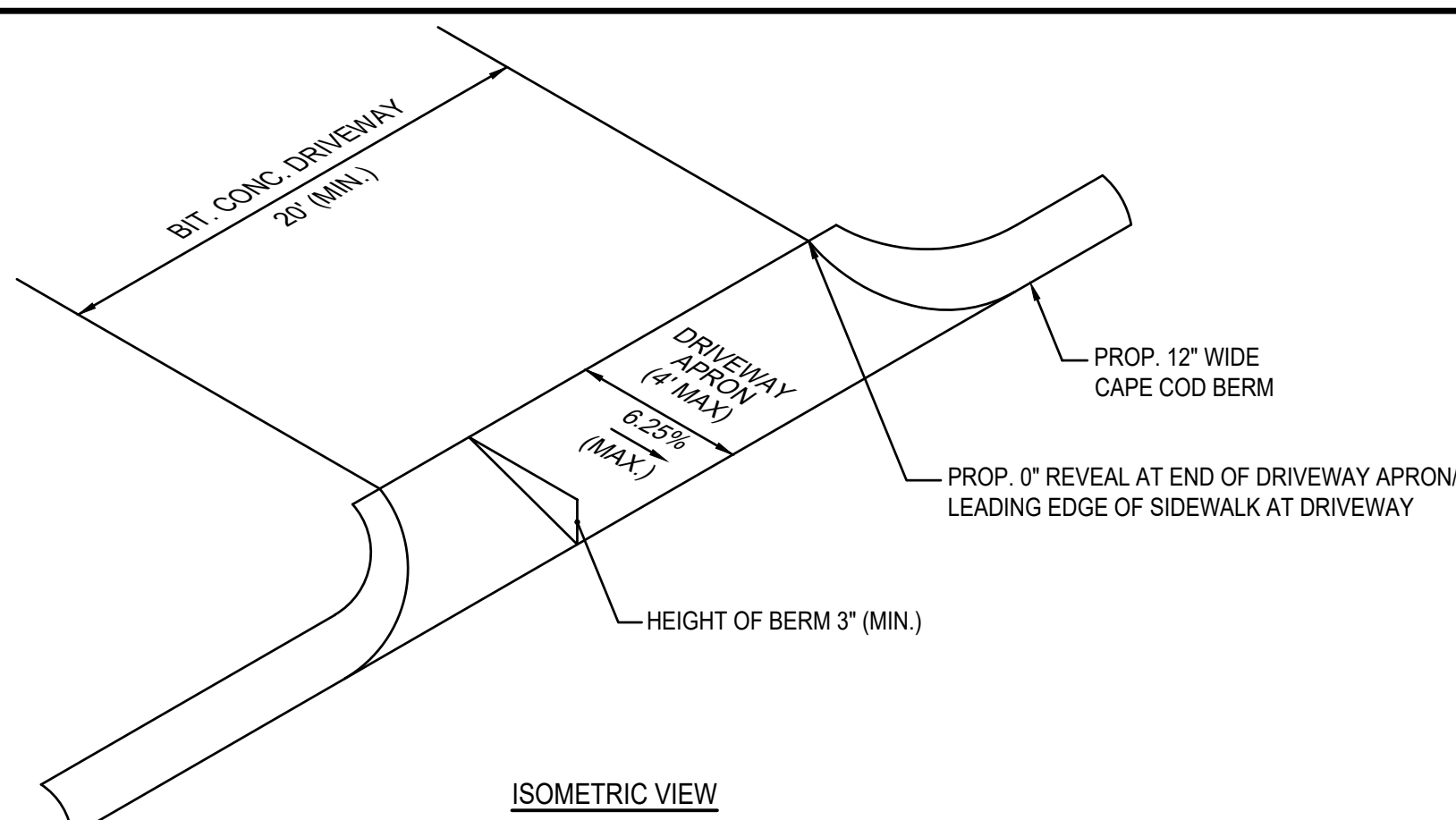




© MCKENZIE ENGINEERING GROUP, INC.

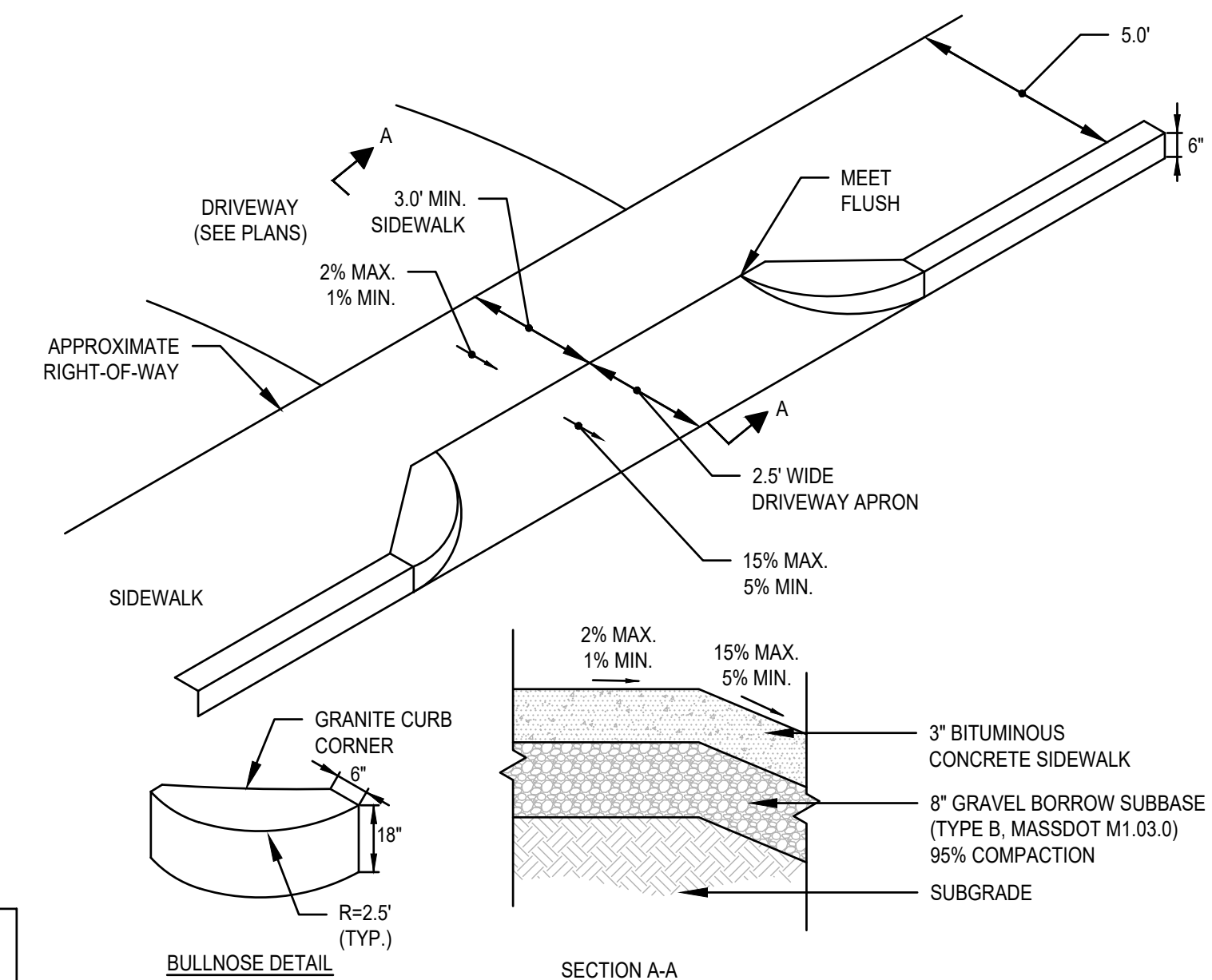
DWG. NO: **L-1**



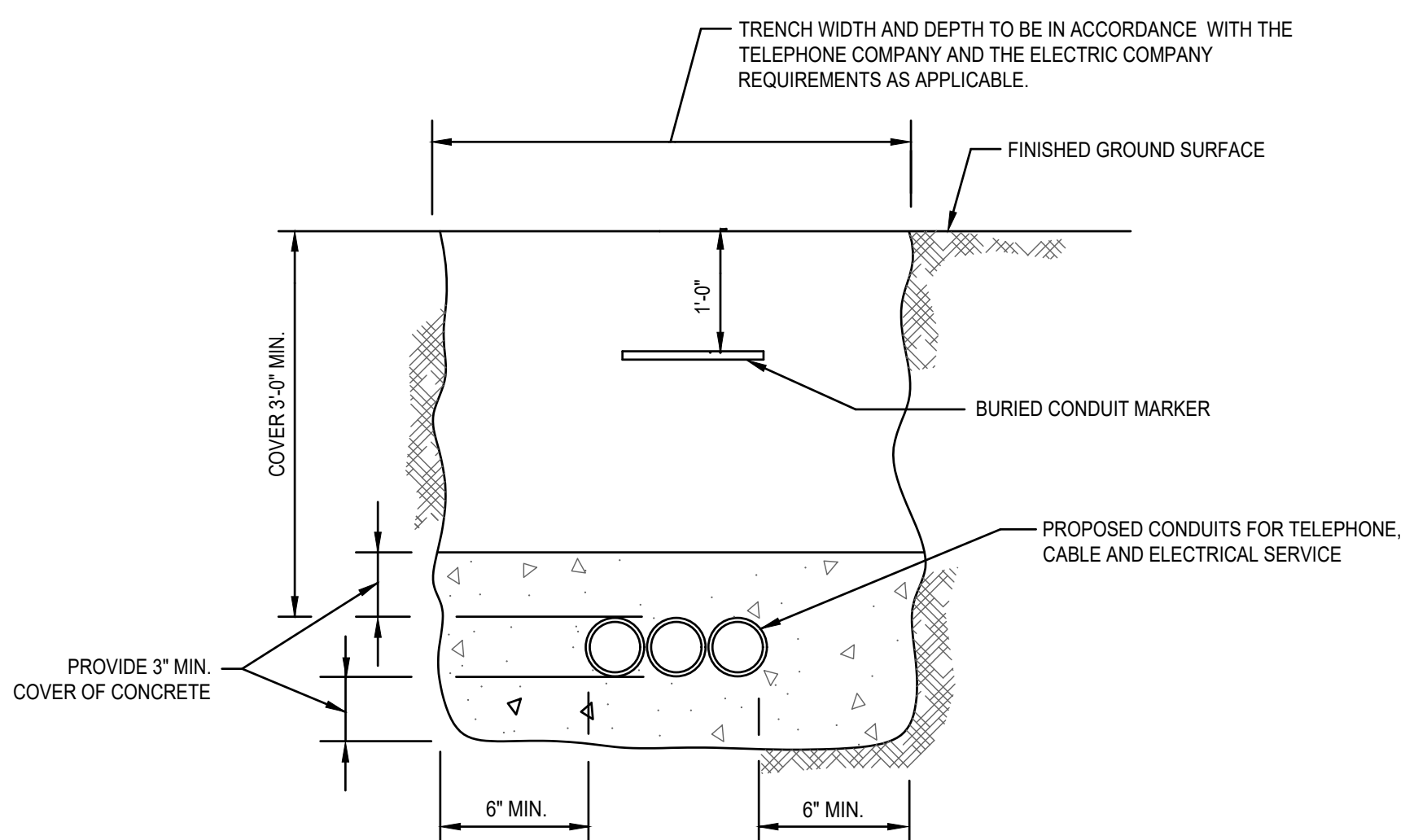


TYPICAL DRIVEWAY DETAIL WITHOUT  
SIDEWALK  
SCALE: N.T.S.

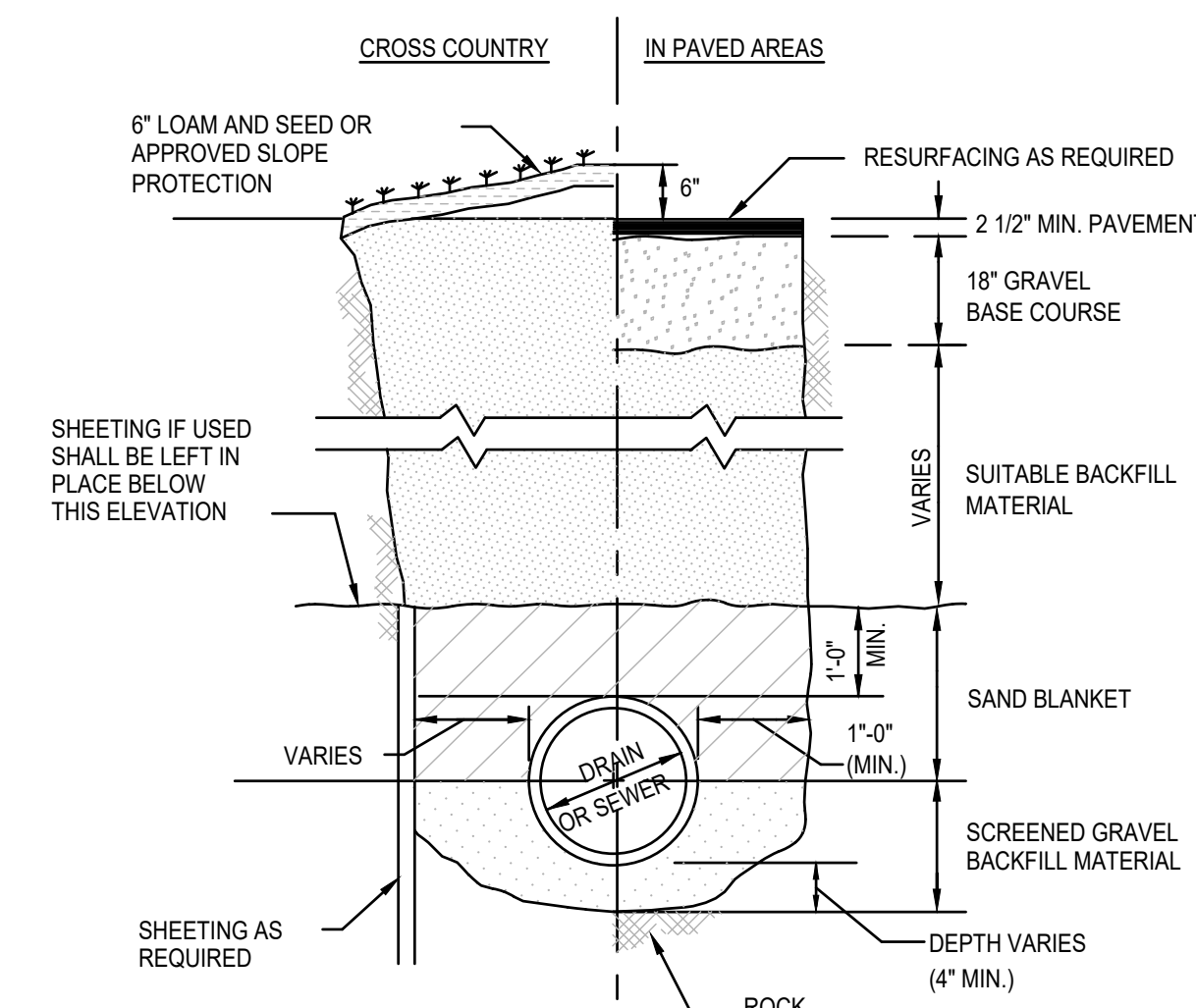
### SECTION VIEW



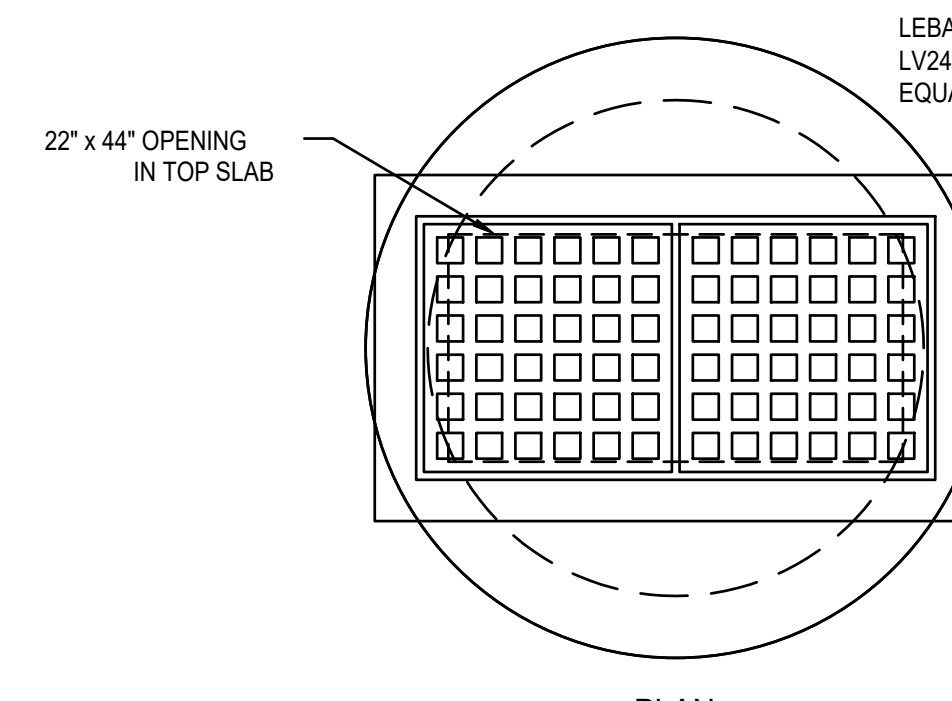
SIDEWALK THRU DRIVEWAYS WITH CURB RETURNS  
SCALE: N.T.S.



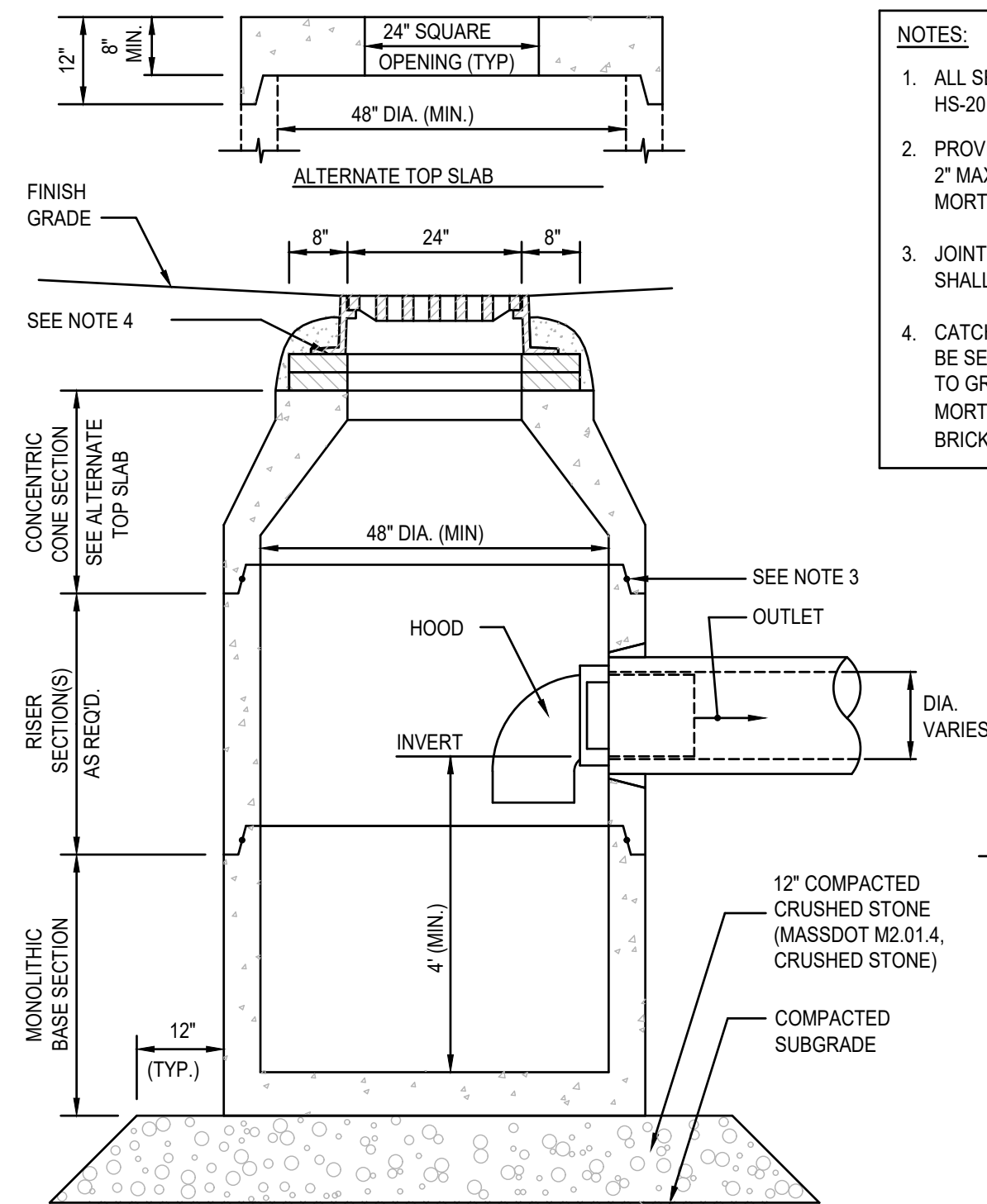
TYPICAL ELECTRIC/TELEPHONE/CABLE CONDUIT  
(US-UTILITY SERVICE)  
SCALE: N.T.S



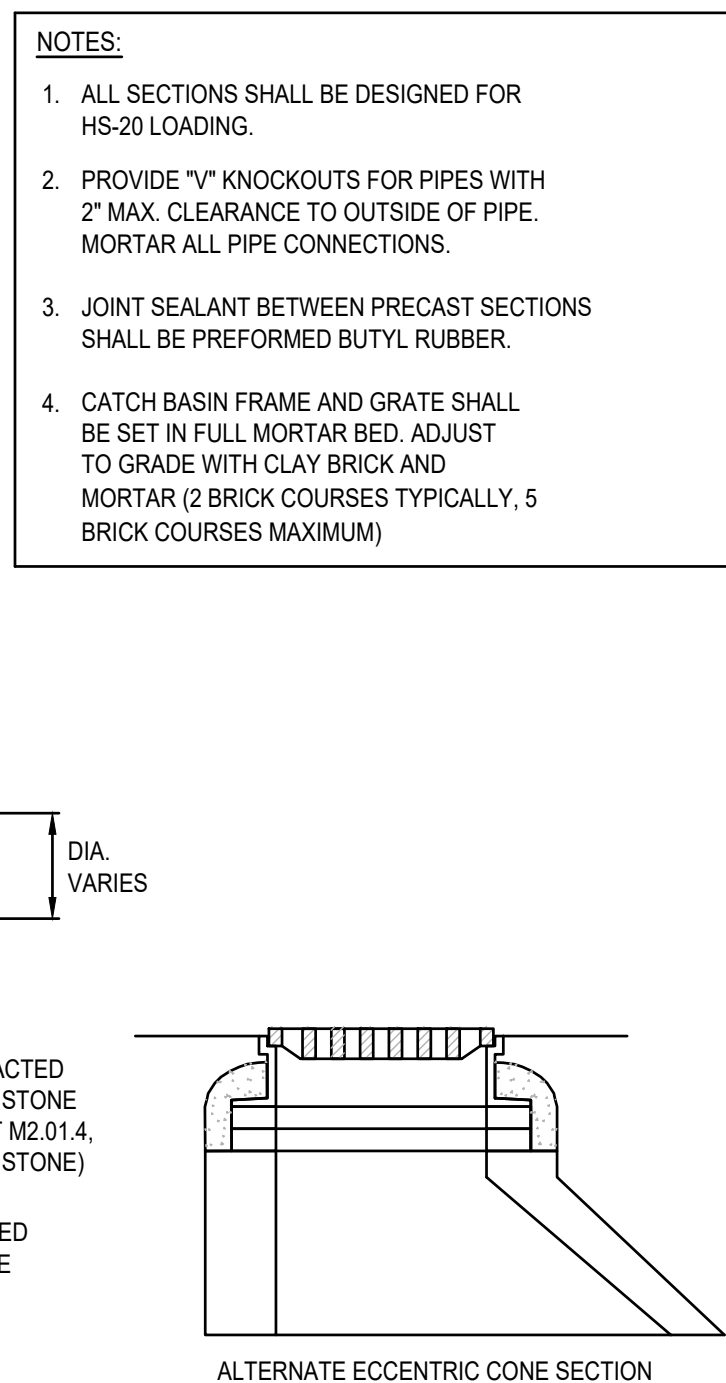
TYPICAL TRENCH DETAIL  
SCALE: N.T.S.



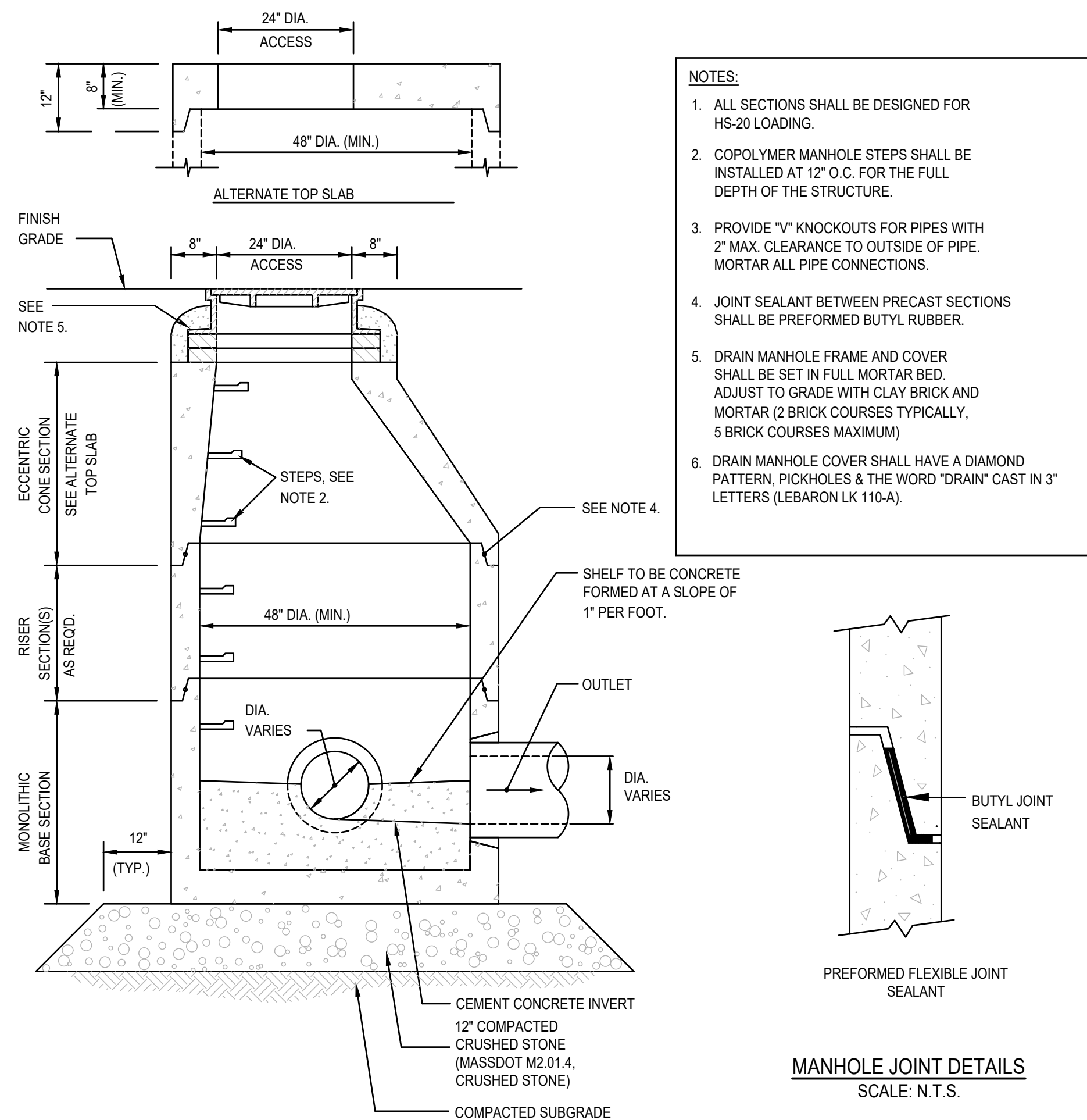
DOUBLE GRATE CATCH BASIN DETAIL  
SCALE: N.T.S.



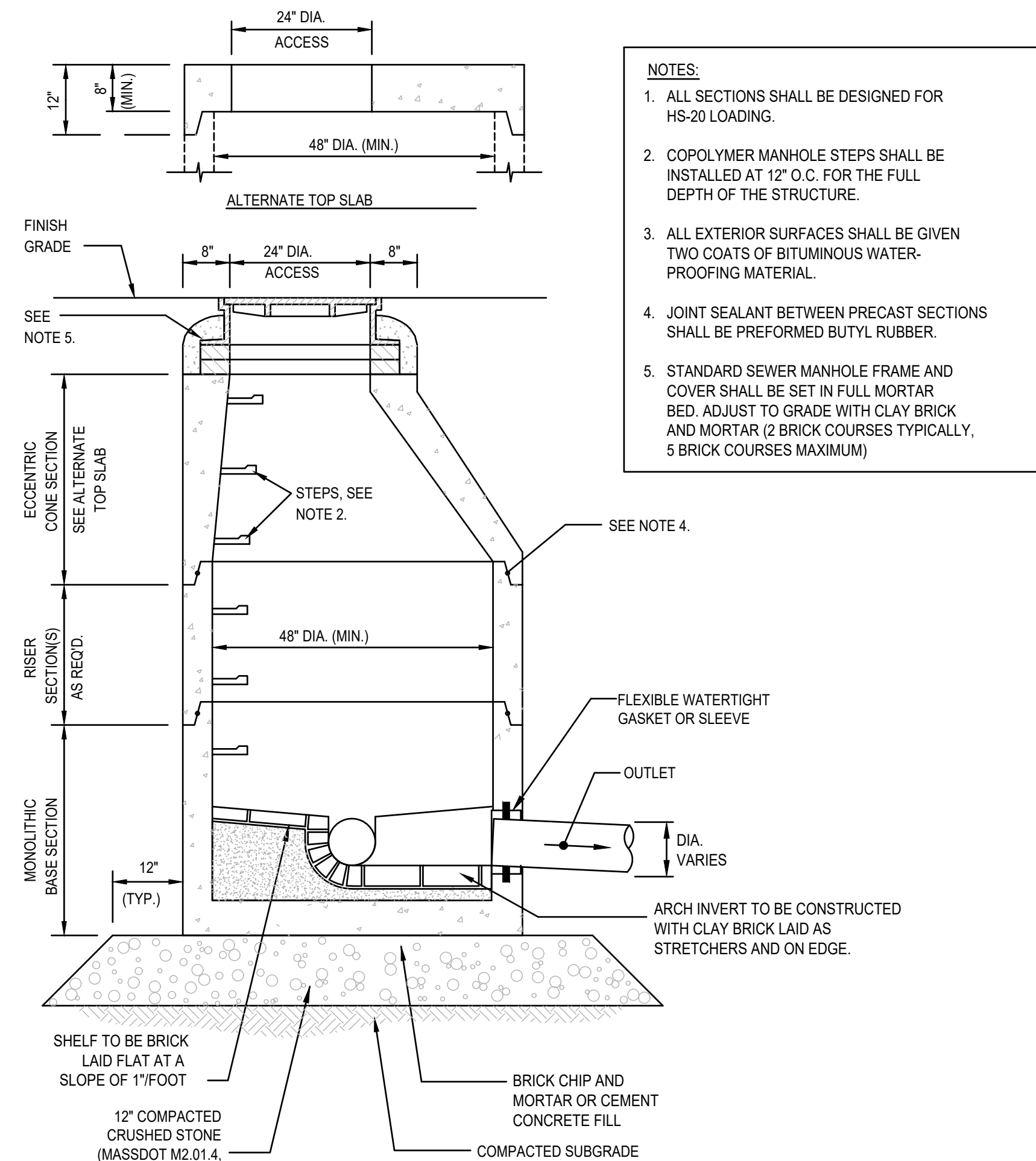
CATCH BASIN W/HOOD  
SCALE: N.T.S.



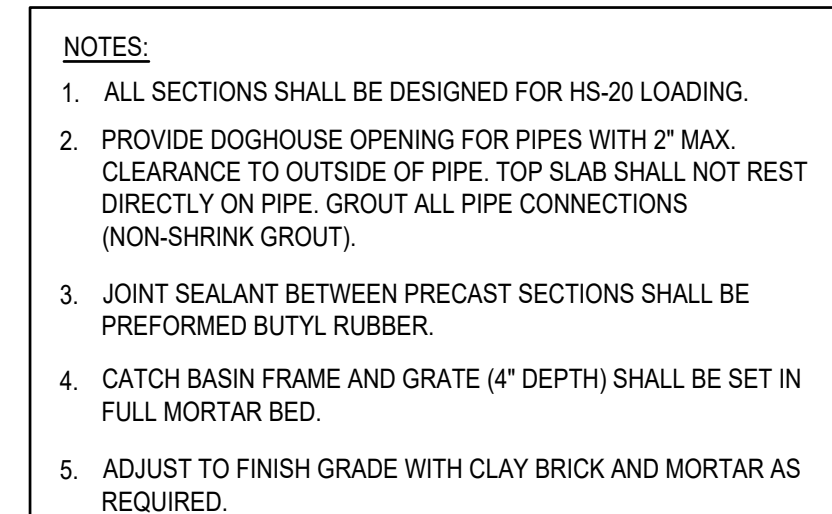
SHALLOW CATCH BASIN W/HOOD  
SCALE: N.T.S.



DRAIN MANHOLE DETAIL  
SCALE: N.T.S.



SEWER MANHOLE DETAIL  
SCALE: N.T.S.



PLAN  
DOUBLE GRATE CATCH BASIN DETAIL  
SCALE: N.T.S.

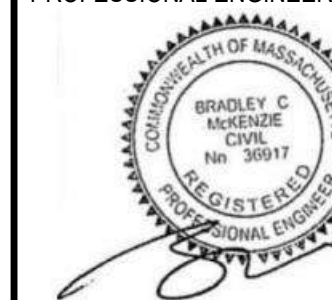
| REV | DATE      | DESCRIPTION   | BY  | APP |
|-----|-----------|---|-----|-----|
| 1   | 5/12/2017 | COMMENTS PER MASSHOUSING                              | SSS | BCM |
| 2   | 7/14/2017 | COMMENTS PER MASSHOUSING                              | SSS | BCM |
| 3   | 1/27/2018 | 786 APPLICATION                                       | AJC | BCM |
| 4   | 1/27/2021 | NO REVISIONS THIS SHEET                               | SSS | BCM |
| 5   | 4/5/2021  | REVISIONS TO DRIVEWAY DETAIL                          | SSS | BCM |
| 6   | 5/9/2021  | NO CHANGES THIS SHEET                                 | SSS | BCM |
| 7   | 6/9/2021  | NO CHANGES THIS SHEET                                 | SSS | BCM |
| 8   | 8/31/2021 | REVISIONS TO TYPICAL ROADWAY SECTION, DRIVEWAY DETAIL | SSS | BCM |

|             |  |  |  |
|-------------|--|--|--|
| PREPARED BY |  |  |  |
|-------------|--|--|--|



**RIVER MARSH VILLAGE  
COMPREHENSIVE PERMIT PLAN**  
(ASSESSOR'S MAP E-17, LOT 0 & E-17A, LOT 274)  
WATER STREET  
PEMBROKE, MASSACHUSETTS

PROFESSIONAL ENGINEER



OWNER/APPLICANT:

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

PERMIT PLAN SET

|              |                    |
|--------------|--------------------|
| DRAWN BY:    | SBS                |
| DESIGNED BY: | SBS                |
| CHECKED BY:  | BCM                |
| APPROVED BY: | BCM                |
| DATE:        | SEPTEMBER 22, 2016 |
| SCALE:       | AS NOTED           |
| PROJECT NO.: | 215-181            |
| DWG. TITLE:  |                    |

Construction  
Details  
Sheet 1 of 6

DWG. NO: **D-1**



## 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<sub>2</sub>): 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 OF 1,000 LBS. PER ACRE OF 5-10-10)
- 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 CULTIPACKING 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.**

|                           | <u>POUND / ACRE</u> | <u>POUNDS / 1,000 S.F.</u> | <u>USE</u>   |
|---------------------------|---------------------|----------------------------|--|
| A. TALL FESCUE            | 20                  | 0.45                       |  |
| CREEPING RED FESCUE       | 20                  | 0.45                       |  |
| REDTOP                    | 2                   | 0.05                       |  |
| TOTAL                     | 42                  | 0.95                       | STEEP CUTS AND<br>FILLS, BORROW<br>AND DISPOSAL<br>AREAS                       |
| B. TALL FESCUE            | 15                  | 0.35                       |  |
| CREEPING RED FESCUE       | 10                  | 0.25                       |  |
| BIRDSFOOT TREFOIL         | 15                  | 0.35                       |  |
| TOTAL                     | 40                  | 0.95                       | WATERWAYS, EMERGENCY<br>SPRINKLES, AND OTHER<br>CHANNELS WITH<br>FLOWING WATER |
| C. TALL FESCUE            | 20                  | 0.45                       |  |
| CREEPING RED FESCUE       | 20                  | 0.45                       |  |
| BIRDSFOOT TREFOIL         | 8                   | 0.20                       |  |
| TOTAL                     | 48                  | 1.10                       | LAWN AREAS   |
| 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                       |  |

SEEDING MIXTURE 1/

E

D

F

PREPARED SEEDED LAWN OR SOD

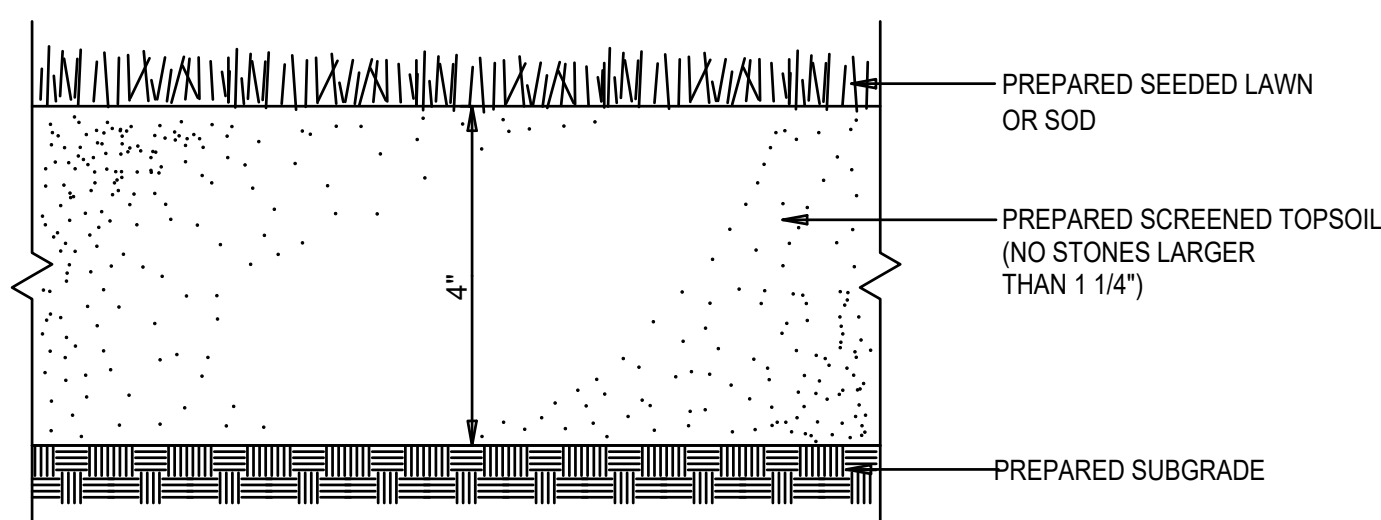
PREPARED SCREENED TOPSOIL (NO STONES LARGER THAN 1 1/4")

PREPARED SUBGRADE

12"

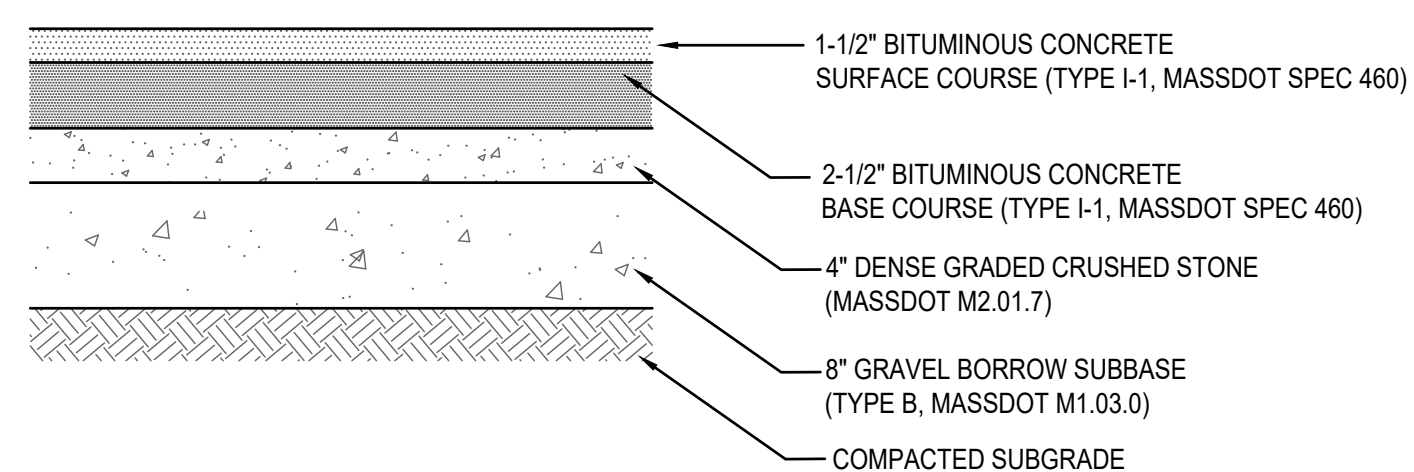
NOTES:

1. TOP OF LOAM (TOPSOIL) IS FINISHED GRADE.
2. LOAM AND SOD OR SEED, SHALL CONFORM TO MASSDOT MATERIAL SPECIFICATIONS M1.05.0, M1.07.0 AND M1.06.1, AND CONSTRUCTION METHODS 751.80 TO 751.63.

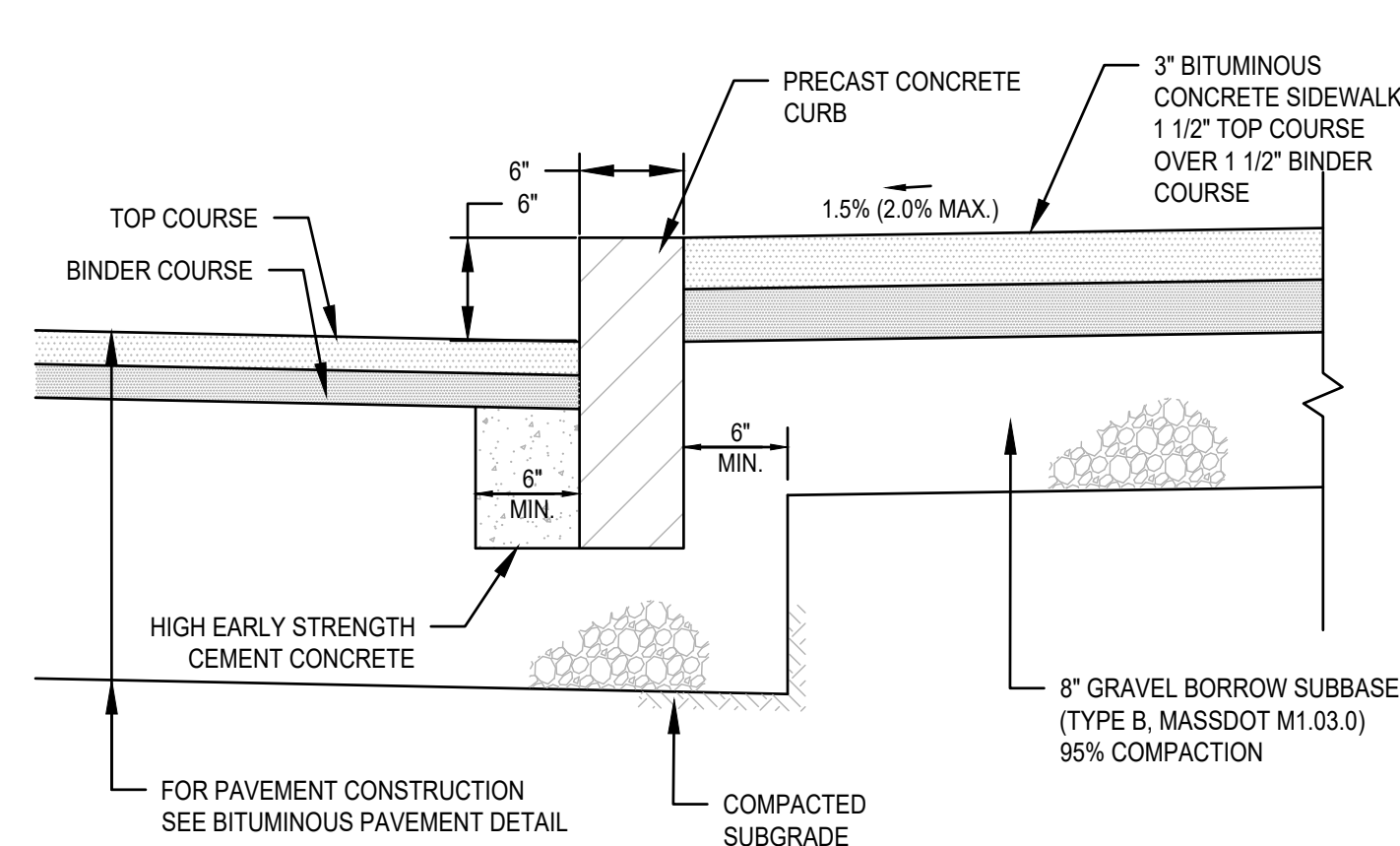


- NOTES:**
1. TOP OF LOAM (TOPSOIL) IS FINISHED GRADE.
  2. LOAM AND SOD OR SEED, SHALL CONFORM TO MASSDOT MATERIAL SPECIFICATIONS M1.05.0, M1.07.0 AND M1.06.1, AND CONSTRUCTION METHODS 751.60 TO 751.63.

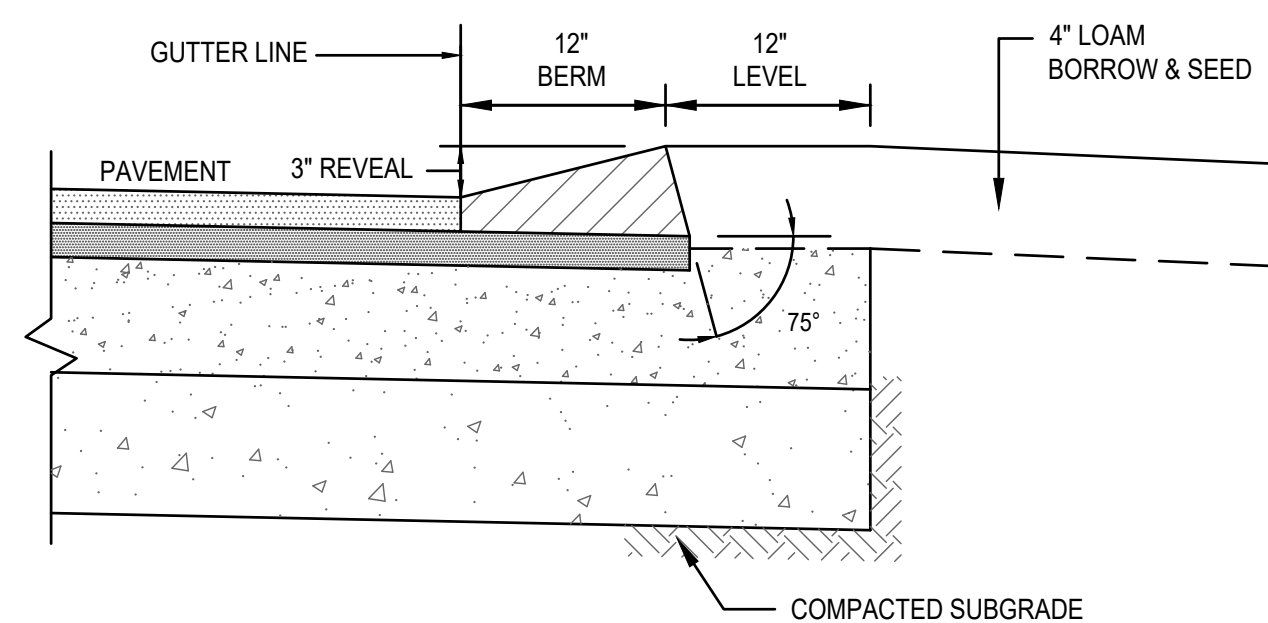
SCALE: N.T.S.



SCALE: N.T.S.



SCALE: N.T.S.



SCALE FACTS

A. HAY, 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

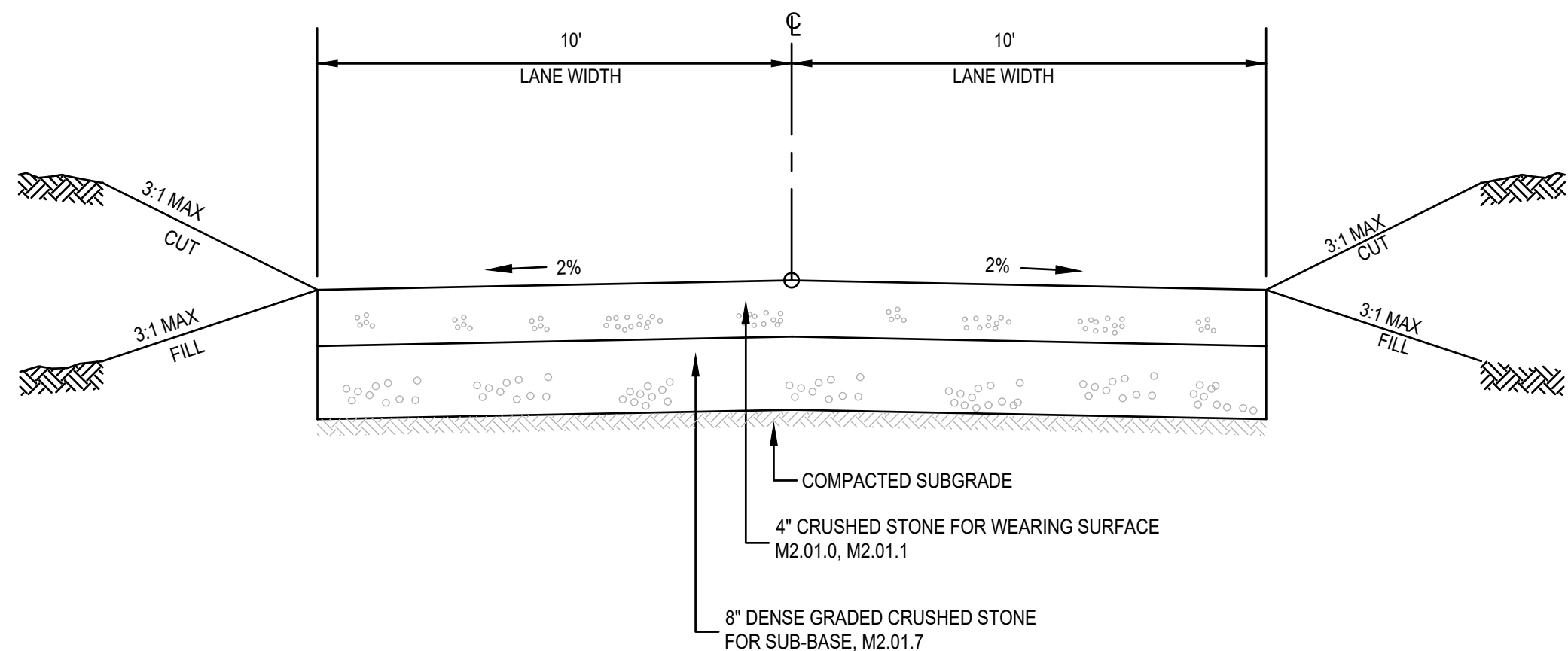
A. PLANTED AREAS SHOULD BE PROTECTED FROM DAMAGE BY FIRE, GRAZING, TRAFFIC, AND DENSE WEED GROWTH.

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.

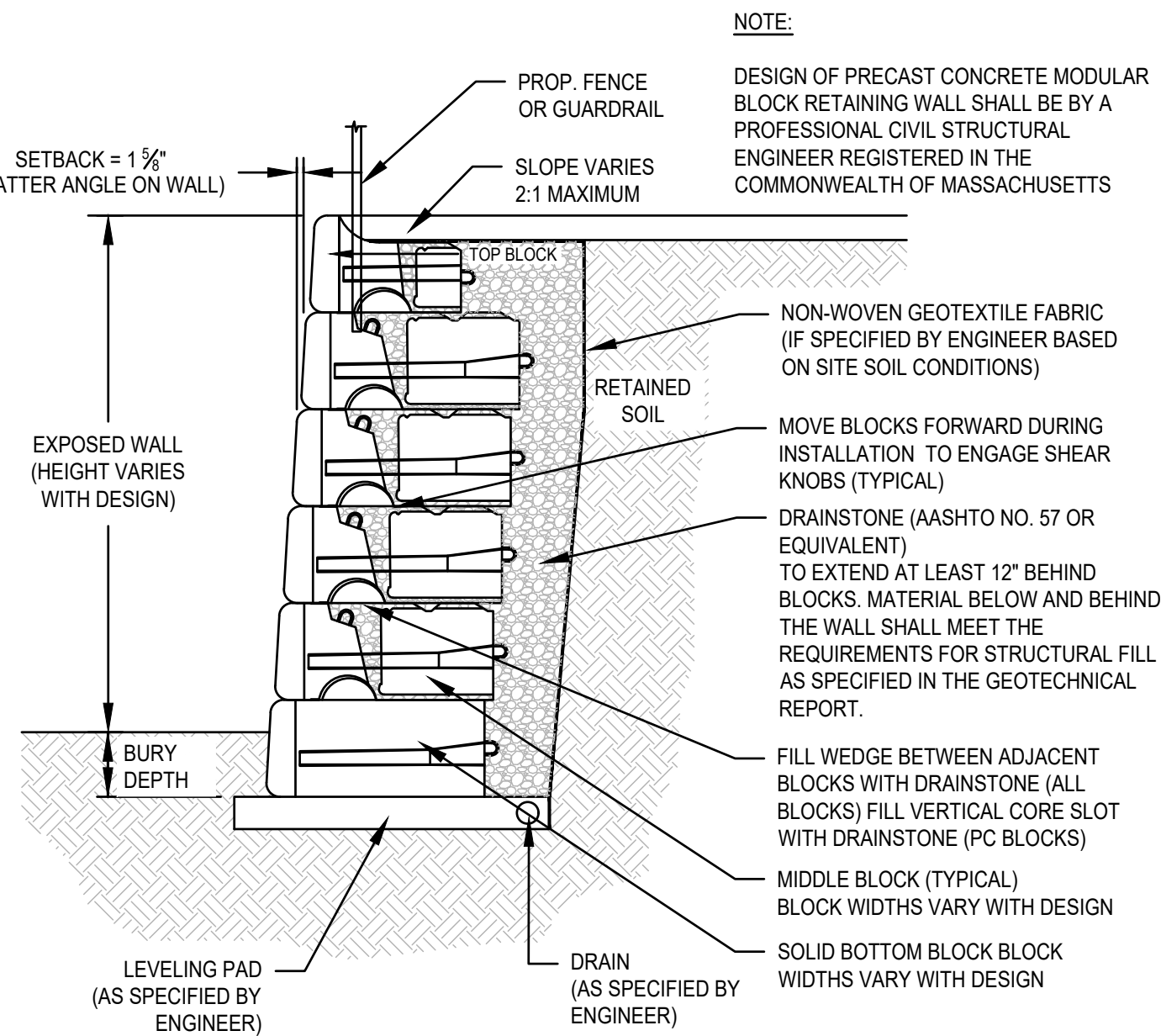
C. IN WATERWAYS, CHANNELS, OR SWALES WHERE UNIFORM FLOW CONDITIONS ARE ANTICIPATED OCCASIONAL MOWING MAY BE NECESSARY TO CONTROL GROWTH OF WOODY VEGETATION.

NOTES:

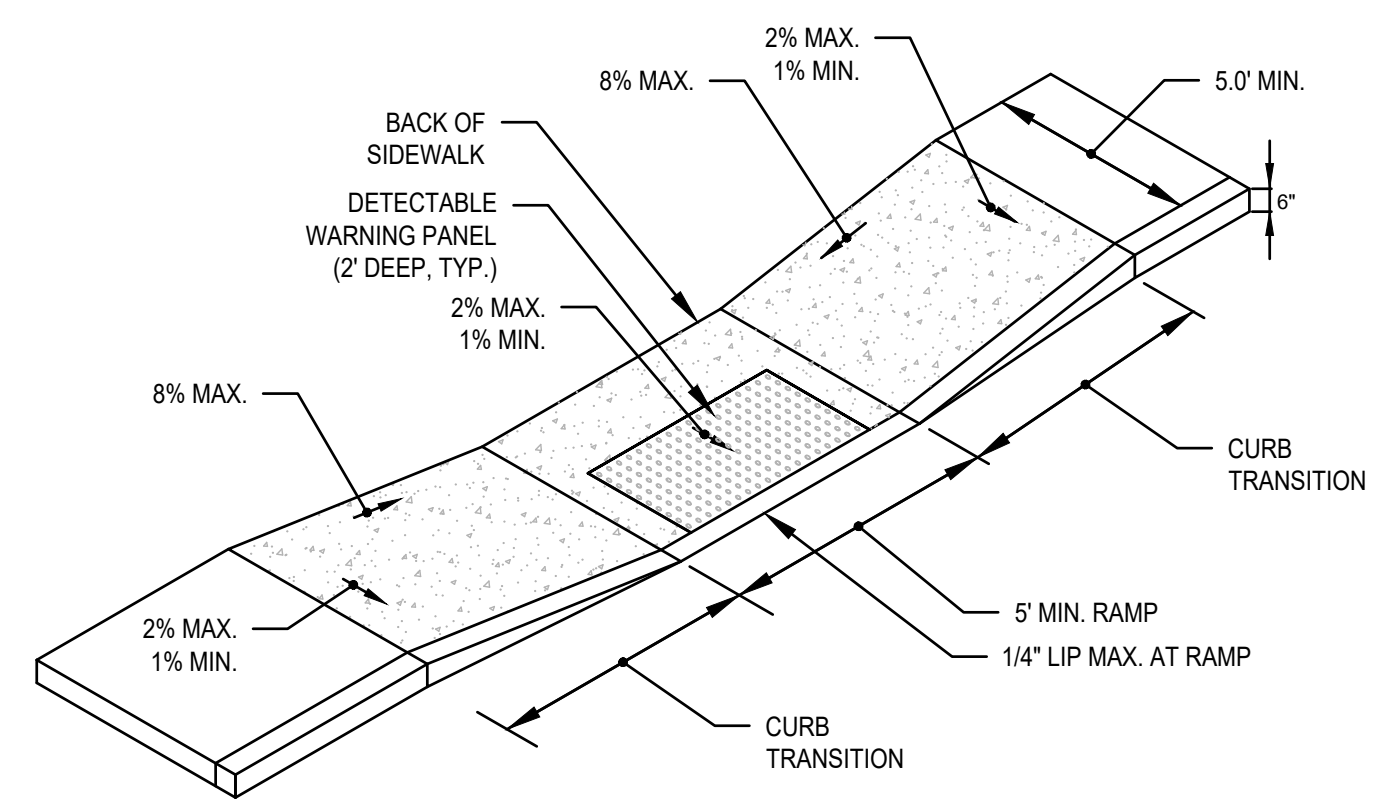
1. TOP OF LOAM (TOPSOIL) IS FINISHED GRADE.
2. TOPSOIL SHALL CONTAIN BETWEEN 5% AND 12% ORGANIC MATTER AND SHALL HAVE A MAXIMUM STONE SIZE OF 3/4" AND SHALL CONFORM



SCALE: N.T.S.



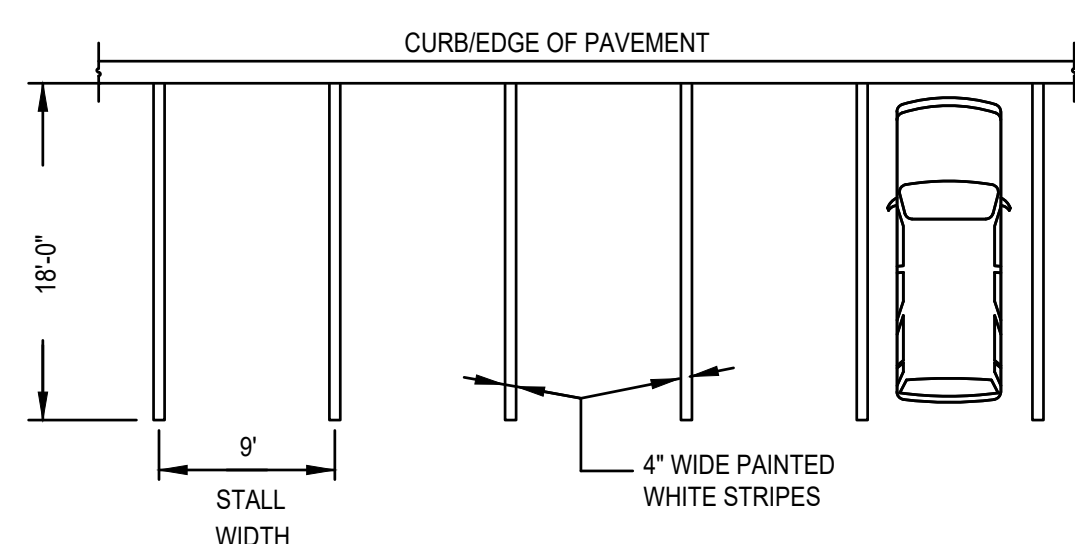
SCALE: N.T.S.



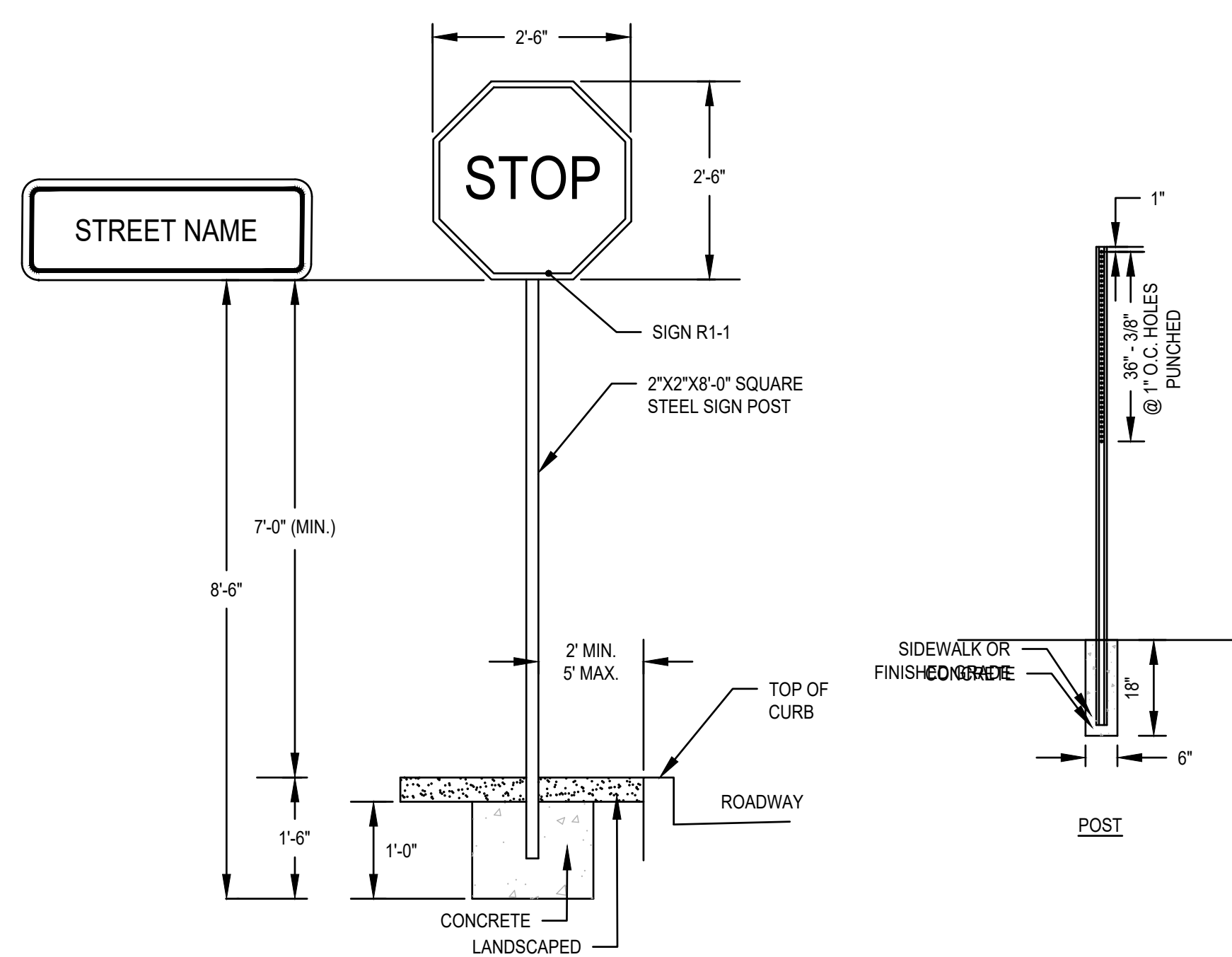
SCALE: N.T.S.

- NOTES:

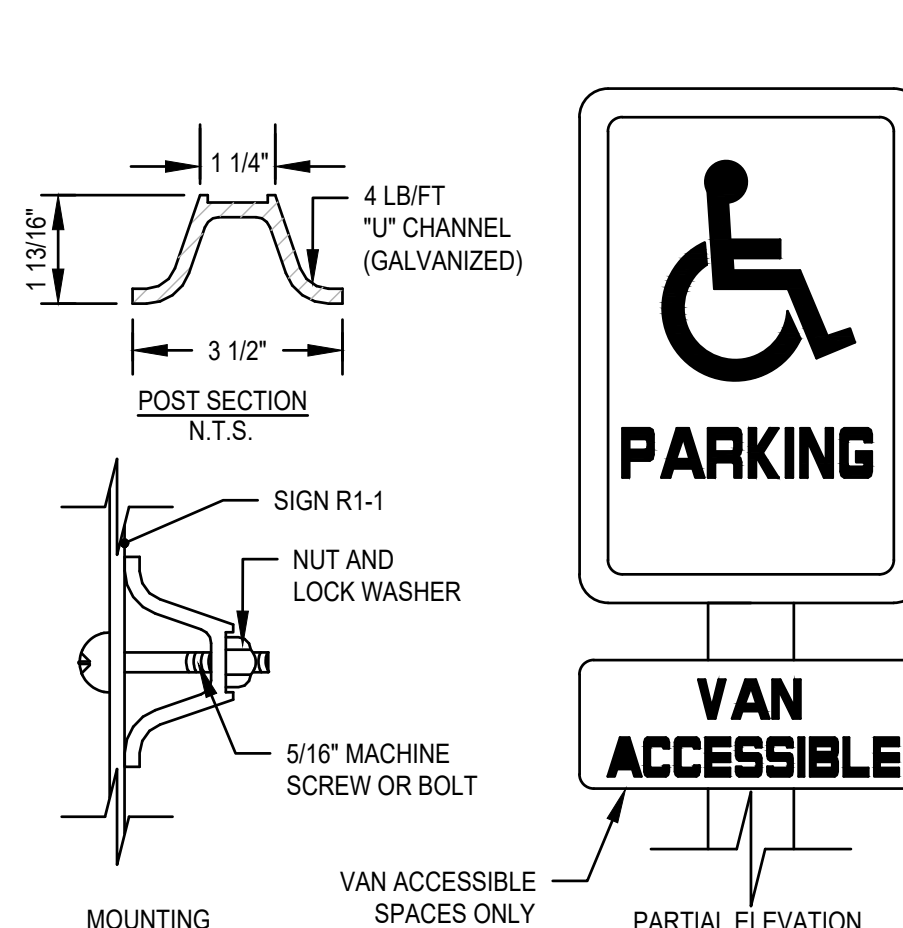
1. CURBS AND WALKS ALONG ACCESSIBLE ROUTES SHALL MEET OR EXCEED THE APPLICABLE REGULATIONS OF THE MASSACHUSETTS ARCHITECTURAL ACCESS BOARD, FAIR HOUSING ACT AND ADA.
2. THE MAXIMUM ALLOWABLE SIDEWALK AND CURB RAMP CROSS SLOPE SHALL BE 2%.
3. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB 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., HYPHANTS, 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 8' 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.



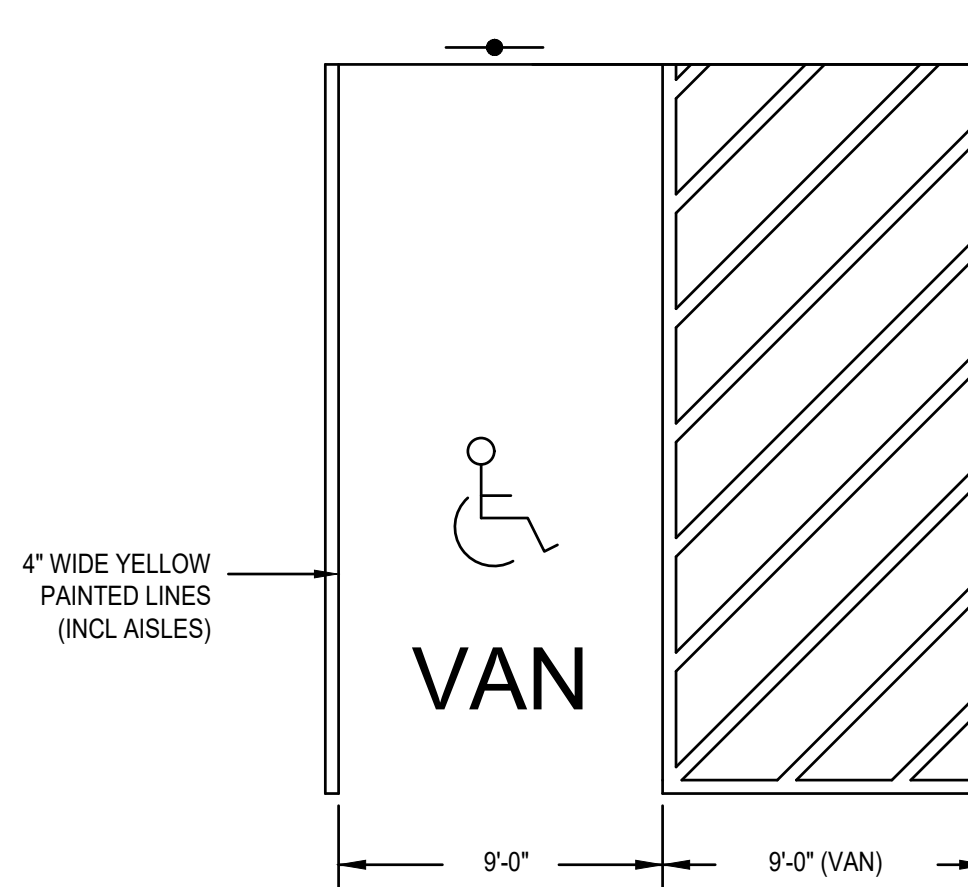
SCALE: N.T.S.



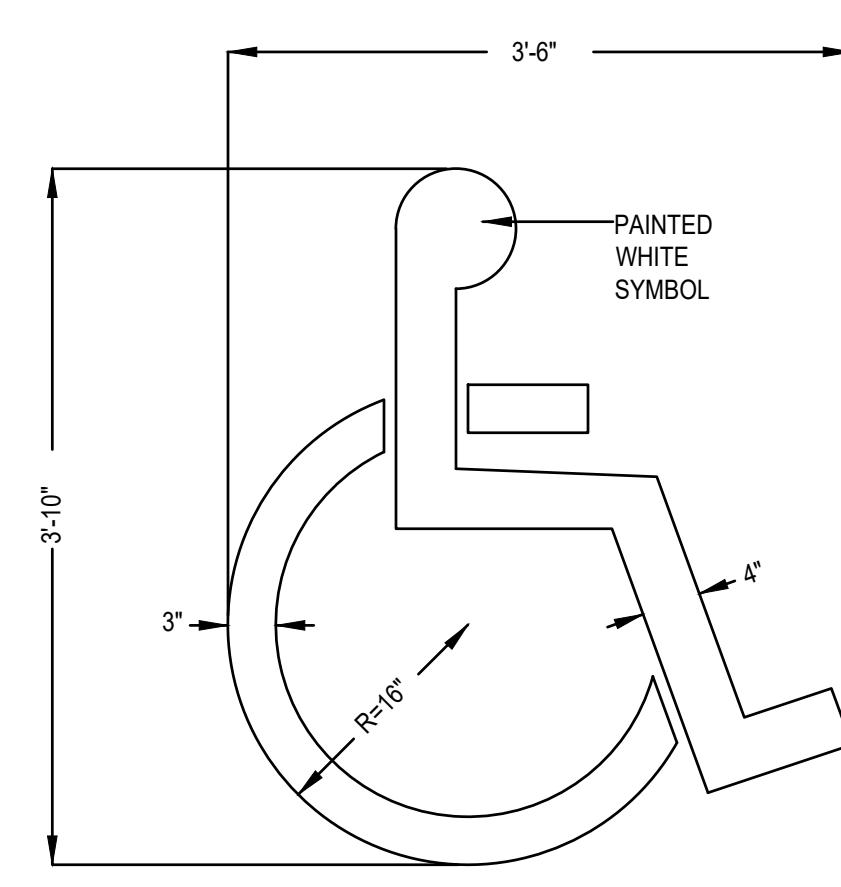
SCALE: N.T.S.



SCALE: N.T.S.



SCALE: N.T.S.



| REV | DATE       | DESCRIPTION  | BY   | APP  |
|-----|------------|--|------|------|
| 1   | 9/22/2017  | COMMENTS PER MARSHALLING   | SSRS | BOCM |
| 2   | 11/24/2017 | COMMENTS PER MARSHALLING   | SSRS | BOCM |
| 3   | 11/27/2018 | COMMENTS PER MARSHALLING   | SSRS | BOCM |
| 4   | 12/2/2021  | ZBA APPLICATION  | AUC  | BOCM |
| 5   | 4/26/2021  | NO REVISIONS THIS SHEET  | SSRS | BOCM |
| 6   | 6/7/2021   | REVISIONS TO STOPWATER INFILTRATION BASIN<br>ADDITION OF MODULAR BLOCK WALL DETAIL | SSRS | BOCM |
| 7   | 6/8/2021   | NO REVISIONS THIS SHEET  | SSRS | BOCM |
| 8   | 8/31/2021  | ADDITION OF PRECAST CONCRETE CURB & SIDEWALK DETAIL                                | SSRS | BOCM |

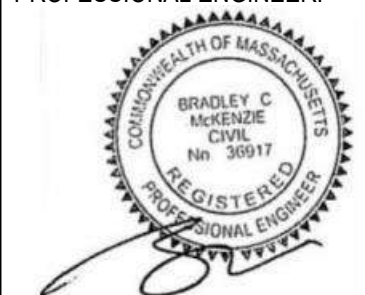
|             |  |  |  |
|-------------|--|--|--|
| PREPARED BY |  |  |  |
|-------------|--|--|--|



Assinippi Office Park  
150 Longwater Drive, Suite 101  
Norwell, MA 02061  
P: 781.792.3900  
F: 781.792.0333  
[www.mckeng.com](http://www.mckeng.com)

**RIVER MARSH VILLAGE  
COMPREHENSIVE PERMIT PLAN**  
(ASSESSOR'S MAP E-17, LOT 0 & E-17A, LOT 274)  
WATER STREET  
PEMBROKE, MASSACHUSETTS

PROFESSIONAL ENGINEER:



OWNER/APPLICANT:

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

PERMIT PLAN SET

|              |                    |
|--------------|--------------------|
| DRAWN BY:    | SBS                |
| DESIGNED BY: | SBS                |
| CHECKED BY:  | BCM                |
| APPROVED BY: | BCM                |
| DATE:        | SEPTEMBER 22, 2016 |
| SCALE:       | AS NOTED           |
| PROJECT NO.: | 215-181            |

Construction  
Details  
Sheet 2 of 6

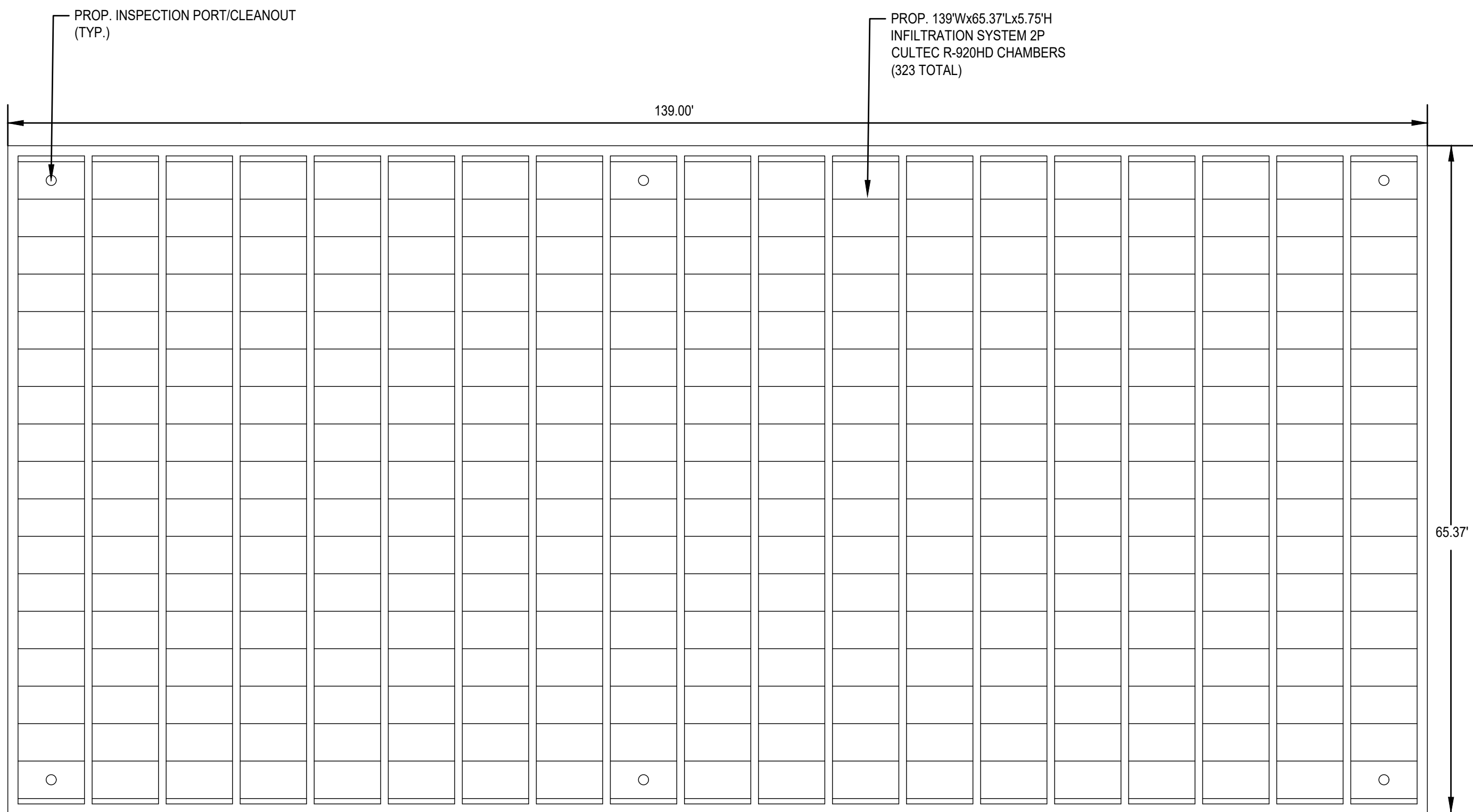
Dwg. No:

D-2









**NOTES:**

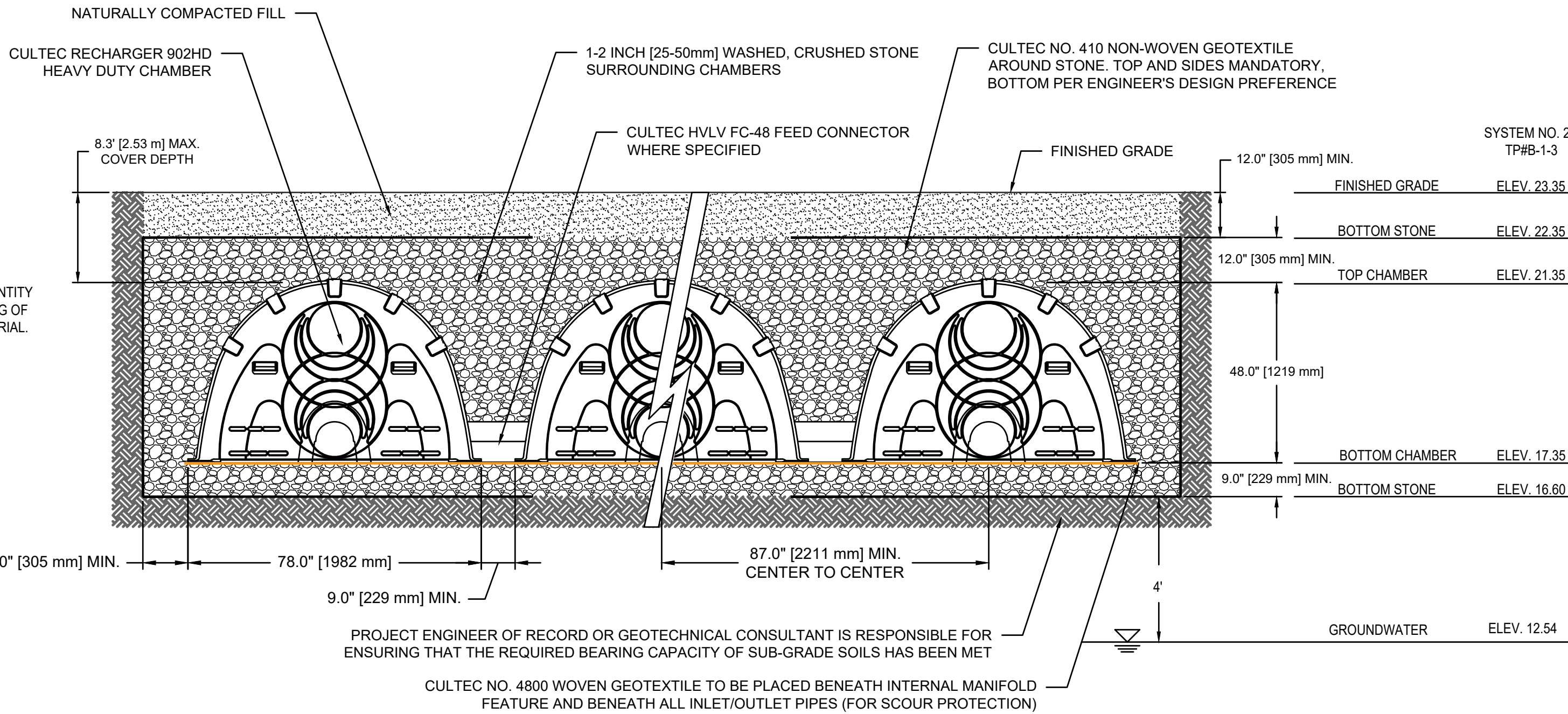
- EXCAVATE BELOW BOTTOM OF CRUSHED STONE BASE AND BACKFILL WITH CLEAN GRAVEL BORROW (MASS. HIGHWAY M1.03.0 TYPE B) TO NATURALLY OCCURRING PERVIOUS MATERIAL. (REFER TO TEST PIT SOIL LOGS SUBMITTED HERewith).
- INSTALLATION AND INSPECTION OF ALL SUBSURFACE INFILTRATION AND DETENTION SYSTEMS SHALL BE PERFORMED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

**CRUSHED STONE:**

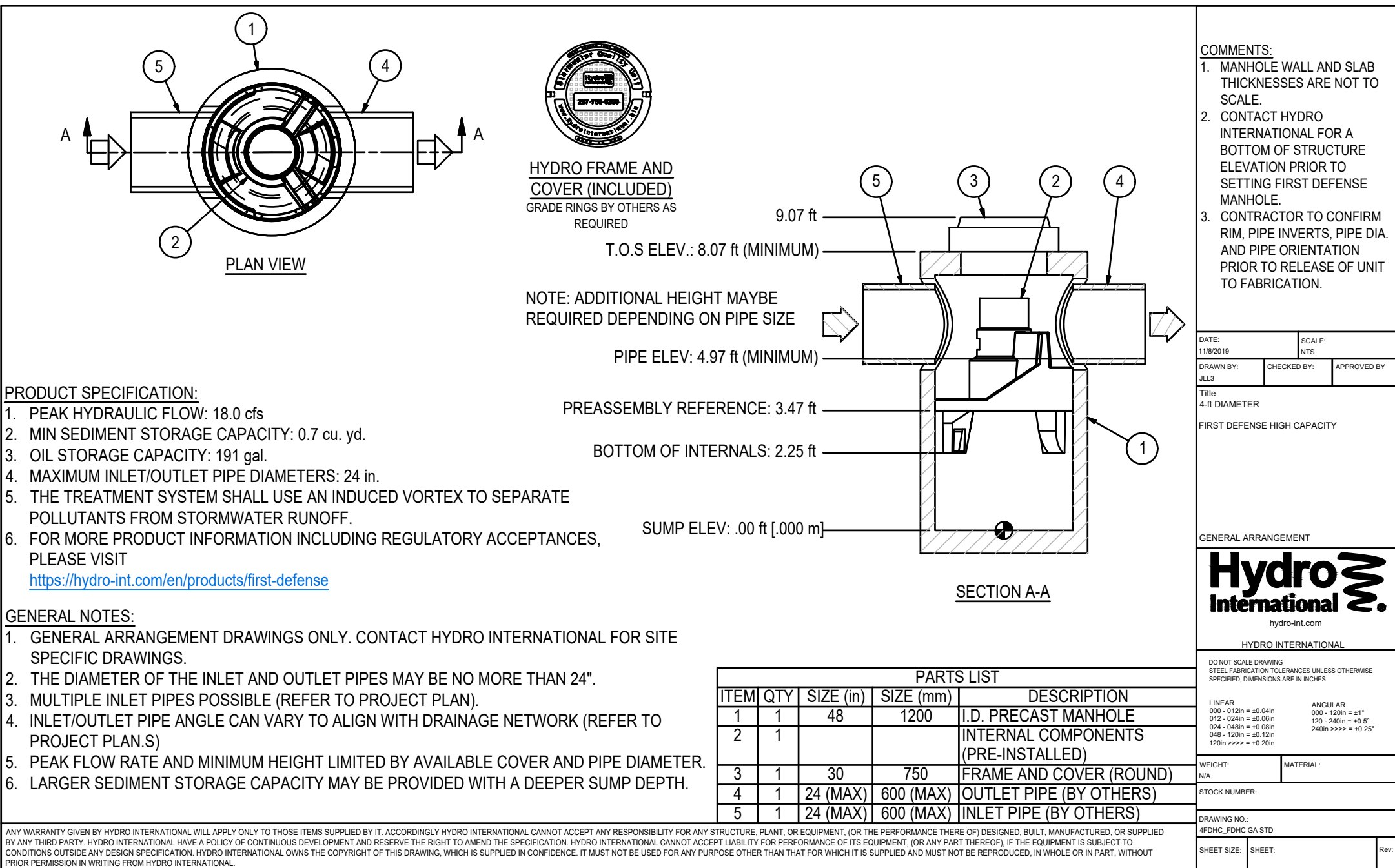
SHALL BE DURABLE CRUSHED ROCK CONSISTING OF ANGULAR FRAGMENTS, FREE FROM A DETRIMENTAL QUANTITY OF THIN, FLAT, ELONGATED PIECES OR DURABLE CRUSHED GRAVEL STONE OBTAINED BY ARTIFICIAL CRUSHING OF BOULDERS OR FIELDSTONE. THE CRUSHED STONE MUST BE FREE FROM CLAY, LOAM, OR DELETERIOUS MATERIAL.

CRUSHED STONE TO CONFORM TO THE FOLLOWING GRADATIONS:

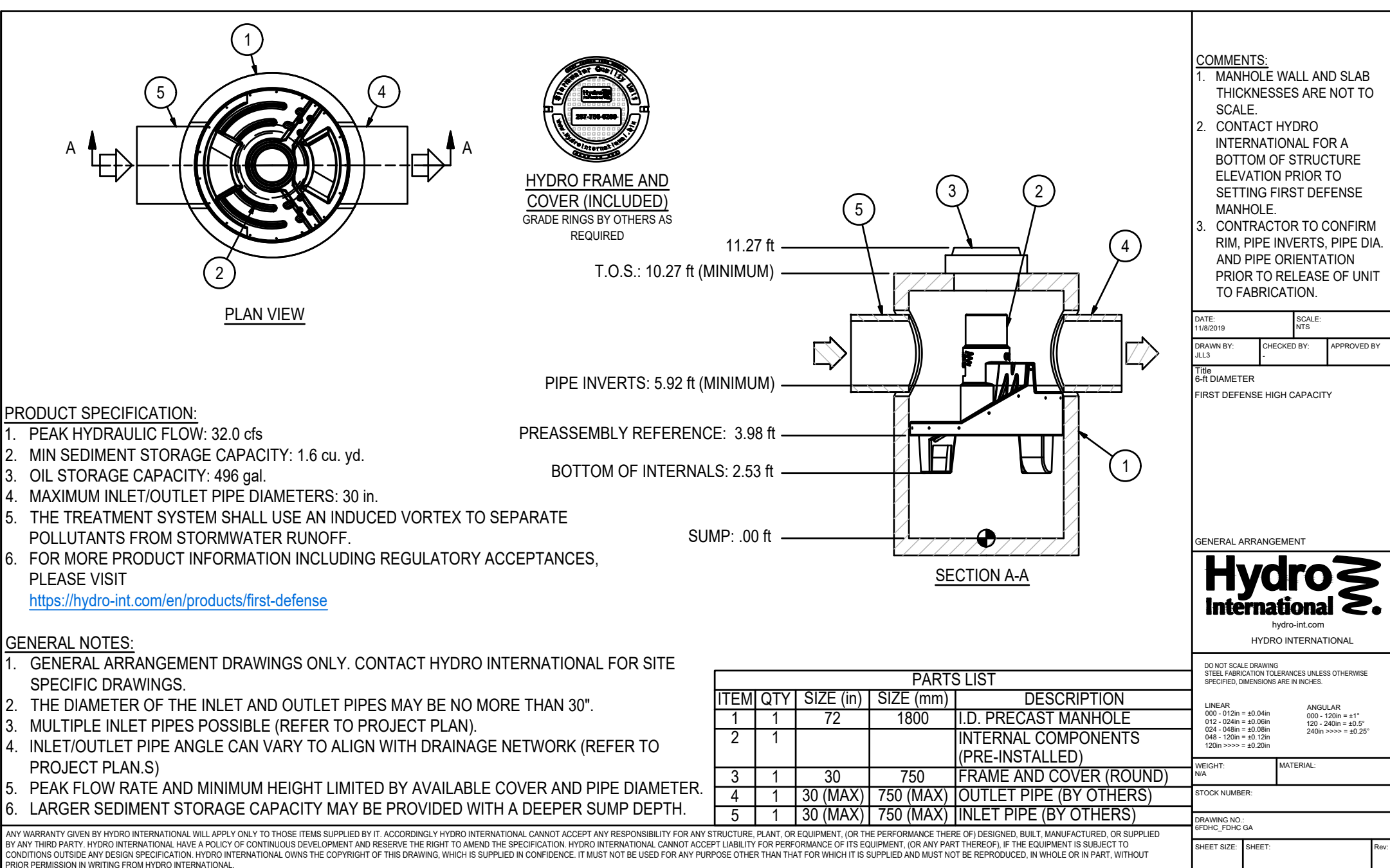
| SIEVE SIZE | PERCENT PASSING |          |          |          |
|------------|-----------------|----------|----------|----------|
|            | STONE SIZE      |          |          |          |
|            | 1 1/4 INCH      | 3/4 INCH | 1/2 INCH | 3/8 INCH |
| 2"         | 100             |    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



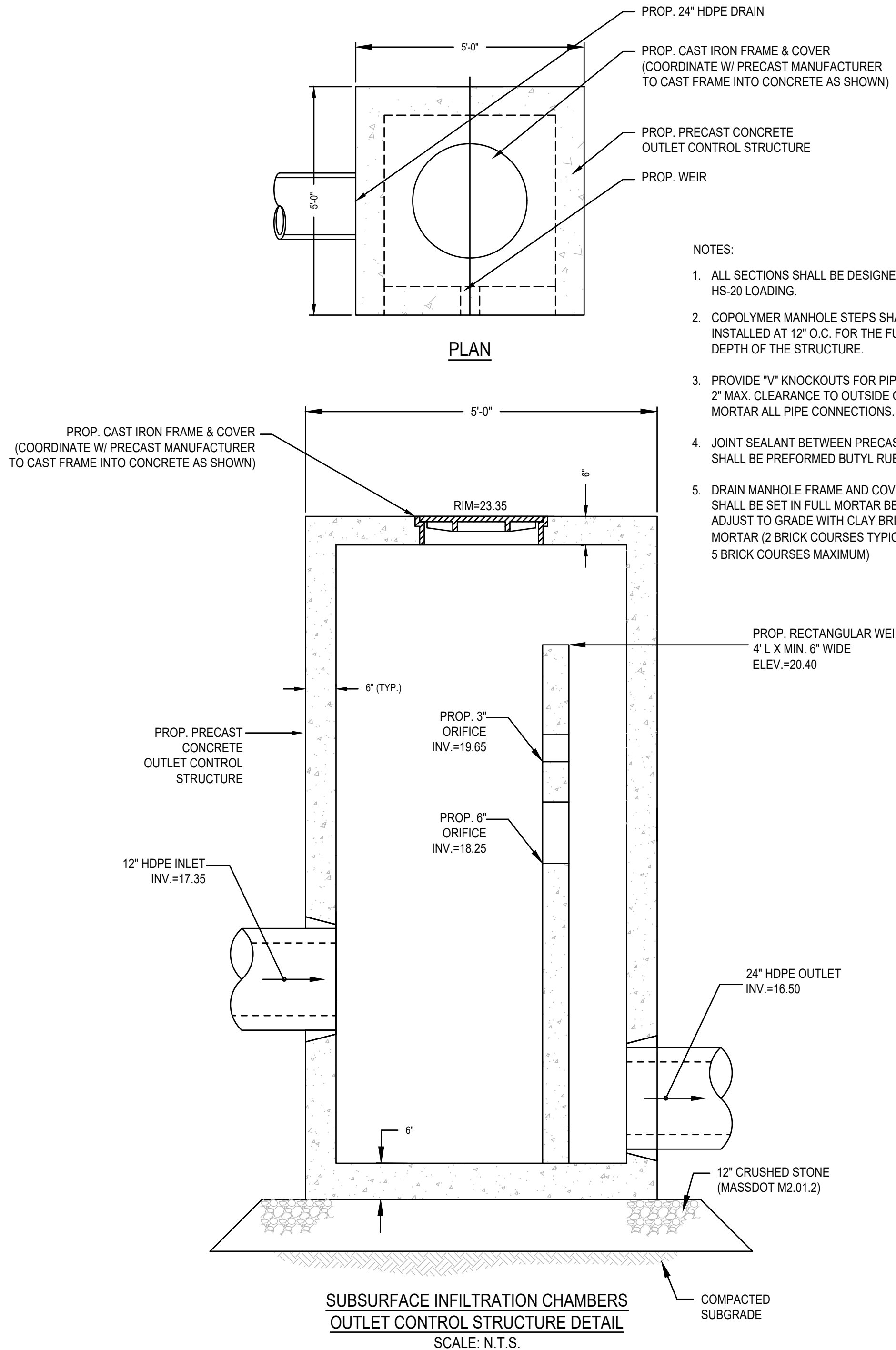
SUBSURFACE INFILTRATION SYSTEM 2P  
SCALE: N.T.S.



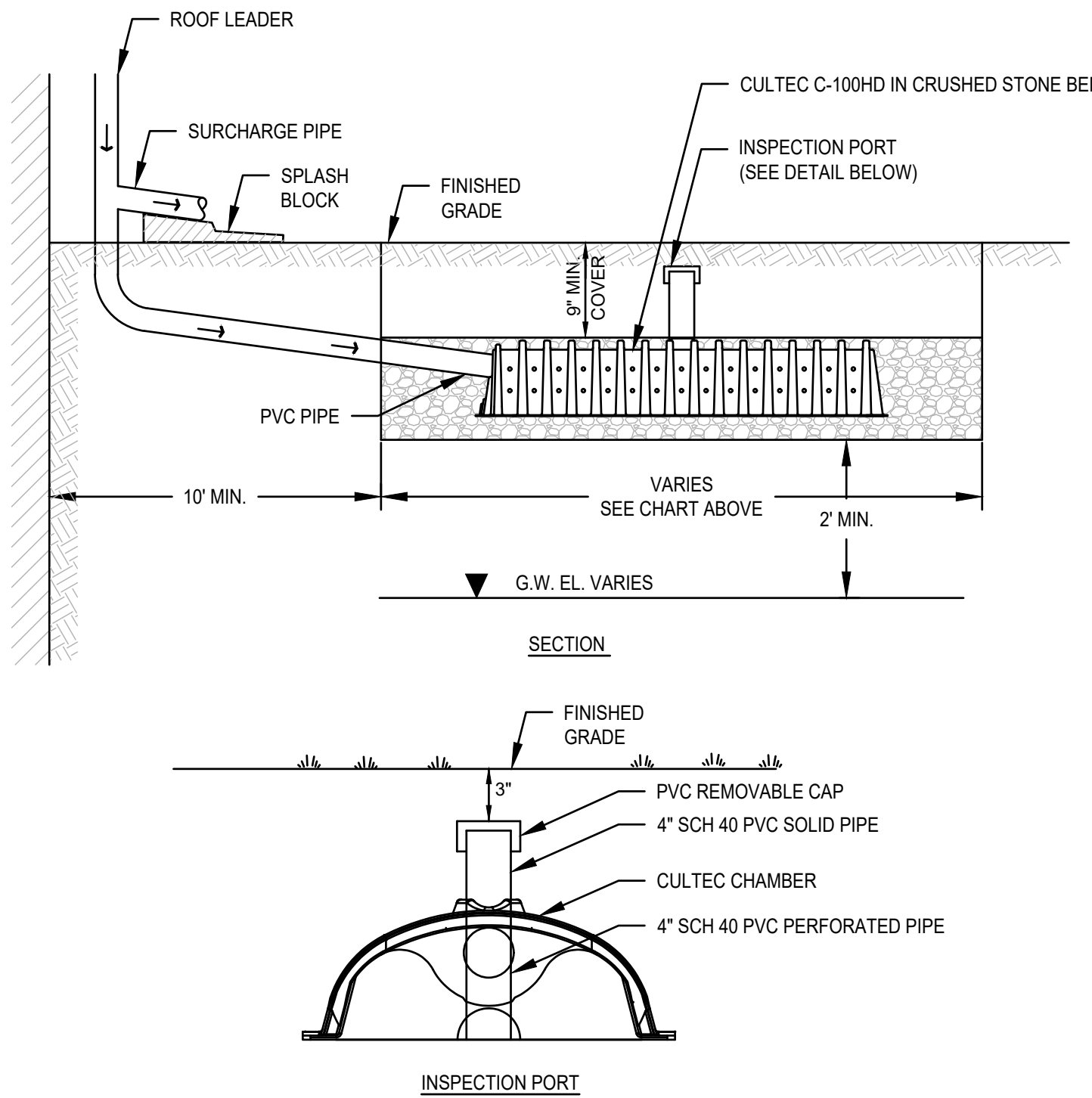
4'-FOOT DIAMETER WATER QUALITY UNIT  
SCALE: N.T.S.



6'-FOOT DIAMETER WATER QUALITY UNIT  
SCALE: N.T.S.



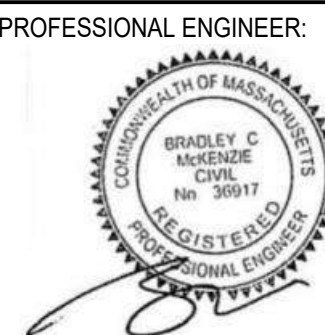
SUBSURFACE INFILTRATION CHAMBERS  
OUTLET CONTROL STRUCTURE DETAIL  
SCALE: N.T.S.



SUBSURFACE ROOF LEACHING DRWELL  
SCALE: N.T.S.

| SYSTEM | LENGTH     | WIDTH      | # UNITS |
|--------|------------|------------|---------|
| 3P     | 47.50 FEET | 35.00 FEET | 60      |
| 4P     | 47.50 FEET | 25.00 FEET | 42      |
| 5P     | 47.50 FEET | 35.00 FEET | 60      |
| 6P     | 47.50 FEET | 25.00 FEET | 42      |

# RIVER MARSH VILLAGE COMPREHENSIVE PERMIT PLAN (ASSESSOR'S MAP E-17, LOT 0 & E-17A, LOT 274) WATER STREET PEMBROKE, MASSACHUSETTS



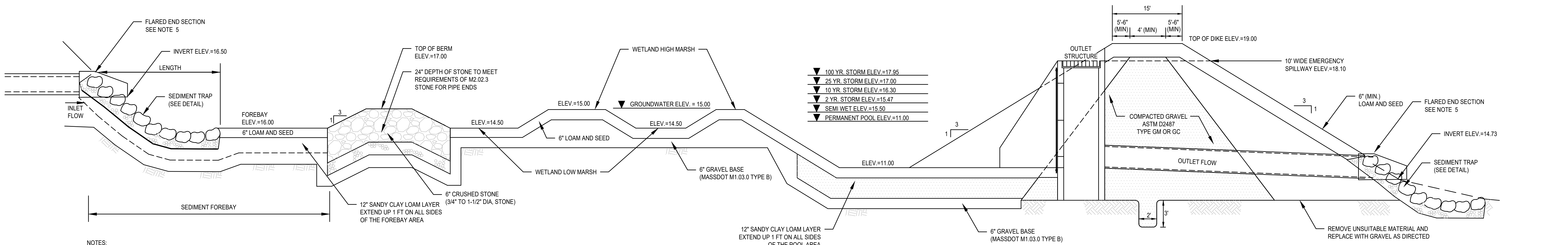
OWNER/APPLICANT:  
RIVER MARSH, LLC  
283R WASHINGTON STREET  
NORWELL, MASSACHUSETTS 02061

DRAWN BY: SBS  
DESIGNED BY: SBS  
CHECKED BY: BCM  
APPROVED BY: BCM  
DATE: SEPTEMBER 22, 2016  
SCALE: AS NOTED  
PROJECT NO.: 215-181

Construction  
Details  
Sheet 4 of 6

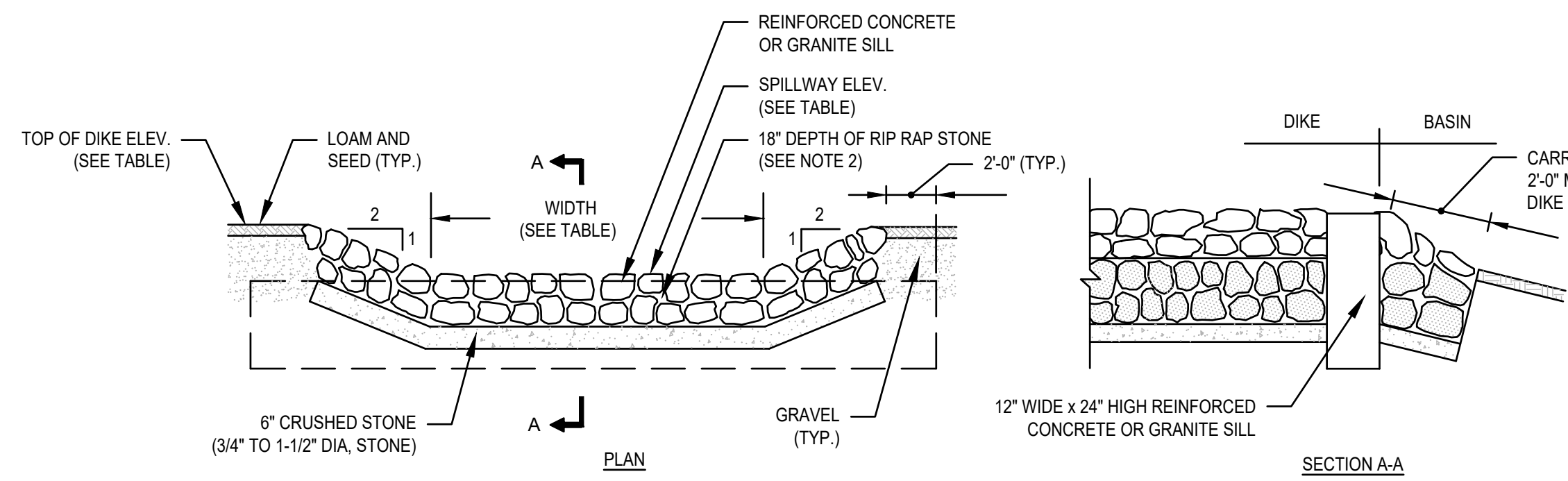
DWG. NO.:  
**D-4**





- NOTES:
- FILL AND BASE FOR DIKE SHALL INSURE WATER TIGHTNESS AND STABILITY.
  - THE CONTRACTOR SHALL NOT DISCHARGE SEDIMENT-LADEN WATER TO BASIN DURING CONSTRUCTION. NO HEAVY EQUIPMENT SHALL BE ALLOWED ON THE BASIN FLOOR AFTER INSTALLATION.
  - ALL CONTRIBUTING AREAS TO THE BASIN SHALL BE FULLY STABILIZED PRIOR TO THE INFILTRATION BASIN BEING PLACED INTO SERVICE.
  - THE CONTRACTOR SHALL PROVIDE SIEVE ANALYSIS SUBMITTALS TO THE ENGINEER FOR APPROVAL PRIOR TO INSTALLATION OF THE SANDY CLAY LOAM MATERIAL USED ON SITE.
  - FLARED END SECTIONS TO BE EQUIPPED TRASH RACKS

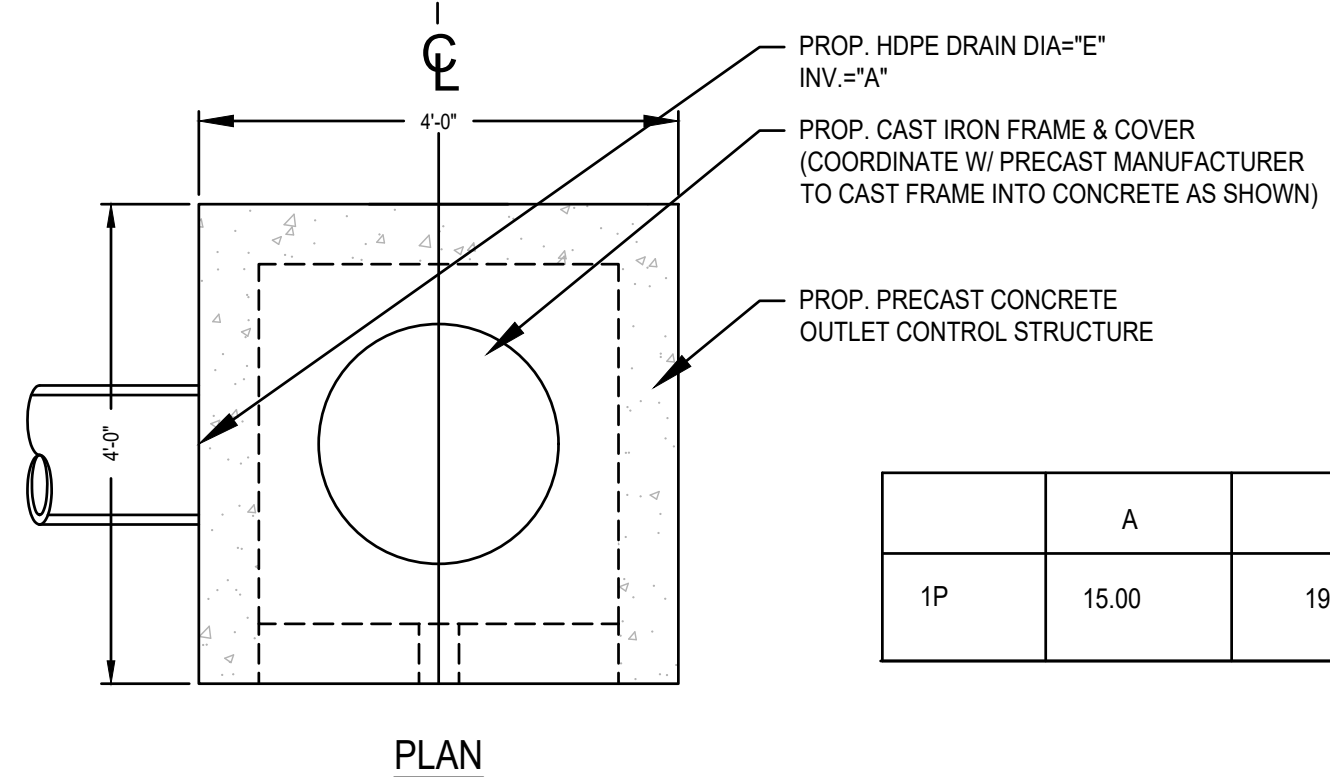
POCKET WETLAND BASIN SECTION  
SCALE: N.T.S.



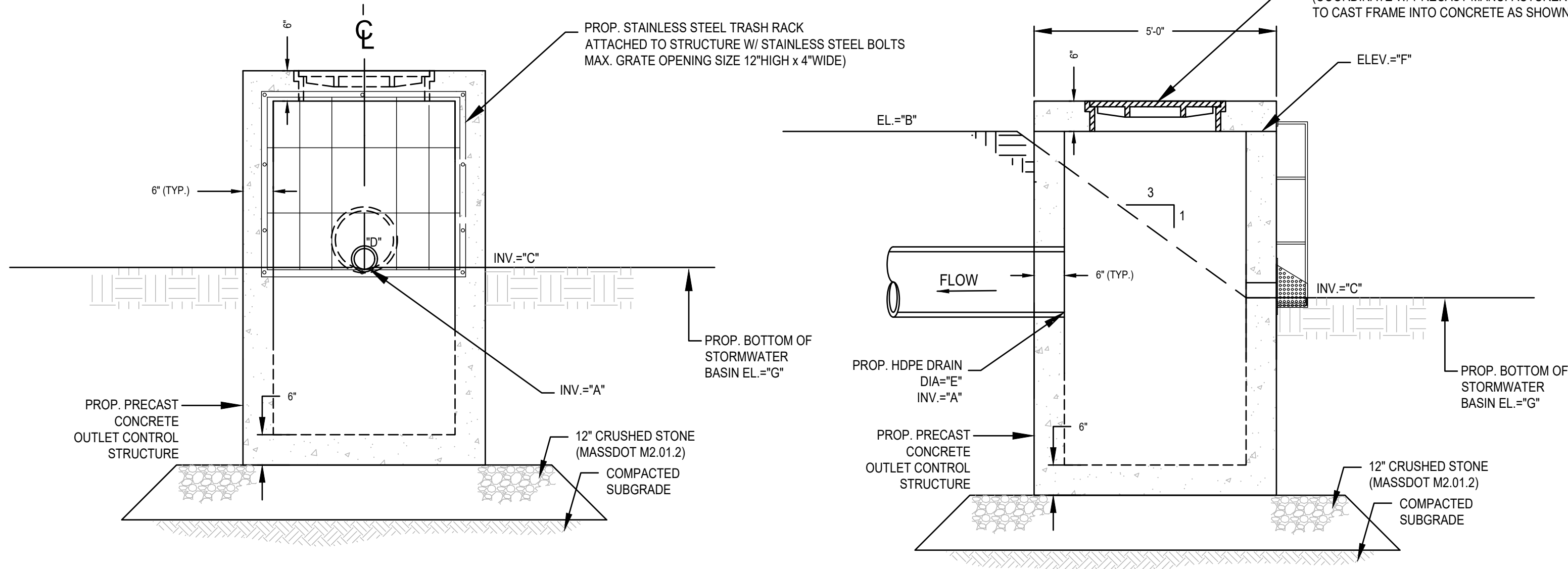
| STORMWATER BASIN | TOP OF DIKE ELEV. | SPILLWAY ELEV. | 100 YEAR STORM ELEV. | FLOOD ELEV. | WIDTH  |
|------------------|-------------------|----------------|----------------------|-------------|--------|
| 1P               | 19.00             | 18.10          | 17.95                | 18.22       | 10 FT. |

- NOTES:
- DIMENSIONS VARY TO SUIT CAPACITY REQUIREMENTS.
  - RIP RAP TO BE HAND CHINKED WITH A SMOOTH SURFACE ALONG THE TOP OF THE DIKE AND A ROUGH SURFACE ALONG THE DOWNSTREAM FACE AND TOE OF THE DIKE. STONE TO MEET MASSDOT REQUIREMENTS OF M2.02.3 STONE FOR PIPE ENDS.
  - RIP RAP SHALL EXTEND A MINIMUM OF 2 FT. DOWN THE UPSTREAM FACE OF DIKE AND DOWN DOWNSTREAM FACE OF THE DIKE TO A POINT AT LEAST 2 FT. BEYOND THE TOE OF SLOPE.

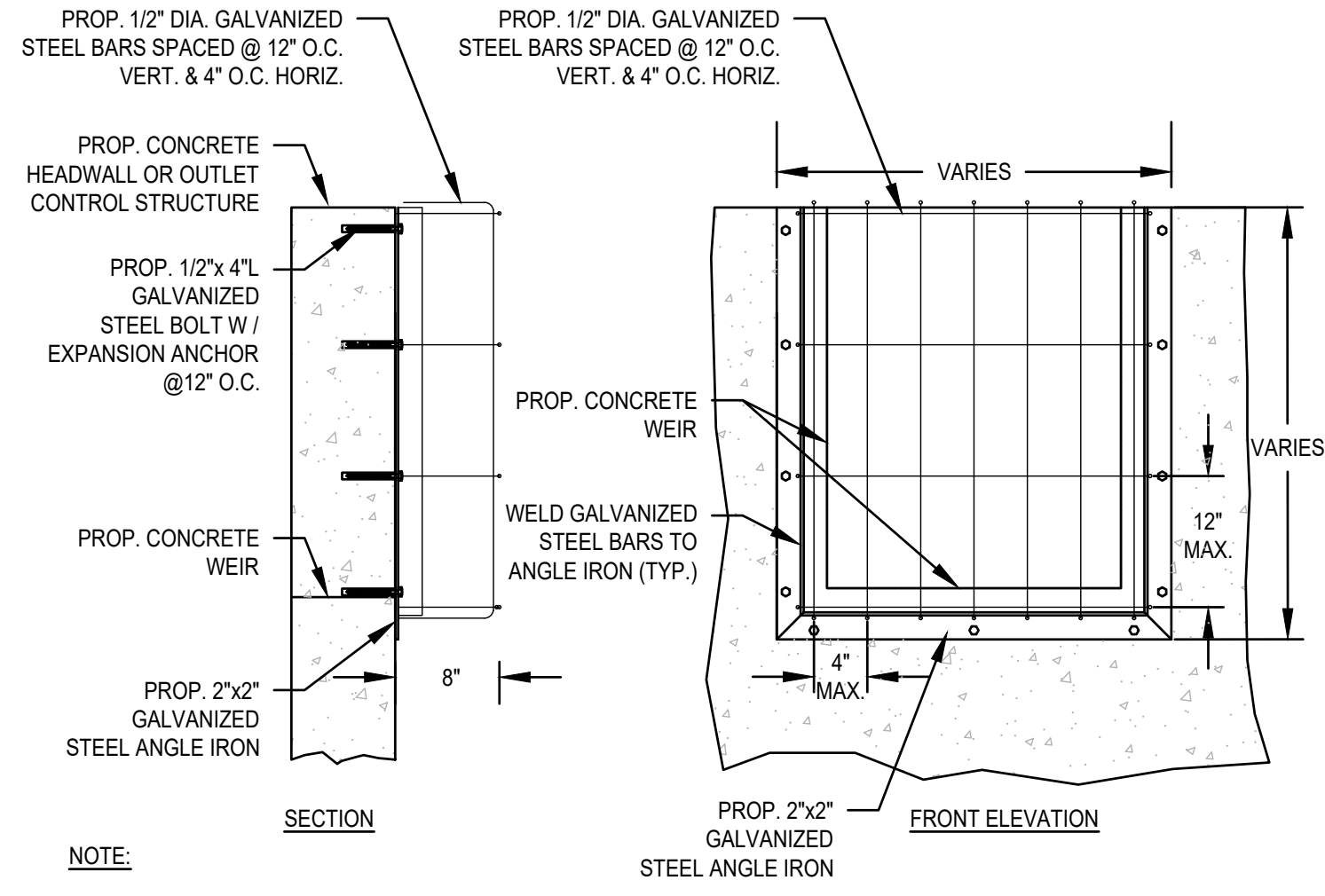
SPILLWAY DETAIL  
SCALE: N.T.S.



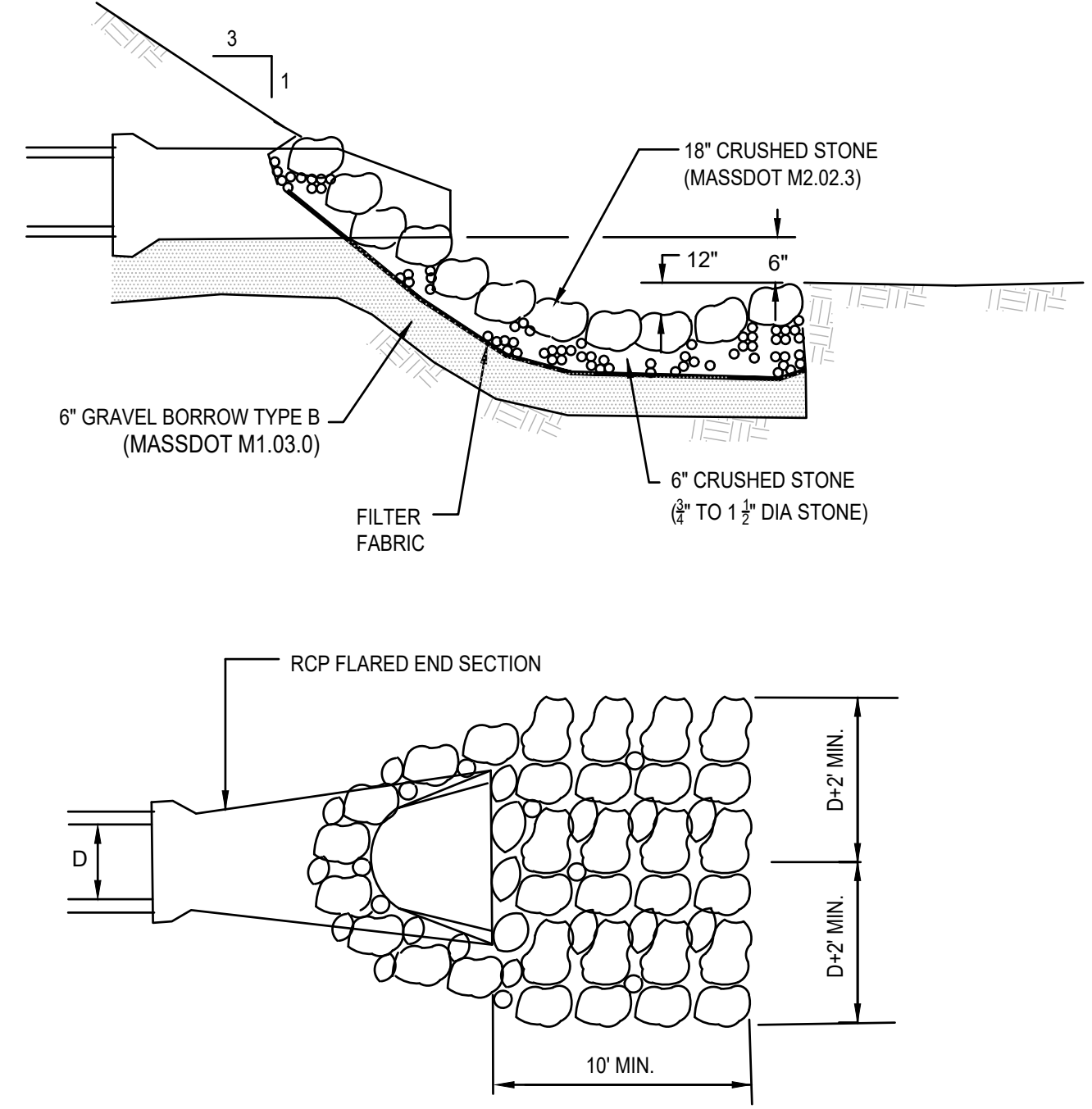
|    | A     | B     | C     | D               | E   | F     | G     |
|----|-------|-------|-------|-----------------|-----|-------|-------|
| 1P | 15.00 | 19.00 | 15.00 | 4" DIA. ORIFICE | 15" | 18.00 | 15.00 |



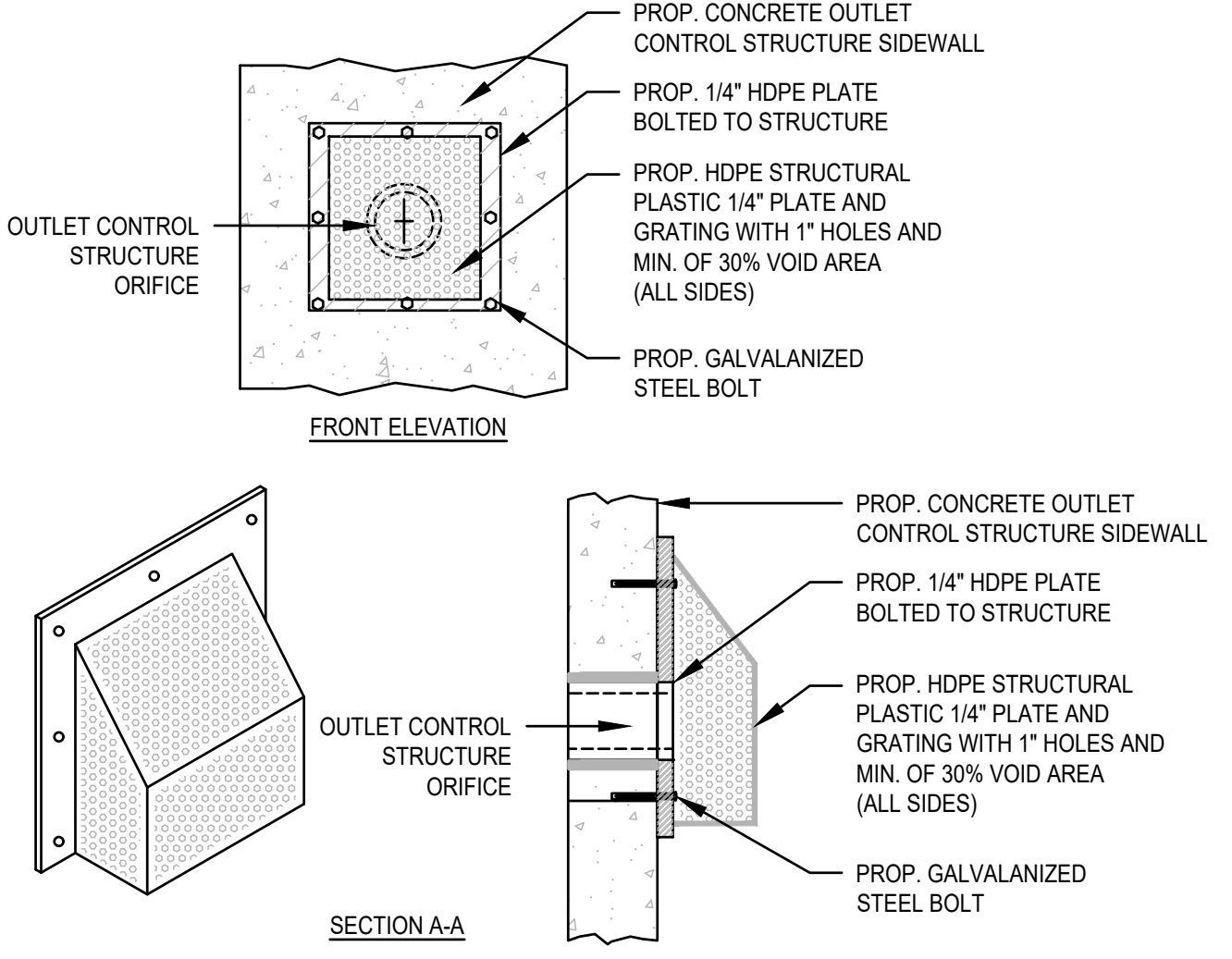
POCKET WETLAND OUTLET CONTROL STRUCTURE DETAIL  
SCALE: N.T.S.



TYPICAL TRASH RACK DETAIL  
SCALE: N.T.S.

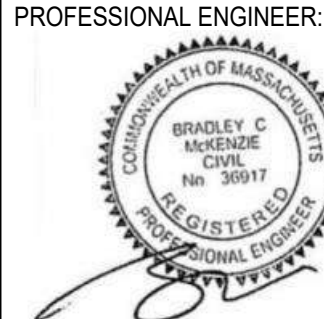


TYPICAL SEDIMENT TRAP DETAIL  
SCALE: N.T.S.



HDPE TRASH RACK DETAIL  
SCALE: N.T.S.

**RIVER MARSH VILLAGE**  
**COMPREHENSIVE PERMIT PLAN**  
(ASSESSOR'S MAP E-17, LOT 0 & E-17A, LOT 274)  
WATER STREET  
PEMBROKE, MASSACHUSETTS



OWNER/APPLICANT:  
**RIVER MARSH, LLC**  
283R WASHINGTON STREET  
NORWELL, MASSACHUSETTS 02061

DRAWN BY: SBS  
DESIGNED BY: SBS  
CHECKED BY: BCM  
APPROVED BY: BCM  
DATE: SEPTEMBER 22, 2016  
SCALE: AS NOTED  
PROJECT NO.: 215-181  
DWG. TITLE:

Construction  
Details  
Sheet 5 of 6

DWG. NO.: **D-5**



---



CULTEC CONTACTOR® 100HD CHAMBER PRODUCT SPECIFICATIONS

**GENERAL**  
CULTEC CONTACTOR 100HD 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**

- THE CHAMBERS SHALL BE MANUFACTURED BY CULTEC, INC. OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
- THE CHAMBER SHALL BE VACUUM THERMOFORMED OF HIGH MOLECULAR WEIGHT HIGH DENSITY POLYETHYLENE (HMWHDPE) WITH A BLACK INTERIOR AND BLUE EXTERIOR.
- THE CHAMBER SHALL BE ARCHED IN SHAPE.
- THE CHAMBER SHALL BE OPEN-BOTTOMED.
- THE CHAMBER SHALL BE JOINED USING AN INTERLOCKING OVERLAPPING RIB METHOD. CONNECTIONS MUST BE FULLY SHOULDERED OVERLAPPING RIBS, HAVING NO SEPARATE COUPLINGS OR SEPARATE END WALLS.
- THE NOMINAL CHAMBER DIMENSIONS OF THE CULTEC CONTACTOR 100HD SHALL BE 12.5 INCHES (318 mm) TALL, 36 INCHES (914 mm) WIDE AND 8 FEET (2.44 m) LONG. THE INSTALLED LENGTH OF A JOINED CONTACTOR 100HD SHALL BE 7.5 FEET (2.29 m).
- MAXIMUM INLET OPENING ON THE CHAMBER ENDWALL IS 10 INCHES (250 mm).
- THE CHAMBER SHALL HAVE TWO SIDE PORTALS TO ACCEPT CULTEC HVLV SFCX2 FEED CONNECTORS TO CREATE AN INTERNAL MANIFOLD. THE NOMINAL INSIDE DIMENSIONS OF EACH SIDE PORTAL SHALL BE 5.75 INCHES (146 mm) HIGH BY 7.5 INCHES (191 mm) WIDE. MAXIMUM ALLOWABLE OUTER DIAMETER (O.D.) PIPE SIZE IN THE SIDE PORTAL IS 6.9 INCHES (175 mm).
- THE NOMINAL CHAMBER DIMENSIONS OF THE CULTEC HVLV SFCX2 FEED CONNECTOR SHALL BE 7.6 INCHES (194 mm) TALL, 12 INCHES (305 mm) WIDE AND 19.7 INCHES (500 mm) LONG.
- THE NOMINAL STORAGE VOLUME OF THE CONTACTOR 100HD CHAMBER SHALL BE 1,866 FT³ / FT (0.173 m³ / m) - WITHOUT STONE. THE NOMINAL STORAGE VOLUME OF A JOINED CONTACTOR 100HD SHALL BE 13,995 FT³ / UNIT (0.396 m³ / UNIT) - WITHOUT STONE.
- THE NOMINAL STORAGE VOLUME OF THE HVLV SFCX2 FEED CONNECTOR SHALL BE 0.294 FT³ / FT (0.027 m³ / m) - WITHOUT STONE.
- THE CONTACTOR 100HD CHAMBER SHALL HAVE FORTY-FOUR DISCHARGE HOLES BORED INTO THE SIDEWALLS OF THE UNIT'S CORE TO PROMOTE LATERAL CONVEYANCE OF WATER.
- THE CONTACTOR 100HD CHAMBER SHALL HAVE 16 CORRUGATIONS.
- THE ENDWALL OF THE CHAMBER, WHEN PRESENT, SHALL BE AN INTEGRAL PART OF THE CONTINUOUSLY FORMED UNIT. SEPARATE END PLATES CANNOT BE USED WITH THIS UNIT.
- THE CONTACTOR 100RHD STARTER UNIT MUST BE FORMED AS A WHOLE CHAMBER HAVING TWO FULLY FORMED INTEGRAL ENDWALLS AND HAVING NO SEPARATE END PLATES OR SEPARATE END WALLS.
- THE CONTACTOR 100EHD MIDDLE/END UNIT MUST BE FORMED AS A WHOLE CHAMBER HAVING ONE FULLY FORMED INTEGRAL ENDWALL AND ONE FULLY OPEN END WALL AND HAVING NO SEPARATE END PLATES OR END WALLS.
- THE HVLV SFCX2 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 CONTACTOR 100HD AND ACT AS CROSS FEED CONNECTIONS.
- CHAMBERS MUST HAVE HORIZONTAL STIFFENING FLEX REDUCTION STEPS BETWEEN THE RIBS.
- THE CHAMBER SHALL BE DESIGNED TO WITHSTAND TRAFFIC LOADS WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS.
- HEAVY DUTY UNITS ARE DESIGNATED BY A COLORED STRIPE FORMED INTO THE PART ALONG THE LENGTH OF THE CHAMBER.
- THE CHAMBER SHALL 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.
- THE UNITS MAY BE TRIMMED TO CUSTOM LENGTHS BY CUTTING BACK TO ANY CORRUGATION.
- THE CHAMBER SHALL BE MANUFACTURED IN AN ISO 9001:2015 CERTIFIED FACILITY.
- THE CHAMBER SHALL BE DESIGNED AND MANUFACTURED TO MEET THE MATERIAL AND STRUCTURAL REQUIREMENTS OF IAPMO PS 63-2019, INCLUDING RESISTANCE TO AASHTO H-10 AND H-20 HIGHWAY LIVE LOADS, WHEN INSTALLED IN ACCORDANCE WITH CULTEC'S INSTALLATION INSTRUCTIONS.
- MAXIMUM ALLOWED COVER ON TOP OF UNIT SHALL BE 12.0 FEET [3.66 m]

CULTEC HVLV SFCx2 FEED CONNECTOR

**GENERAL**  
CULTEC HVLV SFCx2 FEED CONNECTORS ARE DESIGNED TO CREATE AN INTERNAL MANIFOLD FOR CULTEC CONTACTOR 100HD STORMWATER CHAMBERS.

**CHAMBER PARAMETERS**

- THE CHAMBERS SHALL BE MANUFACTURED BY CULTEC, INC. OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
- THE CHAMBER SHALL BE VACUUM THERMOFORMED OF HIGH MOLECULAR WEIGHT HIGH DENSITY POLYETHYLENE (HMWHDPE) WITH A BLACK INTERIOR AND BLUE EXTERIOR.
- THE CHAMBER SHALL BE ARCHED IN SHAPE.
- THE CHAMBER SHALL BE OPEN-BOTTOMED.
- THE NOMINAL CHAMBER DIMENSIONS OF THE CULTEC HVLV SFCx2 FEED CONNECTOR SHALL BE 7.6 INCHES (194 mm) TALL, 12 INCHES (305 mm) WIDE AND 19.7 INCHES (500 mm) LONG.
- THE NOMINAL STORAGE VOLUME OF THE HVLV SFCx2 FEED CONNECTOR SHALL BE 0.294 FT³ / FT (0.027 m³ / m) - WITHOUT STONE.
- THE HVLV SFCx2 FEED CONNECTOR CHAMBER SHALL HAVE 3 CORRUGATIONS.
- THE HVLV SFCx2 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 CONTACTOR 100HD STORMWATER CHAMBER AND ACT AS CROSS FEED CONNECTIONS CREATING AN INTERNAL MANIFOLD.
- THE CHAMBER SHALL BE DESIGNED TO WITHSTAND TRAFFIC LOADS WHEN INSTALLED ACCORDING TO CULTEC'S RECOMMENDED INSTALLATION INSTRUCTIONS.
- THE CHAMBER SHALL BE MANUFACTURED IN AN ISO 9001:2008 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**

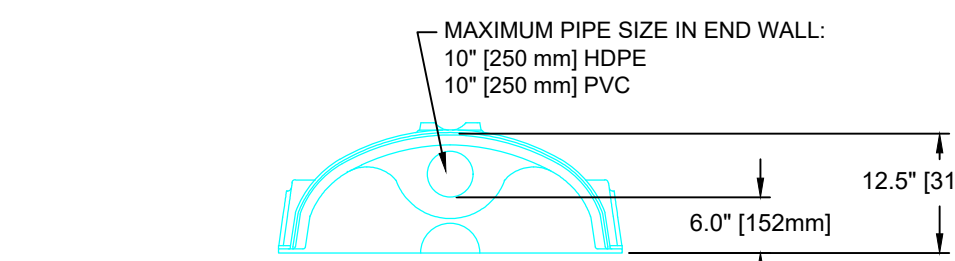
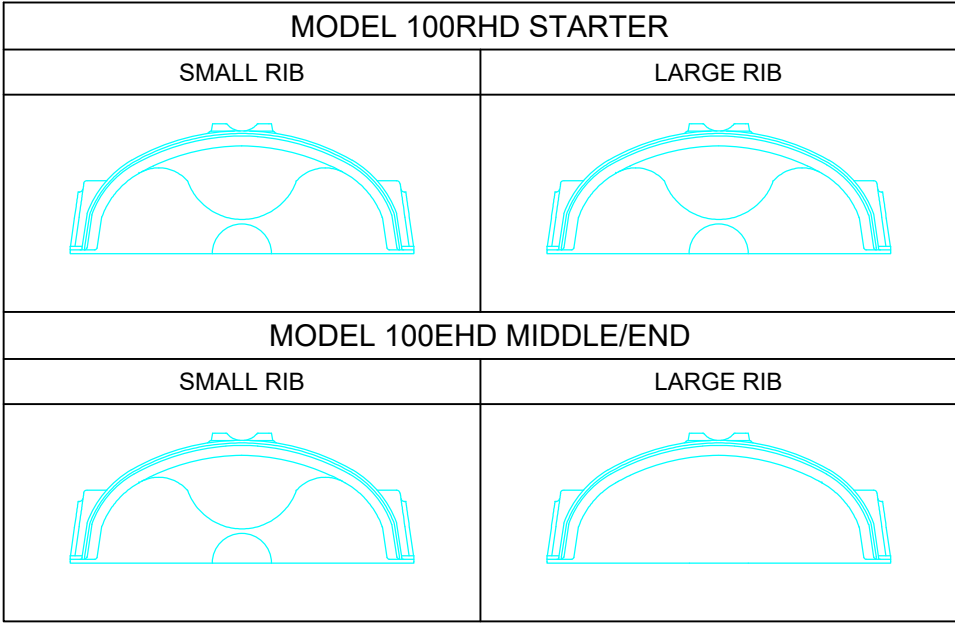
- THE GEOTEXTILE SHALL BE PROVIDED BY CULTEC, INC. OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
- THE GEOTEXTILE SHALL BE BLACK IN APPEARANCE.
- THE GEOTEXTILE SHALL HAVE A TYPICAL WEIGHT OF 4.5 OZ/SY (142 G/M²).
- THE GEOTEXTILE SHALL HAVE A TENSILE STRENGTH VALUE OF 120 LBS (533 N) PER ASTM D4632 TESTING METHOD.
- THE GEOTEXTILE SHALL HAVE AN ELONGATION @ BREAK VALUE OF 50% PER ASTM D4632 TESTING METHOD.
- THE GEOTEXTILE SHALL HAVE A MULLEN BURST VALUE OF 225 PSI (1551 KPA) PER ASTM D3786 TESTING METHOD.
- THE GEOTEXTILE SHALL HAVE A PUNCTURE STRENGTH VALUE OF 65 LBS (289 N) PER ASTM D4833 TESTING METHOD.
- THE GEOTEXTILE SHALL HAVE A CBR PUNCTURE VALUE OF 340 LBS (1513 N) PER ASTM D6241 TESTING METHOD.
- THE GEOTEXTILE SHALL HAVE A TRAPEZOID TEAR VALUE OF 50 LBS (222 N) PER ASTM D4533 TESTING METHOD.
- THE GEOTEXTILE SHALL HAVE A AOS VALUE OF 70 U.S. SIEVE (0.212 MM) PER ASTM D4751 TESTING METHOD.
- THE GEOTEXTILE SHALL HAVE A PERMITTIVITY VALUE OF 1.7 SEC-1 PER ASTM D4491 TESTING METHOD.
- THE GEOTEXTILE SHALL HAVE A WATER FLOW RATE VALUE OF 135 GAL/MIN/SF (5500 L/MIN/SM) PER ASTM D4491 TESTING METHOD.
- THE GEOTEXTILE SHALL HAVE A UV STABILITY @ 500 HOURS VALUE OF 70% PER ASTM D4355 TESTING METHOD.

**CULTEC NO. 4800™ WOVEN GEOTEXTILE**

CULTEC NO. 4800 WOVEN GEOTEXTILE IS DESIGNED AS A UNDERLAYMENT TO PREVENT SCOURING CAUSED BY WATER MOVEMENT WITHIN THE CULTEC CHAMBERS AND FEED CONNECTORS UTILIZING THE CULTEC MANIFOLD FEATURE. IT MAY ALSO BE USED AS A COMPONENT OF THE CULTEC SEPARATOR ROW TO ACT AS A BARRIER TO PREVENT SOIL/CONTAMINANT INTRUSION INTO THE STONE WHILE ALLOWING FOR MAINTENANCE.

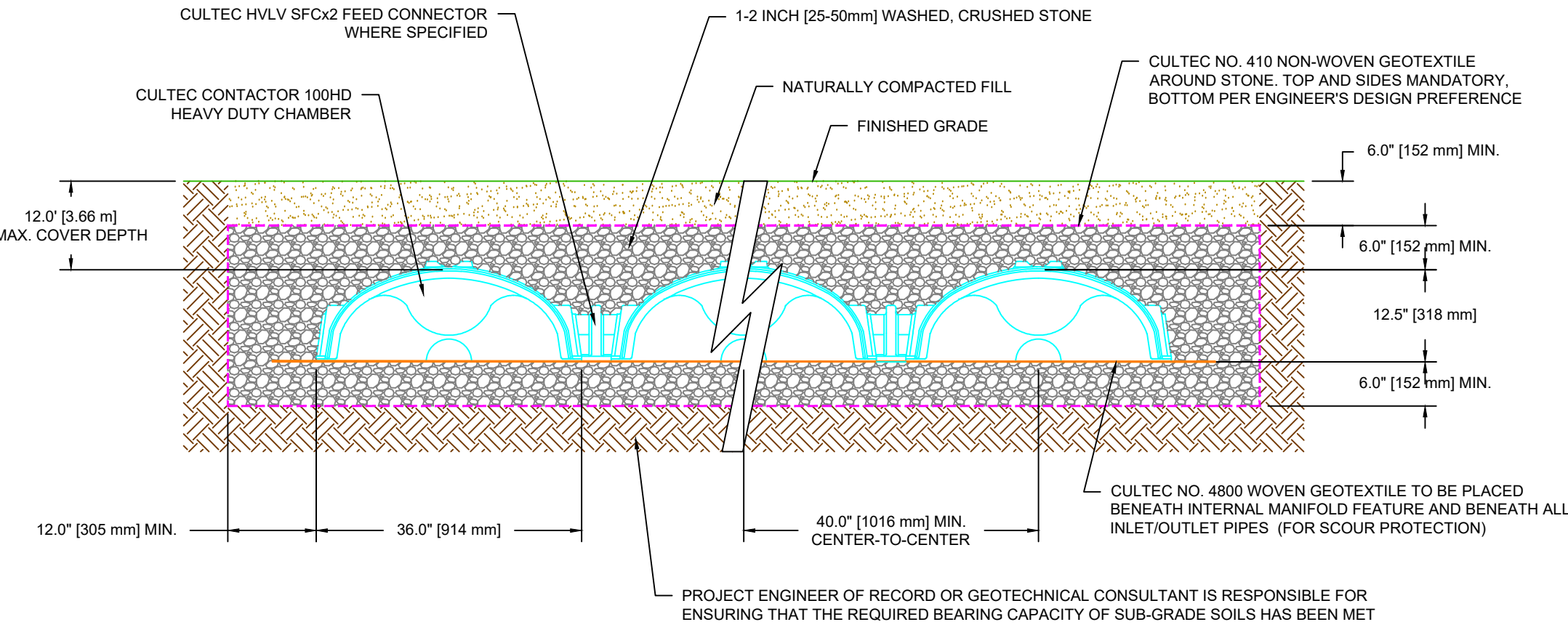
**GEOTEXTILE PARAMETERS**

- THE GEOTEXTILE SHALL BE PROVIDED BY CULTEC, INC. OF BROOKFIELD, CT. (203-775-4416 OR 1-800-428-5832)
- THE GEOTEXTILE SHALL BE BLACK IN APPEARANCE.
- THE GEOTEXTILE SHALL HAVE A TENSILE STRENGTH OF 550 X 550 LBS (2,448 X 2,448 N) PER ASTM D4632 TESTING METHOD.
- THE GEOTEXTILE SHALL HAVE AN ELONGATION @ BREAK RESISTANCE OF 20 X 20% PER ASTM D4632 TESTING METHOD.
- THE GEOTEXTILE SHALL HAVE A WIDE WIDTH TENSILE RESISTANCE OF 5,070 X 5,070 LBS/FT (74 X 74 KN/M) PER ASTM D4595 TESTING METHOD.
- THE GEOTEXTILE SHALL HAVE A WIDE WIDTH TENSILE RESISTANCE @ 2% STRAIN OF 960 X 1,096 LBS/FT (14 X 16 KN/M) PER ASTM D4595 TESTING METHOD.
- THE GEOTEXTILE SHALL HAVE A WIDE WIDTH TENSILE RESISTANCE @ 5% STRAIN OF 2,740 X 2,740 LBS/FT (40 X 40 KN/M) PER ASTM D4595 TESTING METHOD.
- THE GEOTEXTILE SHALL HAVE A WIDE WIDTH TENSILE RESISTANCE @ 10% STRAIN OF 4,800 X 4,800 LBS/FT (70 X 70 KN/M) PER ASTM D4595 TESTING METHOD.
- THE GEOTEXTILE SHALL HAVE A CBR PUNCTURE RESISTANCE OF 1,700 LBS (7,560 N) PER ASTM D6241 TESTING METHOD.
- THE GEOTEXTILE SHALL HAVE A TRAPEZOIDAL TEAR RESISTANCE OF 180 X 180 LBS (801 X 801 N) PER ASTM D4533 TESTING METHOD.
- THE GEOTEXTILE SHALL HAVE AN APPARENT OPENING SIZE OF 40 US STD. SIEVE (0.425 MM) PER ASTM D4753 TESTING METHOD.
- THE GEOTEXTILE SHALL HAVE A PERMITTIVITY RATING OF 0.15 SEC-1 PER ASTM D4491 TESTING METHOD.
- THE GEOTEXTILE SHALL HAVE A WATER FLOW RATING OF 11.5 GPM/FT² (470 LPM/M²) PER ASTM D4491 TESTING METHOD.
- THE GEOTEXTILE SHALL HAVE A UV RESISTANCE OF 80% @ 500 HRS. PER ASTM D4355 TESTING METHOD.

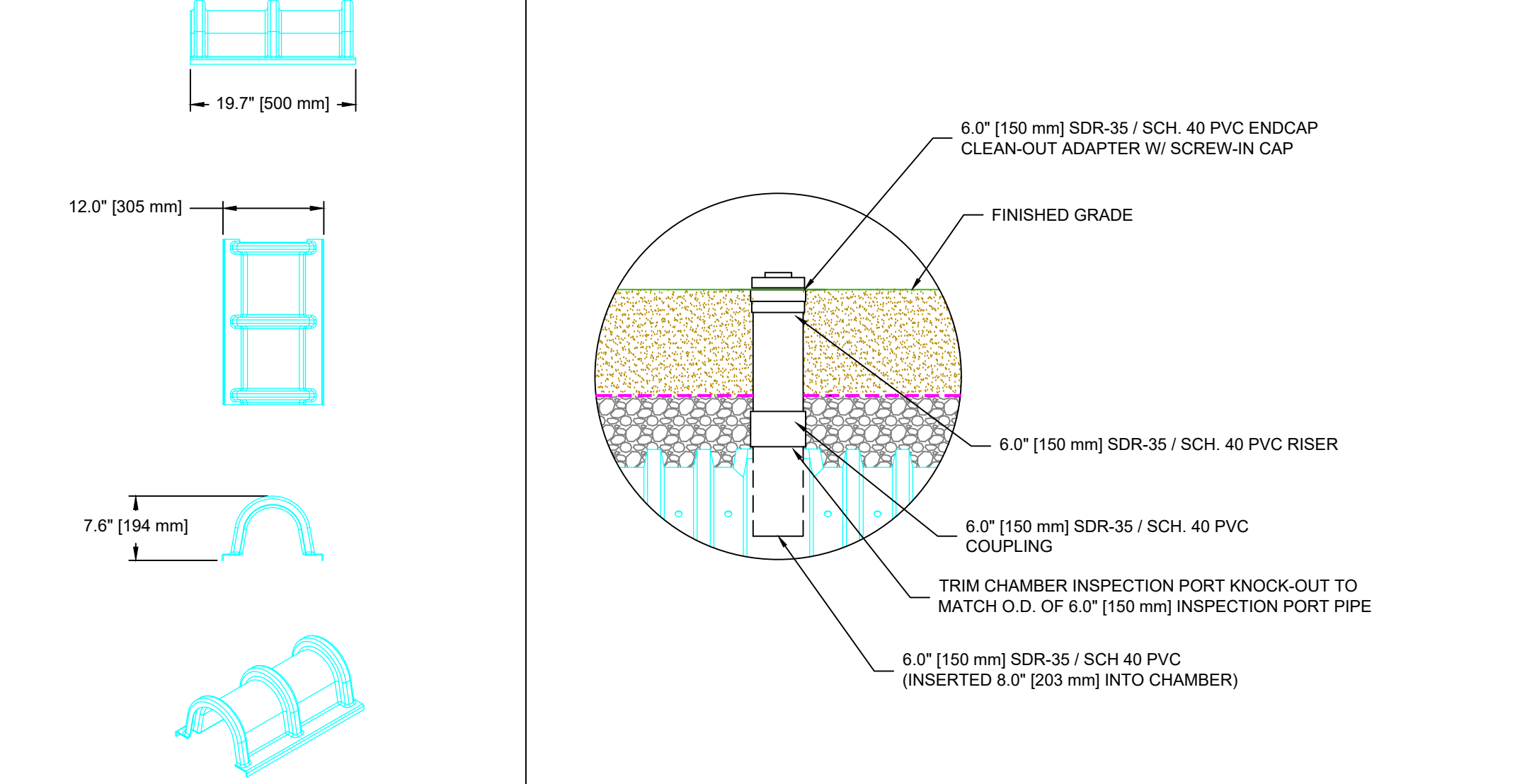


CULTEC CONTACTOR 100HD CHAMBER STORAGE = 1.866 CF/FT [0.173 m³/m]  
INSTALLED LENGTH ADJUSTMENT = 0.5' [0.15 m]

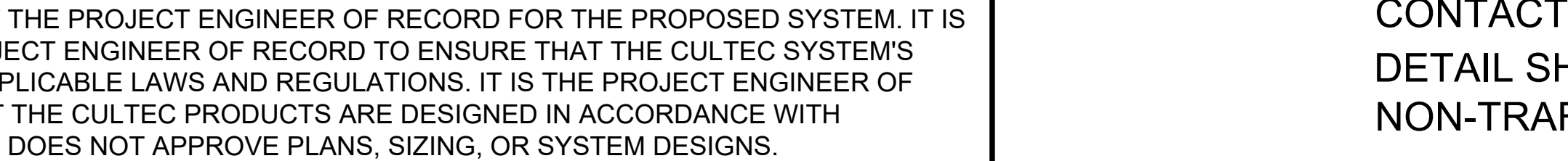
CULTEC CONTACTOR 100HD HEAVY DUTY THREE VIEW



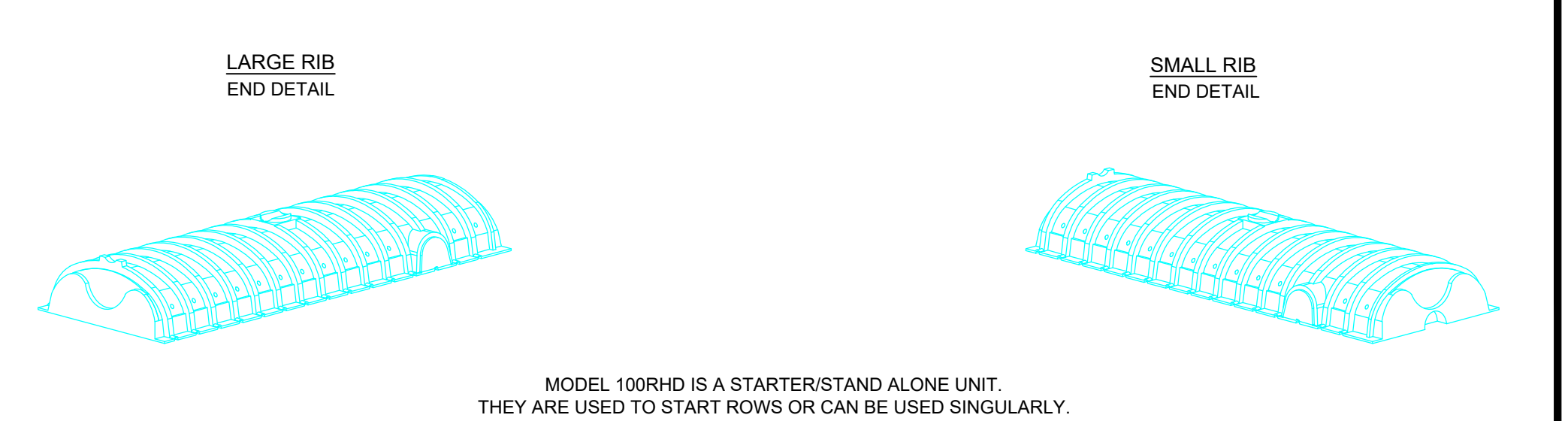
CULTEC CONTACTOR 100HD HEAVY DUTY SYSTEM CROSS SECTION



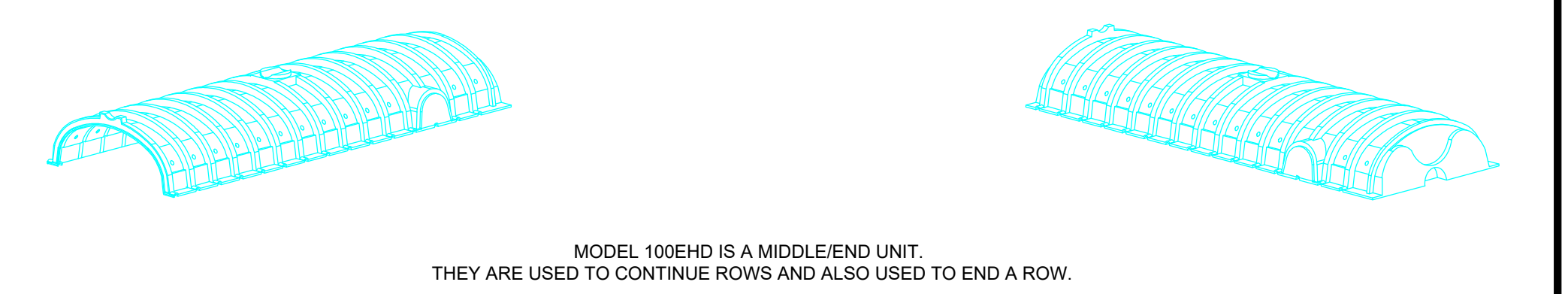
CULTEC HVLV SFCx2 FEED CONNECTOR



OPTIONAL INSPECTION PORT - ZOOM DETAIL

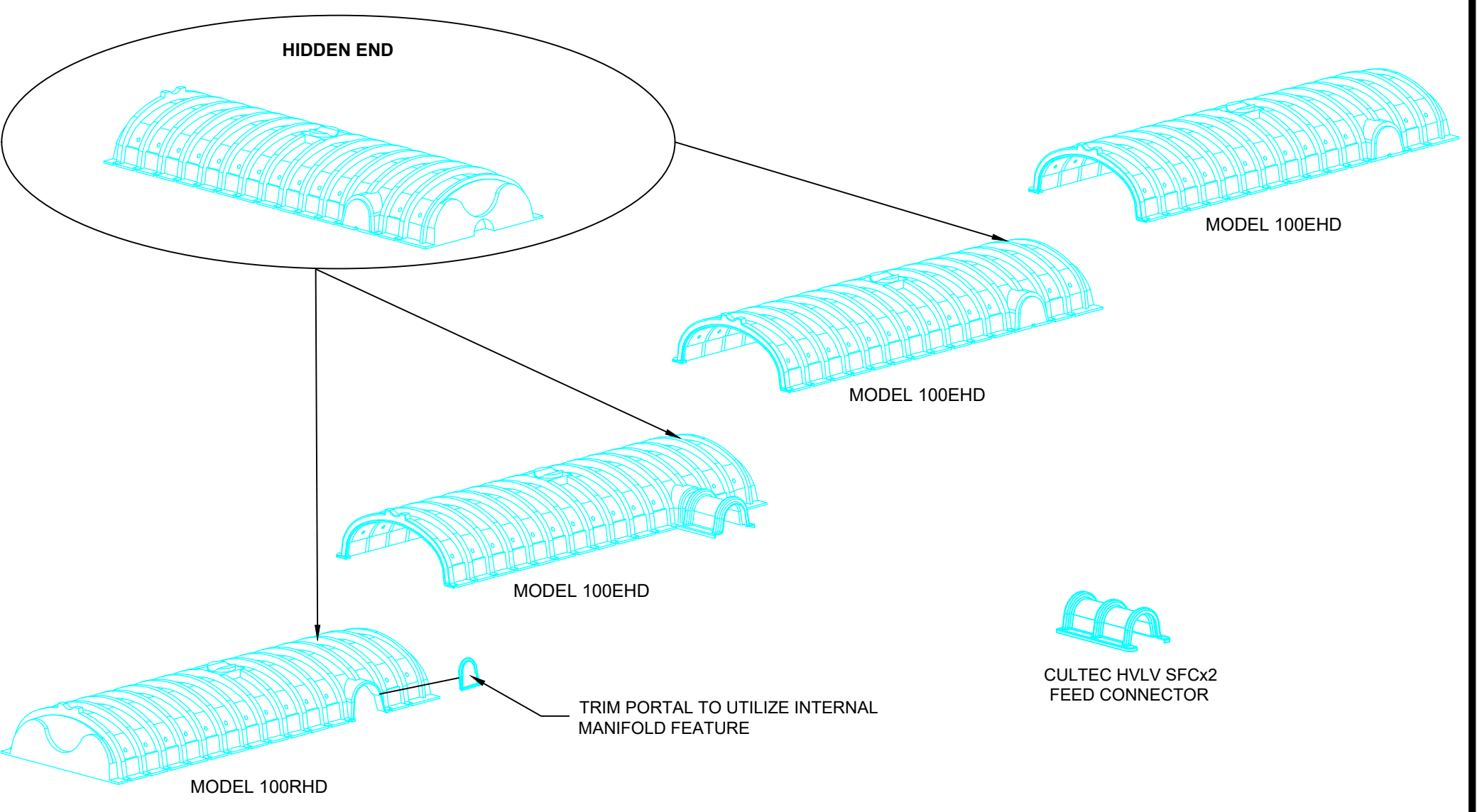


MODEL 100RHD IS A STARTER/STAND ALONE UNIT. THEY ARE USED TO START ROWS OR CAN BE USED SINGULARLY.

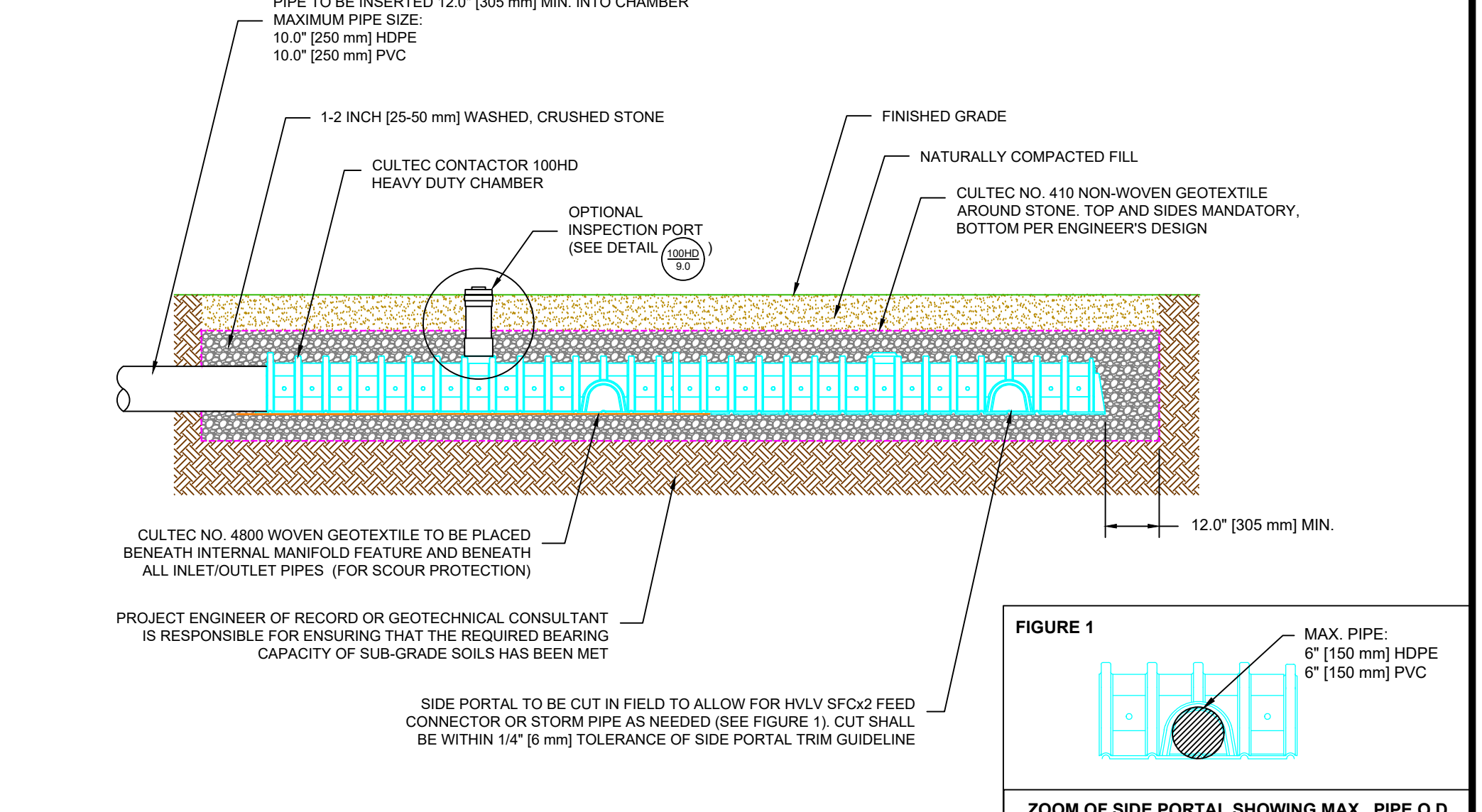


MODEL 100EHD IS A MIDDLE/END UNIT. THEY ARE USED TO CONTINUE ROWS AND ALSO USED TO END A ROW.

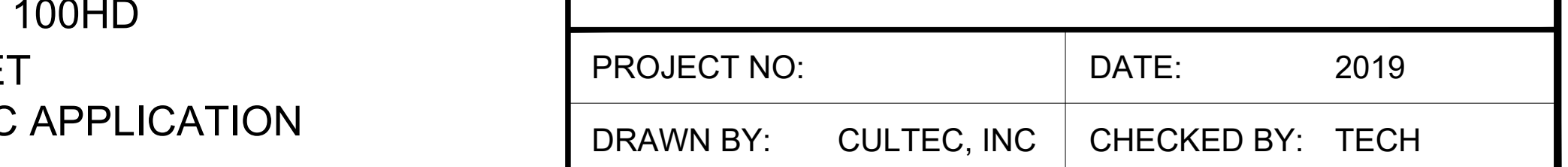
CULTEC CONTACTOR 100HD HEAVY DUTY END DETAIL INFORMATION



CULTEC CONTACTOR 100HD HEAVY DUTY TYPICAL INTERLOCK



CULTEC MANIFOLD - OPTIONAL INSPECTION PORT DETAIL





**CULTEC, Inc.**

Subsurface Stormwater Management Systems

P.O. Box 280  
878 Federal Road  
Brookfield, CT 06804  
www.cultec.com

PH: (203) 775-4416  
PH: (800) 4-CULTEC  
FX: (203) 775-1462  
tech@cultec.com

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

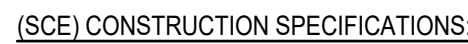
CONTACTOR 100HD  
DETAIL SHEET  
NON-TRAFFIC APPLICATION

| CULTEC STORMWATER CHAMBER |  |             |                  |
|---------------------------|--|-------------|------------------|
| PROJECT NO:               |  | DATE:       | 2019             |
| DRAWN BY:                 |  | CULTEC, INC | CHECKED BY: TECH |
| SCALE:                    |  | N.T.S.      | SHEET NO: D-7    |



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. STABILIZATION PRACTICES FOR EROSION AND SEDIMENT CONTROL SHALL BE INSTALLED

1. STRUCTURAL PRACTICES UTILIZED FOR THE PROJECT WILL INCLUDE SILT SOCK BARRIER CONTROLS, STABILIZED CONSTRUCTION ENTRANCE, TEMPORARY DIVERSION SWALES WITH STONE CHECK DAMS, SEDIMENT BASINS, AND INLET PROTECTION.
2. STABILIZATION PRACTICES UTILIZED FOR THE PROJECT WILL INCLUDE TEMPORARY SEEDING GEOTEXTILES (JUTE MESH), MULCHING, AND PERMANENT SEEDING.
3. IN GENERAL, THE SMALLEST POSSIBLE AREA OF LAND SHOULD 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 RYE MULCHED AND SEEDDED WITH WINTER RYE TO PREVENT EROSION.



1. STONE FOR A STABILIZATION CONSTRUCTION ENTRANCE SHALL BE 1 TO 12 INCH STONE, RECLAIMED STONE.
2. THE LENGTH OF A STABILIZED ENTRANCE SHALL NOT BE LESS THAN 50 FEET EXCEPT FOR A SINGLE RESIDENT LOT A 30 FOOT MINIMUM LENGTH WOULD APPLY.
3. THE THICKNESS OF THE STONE FOR A STABILIZED ENTRANCE SHALL NOT BE LESS THAN 6 INCHES.
4. THE LENGTH OF AN ENTRANCE SHALL NOT BE LESS THAN A FULL WIDTH OF THE ENTRANCE WHERE INGRESS OR EGRESS OCCURS OR A FEET, WHICH EVER 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 BEHIND THE ENTRANCE. IF PIPING IS IMPRACTICAL, A BERM WITH 4:1 SLOPES THAT CAN BE CROSSED BY VEHICLES MAY BE SUBSTITUTED FOR THE PIPE.
7. THE STABILIZED ENTRANCE 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 SHALL BE REMOVED, OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED PROMPTLY.

GENERAL NOTES:

|  |  |                        |
|--|--|------------------------|
| <b>OWNER/APPLICANT:</b><br><br><b>RIVER MARSH, LLC</b><br>293R WASHINGTON STREET<br>NORWELL, MASSACHUSETTS 02061 | <b>PROFESSIONAL ENGINEER:</b><br><br> | <b>PERMIT PLAN SET</b> |
| <b>EROSION CONTROL DETAILS</b>   |  |                        |
| DWG. NO: <b>ES-1</b>   |  |                        |