

SITE DEVELOPMENT PLANS

FOR

33 RIVERSIDE DRIVE
PEMBROKE, MA

MAY 24, 2023

SHEET INDEX						
SHEET No.	DESCRIPTION	LATEST REVISED DATE	CONSTRUCTION	REVISIONS		
1	COVER SHEET	7/6/23				
2	EXISTING CONDITIONS PLAN	7/6/23				
3	LAYOUT PLAN	7/6/23				
4	GRADING PLAN	7/6/23				
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9	DETAIL SHEET	7/6/23				
	PHOTOMETRIC PLAN	5/25/23				

OWNER/APPLICANT:

KRR PEMBROKE LLC
c/o RADER PROPERTIES
80 WASHINGTON ST. BLDG J-40
NORWELL, MA 02061

CIVIL ENGINEERS:

KELLY ENGINEERING GROUP, INC.
0 CAMPANELLI DRIVE
BRAINTREE, MA 02184

ARCHITECT:

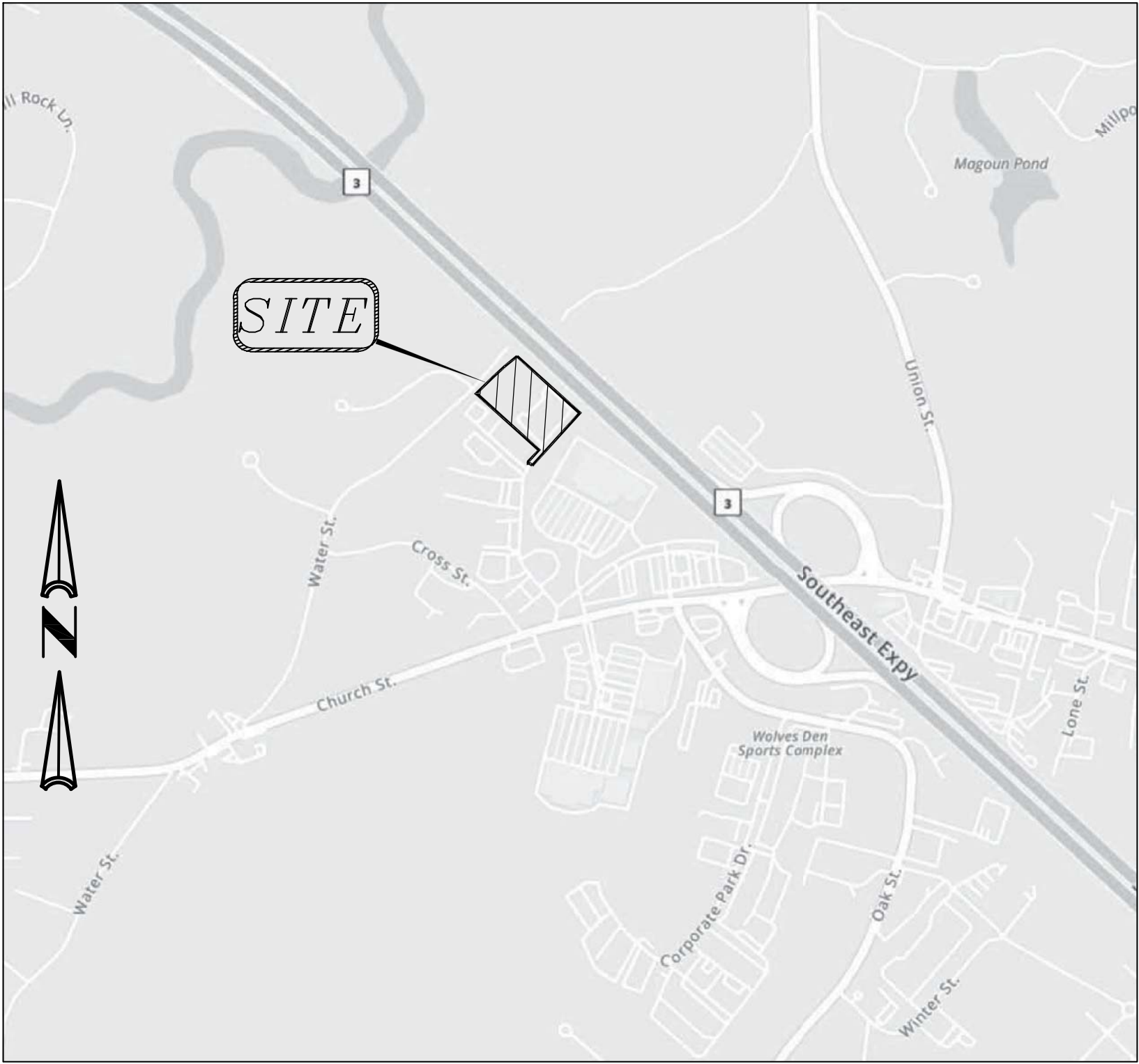
ROTH & SEELEN, INC
50 SOUTH STREET
HINGHAM, MA 02043

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

Steven M. Horsfall
Digitally signed by Steven M. Horsfall
Date: 2023.07.22 09:20:26 -04'00'

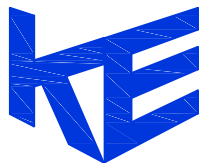


STEVEN M. HORSFALL, P.L.S. DATE



LOCATION MAP

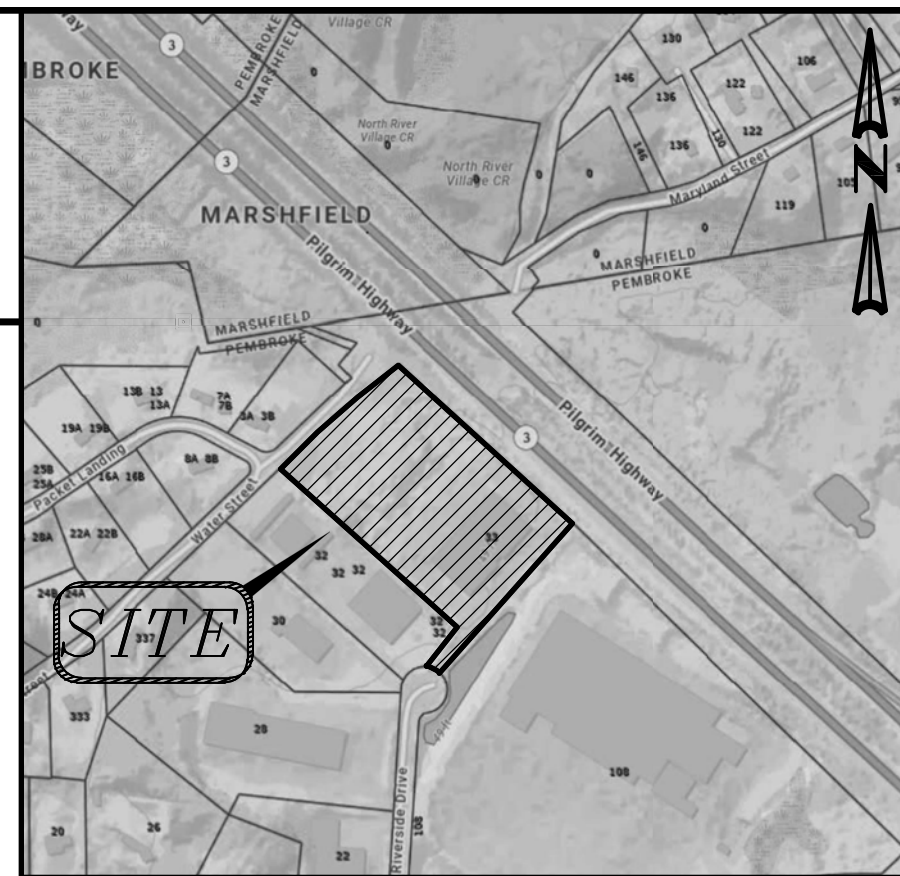
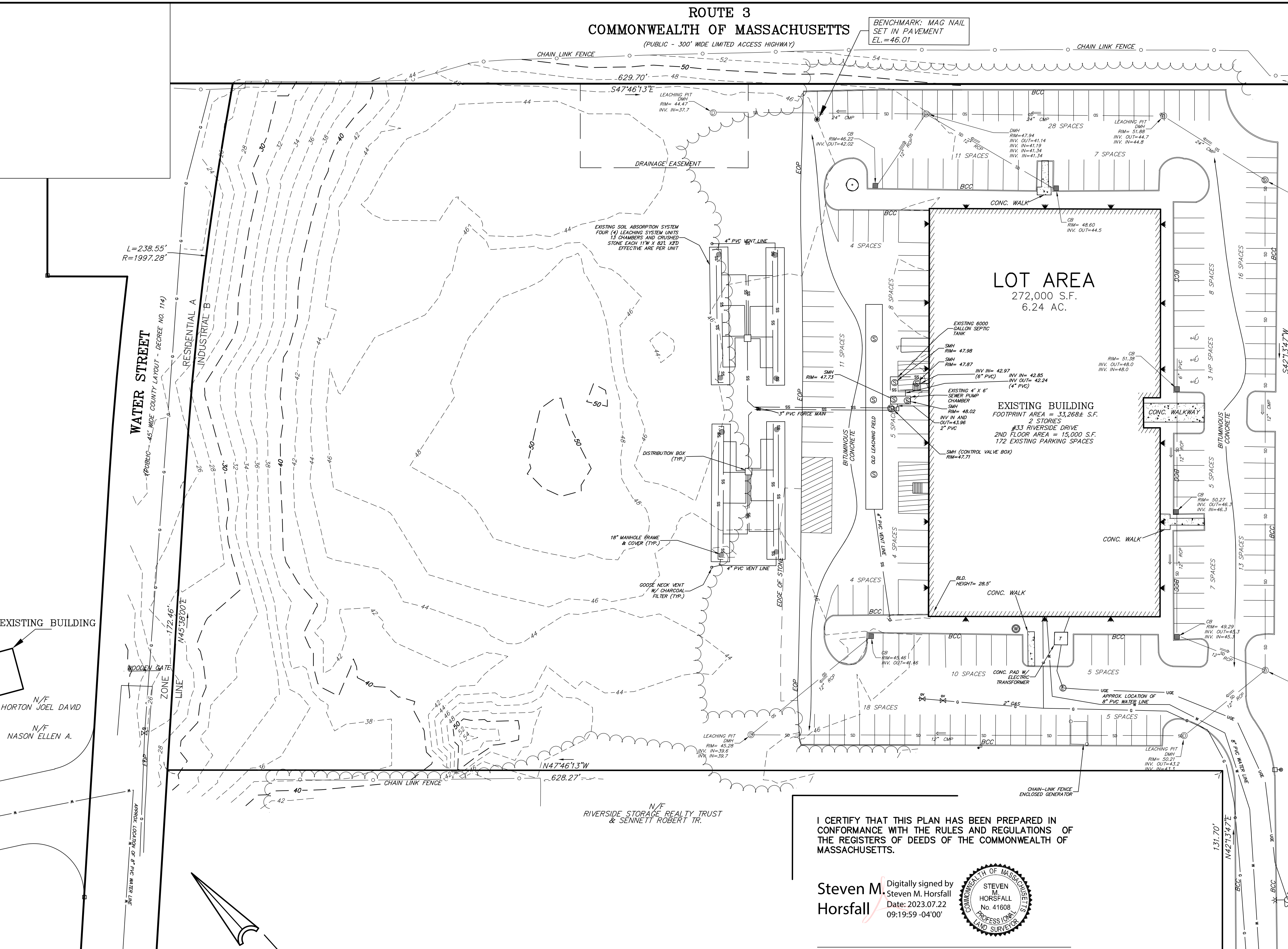
33 RIVERSIDE DRIVE
PEMBROKE, MA



KELLY ENGINEERING GROUP
civil engineering consultants
0 Campanelli Drive, Braintree, MA 02184
Phone: 781-843-4333 www.kellyengineeringgroup.com

SHEET NO.

1



LEGEND	
	CATCH BASIN
	DRAIN MANHOLE
	TELEPHONE MANHOLE
	SEWER MANHOLE
	MANHOLE
	TREE LINE
	POST INDICATOR VALVE
	HYDRANT
	WATER VALVE
	GAS METER
	GAS VALVE
	OVERHEAD ELECTRIC
	GUY POLE
	UTILITY POLE
	ELECTRIC HAND HOLE
	LIGHT POLE
	GUY WIRE
	SIGN
	SLOPED GRANITE CURB
	BITUMINOUS CONCRETE CURB
	VERTICAL GRANITE CURB
	CAPE COD BERM
	CONCRETE
	BIT.
	LANDSCAPED
	STONE BOUND/ DRILL HOLE FOUND
	DRILL HOLE FOUND
	HANDICAP PARKING
	BOLLARD
	MAILBOX
	GUARDRAIL
	WETLAND FLAG
	WETLAND
	WETLAND LINE
	MAJOR CONTOUR
	MINOR CONTOUR
	SPOT GRADE
	SEWER LINE
	WATER LINE
	GAS LINE
	DRAIN LINE
	TELEPHONE LINE
	TEST PITS
	BORING

PLAN REFERENCES:
(Plymouth County Registry of Deeds)

- 1.) Plan 173 of 1984
- 2.) Plan 480 of 2012
- 3.) Plan 799 of 1983
- 4.) Plan 830 of 1997

CURRENT OWNER:
KRR PEMBROKE LLC
Deed Bk: 18507 Pg: 5
Property ID#: F15-60

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Steven M. Horsfall
Digitally signed by Steven M. Horsfall
Date: 2023.07.22 09:19:59 -04'00'



STEVEN M. HORSFALL, P.L.S. DATE

- NOTES:**
- 1.) UNDERGROUND FEATURES HAVE BEEN COMPILED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS. THIS INFORMATION IS TO BE CONSIDERED APPROXIMATE AND KELLY ENGINEERING GROUP, INC. DOES NOT TAKE RESPONSIBILITY FOR SUBSEQUENT ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THIS PLAN AS A RESULT. ADDITIONALLY, OTHER SUCH FEATURES MAY EXIST ON THE SITE. THE EXISTENCE OF WHICH ARE UNKNOWN TO KELLY ENGINEERING GROUP, INC. THE SIZE, LOCATION, AND EXISTENCE OF ALL SUCH FEATURES MUST BE VERIFIED BY THE APPROPRIATE AUTHORITIES PRIOR TO CONSTRUCTION.
 - 2.) THE LOCATION OF ALL UTILITIES SHOWN HEREON HAVE BEEN ESTABLISHED USING ASCE 38-02 (STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA) QUALITY LEVEL C.
 - 3.) THE SITE DETAIL AND SURFACE IMPROVEMENTS DEPICTED HEREON WERE OBTAINED FROM AN ON THE GROUND SURVEY PERFORMED BY KELLY ENGINEERING GROUP ON MARCH 20, 2023.
 - 4.) THE SURVEYED PREMISES IS LOCATED WITHIN FLOOD ZONE "X" (UN-SHADED) AND FLOOD ZONE "A" SHOWN ON THE FLOOD INSURANCE RATE MAPS (FIRM'S) FOR THE TOWN OF PEMBROKE, MASS. DATED 07/06/2021, COMMUNITY PANEL NUMBER 25023C0207K.
 - 5.) THE VERTICAL DATUM SHOWN HEREON IS BASED ON NAVD83 (NORTH AMERICAN VERTICAL DATUM OF 1988), ESTABLISHED VIA GPS.
 - 6.) THE FIELD SURVEY FOR BOUNDARY AND TOPOGRAPHY SHOWN HEREON WAS ON THE GROUND BETWEEN JUNE OF 2021 AND JUNE OF 2022 BY KELLY ENGINEERING GROUP, INC.

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THE EXTENT OF KELLY ENGINEERING GROUP'S LIABILITY FOR THIS PLAN IS LIMITED TO THE EXTENT OF ITS FEE. THIRD PARTY COST
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SCALE 1"= 30'	1	07/06/23	PEER REVIEW COMMENTS	
DATE 05/24/2023	REV	DATE	REVISION	BY
SHEET 2 of 9				
FILE # SU01				
JOB # F:\P\2023-026				
DRAWN BY JPM				
CHKD BY SMH				
APPD BY SMH				
RADER PROPERTIES, INC 33 RIVERSIDE DRIVE PEMBROKE, MASSACHUSETTS EXISTING CONDITIONS PLAN				
KELLY ENGINEERING GROUP civil engineering consultants 0 Campanelli Drive, Braintree, MA 02184 Phone: 781-843-4333 www.kellyengineeringgroup.com				
SHEET NO.				2

ROUTE 3
COMMONWEALTH OF MASSACHUSETTS
(PUBLIC - 300' WIDE LIMITED ACCESS HIGHWAY)

ZONING LEGEND

ZONING DISTRICT: INDUSTRIAL B
OVERLAY DISTRICT: MEDICAL MARIJUANA OVERLAY

	REQUIRED	EXISTING	PROVIDED	COMPLIANCE
MIN. AREA	80,000 S.F.	272,000 S.F.	SAME	YES
MIN. FRONTAGE	200'	411.01'	SAME	YES
MIN. LOT WIDTH	135'	408.9'	SAME	YES
MIN. YARD -FRONT	60'	>60' (1)	140.4'	YES
-SIDE	20'	77.3'	58.7'	YES
-REAR	20'	74.2'	50.2'	YES
MAX. STORIES	4	2	SAME	YES
MAX. COVERAGE	80% (2)	40%	79%	YES
MAX. BFA	45% (3)	24%	34%	YES
PARKING TOTAL	98 (4)	172	270 [98 NEW] (4)	YES
-SIZE	9' X 18'	NA	9' X 18'	YES
-HANDICAP	7	3	7	YES
-LOADING	2	0	14	YES
MAX. DRVWY. WIDTH	41' (5)	24'	SAME	YES
MIN. LANDSCAPING				
-FRONT	50% (6)	> 50%	70%	YES
-SIDE	40% (6)	> 40%	45%	YES
-REAR	40% (6)	56%	SAME	YES

NOTES:

- LOT LINES ADJACENT TO RIVERSIDE DRIVE AND WATER STREET ARE FRONT YARDS, THE LOT LINE OPPOSITE RIVERSIDE DRIVE IS THE REAR YARD, AND ALL OTHER LOT LINES ARE SIDE YARDS.
- COVERAGE (SECTION IV 5A.D.12. OF ZONING BYLAW): THE SUM OF THE GROUND AREA OF THE LOT COVERED, OR TO BE COVERED, BY ALL BUILDINGS OR STRUCTURES AND ALL PAVED AREAS, TO INCLUDE WALKWAYS, PATIOS, ROADWAYS, ACCESS WAYS, TURNAROUNDS, LOADING AREAS, AND PARKING AREAS SHALL NOT EXCEED EIGHTY PERCENT OF THE TOTAL SITE AREA.

COVERAGE = 215,619 S.F. / 272,000 S.F. = 79%

- BUILDING FLOOR AREA (SECTION IV 5A.D.11. OF ZONING BYLAW): THE SUM OF THE FLOOR AREA(S) ON ALL LEVELS OF ALL BUILDINGS OR STRUCTURES, BUT EXCLUDING CELLARS OR ATTICS NOT UTILIZED AS A PRIMARY OR ACCESSORY USE IN SAID BUILDING OR STRUCTURE. THE BUILDING FLOOR AREA SHALL NOT EXCEED FORTY-FIVE PERCENT OF THE TOTAL SITE AREA

BFA = EXIST. BUILDING (33,268 S.F. 1ST FLOOR + 15,000 S.F. 2ND FLOOR) + PROP. BUILDING (45,000 S.F.) = 93,268 S.F. / 272,000 S.F. = 34%

- PARKING REQUIRED:

ASSUMED:

85% OF THE BUILDING IS WAREHOUSE SPACE AND THE OTHER 15% IS OFFICE SPACE.

THE NUMBER OF EMPLOYEES IN WAREHOUSE IS 1 EMPLOYEE PER 1,000 S.F. OF WAREHOUSE SPACE.

THE NUMBER OF EMPLOYEES IN OFFICE IS 1 EMPLOYEE PER 150 S.F. OF OFFICE SPACE.

INDUSTRIAL, MANUFACTURING AND WHOLESALE USES: ONE SPACE FOR EACH EMPLOYEE ON ANY ONE SHIFT.

85% OF THE TOTAL BUILDING (45,000 S.F.) = 38,250 S.F.

OF WAREHOUSE EMPLOYEE SPACES = 38,250 S.F. / 1,000 S.F. = 38 EMPLOYEES SPACES

OFFICES, BANKS AND SIMILAR BUSINESS: ONE SPACE FOR EACH ONE HUNDRED AND FIFTY SQUARE FEET OF FLOOR AREA PLUS ONE SPACE FOR EACH THREE EMPLOYEES OR NEAREST MULTIPLE THEREOF.

15% OF THE TOTAL BUILDING (45,000 S.F.) = 6,750 S.F.

PARKING FOR OFFICE FLOOR AREA = 6,750 S.F. / 150 S.F. = 45 SPACES

OF OFFICE EMPLOYEE SPACES = (6,750 S.F. / 150 S.F.) / 3 EMPLOYEES = 15 EMPLOYEES SPACES

TOTAL REQUIRED PARKING FOR PROPOSED BUILDING = 98 SPACES

PARKING FOR PROPOSED BUILDING = 98 SPACES

PARKING FOR EXISTING BUILDING = 172 SPACES

TOTAL PROPOSED PARKING = 270 SPACES = 172 EXISTING SPACES + 98 NEW SPACES FOR PROPOSED

- DRIVEWAYS: DRIVEWAYS PROVIDING A MEANS OF ACCESS AND EGRESS FOR EACH INDIVIDUAL LOT OR SHALL NOT EXCEED ONE FOOT IN WIDTH FOR EACH TEN FEET OF FRONTAGE, EXCLUDING RADI, AND THERE SHALL NOT BE MORE THAN TWO SUCH DRIVEWAYS. COMMON DRIVEWAYS PROVIDING A MEANS OF ACCESS AND EGRESS FOR MORE THAN ONE LOT SHALL NOT BE ALLOWED.

- LANDSCAPING: AT LEAST FIFTY PERCENT OF ANY YARD OR BUFFER STRIP ABUTTING A RESIDENTIAL USE OR DISTRICT SHALL BE LANDSCAPED OR LEFT IN A NATURAL STATE. ALONG ANY LOT LINE ABUTTING A RESIDENTIAL USE OR DISTRICT THERE SHALL BE PLANTED A DENSE NATURAL HEDGE GREATER THAN SIX FEET IN HEIGHT AND LOCATED WITHIN TEN FEET OF SAID LOT LINE. SAID NATURAL HEDGE SHALL PROVIDE A VISUAL SCREEN BETWEEN ANY STRUCTURE OR PARKING AREA AND THE RESIDENTIAL AREA.

SCALE 1" = 30'				
DATE 05/24/2023	REV	07/06/23	PEER REVIEW COMMENTS	BY
SHEET 3 of 9			REVISION	
FILE # LA01				
JOB # F:\P\2023-026				
DRAWN BY AJV				
CHKD BY GSH				
APPD BY BGL				
RADER PROPERTIES, INC 33 RIVERSIDE DRIVE PEMBROKE, MASSACHUSETTS LAYOUT PLAN				
KELLY ENGINEERING GROUP civil engineering consultants 0 Campanelli Drive, Braintree, MA 02184 Phone: 781-843-4333 www.kellyengineeringgroup.com				

COMMONWEALTH OF MASSACHUSETTS BRANDON G. LI CIVIL No. 57736 REGISTERED PROFESSIONAL ENGINEER	Brandon Li 2023.07.21 16:42:37 -04'00'
SHEET NO.	3

PROPOSED BUILDING
45,000 S.F. ± (FOOTPRINT)
1 STORY
98 PARKING SPACES
14 LOADING DOCK SPACES

LOT AREA
272,000 S.F.
6.24 AC.

EXISTING BUILDING
FOOTPRINT AREA = 33,268± S.F.
2 STORIES
#33 RIVERSIDE DRIVE
2ND FLOOR AREA = 15,000 S.F.
172 EXISTING PARKING SPACES

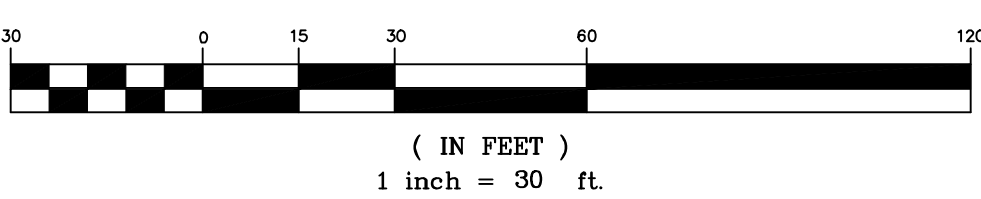
PROPOSED LEGEND

CCB	CAPE COD BERM
ICC	INTEGRATED CONCRETE CURB
CC	CONCRETE CURB
♿ CAR	HANDICAP SPACE
♿ VAN	VAN HANDICAP SPACE
→	HANDICAP RAMP
—	CURB STOP
—	SAW CUT/ MATCH PAVEMENT LINE
▨	HEAVY DUTY PAVEMENT
→	TRAFFIC FLOW
—	SIGN
—	WOOD POST GUARDRAIL
—	CHAIN LINK FENCE
—	SNOW STORAGE
□ □ □	LIGHT POLES
◀	WALL MOUNTED LIGHT
▶	DOOR LOCATION
●	OVERHEAD DOOR LOCATION

PLANTING LEGEND

TREES	KEY	QUANTITY	COMMON NAME	BOTANICAL NAME	SIZE	SPEC
	1	4	BRADFORD CALERY	PYRUS CALLERYANA "BRADFORD"	2 1/2"- 3"	B & B
	2	6	ARISTOCRAT CALERY PEAR	PYRUS CALLERYANA VAR. ARISTOCRAT	2"- 2 1/2" CALIPER	B & B
	3	8	GREENSPIRE LINDEN	TILIA CORDATA "GREENSPIRE"	2"- 2 1/2" CALIPER	B & B
	4	8	NORWAY SPRUCE	PICEA ABIES	3" CALIPER	B & B
SHRUBS						
	S1	24	AMERICAN CRANBERRY BUSH	VIBURNUM TRILOBUM	#2 POT	B & B
	S2	18	SHASTA VIBURNUM	VIBURNUM PLICATUM VAR. SHASTA	#2 POT	B & B
	S3	18	SHAMROCK INKBERY	LIECH GLABRA VAR. SHAMROCK	#2 POT	B & B

GRAPHIC SCALE

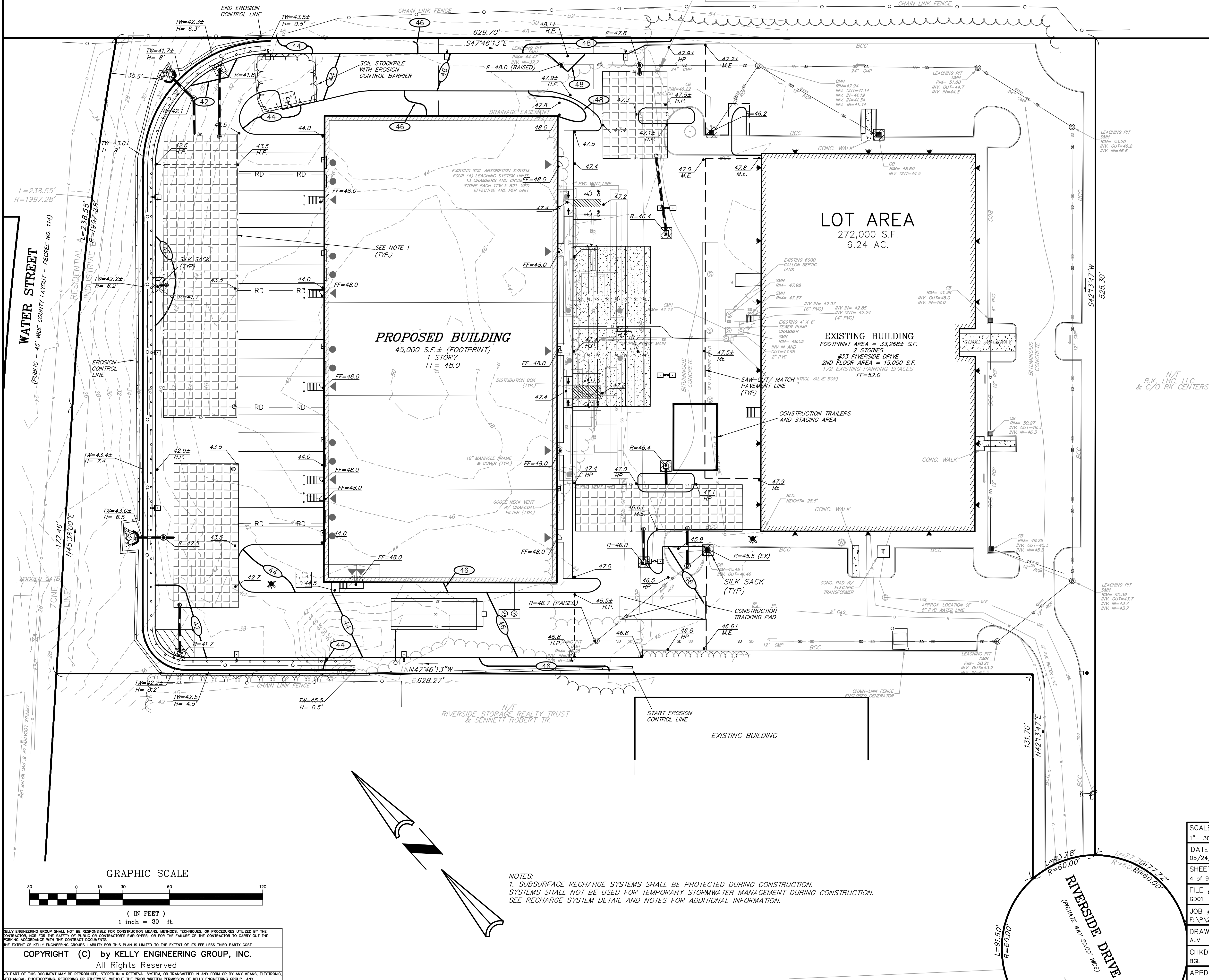


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ROUTE 3
COMMONWEALTH OF MASSACHUSETTS
(PUBLIC - 300, WIDE LIMITED HIGHWAY ACCESS HIGHWAY)

BENCHMARK: MAG NAIL
SET IN PAVEMENT
EL. = 46.01



PROPOSED LEGEND

	RIP RAP
	FLARED END SECTION
	CATCH BASIN
	DOUBLE CATCH BASIN
	DRAIN MANHOLE
	INSPECTION PORT
	DRAIN LINE
	ROOF DRAIN LINE
	SAW CUT/ MATCH PAVEMENT LINE
	CONTOUR LINE
	SPOT GRADE
	MATCH EXISTING
	HIGH POINT
	HIGH POINT LINE
	EROSION CONTROL LINE
	SILT SACK
	SILT SACK
	DRAIN RIP-RAP

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

Steven M. Horsfall
Digitally signed by Steven M. Horsfall
Date: 2023.07.22 09:19:06 -04'00'



STEVEN M. HORSFALL, P.L.S.

DATE

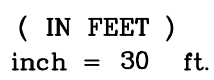
SCALE 1" = 30'	1	07/06/23	PEER REVIEW COMMENTS	
DATE 05/24/2023	REV	DATE	REVISION	BY
SHEET 4 of 9				
FILE # G001				
JOB # F:\P\2023-026				
DRAWN BY AJV				
CHKD BY BGL				
APPD BY BGL				
RADER PROPERTIES, INC 33 RIVERSIDE DRIVE PEMBROKE, MASSACHUSETTS GRADING PLAN				
KELLY ENGINEERING GROUP civil engineering consultants 0 Campanelli Drive, Braintree, MA 02184 Phone: 781-843-4333 www.kellyengineeringgroup.com				

COMMONWEALTH OF MASSACHUSETTS REGISTERED PROFESSIONAL ENGINEER BRANDON G. LI No. 57738 2023.07.21 16:42:16 -04'00'	SHEET NO. 4
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NOTES:
1. SUBSURFACE RECHARGE SYSTEMS SHALL BE PROTECTED DURING CONSTRUCTION.
SYSTEMS SHALL NOT BE USED FOR TEMPORARY STORMWATER MANAGEMENT DURING CONSTRUCTION.
SEE RECHARGE SYSTEM DETAIL AND NOTES FOR ADDITIONAL INFORMATION.

(PUBLIC - 300' WIDE LIMITED ACCESS HIGHWAY)

CHAIN LINK FENCE



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NOTES:

1. ALL STRUCTURE INVERTS ARE LISTED WITH OUTLET FIRST THEN CLOCKWISE AROUND STRUCTURE.
2. FOR EXISTING SYMBOL LEGEND SEE SHEET 02

Steven M. Horsfall



SCALE						
1" = 30'						
DATE	1	07/06/23	PEER REVIEW COMMENTS			
05/24/2023	REV	DATE	REVISION		BY	
SHEET	<div style="text-align: center;">  <p>COMMONWEALTH OF MASSACHUSETTS PROFESSIONAL ENGINEER BRANDON G. LI CIVIL No. 67736 REGISTERED</p> </div>					
5 of 9						
FILE #						
SD01						
JOB #						
F:\P\2023-026	<div style="text-align: center;"> <p>RADER PROPERTIES, INC 33 RIVERSIDE DRIVE PEMBROKE, MASSACHUSETTS SEWER AND DRAINAGE PLAN</p> </div>					
DRAWN BY	<div style="text-align: center;">  <p>KELLY ENGINEERING GROUP civil engineering consultants 0 Campanelli Drive, Braintree, MA 02184 Phone: 781-843-4333 www.kellyengineeringgroup.com</p> </div>					
AJV						
CHKD BY						
BGL						
APPD BY	<div style="text-align: right;"> <p>Brandon Li 2023.07.21 16:41:49 -04'00'</p> </div>					
BGL	<div style="text-align: center;"> <p>SHEET NO. 5</p> </div>					

BENCHMARK: MAG NAIL
SET IN PAVEMENT
EL.=46.01



NOTE:
FOR EXISTING SYMBOL LEGEND SEE SHEET 2

SILT SOCKS SHALL BE INSTALLED AROUND THE PERIMETER OF ALL STOCKPILES.

NO HEAVY EQUIPMENT/VEHICLE WASHING
WILL BE ALLOWED ON-SITE UNLESS TO HOSE
OFF SEDIMENTS TO PREVENT VEHICLE
TRACK-OUT ONTO PUBLIC ROADS. NO
SOAPS OR DETERGENTS SHALL BE USED.

CONSTRUCTION EQUIPMENT SHALL BE
PARKED/STAGED WITHIN DESIGNATED AREAS
OUTSIDE OF THE BUFFER ZONE FROM
WETLAND RESOURCE AREAS.

SUBSURFACE INFILTRATION CHAMBER
SYSTEMS ARE NOT TO BE UTILIZED FOR
TEMPORARY SEDIMENT TRAPS AND SHALL BE
PROTECTED FROM HEAVY CONSTRUCTION
TRAFFIC TO AVOID COMPROMISING THE SOIL
CONDITIONS


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MASSACHUSETTS.

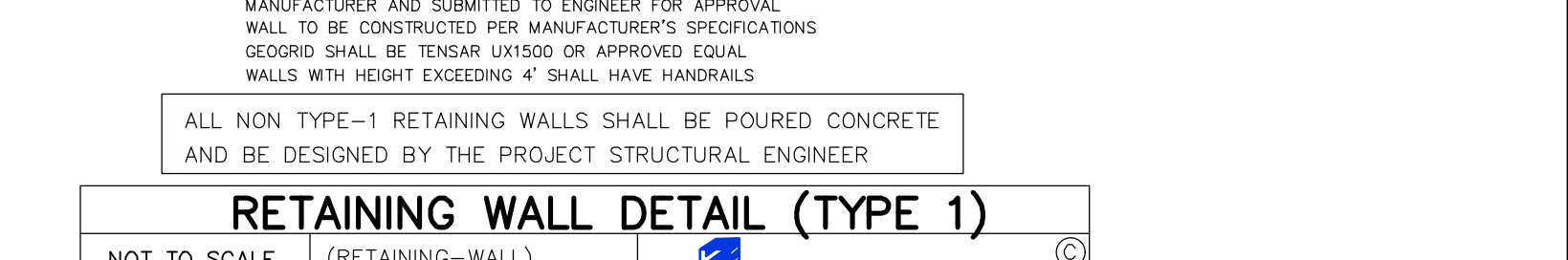
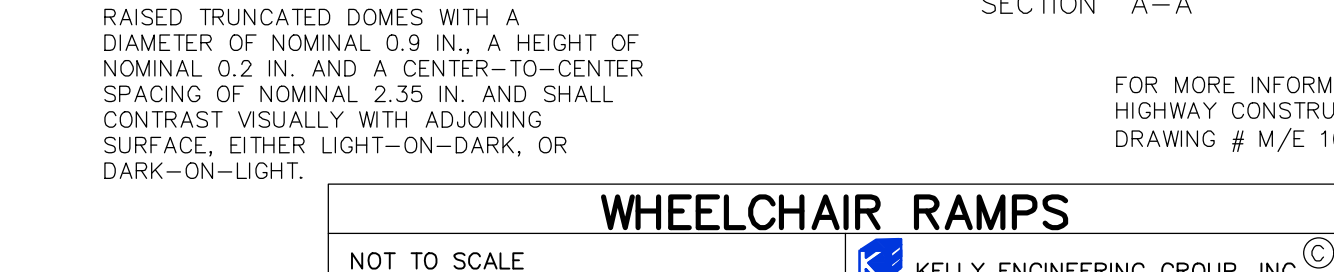
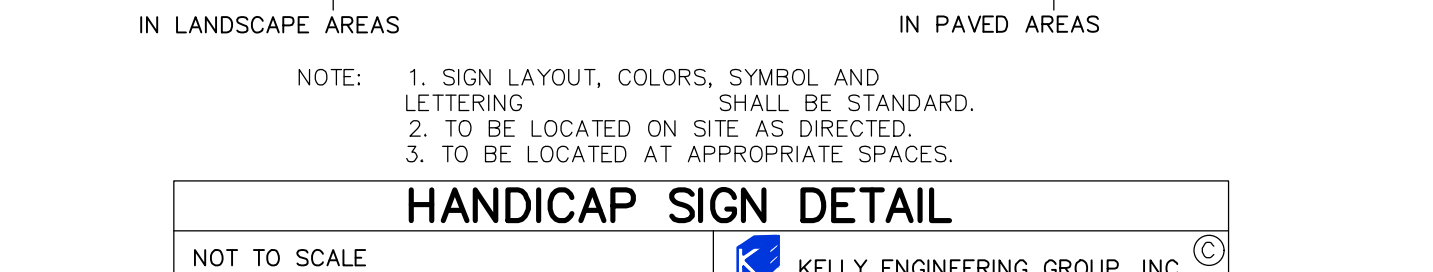
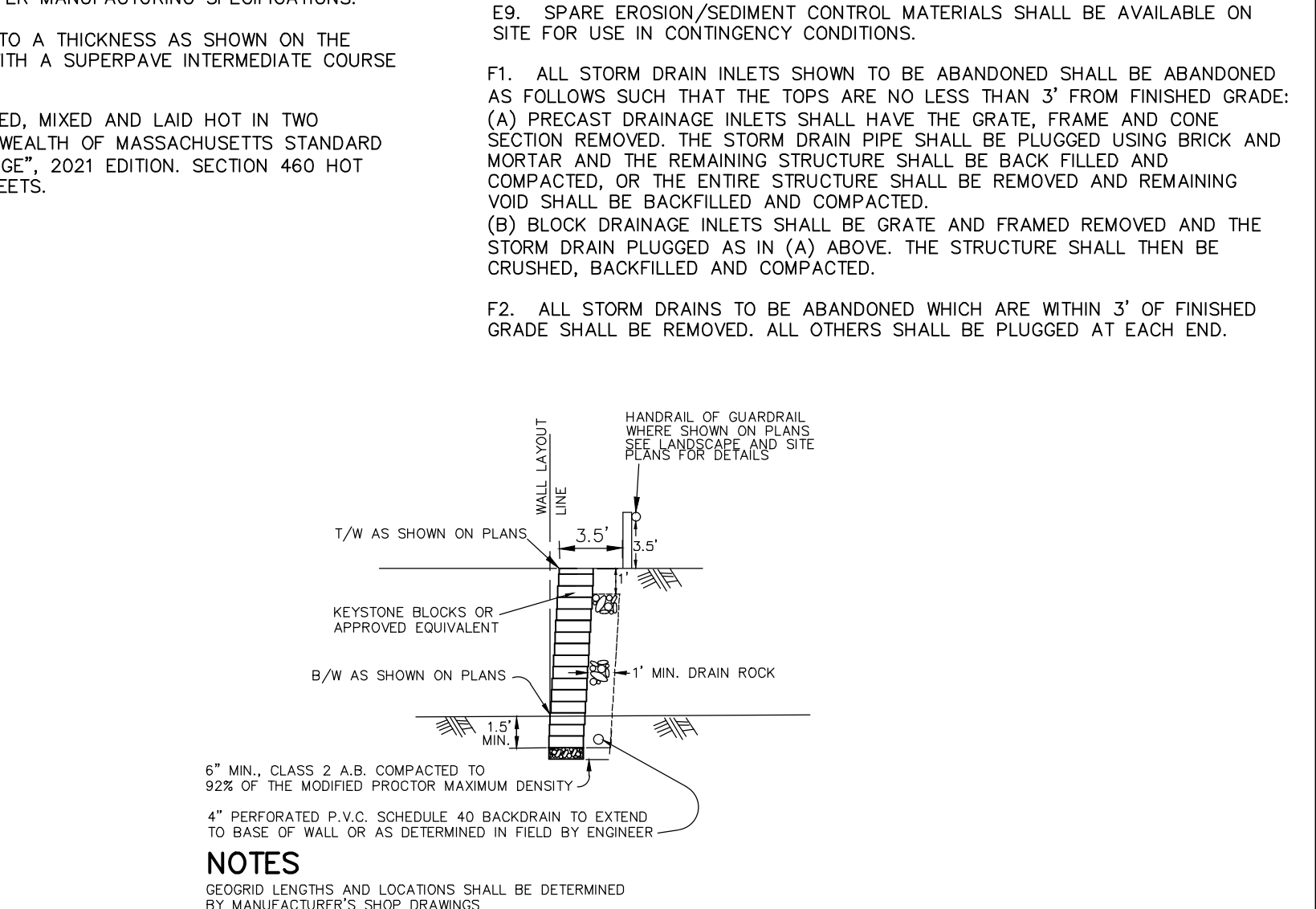
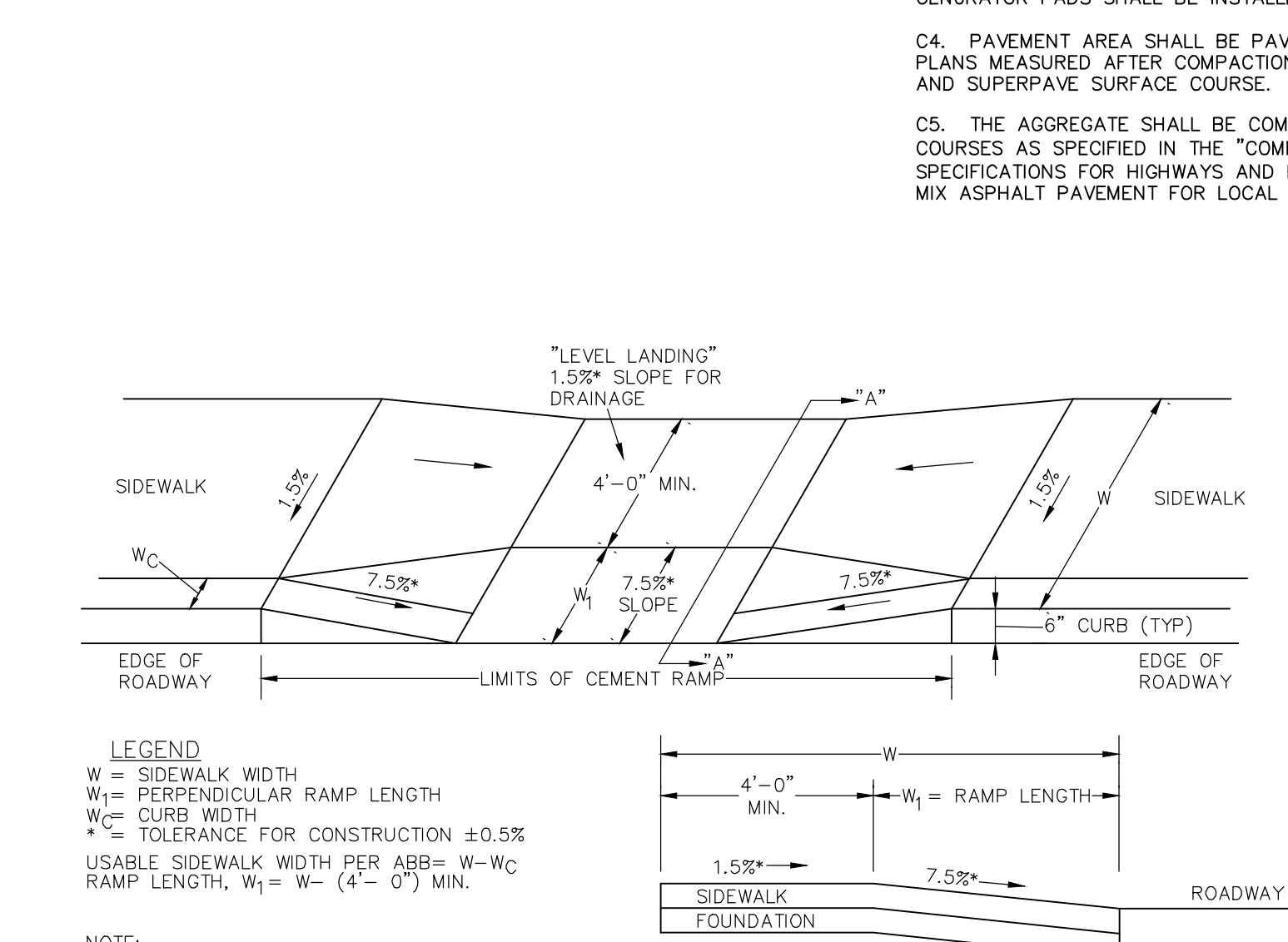
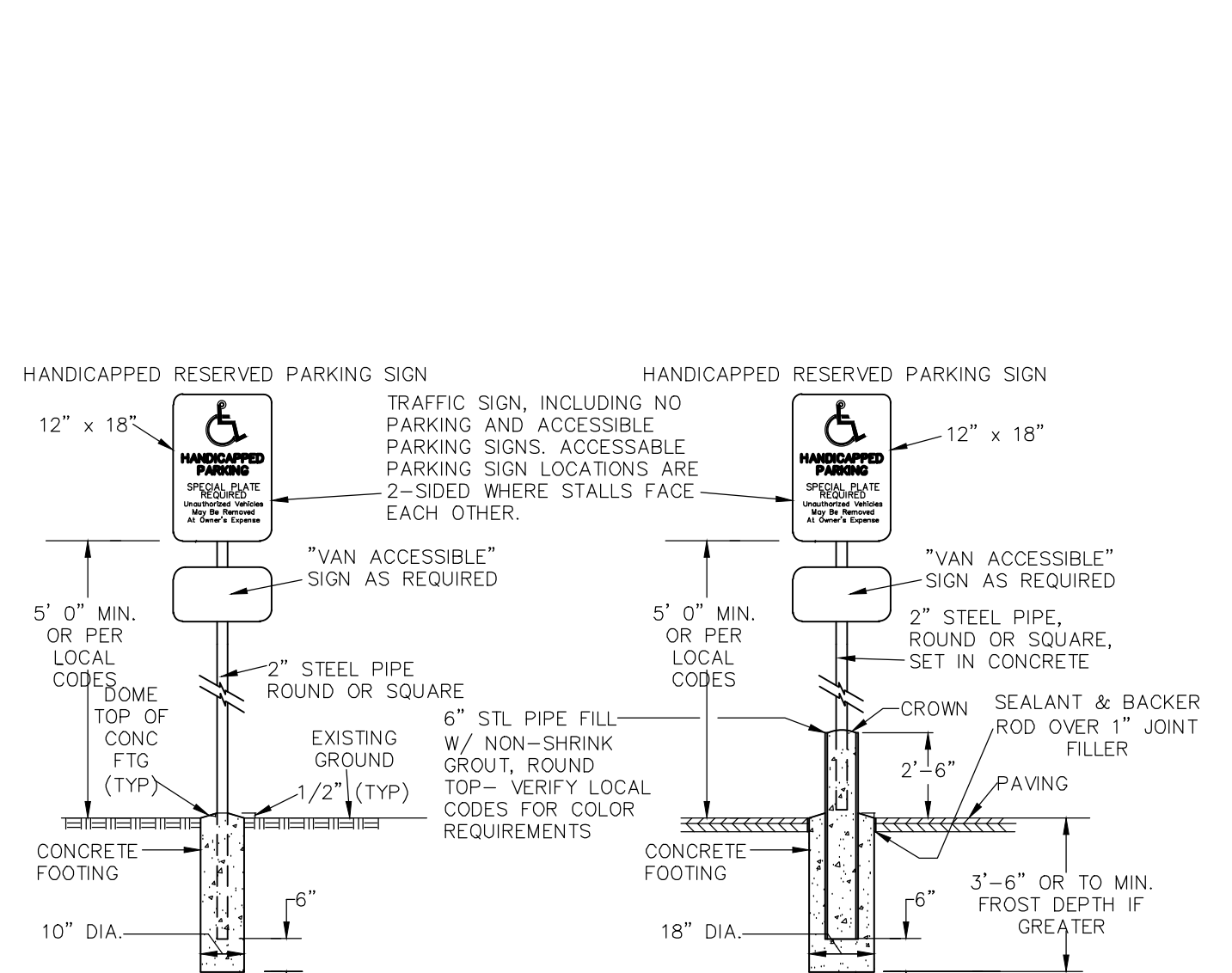
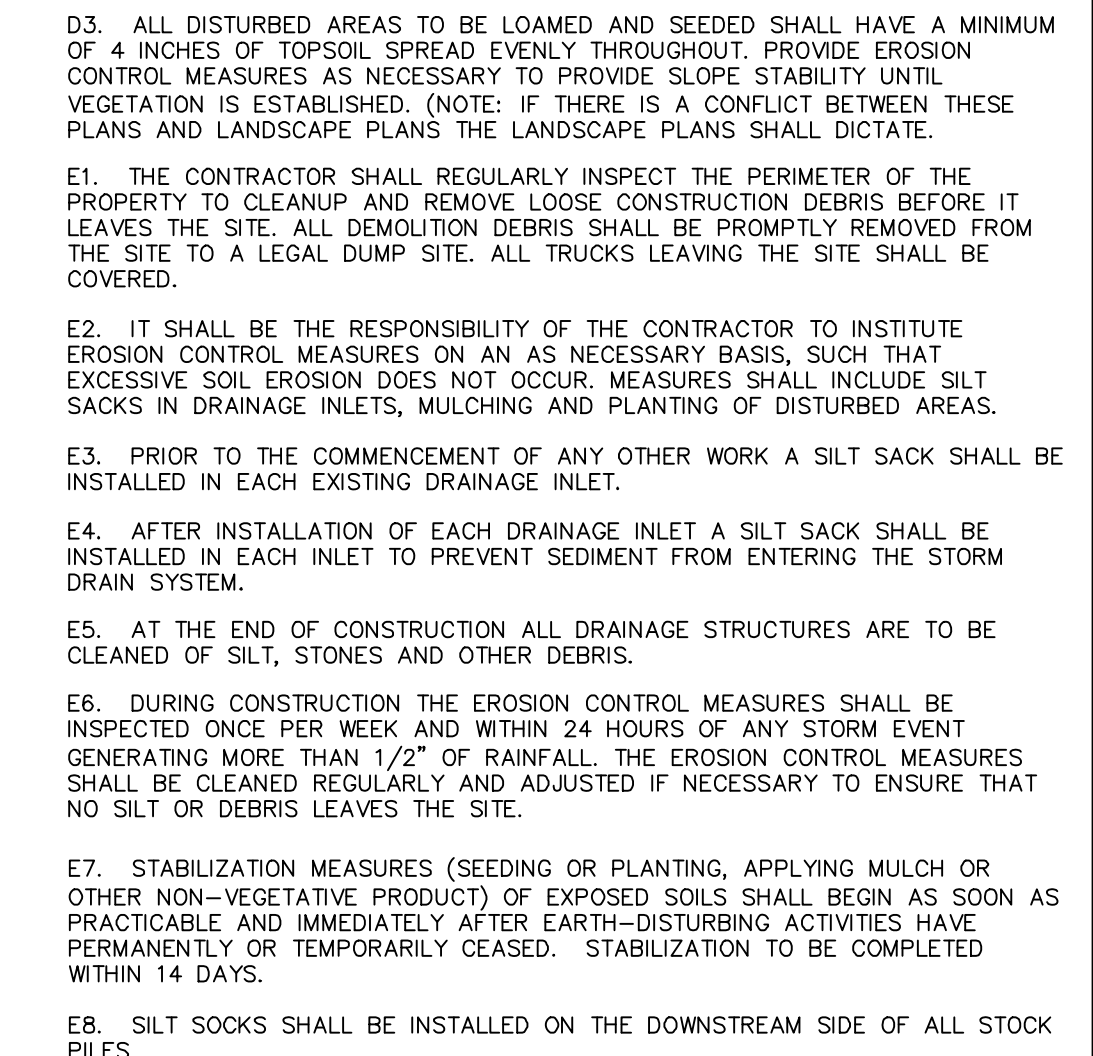
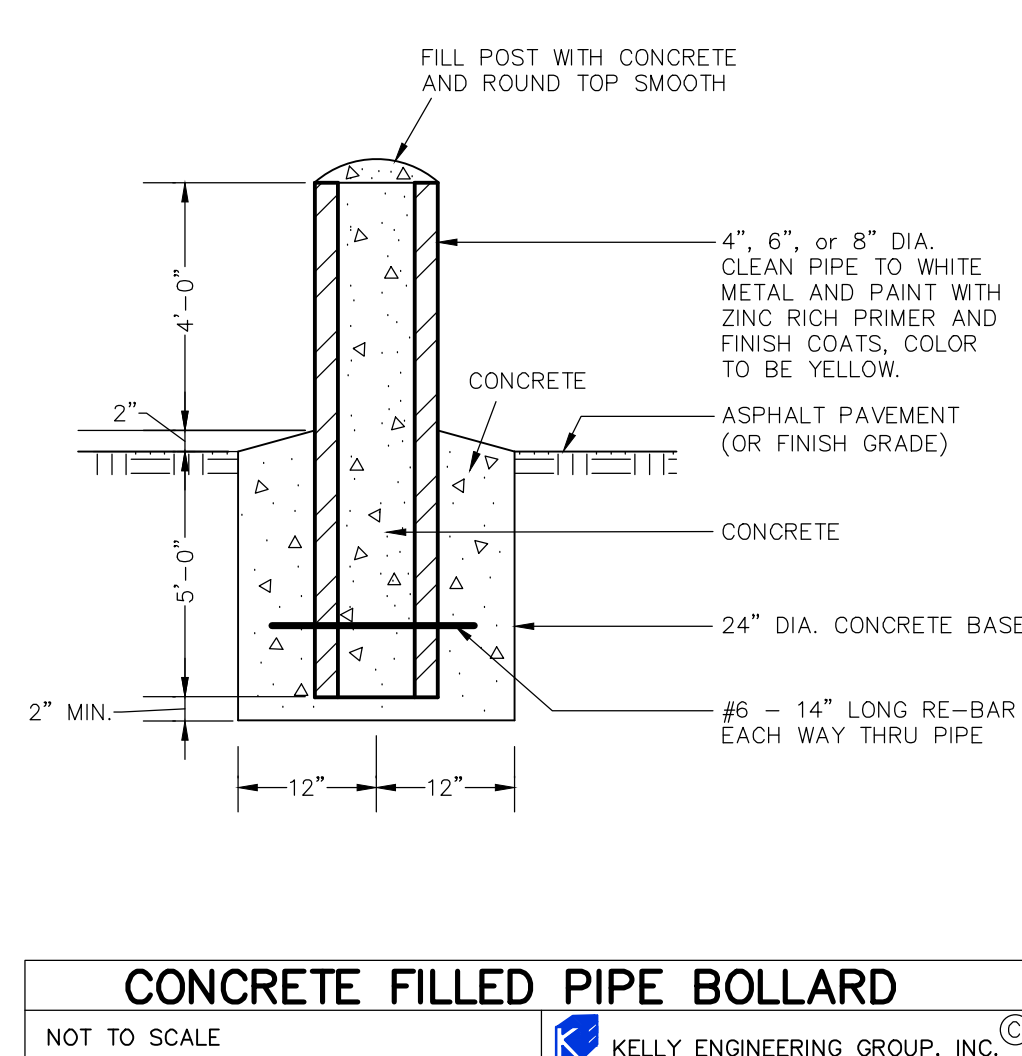
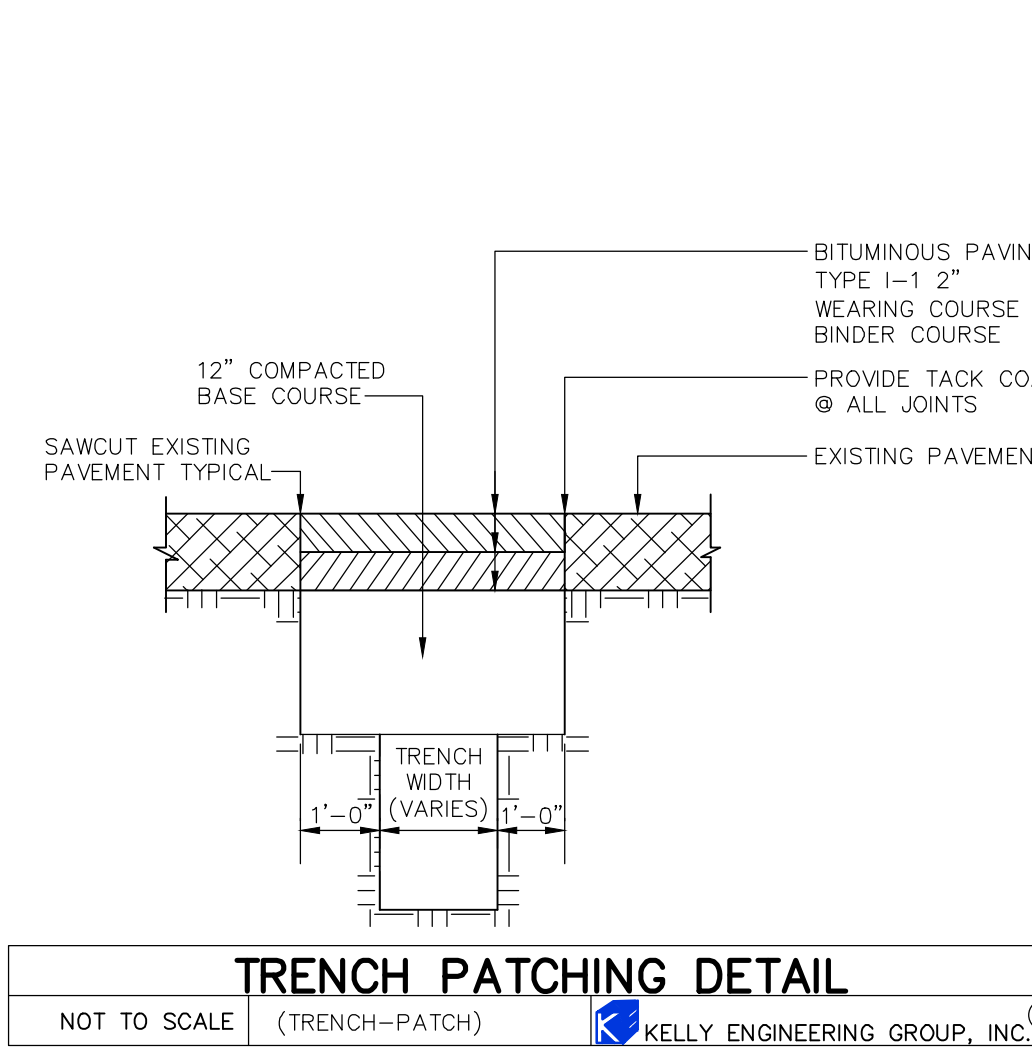
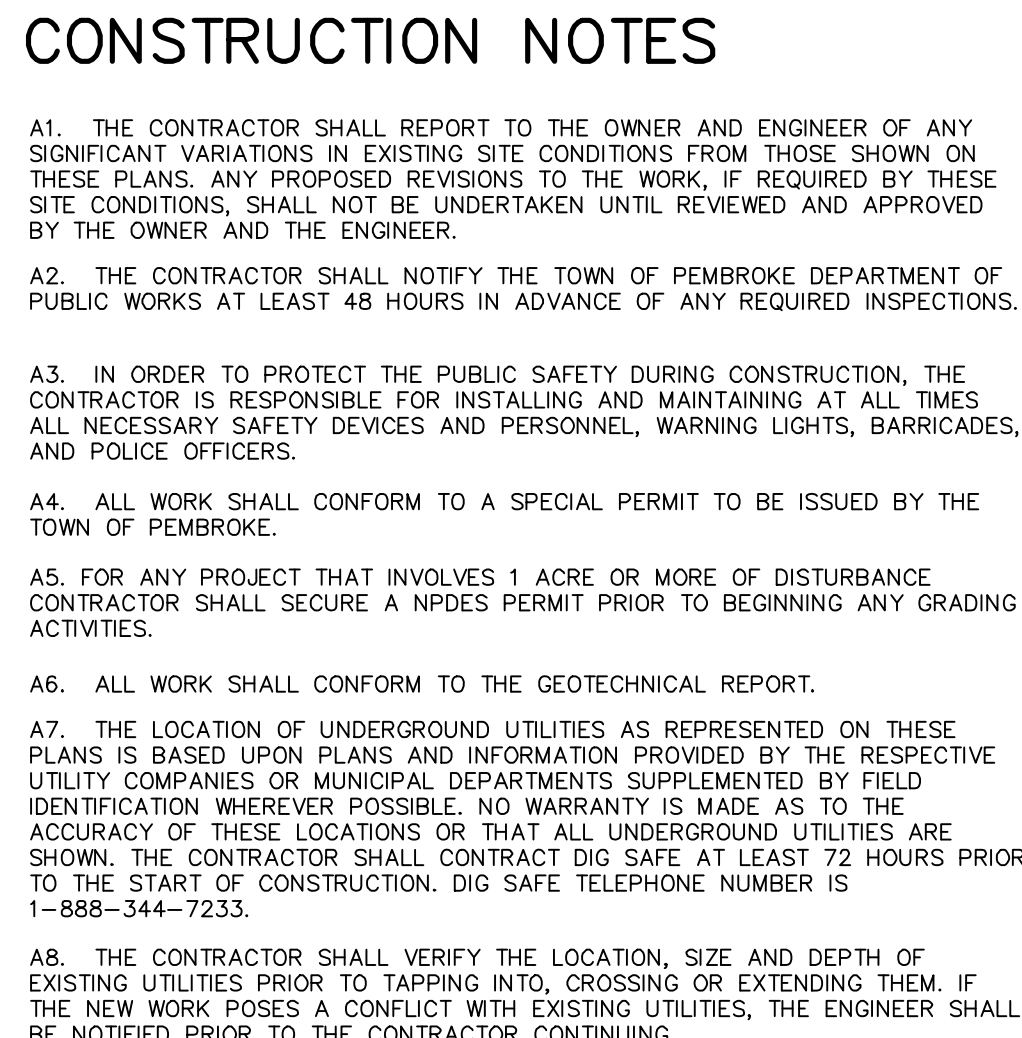
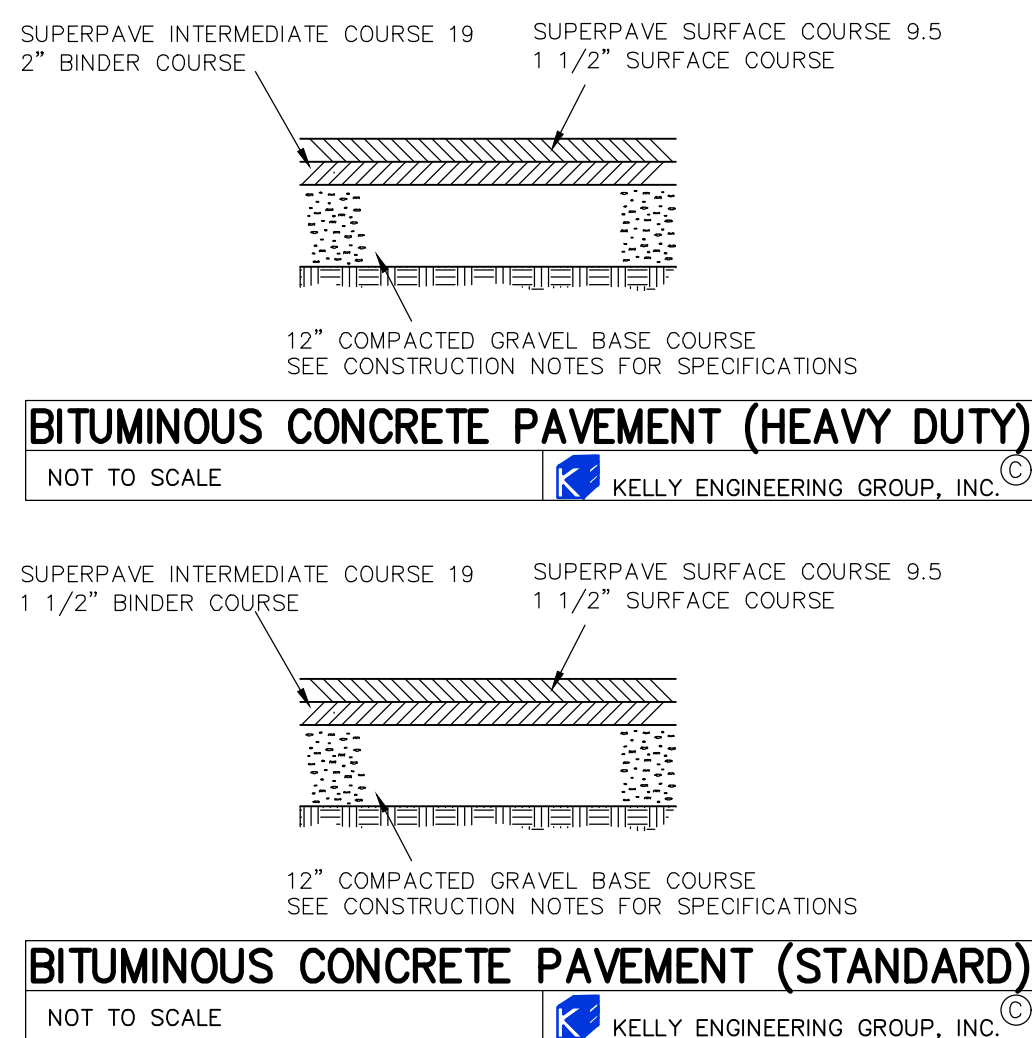
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DATE _____

SCALE 1"= 30'				
DATE 05/24/2023	1 REV	07/06/23 DATE	PEER REVIEW COMMENTS REVISION	BY
SHEET 6 of 9	RADER PROPERTIES, INC 33 RIVERSIDE DRIVE PEMBROKE, MASSACHUSETTS			
FILE # UTO1	UTILITY PLAN			
JOB # F:\P\2023-026	 KELLY ENGINEERING GROUP civil engineering consultants 0 Campanelli Drive, Braintree, MA 02184 Phone: 781-843-4333 www.kellyengineeringgroup.com			
DRAWN BY AJV	Brandon Li 2023.07.21 16:41:26 -04'00'			
CHKD BY BGL	SHEET NO.			
APPD BY				





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Steven M. Horsfall

Digitally signed by Steven M.
Horsfall
Date: 2023.07.22
09:21:37 -04'00'

COMMONWEALTH OF MASSACHUSETTS
STEVEN
M.
HORSFALL
No. 41608
PROFESSIONAL
LAND SURVEYOR

STEVEN M. HORSFALL, P.L.S. DATE

SCALE					
NA					
DATE	1	07/06/23	PEER REVIEW COMMENTS		
05/24/2023	REV	DATE	REVISION	BY	
SHEET	<p style="text-align: center;">RADER PROPERTIES, INC 33 RIVERSIDE DRIVE PEMBROKE, MASSACHUSETTS</p>				
7 of 9					
FILE #					
DT01	<p style="text-align: center;">DETAIL SHEET</p>				
JOB #					
F:\P\2023-026					
DRAWN BY	 <p>KELLY ENGINEERING GROUP civil engineering consultants 0 Campanelli Drive, Braitree, MA 02184 Phone: 781-843-4333 www.kellyengineeringgroup.com</p>				
AJV					
CHKD BY					
BGL	<p>SHEET NO. 7</p>				
APPD BY					
BGL					

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

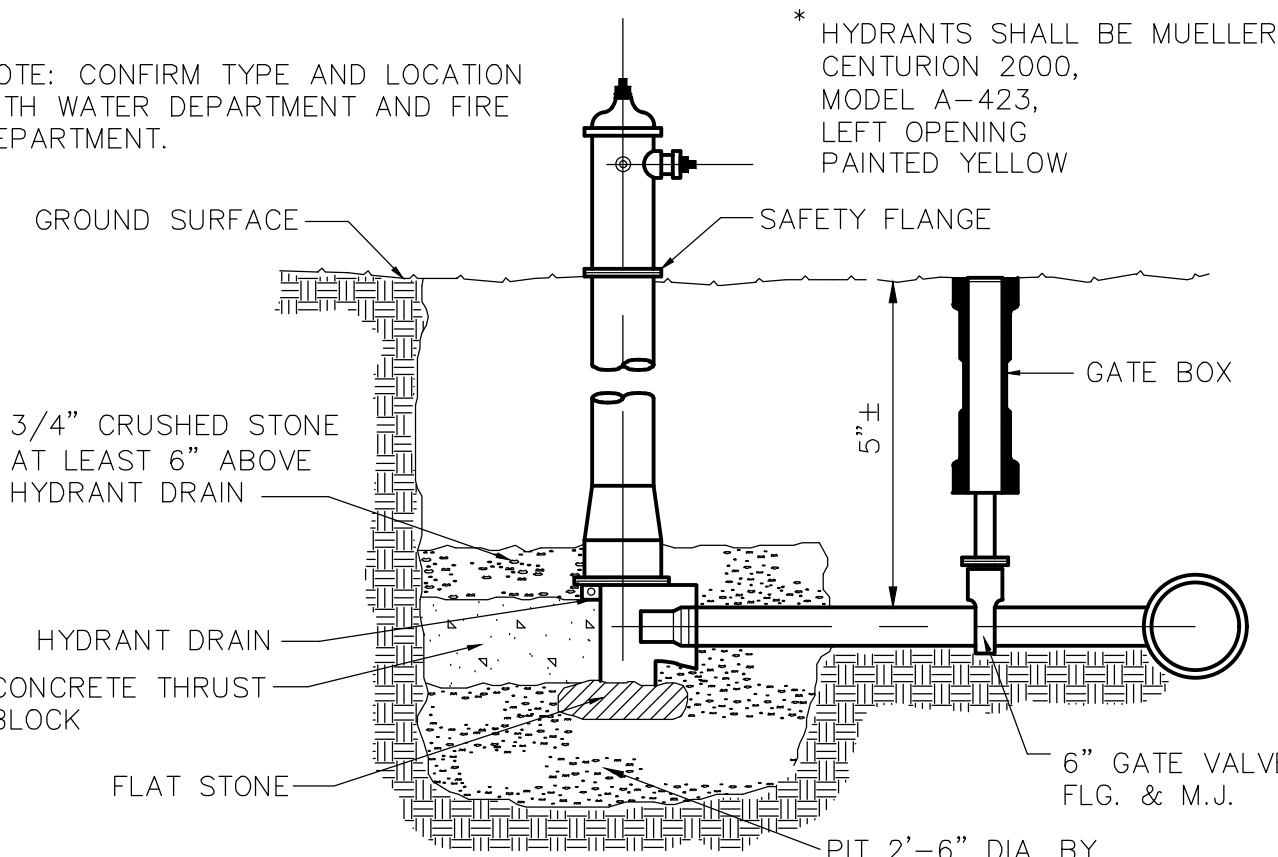
Steven M. Horsfall
Date: 2023.07.22
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STEVEN M. HORSFALL, P.L.S.

DATE

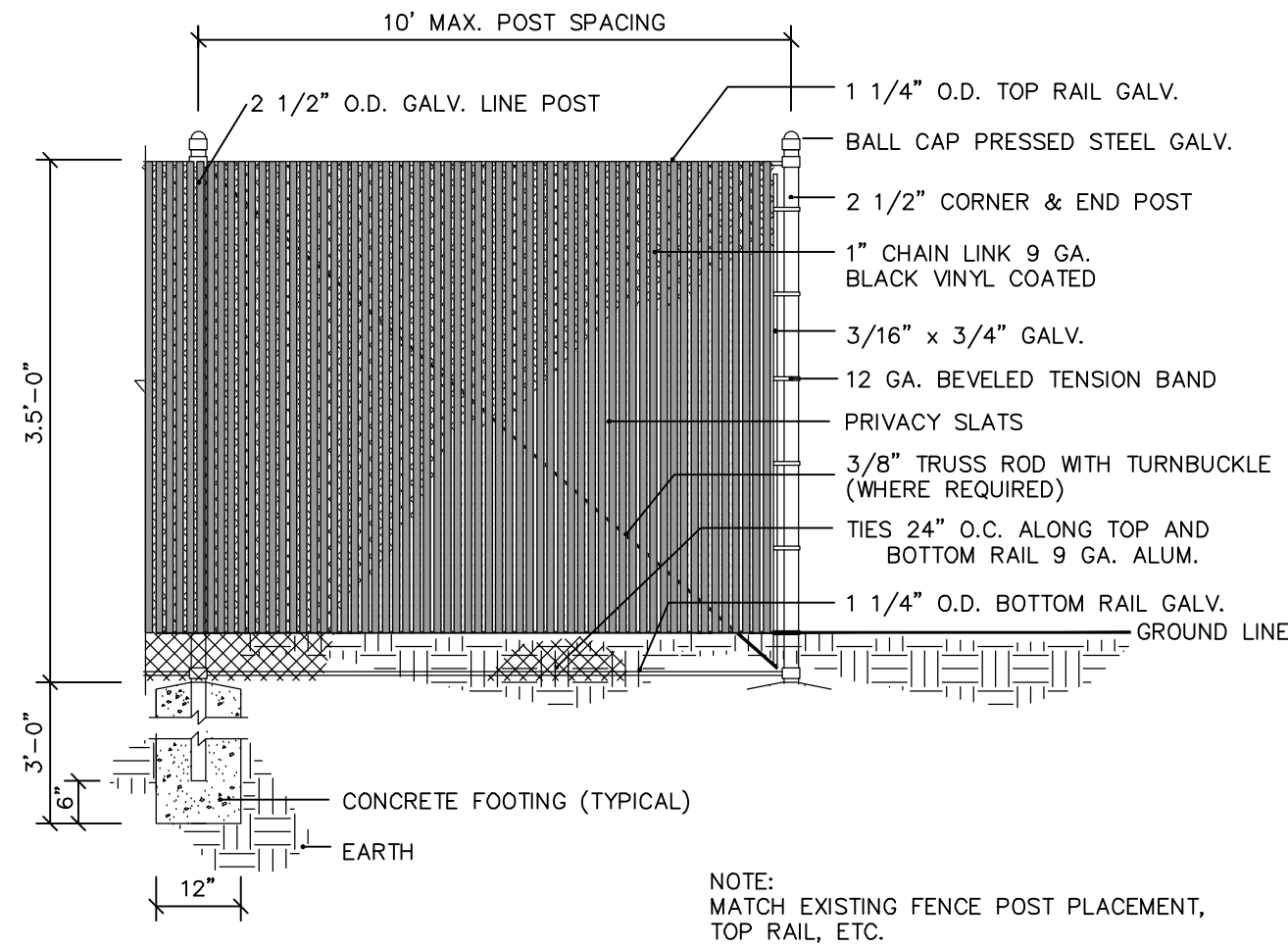
NOTE: CONFIRM TYPE AND LOCATION WITH WATER DEPARTMENT AND FIRE DEPARTMENT.



HYDRANT SETTING DETAIL

NOT TO SCALE

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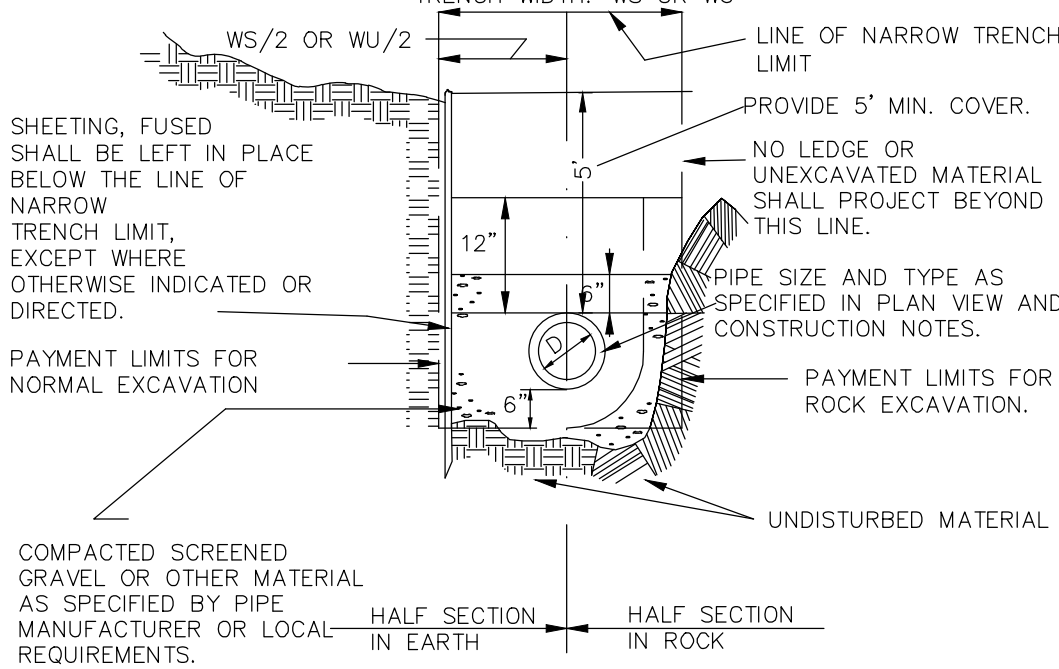
3.5' CHAIN LINK FENCE WITH PRIVACY SLATS

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TRENCH WIDTH WS OR WU

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



WATER TRENCH SECTION

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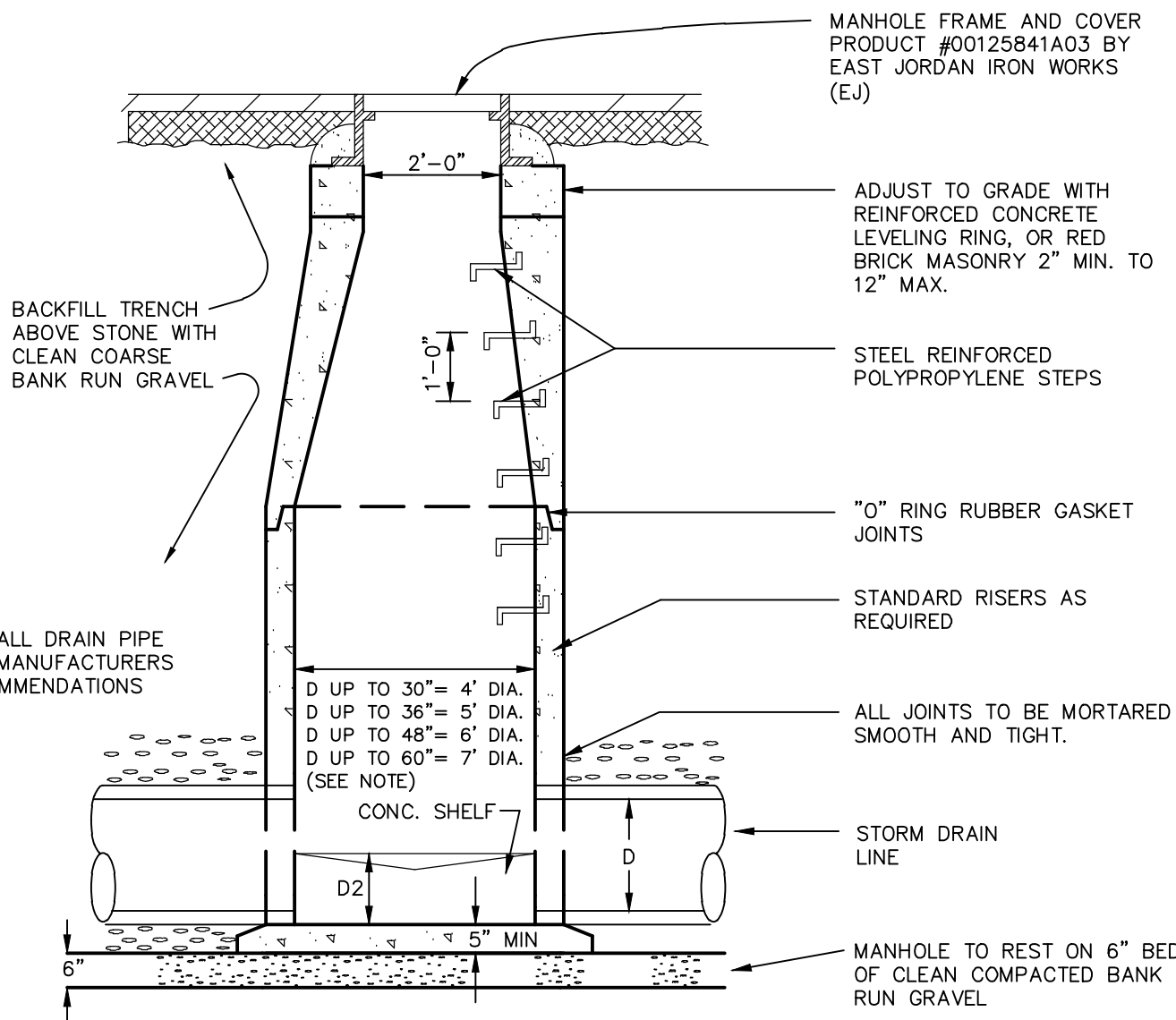
THRUST BLOCK SCHEDULE			
TABLE OF MINIMUM BEARING AREA IN SQ. IN. AGAINST UNDISTURBED SOIL FOR 8 IN. DIA. PIPE			
SOIL BEARING CAPACITY (PSF)	90 DEGREE BEND	TEE	45 DEGREE BEND
1000	945	674	516
1500	630	450	344
2000	473	337	258
3000	315	225	172

NOTE: FOR FITTINGS W/LESS THAN 45° DEFLECTION USE BEARING AREA FOR 45° BEND BASED ON INTERNAL PRESSURE OF 80 PSI

THRUST BLOCK

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PRECAST DRAIN MANHOLE DETAIL

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- NOTES:
- 1) CONCRETE, 4,000 PSI MINIMUM AFTER 28 DAYS.
 - 2) REINFORCED STEEL TO CONFORM TO LATEST ASTM A185 SPEC. 0.12 SQ. IN./LINEAL FT. AND 0.12 SQ. IN. (BOTH WAYS) BASE BOTTOM.
 - 3) H-20 DESIGN LOADING PER AASHTO HS-20-44; ASTM C478 SPEC. FOR "PRECAST REINFORCED CONCRETE MANHOLE SECTIONS."
 - 4) STEEL REINFORCED COPOLYMER POLYPROPYLENE PLASTIC STEP TO CONFORM TO LATEST ASTM C478 SPEC.

NOTE: CONFIGURATIONS W/ MULTIPLE INLETS MAY REQUIRE LARGER STRUCTURES

ROOF DRAIN CONNECTION DETAIL

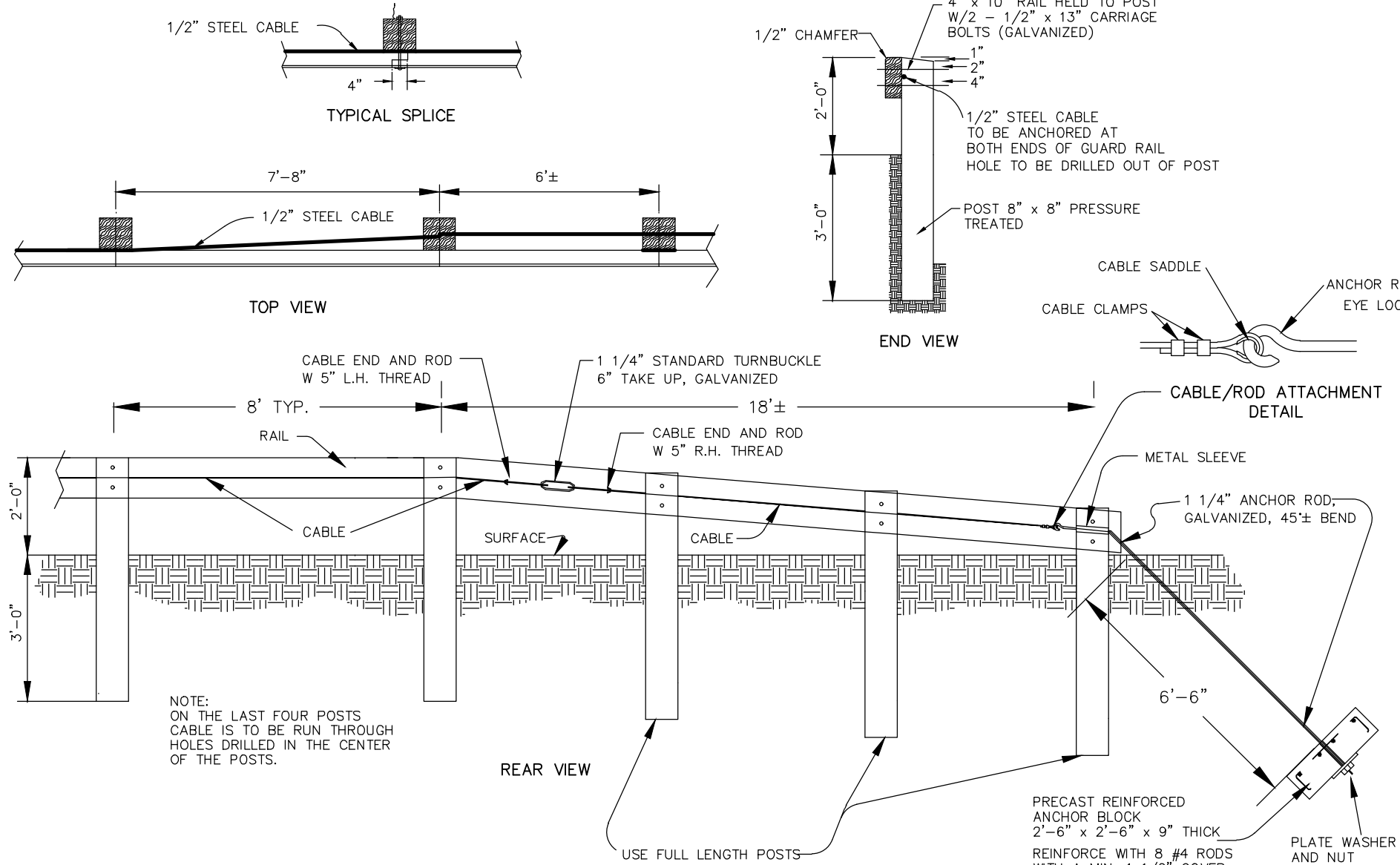
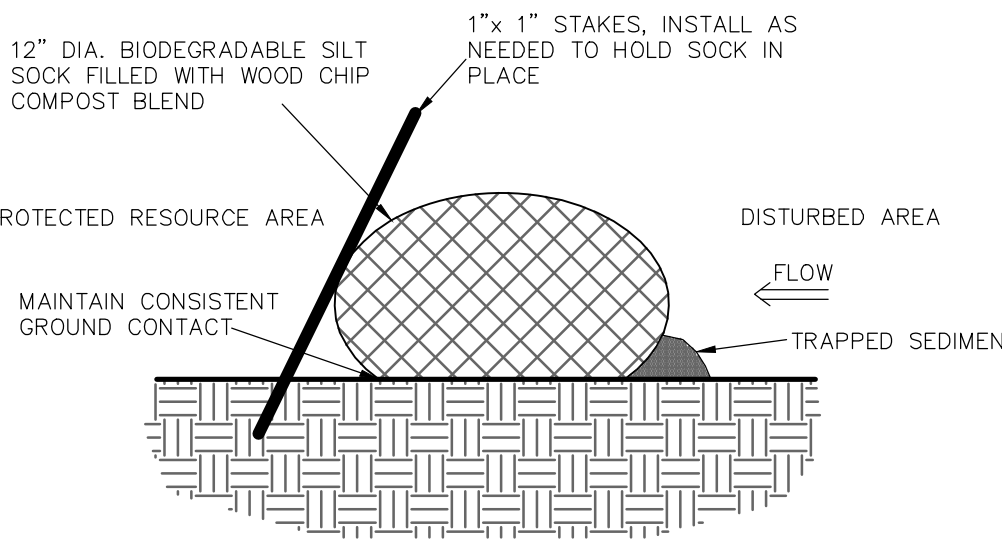
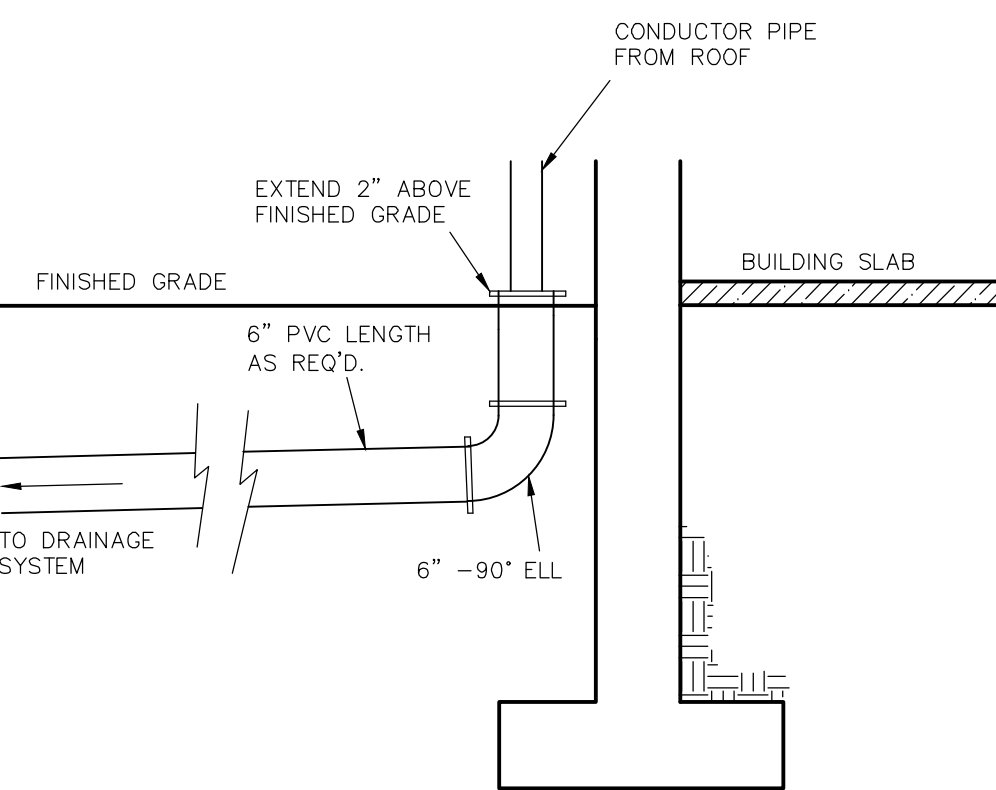
NOT TO SCALE

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SILT SOCK LINE DETAIL

NOT TO SCALE

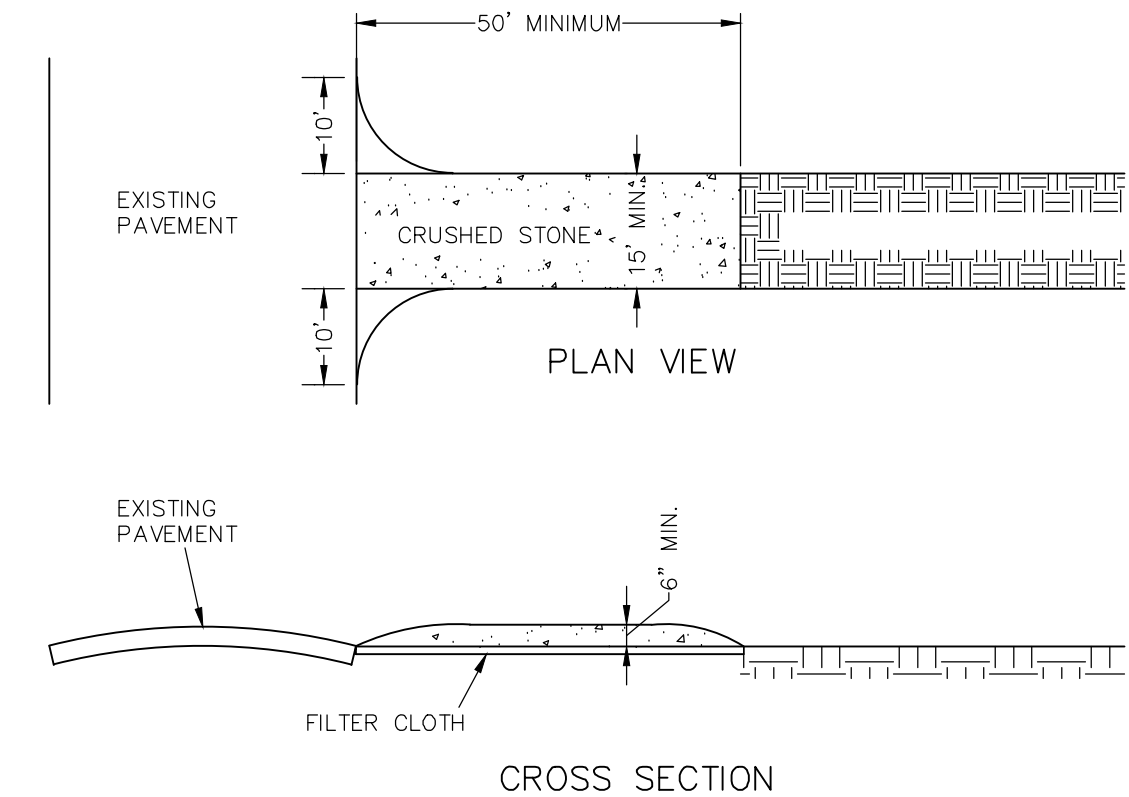
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WOOD POST & RAIL DETAIL

NOT TO SCALE

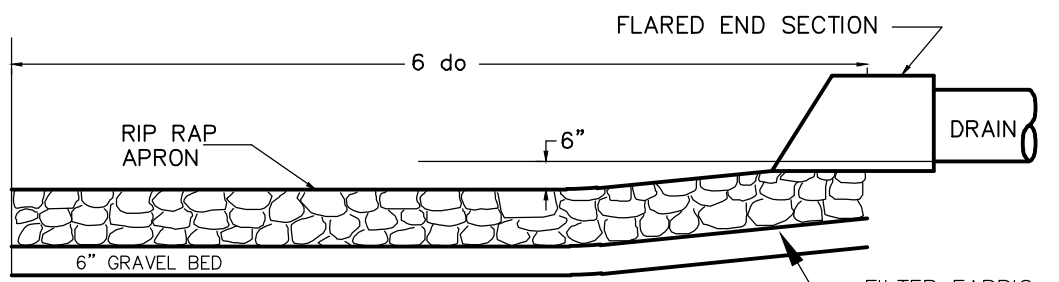
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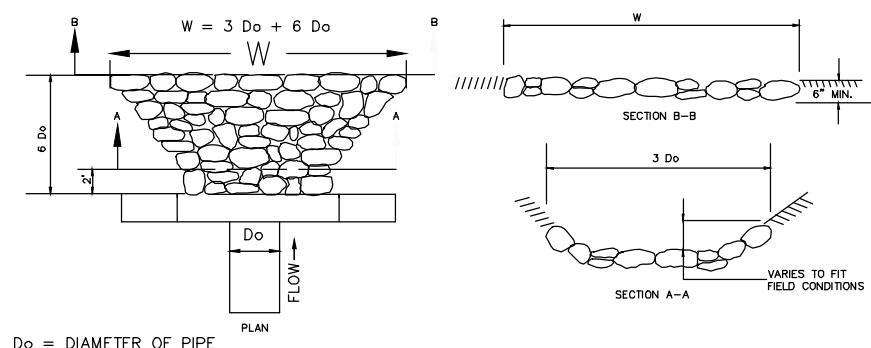
CONSTRUCTION TRACKING PAD

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KELLY ENGINEERING GROUP, INC.



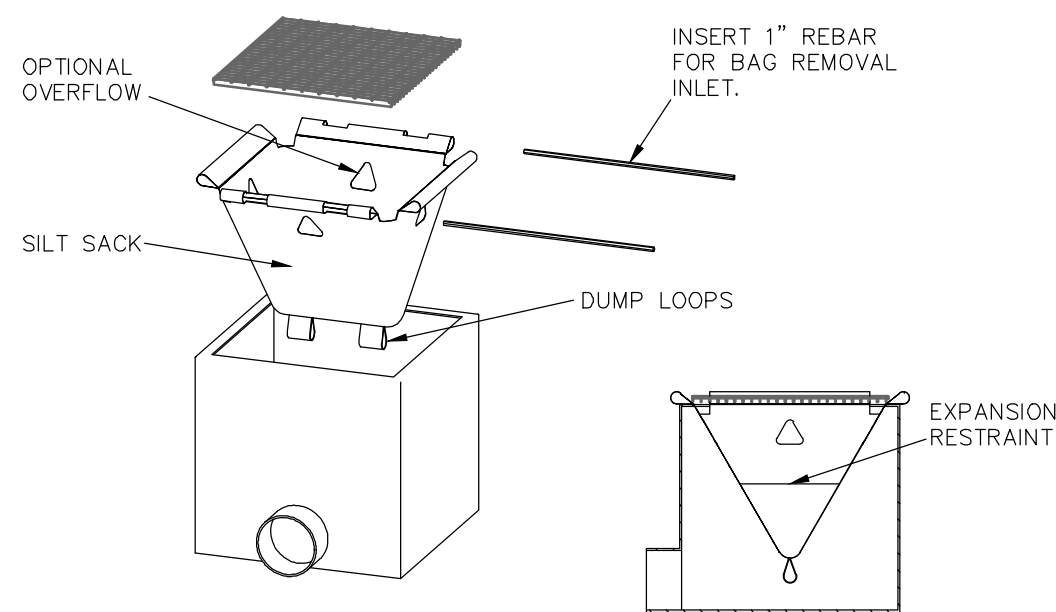
APRON TO BE COMPOSED OF A LAYER OF STONES 12" IN THICKNESS OR MORE, PLACED UPON A BED OF SAND AND GRAVEL 6" IN THICKNESS. THE STONES SHALL BE SIZED SO THAT NOT LESS THAN 60% SHALL HAVE ONE DIMENSION 12" OR MORE. THE STONES, AFTER BEING LAID, SHALL BE CAREFULLY CHINKED BY HAND TO MAKE A REASONABLY SMOOTH AND SHAPED SURFACE. RIP RAP IS TO BE USED WHERE INDICATED ON THE PLAN.



RIP-RAP APRON DETAIL AT F.E.S.

NOT TO SCALE

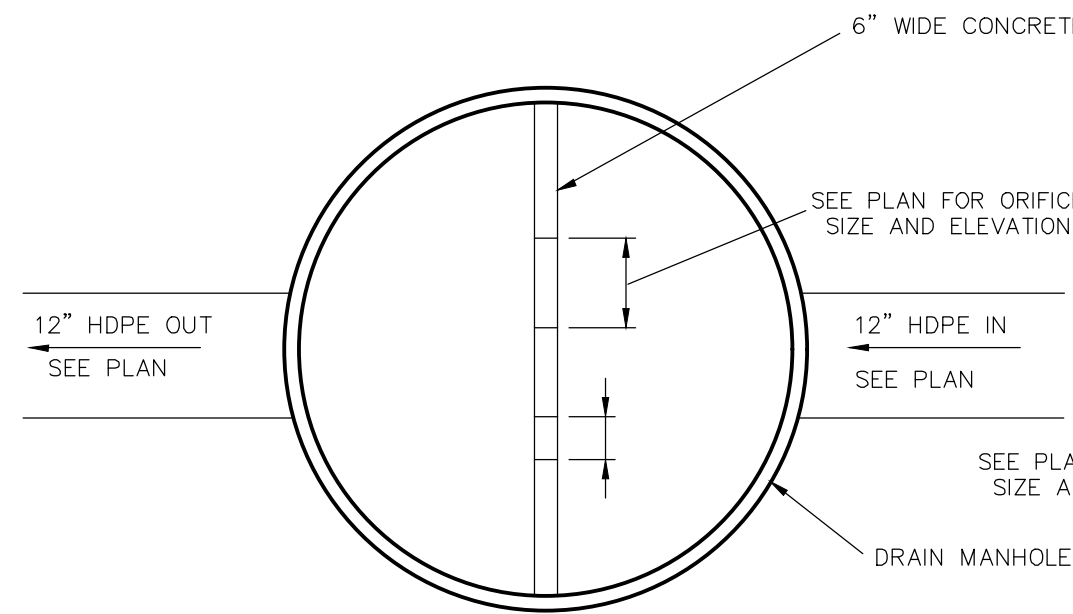
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SILT SACK - TYPE A DETAIL

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KELLY ENGINEERING GROUP, INC.



TOP VIEW

SECTION

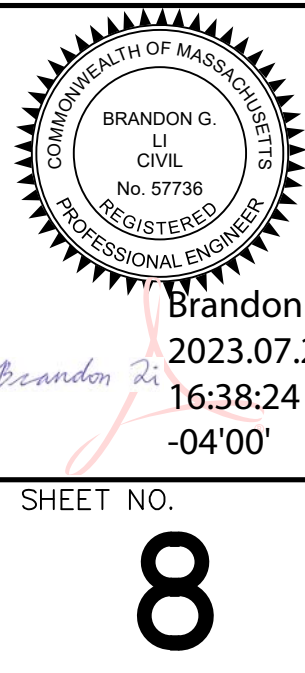
NOTE: FOR OTHER NOTES AND DETAILS SEE TYPICAL DRAIN MANHOLE DETAIL

CONTROL STRUCTURE MANHOLE

NOT TO SCALE

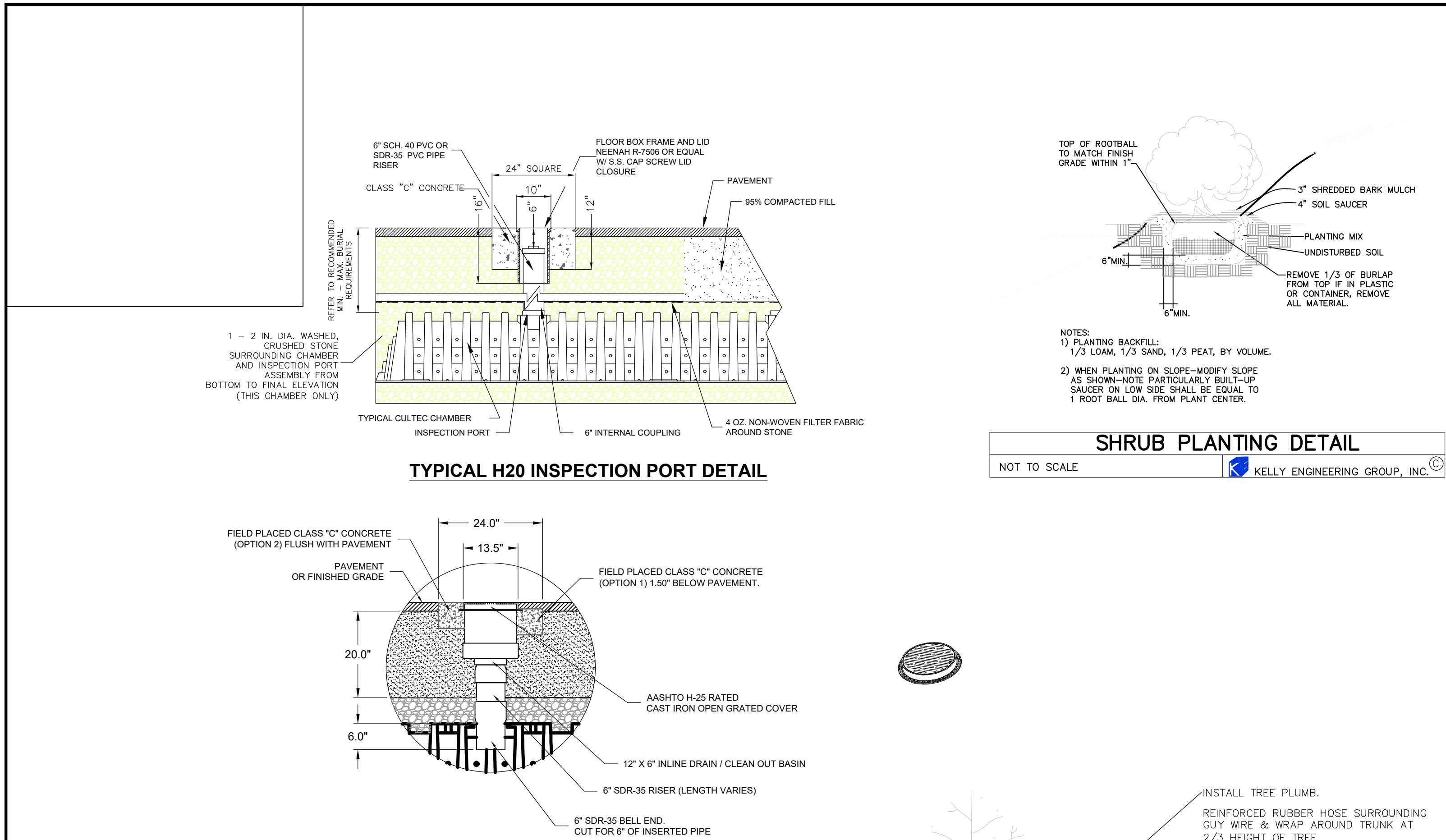
KELLY ENGINEERING GROUP, INC.

SCALE	DATE	REV	DATE	PEER REVIEW COMMENTS	BY
NA	05/24/2023	1	07/06/23		
SHEET 8 of 9	FILE # D701	JOB # F:\P\2023-026	DRAWN BY AJV	CHKD BY BGL	APPD BY BGL
RADER PROPERTIES, INC 33 RIVERSIDE DRIVE PEMBROKE, MASSACHUSETTS					
DETAIL SHEET					
KELLY ENGINEERING GROUP civil engineering consultants 0 Campanelli Drive, Braintree, MA 02184 Phone: 781-843-4333 www.kellyengineeringgroup.com					
SHEET NO. 8					



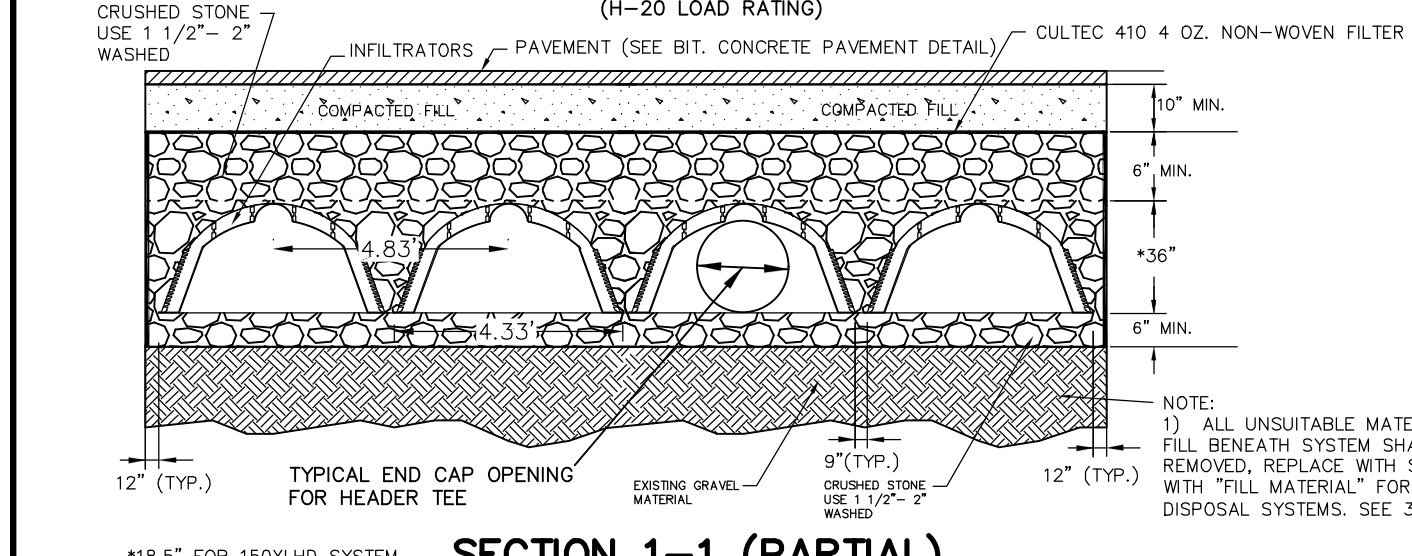
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TYPICAL SUBSURFACE RECHARGE AREA (CULTEC 360XLHD) PLAN VIEW (INFILTRATION TO BE CULTEC OR APPROVED EQUAL)

*SEE CULTEC RECHARGER 330XLHD STORMWATER MANAGEMENT SYSTEM DESIGN FOR INSTALLATION INSTRUCTIONS PROPRIETARY SHOP DRAWINGS TO BE PROVIDED PRIOR TO INSTALLATION



STORMWATER MANAGEMENT SYSTEM CONSTRUCTION OPERATION + MAINTENANCE NOTES:

- EXTREME CARE SHALL BE TAKEN DURING CONSTRUCTION TO AVOID SILTATION DURING THE CONSTRUCTION PROCESS. SILT CAGES AND HAYBALE DIKES SHALL BE INSPECTED DAILY AND REPLACED IF NECESSARY.
- EXTREME CARE SHALL BE TAKEN TO PREVENT COMPACTION OF UNDISTURBED SOILS BENEATH RECHARGE SYSTEM.
- THERE SHALL BE NO DISCHARGE OF WATER FOR CONSTRUCTION DEWATERING ACTIVITIES INTO THE STORMWATER MANAGEMENT SYSTEM.
- THERE SHALL BE NO DISCHARGE OF STORMWATER INTO THE RECHARGE SYSTEM UNTIL THE SITE HAS BEEN STABILIZED.

CONSTRUCTION INSPECTION AND MAINTENANCE SCHEDULE:

CONSTRUCTION INSPECTION SCHEDULE

- WEEKLY INSPECTIONS SHALL BE PERFORMED BY THE APPLICANTS ENGINEER AND A REPRESENTATIVE FROM THE TOWN'S ENGINEERING DEPARTMENT.
- INSPECTIONS SHALL INCLUDE THE PAVEMENT TO DETERMINE IF ACCUMULATED SEDIMENT IS TO BE REMOVED, OF THE CATCH BASINS TO DETERMINE DEPTH OF SEDIMENTS AND REQUIRED CLEANING, INSPECTION OF THE STORMCEPTOR TO DETERMINE IF CLEANING IS NECESSARY AND INSPECTION OF THE LEACHING SYSTEM SHALL BE CONDUCTED BY THE ENGINEER AND THE TOWN'S ENGINEERING DEPARTMENT.
- AN INSPECTION OF THE EXCAVATION OF THE LEACHING SYSTEM SHALL BE CONDUCTED BY THE ENGINEER AND A REPRESENTATIVE THE TOWN'S ENGINEERING DEPARTMENT PRIOR TO PLACEMENT OF ANY MATERIAL OR CHAMBERS.

CONSTRUCTION MAINTENANCE SCHEDULE

- WHEN THE BINDER COURSE HAS BEEN INSTALLED THE PAVEMENT SHALL BE KEPT CLEAR OF ACCUMULATED SEDIMENTS. IF ACCUMULATED SEDIMENTS ARE DEPOSITED ON THE PAVEMENT THE SEDIMENT SHALL BE CLEANED IMMEDIATELY. THE PAVEMENT SHALL BE SWEEP AS NECESSARY BASED ON THE WEEKLY INSPECTIONS. THE CONTRACTOR SHALL INSPECT THE PAVEMENT ON A DAILY BASIS AND REMOVE ACCUMULATED SEDIMENTS AS NECESSARY.
- "SILT SAKS" SHALL BE INSTALLED AT ALL CATCH BASIN AND DROP INLET LOCATIONS. THE CONTRACTOR SHALL INSPECT THE "SILT SAKS" ON A WEEKLY BASIS AND AFTER HEAVY RAINSTORMS AND EMPTIED BASED ON MANUFACTURERS RECOMMENDATIONS.
- THE CATCH BASINS SHALL BE INSPECTED ON A WEEKLY BASIS ANDS AFTER HEAVY RAINSTORMS. THE CATCH BASINS SHALL BE CLEANED WHEN 6" OF SEDIMENT HAS ACCUMULATED IN THE SUMP.
- THE STORMCEPTOR SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER HEAVY RAINSTORMS. THE STORMCEPTOR SHALL BE CLEANED BASED ON THE MANUFACTURERS RECOMMENDATIONS.
- THE INFILTRATOR GALLEYS SHALL BE INSPECTED ON A WEEKLY BASIS AND AFTER HEAVY RAINSTORMS AND SHALL BE CLEANED WHEN 2" OF SEDIMENT HAS ACCUMULATED IN THE INLET CHAMBER.

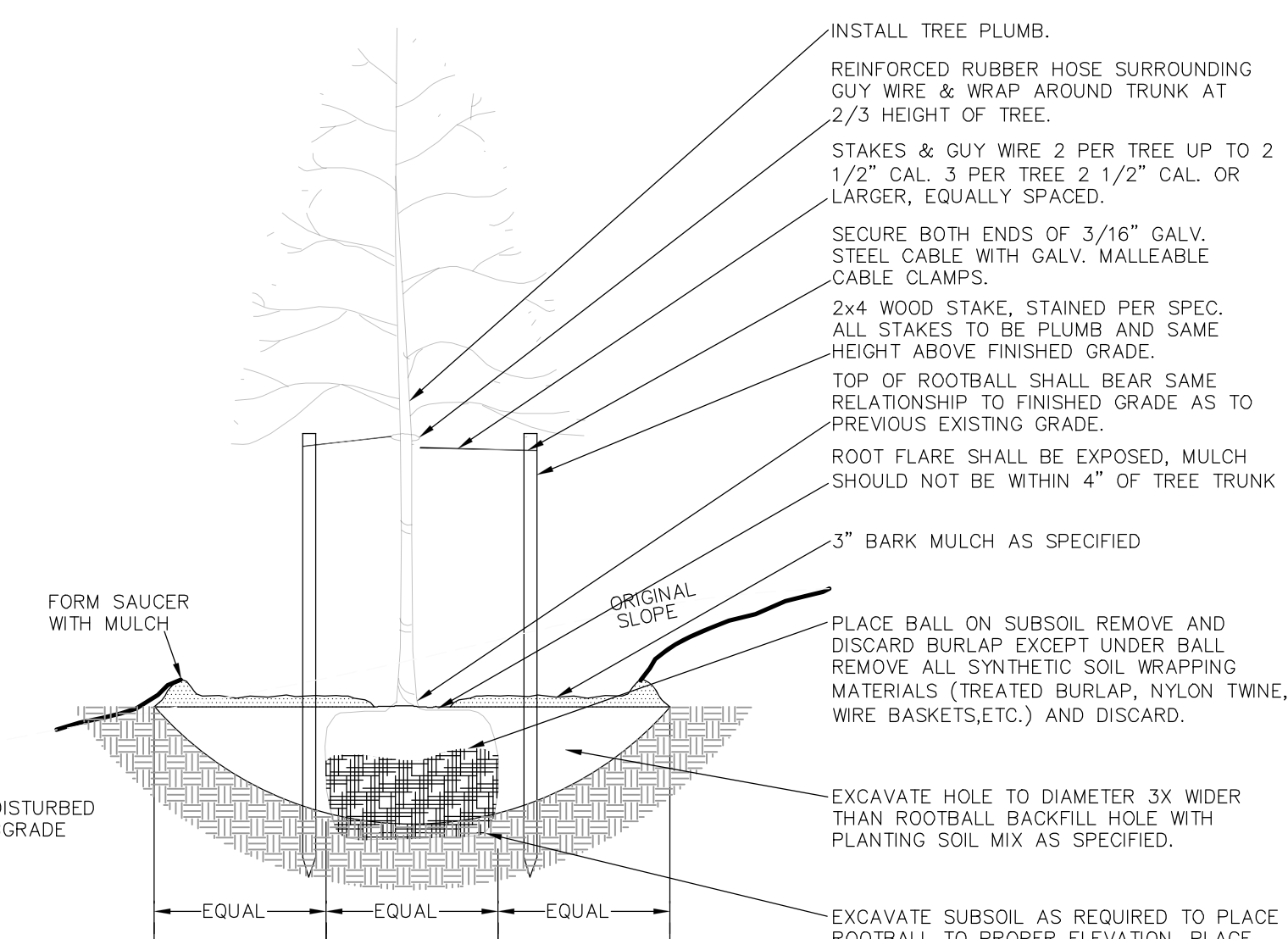


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NOTES:

- PLANTING BACKFILL: 1/3 LOAM, 1/3 SAND, 1/3 PEAT, BY VOLUME.
- WHEN PLANTING ON SLOPE-MODIFY SLOPE AS SHOWN-NOTE PARTICULARLY BUILT-UP SAUCER ON LOW SIDE SHALL BE EQUAL TO 1 ROOT BALL DIA. FROM PLANT CENTER.
- STAKE ONLY THOSE TREES SUBJECT TO HIGH WIND CONDITIONS.



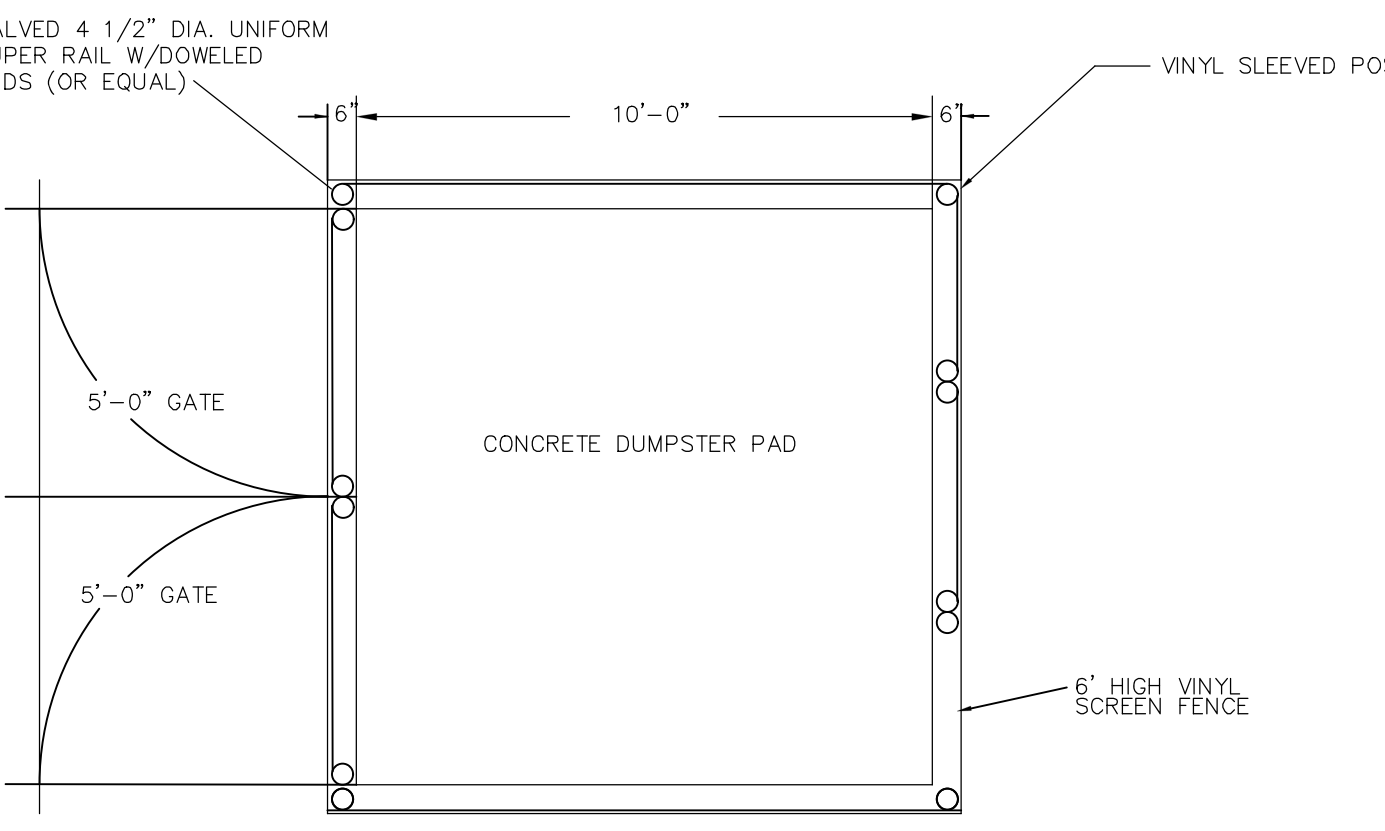
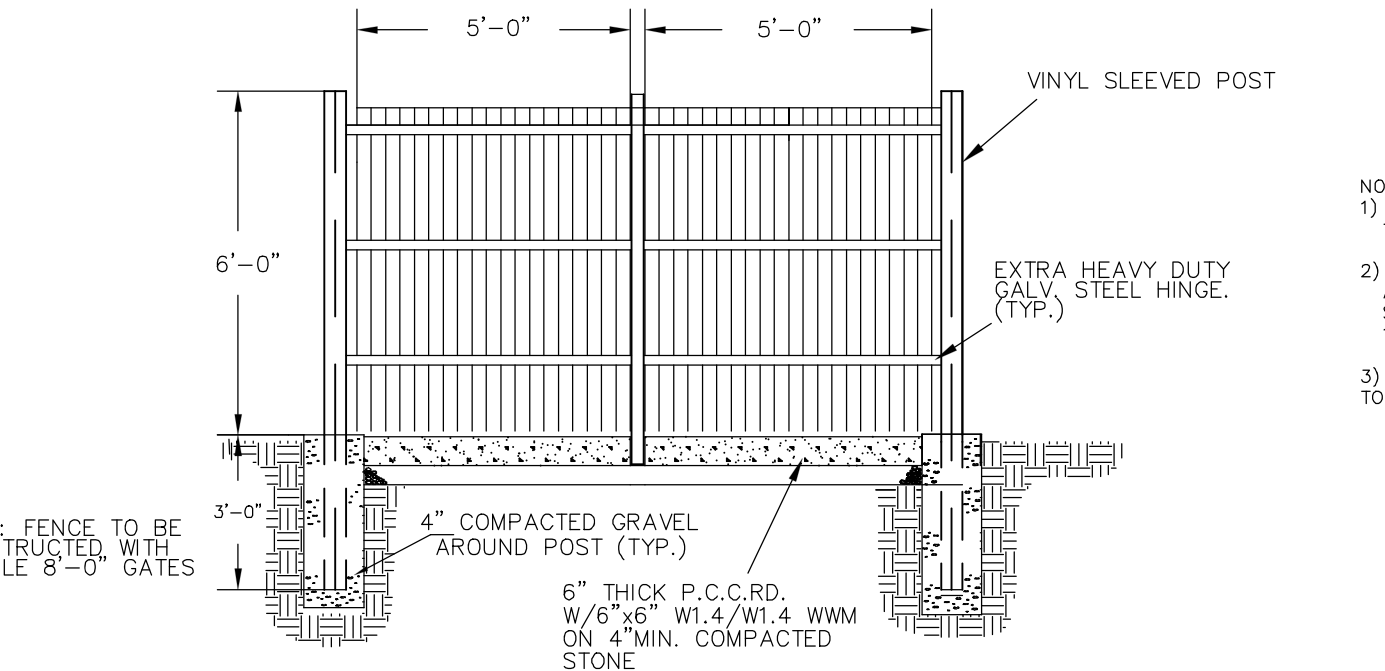
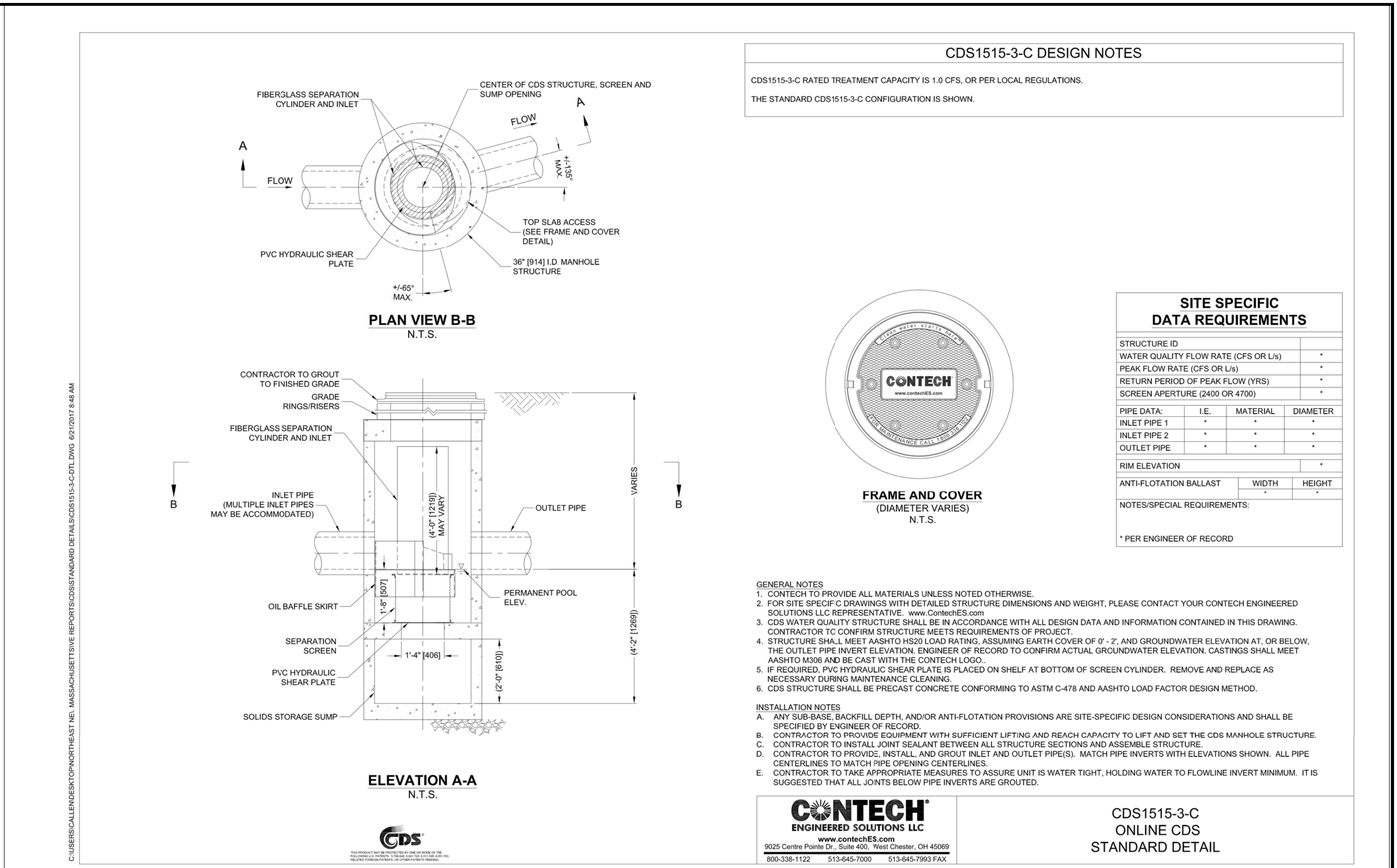
I CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.

Steven M. Horsfall

Digitally signed by Steven M. Horsfall
Date: 2023.07.22 09:16:57 -0400

STEVEN M. HORSFALL, P.L.S.

DATE



SCALE					
NA					
DATE	05/24/2023	REV	1	07/06/23	PEER REVIEW COMMENTS
SHEET	9 of 9				REVISION
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33 RIVERSIDE DRIVE	
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DETAIL SHEET	

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COMMONWEALTH OF MASSACHUSETTS	BRANDON G. LI
CIVIL	No. 57736
REGISTERED	
PROFESSIONAL ENGINEER	

Brandon Li

2023.07.21

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SHEET NO.

9