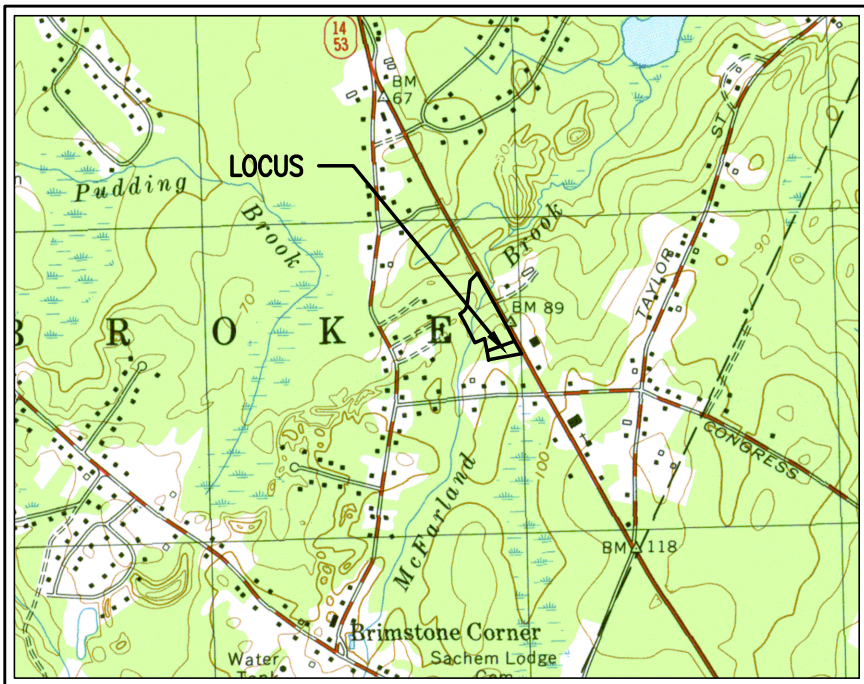


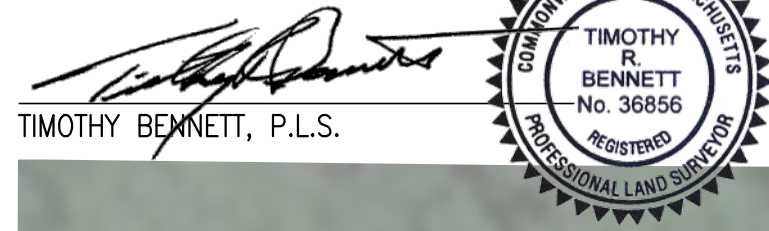


LOCATION MAP (NOT TO SCALE)

I HEREBY CERTIFY THAT AND INSTRUMENT BOUNDARY SURVEY HAS BEEN CONDUCTED ON THIS PROPERTY AND I CERTIFY THAT THE LOCATIONS OF THE BUILDING, SETBACKS AND ALL OTHER DIMENSIONS, ELEVATIONS AND MEASUREMENTS ARE ACCURATE.

TIMOTHY BENNETT, P.L.S.

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



TIMOTHY BENNETT, P.L.S.

RECORD OWNER:
ASSESSOR MAP F9 LOT 24
DANIEL P. & SUSAN M SPURLING, TRUSTEES OF ROSE REALTY TRUST
DEED BOOK 48500 PAGE 216

PLAN REFERENCES

1. PLAN No. 282 OF 1956
2. PLAN No. 561 OF 1973
3. PLAN No. 663 OF 1973
4. PLAN No. 226 OF 1994
5. PLAN No. 308 OF 1995
6. MASSACHUSETTS STATE HIGHWAY LAYOUT No. 2771

ZONE: RESIDENTIAL-COMMERCIAL
EXISTING USE: VACANT
PROPOSED USE: ALLOWED USE PER ZBL SECTION IV.2.A.2 - BUSINESS, FINANCIAL, GOVERNMENTAL, INSURANCE, MEDICAL, PROFESSIONAL, REAL ESTATE, FITNESS/HEALTH CENTERS, OR SIMILAR OFFICE USES. (INCLUDING FOR USE AND STORAGE BY TRADESMEN)

PARCEL SIZE 185,565 SF (RECORD), 182,484 SF (CALC)

DIMENSIONAL REQUIREMENTS:	REQUIRED/ALLOWED	EXISTING	PROPOSED
LOT AREA (RECORD 185,565 S.F.)	120,000 S.F.	182,484 SF	182,484 S.F.
LOT AREA EXCLUSIVE OF WETLANDS	120,000 S.F.	111,048 S.F.	111,048 S.F.
LOT PERIMETER RATIO (182484/1,859)	55:1	98:1	98:1
LOT FRONTAGE	250 FT	658.04 FT	658.04 FT
(BUILDING, STRUCTURES, PAVED AREAS)			
FRONT SETBACK	100 FT	N/A FT	100.5 FT
SIDE SETBACK	40 FT	N/A FT	40.3 FT
REAR SETBACK	50 FT	N/A FT	66.6 FT
MAX HEIGHT	2.5 STORIES	N/A	2 STORIES
MAX BUILDING FLOOR AREA (%)	35%	N/A	8.21%
COVERAGE (%)	60%	N/A	17.0%
LANDSCAPING	40%	N/A	83.0%
FRONT 40% OF ANY YARD SHALL BE LANDSCAPED OR LEFT IN A NATURAL STATE (50% ABUTTING RESIDENTIAL USE)			
FRONT 100 X.4	40 FT		40.0 FT
SIDE 40 X.4 (ABUT COMMERCIAL)	16 FT		20.8 FT
SIDE 40 X.5 (ABUT RESIDENTIAL)	20 FT		20.8 FT
REAR 50 X.5 (ABUT RESIDENTIAL)	25 FT		38.1 FT

PARKING V.4.A.1.G. FOR WHOLESALE, STORAGE OR INDUSTRIAL ESTABLISHMENTS, ONE PARKING SPACE FOR EVERY THREE PERSONS EMPLOYED AT ANY ONE PEAK PERIOD. (5 BAYS WITH 6 EMPLOYEES)
V.4.A.1.E FOR OFFICE BUILDINGS, ONE PARKING SPACE FOR EVERY SIX HUNDRED SQUARE FEET OF RENTABLE SPACE

(COMMERCIAL)	REQUIRED	PROPOSED
1 SP/3 EMPLOYEES x 30 EMPLOYEES	10 SPACES	
5000 SF OF RENTABLE OFFICE / 600 SF/SP	8.3 SPACES	
TOTAL	19 SPACES	25 SPACES

FOR REGISTRY USE ONLY

SITE PLAN APPROVAL REQUEST

SECTION V.7.B - NO STRUCTURE SHALL HEREAFTER BE CONSTRUCTED, ERECTED, RELOCATED, OR EXTERNALLY ENLARGED AND NO USE SHALL BE ESTABLISHED, ADDED, CHANGED, OR EXPANDED IN ANY DISTRICT EXCEPT IN CONFORMANCE WITH A SITE PLAN REVIEW, AND CONDITIONS THEREON, APPROVED BY THE PLANNING BOARD.

WAIVER REQUEST

- SECTION IV 4.2.2 TRAFFIC IMPACT STUDY - PREPARED BY REGISTERED PROFESSIONAL TRAFFIC ENGINEER
- SECTION V 5.4 PARKING AND LOADING - VERTICAL GRANITE CURBING AT ACCESS DRIVE RADII
- SECTION V.5.7.1 ACCESS CONNECTIONS - WAIVER FOR CURBING AT THE EDGE OF ALL PAVED SURFACES
- SECTION V.5.1.6 50 FT BUFFER TO RESIDENTIAL PROPERTIES - ACCESS CONNECTION SPACING TABLE (FROM 350' TO 222').
- 50 FT LANDSCAPE BUFFER TO BE PROVIDED TO ALL RESIDENTIAL ABUTTING PROPERTIES (ZBL REQUIRES 20 FT, PLAN COMPLIES)

PEMBROKE PLANNING BOARD

THIS SITE PLAN DOES NOT NECESSARILY INDICATE COMPLIANCE WITH THE PEMBROKE ZONING BYLAW

DATE APPROVED: _____

DATE SIGNED: _____

PEMBROKE TOWN CLERK

I, TOWN CLERK OF THE TOWN OF PEMBROKE, MA HEREBY CERTIFY THAT THE NOTICE OF APPROVAL OF THIS PLAN BY THE PLANNING BOARD HAS BEEN RECEIVED AND RECORDED AT THIS OFFICE AND NO APPEAL WAS RECEIVED DURING THE NEXT TWENTY DAYS AFTER RECEIPT AND RECORDING OF SAID NOTICE.

DATE: _____

TOWN CLERK, TOWN OF PEMBROKE:

SHEET INDEX

SHEET	ZONING
SHEET 1	ZONING
SHEET 2	EXISTING CONDITIONS
SHEET 3	GRADING
SHEET 4	SEPTIC
SHEET 5	UTILITIES & DRAINAGE
SHEET 6	LANDSCAPE, LIGHTING, & SITE DISTANCE
SHEET 7	DETAILS
SHEET 8	DETAILS
SHEET 9	DETAILS
SHEET 10	EROSION CONTROL PLAN

REVISIONS	
2021-12-16	PLANNING BOARD AND PEER REVIEW COMMENTS
2022-01-24	UPLAND AREA

SITE PLAN

#715 WASHINGTON STREET
(ASSESSORS MAP F9 LOT 24)

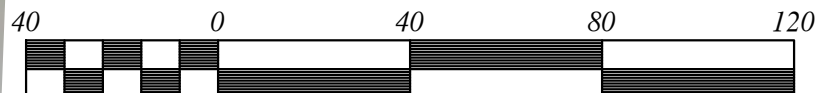
PEMBROKE, MASSACHUSETTS

PREPARED FOR:
GEORGE THIBEAULT
599 SUMMER STREET
MARSHFIELD, MA 02050

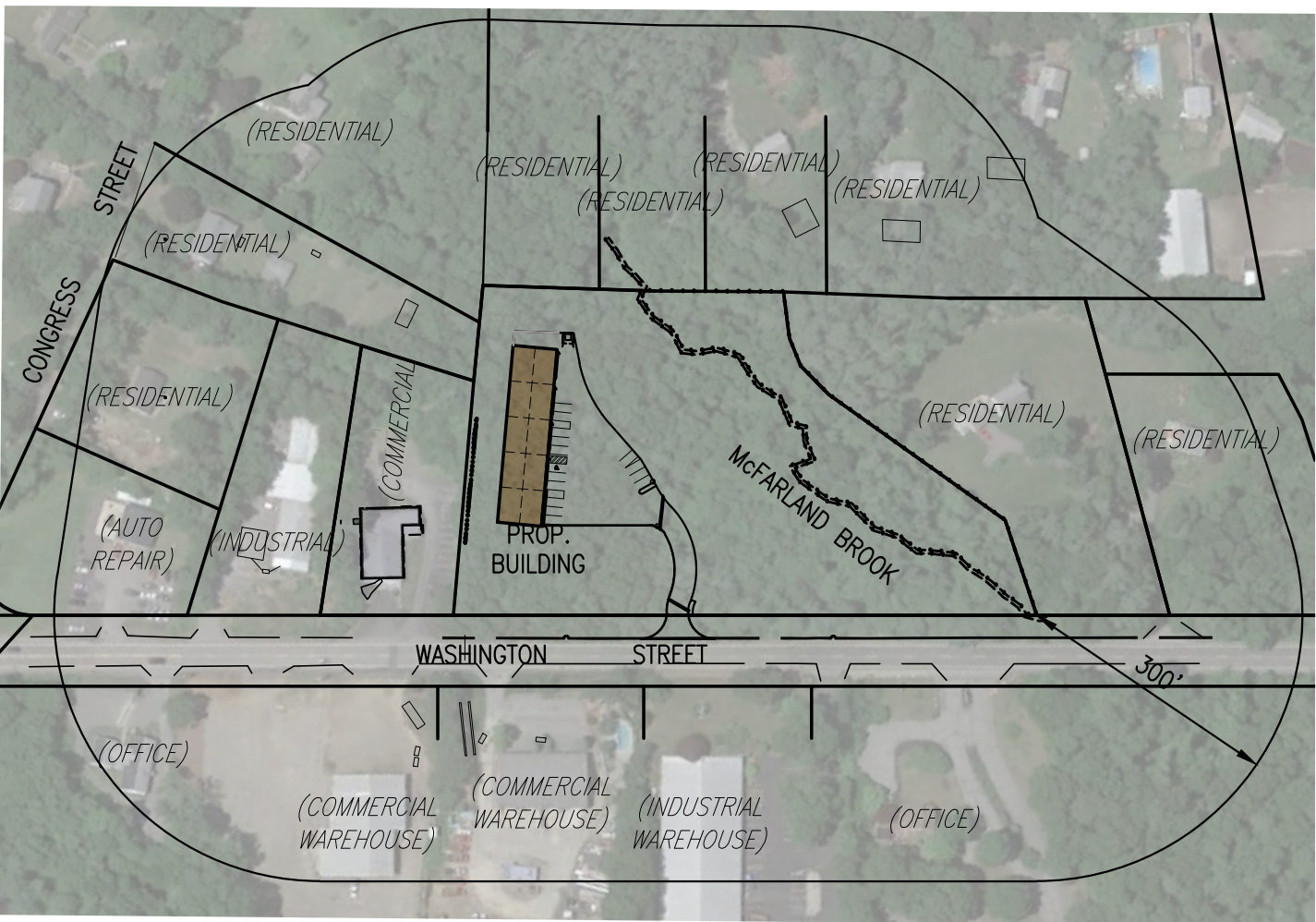
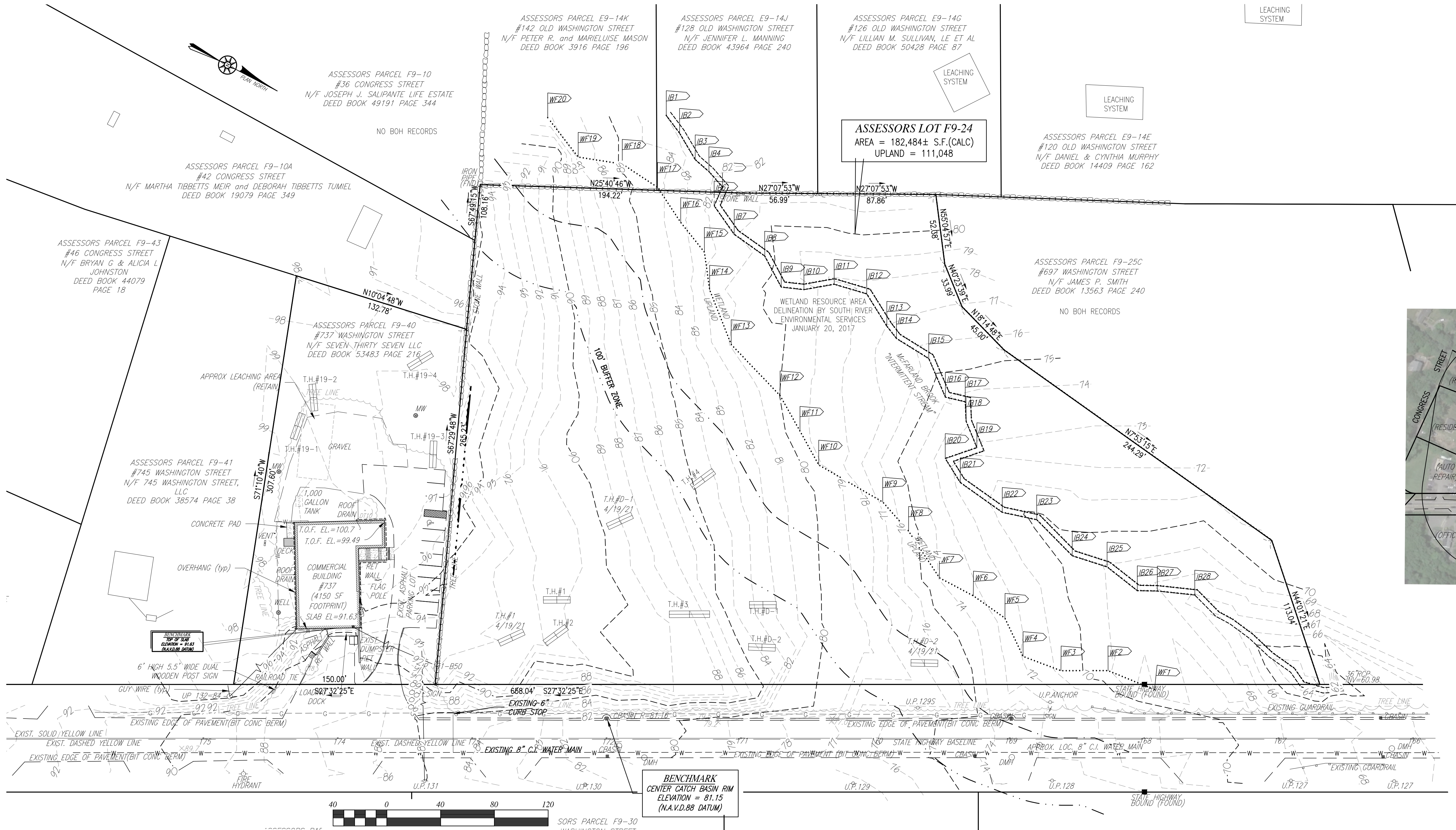
OCTOBER 27, 2021
SCALE: 1"=40'
JOB No. 20-365

GRADY CONSULTING, L.L.C.

Civil Engineers and Land Surveyors
71 Evergreen Street, Suite 1, Kingston, MA 02364
Phone (781) 585-2300 Fax (781) 585-2378



Scale 1" = 40'



VICINITY MAP WITHIN 300 FT
SCALE: 1"=200'

T.H.#D-1 EL. 83.10	T.H.#D-2 EL. 84.25	T.H.#1 EL. 91.90	T.H.#2 EL. 92.20	T.H.#3 EL. 88.50	T.H.#4 EL. 85.00	T.H.#19-1 EL. 99.10	T.H.#19-2 EL. 98.90	T.H.#19-3 EL. 97.50	T.H.#19-4 EL. 98.20	T.H.#D-1 4/19/21 EL. 89.05	T.H.#D-2 4/19/21 EL. 77.00
0'-8" A LOAM	0'-8" A LOAM	0'-6" A LOAM	0'-6" A LOAM	0'-6" A LOAM	0'-8" A LOAM	0'-32" FILL	0'-24" FILL	0'-24" FILL	0'-6" A LOAM	0'-4" A LOAM	0'-6" A LOAM
8'-30" B SANDY LOAM	8'-28" B SANDY LOAM	6'-22" B SANDY LOAM	6'-22" B SANDY LOAM	6'-18" B SANDY LOAM	8'-24" B SANDY LOAM	32'-36" A LOAM	24'-30" A LOAM	24'-30" A LOAM	6'-30" B LOAMY SAND	6'-32" B SANDY LOAM	6'-28" B SANDY LOAM
30'-84" C1 GRAVELLY SANDY LOAM (REMOVE)	28'-60" C1 GRAVELLY SANDY LOAM (REMOVE)	22'-48" C1 GRAVELLY SAND	22'-48" C1 GRAVELLY SAND	18'-60" C1 GRAVELLY SAND	24'-60" C1 GRAVELLY SAND	36'-40" B LOAMY SAND	30'-84" C1 MED SAND	30'-40" B LOAMY SAND	30'-120" C LOAMY SAND	32'-88" SANDY LOAM (REMOVE)	28'-90" SANDY LOAM (REMOVE)
84'-120" C2 MEDIUM SAND BOULDERS	60'-108" C2 MEDIUM SAND BOULDERS	96'-152" C3 MEDIUM SAND	48'-96" C2 GRAVELLY SANDY LOAM	60'-108" C2 GRAVELLY SANDY LOAM	48'-96" C2 GRAVELLY SANDY LOAM	40'-132" C1 LOAMY SAND	84'-120" C2 MED SAND	40'-72" C LOAMY SAND	88'-150" GRAVELLY MEDIUM SAND	90'-108" MEDIUM TO COARSE SAND	90'-108" MEDIUM TO COARSE SAND
D=10'-0" NO WATER	D=9'-0" NO WATER	D=12'-8" NO WATER	D=15'-0" NO WATER	D=9'-0" NO WATER	D=9'-0" NO WATER	D=11'-0" WATER @ 10'-10"	D=10'-0" NO WATER	D=6'-0" NO WATER	D=10'-0" NO WATER	D=12'-6" NO WATER	D=9'-0" MOTTLING @ 3'-6" (EL=73.50)

SOILS TESTING 2007-12-13 (D-1 & D-2)

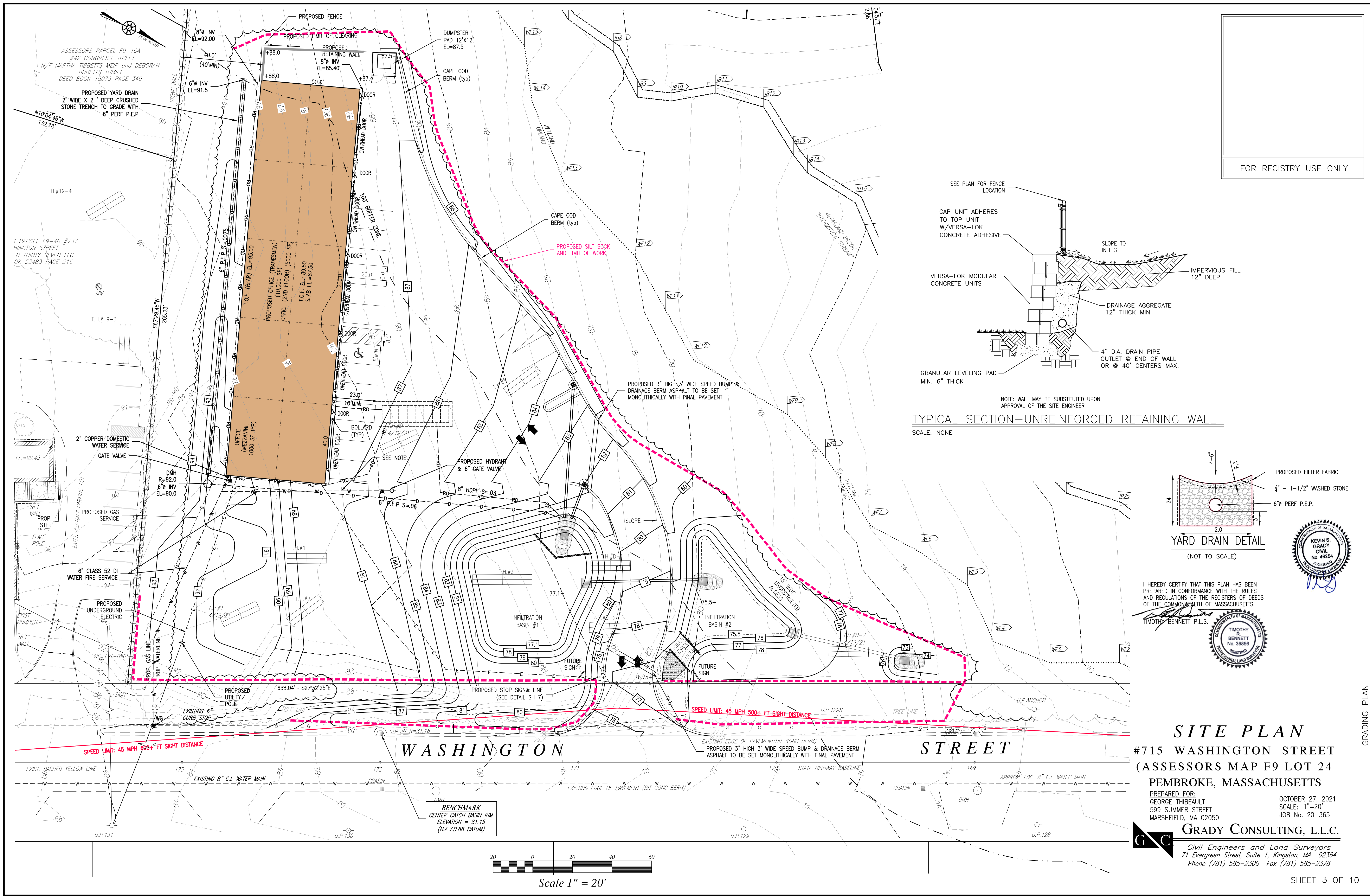
I HEREBY CERTIFY THAT THIS PLAN HAS BEEN PREPARED IN CONFORMANCE WITH THE RULES AND REGULATIONS OF THE REGISTERS OF DEEDS OF THE COMMONWEALTH OF MASSACHUSETTS.
TIMOTHY BENNETT P.L.S.



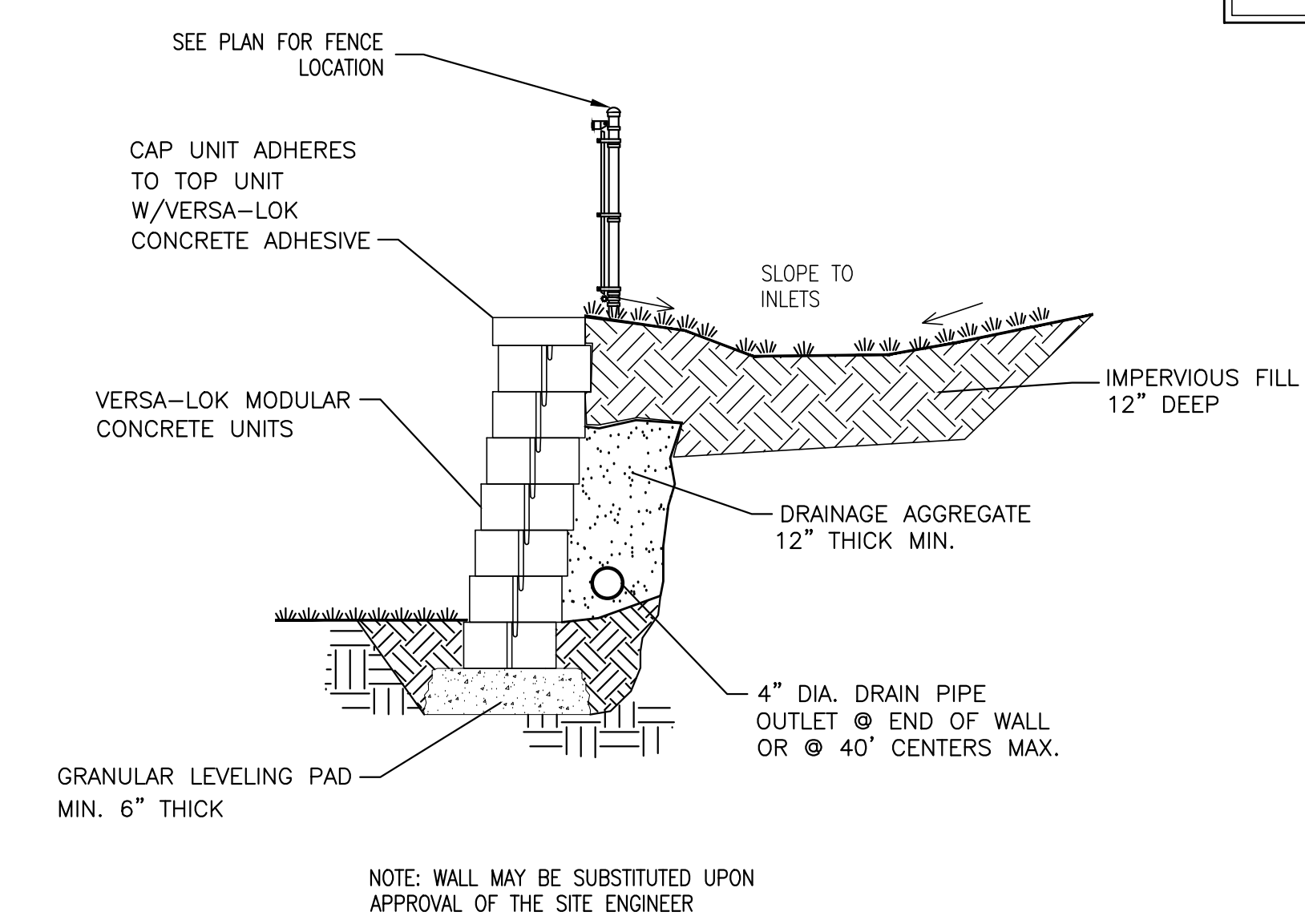
SITE PLAN
#715 WASHINGTON STREET
(ASSESSORS MAP F9 LOT 24)
PEMBROKE, MASSACHUSETTS
PREPARED FOR:
GEORGE THIBEAULT
599 SUMMER STREET
MARSHFIELD, MA 02050
OCTOBER 27, 2021
SCALE: 1"=40'
JOB No. 20-365
GRADY CONSULTING, L.L.C.
Civil Engineers and Land Surveyors
71 Evergreen Street, Suite 1, Kingston, MA 02364
Phone (781) 585-2300 Fax (781) 585-2378



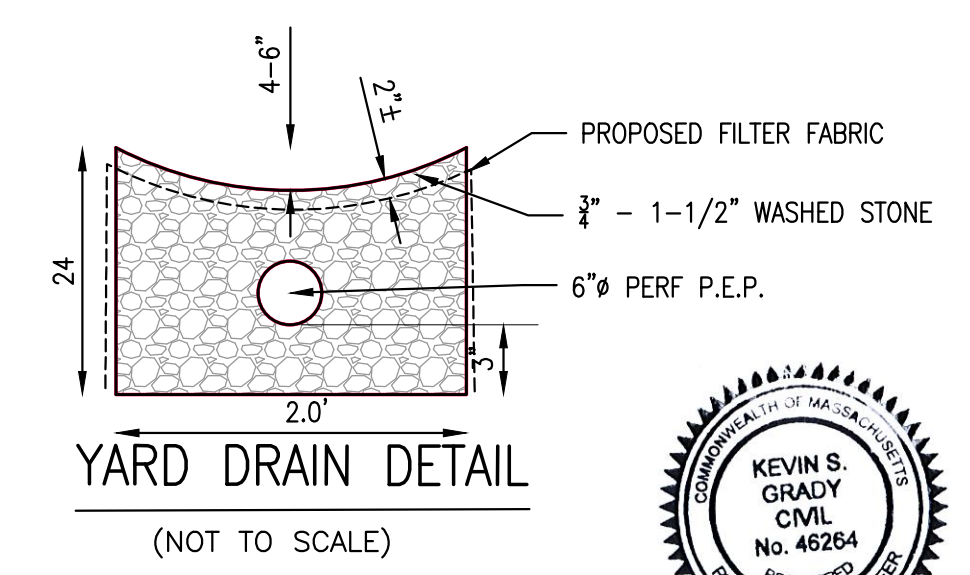
EXISTING CONDITIONS



FOR REGISTRY USE ONLY



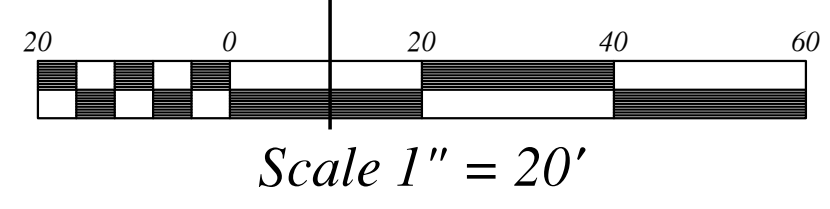
TYPICAL SECTION-UNREINFORCED RETAINING WALL
SCALE: NONE



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

TIMOTHY BENNETT P.L.S.
TIMOTHY R. BENNETT
No. 36656
PROFESSIONAL LAND SURVEYOR

SITE PLAN
#715 WASHINGTON STREET
(ASSESSORS MAP F9 LOT 24)
PEMBROKE, MASSACHUSETTS
PREPARED FOR:
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599 SUMMER STREET
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GRADING PLAN

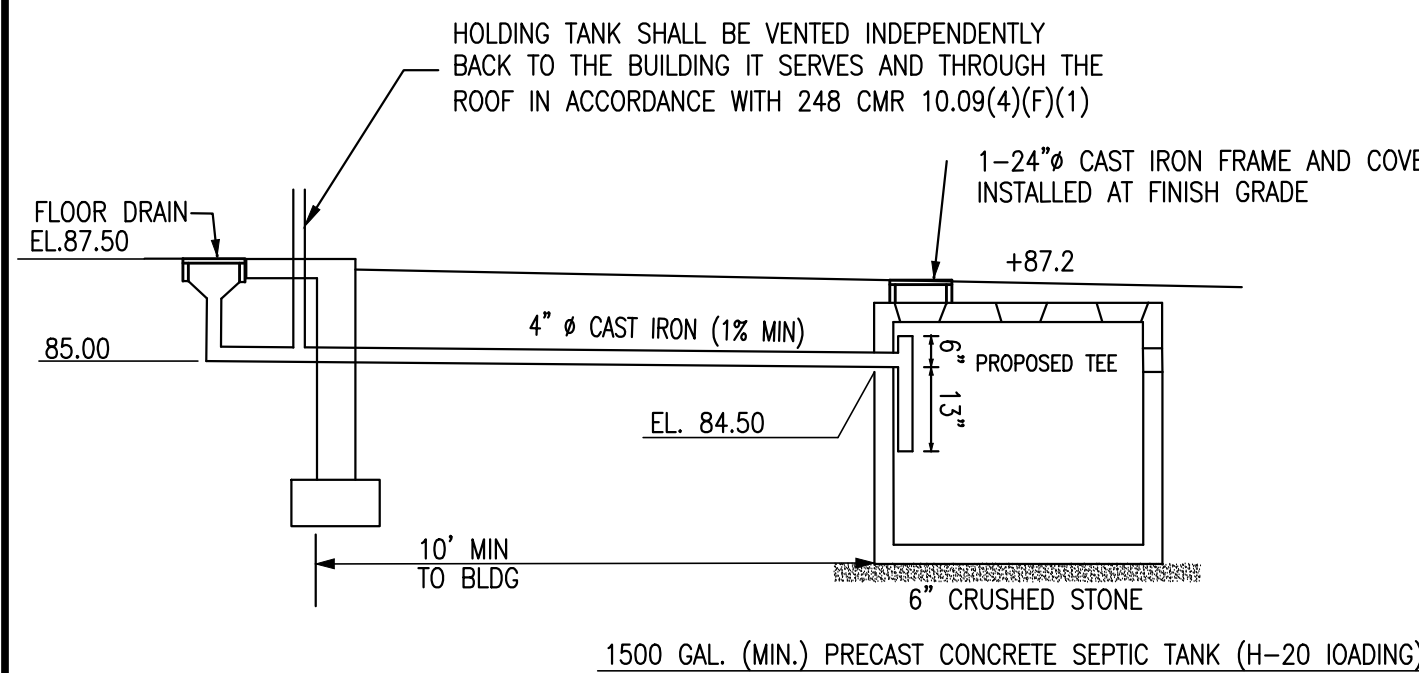
SOIL LOGS

T.H.#1 EL. 91.90	T.H.#2 EL. 92.20	T.H.#3 EL. 88.50	T.H.#4 EL. 85.00
0'-6" A LOAM	0'-6" A LOAM	0'-6" A LOAM	0'-8" A LOAM
6'-22" B SANDY LOAM	6'-22" B SANDY LOAM	6'-18" B SANDY LOAM	8'-24" B SANDY LOAM
22'-48" C1 GRAVELLY SAND	22'-48" C1 GRAVELLY SAND	18'-60" C1 GRAVELLY SAND	24'-60" C1 GRAVELLY SAND
48'-96" C2 GRAVELLY SANDY LOAM	48'-96" C2 GRAVELLY SANDY LOAM	60'-108" C2 GRAVELLY SANDY LOAM	60'-90" C2 GRAVELLY SANDY LOAM
96'-152" C3 MEDIUM SAND	96'-180" C3 MEDIUM SAND	108'-126" C3 MEDIUM SAND	96'-148" C3 MEDIUM SAND
D=12'-8"	D=15'-0"	D=9'-0"	D=9'-0"
NO WATER	NO WATER	NO WATER	NO WATER

NOTES:
CONCRETE TANK: T-2000 H-20
CONCRETE: 5,000 PSI AFTER 28 DAYS
REINFORCEMENT PER ASTM C1227-93
DISTRIBUTED THROUGH PEMBROKE CONCRETE PRODUCTS INC.(781-826-6463)

PLASTIC TANK: ROTH MODEL NO. RMT-1060
DISTRIBUTED THROUGH CAPE COD WINNATER WORKS(508-862-0166)

INSTALLER TO COORDINATE WITH PEMBROKE CONCRETE PRODUCTS INC. & CAPE COD WINNATER WORKS
FOR CONSTRUCTION OF THE HOLDING TANK.

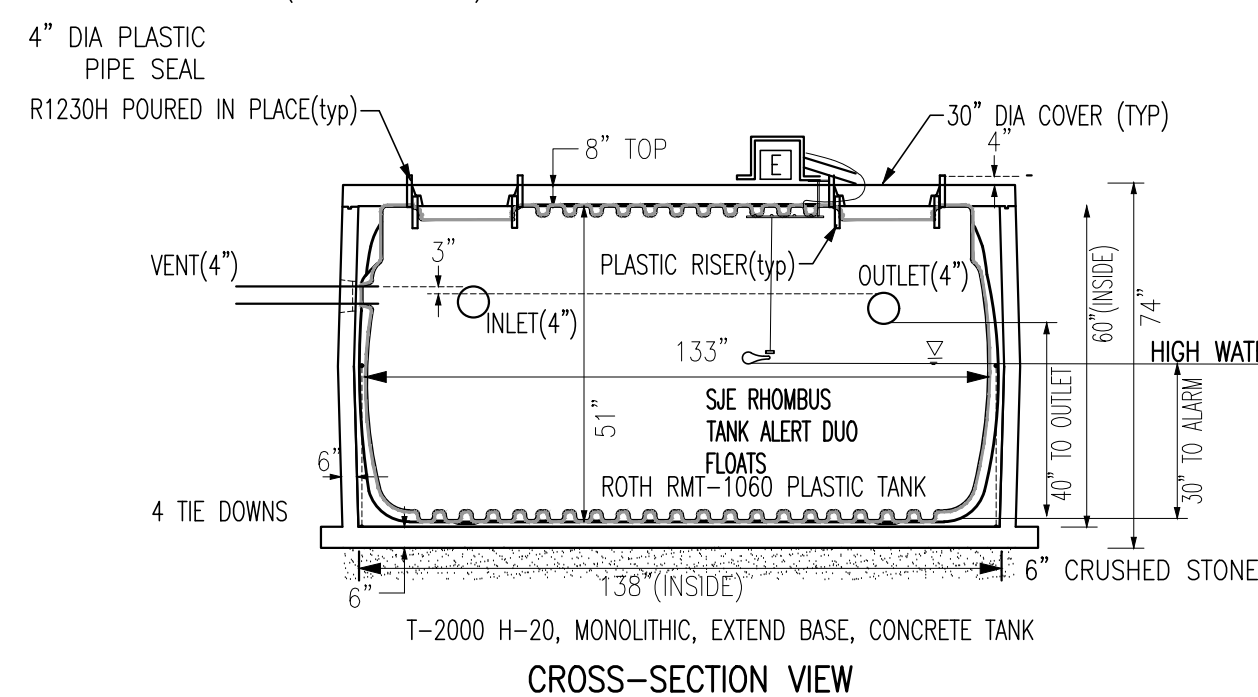
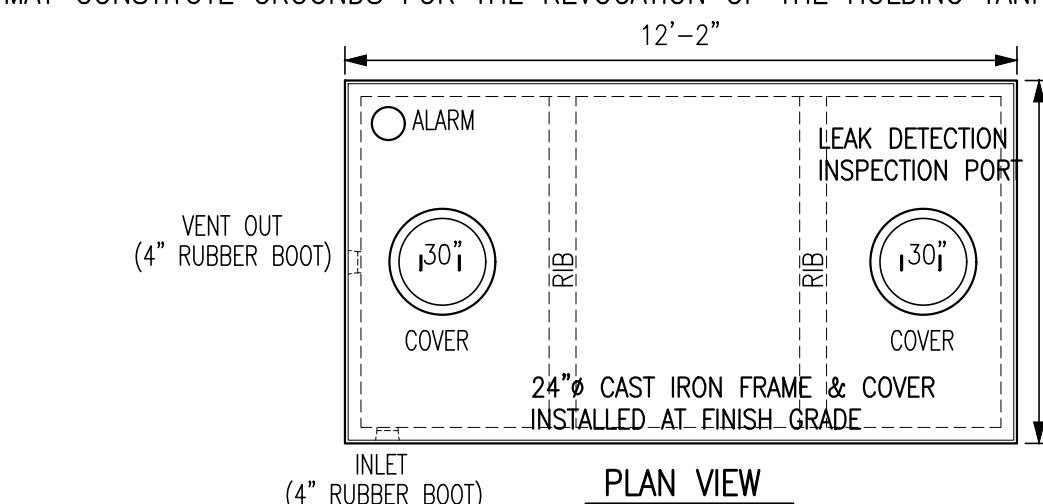


HOLDING TANK PROFILE

SPECIAL INSTRUCTIONS & NOTES FOR HOLDING TANK INSTALLATION:

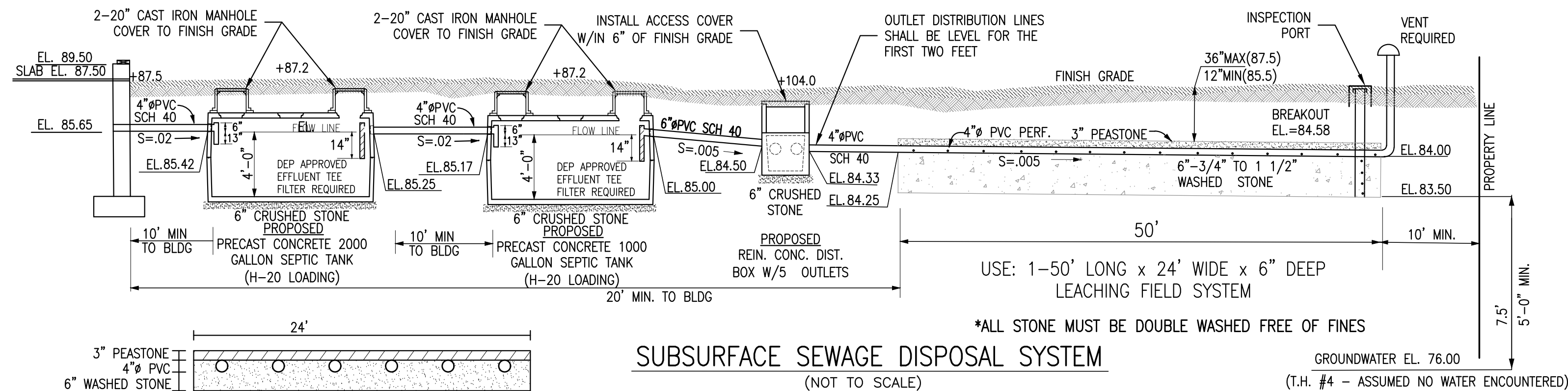
1. THE TANK SHALL BE INSTALLED ONTO A LEVEL (AND COMPACTED) BED OF SAND.
2. HOLDING TANK TO BE INSPECTED EVERY 3 MONTHS TO ENSURE PROPER OPERATION AND MAINTENANCE 310 CMR 15.260 (I).
3. THE HOLDING TANK WILL BE WATERPROOF AND WATERTIGHT 310 CMR 15.260(J).
4. VENTING SHALL BE PROVIDED THROUGH THE ROOF OF THE BUILDING IN ACCORDANCE WITH THE MASSACHUSETTS PLUMBING CODE.
5. INSTALL RHOMBUS TANK ALERT 2 HIGHWATER ALARM WITH SLIDE RAIL FLOAT.
6. A PLAQUE OR SIGN WITH "NON-HAZARDOUS INDUSTRIAL WASTEWATER" SHALL BE INSTALLED NEAR TANK.

FAILURE BY THE APPLICANT TO PROPERLY MAINTAIN THE HOLDING TANK
MAY CONSTITUTE GROUNDS FOR THE REVOCATION OF THE HOLDING TANK PERMIT.



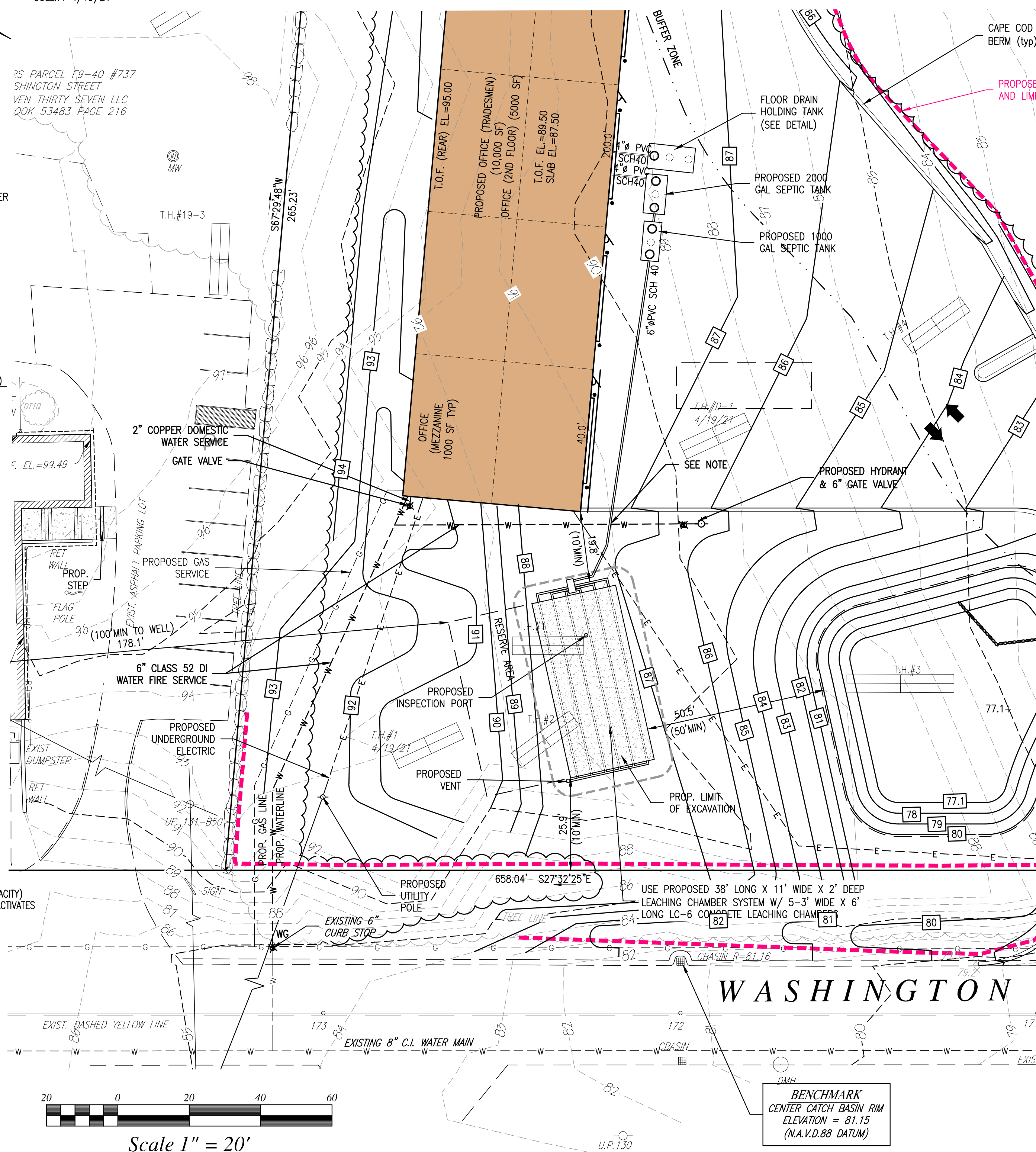
1,060 GALLON (MIN) (H2O LOADING) HOLDING TANK DETAIL

(MONOLITHIC TANK WITH EXTENDED BASE)
NOT TO SCALE



LEACHING FIELD X-SECTION A-A

(NOT TO SCALE)



Scale 1" = 20'

SEPTIC DESIGN (NOT DESIGNED FOR GARBAGE GRINDER)

1. DESIGN DAILY FLOW:
OFFICE: 5,000 S.F. x 75 GPD/1000 S.F. = 375 GPD
WAREHOUSE: 30 PROJECTED EMPLOYEES x 15 GPD/EMPLOYEE = 450 GPD
(WITHOUT CAFETERIA) TOTAL = 825 GPD

2. SEPTIC TANK: USE: 2 TANKS IN SERIES
825 GPD x 2 = 1650 GAL. USE 2000 GAL 1ST TANK
825 GPD x 1 = 825 GAL. USE 1000 GAL 2ND TANK

3. LEACHING CHAMBERS: P.R. <2 MIN/IN CLASS I

TOTAL: 1-44' LONG X 24' WIDE X 6" DEEP LEACHING FIELD

TITLE 5

PROPOSED AREA: 24 X 50 = 1200 SF
CAPACITY: 1200 S.F. X 0.74 GPD/S.F. = 888 > 825 GPD (D.D.F.)

SEPTIC NOTES

1. PROPERTY LINE DATA FROM THE FOLLOWING PLANS RECORDED AT PLYMOUTH COUNTY REGISTRY OF DEEDS: PLAN No. 282 OF 1956, PLAN No. 561 OF 1973, PLAN No. 663 OF 1973, PLAN No. 226 OF 1994, PLAN No. 308 OF 1995, AND MASSACHUSETTS STATE HIGHWAY LAYOUT No. 2771.
2. TOPOGRAPHIC SURVEY BY GRADY CONSULTING JANUARY 2017 & DECEMBER 2020.
3. SOILS TESTING BY KEVIN GRADY, GRADY CONSULTING WITNESSED BY HEALTH AGENT FRED LEARY AUGUST 14, 2007. ADDITIONAL TESTING BY KEVIN GRADY, GRADY CONSULTING WITNESSED BY HEALTH AGENT LISA CULLITY AUGUST 9, 2019, APRIL 19, 2021.
4. CALL DIG SAFE 1-888-344-7233 AT LEAST 4 DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
5. NOTIFY TOWN AND GRADY CONSULTING PRIOR TO BACKFILLING OF SYSTEM.
6. NO KNOWN WELLS EXIST WITHIN 200' OF THE PROPOSED SYSTEM.
7. THE SITE IS NOT LOCATED IN AN AQUIFER PROTECTION ZONE II.
8. ALL SYSTEM COMPONENTS SHALL BE MARKED WITH MAGNETIC MARKING TAPE OR A COMPARABLE MEANS IN ORDER TO LOCATE THEM ONCE BURIED (310 CMR 15.221(12)).
9. NO STREAMS, SURFACE & SUBSURFACE DRAINS AND WETLANDS EXIST WITHIN 100 FT OF THE PROPOSED SYSTEM, EXCEPT AS SHOWN.
10. THE SITE IS NOT LOCATED IN A FLOOD PLAIN DISTRICT.
11. NO KNOWN EASEMENTS ARE IN THE AREA OF THE PROPOSED SYSTEM.
12. EXCAVATE ALL MATERIAL (A,B, C1, C2 LAYERS) TO MED SAND C3 LAYER (96"±), 5' AROUND SYSTEM. REPLACE WITH CLEAN COARSE SAND IN ACCORDANCE WITH 310 CMR 15.255 (3). EXCAVATION TO BE INSPECTED BY GRADY CONSULTING L.L.C. AND TOWN PRIOR TO SOIL REPLACEMENT

APPROXIMATE PERC SAND VOLUME = $60 \times 24 \times (84.5 - 83.5) / 27 + 20\% = 64\pm$ C.Y.



I HEREBY CERTIFY THAT THIS PLAN HAS BEEN
PREPARED IN CONFORMANCE WITH THE RULES
AND REGULATIONS OF THE REGISTERS OF DEEDS
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TIMOTHY BENNETT P.L.S.



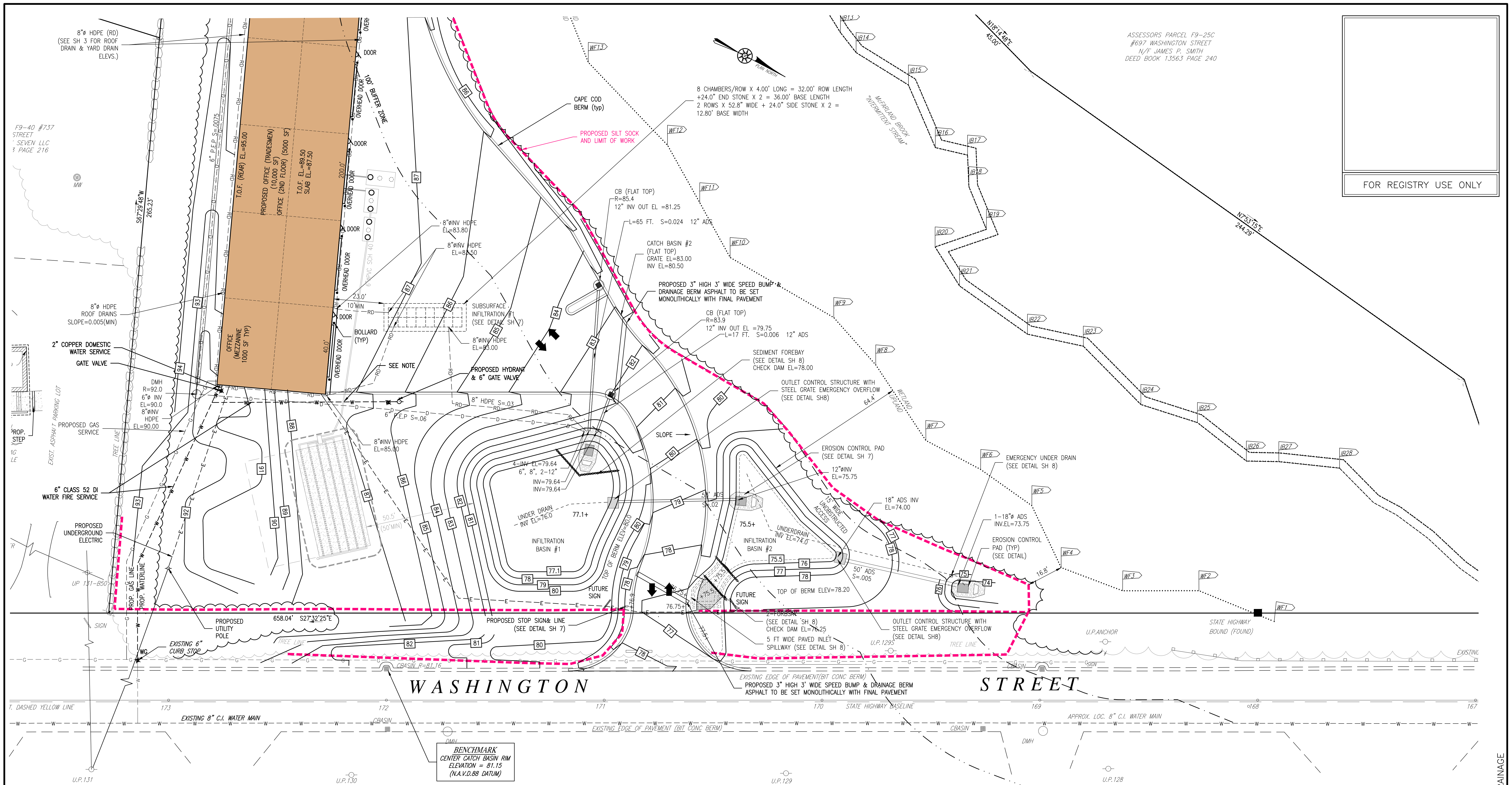
SITE PLAN #715 WASHINGTON STREET (ASSESSORS MAP F9 LOT 24) PEMBROKE, MASSACHUSETTS

PREPARED FOR:
GEORGE THIBEAULT
599 SUMMER STREET
MARSHFIELD, MA 02050

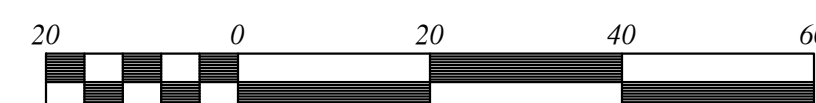
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SEPTIC PLAN



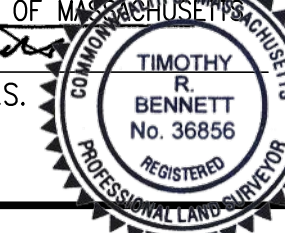
NOTE:
WHEREVER SEWER LINES MUST CROSS WATER SUPPLY LINES, BOTH
PIPES SHALL BE CONSTRUCTED OF CLASS 150 PRESSURE PIPE
AND SHALL BE PRESSURE TESTED TO ASSURE WATERTIGHTNESS



Scale 1" = 20'

I HEREBY CERTIFY THAT THIS PLAN HAS BEEN
PREPARED IN CONFORMANCE WITH THE RULES
AND REGULATIONS OF THE REGISTERED PROFESSIONAL
ENGINEERS OF THE COMMONWEALTH OF MASSACHUSETTS.

TIMOTHY BENNETT P.L.S.



SITE PLAN

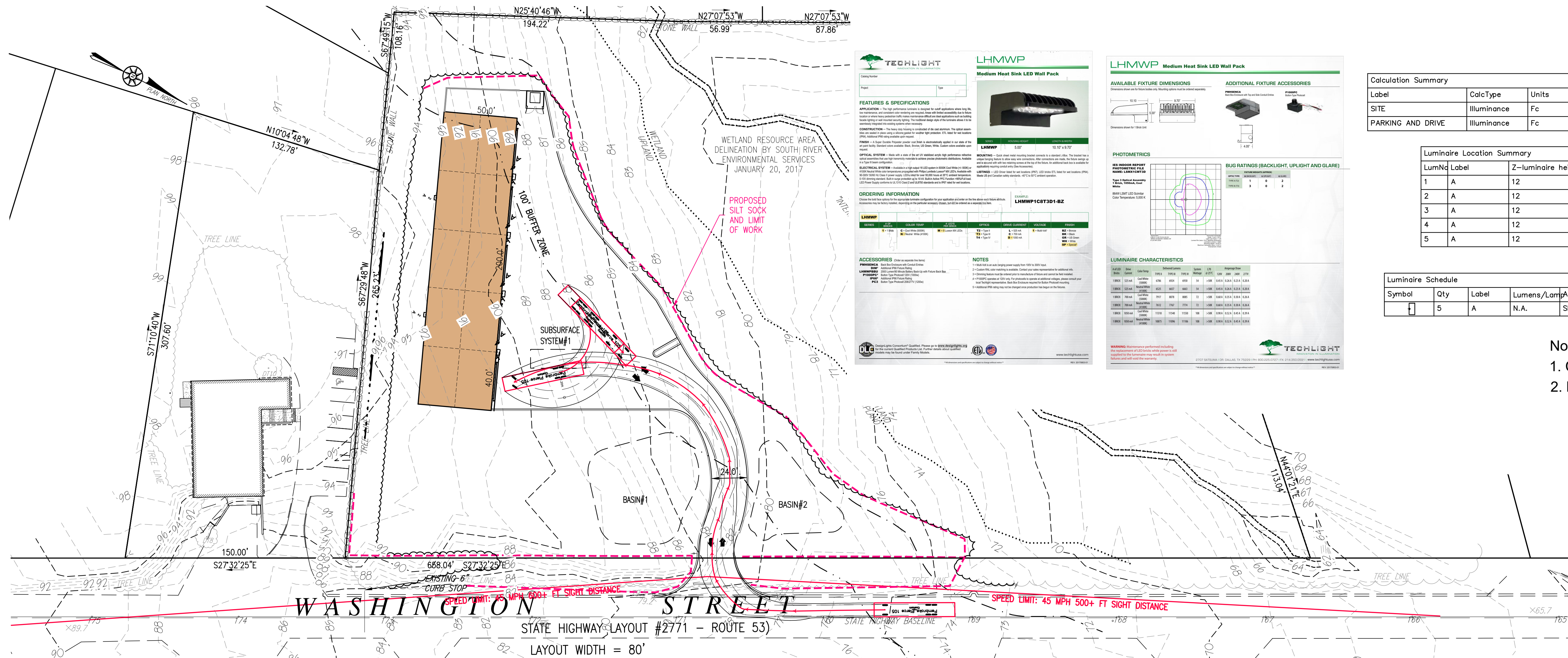
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TECHLIGHT LHMWP
Medium Heat Sink LED Wall Pack

AVAILABLE FIXTURE DIMENSIONS

ADDITIONAL FIXTURE ACCESSORIES

PHOTOMETRICS

BUG RATINGS (BACKLIGHT, UPLIGHT AND GLARE)

LUMINAIRE CHARACTERISTICS

FEATURES & SPECIFICATIONS

ORDERING INFORMATION

ACCESSORIES

NOTES

TECHLIGHT LHMWP
Medium Heat Sink LED Wall Pack

AVAILABLE FIXTURE DIMENSIONS

ADDITIONAL FIXTURE ACCESSORIES

PHOTOMETRICS

BUG RATINGS (BACKLIGHT, UPLIGHT AND GLARE)

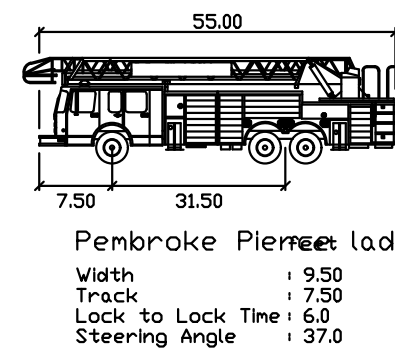
LUMINAIRE CHARACTERISTICS

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
SITE	Illuminance	Fc	0.25	10.0	0.0	N.A.	N.A.
PARKING AND DRIVE	Illuminance	Fc	0.99	7.2	0.0	N.A.	N.A.

Luminaire Location Summary			
LumNc	Label	Z-luminaire height	Tilt
1	A	12	0
2	A	12	0
3	A	12	0
4	A	12	0
5	A	12	0

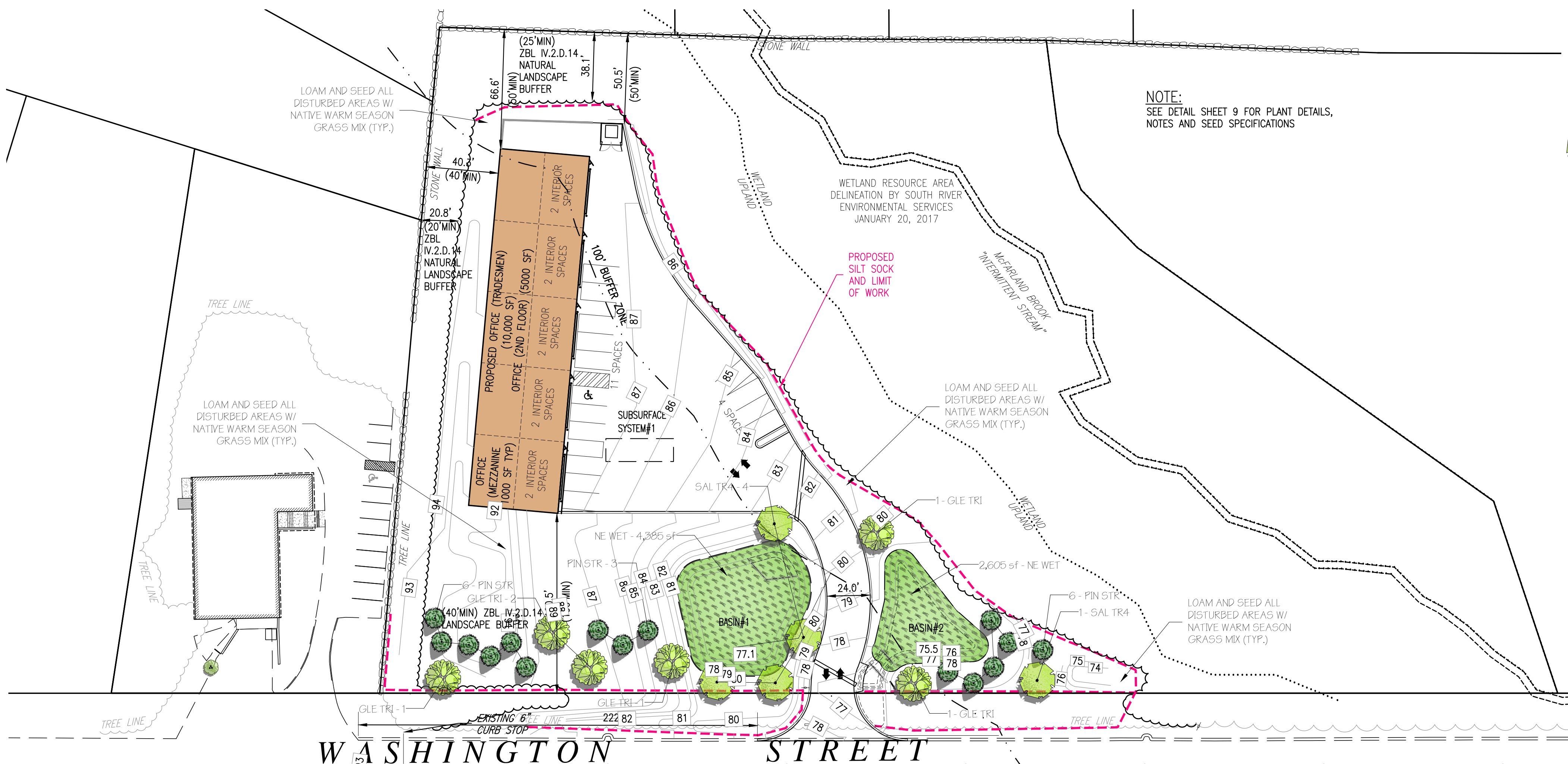
Luminaire Schedule					
Symbol	Qty	Label	Lumens/Lamp	Arrangement	LLF Description
	5	A	N.A.	SINGLE	0.900 LHMWP-1-N-M-T3-D-ONE BRICK TYPE 3 1050MA LED WALL PACK

- Notes:
1. Calculation at grade.
 2. Based on 12' AFG fixture mounting.



FIRE TRUCK DETAIL
NOT TO SCALE

- NOTES:
1. SIGHT DISTANCES SHOWN HEREON ARE BASED UPON THE AASHTO TRAFFIC CODE
 2. POSTED SPEED LIMIT IS 45 MPH
 3. AASHTO SECTION 1340 DIAGRAM 3 REQUIRES A 500' STOPPING DISTANCE FROM A DRIVEWAY FOR A POSTED SPEED LIMIT OF 45 MPH
 4. INTERSECTION LINE OF SIGHT MAY BE TAKEN FROM ANY POINT FROM 10' TO 18' OFF THE EDGE OF ROADWAY PAVEMENT PER AASHTO SECTION 1340
 5. FOR INTERSECTION SIGHT DISTANCE STUDIES THE HEIGHT OF MOTORISTS EYE IS 3.5' AND THE HEIGHT OF APPROACHING OBJECT IS 3.5' PER AASHTO
 6. FOR STOPPING SIGHT DISTANCE THE HEIGHT OF MOTORISTS EYE IS 3.5' AND THE HEIGHT OF OBJECT IS 2.0' PER AASHTO

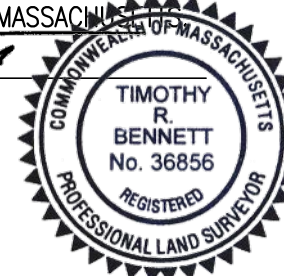


PLANT SCHEDULE

DECIDUOUS TREES	CODE	QTY	BOTANICAL / COMMON NAME	CONT	CAL	SIZE
	GLE TRI	6	GLEDITSIA TRIACANTHOS INERMIS / THORNLESS COMMON HONEYLOCUST	B & B	2.5"-3.0" CAL.	
	SAL TR4	5	SALIX ALBA 'TRISTIS' / GOLDEN WEEPING WILLOW	B & B	2.5"-3.0" CAL.	
EVERGREEN TREES	CODE	QTY	BOTANICAL / COMMON NAME	CONT	CAL	SIZE
	PIN STR	15	PINUS STROBUS / WHITE PINE	B & B		5-6' HGT.
GROUND COVERS	CODE	QTY	BOTANICAL / COMMON NAME	CONT	SIZE	
	NE WET	6,990 SF	NE. WETMIX / LOAM, FINE GRADE & SEED	SEED		

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

TIMOTHY BENNETT P.L.S.



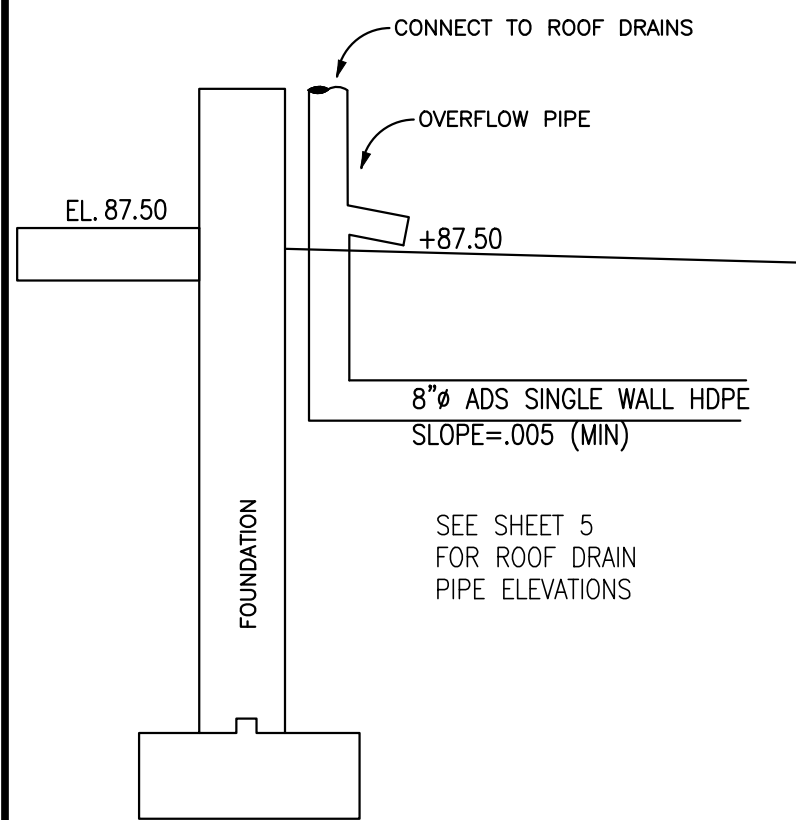
Scale 1" = 40'

SITE PLAN
#715 WASHINGTON STREET
(ASSESSORS MAP F9 LOT 24)
PEMBROKE, MASSACHUSETTS

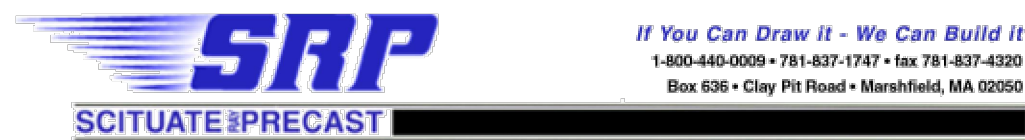
PREPARED FOR:
GEORGE THIBEAULT
599 SUMMER STREET
MARSHFIELD, MA 02050

OCTOBER 27, 2021
SCALE: 1"=40'
JOB No. 20-365

GRADY CONSULTING, L.L.C.
Civil Engineers and Land Surveyors
71 Evergreen Street, Suite 1, Kingston, MA 02364
Phone (781) 585-2300 Fax (781) 585-2378

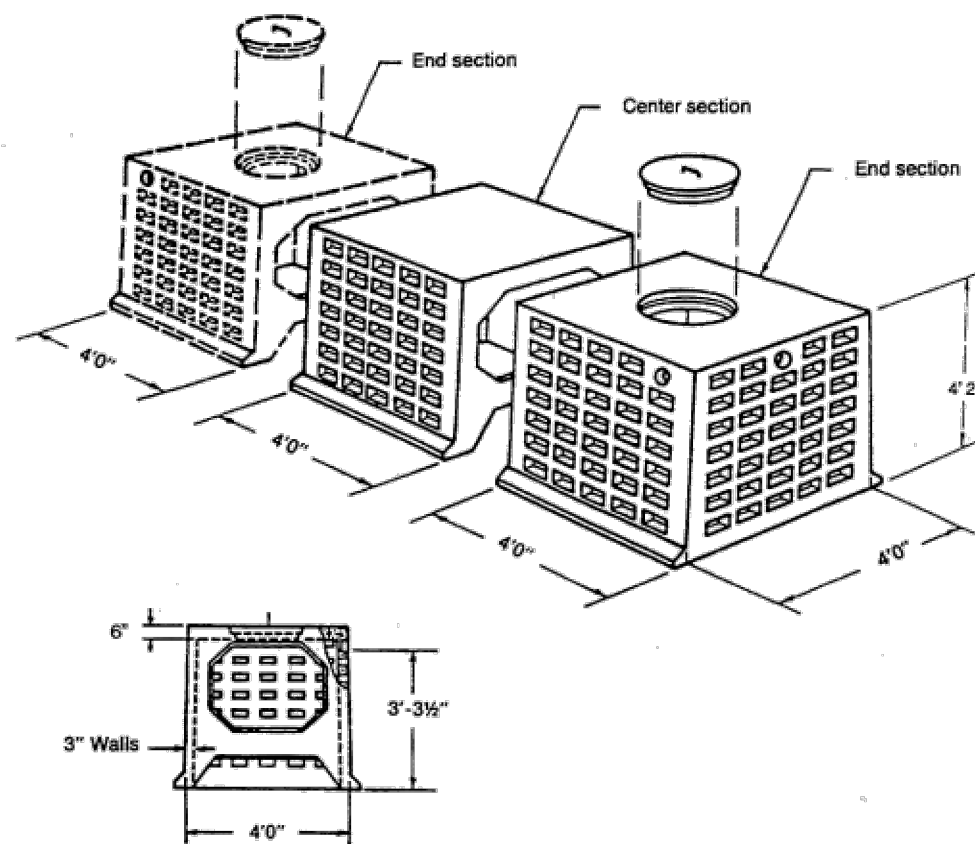


ROOF DRAIN & DOWNSPOUT DETAIL
(NOT TO SCALE)



Leaching Chambers
4FT x 4FT x 4FT Precast Galley

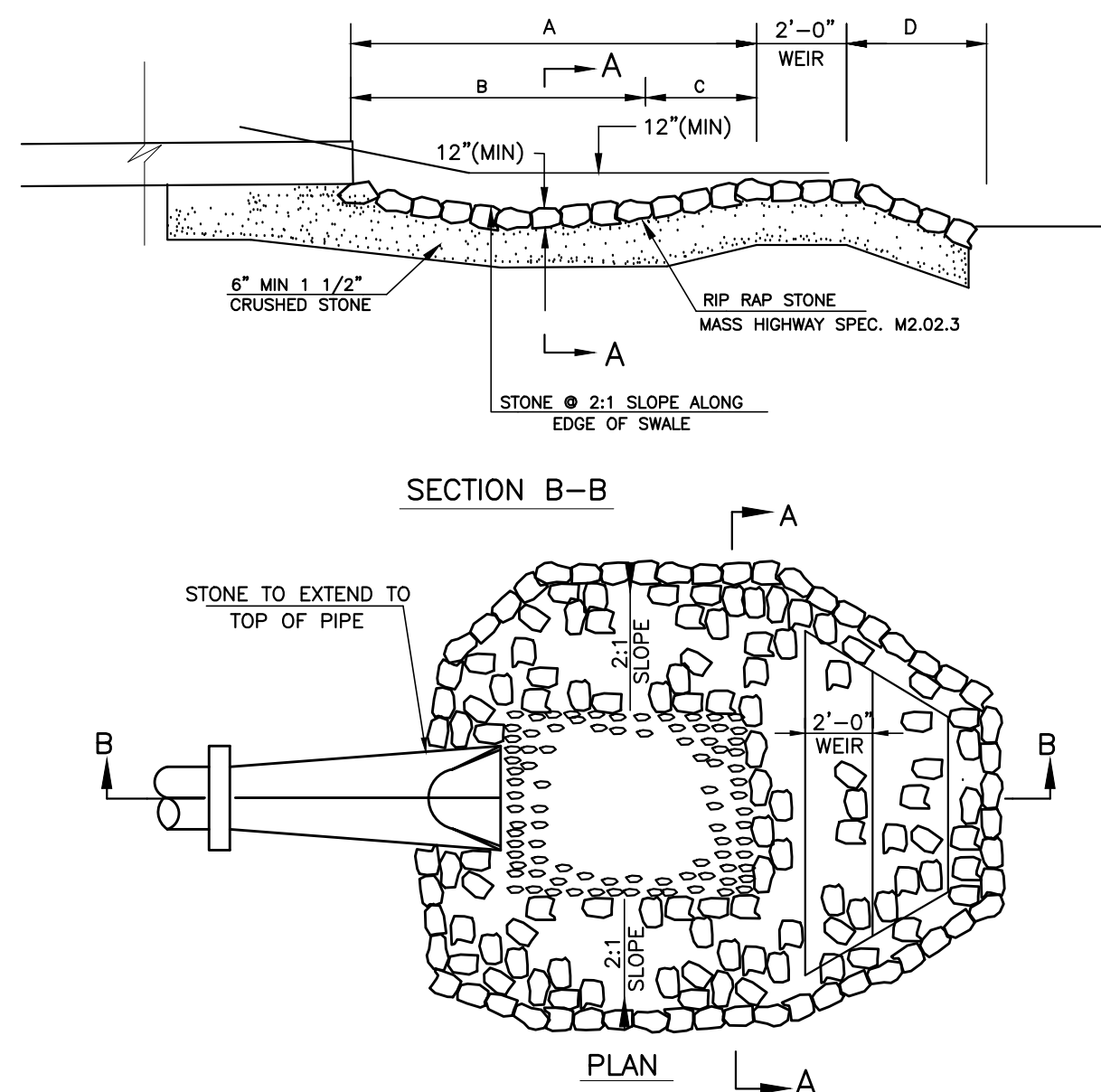
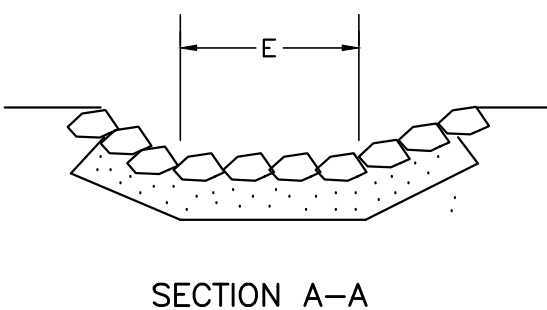
Design notes:
1. Available in 4' sections. A combination of sections may be used to reach desired length.
2. Concrete 4000 PSI, #28 days
3. Available in with 20" or 24" straight opening or concrete cover
4. Available in H-10 or H-20 covers



PIPE DIA.	10"	12"	18"
A	5'-0"	10'-0"	15'-0"
B	2'-6"	7'-6"	11'-3"
C	2'-6"	2'-6"	3'-9"
D	3'-0"	3'-0"	4'-6"
E	3'-0"	4'-0"	6'-0"

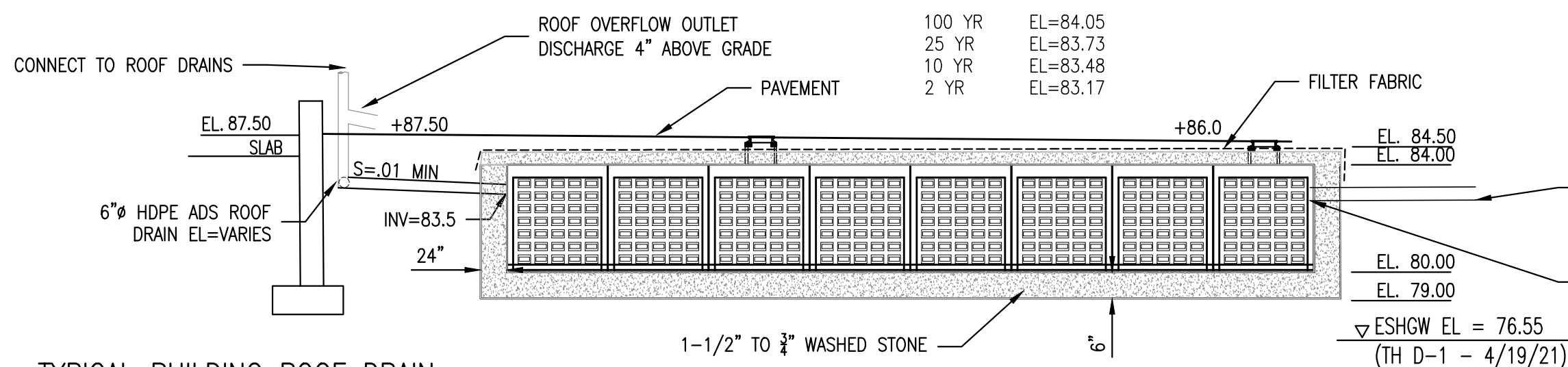
- NOTES:
- STONE FOR EROSION CONTROL PADS SHALL COMPLY WITH MDPW MATERIAL SPEC. M. 2.02.3
 - STONE BERM FOR SILT TRAP SHALL BE CONSTRUCTED AROUND SIDES OF EROSION CONTROL PADS

NOTE: DIMENSIONS DESIGNATED S.B. REFER TO SEDIMENTATION BASIN
DIMENSIONS DESIGNATED D.B. REFER TO DETENTION BASIN



DETAIL - SILT TRAP, EROSION CONTROL PAD FROM
OUTLET CONTROL STRUCTURE BASIN #1
(NOT TO SCALE)

REMOVE AND REPLACE A, B, C1 TO C2 MEDIUM SAND LAYER (EL=81.7±)
SUBSURFACE INFILTRATION SYSTEM #1 (TH D-1 4/19/21)
EXCAVATION TO BE INSPECTED BY GRADY CONSULTING, L.L.C. PRIOR TO SOIL REPLACEMENT. SITE BORROW MAY BE ACCEPTABLE WITH SIEVE ANALYSIS MEETING TEXTURAL TRIANGLE PER 310 CMR 15.243 (SAND)



TYPICAL BUILDING ROOF DRAIN
CONNECTION

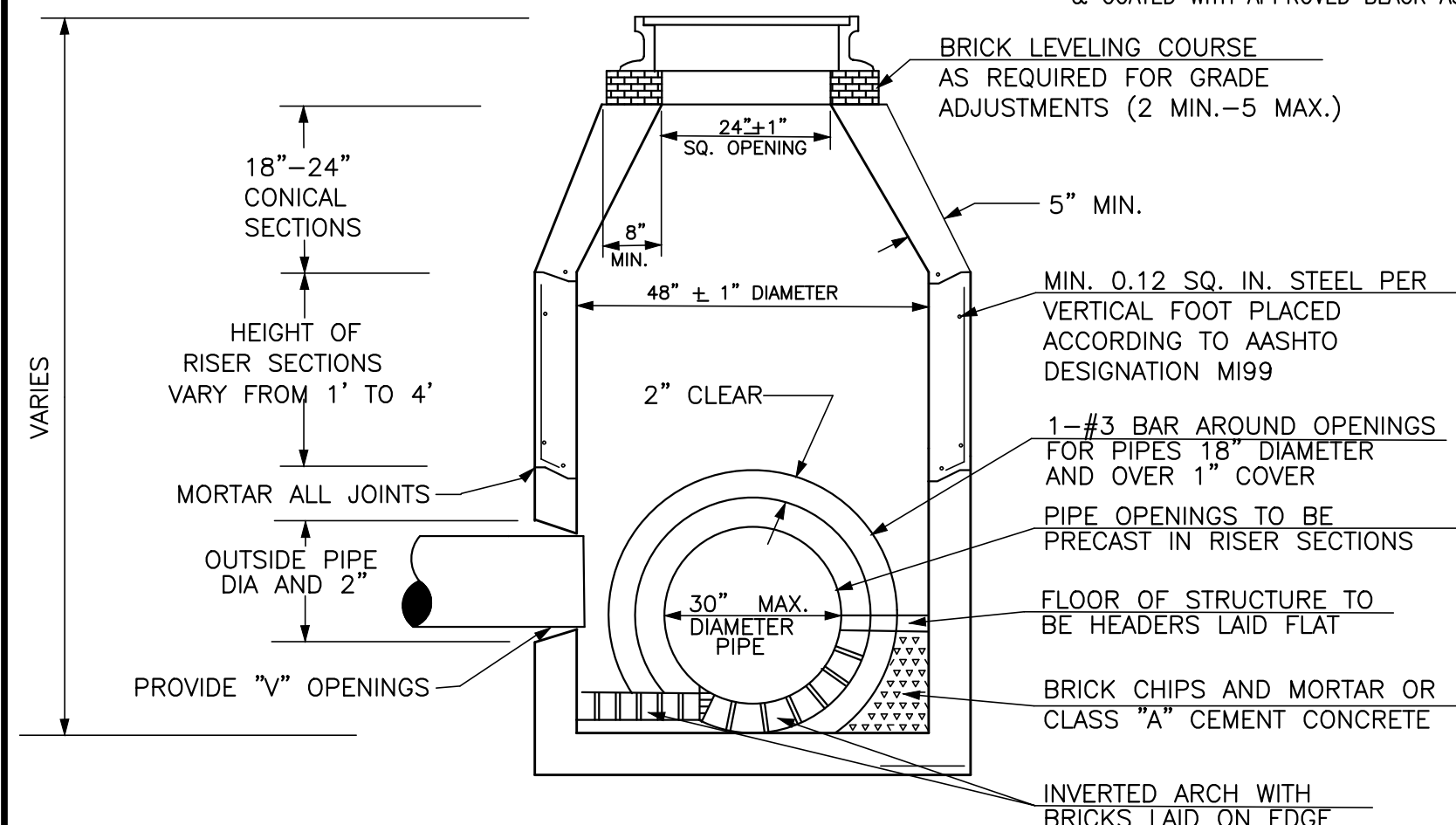
SUBSURFACE SYSTEM#1

CHAMBER MODEL = CONCRETE GALLEY 4X4X4 (CONCRETE GALLEY, UCPI 4X4X4 GALLEY OR EQUIVALENT)
8 CHAMBERS/ROW X 4.00' LONG = 32.00' ROW LENGTH +24.0' END STONE X 2 = 36.00' BASE LENGTH
2 ROWS X 52.8" WIDE + 24.0" SIDE STONE X 2 = 12.80' BASE WIDTH
12.0" BASE + 48.0" CHAMBER HEIGHT + 6.0" COVER = 5.50' FIELD HEIGHT
16 CHAMBERS X 44.3 CF = 709.5 CF OF CHAMBER STORAGE
16 CHAMBERS X 58.9 CF = 942.0 CF OF DISPLACEMENT
2,534.4 CF FIELD - 942.0 CF CHAMBERS = 1,592.4 CF OF STONE X 40.0% VOIDS = 637.0 CF OF STONE STORAGE
CHAMBER STORAGE + STONE STORAGE = 1,346.5 CF = 0.031 AF
OVERALL STORAGE EFFICIENCY = 53.1%
OVERALL SYSTEM SIZE = 36.00' X 12.80' X 5.50'

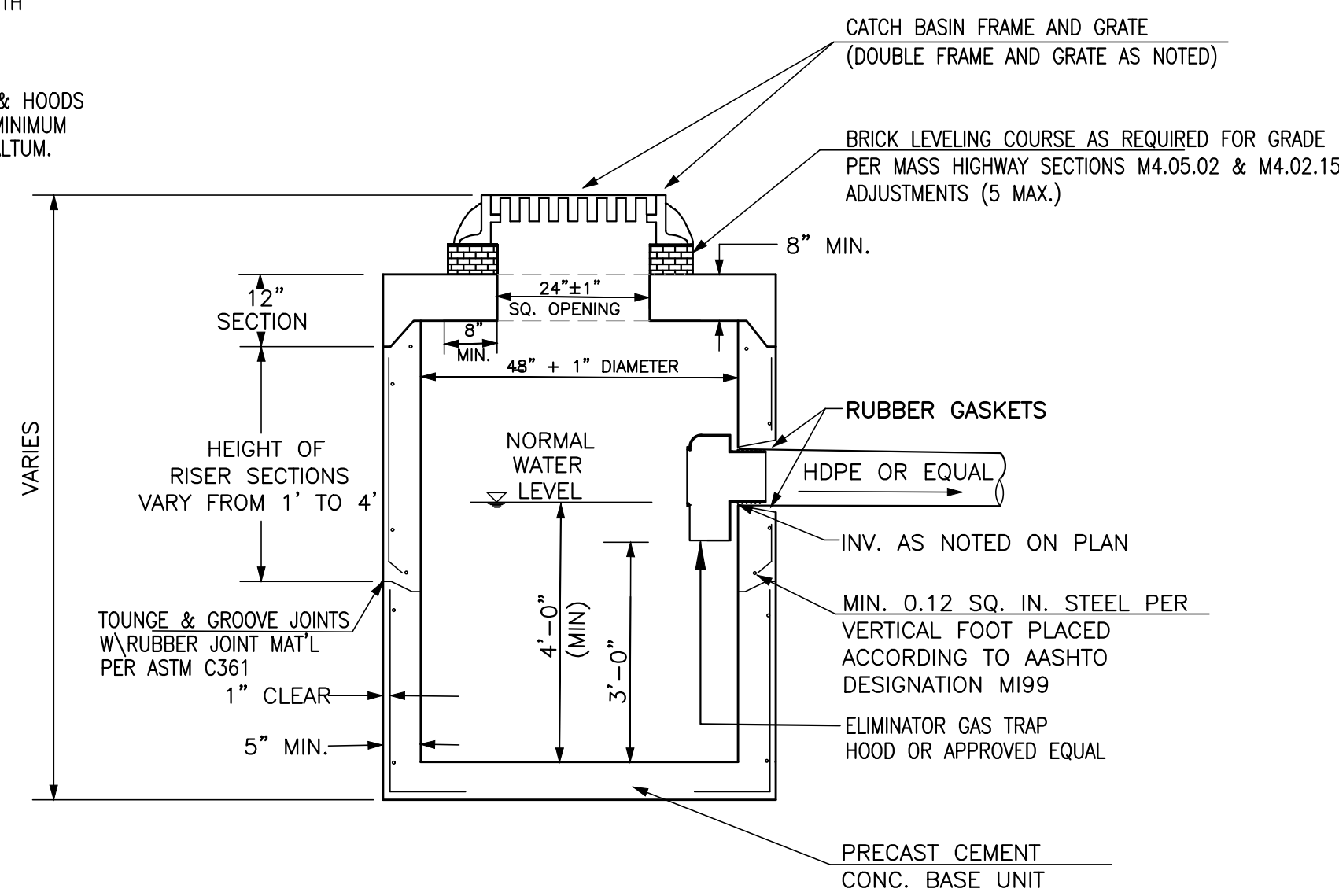
SUBSURFACE INFILTRATION SYSTEM #1 (NOT TO SCALE)

NOTES:

- PRECAST CONCRETE UNITS TO CONFORM TO THE MASS HIGHWAY SECTION M4.02.14
- 4000 PSI MINIMUM COMPRESSIVE STRENGTH
- PRECAST UNITS TO BE HS-20 LOADING
- EXTERIOR SURFACES TO BE SEALED W/ COLD APPLIED BITUMINOUS SEALER
- CASTINGS FOR FRAME, GRATES, COVERS & HOODS TO CONFORM TO ASTM A48, GRADE 30 MINIMUM & COATED WITH APPROVED BLACK ASPHALTUM.



PRECAST CONCRETE MANHOLE
(NOT TO SCALE)



FLAT-TOP PRECAST GASOLINE TRAP CATCH BASIN
(NOT TO SCALE)

GENERAL NOTES:

- PROVIDE 24" x 24" OPENING AND EAST JORDAN FRAME AND GRATE FOR SINGLE GRATE CATCH BASIN (CB) OR APPROVED EQUAL.
- CATCH BASIN HOOD WILL NOT BE INSTALLED.
- SET FRAME IN FULL BED OF MORTAR. BRICKS MAY BE USED FOR GRADE ADJUSTMENT.
- MORTAR ALL JOINTS.
- PROVIDE "V" KNOCKOUTS FOR PIPES W/ 2" CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS.
- REINFORCED STEEL CONFORMS TO LATEST ASTM SPEC. 0.12 SQ. IN./LINEAR FT. AND 0.12 SQ. IN. (BOTH WAYS) BASE BOTTOM.
- CONCRETE COMPRESSIVE STRENGTH-4000 PSI MIN.
- MANHOLE DESIGN SPECS CONFORM TO LATEST ASTM C-478 SPEC FOR "PRECAST CONCRETE MANHOLE SECTIONS"

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

TIMOTHY BENNETT P.L.S.



FOR REGISTRY USE ONLY

Massachusetts Municipal Drainage Frames and Grates



Square hole grate

Grate Type	Product Number
Standard grate	OMA552000074
Square hole grate	OMA552000075
Cascade grate (left)	OMA552000076
Cascade grate (right)	OMA552000077
ADA grate	OMA552000078

Note: 2 grates required per frame

New England Municipal and Construction Castings

Massachusetts Municipal Manhole Frames and Covers

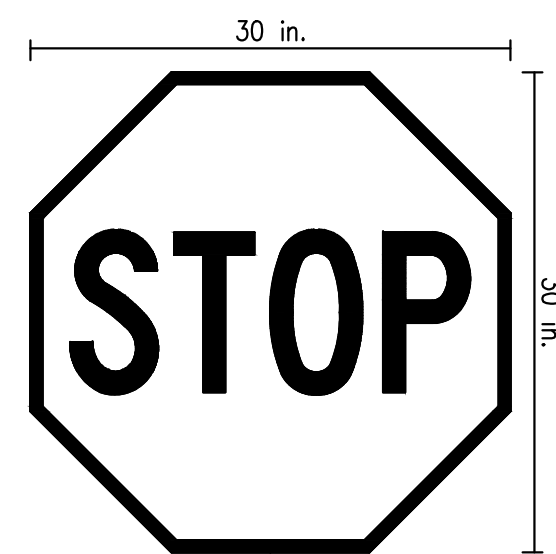
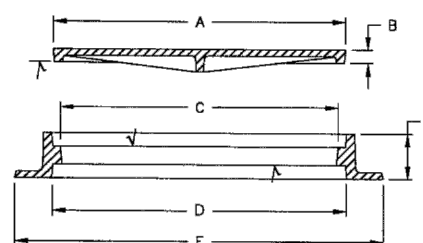
V-1600/V-1800 FRAMES AND COVERS



V-1600-4 assembly

Features
Heavy duty
Reversible frame (BF = V-1600, TF = V-1800)

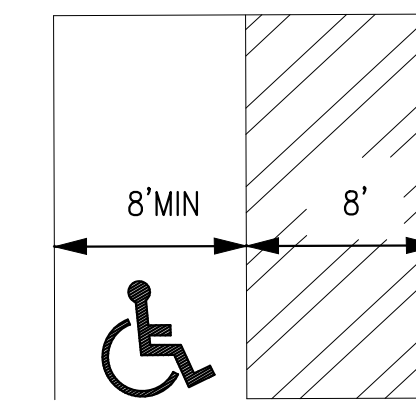
Options
Solid or vented covers
Special lettered covers
Custom logo covers
Bolted assemblies
Grates (see V-3600/V-3800)
Hinged unit available in select sizes



STOP SIGN SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES WITH THE EXCEPTION OF BEING DIAMOND GRADE. (R1-1)

12" WIDE x 12 FT LONG STOP LINE TO BE PLACED 5 FT IN ADVANCE OF NEAREST CROSSWALK OR WAY.

STOP SIGN DETAIL
(NOT TO SCALE)



STANDARD HANDICAPP VAN ACCESSIBLE SPACES

WHEELCHAIR RAMP &
HANDICAP SPACE STRIPING DETAIL
(NOT TO SCALE)

V-1600/V-1800 Frame and Cover Options

Catalog Number	A Cover Diameter	B Cover Thickness	C Clear Opening	D Frame Opening	E Flange Diameter	F Height
V-1600-1	19 1/4	1 1/2	18 1/4	19 1/2	24	4
V-1600-2	23 1/2	1 1/2	22	23 3/4	28 1/2	4
V-1600-3	25 3/8	1 1/2	24	25 5/8	32 1/8	4
V-1600-4	31 3/4	1 3/8	30	32 1/8	38	4
V-1600-5	38	2	36	38 1/4	46	6
V-1600-6	50 1/4	2	48	50 1/2	56 1/2	6
V-1800-1	19 1/4	1 1/2	18 1/4	20 1/2	24	4
V-1800-2	23 1/2	1 1/2	22	24 3/4	28 1/2	4
V-1800-3	25 3/8	1 1/2	24	26 5/8	32 1/8	4
V-1800-4	31 15/16	1 3/8	30	33 1/8	38	4
V-1800-5	38	2	36	40	46	6
V-1800-6	50 1/4	2	48	52	56 1/2	6

Note: all dimensions are in inches.



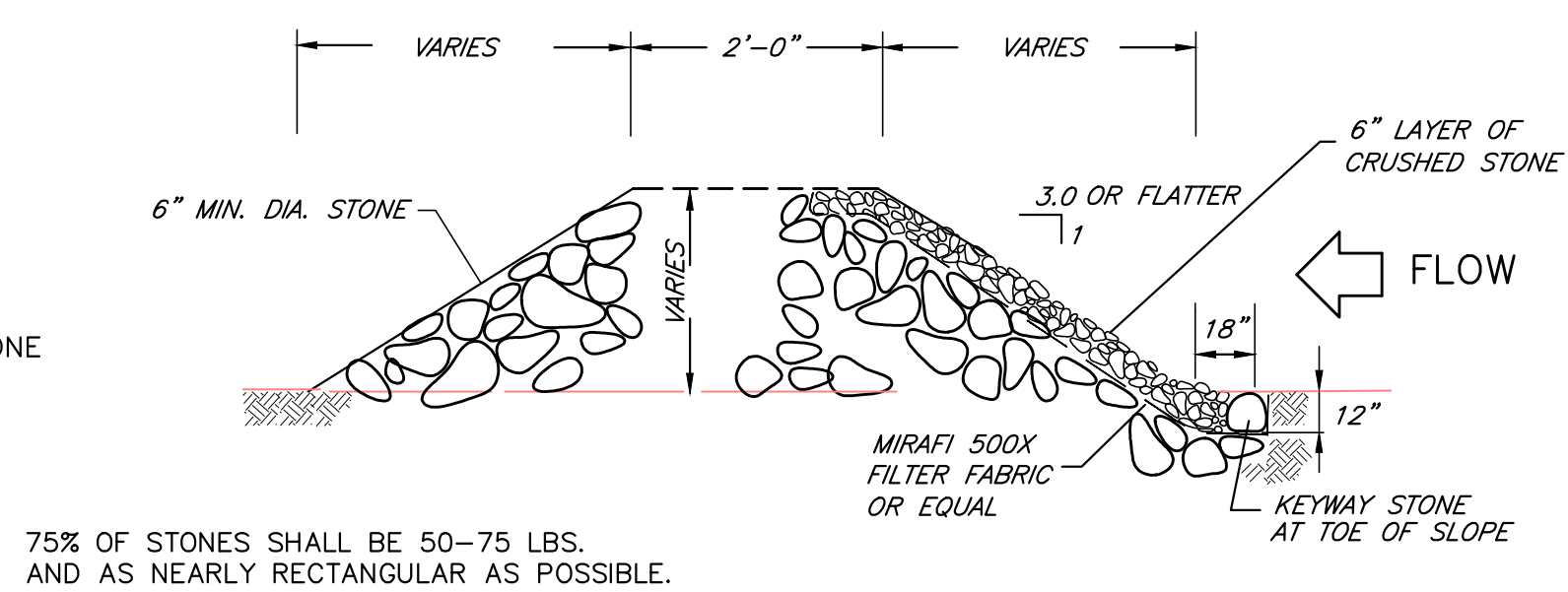
SITE PLAN
#715 WASHINGTON STREET
(ASSESSORS MAP F9 LOT 24)
PEMBROKE, MASSACHUSETTS

PREPARED FOR:
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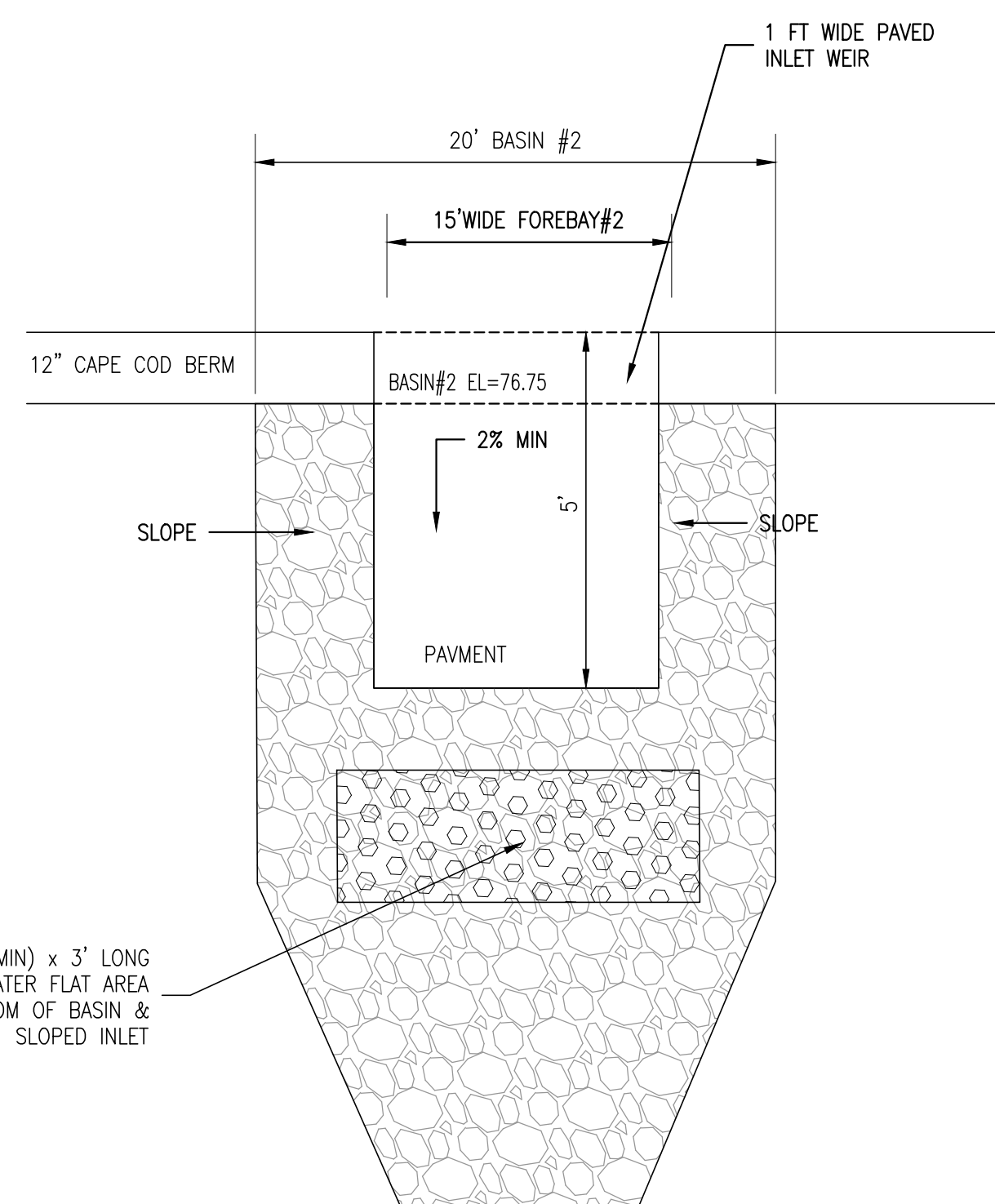
OCTOBER 27, 2021
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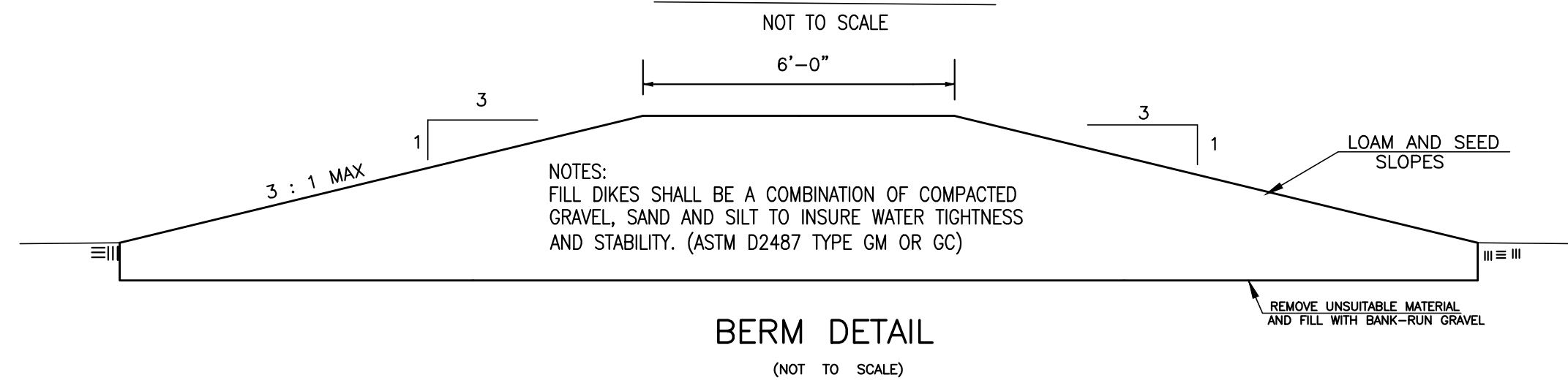
GRADY CONSULTING, L.L.C.
Civil Engineers and Land Surveyors
71 Evergreen Street, Suite 1, Kingston, MA 02364
Phone (781) 585-2300 Fax (781) 585-2378



DETAIL — CHECK DAM
(NOT TO SCALE)



BASIN DETAIL



BERM DETAIL
(NOT TO SCALE)

ELEVATION TABLE			
BASIN	BOTTOM BASIN	BASIN TOP BERM	GROUNDWATER
1	77.10	80.00	73.10(TH D-1) 2007-12-13
2	75.50	78.00	73.50(TH D-1) 2021-04-19

CONSTRUCTION NOTES

GENERAL:

1. THE ACCURACY OF THE EXISTING UTILITY LOCATIONS, DIMENSIONS AND LINES IS FROM EXISTING INFORMATION OF RECORD AND IS NOT WARRANTED. CONTRACTOR TO VERIFY PRIOR TO INITIATING CONSTRUCTION.
2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL SECURE ALL NECESSARY STATE, MUNICIPAL AND OTHER UTILITY PERMITS AND VERIFY THE PROPOSED LOCATIONS OF UTILITIES WITH UTILITY COMPANIES.
3. CONTRACTOR SHALL NOTIFY "DIG SAFE" (1-888-344-7233) AT LEAST 4 DAYS PRIOR TO CONSTRUCTION.
4. UNDERGROUND UTILITIES SHALL BE INSTALLED IN ACCORDANCE WITH THE SPECIFICATIONS OF THE APPROPRIATE DEPARTMENT OR COMPANY. THE CONTRACTOR SHALL NOTIFY THE PEMBROKE D.P.W. (293-5626) AT LEAST 4 DAYS PRIOR TO CONSTRUCTION OF DRAINAGE & WATER SYSTEMS.
5. THE CONTRACTOR SHALL BE SUBJECT TO THE FOLLOWING REGULATIONS, PLANS AND ORDINANCES, REGULATIONS, DPW SPECIFICATIONS, CONSERVATION COMMISSION REGULATIONS AND ALL OTHER APPLICABLE CODES.
6. ALL STORM SEWER BE DISPOSED OFF SITE AND SATISFY THE REQUIREMENTS OF THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

WATER SYSTEM NOTES:

1. ALL WATER SERVICES SHALL BE 1" TYPE 1" COPPER TUBING OR APPROVED EQUAL.
2. ALL CONSTRUCTION MATERIALS AND METHODS SHALL CONFORM TO TOWN OF PEMBROKE WATER DEPARTMENT REQUIREMENTS.
3. ALL WATER GATES SHALL BE MUELLER, OPEN LEFT.

EROSION CONTROL:

1. ALL CUT AND FILL AREAS, AND DISTURBED DRAINAGE AREAS ARE TO BE BROUGHT TO FINISHED GRADE WITH A MINIMUM OF 4" OF LOAM, SEEDED WITH A MIXTURE OF ANNUAL RYEGRASS AND PERENNIAL GRASSES, AND MAINTAINED UNTIL VEGETATION STABILIZES THESE AREAS.
2. HAY MULCH, OR OTHER SUITABLE EROSION PROTECTION, SHALL BE UTILIZED ON ALL EXPOSED SLOPES.

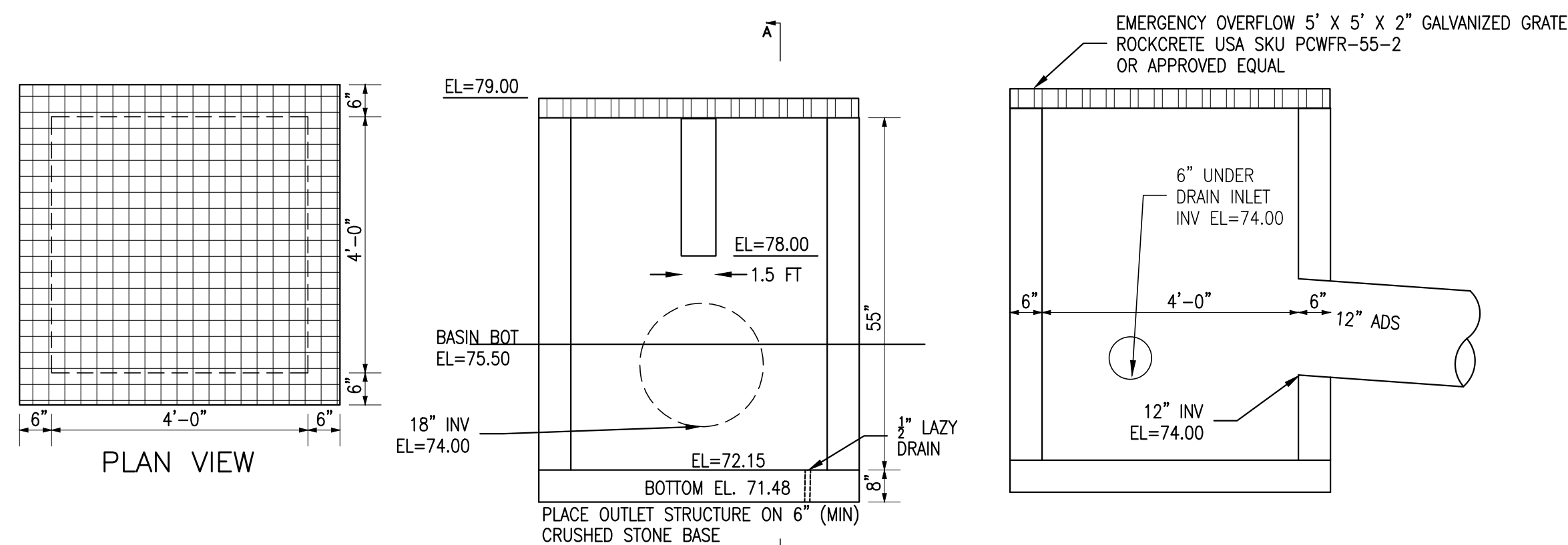
CONSTRUCTION SEQUENCE:

INSTALL SILT SOCK
GRADE SEDIMENT FOREBAY AND INFILTRATION BASIN

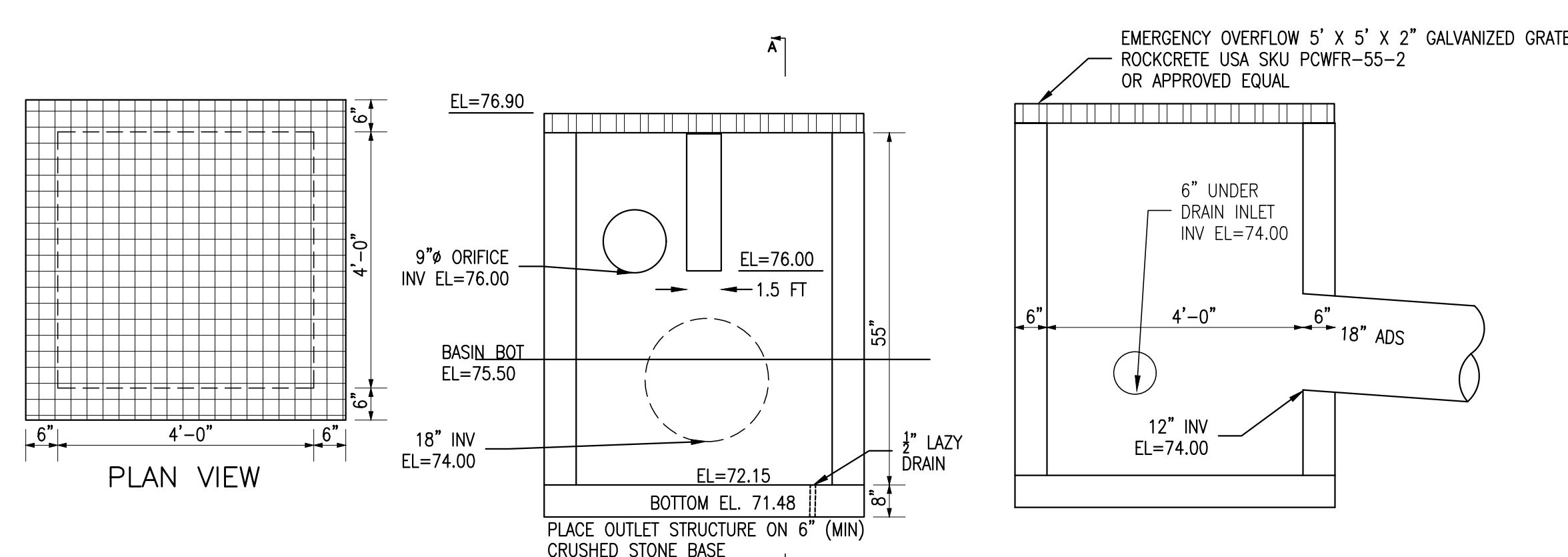
CLEAR AND GRUB SEDIMENT FOREBAY AND INFILTRATION BASIN
BRING CUT AREAS TO SUBGRADE
GRADE FOREBAY AND BASIN AS TEMPORARY SEDIMENT BARRIER DURING CONSTRUCTION

CONSTRUCT REMAINDER OF SITE

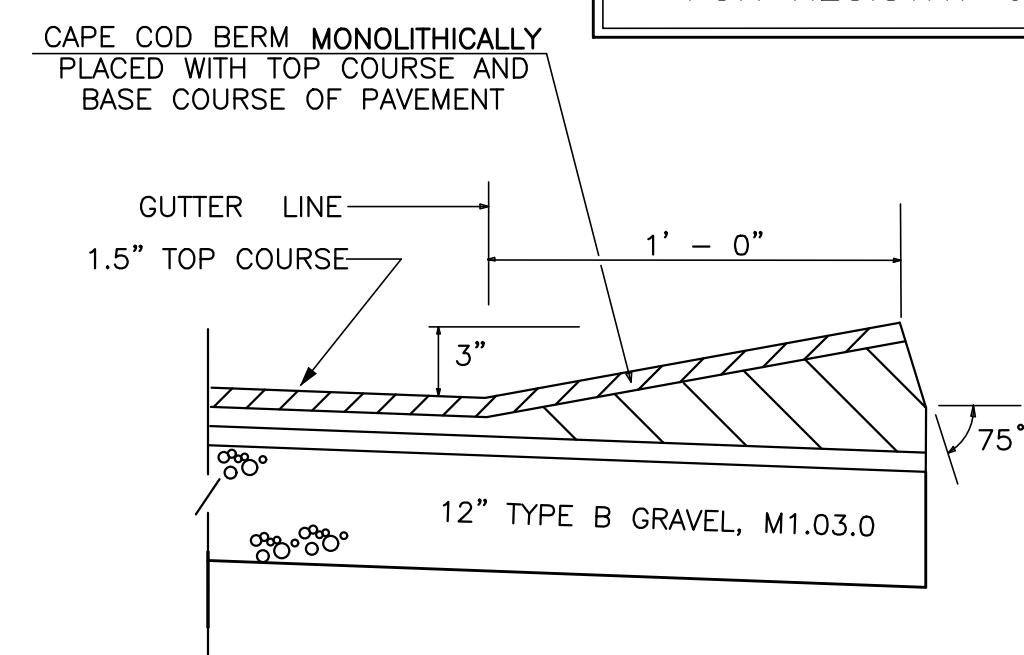
CLEAR AND GRUB SITE AREAS
BRING CUT AREAS TO SUBGRADE
INSPECT BASIN AFTER ALL STORMS AND AT LEAST MONTHLY DURING CONSTRUCTION AND REMOVE SEDIMENT
EXCAVATE FOUNDATION, FLOOR, STRIP AND BACKFILL
INSTALL UTILITIES (ie, DRAIN, WATER, ELECTRIC, etc.)
CATCH BASIN GRATES ARE TO BE SET AT BINDER GRADE
INSTALL EROSION CONTROLS ON EXPOSED SLOPES
PLACE BASE COURSE OF PAVEMENT / LOAM AND SEED GRASS AREAS INSTALL LANDSCAPING INCLUDING
FINISH PAVING ON ROADWAY



OUTLET CONTROL STRUCTURE-BASIN#1
(NOT TO SCALE)

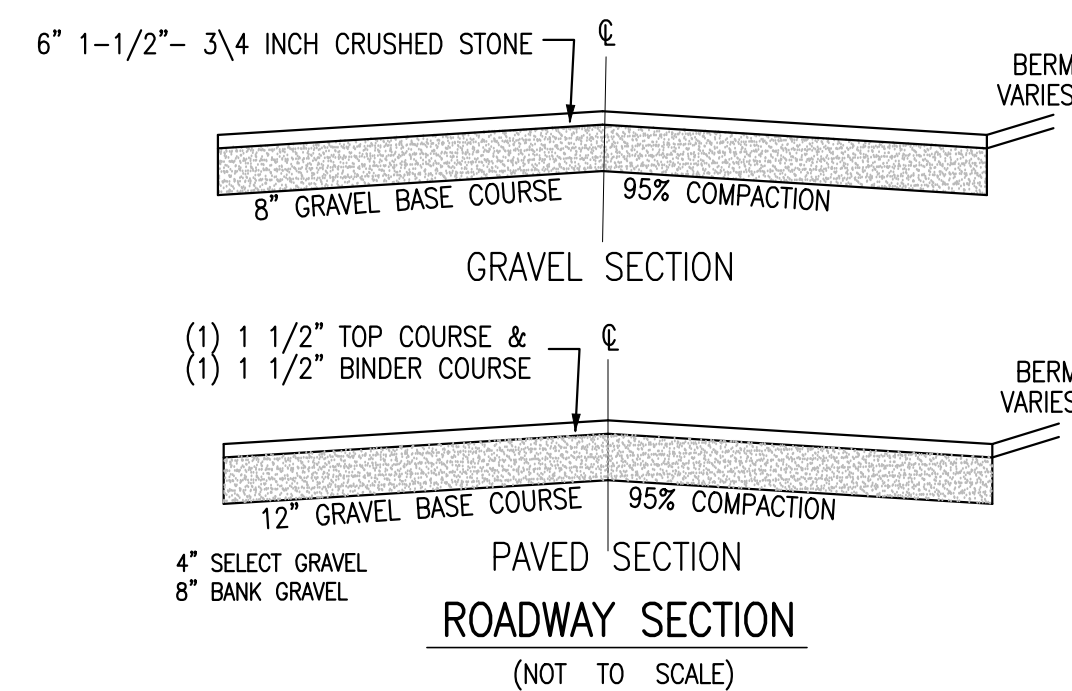


OUTLET CONTROL STRUCTURE-BASIN#2
(NOT TO SCALE)



CAPE COD BERM DETAIL

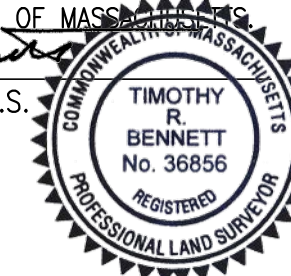
(NOT TO SCALE)



ENTRANCE CROSS SECTION DETAIL
SECTION A-A
(NOT TO SCALE)

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OF THE COMMONWEALTH OF MASSACHUSETTS.

TIMOTHY BENNETT P.L.S.



SITE PLAN

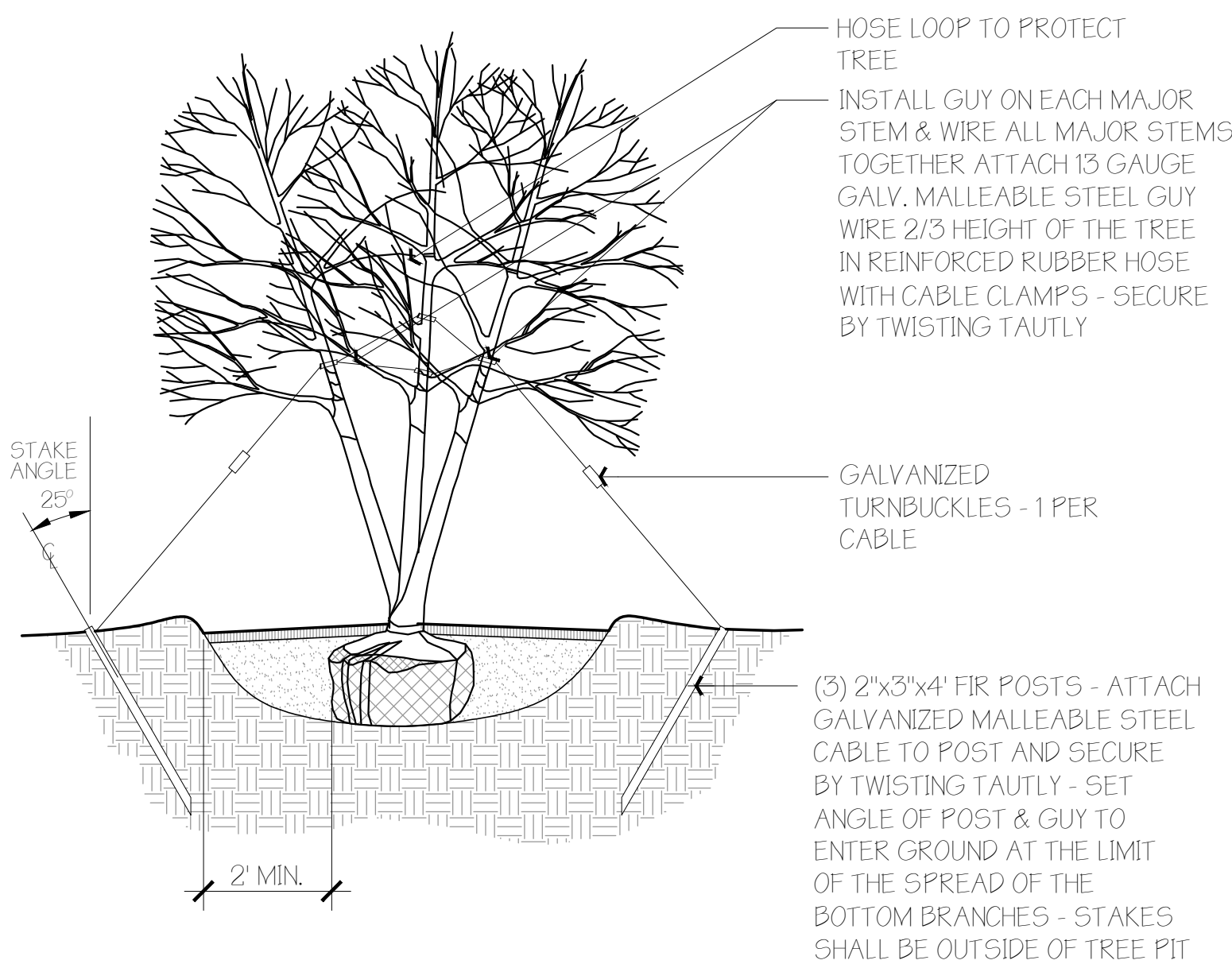
#715 WASHINGTON STREET
(ASSESSORS MAP F9 LOT 24

PEMBROKE, MASSACHUSETTS

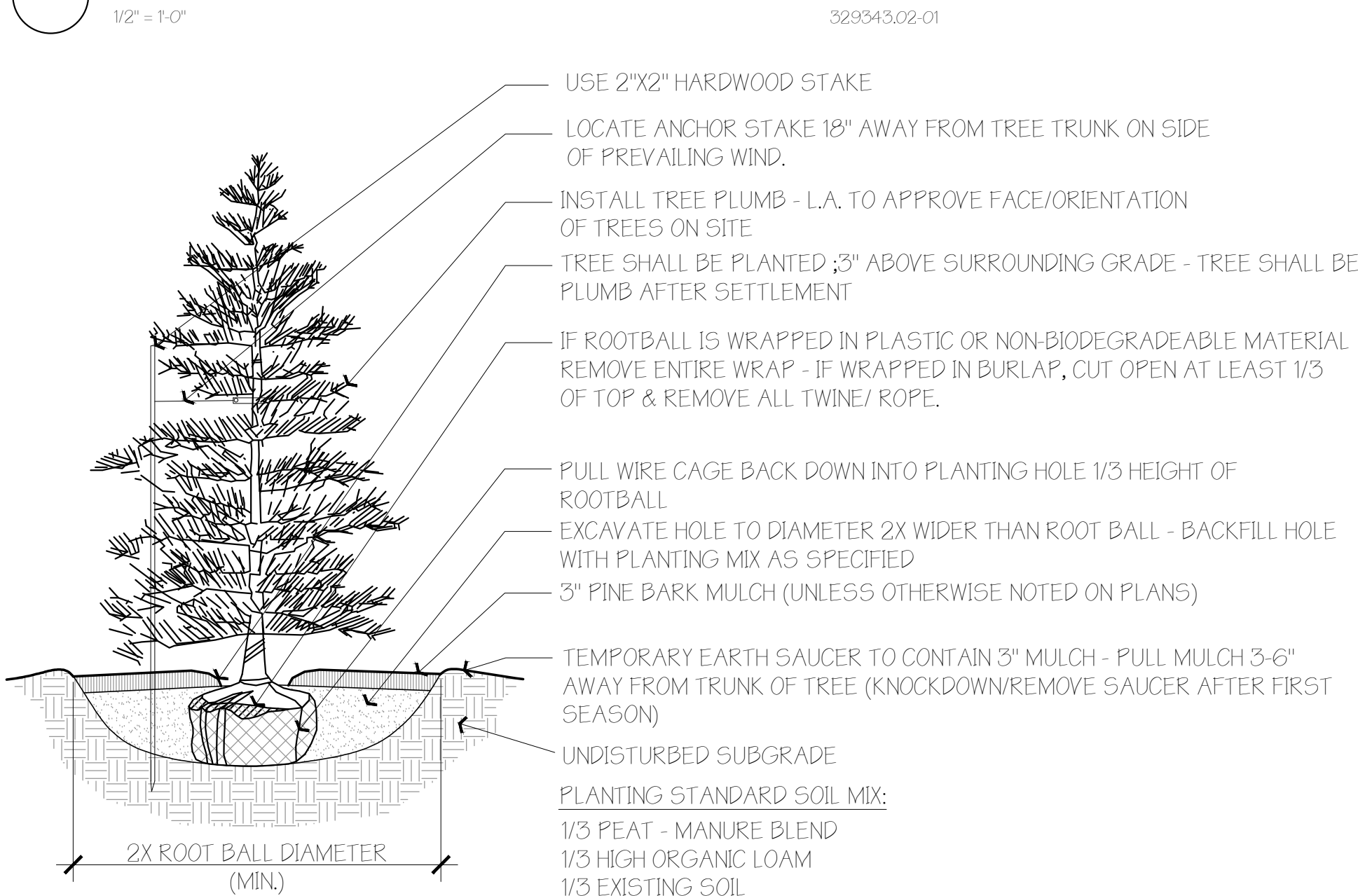
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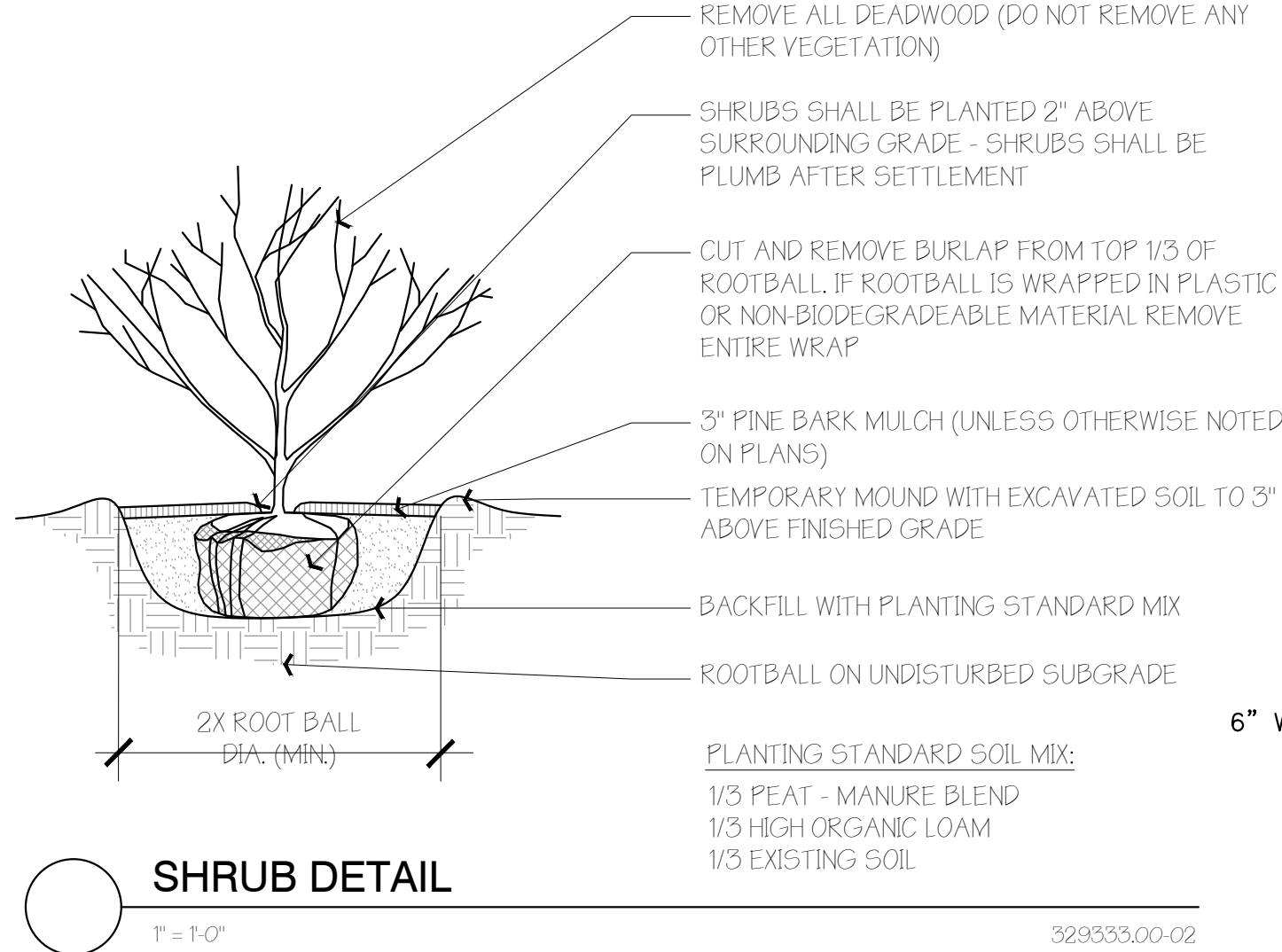
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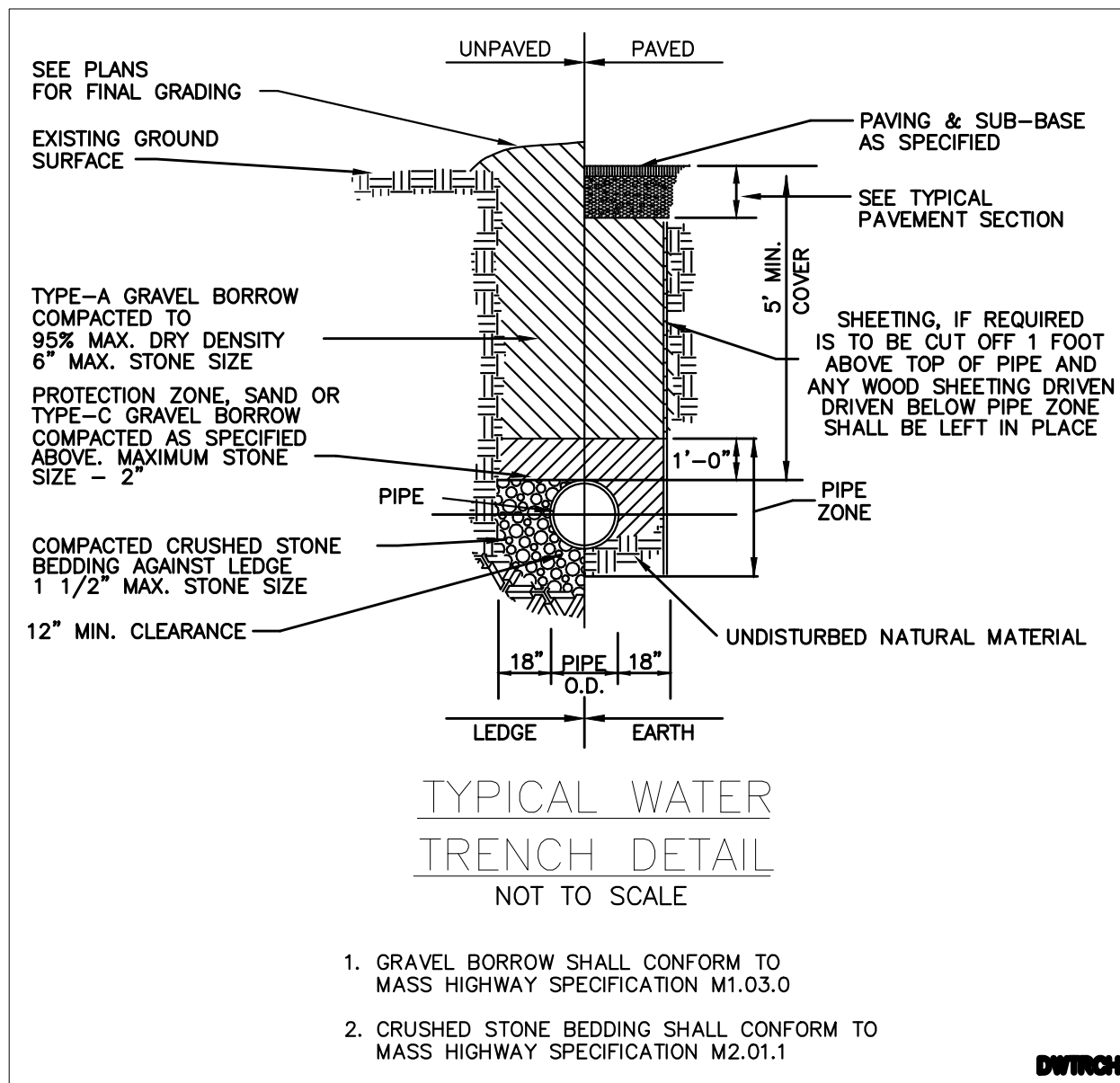
TREE GUYING DETAIL - MULTISTEM



EVERGREEN TREE DETAIL

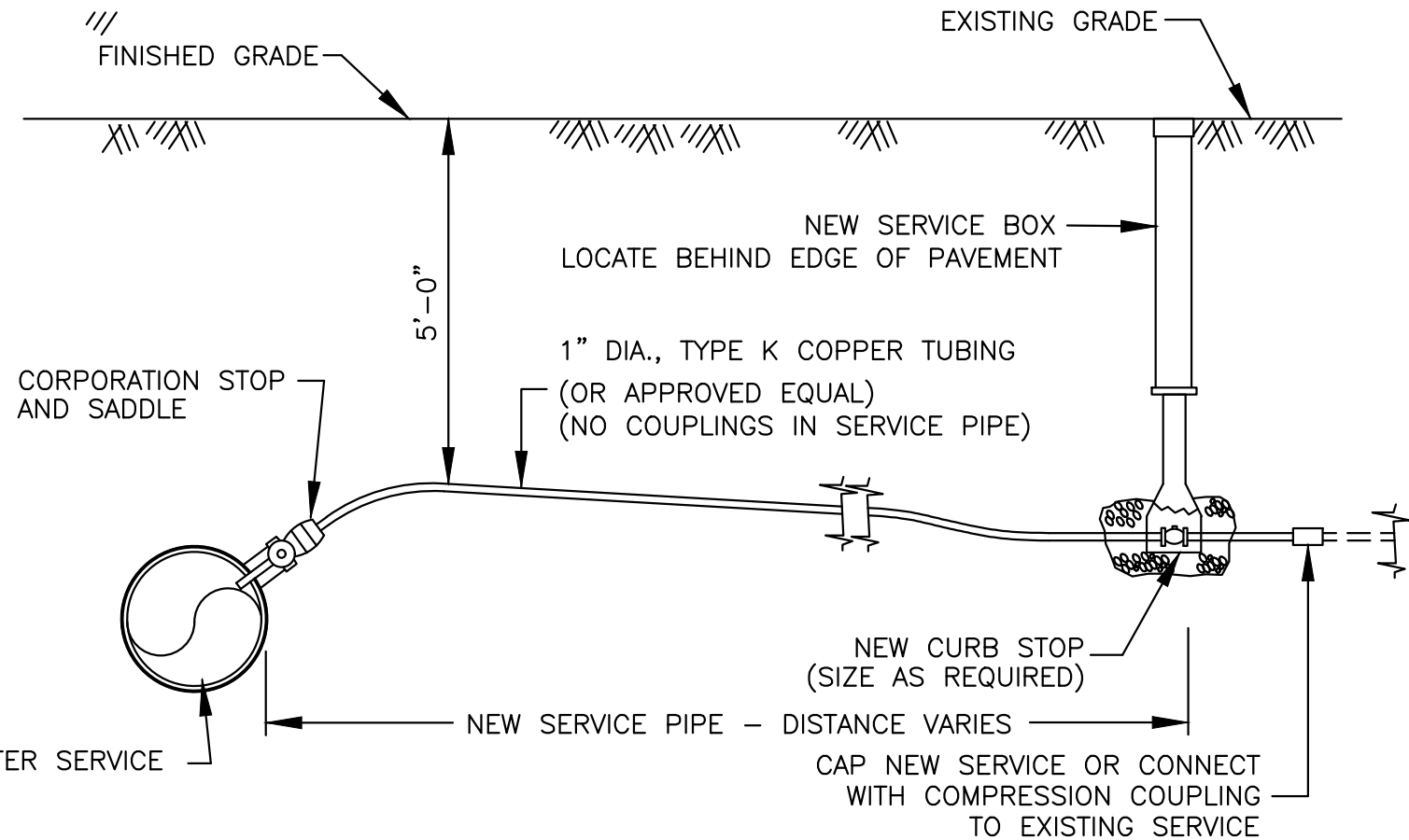


SHRUB DETAIL



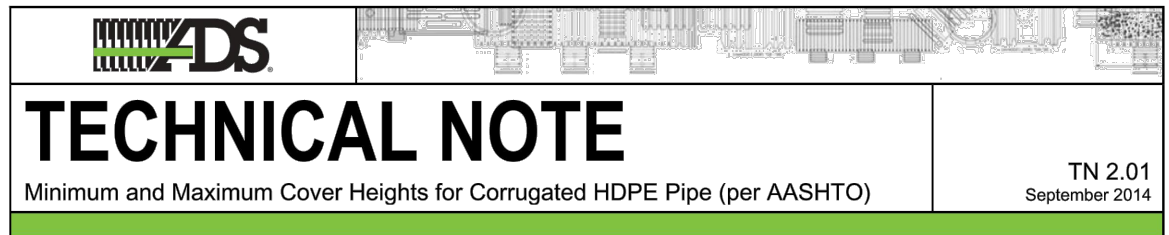
PLANTING NOTES

- 1) NOTIFY DIG-SAFE AND LOCAL AUTHORITIES PRIOR TO ANY TYPE OF SITE PREPARATION OR CONSTRUCTION.
- 2) ALL PLANTS TO HAVE THE SAME RELATIONSHIP TO FINISH GRADE AFTER SETTLEMENT AS TO THEIR ORIGINAL GRADE BEFORE DIGGING. LOCATE PLANT COLLAR TWO OR THREE INCHES HIGHER THAN PLANTING SOIL MIX TO INSURE CORRECT FINAL RELATIONSHIP.
- 3) APPLY AN APPROVED ANTI-DESSICANT TO ALL PLANTS IN LEAF AT PLANTING TIME, AND TO ALL EVERGREENS BEFORE THEIR FIRST WINTER.
- 4) FLOOD ALL PLANTS WITH CLEAN WATER TWICE IN THE FIRST 24 HOUR AFTER PLANTING. CONTRACTOR TO ARRANGE FOR ALL PLANTS TO BE PLANTED WITHIN THREE DAYS AFTER DELIVERY TO THE SITE UNLESS OTHERWISE APPROVED BY THE LANDSCAPE ARCHITECT.
- 5) NEVER CUT A LEADER.
- 6) TRIM ONLY BROKEN OR DEAD BRANCHES FROM EVERGREEN PLANTS.
- 7) THE CONTRACTOR SHALL SUPPLY ALL PLANT MATERIAL AND MULCH IN SUFFICIENT QUANTITIES TO COMPLETE PLANTING AS SHOWN ON THE DRAWINGS. DRAWING QUANTITIES TAKE PRECEDENCE OVER PLANT LIST QUANTITIES.
- 8) ALL PLANT MATERIAL SHALL CONFORM TO THE GUIDELINES BY "THE AMERICAN STANDARD FOR NURSERY STOCK," PUBLISHED BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
- 9) ALL TREES SHALL HAVE "BEST FACE" SIDE TAGGED AT NURSERY PRIOR TO DIGGING.
- 10) ALL PLANTS SHALL BE BALLED AND BURLAPPED OR CONTAINER GROWN, UNLESS OTHERWISE APPROVED BY THE LANDSCAPE ARCHITECT.
- 11) CONTRACTOR TO STAKE TREE LOCATIONS FOR APPROVAL BY LANDSCAPE ARCHITECT.
- 12) LANDSCAPE ARCHITECT TO APPROVE IN PLACE ALL SHRUBS, PERENNIALS AND VINES PRIOR TO PLANTING.
- 13) ALL TREES TO RECEIVE A MINIMUM OF THREE INCHES OF MULCH. ALL SHRUBS, VINES AND GROUND COVERS TO RECEIVE A MINIMUM OF TWO INCHES OF MULCH.
- 14) WHERE SPECIFIED, CALIPER SIZE TO BE OVERKING FACTOR IN TREE SELECTION.
- 15) STAKE OR GUY ALL TREES AND LARGE EVERGREEN MATERIAL.
- 16) CONTRACTOR TO PROVIDE TWO YEAR GUARANTEE ON ALL MATERIAL. CONTRACTOR TO MAINTAIN ALL PLANTING AND LAWNS UNTIL FINAL PROJECT ACCEPTANCE. GUARANTEE PERIOD TO BEGIN AT FINAL ACCEPTANCE.
- 17) ALL PLANT MATERIAL SHALL BE INSTALLED PRIOR TO FINAL TOP-DRESSING AND SODDING/SEEDING.
- 18) COORDINATE LANDSCAPE INSTALLATION WITH INSTALLATION OF UNDERGROUND SPRINKLER SYSTEM & LANDSCAPE LIGHTING (IF APPLICABLE).
- 19) NO PLANTING BEFORE THE ACCEPTANCE OF ROUGH GRADING.
- 20) CONTRACTOR TO PROVIDE SOIL TESTS IN AREAS DESIGNATED BY LANDSCAPE ARCHITECT IN FIELD FOR EXISTING SOILS TO DETERMINE APPROPRIATE SOIL AMENDMENTS PRIOR TO THE DISTURBANCE OF SITE.
- 21) ALL PLANTING BEDS TO BE TREATED WITH PREEN AND GREEN OR APPROVED EQUAL TO PROHIBIT WEED GERMINATION AND GROWTH PRIOR TO THE SPREADING OF MULCH.
- 22) ALL PERENNIALS ARE TO BE PLANTED INTO DAMP SOIL.
- 23) PLANT LIST: A COMPLETE LIST OF PLANTS INCLUDING A SCHEDULE OF QUANTITIES, SIZES, TYPES AND NAMES IS INCLUDED IN THIS SET OF DRAWINGS. IN THE EVENT OF DISCREPANCIES BETWEEN QUANTITIES OF PLANTS IN THE PLANT LIST AND THE QUANTITIES SHOWN ON THE DRAWINGS, THE PLAN SHALL GOVERN. WHEN MULTIPLE PLANT SPECIES ARE LISTED IN ONE PLANT CATEGORY, THE GOAL IS TO PROVIDE THE BEST PLANTS AVAILABLE AT THE TIME OF INSTALLATION. GRADY CONSULTING SHALL SELECT OR COORDINATE THE SELECTION OF THE APPROPRIATE PLANTS AT LOCAL NURSERIES. GRADY CONSULTING HAS THE RIGHT TO REJECT ANY PLANT THAT DOES NOT MEET THE SPECIFICATIONS LISTED IN THE PLANT TABLE.
- 24) PLANT SUBSTITUTION ARE NOT ALLOWED UNLESS APPROVED BY GRADY CONSULTING.
- 25) ALL DISTURBED AREAS TO BE LOAMED AND SEEDED AND BLENDED INTO EXISTING GRADE AND CONDITIONS (REFER TO ENGINEER'S SOIL STABILIZATION AND EROSION CONTROL PLAN FOR FURTHER INFORMATION).



1. SERVICES SHALL CONSIST OF COPPER TUBING, A CORPORATION COCK AT THE MAIN, A CURB STOP AND CURB BOX AT THE PROPERTY LINE AND AN INSIDE VALVE AND METER ON THE OWNERS PREMISES.
2. ALL SERVICE PIPE SHALL BE OF TYPE "K" COPPER TUBING, THE SIZE TO BE DETERMINED BY THE DEPARTMENT.
3. SERVICE PIPE SHALL BE PLACED FIVE FEET BELOW FINAL GRADE.
4. SERVICE BOXES SHALL BE CENTERED OVER THE CURB STOP AND SET FLUSH WITH THE GROUND SURFACE.
5. CONNECTIONS TO WATER MAINS SHALL BE DONE BY THE DEPARTMENT. A SERVICE CHARGE WILL BE LEVED FOR THIS SERVICE.
6. NO PIPE OR FITTING SHALL BE BACKFILLED BEFORE INSPECTION BY A PERSON DESIGNATED BY THE DEPARTMENT.
7. ALL DAMAGE OF WHATEVER NATURE RESULTING FROM THE WORK, OR RESULTING TO THE WORK FROM WHATEVER CAUSE SHALL BE BORNE AND SUSTAINED BY THE CONTRACTOR.
8. DAMAGES TO ANY EXISTING UNDERGROUND STRUCTURE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
9. NO WATER SERVICE SHALL BE INSTALLED NEARER THAN 10 FEET TO ANY SEPTIC TANK, CESSPOOL, LEACHING FIELD DRAINAGE PIT, SEWER LINE OR DRAIN LINE AS PER DEP 310 CMR, SECTION 15.211.
10. THE CONTRACTOR WILL HAVE AN APPROVED STREET OPENING PERMIT FROM THE PEMBROKE DEPARTMENT OF PUBLIC WORKS (THE DEPARTMENT) PRIOR TO THE START OF ANY WORK PERFORMED IN A PUBLIC WAY. A SERVICE LINE INSTALLED BY A PRIVATE CONTRACTOR IN A PUBLIC WAY MUST BE GUARANTEED FOR ONE YEAR FROM THE DATE OF COMPLETION. THE CONTRACTOR SHALL REPAIR ANY SETTLEMENT OF THE TRENCH PAVEMENT BY A METHOD APPROVED BY THE DEPARTMENT AND AT HIS OWN EXPENSE FOR THE SAME ONE-YEAR PERIOD STARTING FROM THE DATE OF COMPLETION.

1"Ø DOMESTIC WATER SERVICE DETAIL



Introduction

The information in this document is designed to provide answers to general cover height questions; the data provided is not intended to be used for project design. The design procedure described in the Structures section (Section 2) of the Drainage Handbook provides detailed information for analyzing most common installation conditions. This procedure should be utilized for project specific designs.

The two common cover height concerns are minimum cover in areas exposed to vehicular traffic and maximum cover heights. Either may be considered "worst case" scenario from a loading perspective, depending on the project conditions.

Minimum Cover in Traffic Applications

Pipe diameters from 4- through 48-inch (100-1200 mm) installed in traffic areas (AASHTO H-25 or HS-25 loads) must have at least one foot (0.3m) of cover over the pipe crown, while 54- and 60-inch (1350 and 1500 mm) pipes must have at least 24 inches (0.6m) of cover. The backfill envelope must be constructed in accordance with the Installation section (Section 5) of the Drainage Handbook and the requirements of ASTM D2321. The backfill envelope must be of the type and compaction listed in Appendix A-5, Table A-5-2 of the Drainage Handbook. In Table 1 below, this condition is represented by a Class III material compacted to 90% standard Proctor density, although other material can provide similar strength at slightly lower levels of compaction. Structural backfill material should extend six inches (0.15m) over the crown of the pipe; the remaining cover should be appropriate for the installation and as specified by the design engineer. If settlement or rutting is a concern, it may be appropriate to extend the structural backfill to grade. Where pavement is involved, sub-base material can be considered in the minimum burial depth. While rigid pavements can be included in the minimum cover, the thickness of flexible pavements should not be included in the minimum cover.

Additional information that may affect the cover requirements is included in the Installation section (Section 5) of the Drainage Handbook. Some examples of what may need to be considered are temporary heavy equipment, construction loading, paving equipment and similar loads that are less than the design load, the potential of pipe flotation, and the type of surface treatment which will be installed over the pipe zone.

Table 1 Minimum Cover Requirements for ADS N-12 [®] , N-12 ST, and N-12 WT (per AASHTO) with AASHTO H-25 or HS-25 Load					
Inside Diameter, ID, in.(mm)	Minimum Cover, ft. (m)	Inside Diameter, ID, in.(mm)	Minimum Cover, ft. (m)	Inside Diameter, ID, in.(mm)	Minimum Cover, ft. (m)
4 (100)	1 (0.3)	24 (600)	1 (0.3)	48 (1200)	2 (0.6)
6 (150)	1 (0.3)	30 (750)	1 (0.3)		
8 (200)	1 (0.3)	36 (900)	1 (0.3)		
10 (250)	1 (0.3)	42 (1050)	1 (0.3)		
12 (300)	1 (0.3)	48 (1200)	1 (0.3)		
16 (400)	1 (0.3)	54 (1350)	2 (0.6)		
18 (450)	1 (0.3)	60 (1500)	2 (0.6)		

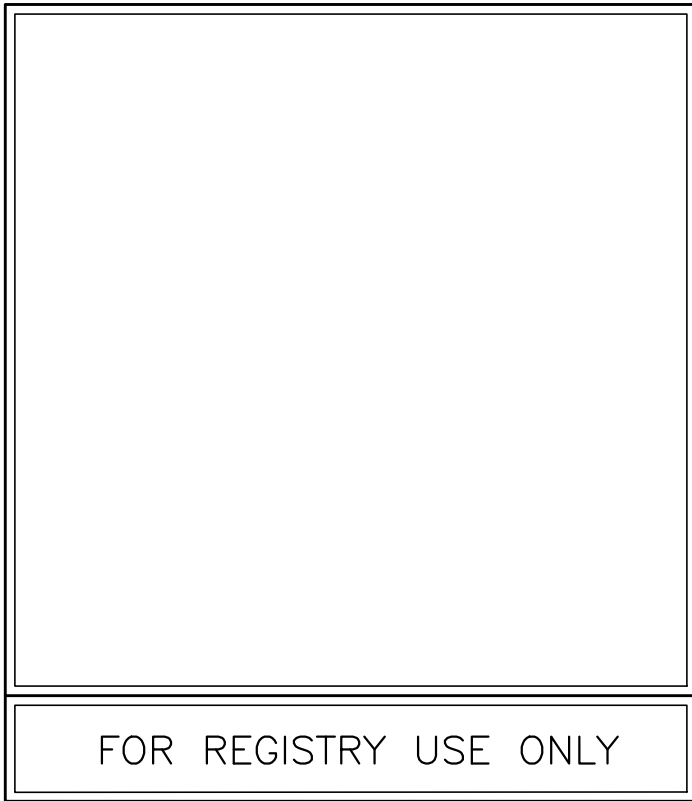
Note: Minimum covers presented here were calculated assuming Class III backfill material compacted to 90% standard Proctor density around the pipe and a minimum of 6-inches (0.15m) structural backfill over the pipe crown, as recommended in Section 5 of the Drainage Handbook, with an additional layer of compacted traffic lane sub-base for a total cover as required. In shallow traffic installations, especially where pavement is involved, a good quality compacted material to grade is required to prevent surface settlement and rutting.

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ALL DRAIN PIPE TO BE ADS N-12
EQUIVALENT OR APPROVED EQUAL

DRAIN PIPE DETAIL

(NOT TO SCALE)



WATER SUPPLY NOTES

1. THERE SHALL BE NO PHYSICAL CONNECTION BETWEEN A PUBLIC OR PRIVATE POTABLE WATER SUPPLY SYSTEM AND A SEWER, OR APPURTENANCE THERETO WHICH WOULD PERMIT THE PASSAGE OF ANY WASTEWATER OR POLLUTED WATER INTO THE POTABLE SUPPLY.
2. THE SEWER MAY BE LAID CLOSER THAN 10 FEET TO A WATER MAIN PROVIDED THAT IT IS
 - A. LAID IN A SEPARATE TRENCH, AND
 - B. THE ELEVATION OF THE TOP(CROWN) OF THE SEWER IS AT LEAST 18 INCHES BELOW THE BOTTOM(INVERT) OF THE WATER MAIN.
3. WHENEVER SEWERS MUST CROSS UNDER WATER MAINS, THE SEWER SHALL BE LAID AT SUCH AN ELEVATION THAT THE TOP OF THE SEWER IS AT LEAST 18 INCHES BELOW THE BOTTOM OF THE WATER MAIN. WHEN THE ELEVATION OF THE SEWER CANNOT BE VARIED TO MEET THIS REQUIREMENT, THE WATER MAIN SHALL BE RELOCATED TO PROVIDE THIS SEPARATION OR RECONSTRUCTED WITH MECHANICAL JOINT PIPE FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE SEWER. ONE FULL LENGTH OF WATER MAIN SHOULD BE CENTERED OVER THE SEWER SO THAT BOTH JOINTS WILL BE AS FAR FROM THE SEWER AS POSSIBLE.
4. WHEN IT IS IMPOSSIBLE TO OBTAIN PROPER HORIZONTAL AND VERTICAL SEPARATION AS STIPULATED ABOVE, BOTH THE WATER MAIN AND SEWER SHALL BE CONSTRUCTED OF MECHANICAL JOINT CAST IRON PIPE AND SHALL BE PRESSURE TESTED TO ASSURE WATERTIGHTNESS.

SPECIFICATIONS

1. ALL WATER MAIN PIPE SHALL BE MANUFACTURED IN ACCORDANCE WITH A WW A C 151. PIPE SHALL BE DUCTILE IRON, THICKNESS CLASS 52. THE INSIDE OF THE PIPE SHALL BE GIVEN A CEMENT LINING AND ASPHALTIC SEAL COAT IN ACCORDANCE WITH A WW A C 104.
2. ALL INSTALLED WATER PIPE SHALL HAVE FIVE FEET OF COVER MEASURED AT FINAL GRADE.
3. GENERALLY, NO PIPE SMALLER THAN EIGHT INCHES IN INTERNAL DIAMETER SHALL BE UTILIZED FOR WATER MAINS CONNECTED TO A HYDRANT.
4. ALL FITTINGS SHALL BE MECHANICAL JOINT, CONFORM TO THE REQUIREMENTS OF A WW A CL 10 OR C153, AND BE CAPABLE OF WITHSTANDING 250 PSI.
5. TAPPING SLEEVES SHALL HAVE STAINLESS STEEL WRAP TEES.
6. ALL VALVES AND FITTINGS SHALL BE BRACED AGAINST MOVEMENT UTILIZING APPROVED JOINT RESTRAINT SYSTEMS (I.E. MEGALUG® FITTINGS SERIES 1100 OR APPROVED EQUAL).
7. WATER VALVES SHALL BE RESILIENT WEDGE TYPE GATE VALVES MANUFACTURED TO AWWA C509 STANDARDS. VALVES SHALL OPEN RIGHT (CLOCKWISE). ALL VALVES THAT ARE 16 INCHES IN SIZE OR GREATER, SHALL BE BUTTERFLY VALVES. BUTTERFLY VALVES SHALL BE IN ACCORDANCE WITH "RUBBER SEATED BUTTERFLY VALVES", AWWA DESIGNATION C504. ALL GATE VALVES AND BUTTERFLY VALVES SHALL BE MANUFACTURED BY MUELLER CO.
8. GATE BOXES SHALL BE SET PLUMB AND FLUSH WITH THE GROUND SURFACE AND CONFORM TO A WWA C500. GATE VALVE BOXES SHALL BE EQUIPPED WITH PAVEMENT FLANGE.
9. NO PIPE OR FITTING SHALL BE BACKFILLED BEFORE INSPECTION BY A PERSON DESIGNATED BY THE WATER DEPARTMENT.
10. HYDRANTS SHALL CONFORM TO THE REQUIREMENTS OF AWWA C502. HYDRANTS SHALL BE SET PLUMB, WITH THE STEAMER NOZZLE FACING THE ROAD. THE AREA AROUND THE DRIPS SHALL BE FILLED WITH CLEAN STONE. APPROVED JOINT RESTRAINT FITTINGS SHALL BE UTILIZED FOR HYDRANT INSTALLATION. HYDRANTS SHALL BE PLACED SO THAT THEY ARE WITHIN ONE FOOT OF THE PROPERTY LINE AND SHALL BE THE 5 1/4 CENTURION MODEL AS MANUFACTURED BY MUELLER COMPANY.
11. THE COMPLETED WATER MAIN SHALL BE CHLORINATED BY USING ONE PART SOLUTION OF AVAILABLE CHLORINE IN SUCH VOLUME THAT THE RATE OF DOSAGE OF THE WATER CONTENT OF THE MAIN SHALL BE AT LEAST FIFTY PARTS PER MILLION AVAILABLE CHLORINE. THE CONTACT PERIOD SHALL BE AT LEAST TWENTY-FOUR HOURS, LONGER IF THE TEST FOR RESIDUAL CHLORINE INDICATES THAT IT IS NECESSARY FOR PROPER DISINFECTION. WATER MAIN DISINFECTION SHALL BE IN ACCORDANCE WITH AN APPROVED A WW A METHOD FOR DISINFECTING WATER MAINS. THE DEPARTMENT WILL TAKE BACTERIA SAMPLES AND PERFORM ANALYSIS. THE CUSTOMER SHALL BE RESPONSIBLE FOR FLUSHING AND PRESSURE TESTING NEW WATER MAIN. NO WATER MAIN SHALL BE PLACED INTO SERVICE UNTIL THE DEPARTMENT HAS GIVEN APPROVAL.
12. ALL DAMAGES OF WHATEVER NATURE RESULTING FROM THE WORK OR RESULTING TO THE WORK, FROM WHATEVER CAUSE SHALL BE BORNE AND SUSTAINED BY THE CONTRACTOR.
13. DAMAGE TO ANY EXISTING UNDERGROUND STRUCTURE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
14. PRESSURE TESTS OF THE NEW WATER MAIN SHALL BE CARRIED OUT AT 150 POUNDS GAUGE FOR ONE HOUR. LEAKAGE TESTS SHALL BE PERFORMED IF THE PRESSURE DROPS AFTER THE ONE HOUR TIME PERIOD. THE RATE OF LEAKAGE SHALL NOT EXCEED ONE GALLON PER DAY PER LINEAR FOOT OF JOINT.
15. THE CONTRACTOR SHALL GUARANTEE ALL MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR AFTER THE COMPLETION OF STRENGTH AND LEAKAGE TESTS.
16. IN THE CASE WHERE THE TOWN OF PEMBROKE SUPPLIES WATER TO INDIVIDUAL HOUSES IN A DEVELOPMENT AND AFTER ALL THE FOREGOING CONDITIONS HAVE BEEN MET, AND BEFORE THE TOWN ACCEPTS THE ROAD OR ROADS AND/OR UTILITIES, THE OWNER OF THE DEVELOPMENT SHALL PAY, AT COST, FOR- ANY REPAIRS TO THE MAINS AND APPURTENANCES WHICH MAY BECOME NECESSARY.
17. THE WATER MAIN SHOULD HAVE A MINIMUM OF 18" OF CLEARANCE BETWEEN ANY UTILITIES WHETHER RUNNING PARALLEL OR CROSSING A UTILITY.
18. THE WATER MAIN, FITTINGS AND HYDRANTS LATERALS SHALL BE POLYETHYLENE ENCASED WITH V-BIO IN ANY INSTANCE THE WATER SYSTEM APPURTENANCES MAY BE INSTALLED WITHIN THE SEASONAL HIGH GROUND WATER.

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

TIMOTHY BENNETT P.L.S.



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