

LOCATION MAP

SCALE: 1"=2083'±

RECORD OWNER:
ASSESSOR ID F15-38 - OAK STREET
FREDERICK J. TOMASI
299 OAK STREET
PEMBROKE MA, 02359
DEED BOOK 10600 PAGE 315

ZONE: BUSINESS B
EXISTING USE: BUSINESS OFFICE
PROPOSED USE: BUSINESS OFFICE
PARCEL SIZE: 43,865 S.F.

DIMENSIONAL REQUIREMENTS:			
	REQUIRED	EXISTING	PROPOSED
LOT AREA	80,000 S.F.	43,865 S.F.	43,865 S.F.
LOT AREA (UPLAND)	70,000 S.F.	43,865 S.F.	43,865 S.F.
LOT FRONTAGE	200 FT	296.7 FT	296.7 FT
LOT WIDTH	135 FT	256.6 FT	256.6 FT
FRONT YARD	60 FT	94.9 FT	60.0 FT
SIDE YARD	30 FT	67.9 FT	30.0 FT
REAR YARD	40 FT	37.6 FT	40.8 FT
LOT PERIMETER RATIO	>44	49	49
BUILDING FLOOR AREA	35%(15,352 SF)	985 SF (2.2%)	3,960 SF (8.1%)
COVERAGE (IMPERVIOUS SITE)	60%(33,219 SF)	8,538 SF (19.4%)	22,052 SF (50.3%)
BUILDING HEIGHT	3 STORIES	1.5 STORIES	2 STORIES

PARKING 4.2.b 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

	REQUIRED	PROPOSED
12 EMPLOYEES * 1SP\3 EMPLOYEES	4 SP	
4800 SF BUILDING * 1SP\150 SF	32 SP	37 SP

VARIANCE REQUESTS (ZONING BOARD OF APPEALS):
PRE-EXISTING NON-CONFORMING LOT (AREA AND FRONTAGE) - APPROVED AT MAY 6, 2019 ZONING BOARD OF APPEALS MEETING

IV.4.D.1. LOT SIZES
IV.4.D.5. SIDE YARDS: NO BUILDING, STRUCTURE, OR PAVED AREA SHALL BE ERRECTED WITHIN THIRTY FEET OF THE SIDE LOT LINES.
IV.4.D.6. REAR YARDS: NO BUILDING, STRUCTURE, OR PAVED AREA SHALL BE ERRECTED WITHIN FORTY FEET OF THE REAR LOT LINE.

SITE PLAN REQUIRED (7.A.3. PLANNING BOARD IS THE SITE PLAN APPROVING AUTHORITY)

WAIVER REQUESTS (PLANNING BOARD):
IV.4.22 TRAFFIC STUDY
V.5.1.2 3 FT WIDE LANDSCAPING STRIP ALONG ALL FOUNDATION WALLS
V.5.4 PARKING & LOADING
PARKING TO BE LOCATED BETWEEN THE PROPOSED BUILDING AND STREET LAYOUT.
CURBING TO BE CAPE COD BERM AT ACCESS DRIVE RADI
V.5.6.2 CURBING SHALL NOT BE BITUMINOUS CONCRETE
V.5.7.1 ACCESS CONNECTION SPACING
V.5.7.2 WIDTH OF ACCESS CONNECTION
V.5.7.3 45 FT DEPTH BETWEEN THE PROPERTY LINE AND THE BEGINNING OF ANY PARKING AREAS.

PEMBROKE PLANNING BOARD

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

DATE APPROVED: _____

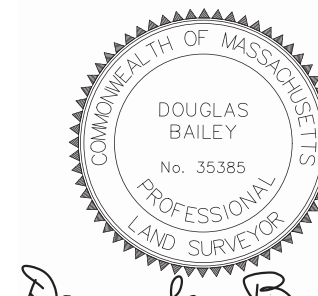
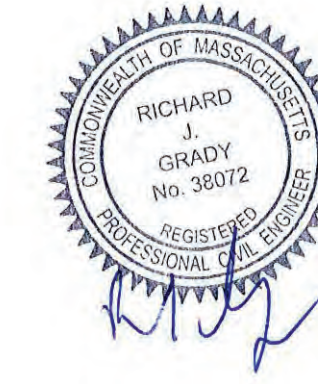
DATE SIGNED: _____

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: _____



Douglas Bailey
DOUGLAS BAILEY P.L.S. #35385

SITE PLAN

#345 OAK STREET
PEMBROKE, MASSACHUSETTS

PREPARED FOR:
CHAMPION BUILDERS INC
P.O. BOX 1414
DUXBURY, MA 02331

MAY 30, 2019
SCALE: 1"=20'
JOB No. 18-365

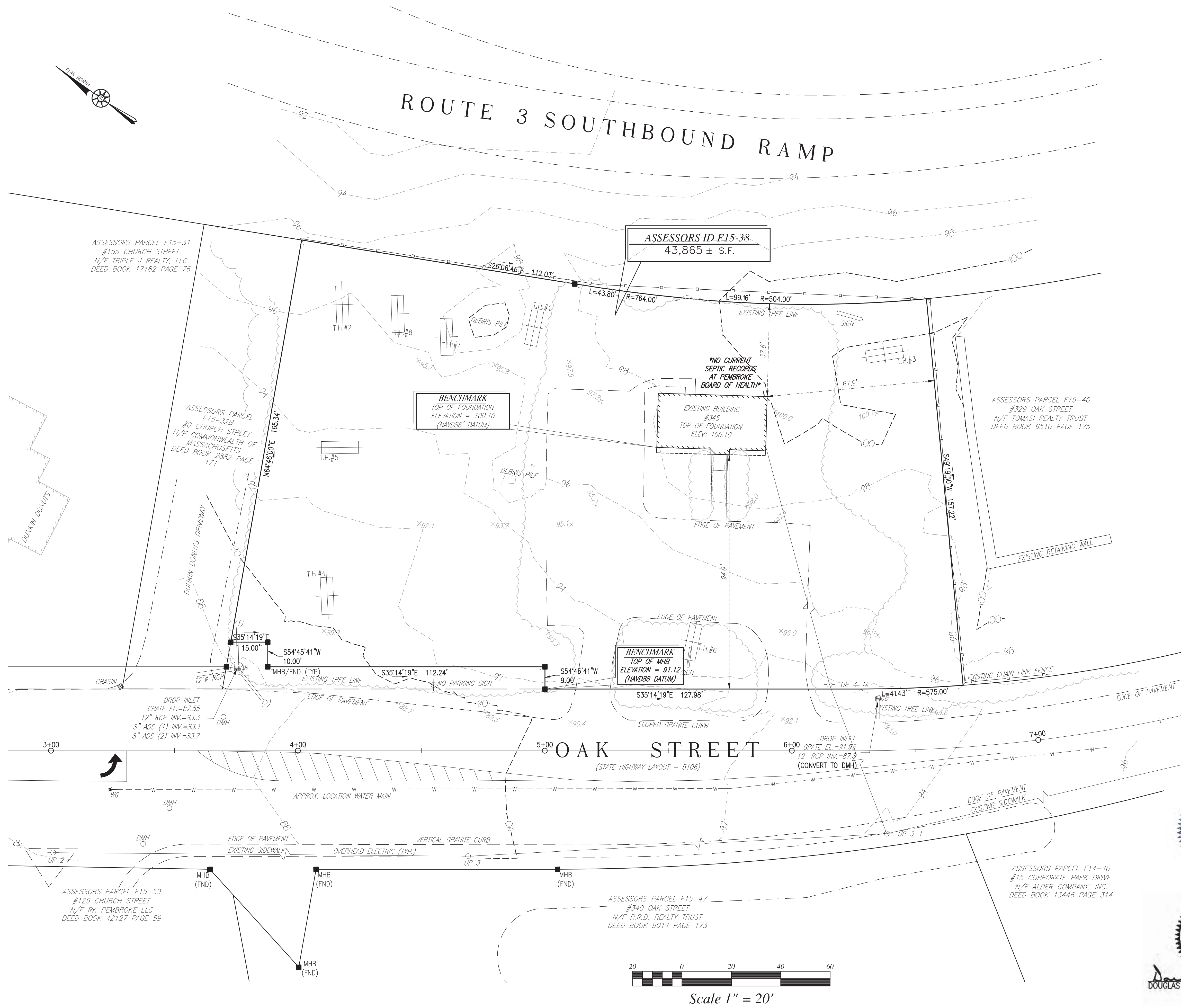
GRADY CONSULTING, L.L.C.
Civil Engineers, Land Surveyors &
Landscape Architects
71 Evergreen Street, Suite 1, Kingston, MA 02364
Phone (781) 585-2300 Fax (781) 585-2378

SHEET INDEX

SHEET 1	COVER / ZONING
SHEET 2	EXISTING CONDITIONS
SHEET 3	PROPOSED SITE PLAN
SHEET 4	SEPTIC
SHEET 5	DETAILS (PARKING)
SHEET 6	DETAILS (WATER)
SHEET 7	LANDSCAPE



Scale 1" = 20'



REAR



LEFT



FRONT RIGHT

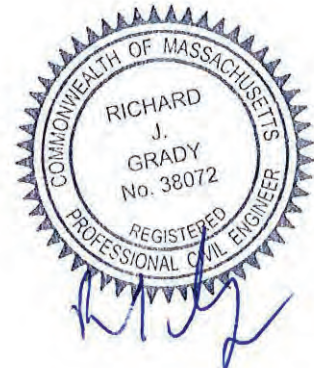
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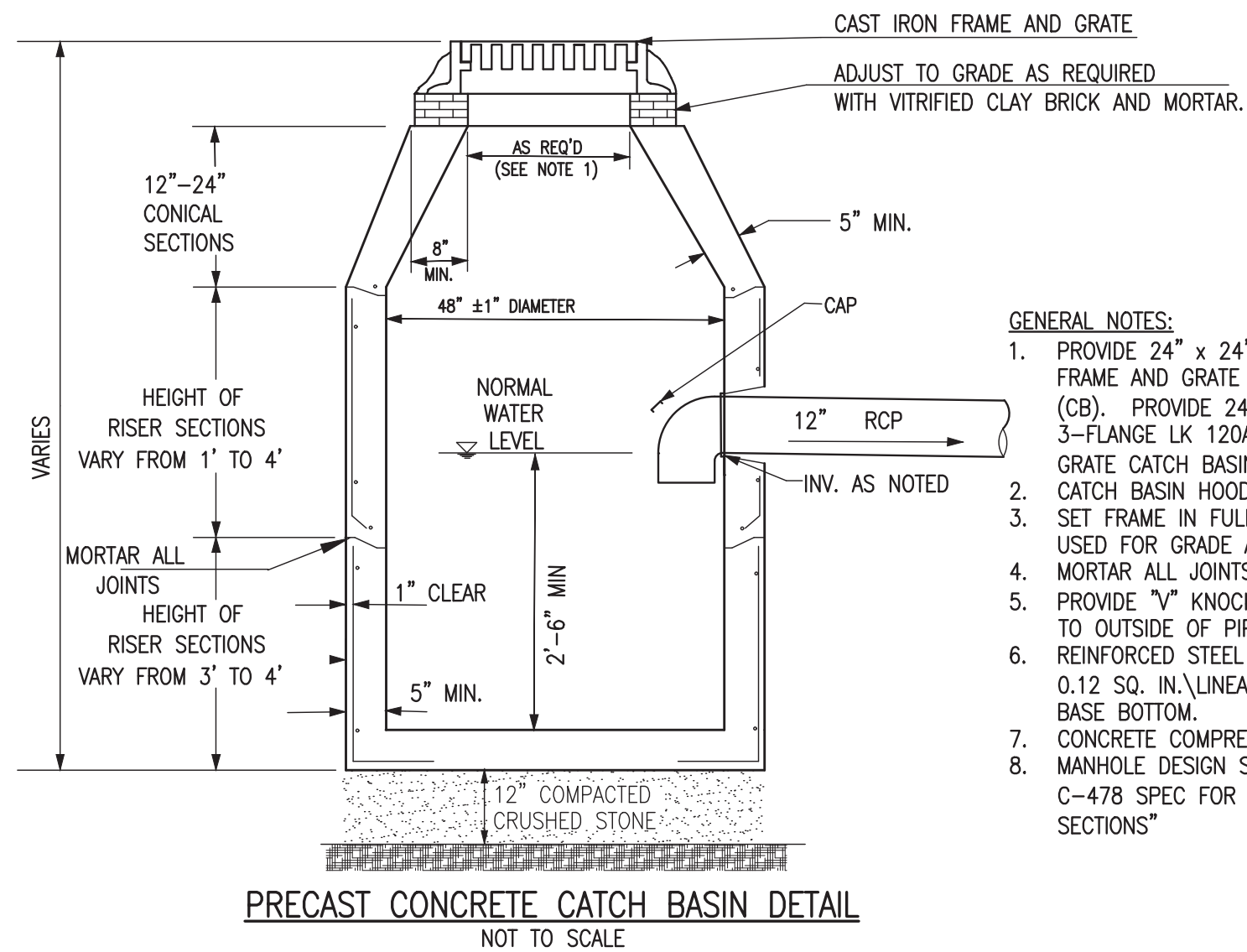
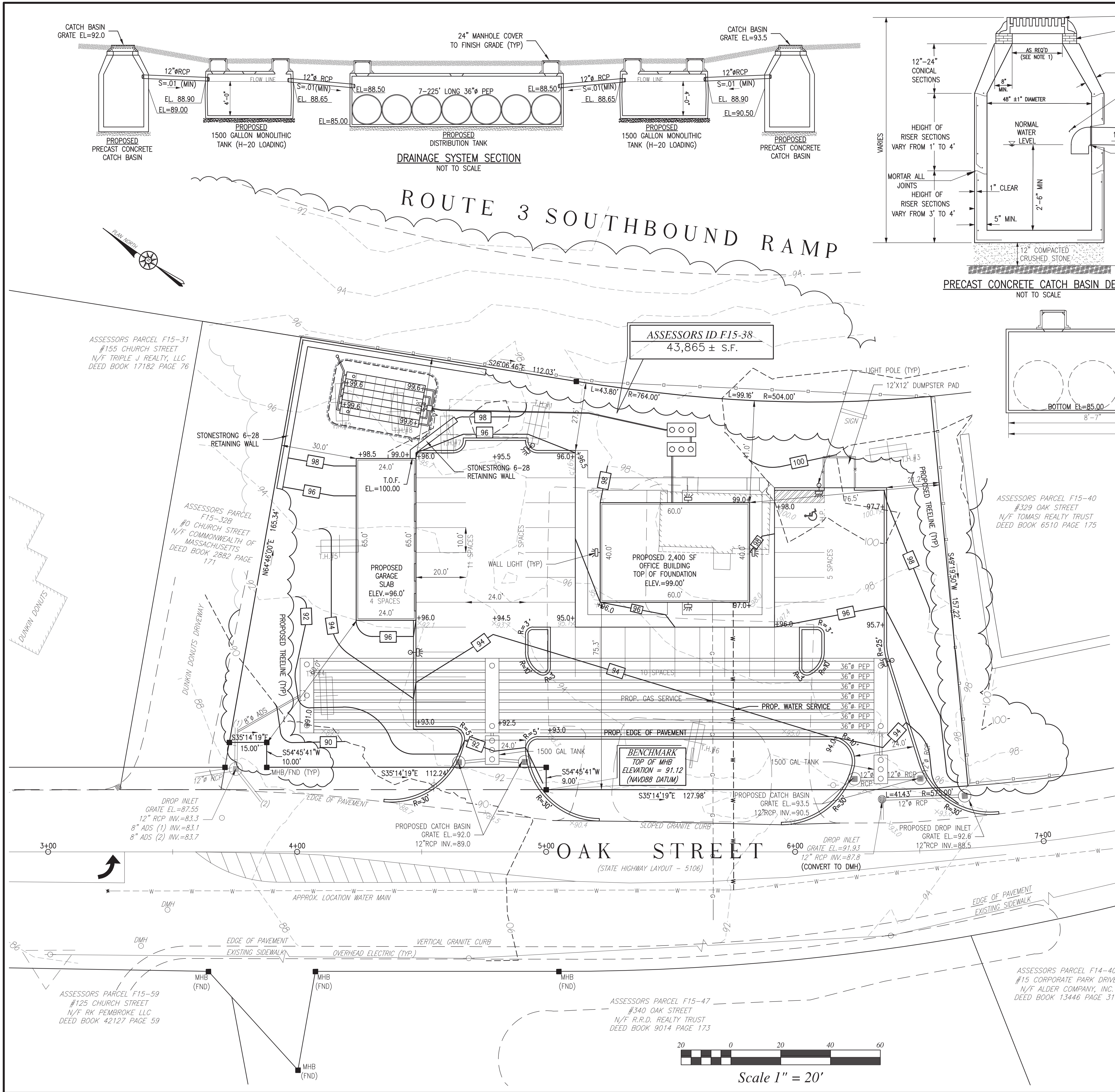
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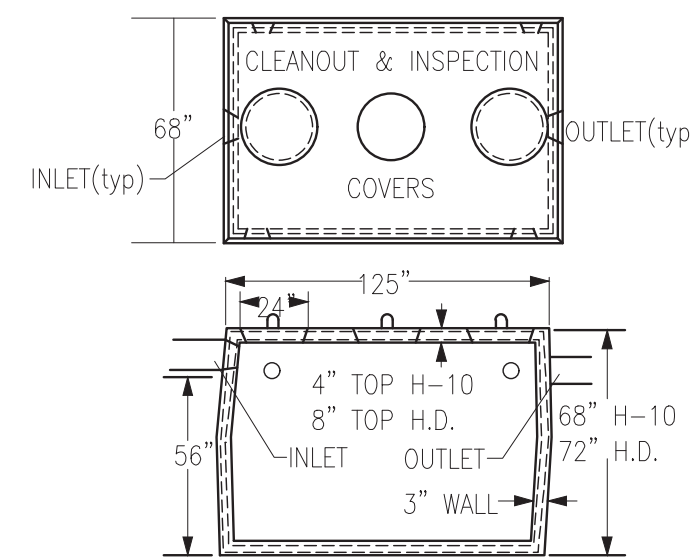


DOUGLAS BAILEY P.L.S. #35385

EXISTING CONDITIONS

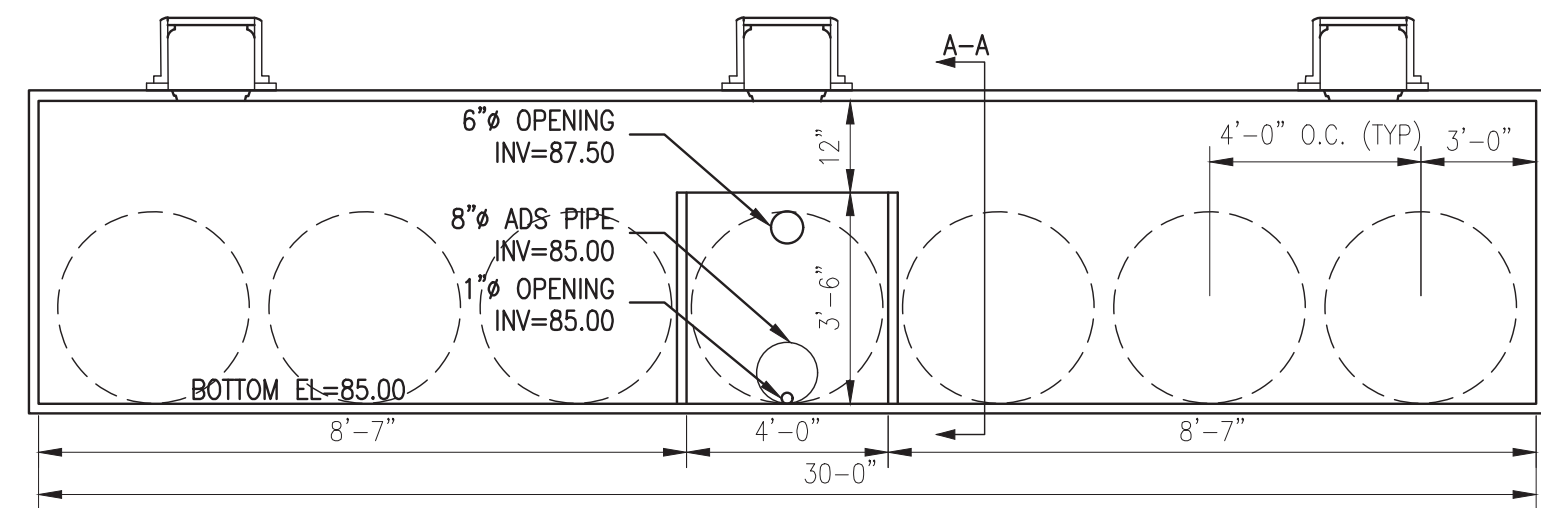


- GENERAL NOTES:
1. PROVIDE 24" x 24" OPENING AND LE BARON LF248-2 FRAME AND GRATE FOR SINGLE GRATE CATCH BASIN (CB). PROVIDE 24" x 36" OPENING AND 2 LE BARON 3-FLANGE LK 120A FRAME AND GRATES FOR DOUBLE GRATE CATCH BASIN (CB-DBL).
 2. CATCH BASIN HOOD WILL NOT BE INSTALLED.
 3. SET FRAME IN FULL BED OF MORTAR. BRICKS MAY BE USED FOR GRADE ADJUSTMENT.
 4. MORTAR ALL JOINTS.
 5. PROVIDE "V" KNOCKOUTS FOR PIPES W/ 2" CLEARANCE TO OUTSIDE OF PIPE. MORTAR ALL PIPE CONNECTIONS. REINFORCED STEEL CONFORMS TO LATEST ASTM SPEC.
 6. 0.12 SQ. IN./LINEAR FT. AND 0.12 SQ. IN. (BOTH WAYS) BASE BOTTOM.
 7. CONCRETE COMPRESSIVE STRENGTH-4000 PSI MIN.
 8. MANHOLE DESIGN SPECS CONFORM TO LATEST ASTM C-478 SPEC FOR "PRECAST CONCRETE MANHOLE SECTIONS"

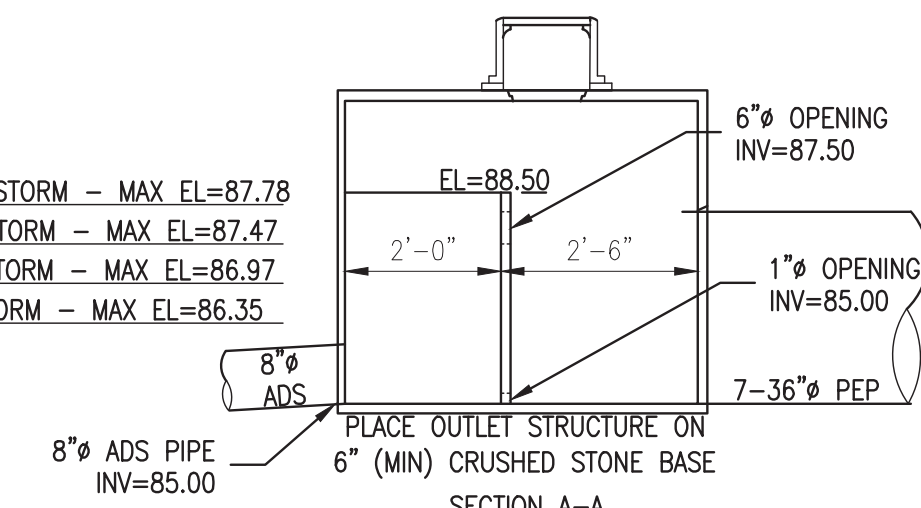


- DESIGN NOTES:
1. TOP & BOTTOM MATCHING KEY JOINT SEALED BUTYL RESIN AS SPECIFIED BY THE MANUFACTURER.
 2. TANK COMPLETELY REINFORCED.
 3. CONCRETE IS 4,000 P.S.I. @ 28 DAYS.
 4. AVAILABLE IN STANDARD, H-10, AND HEAVY DUTY TOP.

1500 GALLON TANK DETAIL
NOT TO SCALE



OUTLET STRUCTURE DETAIL
NOT TO SCALE



	2 YEAR		10 YEAR		25 YEAR		100 YEAR	
	PRE	POST	PRE	POST	PRE	POST	PRE	POST
CB1	0.23	0.22	0.41	0.38	0.53	0.49	0.72	0.66
CB2	0.04	0.02	0.06	0.03	0.08	0.04	0.11	0.05
STREET	1.76	0.29	2.87	0.47	3.65	0.60	4.88	0.81
TOTAL	2.03	0.53	3.33	0.88	4.26	1.13	5.72	1.52

PEAK RATE ANALYSIS

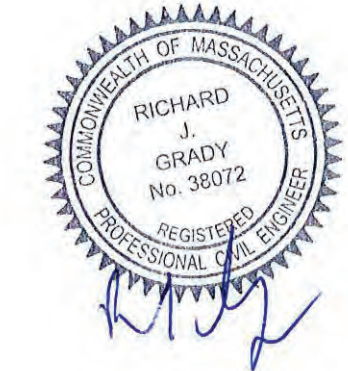
SOIL LOGS

T.H.#1 EL. 97.6	T.H.#2 EL. 95.8	T.H.#3 EL. 99.7	T.H.#4 EL. 90.7	T.H.#5 EL. 93.4	T.H.#6 EL. 95.2
0'-18" FILL	0'-18" FILL	0'-50" FILL	0'-18" FILL	0'-18" FILL	0'-42" FILL
18'-36" B SILTY LOAM	18'-50" B LOAM	50'-78" C SILTY LOAM	18'-42" B SANDY LOAM	18'-36" B SANDY LOAM	42'-60" C SANDY LOAM
36'-108" C SILTY LOAM	50'-120" C SANDY LOAM	50'-78" C SILTY LOAM	42'-60" C SANDY LOAM	36'-66" C SANDY LOAM	42'-60" C SANDY LOAM
D= 9'-0" MOTTLING @ 4'-0" (EL. 93.6)	D= 10'-0" MOTTLING @ 5'-0" (EL. 90.8)	D= 6'-6" MOTTLING @ 4'-2" (EL. 95.5)	D= 5'-0" MOTTLING @ 4'-0" (EL. 86.7)	D= 5'-6" MOTTLING @ 3'-4" (EL. 90.1)	D= 5'-0" MOTTLING @ 4'-0" (EL. 91.2)

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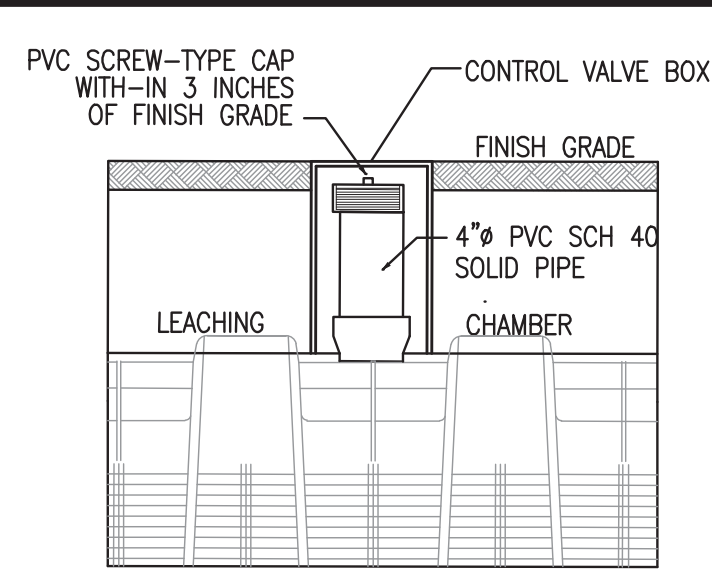
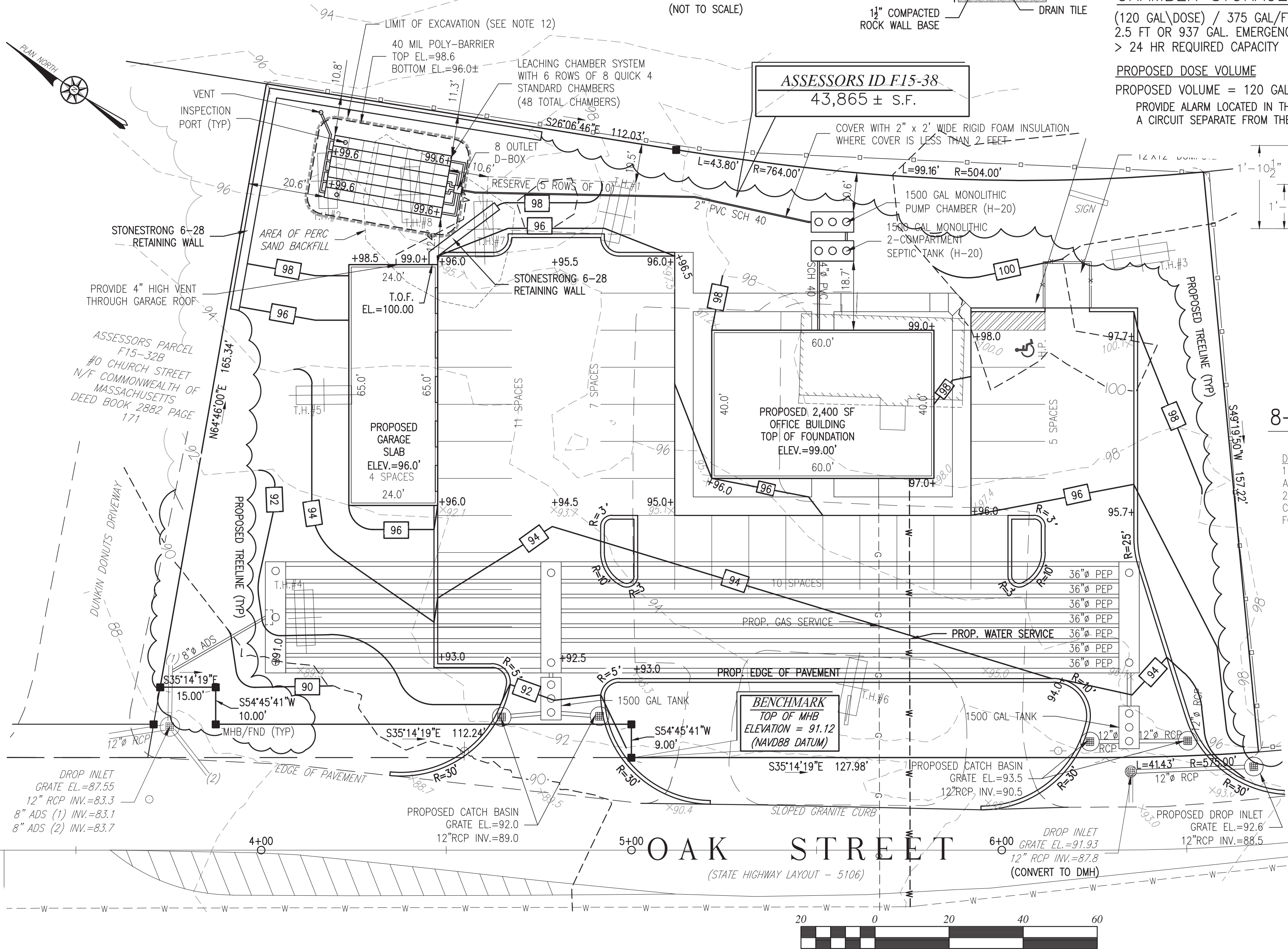
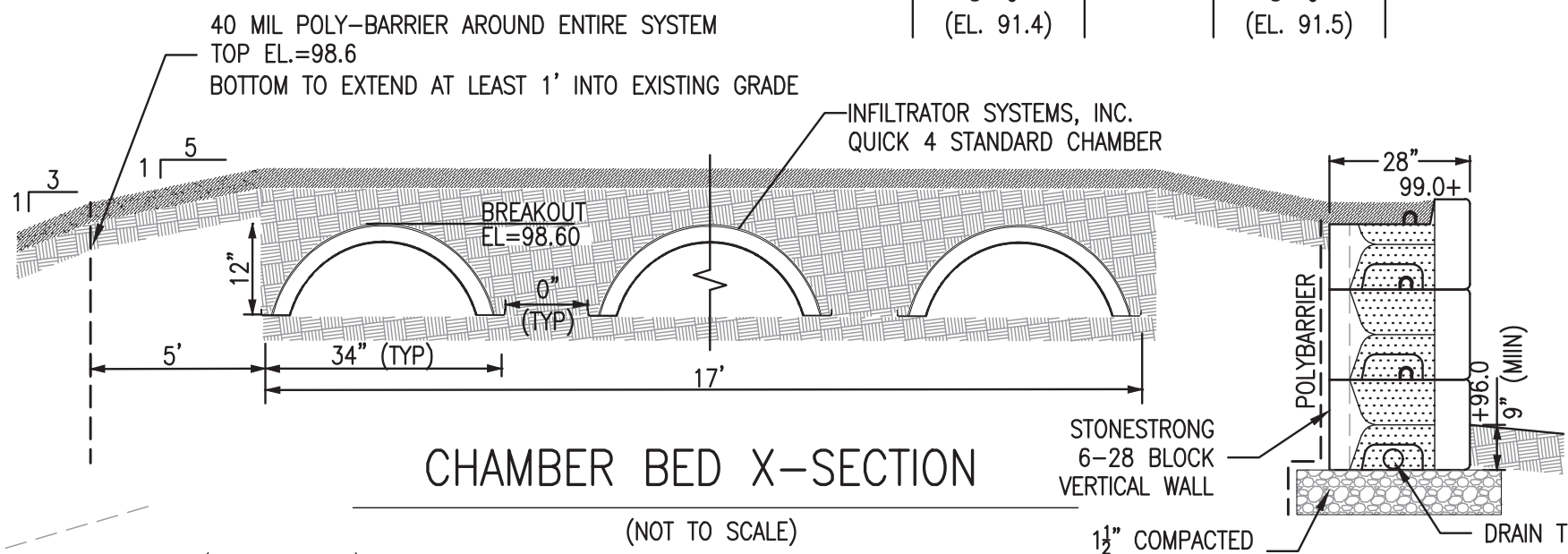
SOIL LOGS							
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0'-18" FILL	0'-18" FILL	0'-50" FILL	0'-18" FILL	0'-18" FILL	0'-42" FILL	0'-18" FILL	0'-18" FILL
96.1	94.3		89.2	91.9		94.9	95.0
18"-36" B SILTY LOAM	18"-50" B LOAM		18"-42" B SANDY LOAM	18"-36" B SANDY LOAM		18"-48" B SILTY LOAM	18"-48" B SILTY LOAM
94.6		91.6	87.2	90.4		92.6	92.5
			42"-60" C SANDY LOAM	36"-66" C SANDY LOAM	42"-60" C SANDY LOAM	48"-84" C1 SILTY LOAM	48"-84" C1 SILTY LOAM
		95.5	85.7	87.9	90.2	89.4 PERC 84"-102" P.R.=20 MIN/N	89.5 PERC 84"-102" P.R.=20 MIN/N
			D= 5'-0" MOTTLING 4'-0" (EL. 86.7)	D= 5'-6" MOTTLING 3'-4" (EL. 90.1)	D= 5'-0" MOTTLING 4'-0" (EL. 91.2)	84"-150" C2 SANDY LOAM	84"-150" C2 SANDY LOAM
		93.2				83.9	84.0
36"-108" C SILTY LOAM	50"-120" C SANDY LOAM					D= 10'-0" MOTTLING 5'-0" (EL. 91.4)	D= 10'-0" MOTTLING 5'-0" (EL. 91.5)
88.6	85.8						
D= 9'-0" MOTTLING 4'-0" (EL. 93.6)	D= 10'-0" MOTTLING 5'-0" (EL. 90.8)						

INFILTRATOR SYSTEM NOTES

THIS SYSTEM HAS BEEN DESIGNED IN ACCORDANCE WITH THE COMMONWEALTH OF MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION MODIFIED CERTIFICATION FOR GENERAL USE, PURSUANT TO TITLE V, 310 CMR 15.000, REVISED JUNE 12, 2015 AND STANDARD CONDITIONS FOR ALTERNATIVE SOIL ABSORPTION SYSTEMS WITH GENERAL USE CERTIFICATION AND/OR APPROVED FOR REMEDIAL USE REVISED MARCH 5, 2018. A DISCLOSURE NOTICE IN THE DEED TO THE PROPERTY IS REQUIRED FOR SYSTEMS INSTALLED UNDER THE REMEDIAL USE APPROVAL.

NO STONE AROUND OR BELOW CHAMBERS IS REQUIRED.

BACKFILL CHAMBERS WITH ON SITE SAND SOIL OR CLEAN COARSE SAND IN ACCORDANCE WITH 310 CMR 15.255(3).



INSPECTION PORT DETAIL

NOT TO SCALE

PUMP DESIGN

STATIC HEAD = 7.15 FT
PIPE LENGTH = 95 FT
PIPE DIAMETER = 2 IN

PUMP SPECIFICATIONS:

TYPE: GOULD MODEL 3887(OR APPROVED EQUAL)
RATING: 20 G.P.M. @ 7.25 TDH
MOTOR: 1/3 HORSE POWER
VOLTAGE REQUIRED: 230 VOLTS, 4.9A (SINGLE PHASE)

GPM	H _L (ft/100ft)	H _L (ft)	H _L (total)
20	0.86	0.82	7.97
40	3.11	2.96	10.11
60	6.59	6.26	13.41
80	11.22	10.66	17.81

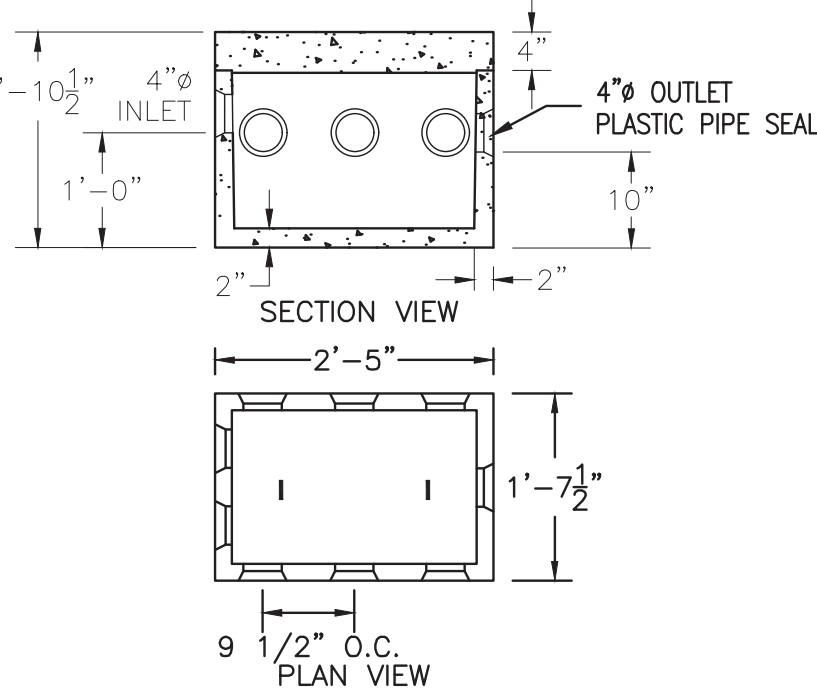
REFERENCE: CAMERON HYDRAULIC DATA, PG 3-38 & GOULDS PUMPS WASTEWATER & SEWAGE

CHAMBER STORAGE CAPACITY

(120 GAL/DOSE) / 375 GAL/FT OF TANK = 0.32 FT (MIN)
2.5 FT OR 937 GAL. EMERGENCY STORAGE CAPACITY PROVIDED
> 24 HR REQUIRED CAPACITY

PROPOSED DOSE VOLUME

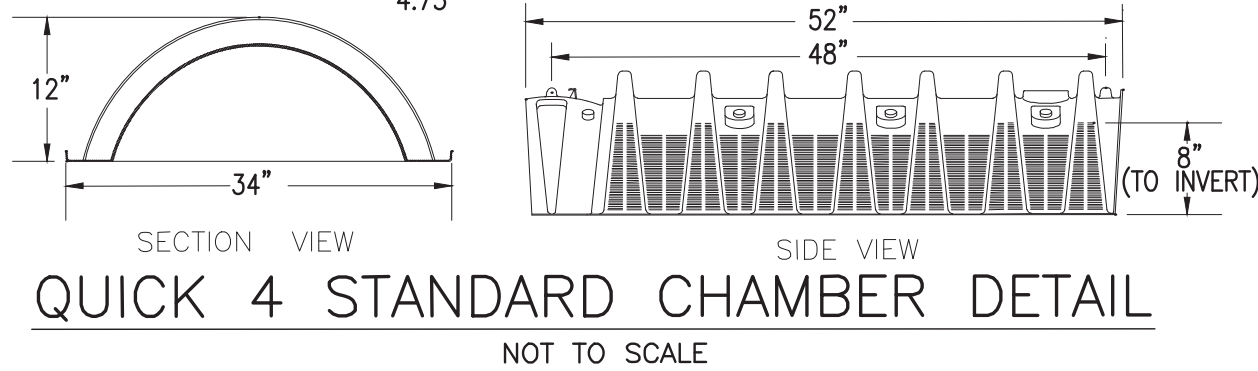
PROPOSED VOLUME = 120 GALLONS PER DOSE
PROVIDE ALARM LOCATED IN THE BUILDING AND POWERED BY A CIRCUIT SEPARATE FROM THE CIRCUIT TO THE PUMP.



8-OUTLET D-BOX DETAIL

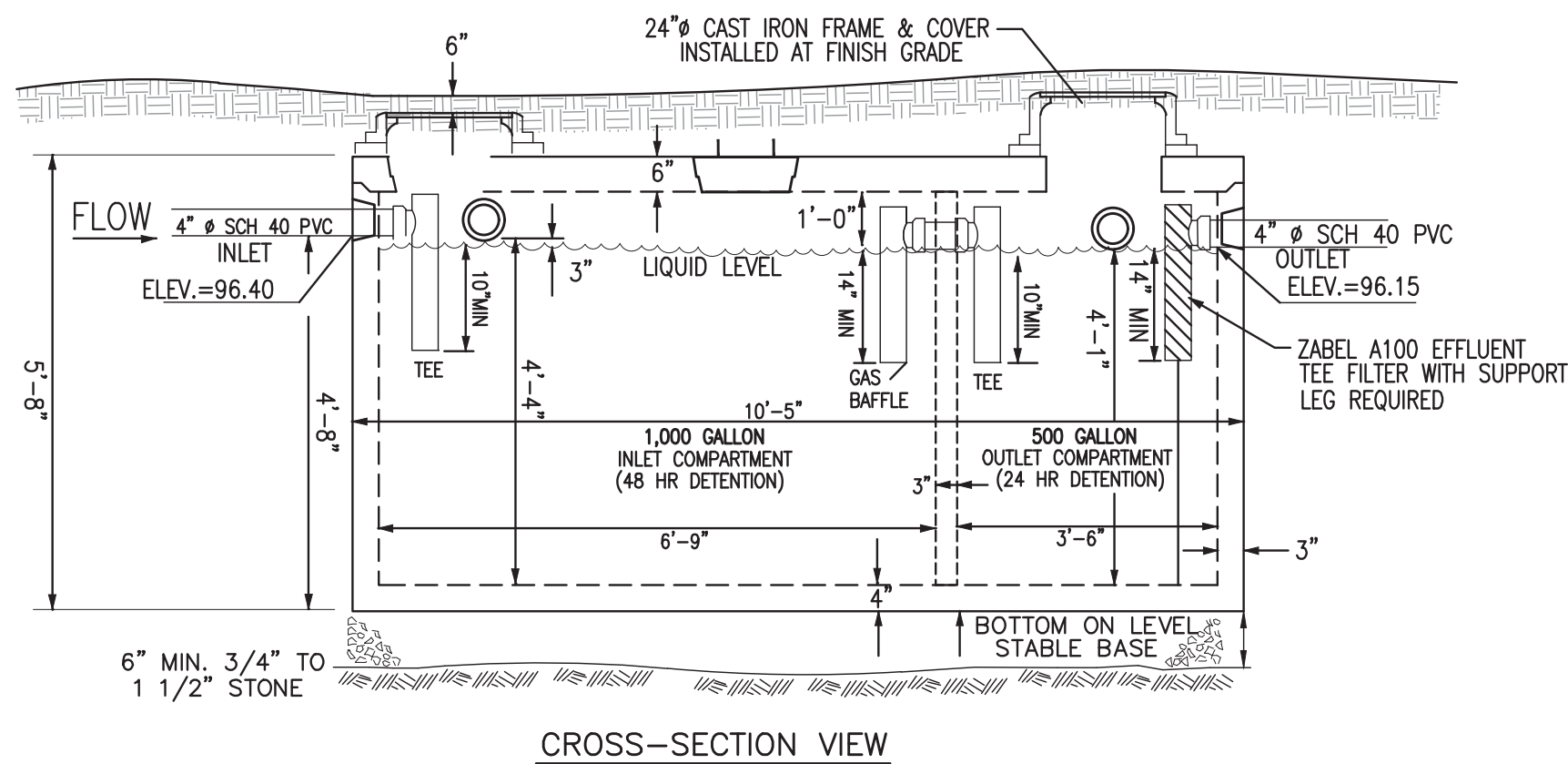
NOT TO SCALE

D-BOX NOTES:
1. CONCRETE: 4,000 PSI MINIMUM AFTER 28 DAYS.
2. DESIGN CONFORMS WITH 310 CMR 15.000, DEP TITLE 5 REGS. FOR DISTRIBUTION BOXES.



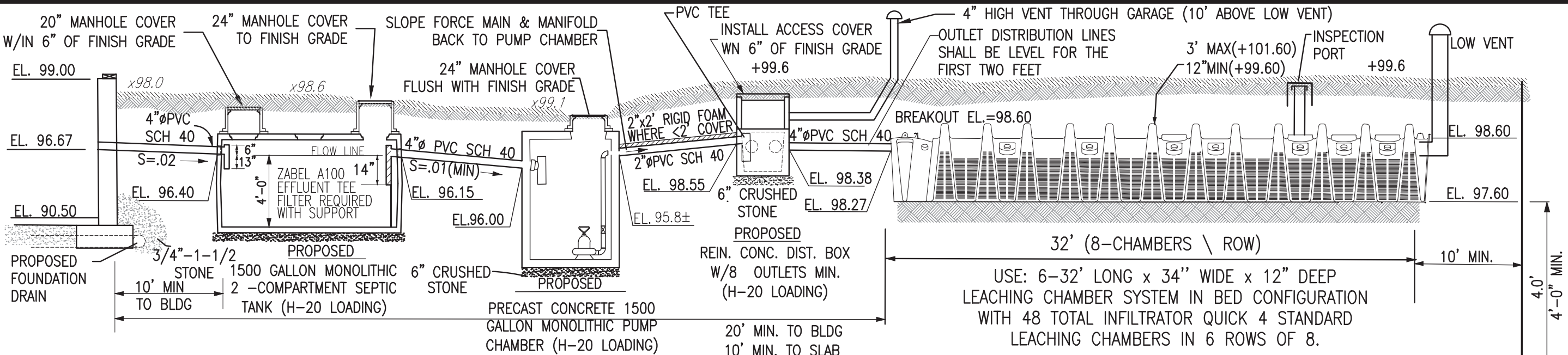
QUICK 4 STANDARD CHAMBER DETAIL

NOT TO SCALE



1500 GALLON 2-COMPARTMENT SEPTIC TANK

(NOT TO SCALE)



SUBSURFACE SEWAGE DISPOSAL SYSTEM

(NOT TO SCALE)

SEPTIC DESIGN

(NOT DESIGNED FOR GARBAGE GRINDER)

- DESIGN DAILY FLOW (OFFICE): 4800 S.F. x 75 GPD/1000 S.F. = 360 GPD
- SEPTIC TANK: 360 GPD x 2 = 720 GAL. USE: 1500 GAL (MIN)
- LEACHING CHAMBERS: P.R. = 20 MIN/IN CLASS II - E.L.R. = 0.53 GPD/S.F.

USE: 6-32' LONG x 34" WIDE x 12" DEEP LEACHING CHAMBER SYSTEM IN BED CONFIGURATION WITH 48 TOTAL INFILTRATOR QUICK 4 STANDARD LEACHING CHAMBERS IN 6 ROWS OF 8.

FOR RESERVE AREA: 50 TOTAL INFILTRATOR QUICK 4 STANDARD CHAMBERS IN 5 ROWS OF 10

TITLE 5

(PER MODIFIED CERTIFICATION FOR GENERAL USE DESIGN STANDARD ITEM 6.)

EFFECTIVE LEACHING AREA = 4.73 SF/LF

PROPOSED AREA: 192 LF x 4.73 SF/LF = 908 S.F.

CAPACITY: 908 S.F. x 0.53 GPD/S.F. = 481 > 360 GPD(D.D.F.)

FULL SIZE CONVENTIONAL SEPTIC DESIGN-PER STANDARD CONDITIONS FOR ALTERNATIVE SOIL ABSORPTION SYSTEMS

LEACHING TRENCHES: P.R. = 20 MIN/IN CLASS II

USE: 2-75' LONG x 2' WIDE x 2' DEEP LEACHING TRENCHES

PROPOSED AREA: 2(6 x 75) = 900 S.F. (900 S.F. MIN)

CAPACITY: 900 S.F. x 0.53 GPD/S.F. = 477 > 360 GPD(D.D.F.)

SEPTIC NOTES

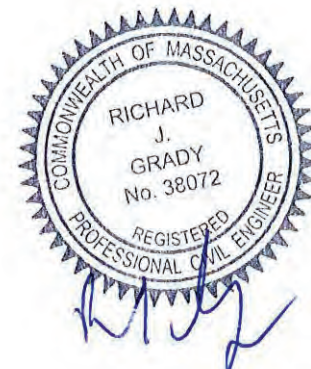
- PROPERTY LINE DATA FROM "LOTS IN PEMBROKE" FOR JOHN D. WALSH, BY DELANO & KEITH, DATED JANUARY 21, 1964. RECORDED WITH PLYMOUTH COUNTY REGISTRY OF DEEDS PLAN BOOK 3135, PAGE 477.
- TOPOGRAPHIC SURVEY BY GRADY CONSULTING DECEMBER 12, 2018.
- SOILS TESTING BY BRENDAN KLING, GRADY CONSULTING WITNESSED BY LISA CULLITY JANUARY 29, 2019 & MARCH 20, 2019.
- CALL DIG SAFE 1-888-344-7233 AT LEAST 4 DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
- NOTIFY TOWN AND GRADY CONSULTING PRIOR TO BACKFILLING OF SYSTEM.
- NO KNOWN WELLS EXIST WITHIN 200' OF THE PROPOSED SYSTEM
- THE SITE IS NOT LOCATED IN AN AQUIFER PROTECTION ZONE II.
- 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))
- NO STREAMS, SURFACE & SUBSURFACE DRAINS AND WETLANDS EXIST WITHIN 100 FT OF THE PROPOSED SYSTEM, EXCEPT AS SHOWN.
- THE SITE IS NOT LOCATED IN A FLOOD PLAIN DISTRICT.
- NO KNOWN EASEMENTS ARE IN THE AREA OF THE PROPOSED SYSTEM.
- EXCAVATE ALL MATERIAL (A,B, C1 LAYERS) TO SANDY LOAM C2 LAYER (84"), 5' AROUND SYSTEM. REPLACE WITH CLEAN COURSE 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 = 42 x 27 x 27 (98.6 - 89.4) / 27 + 20% = 464± C.Y.

REQUIRED INSPECTIONS

- AFTER EXCAVATION OF LEACHING AREA PRIOR TO INSTALLING SAND.
- AFTER SYSTEM CONSTRUCTION PRIOR TO BACKFILLING.
- AFTER FINAL GRADING IS COMPLETED.

(ADDITIONAL INSPECTIONS MAY BE REQUIRED BY THE BOARD OF HEALTH)



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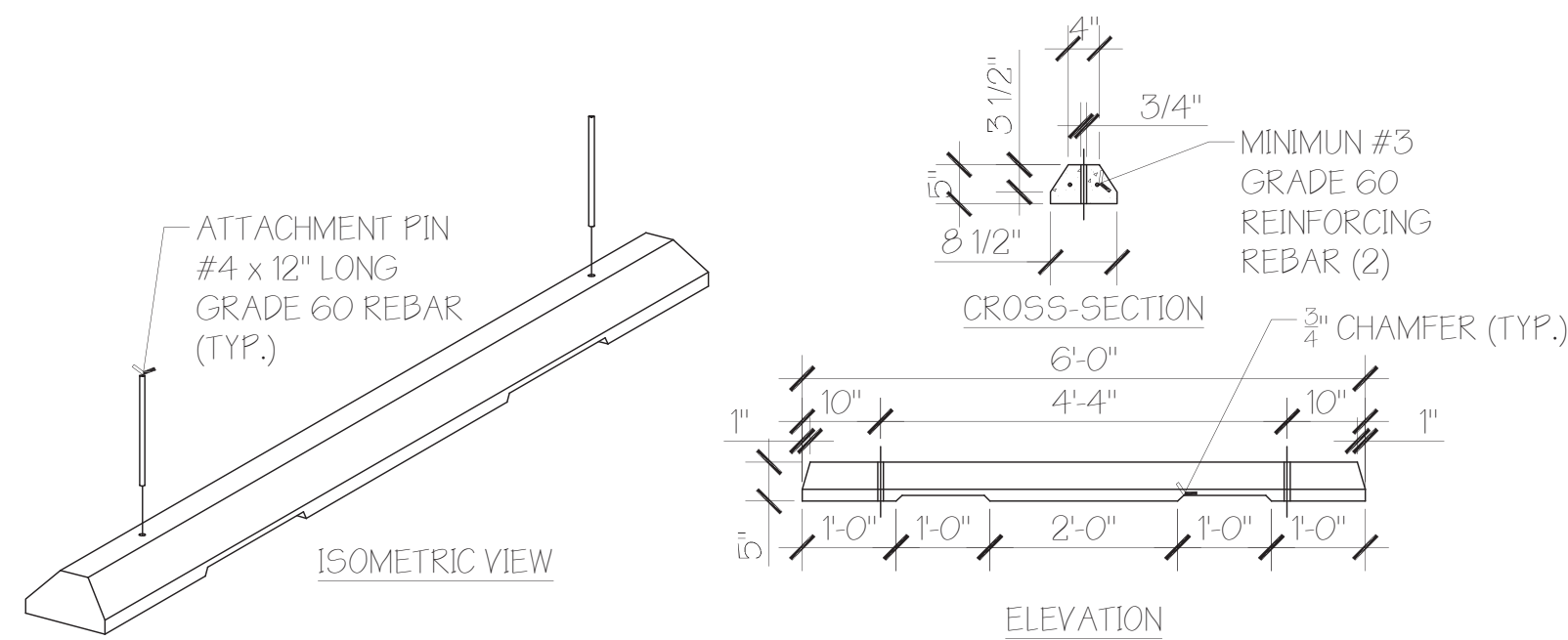
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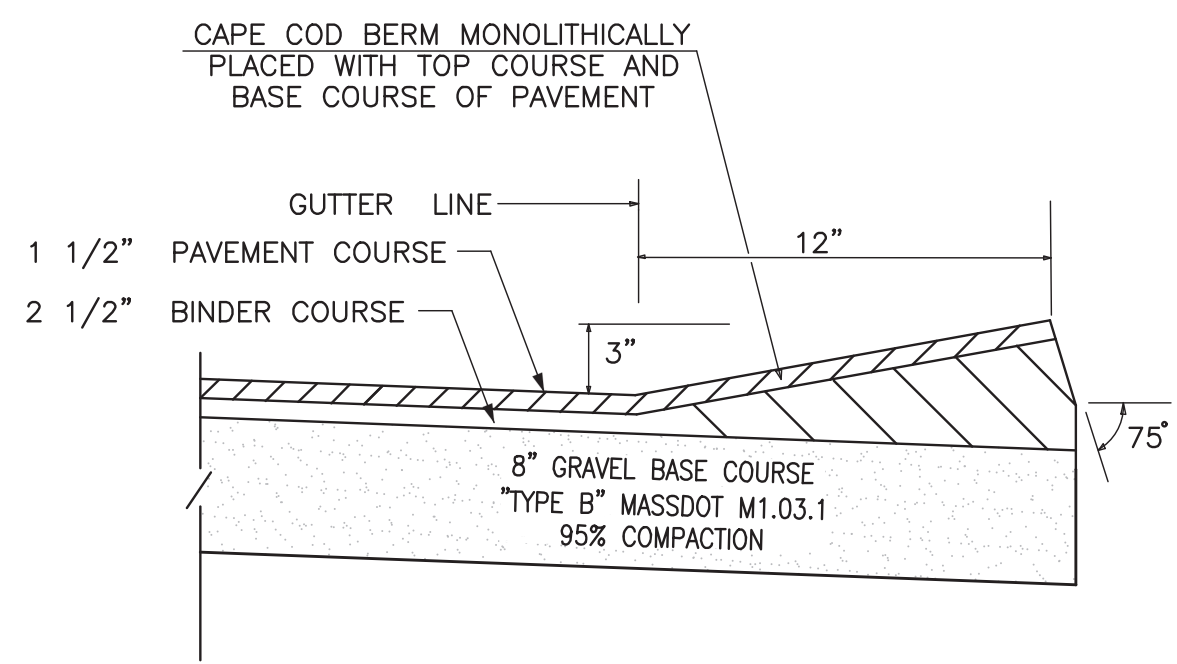
SHEET 4 OF 7

SEPTIC

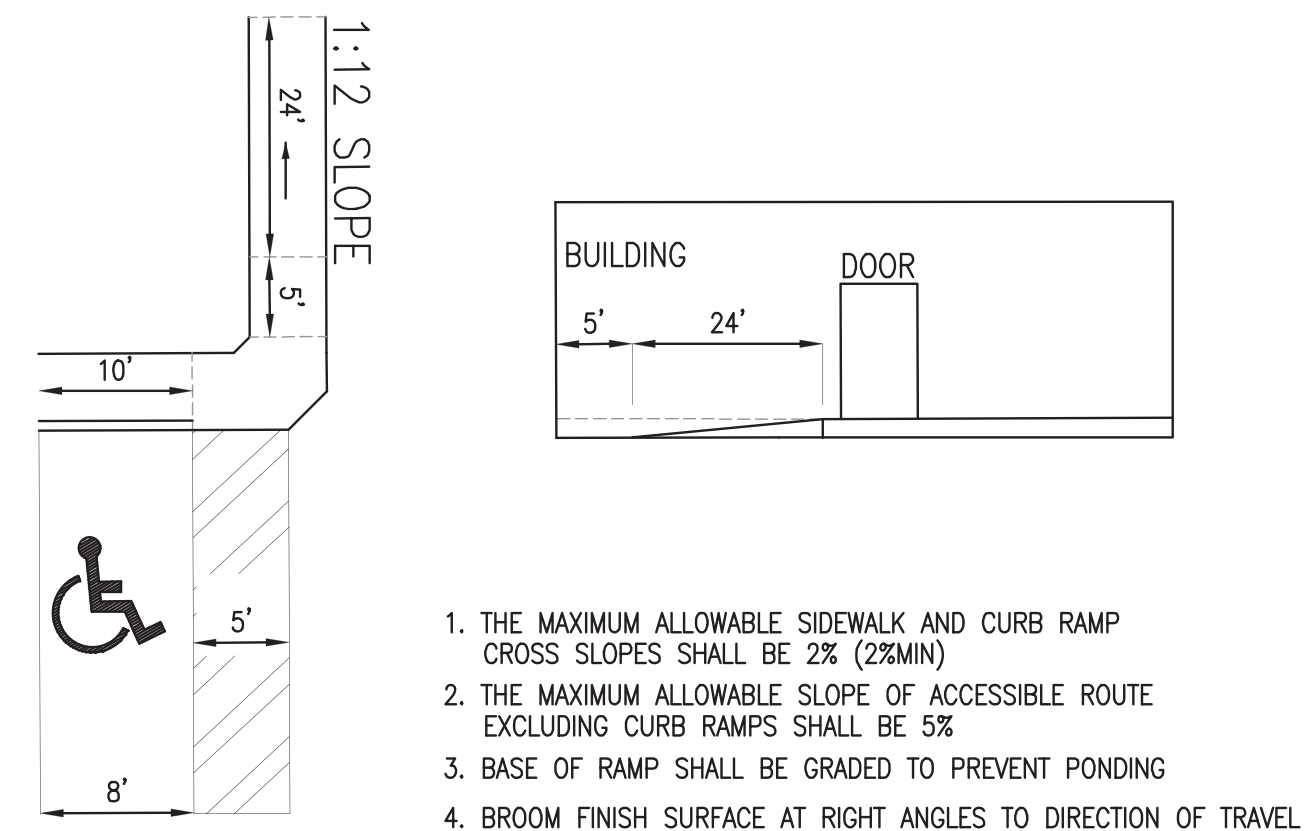


GENERAL NOTES:
 1. CONSTRUCTION AND MATERIALS SHALL MEET REQUIREMENTS OF ITEM 537 "WHEEL STOPS".
 2. CONCRETE FOR WHEEL STOP: MINIMUM 3,000 PSI IN 28 DAYS
 3. REINFORCING STEEL: PER ASTM A615, GRADE 60
 4. ATTACHMENT PINS SHALL HAVE 7 INCH EMBEDMENT.

PRECAST WHEELSTOP DETAIL
 1/2" = 1'-0"
 34 7101-01

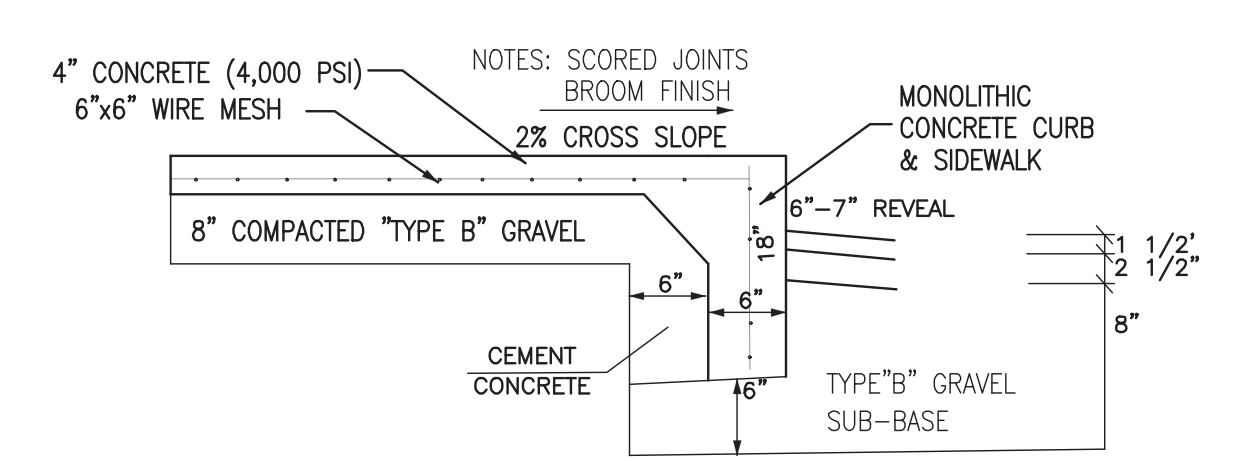


PARKING LOT & CAPE COD BERM DETAIL
 (NOT TO SCALE)



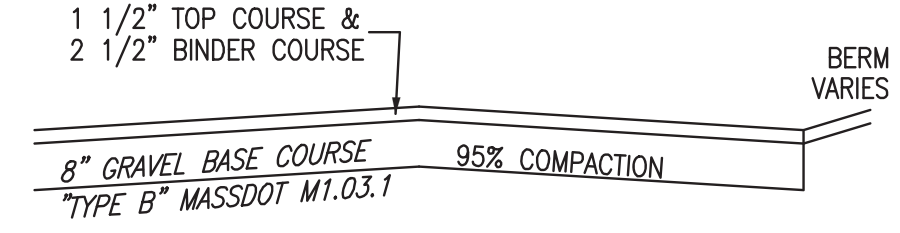
WHEELCHAIR RAMP DETAIL
 (NOT TO SCALE)

1. THE MAXIMUM ALLOWABLE SIDEWALK AND CURB RAMP CROSS SLOPES SHALL BE 2% (2%MIN)
2. THE MAXIMUM ALLOWABLE SLOPE OF ACCESSIBLE ROUTE EXCLUDING CURB RAMP SHALL BE 5%
3. BASE OF RAMP SHALL BE GRADED TO PREVENT PONDING
4. BROOM FINISH SURFACE AT RIGHT ANGLES TO DIRECTION OF TRAVEL

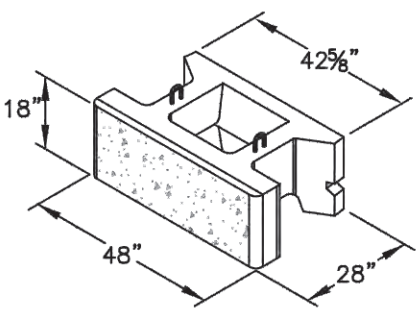


- NOTES:
1. SIDEWALKS SHALL BE BROOM FINISHED WITH 1" DEEP SCORE LINES SPACED FIVE FEET ON CENTER
 2. SIDEWALK SECTIONS SHALL BE A MAXIMUM OF 30' IN LENGTH, WITH SECTION SEPERATED BY 1/2" THICK PREMOLED BITUMASTIC FILLER, THE FILLER DEPTH SHALL BE 4" EXCEPT AT DRIVEWAYS WHERE FILLER DEPTH WILL BE 6".
 3. 6" x 18" CONCRETE CURB MAY BE SUBSTITUTED UPON OWNER APPROVAL

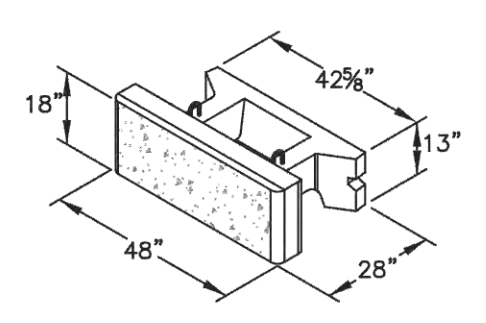
CONCRETE SIDEWALK DETAIL
 N.T.S.



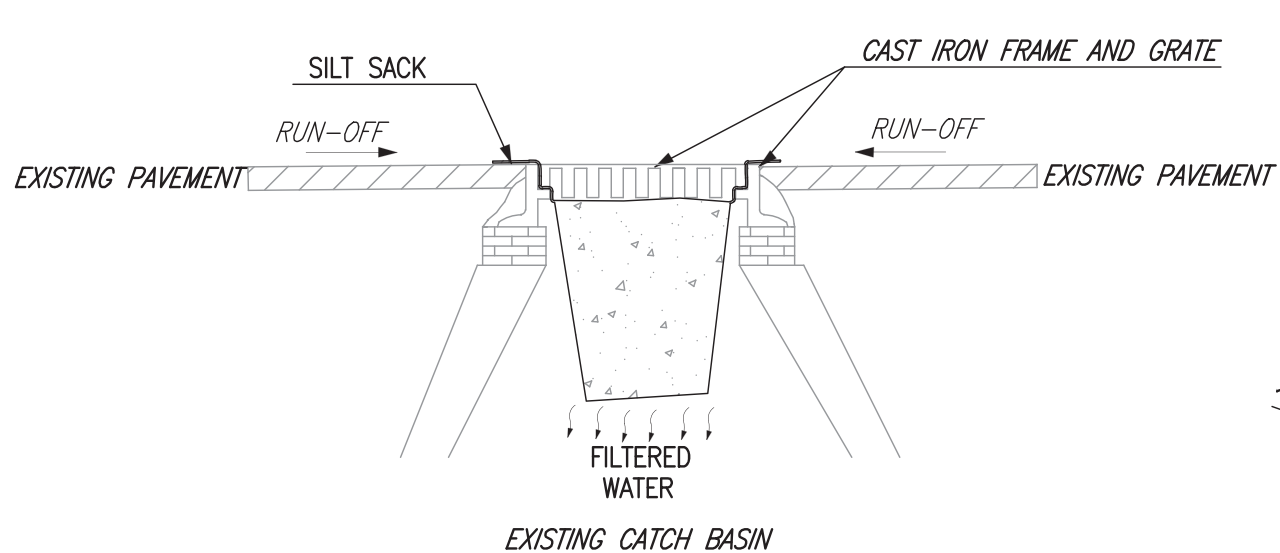
PARKING LOT SECTION
 (NOT TO SCALE)



STONE STRONG 6-28 UNIT
 NOT TO SCALE

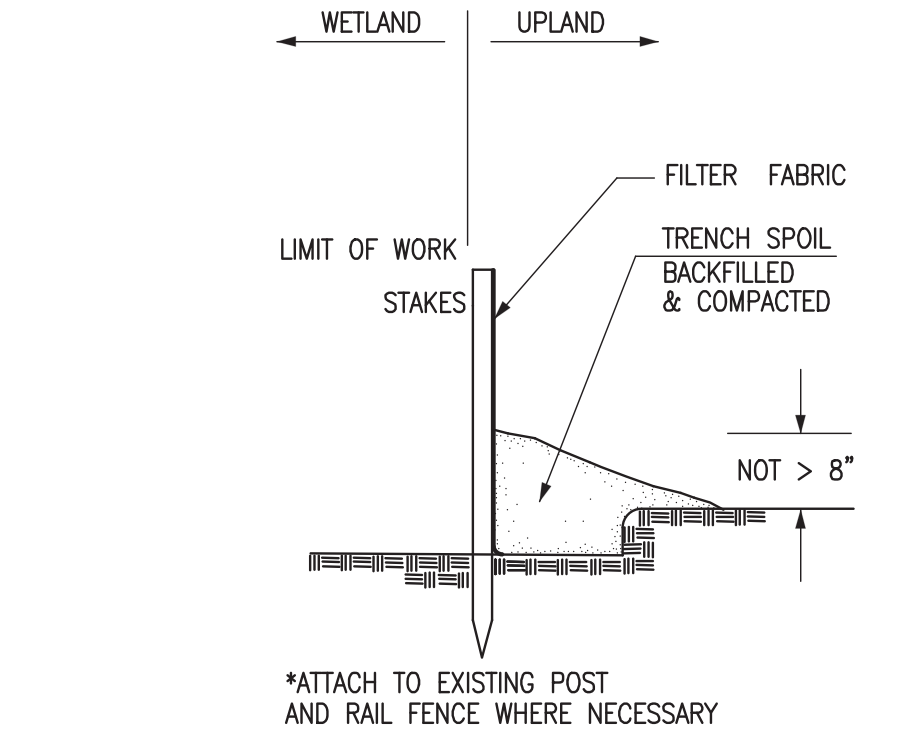


STONE STRONG 6-28 TOP UNIT
 NOT TO SCALE

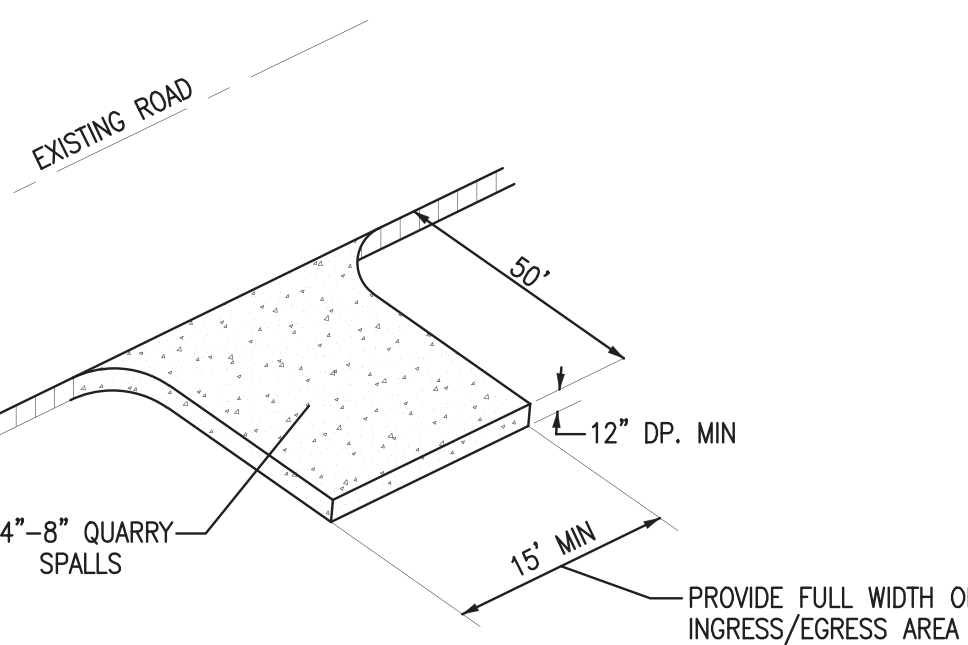


NOTE: SILT SACKS SHALL BE INSPECTED DAILY AND SILT SHALL BE REMOVED WHEN ACCUMULATED TO ALLOW CATCH BASIN TO FUNCTION PROPERLY. REMOVE PERMANENTLY WHEN SITE STABILIZATION HAS OCCURRED.

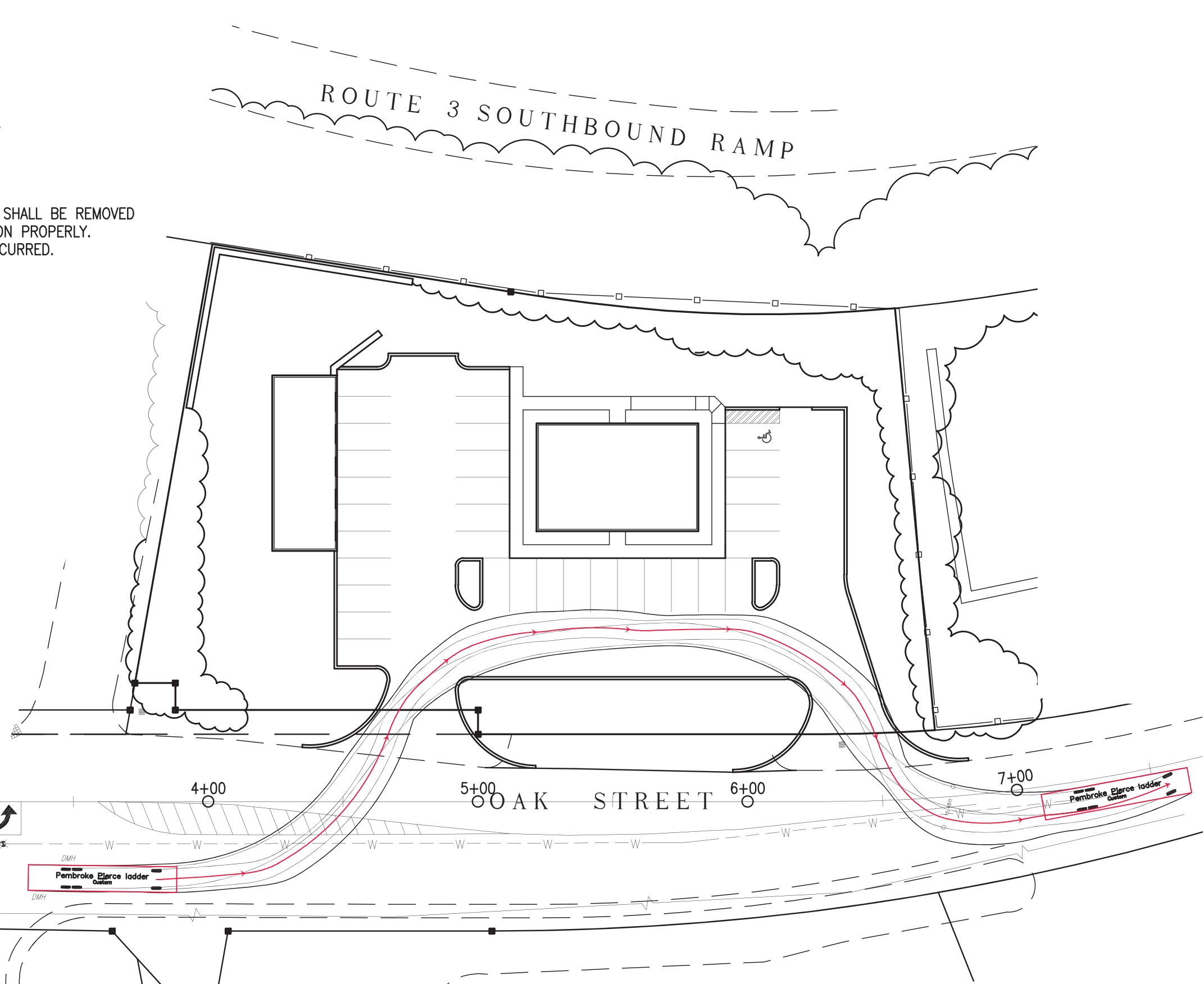
SILT SACK
 (NOT TO SCALE)



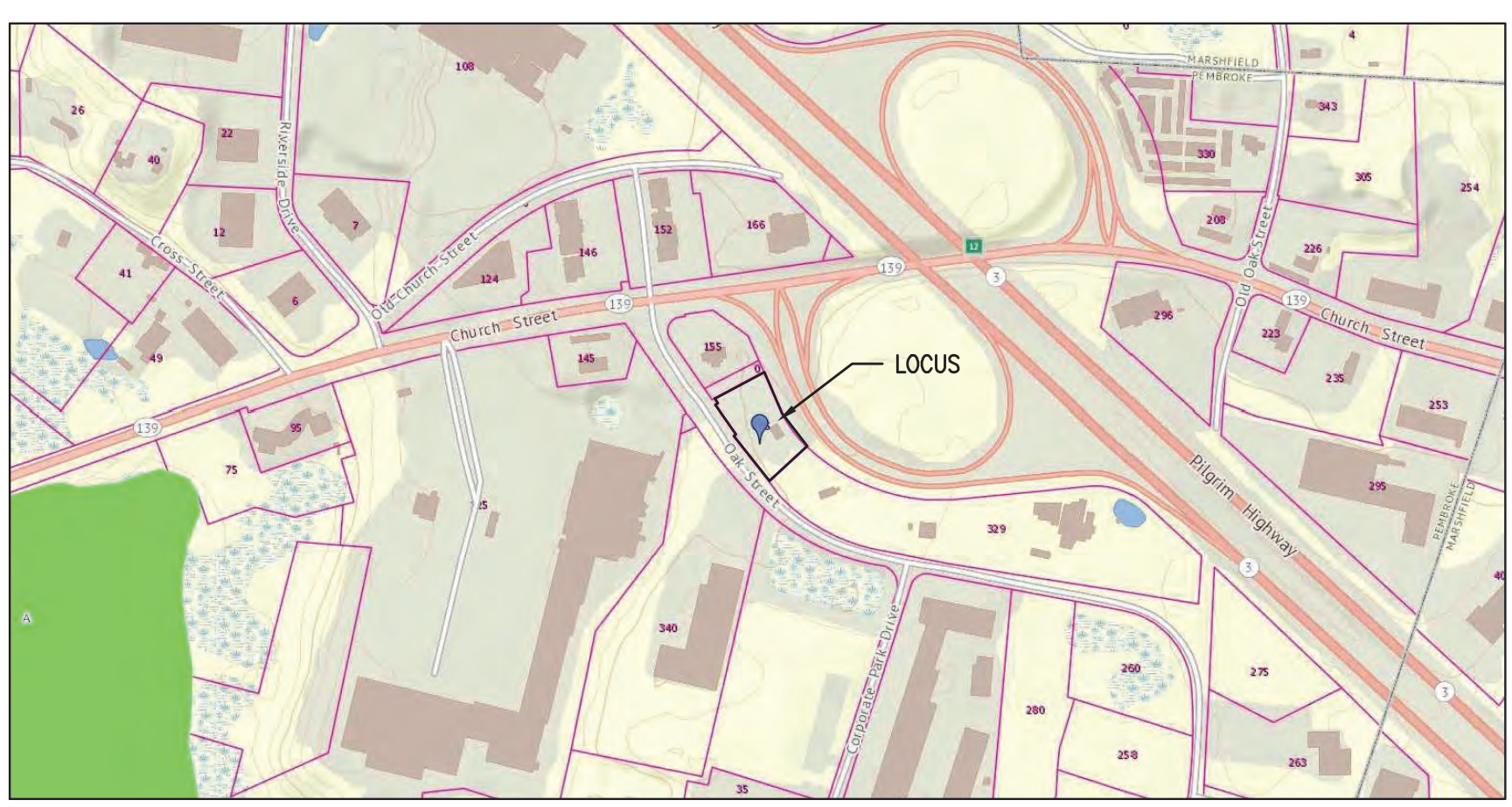
2 SILT FENCE
 N.T.S.



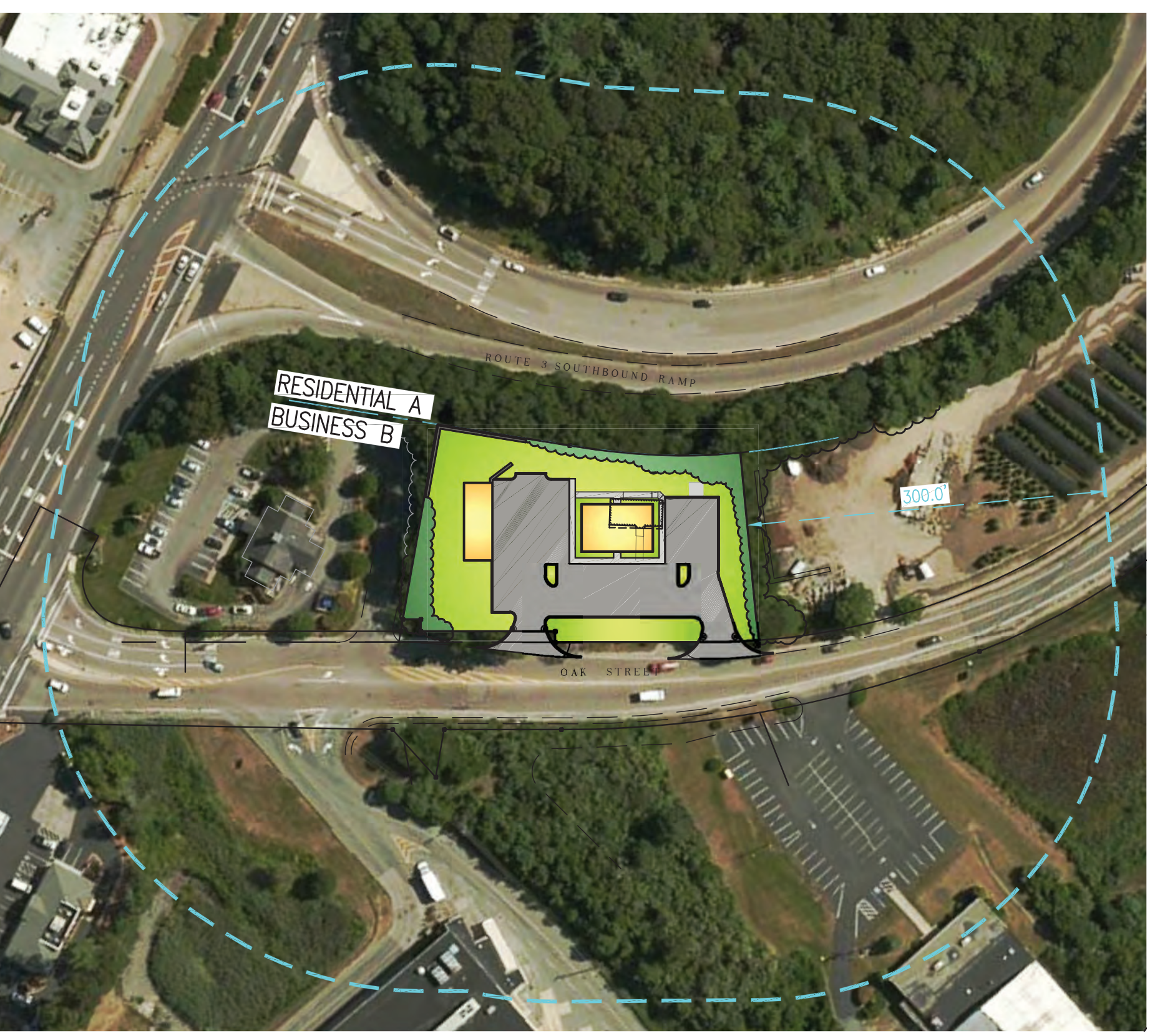
CONSTRUCTION ENTRANCE
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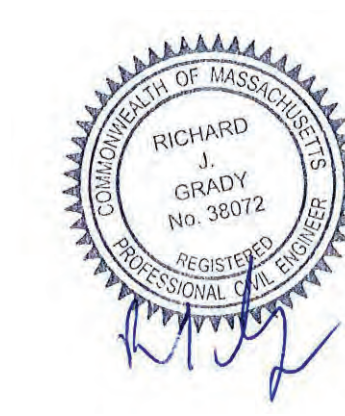
1 LADDER TRUCK TURNING ANALYSIS
 1"=40'



FEMA / NHESP MAPS
 N.T.S.



300' PROPERTY BUFFER / ZONING DISTRICTS
 1"=100'



SITE PLAN #345 OAK STREET PEMBROKE, MASSACHUSETTS

PREPARED FOR:
 CHAMPION BUILDERS INC
 P.O. BOX 1414
 DUXBURY, MA 02331

MAY 30, 2019
 SCALE: 1"=20'
 JOB No. 18-365

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

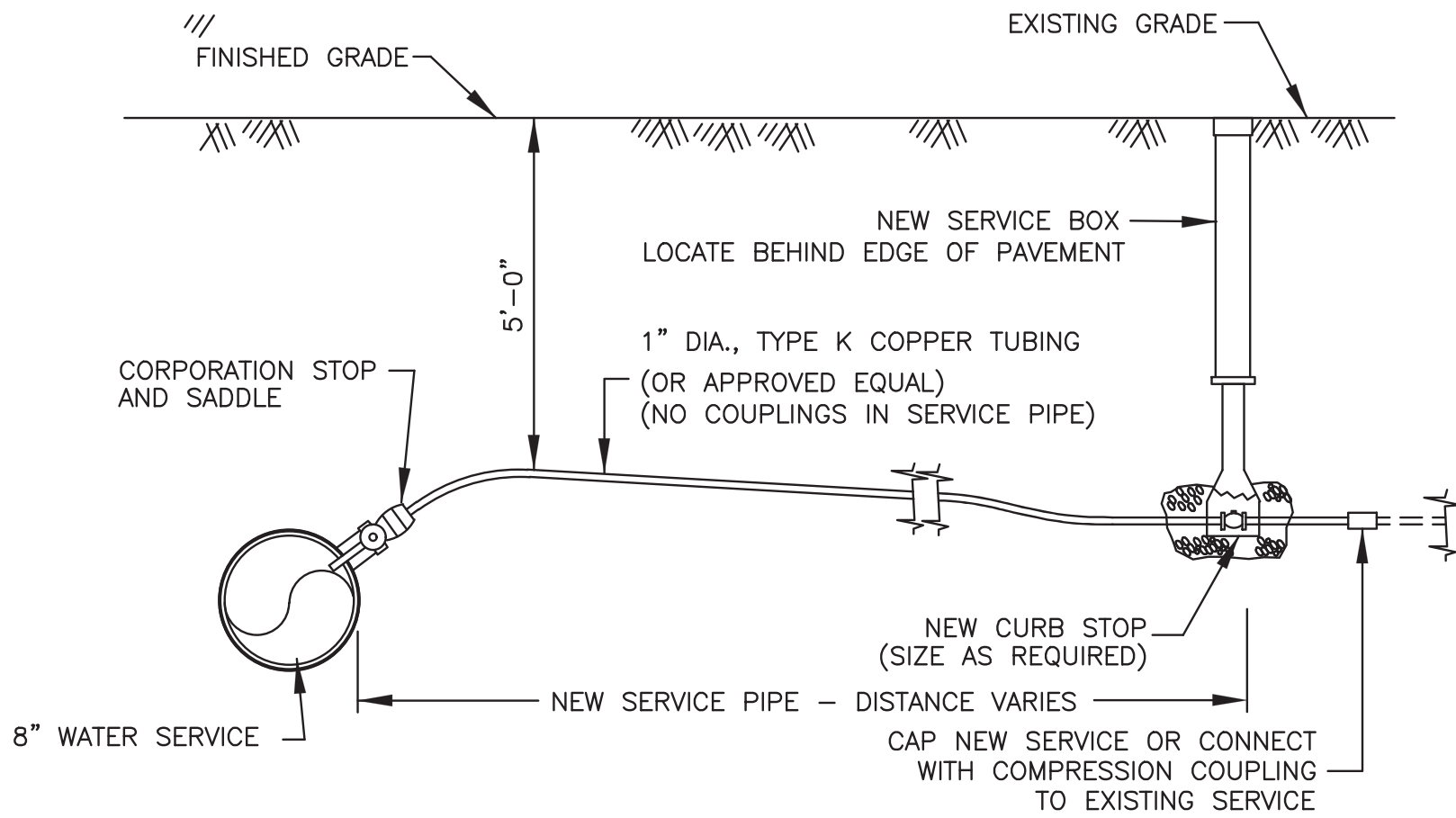
SEPTIC and EROSION CONTROL

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.

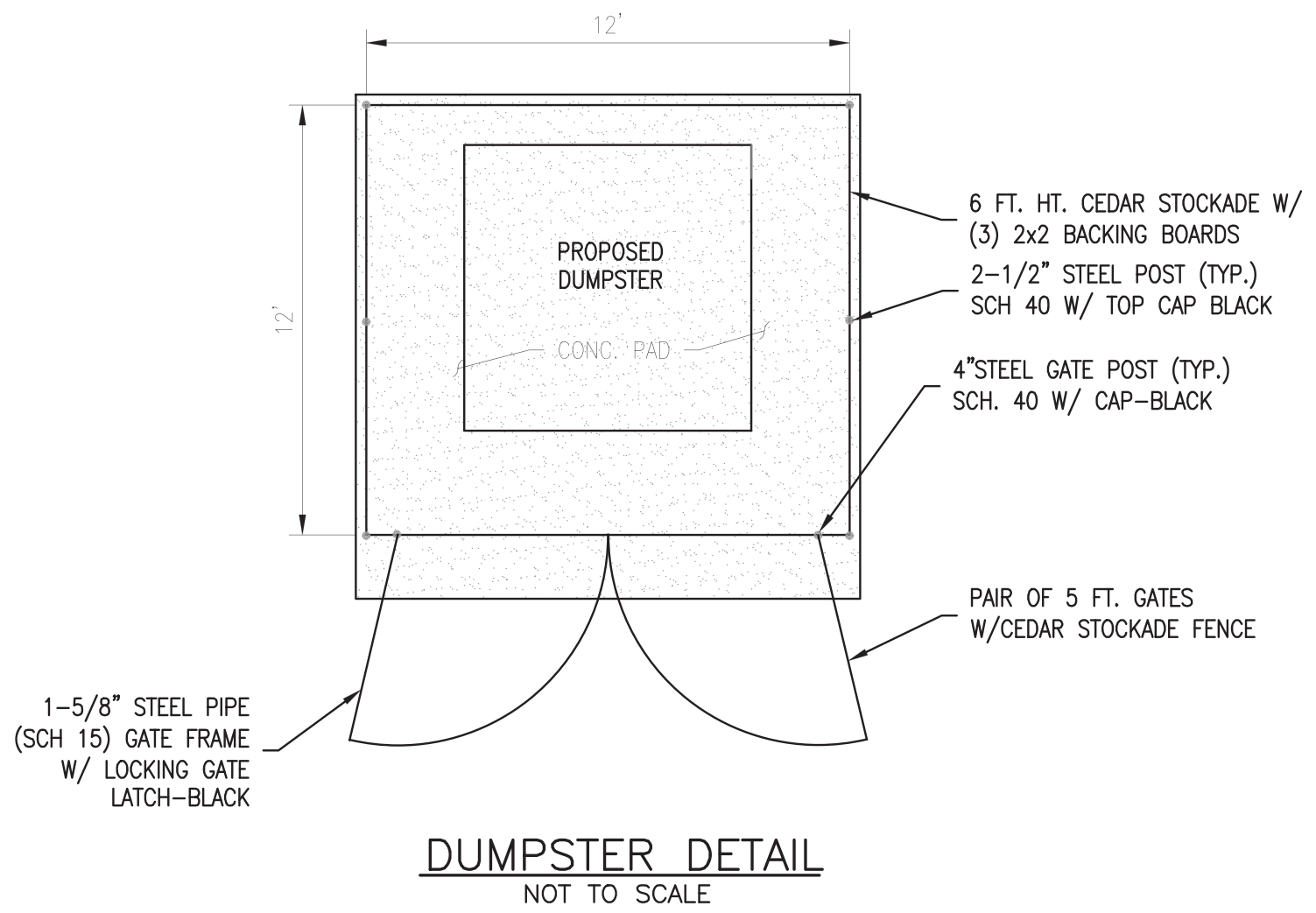
SPECIFICATIONS

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 5/8" 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.



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 LEVIED 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.
11. 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



CONSTRUCTION NOTES

GENERAL:

1. THE ACCURACY OF 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" (1-800-322-4844) AT LEAST 4 DAYS PRIOR TO CONSTRUCTION.
4. UNDERGROUND UTILITIES SHALL BE INSTALLED IN ACCORDANCE WITH THE SPECIFICATIONS OF THE APPROPRIATE DEPARTMENT OR COMPANY.
5. ALL CONSTRUCTION SHALL CONFORM TO TOWN OF PEMBROKE PLANNING BOARD RULES AND REGULATIONS, DPW SPECIFICATIONS, CONSERVATION COMMISSION REGULATIONS AND ALL OTHER APPLICABLE CODES.
6. ALL STUMPS SHALL BE DISPOSED OFF SITE.
7. CLEANUP - UPON COMPLETION OF ALL WORK ON THE GROUND, THE DEVELOPER SHALL REMOVE FROM THE STREETS AND ADJOINING PROPERTY, ALL TEMPORARY STRUCTURES AND ALL SURPLUS MATERIAL AND RUBBISH WHICH MAY HAVE ACCUMULATED DURING CONSTRUCTION, AND SHALL LEAVE THE WORK IN A NEAT AND ORDERLY CONDITION. DURING CONSTRUCTION, THE DEVELOPER SHALL KEEP THE SITE FREE OF RUBBISH WHICH MAY BE CARRIED BY WIND OR RAIN OFF THE SITE TO ABUTTING PROPERTIES OR ONTO PUBLIC WAYS.

DRAINAGE SYSTEM NOTES:

1. CONTACT THE DESIGN ENGINEER FOR APPROVAL OF ANY CONSTRUCTION PHASE CHANGES.
2. CONTRACTOR TO AVOID SOILS COMPACTION WITHIN DRAINAGE SYSTEM AREA. CONTRACTOR SHOULD AVOID MACHINERY OR VEHICLE USE OVER STORM WATER SYSTEMS.

CONSTRUCTION SEQUENCE:

STAKE LIMIT OF WORK CLEARING
INSTALL SILT SOCK EROSION CONTROL BARRIER
CLEAR AND GRUB SITE AREAS
INSTALL CONSTRUCTION APRON & DRIVEWAY BASE
STAKE BUILDING PARKING LOT & DRAINAGE BASIN LOCATION
BRING CUT AREAS TO SUBGRADE
INSTALL SILT FENCE FOR STOCKPILE AREAS
INSTALL FOUNDATION & BEGIN FRAMING
INSTALL TEMPORARY DRAINAGE AREAS WHERE NECESSARY
INSTALL ELECTRIC, GAS & WATER UTILITIES
PLACE FILL MATERIAL TO BASE COURSE
CONSTRUCT DRAINAGE BASINS
COMPLETE FINISH GRADING
INSTALL ENERGY DISSIPATERS AND CONNECT ALL OUTLETS
COMPLETE BUILDING CONSTRUCTION
INSTALL/RAISE MANHOLE STRUCTURES TO FINISH GRADE DRAIN, SEPTIC, LOAM & SEED DISTURBED AREAS, MULCH AND PLANT RAIN GARDEN & LANDSCAPE AREAS
INSTALL FINISH PAVEMENT COAT
SCHEDULE FINAL SITE INSPECTION FOR CERTIFICATION
REMOVE SEDIMENT CONTROLS



Maximum Cover

Wall thrust generally governs the maximum cover a pipe can withstand and conservative maximum cover heights will result when using the information presented in the *Structures* section (Section 2) of the Drainage Handbook.

The maximum burial depth is highly influenced by the type of backfill and level of compaction around the pipe. General maximum cover limits for ADS N-12, N-12 ST, N-12 WT pipe, (ASTM F2306 and AASTHO M252/M294 Type S pipes) are shown in Table 3 for a variety of backfill conditions.

Table 3 was developed assuming pipe is installed in accordance with ASTM D2321 and the *Installation* section (Section 5) of the Drainage Handbook. Additionally, the calculations assume zero hydrostatic load, incorporate the maximum safety factors represented in Structures section of the Drainage Handbook, use material properties consistent with the expected performance characteristics for N-12 (per ASTM F2306) materials as shown in Table 2 below, and assume the native soil is of adequate strength and is suitable for installation. For applications requiring fill heights greater than those shown in Table 3 or where hydrostatic pressure due to groundwater is present, contact an ADS engineering representative.

Figure 1
ADS N-12®, N-12 ST, and N-12 WT (per AASHTO) Trench Detail Under Pavement

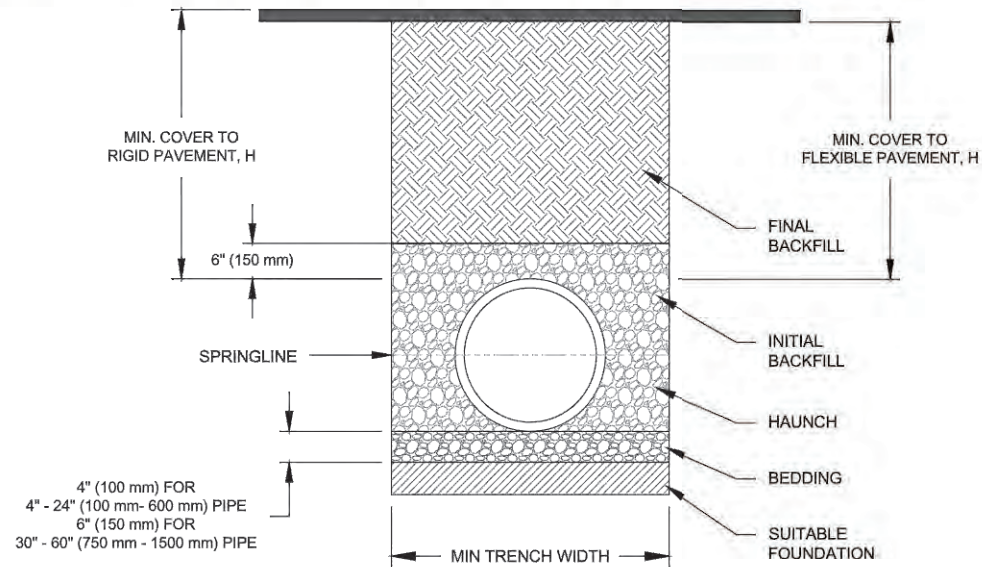


Table 2
ADS N-12 (per AASHTO) Mechanical Properties

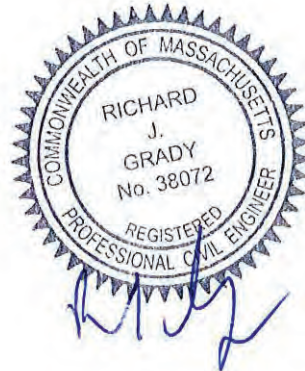
Cell Class	Factored Compressive Strain (%)	Tension Strain (%)	Initial		75-Year	
			Fu (psi)	E (psi)	Fu (psi)	E (psi)
ASTM D3350 435400C	4.1	5.0	3,000	110,000	900	21,000

2	4640 TRUEMAN BLVD. HILLIARD, OH 43026 (800) 821-6710 www.ads-pipe.com
ATN2.01	© ADS 2014

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

DRAIN PIPE DETAIL

(NOT TO SCALE)



SITE PLAN
#345 OAK STREET
PEMBROKE, MASSACHUSETTS

PREPARED FOR:
CHAMPION BUILDERS INC
P.O. BOX 1414
DUXBURY, MA 02331

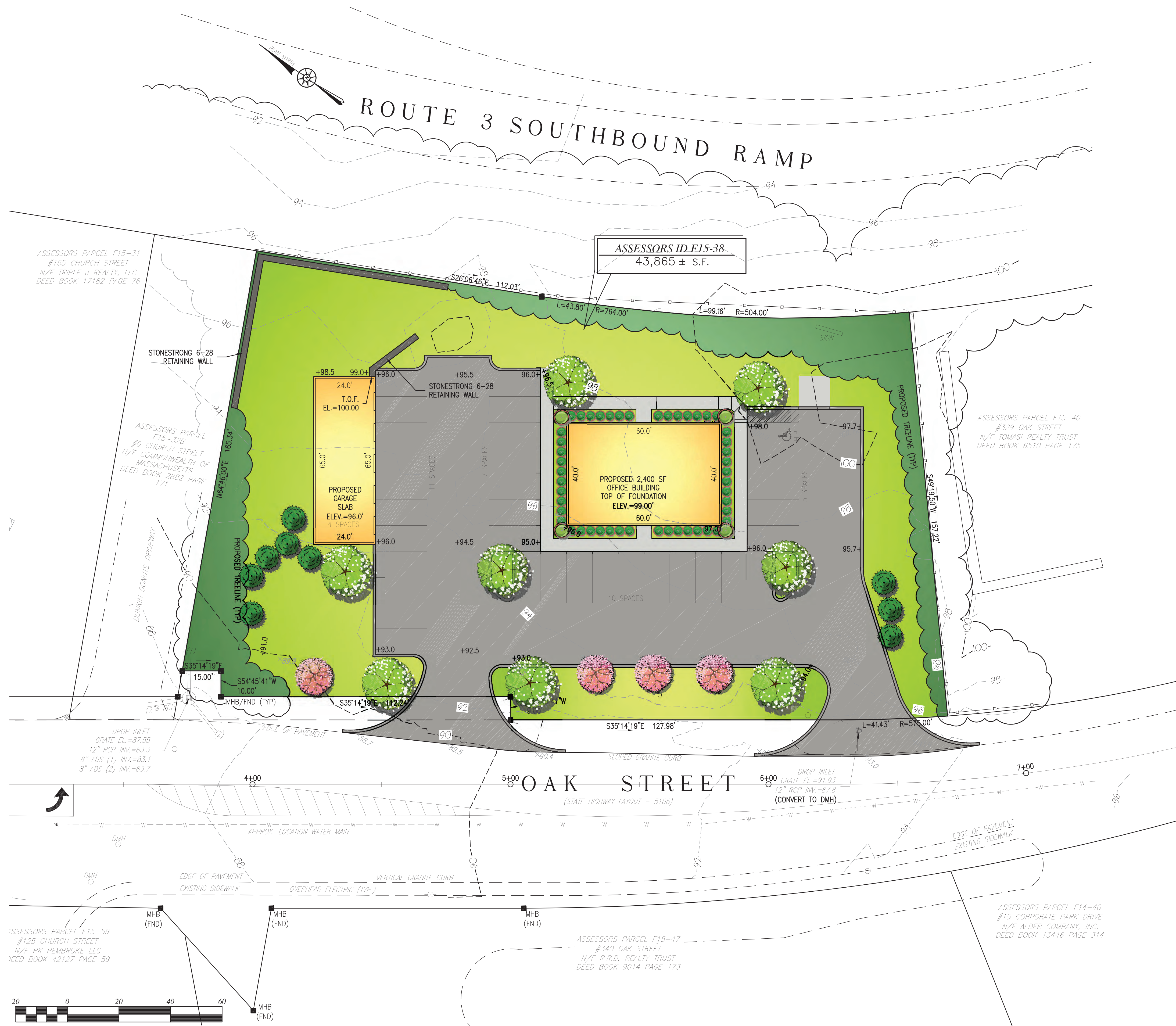
MAY 30, 2019
SCALE: 1"=20'
JOB No. 18-365



GRADY CONSULTING, L.L.C.

Civil Engineers, Land Surveyors &
Landscape Architects

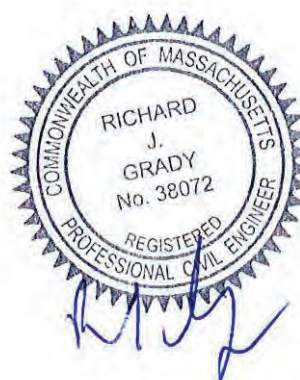
71 Evergreen Street, Suite 1, Kingston, MA 02364
Phone (781) 585-2300 Fax (781) 585-2378



CONCEPT PLANT SCHEDULE

2018-10-23 10:28

- EVERGREEN TREES
 - JAP. BLACK PINE / WHITE SPRUCE
 - PICEA ABIES / NORWAY SPRUCE
 - PICEA GLAUCA / WHITE SPRUCE
 - PICEA PUNGENS 'GLAUCA' / COLORADO BLUE SPRUCE
 - PINUS NIGRA / AUSTRIAN BLACK PINE
 - PINUS STROBUS / WHITE PINE
- FLOWERING TREES
 - CORNUS FLORIDA / EASTERN DOGWOOD
 - PRUNUS CERASIFERA 'THUNDERCLOUD' / THUNDERCLOUD PLUM
 - PRUNUS SERRULATA 'KWANZAN' / FLOWERING CHERRY
 - PYRUS CALLERYANA 'CHANTICLEER' / CHANTICLEER PEAR
 - SYRINGA RETICULATA / JAPANESE TREE LILAC
- STREET TREES
 - ACER RUBRUM 'RED SUNSET' / RED SUNSET MAPLE
 - FRAXINUS PENNSYLVANICA / GREEN ASH
 - GLEDETZIA TRIACANTHOS 'NERMES' / THORNLESS COMMON HONEYLOCUST
 - PLATANUS X ACERIFOLIA / LONDON PLANE TREE
 - QUERCUS RUBRA / RED OAK
 - ILIX CORDATA 'RECTA' / LITTLELEAF LINDEN
 - ZELKOVA SERRATA / SAWLEAF ZELKOVA
- SHRUBS (LARGE)
 - AMELANCHIER ALNIFOLIA / SERVICEBERRY
- SHRUBS (FOUNDATION)
 - ILEX GLABRA 'COMPACTA' / COMPACT INKBERY



SITE PLAN
#345 OAK STREET
PEMBROKE, MASSACHUSETTS

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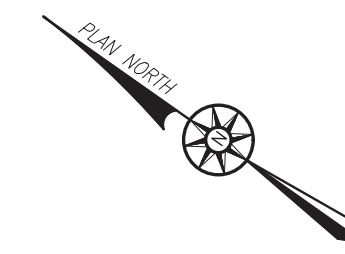
LANDSCAPE

SOIL LOGS

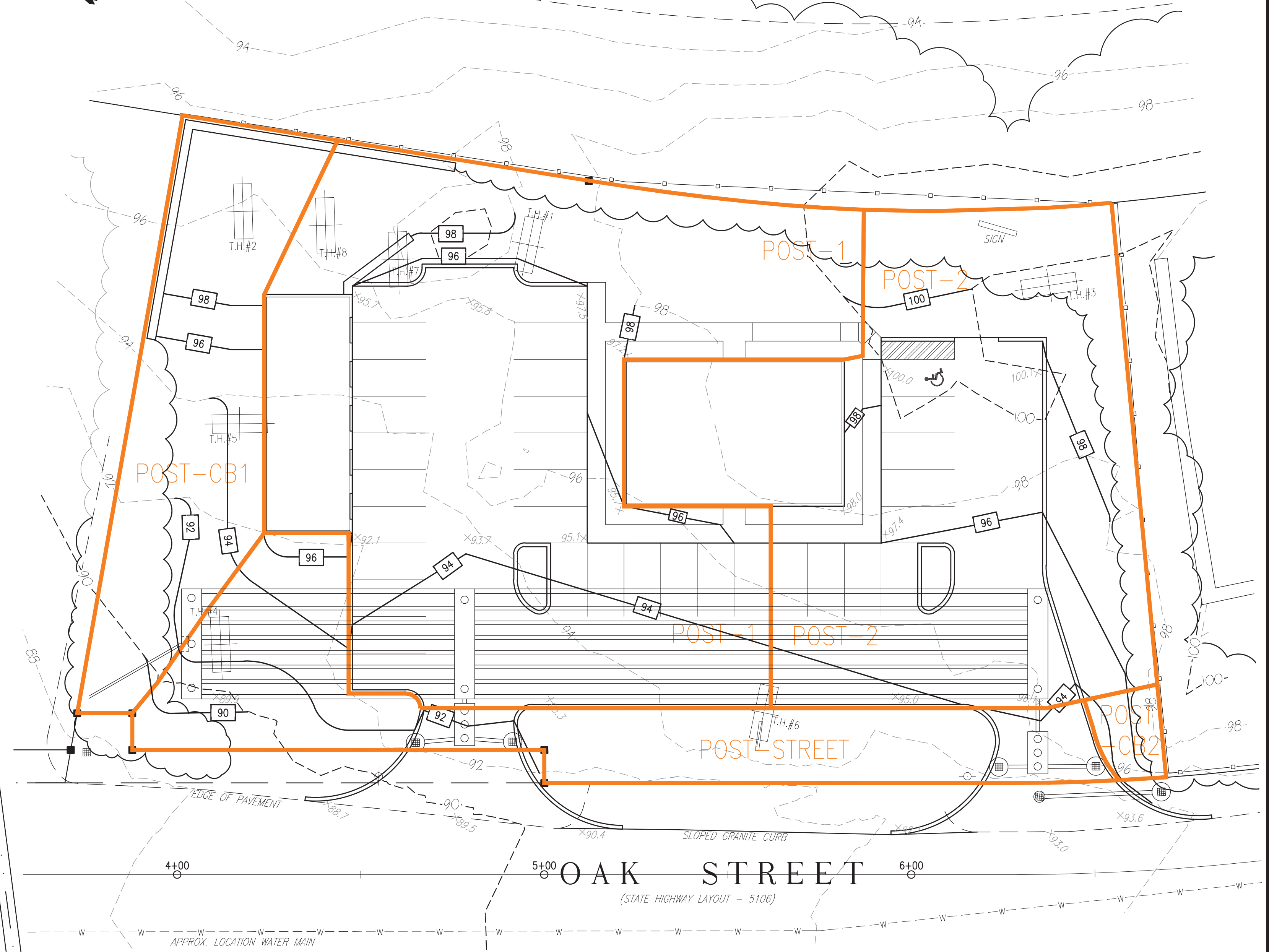
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0'-18" FILL	0'-18" FILL	0'-50" FILL	0'-18" FILL	0'-18" FILL	0'-42" FILL
18"-36" B SILTY LOAM	18"-50" B LOAM		18"-42" B SANDY LOAM	18"-36" B SANDY LOAM	
			42"-60" C SANDY LOAM	36"-66" C SANDY LOAM	42"-60" C SANDY LOAM
36"-108" C SILTY LOAM	50"-120" C SANDY LOAM	50"-78" C SILTY LOAM	D= 5'-0" MOTTLING @ 4'-0" (EL. 86.7)	D= 5'-6" MOTTLING @ 3'-4" (EL. 90.1)	D= 5'-0" MOTTLING @ 4'-0" (EL. 91.2)
D= 9'-0" MOTTLING @ 4'-0" (EL. 93.6)	D= 10'-0" MOTTLING @ 5'-0" (EL. 90.8)	D= 6'-6" MOTTLING @ 4'-2" (EL. 95.5)			
96.1	94.3	95.5	89.2	91.9	91.7
94.6		93.2	87.2	90.4	90.2
88.6	85.8		85.7	87.9	

EXISTING

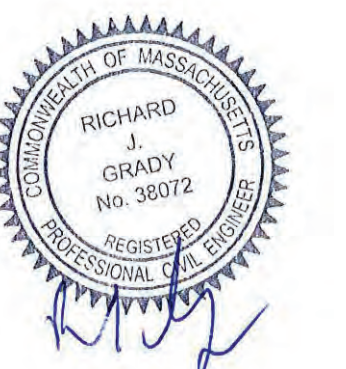
ROUTE 3 SOUTHBOUND RAMP



ROUTE 3 SOUTHBOUND RAMP

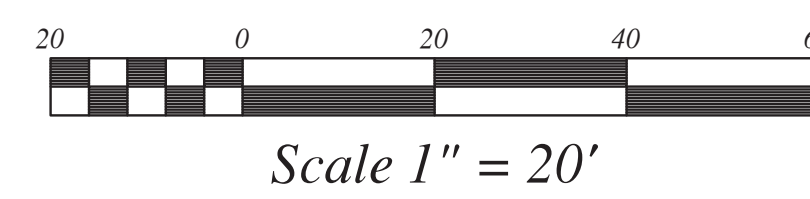


PROPOSED



TRIBUTARY AREA PLAN

#345 OAK STREET
PEMBROKE, MASSACHUSETTS



PREPARED FOR:
CHAMPION BUILDERS INC
P.O. BOX 1414
DUXBURY, MA 02331

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