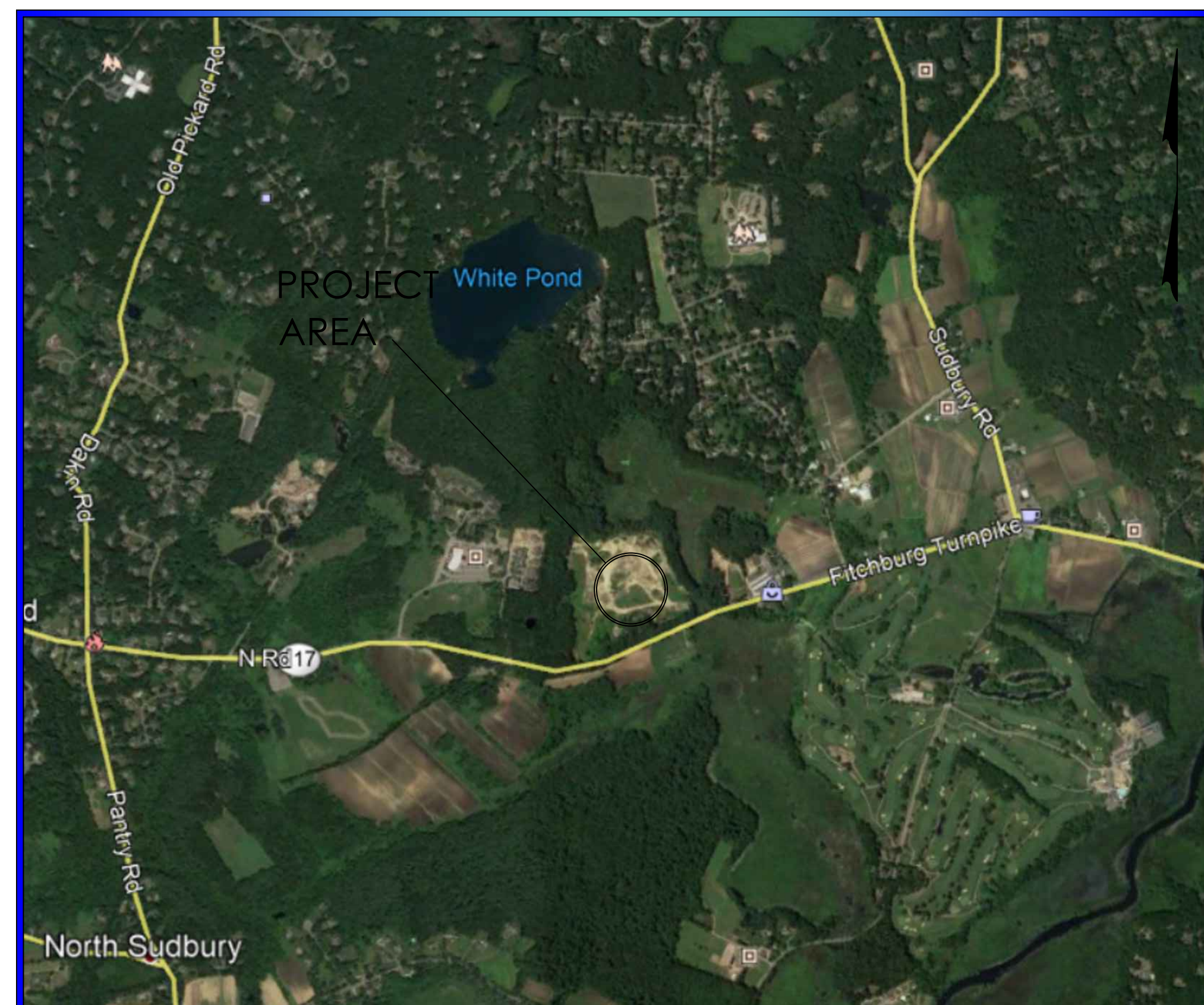


COLD BROOK CROSSING QUARRY NORTH ROAD, LLC WATER RESOURCE RECOVERY FACILITY SUDBURY, MASSACHUSETTS

DRAWING INDEX

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LOCUS MAP



Raymond L. Willis III

**MASSDEP REVIEW
DRAWINGS**

NOT FOR CONSTRUCTION

MARCH 2020

GENERAL NOTES

DESCRIPTION	PROPOSED	EXISTING
WATER MAIN		
VALVE		
REDUCER		
TRANSITION COUPLING		
CAP		
CROSS		
TEE		
BEND		
CURB STOP		
SOLID SLEEVE		
FIRE HYDRANT		
WATER SERVICE LINE		
WELL		
ZONE 1		
SEWER MANHOLE		
SEWER GRAVITY MAIN		
SEWER FORCE MAIN		
VENT		
DRAIN MANHOLE		
CATCH BASIN		
DRAIN LINE		
RIP RAP		
FLARED DRAINAGE PIPE		
COMM. BOX		
COMM. LINE		
COMM. MANHOLE		
ELECTRIC LINE		
ELECTRIC MANHOLE		
ELECTRIC OVERHEAD WIRE		
TRANSFORMER		
UTILITY POLE		
GUY WIRE		
LIGHT WALL MOUNT / POLE		
GAS LINE		
GAS VALVE		
MISC. MANHOLE		
TREE LINE		
TREE		
SHRUB		
ROCK		
WETLANDS		
WETLAND FLAG		
WETLAND BUFFER		
EDGE OF WATER		
RIVER FRONT		
100 YEAR FEMA FLOOD ZONE		
HAYBALES		
SILTATION FENCE		
LIMIT OF WORK		
10' CONTOUR		
2' CONTOUR		
SPOT ELEVATION		
BORING		
MONITORING WELL		
EASEMENT		
SURVEY MARKER		
STATIONING		
TOWN LINE		
CHAIN LINK FENCE		
STONE WALL		
GUARD RAIL		
BOLLARD		
MAIL BOX		
SIGN POST		
EDGE OF PAVEMENT		
PROPERTY LINE		
BENCH MARK		
EASEMENT LINE		
STRAW WATTLES		
LOAM & SEED		
TEST PIT		

ABBREVIATIONS

HYD	HYDRANT
RCP	REINFORCED CONCRETE PIPE
DI	DUCTILE IRON
AC	ASBESTOS CONCRETE
CI	CAST IRON
WI	WROUGHT IRON
CLAY	VITRIFIED CLAY
PVC	POLYVINYL CHLORIDE
TYP	TYPICAL
PB	PULL BOX
IRR	IRRIGATION SYSTEM AREA
TCS	TRAFFIC CONTROL BOX
TRAN	TRANSFORMER
TRLT	TRAFFIC LIGHT
FM	FORCE MAIN
LDET	LOOP DETECTOR
CDP	CONTROLLED DENSITY FILL
CB	CATCH BASIN
DMH	DRAIN MANHOLE
SMH	SEWER MANHOLE
CONC	CONCRETE
BIT	BITUMINOUS
BLDG	BUILDING
DIA	DIAMETER
EX	EXISTING
ID	INNER DIAMETER
OD	OUTER DIAMETER
BFV	BUTTERFLY VALVE
GV	GATE VALVE

1. THE CONTRACTOR SHALL CONTACT "DIG SAFE" AT 1-888-344-7233, 72 HOURS PRIOR TO ANY EXCAVATION AND/OR SUBSURFACE TESTING TO INFORM THE UTILITY COMPANIES OF ANY EXCAVATION.
2. ONSITE ENGINEERING, INC. APPROVAL SHALL BE REQUIRED FOR ALL FIELD CHANGES IN THE WORK PRIOR TO IMPLEMENTATION; ONSITE ENGINEERING, INC., 279 EAST CENTRAL STREET, #241, FRANKLIN, MA 02038, (508) 553-0616. NO FIELD CHANGES SHALL BE MADE IN ANY SPECIFIED SITE WORK OR ANY MATERIALS FOR WHICH SHOP DRAWINGS HAVE BEEN SUBMITTED AND APPROVED WITHOUT PRIOR CONSULTATION OF ONSITE ENGINEERING, INC. ANY CHANGES SO MADE WITHOUT THE WRITTEN CONSENT OF ONSITE ENGINEERING, INC. SHALL, IF DEEMED UNACCEPTABLE BY ONSITE ENGINEERING, INC., BE PROMPTLY REMOVED FROM THE WORK SITE AT NO ADDITIONAL COST TO THE OWNER.
3. ALL CONSTRUCTION METHODS AND MATERIALS, AS WELL AS ALL MATERIAL SHOP DRAWINGS AND MANUFACTURERS DATA SHALL REQUIRE THE WRITTEN APPROVAL OF ONSITE ENGINEERING, INC. PRIOR TO FABRICATION AND INSTALLATION. ONSITE ENGINEERING, INC. IS NOT RESPONSIBLE FOR ANY WORK FOR WHICH SHOP DRAWINGS AND/OR CONSTRUCTION MATERIALS HAVE NOT BEEN PRE-APPROVED BY ONSITE ENGINEERING, INC.
4. ONSITE ENGINEERING, INC. ASSUMES NO RESPONSIBILITY OR LIABILITY FOR DAMAGES INCURRED AS A RESULT OF UTILITIES OMITTED OR INACCURATELY SHOWN ON THESE DRAWINGS. THIS PLAN DOES NOT PURPORT TO SHOW ALL EXISTING OR PROPOSED UTILITY LOCATIONS OR ELEVATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CHECK AND VERIFY ALL UTILITY LOCATIONS AND ELEVATIONS PRIOR TO ANY CONSTRUCTION ACTIVITY.
5. BASEPLAN USED IS BY OTHERS. ONSITE ENGINEERING, INC. IMPLIES NO WARRANTY AS TO THE ACCURACY OF ONSITE UTILITIES OR PROPERTY LINES. ALL PROPERTY LINE INFORMATION, WETLAND RESOURCE AREA BOUNDARIES AND ROADWAY AND UTILITY DATA WAS COMPILED BY OTHERS. ONSITE ENGINEERING DOES NOT ATTEST TO THE ACCURACY OF THE EXISTING CONDITION PLAN.
6. BASE PLAN USED IS PROVIDED BY CIVIL DESIGN GROUP, LLC.
7. THE CONTRACTOR SHALL MAKE APPLICATION FOR AND PAY ALL FEES FOR PERMITS REQUIRED TO CONSTRUCT THIS PROJECT.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISPOSAL OF ALL WASTE MATERIAL AT A LOCATION APPROVED BY THE BOARD OF HEALTH AND/OR APPLICABLE APPROVING AUTHORITIES. BURIAL OF WASTE MATERIAL ON SITE WILL NOT BE PERMITTED.
9. THE CONTRACTOR SHALL CONTACT THE RESPECTIVE UTILITY COMPANIES TO DETERMINE THE LOCATION, SIZE, MATERIALS AND ELEVATION OF ALL EXISTING UTILITIES, CONDUITS AND LINES.
10. DRAINAGE GENERATED AS A RESULT OF DEWATERING SHALL BE DISCHARGED TO EXISTING DRAINAGE COURSES WITH PROPER EROSION CONTROL MEASURES SUBJECT TO APPROVAL BY THE ENGINEER. DISCHARGE ONTO PAVEMENT OR PRIVATE PROPERTY SHALL NOT BE ALLOWED.
11. THE MATERIALS AND CONSTRUCTION OF ALL PROPOSED UTILITIES SHALL CONFORM TO THE MASSDOT STANDARDS AND SPECIFICATIONS, LATEST EDITION, NEIWPCC TECHNICAL RELEASE 16 AND THE MASSDEP GUIDELINES FOR SMALL WASTEWATER TREATMENT FACILITIES.
12. WHENEVER EXISTING STRUCTURES ARE ENCOUNTERED, THE CONTRACTOR SHALL REPAIR ANY DAMAGED STRUCTURES, PAVEMENT, SIDEWALKS, WALLS, ETC. OR REPLACE ANY REMOVED STRUCTURES, AND MAKE ANY IMPROVEMENTS ABOVE AND BELOW GRADE TO A CONDITION BETTER THAN OR EQUAL TO PRE-EXISTING CONDITIONS AT NO ADDITIONAL COST TO THE OWNER.
13. ANY ERRORS, OMISSIONS AND CHANGES IN CONDITIONS AT THE SITE SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO PERFORMING THE RELATED WORK.
14. ALL OPEN EXCAVATIONS SHALL BE ADEQUATELY SAFEGUARDED BY PROVIDING TEMPORARY BARRICADES AND/OR FENCING, CAUTION SIGNS, LIGHTS AND OTHER MEANS TO PREVENT ACCIDENTS TO PERSONS, AND DAMAGE TO PROPERTY. THE CONTRACTOR SHALL, AT THEIR OWN EXPENSE, PROVIDE SUITABLE AND SAFE BRIDGES AND OTHER CROSSINGS FOR ACCOMMODATING TRAVEL BY PEDESTRIANS AND WORKMEN AND PROVIDE POLICE DETAILS AS NECESSARY. ALL EXCAVATION MUST COMPLY WITH THE COMMONWEALTH OF MASSACHUSETTS TRENCH SAFETY REQUIREMENTS.
15. ALL WORK ASSOCIATED WITH THE TREATMENT WORKS SHALL BE PERFORMED IN ACCORDANCE WITH THE APPROVED PLANS. ALL CHANGES TO THE PLAN MUST BE APPROVED BY ONSITE ENGINEERING, INC.

16. ONSITE ENGINEERING, INC. IS NOT RESPONSIBLE FOR THE FAILURE OF THE CONTRACTOR TO NOTIFY THE ENGINEER FOR THE PROPER INSPECTIONS DURING CONSTRUCTION.
17. THE CONTRACTOR SHALL MAINTAIN 10 FEET HORIZONTAL SEPARATION FROM ALL WATER MAINS/SERVICES AND ALL SEWER LINES SHALL MAINTAIN A MINIMUM VERTICAL CLEARANCE OF LEAST (18) EIGHTEEN INCHES BELOW ALL WATER MAINS/SERVICES. SEWER LINES SHALL BE SLEEVED THAT CROSS BELOW, BUT WITHIN 18 INCHES OF THE WATER MAIN/SERVICE. BOTH THE SEWER LINE AND WATER MAIN/SERVICE SHALL BE SLEEVED WITHIN 10 FEET OF THE CROSSING WHEN THE SEWER LINE CROSSES ABOVE WATER MAINS/SERVICES.
18. ALL PRECAST STRUCTURE PENETRATIONS SHALL BE WATERTIGHT AND UTILIZE KOR-N-SEAL BOOTS WITH STAINLESS STEEL CLAMPS AND EXPANSION RINGS (GRAVITY SEWER) OR MECHANICAL LINK SEALS (FORCE MAINS) AND TESTED FOR WATER-TIGHTNESS.
19. ALL PRECAST CONCRETE TANKS SHALL BE TESTED FOR WATERTIGHTNESS IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. IN ADDITION, ALL PRECAST CONCRETE STRUCTURES SHALL BE PROVIDED WITH SUFFICIENT BALLAST TO OFFSET GROUNDWATER CONDITIONS. CONTRACTOR, VIA TANK MANUFACTURER, IS RESPONSIBLE FOR DETERMINING BALLAST REQUIREMENTS BASED ON STRUCTURES TO BE PROVIDED PER THE PROJECT SPECIFICATION REQUIREMENTS.
20. ALL WORK/EXCAVATION PERFORMED IN PAVED AREAS SHALL REQUIRE THE SAWCUTTING OF PAVEMENT AND ULTIMATELY REPLACING THE PAVEMENT.
21. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING INVERT ELEVATIONS OF ALL SEWER MANHOLES PRIOR TO THE SUBMISSION OF MANHOLE SHOP DRAWINGS.
22. THE WORK DETAILED ON THESE DRAWINGS SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, WHICH ARE INCLUDED AS A SEPARATE MANUAL. ANY DISCREPANCIES BETWEEN THE DRAWINGS AND SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO PERFORMING THE WORK. IN THE EVENT OF A DISCREPANCY, THE MORE STRINGENT OF THE REQUIREMENTS, AS DETERMINED BY THE ENGINEER, SHALL BE ADHERED TO.
23. THE STOCKPILING OF MATERIAL ON THE SITE SHALL BE LIMITED TO THE GREATEST EXTENT POSSIBLE. THE CONTRACTOR SHALL PLAN TO IMMEDIATELY REMOVE ANY MATERIAL NOT TO BE RE-USED, WHICH SHALL BE LEGALLY DISPOSED OF. ADDITIONALLY, ANY EXCAVATED MATERIAL SHALL BE PLACED/STORED IN TRUCKS AND NOT STOCKPILED ON THE SITE TO THE GREATEST EXTENT PRACTICABLE.
24. THE PLACEMENT OF CONSTRUCTION VEHICLES SHALL BE SUBJECT TO THE REVIEW OF THE LOCAL POLICE AND FIRE DEPARTMENTS. REFER TO SECTION 01100-SPECIAL PROJECT PROCEDURES AND SECTION 01570-TRAFFIC REGULATION FOR FURTHER REQUIREMENTS.
25. SITE LAYOUT, UTILITIES, STRUCTURES, GRADING, ETC. IS SHOWN FOR INFORMATIONAL PURPOSES ONLY AS A GUIDE TO THE CONTRACTOR. REFER TO DRAWINGS PREPARED BY CIVIL DESIGN GROUP, LLC. FOR ALL SITE DETAILS.
26. THE EFFLUENT DISPOSAL SYSTEM FOR THE PROJECT IS DESIGNED BY OTHERS. REFER TO DRAWINGS PREPARED BY PROVENCHER ENGINEERING FOR ALL EFFLUENT DISPOSAL SYSTEM DETAILS.

COLD BROOK CROSSING
QUARRY NORTH ROAD, LLC
SUDBURY, MASSACHUSETTS
WATER RESOURCE RECOVERY FACILITY
LEGEND AND GENERAL NOTES



Raymond L. Willis

MASSDEP REVIEW SUBMITTAL

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REV	DATE	DESCRIPTION

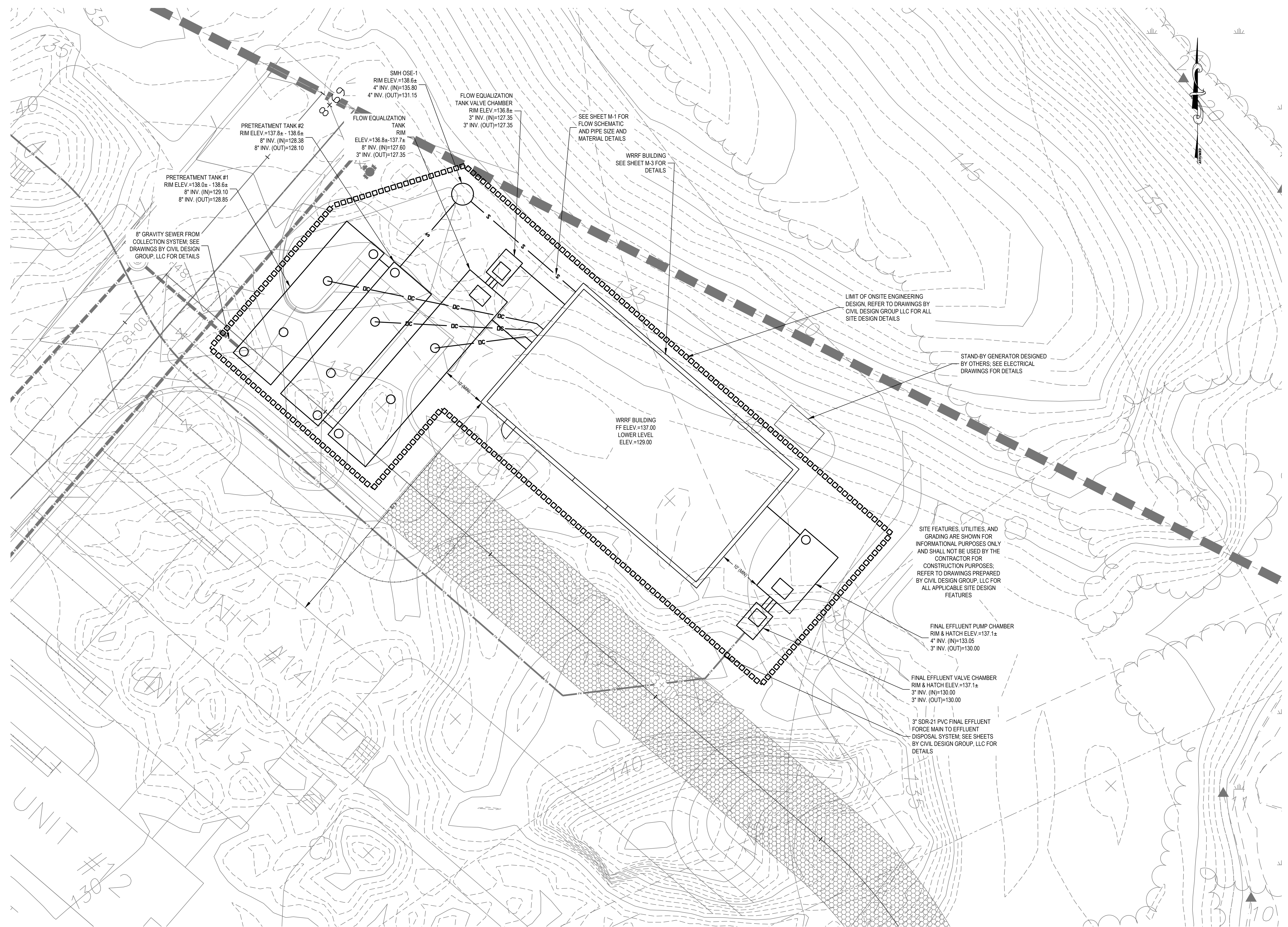
PROJECT NO.: 01536
DATE: MARCH 2020
SCALE: N.T.S.
SHEET: 1 OF 9

DRAWN BY: RLW DESIGNED BY: RLW
CHECKED BY: DCF APPROVED BY: DCF

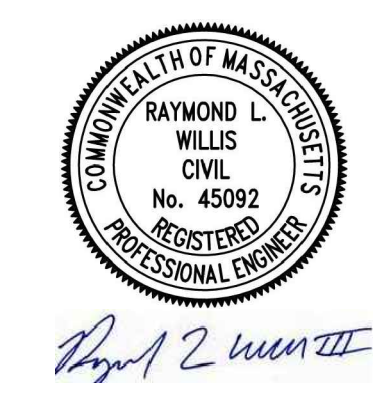
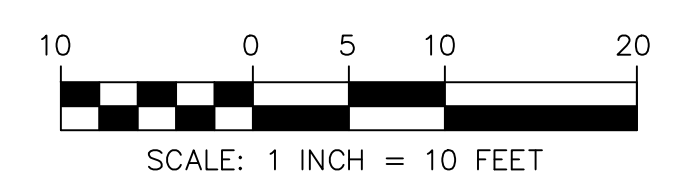
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**COLD BROOK CROSSING
QUARRY NORTH ROAD, LLC
SUDBURY, MASSACHUSETTS**

WATER RESOURCE RECOVERY FACILITY
WRRF SITE PLAN



WRRF SITE PLAN
SCALE: 1" = 10'



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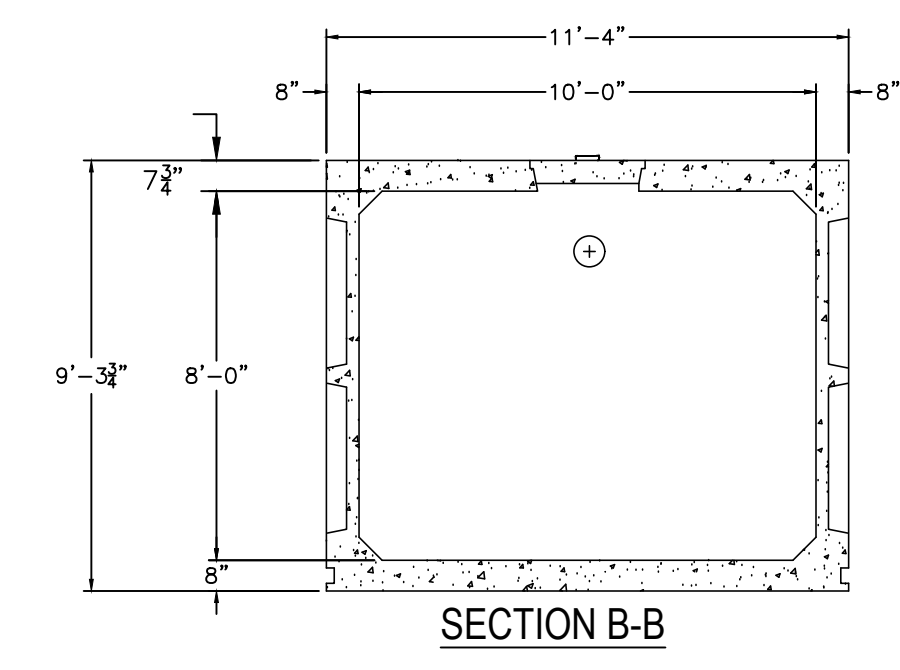
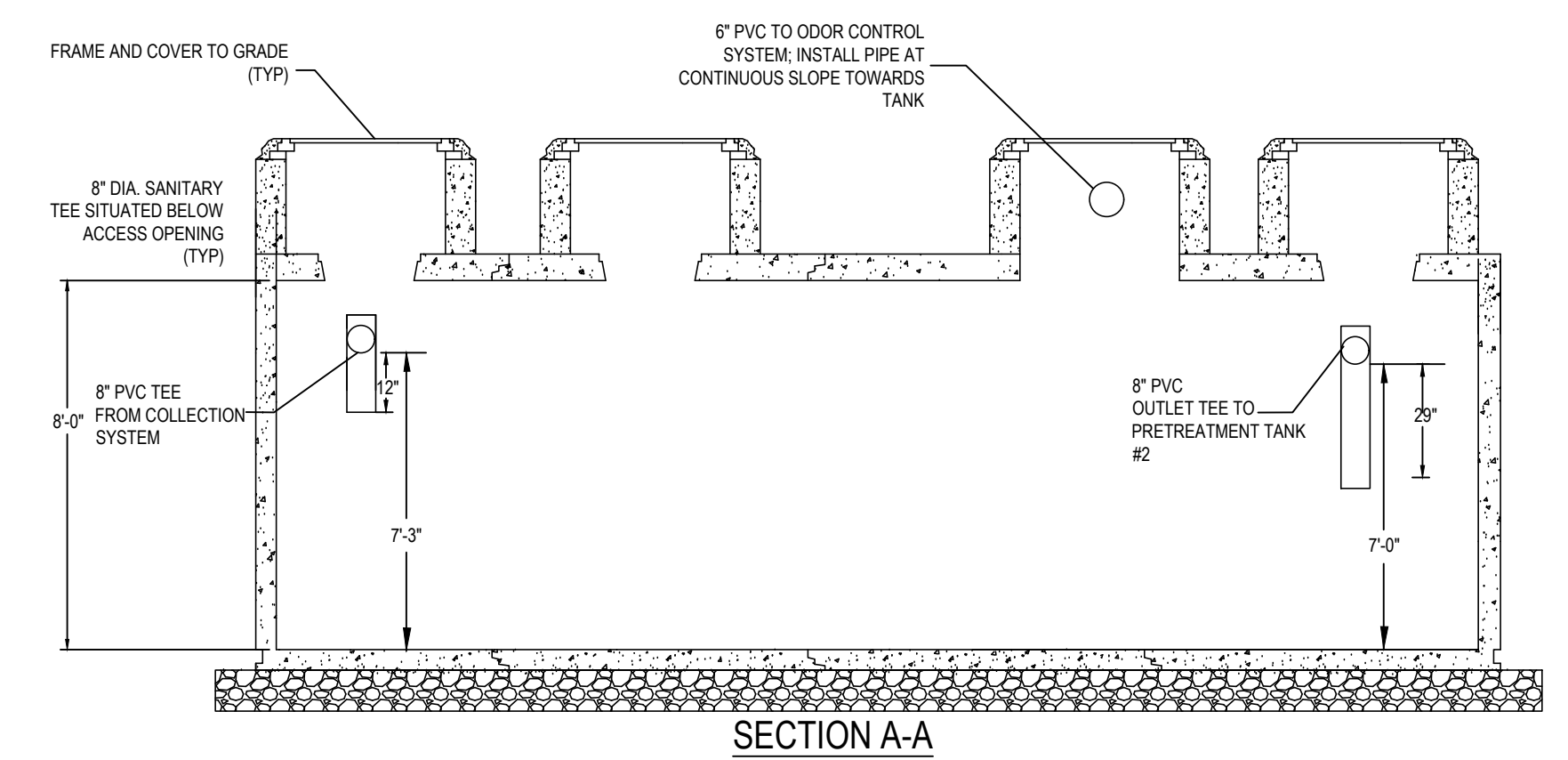
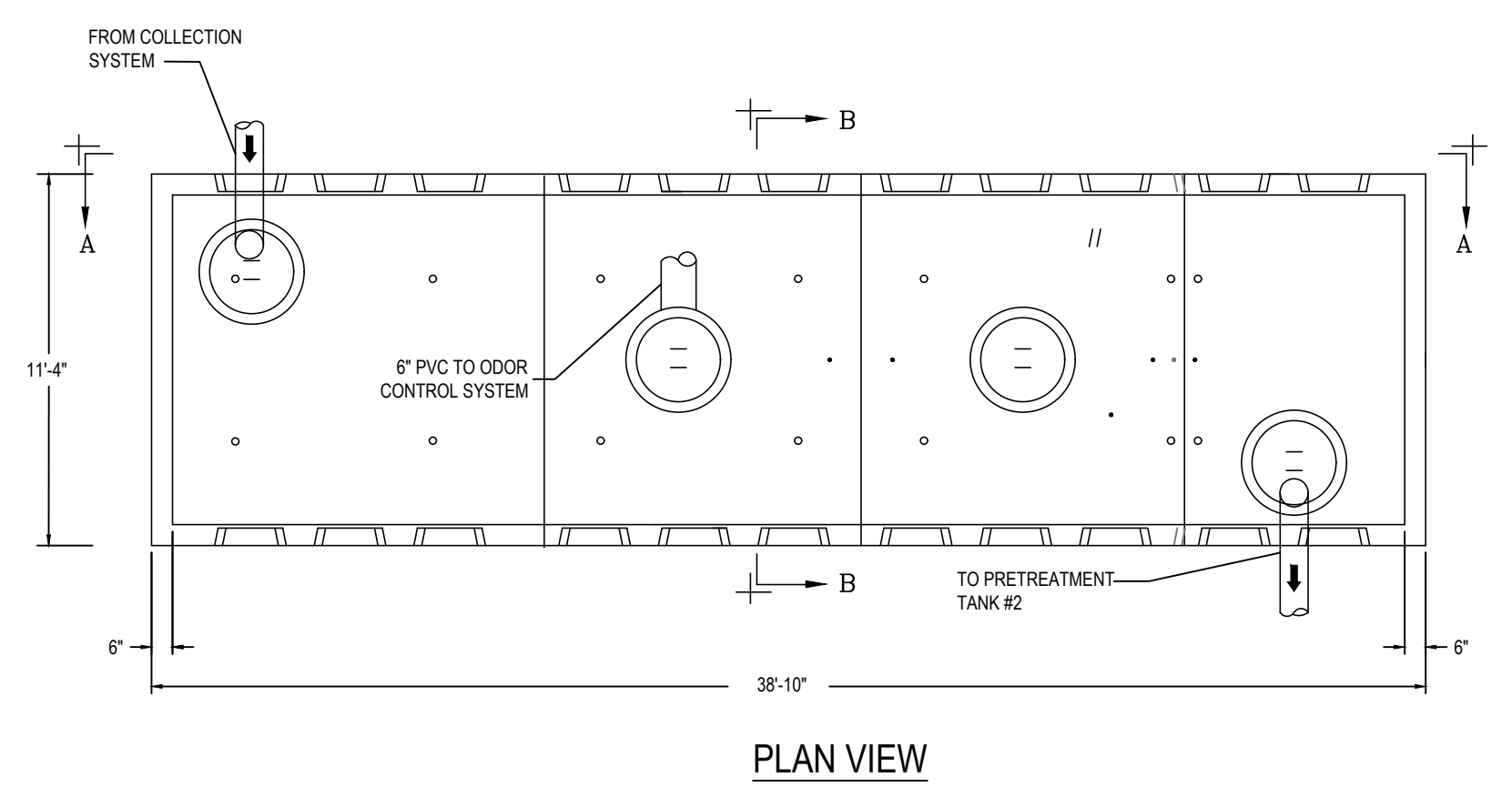
REV	DATE	DESCRIPTION

PROJECT NO.: 01536
DATE: MARCH 2020
SCALE: 1"=10'
SHEET: 2 OF 9

DRAWN BY: RLW DESIGNED BY: RLW
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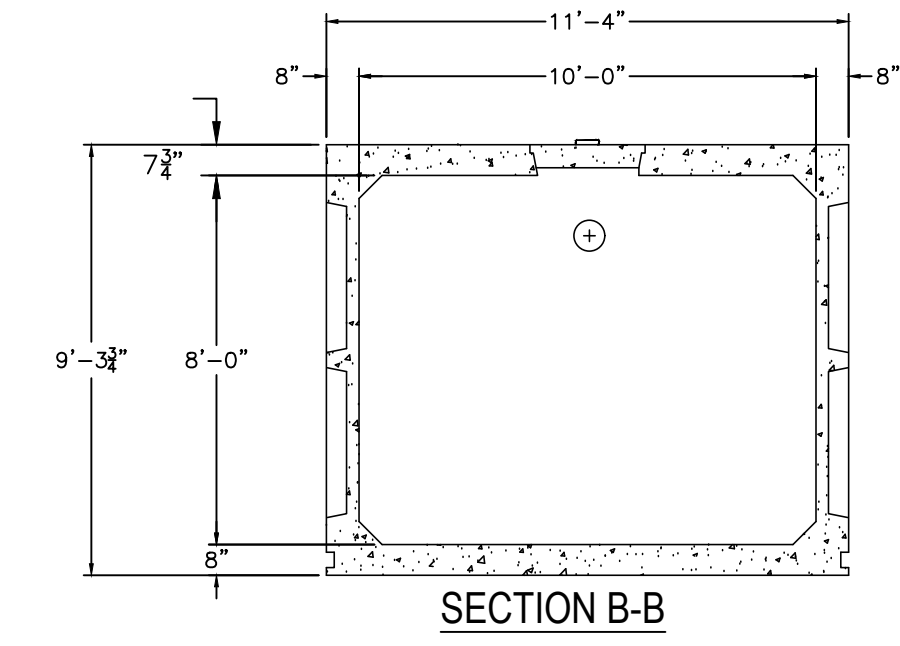
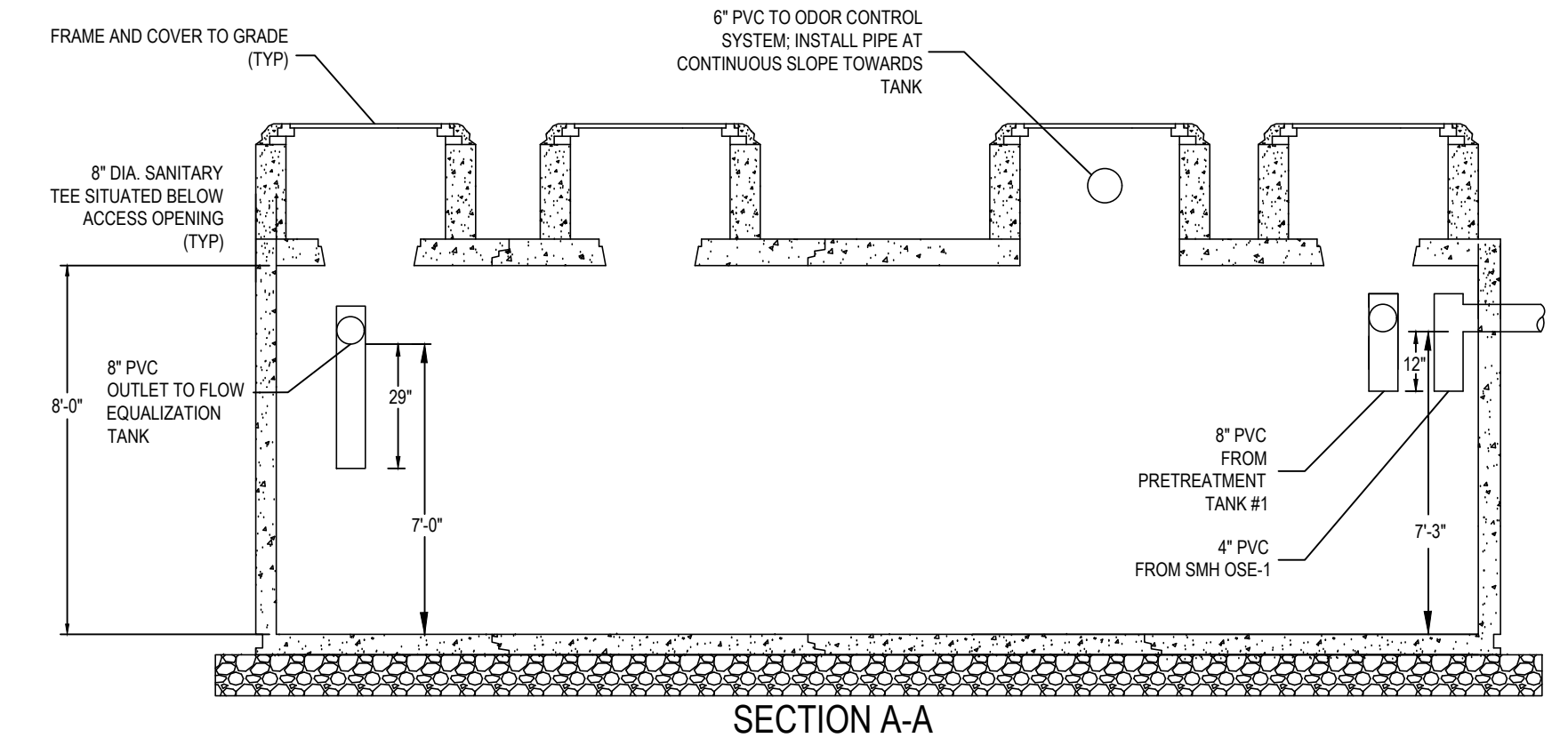
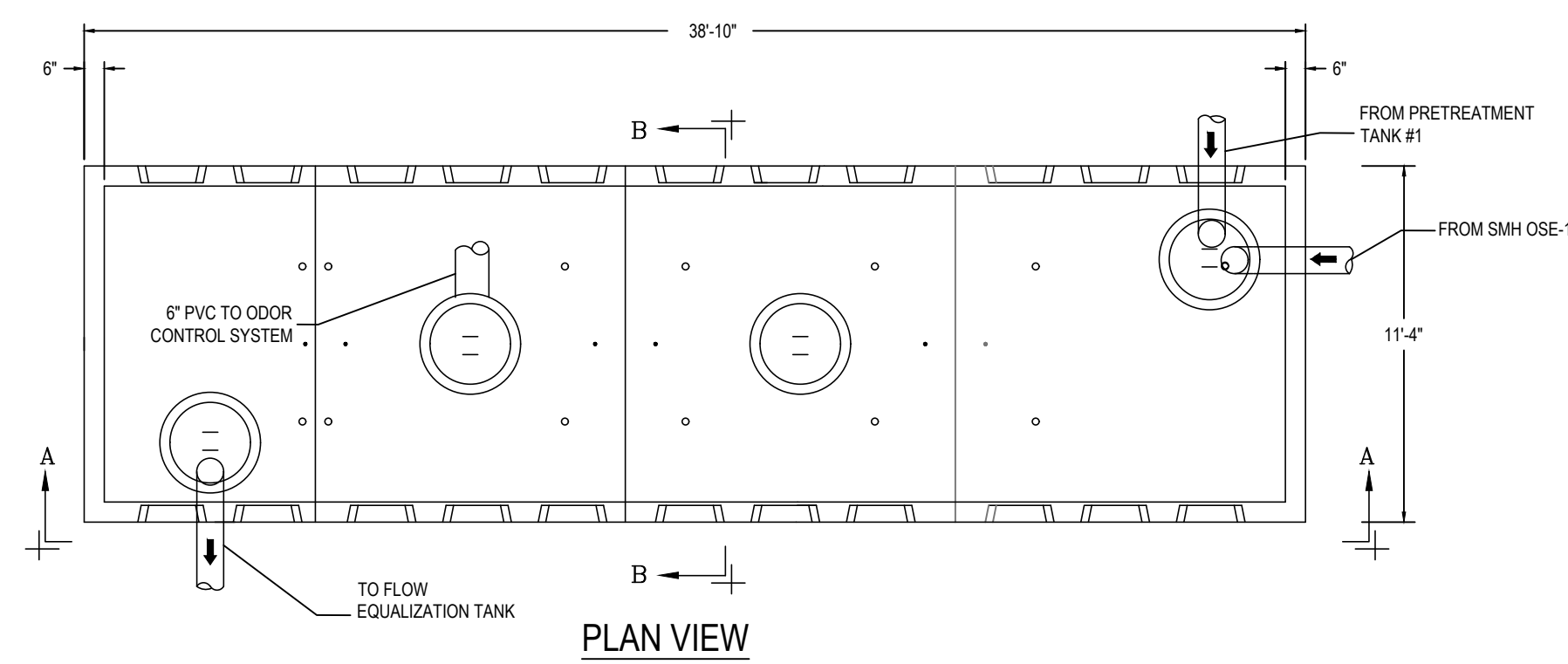
**COLD BROOK CROSSING
QUARRY NORTH ROAD, LLC
SUDBURY, MASSACHUSETTS**
WATER RESOURCE RECOVERY FACILITY
TANK DETAILS I



PRETREATMENT TANK #1
SCALE: NONE

SEE SCHEDULE OF ELEVATIONS FOR INVERT DETAILS
ROTONDO PRECAST MODEL LWT 8x10-20 WITH 20,000 GALLON CAPACITY, OR APPROVED EQUAL

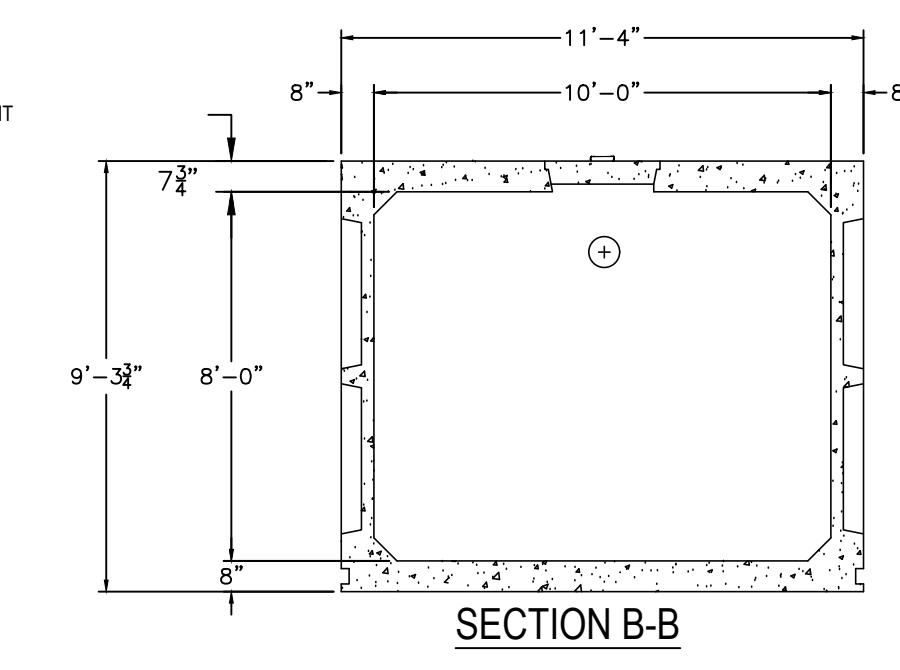
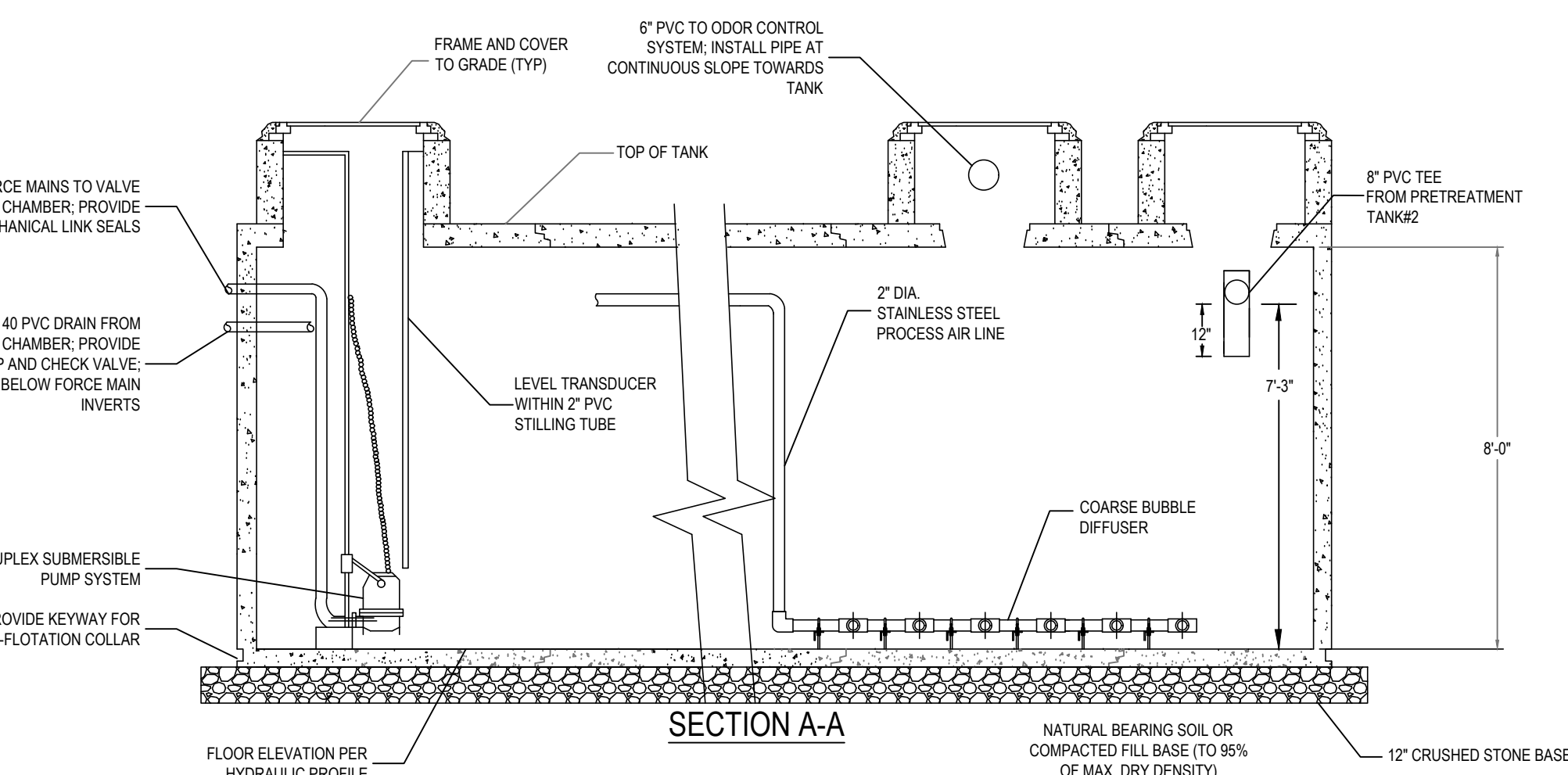
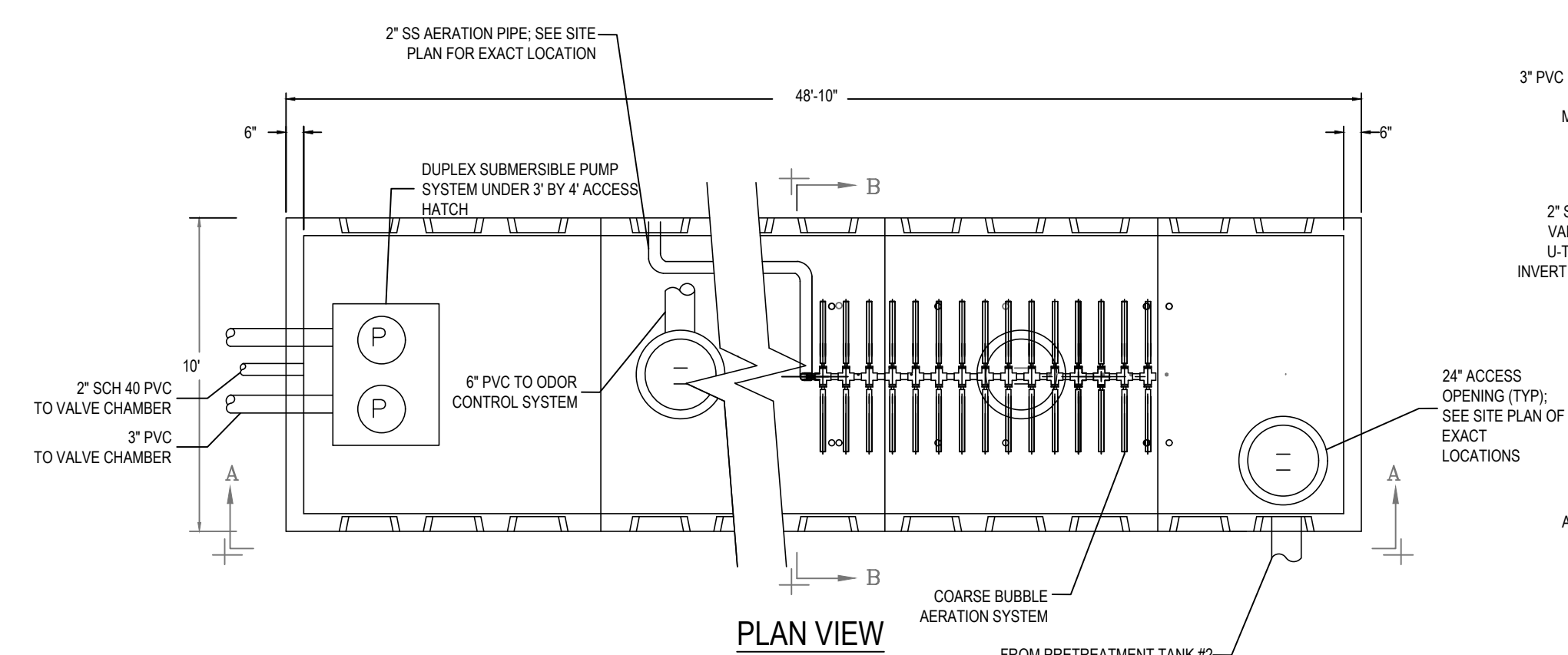
- NOTES:
1. CONCRETE : 5,000 P.S.I. MINIMUM STRENGTH @ 28 DAYS
 2. MINIMUM STRENGTH @ 28 DAYS
 3. COVER TO STEEL - 1"
 4. DESIGNED PER - ACI 318 & AASHTO STANDARD SPECS. FOR HIGHWAY BRIDGES
 5. LOADING - AASHTO HS20 TRUCK
 6. EARTH COVER - 0' MIN. TO 8' MAX.
 7. CONTRACTOR TO VERIFY SIZE AND LOCATION OF OPENINGS.



PRETREATMENT TANK #2
SCALE: NONE

SEE SCHEDULE OF ELEVATIONS FOR INVERT DETAILS
ROTONDO PRECAST MODEL LWT 8x10-20 WITH 20,000 GALLON CAPACITY, OR APPROVED EQUAL

- NOTES:
1. CONCRETE : 5,000 P.S.I. MINIMUM STRENGTH @ 28 DAYS
 2. MINIMUM STRENGTH @ 28 DAYS
 3. COVER TO STEEL - 1"
 4. DESIGNED PER - ACI 318 & AASHTO STANDARD SPECS. FOR HIGHWAY BRIDGES
 5. LOADING - AASHTO HS20 TRUCK
 6. EARTH COVER - 0' MIN. TO 8' MAX.
 7. CONTRACTOR TO VERIFY SIZE AND LOCATION OF OPENINGS.



FLOW EQUALIZATION TANK
SCALE: NONE

SEE SCHEDULE OF ELEVATIONS FOR INVERT DETAILS
ROTONDO PRECAST MODEL LWT 8x10-25 WITH 25,000 GALLON CAPACITY, OR APPROVED EQUAL

- NOTES:
1. CONCRETE : 5,000 P.S.I. MINIMUM STRENGTH @ 28 DAYS
 2. MINIMUM STRENGTH @ 28 DAYS
 3. COVER TO STEEL - 1"
 4. DESIGNED PER - ACI 318 & AASHTO STANDARD SPECS. FOR HIGHWAY BRIDGES
 5. LOADING - AASHTO HS20 TRUCK
 6. EARTH COVER - 0' MIN. TO 8' MAX.
 7. CONTRACTOR TO VERIFY SIZE AND LOCATION OF OPENINGS.



Raymond L. Willis

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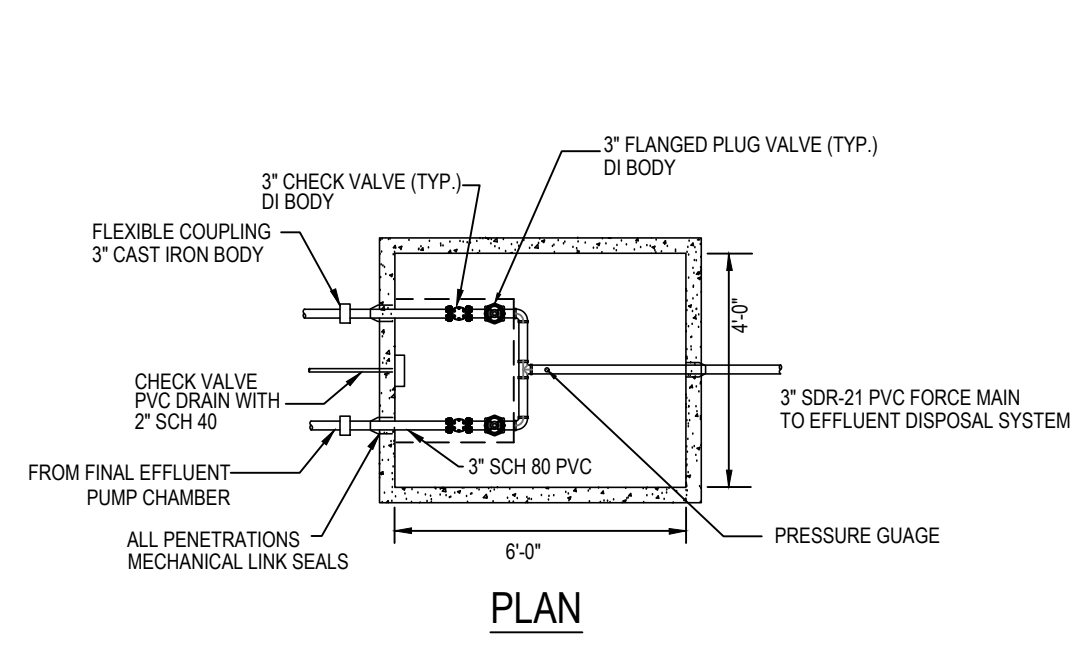
REV	DATE	DESCRIPTION

PROJECT NO.: 01536
DATE: MARCH 2020
SCALE: N.T.S.
SHEET: 3 OF 9
DRAWN BY: RLW DESIGNED BY: RLW
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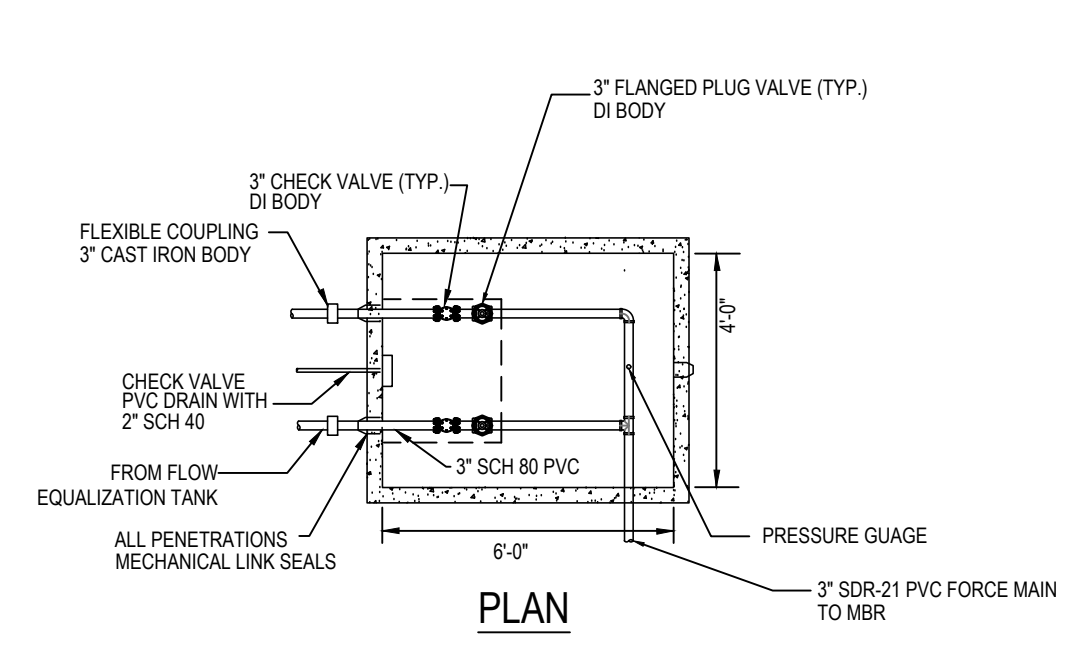
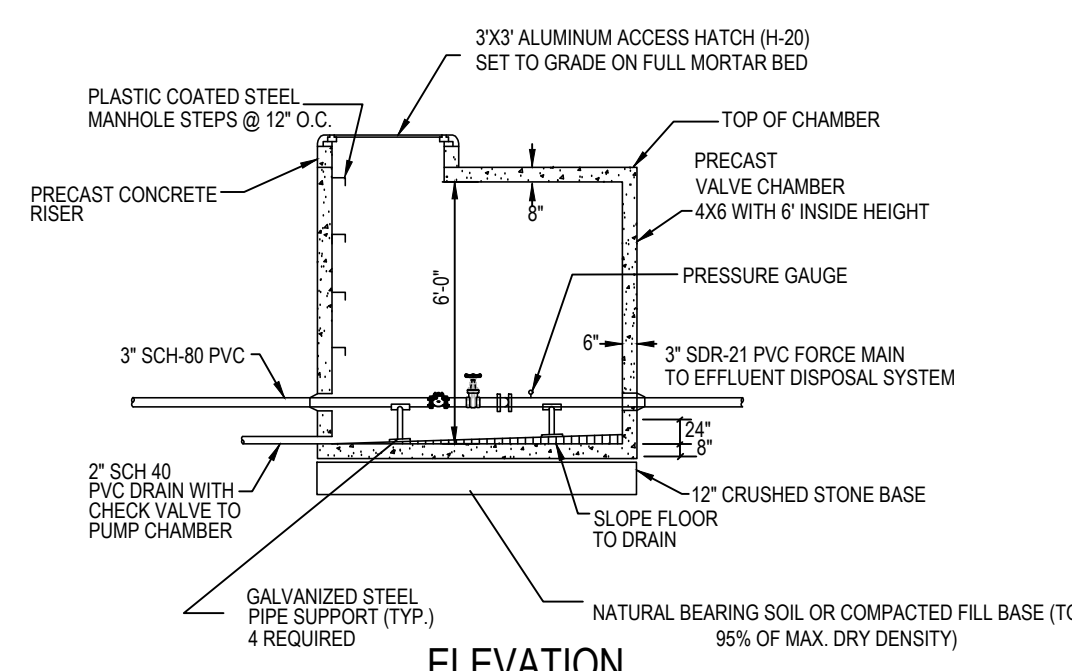
**COLD BROOK CROSSING
QUARRY NORTH ROAD, LLC
SUDBURY, MASSACHUSETTS**

WATER RESOURCE RECOVERY FACILITY
TANK DETAILS II & CIVIL DETAILS



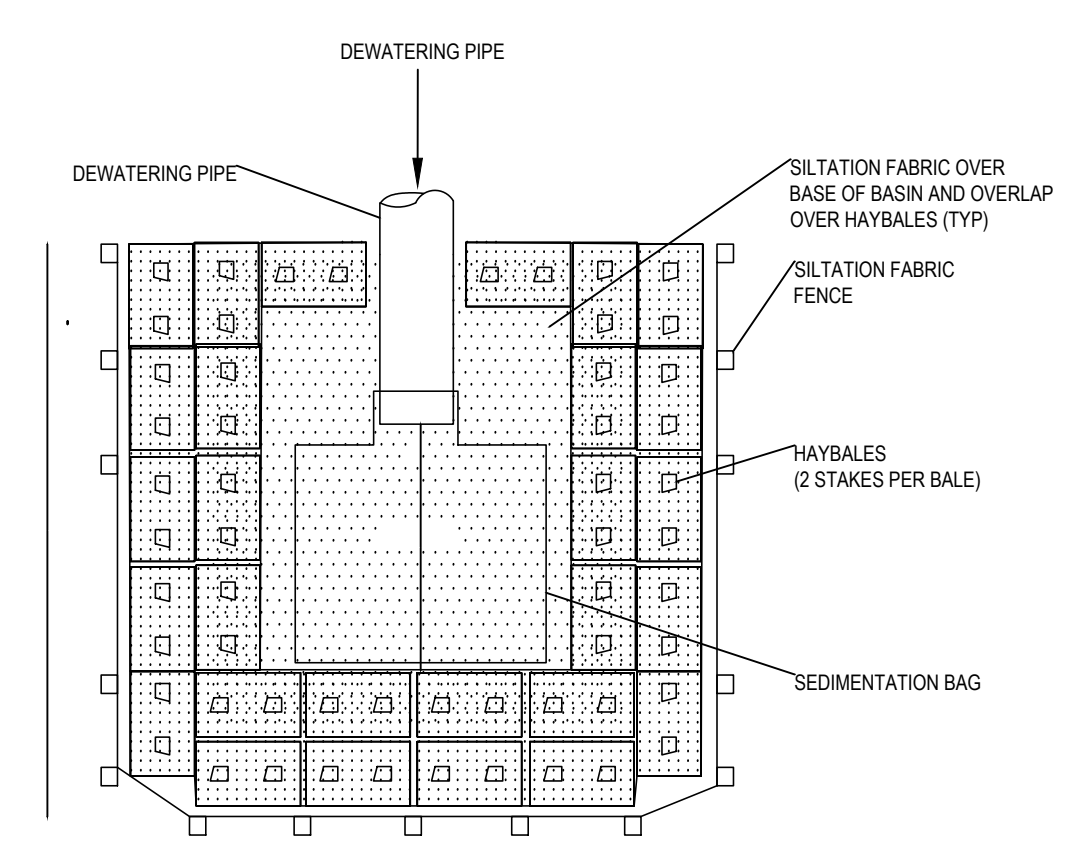
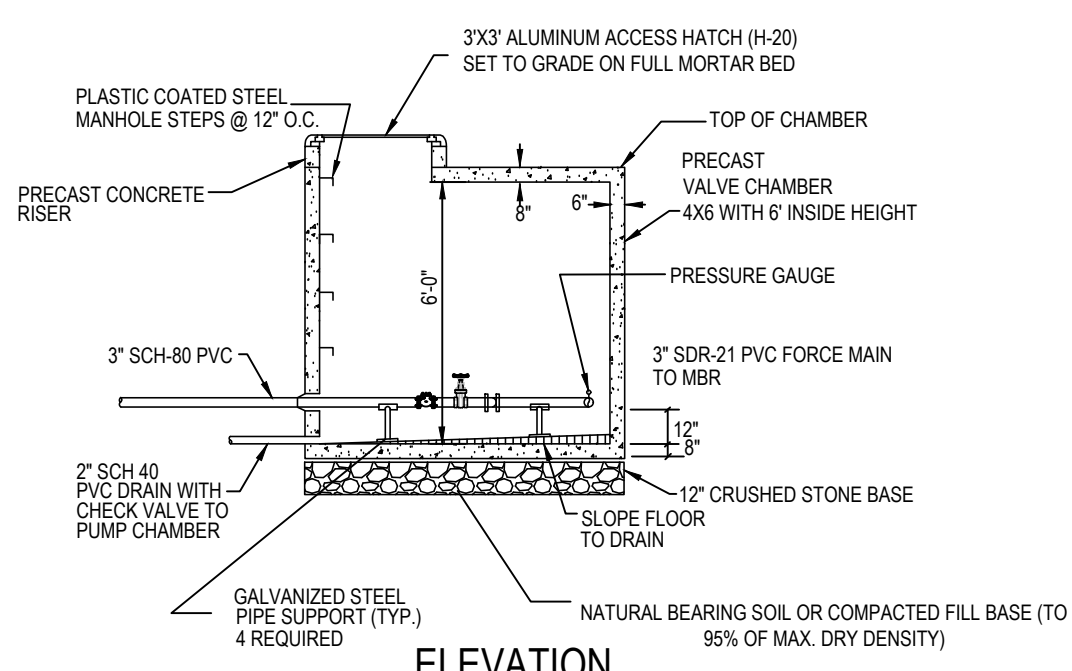
ROTONDO PC 4X6 WITH 6'-0" INSIDE HEIGHT OR APPROVED EQUAL

FINAL EFFLUENT VALVE CHAMBER
SCALE: NONE

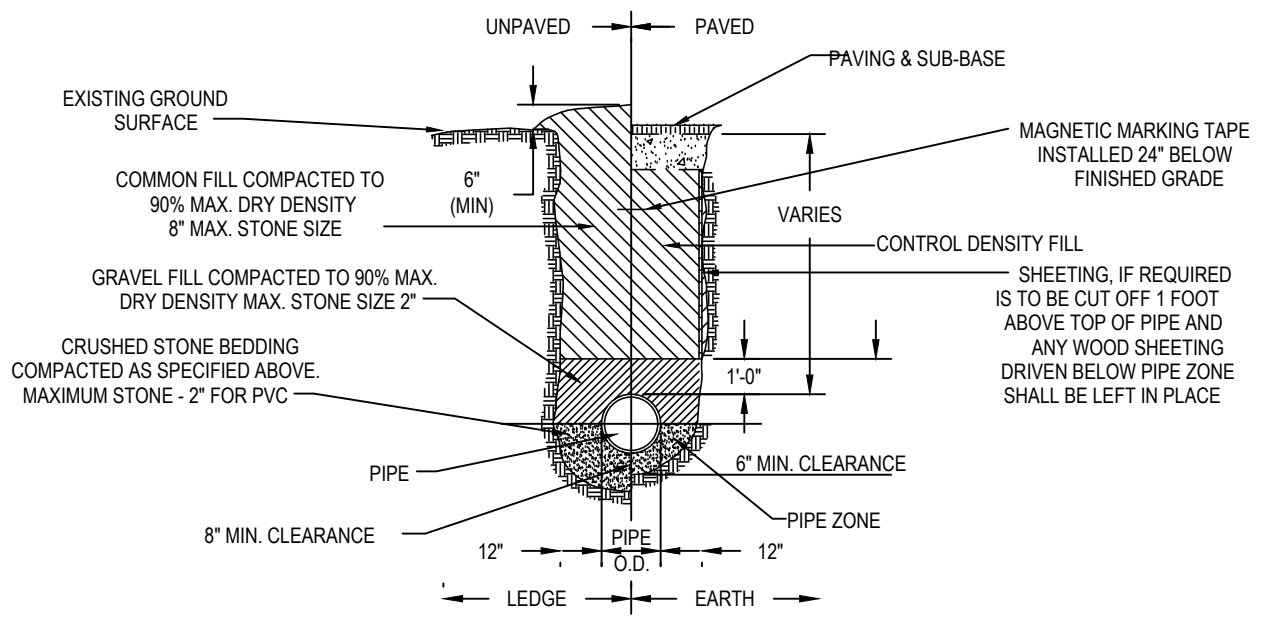


ROTONDO PC 4X6 WITH 6'-0" INSIDE HEIGHT OR APPROVED EQUAL

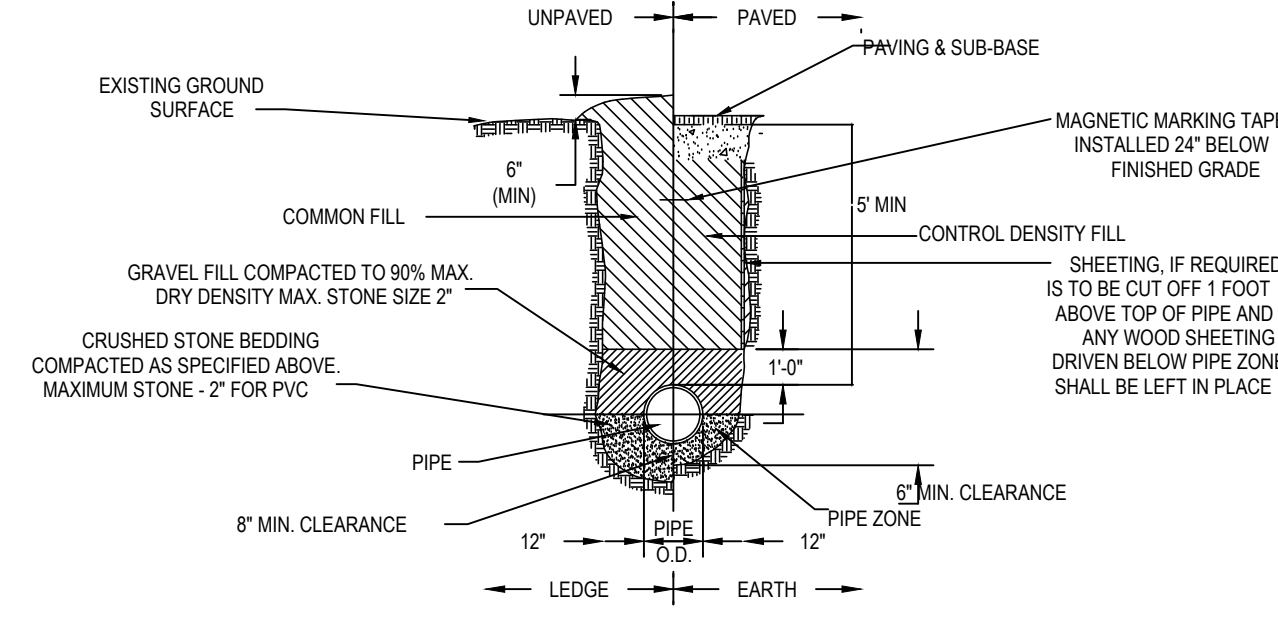
FLOW EQUALIZATION TANK VALVE CHAMBER
SCALE: NONE



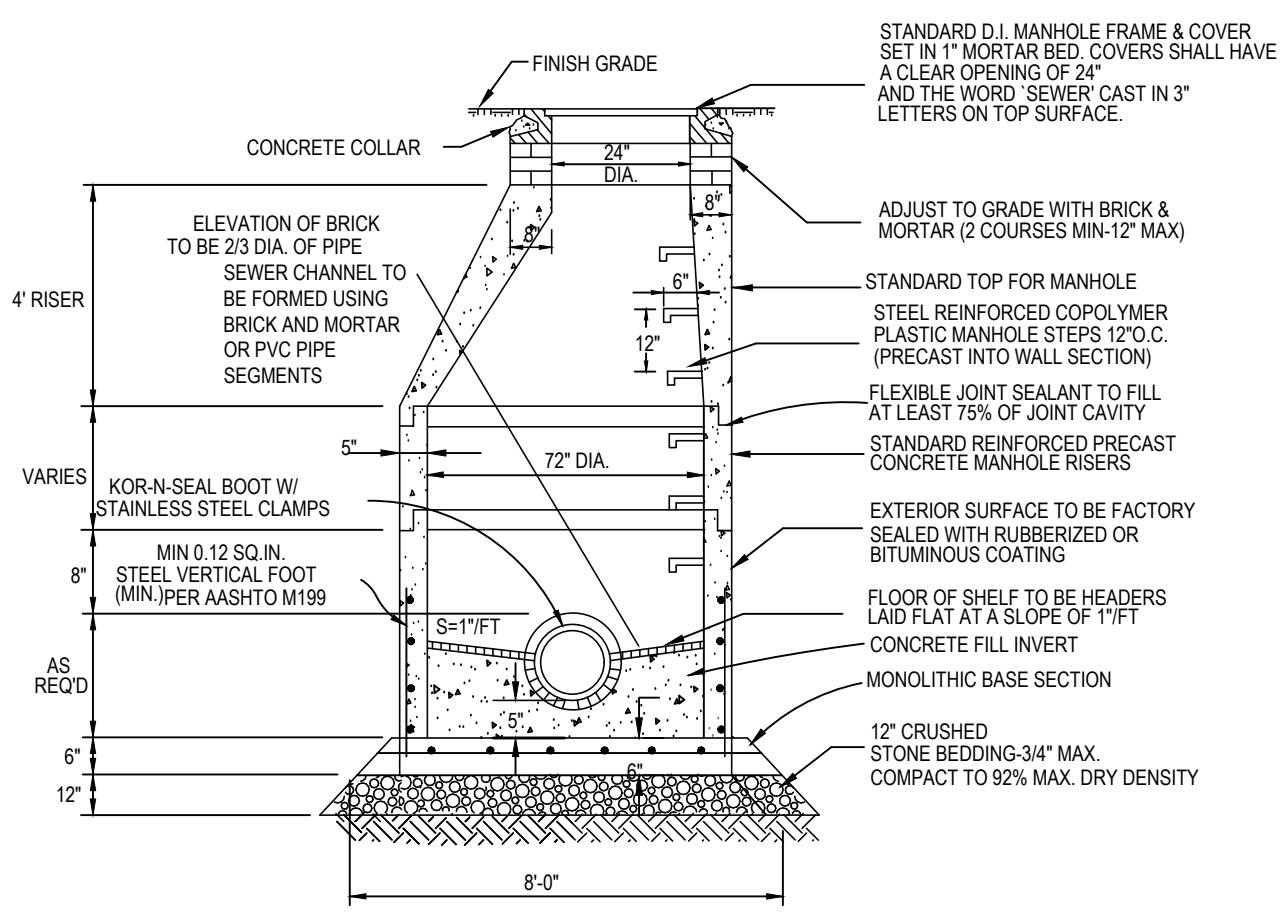
SEDIMENTATION DISCHARGE CONTROL
SCALE: NONE



GRAVITY SEWER TRENCH
SCALE: NONE



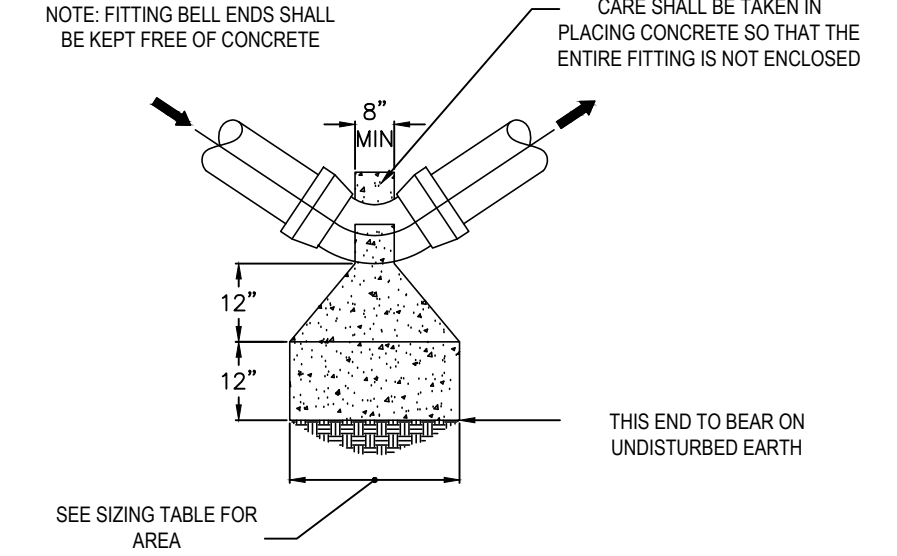
FORCE MAIN TRENCH
SCALE: NONE



- NOTES:
1. MANHOLE DESIGN TO CONFORM TO "PRECAST CONCRETE MANHOLE SECTIONS-ASTM C478 LATEST REVISION."
2. FILL OUTSIDE FACE OF ALL MANHOLE JOINTS WITH SHRINK MORTAR.
3. USE FLAT TOP SLAB WHEN HEIGHT OF CONE SECTION IS LESS THAN 3'-0".
4. PROVIDE PIPE JOINTS NO MORE THAN 3'-0" FROM OUTSIDE FACE OF MANHOLE.
5. PLUG LIFT HOLES SOLID W/ MASTIC.
6. PROVIDE FLEXIBLE SLEEVE & STAINLESS STEEL STRAP AT ALL PIPE TO MANHOLE JOINTS.
7. COAT OUTSIDE SURFACE WITH BITUMINOUS WATERPROOFING.

SEWER MANHOLE
SCALE: NONE

FITTING PIPE Ø	AREA OF BEARING SURFACE FOR THRUST BLOCKS (SF)					
	22 1/2"	33 3/4"	45"	56 1/4"	67 1/2"	90"
UP TO 4"	0.49	0.72	1.00	1.21	1.44	1.69
6"	1.67	1.83	2.00	-	-	-



* SQUARE CONFIGURATION PREFERRED HOWEVER AT CONTRACTORS OPTION PROVIDE RECTANGULAR THRUST BLOCK OF EQUAL CROSS-SECTIONAL AREA

THRUST BLOCK DETAIL
SCALE: NONE



Raymond L. Willis

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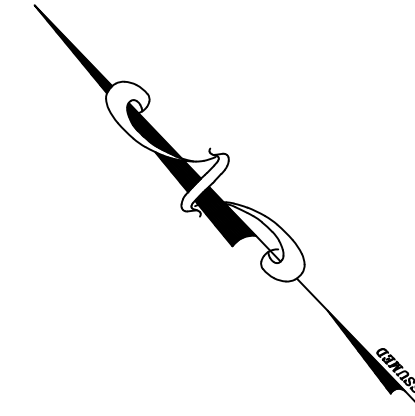
PROJECT NO.: 01536
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SCALE: N.T.S.
SHEET: 4 OF 9
DRAWN BY: RLW DESIGNED BY: RLW
CHECKED BY: DCF APPROVED BY: DCF

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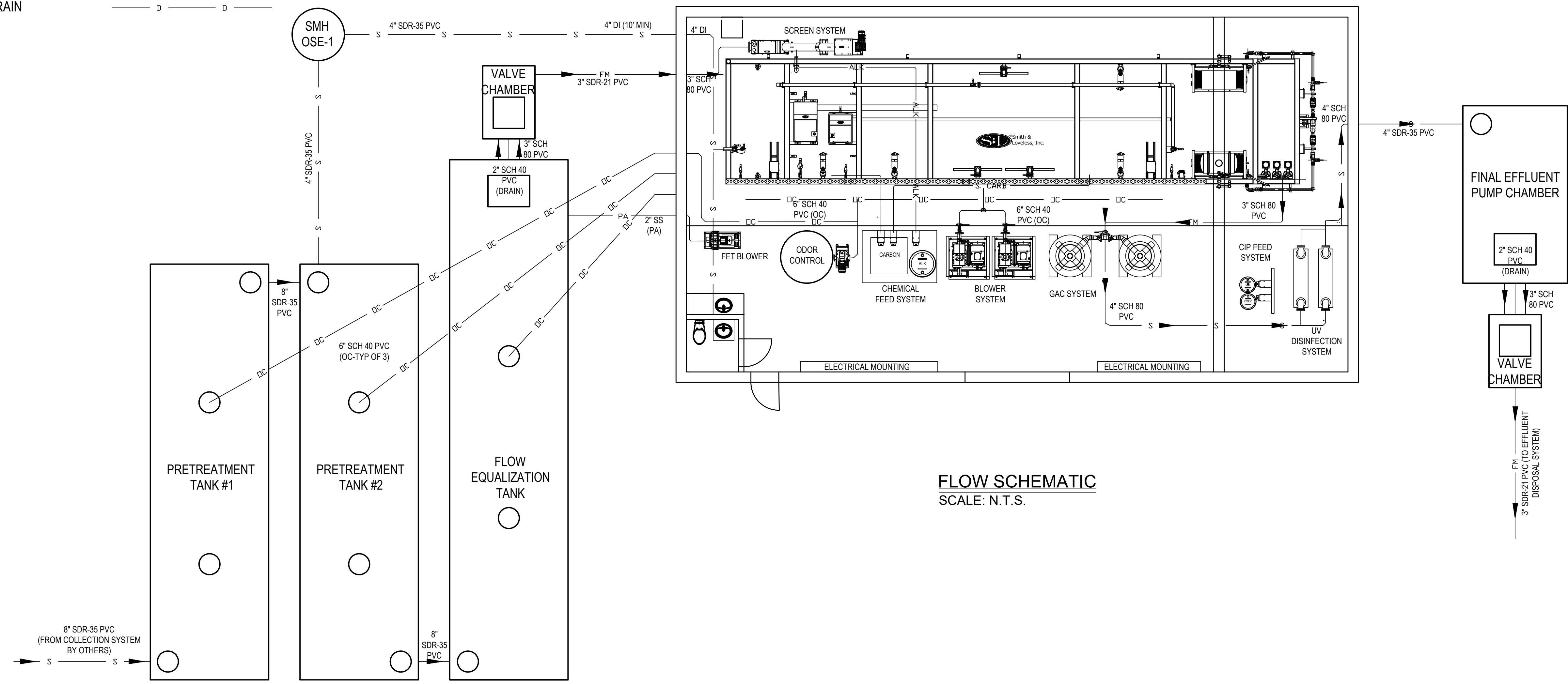
**COLD BROOK CROSSING
QUARRY NORTH ROAD, LLC
SUDBURY, MASSACHUSETTS**
WATER RESOURCE RECOVERY FACILITY
FLOW SCHEMATIC

PIPE LEGEND PROPOSED

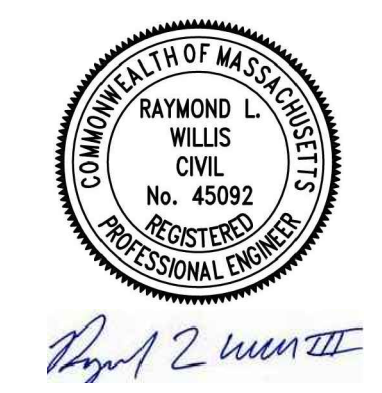
GRAVITY SEWER (SIZE VARIES)	— S — S —
FORCE MAIN/PRESSURIZED (SIZE VARIES)	— FM —
PROCESS AIR (SIZE VARIES)	— PA —
SUPPLEMENTAL CARBON	— S. CARB —
ALKALINITY ADJUSTMENT	— ALK —
ODOR CONTROL	— DC — DC —
DRAIN	— D — D —



STANDBY GENERATOR



FLOW SCHEMATIC
SCALE: N.T.S.

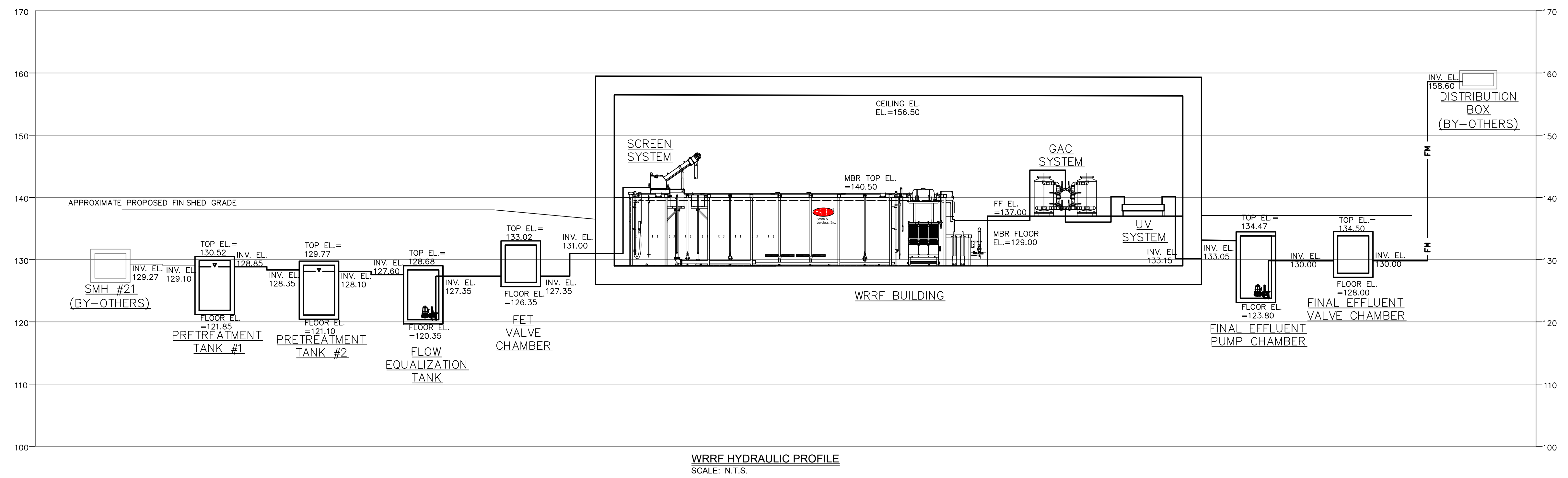


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CONSTRUCTION**

REV	DATE	DESCRIPTION

PROJECT NO.: 01536
DATE: MARCH 2020
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SCHEDULE OF ELEVATIONS							
STRUCTURE	INV. IN	IN PIPE	INV. OUT	OUT PIPE	TOP	FLOOR	RIM
SMH #21 (BY-OTHERS)	-	-	129.27	8" SDR-35 PVC	-	-	-
PRETREATMENT TANK #1	129.10	8" SDR-35 PVC	127.15	8" SDR-35 PVC	130.52	121.85	138.0± - 138.6±
PRETREATMENT TANK #2	128.35	8" SDR-35 PVC	128.10	8" SDR-35 PVC	129.77	121.10	137.8± - 138.6±
FLOW EQUALIZATION TANK	127.60	8" SDR-35 PVC	127.35	3" SCH 80 PVC	128.68	120.35	136.8± - 137.7±
FET VALVE CHAMBER	127.35	3" SCH 80 PVC	127.35	3" SDR-21 PVC	133.02	126.35	136.8±
SCREEN SYSTEM	141.50	3" SCH 80 PVC	141.50	4" SCH 80 PVC	148.41	-	-
MEMBRANE BIOREACTOR	140.00	4" SCH 80 PVC	134.45	3" SCH 80 PVC	140.50	129.00	-
GAC SYSTEM	144.50	3" SCH 80 PVC	139.00	4" SCH 80 PVC	145.50	137.00	-
ULTRAVIOLET DISINFECTION	138.38	4" SCH 80 PVC	138.38	4" SCH 80 PVC	138.38	137.00	-
FINAL EFFLUENT PUMP CHAMBER	133.05	4" SCH 80 PVC	130.00	3" SCH 80 PVC	134.47	123.80	137.1±
FINAL EFFLUENT VALVE CHAMBER	130.00	3" SCH 80 PVC	130.00	3" SDR-21 PVC	134.50	128.00	137.1±
DISTRIBUTION BOX (BY-OTHERS)	158.60	3" SDR 21 PVC	-	-	-	-	-

DESIGN CALCULATIONS

DESIGN CRITERIA FOR THE PROPOSED WASTEWATER TREATMENT FACILITY WAS ESTABLISHED IN ACCORDANCE WITH THE "GUIDELINES FOR THE DESIGN, CONSTRUCTION, OPERATION AND MAINTENANCE OF SMALL SEWAGE TREATMENT FACILITIES WITH LAND DISPOSAL" PUBLISHED BY THE MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION AND 310 CMR 15.000, TITLE 5.

DESIGN FLOW

THE EFFLUENT DISPOSAL SYSTEM HAS BEEN PERMITTED TO ACCOMMODATE 37,380 GALLONS. DESIGN FLOW FOR THIS PROJECT HAS BEEN ESTIMATED AT 49,755 GPD. THIS DESIGN FLOW IS DERIVED FROM 310 CMR 15.000, TITLE 5 AND IS CALCULATED AS FOLLOWS:

USE	QUANTITY	UNIT	DESIGN FLOW
APARTMENTS	162 BEDROOMS	110 GPD/BEDROOM	17,820 GPD
TOWNHOMES (NON-AGE RESTRICTED)	188 BEDROOMS	110 GPD/BEDROOM	20,680 GPD
TOWNHOMES (AGE RESTRICTED, 2 BEDROOMS)	31 UNITS	150 GPD/UNIT	4,650 GPD
CONDOMINIUMS (AGE RESTRICTED, 1 BEDROOM)	23 BEDROOMS	110 GPD/BEDROOM	2,530 GPD
CONDOMINIUMS (AGE RESTRICTED, 2 BEDROOMS)	27 UNITS	150 GPD/UNIT	4,050 GPD
	TOTAL		49,730 GPD

WASTEWATER CHARACTERISTICS (BASED UPON THE GUIDELINES & INFLUENT DATA FROM SIMILAR COMPLEXES AND HIGH STRENGTH RESIDENTIAL WASTEWATER CHARACTERISTICS):

FLOW (GPD)	49,755 GPD MAX DAY FLOW
TOTAL 5 DAY BIOCHEMICAL OXYGEN DEMAND (BOD ₅)	350 mg/L
TOTAL SUSPENDED SOLIDS	300 mg/L
TOTAL NITROGEN (AS NITROGEN)	65 mg/L
AMMONIA NITROGEN (AS NITROGEN)	55 mg/L
TEMPERATURE	55°F
ALKALINITY (AS CaCO ₃)	275 mg/L

DESIGN EFFLUENT CRITERIA:

BIOCHEMICAL OXYGEN DEMAND	≤ 10 mg/L
TOTAL SUSPENDED SOLIDS	≤ 5 mg/L
TOTAL NITROGEN	≤ 5 mg/L
NITRATE-NITROGEN	≤ 5 mg/L

PRETREATMENT TANK SELECTION:

PROVIDE 75% DETENTION TIME FOR PRELIMINARY TREATMENT WITH GARBAGE GRINDERS PER GUIDELINES 3/4 DAY X 49,755 GPD = 37,316 GALLONS

USE TWO (2) PRECAST CONCRETE SEPTIC TANKS PIPED IN SERIES, MODEL LWT 8x10-20 WITH 20,000 GALLONS EFFECTIVE CAPACITY EACH FOR A COMBINED CAPACITY OF 40,000 GALLONS, AS MANUFACTURED BY ROTONDO PRECAST, OR APPROVED EQUAL. THE PRETREATMENT TANKS SHALL BE WATER-TIGHT AND CAPABLE OF WITHSTANDING AASHTO H-20 LOADING.

FLOW EQUALIZATION TANK SELECTION:

PROVIDE 50% DETENTION TIME 1/2 DAY X 49,755 GPD = 24,877 GALLONS

USE ONE (1) PRECAST CONCRETE SEPTIC TANK, MODEL LWT 8x10-25 WITH 25,000 GALLONS EFFECTIVE CAPACITY, AS MANUFACTURED BY ROTONDO PRECAST, OR APPROVED EQUAL. THE FLOW EQUALIZATION TANK SHALL BE WATER-TIGHT AND CAPABLE OF WITHSTANDING AASHTO H-20 LOADING.

FINAL EQUALIZATION TANK VALVE CHAMBER:

USE ONE (1) PRECAST CONCRETE PUMP CHAMBER, MODEL PC 4x6 WITH 6' INSIDE HEIGHT AS MANUFACTURED BY ROTONDO PRECAST OR APPROVED EQUAL.

MEMBRANE BIOREACTOR REACTOR:

DESIGN OF MEMBRANE BIOREACTOR SHALL BE A TITAN MBR AS DESIGNED BY SMITH & LOVELESS TO MEET THE SPECIFIED EFFLUENT REQUIREMENTS BASED ON THE ANTICIPATED INFLUENT LOADING. SEE DESIGN REPORT FOR KINETICS DESIGN BY SMITH & LOVELESS.

GAC SYSTEM:

DESIGN OF THE GAC SYSTEM IS BASED ON THE FOLLOWING:

INFLUENT TOC	8 MG/L
INFLUENT FLOW RATE	45 GPM
EFFLUENT TOC	≤ 1 MG/L

USE TWO (2) 2,000 LBS ACTIVATED CARBON FILTERS ARRANGED IN PARALLEL AS MANUFACTURED BY CONTINENTAL CARBON GROUP OR APPROVED EQUAL.

ULTRAVIOLET DISINFECTION SYSTEM:

USE TWO (2) AQUIONICS 100R LOW PRESSURE ULTRAVIOLET DISINFECTION SYSTEM UNITS CAPABLE OF ACCOMMODATING UP TO 60 GPM, OR APPROVED EQUAL.

FINAL EFFLUENT PUMP CHAMBER SELECTION:

FINAL EFFLUENT CHAMBER HAS BEEN DESIGNED TO PROVIDE 12 DOSES TO THE EFFLUENT DISPOSAL SYSTEM OVER EACH DAY.

49,755 GPD/12 DOSES PER DAY = 4,146 GALLONS PER DOSE

USE ONE (1) PRECAST CONCRETE PUMP CHAMBER, MODEL PC 9X16 WITH A 10'-0" INSIDE HEIGHT FOR A CAPACITY OF 9,155 GALLONS, AS MANUFACTURED BY ROTONDO PRECAST, OR APPROVED EQUAL.

FINAL EFFLUENT VALVE CHAMBER:

USE ONE (1) PRECAST CONCRETE PUMP CHAMBER, MODEL PC 4x6 WITH 6' INSIDE HEIGHT AS MANUFACTURED BY ROTONDO PRECAST OR APPROVED EQUAL.

EFFLUENT DISPOSAL:

EFFLUENT DISPOSAL SYSTEM HAS BEEN DESIGNED BY OTHERS. REFER TO DRAWINGS PREPARED BY PROVENCHER ENGINEERING FOR DETAILS.

THE EFFLUENT DISPOSAL SYSTEM CONSISTS OF THREE (3) LEACHING CHAMBER BEDS WITH DIMENSIONS OF 100 FEET BY 56.67 FEET.

3 BEDS x 100 FEET LONG x 56.67 FEET WIDE = 17,001 SF OF LEACHING AREA

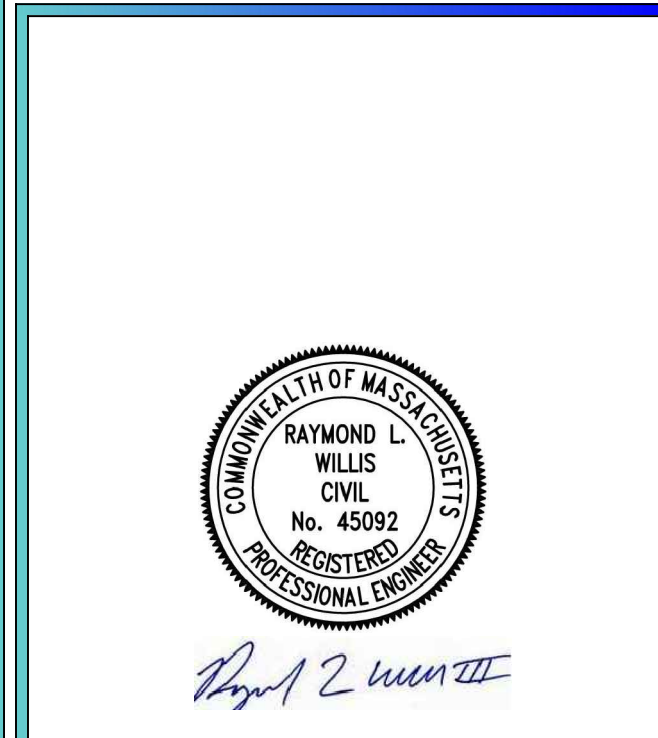
MASSDEP ALLOWED LOADING RATE OF 3 GPD/SF OF LEACHING AREA BASED ON A PERCOLATION RATE ≤ 5 MIN/INCH AND THE USE OF CHAMBERS.

17,001 SF OF LEACHING AREA x 3 GPD/SF = 51,003 GALLONS

STANDBY GENERATOR:

THE TREATMENT PLANT SHALL BE PROVIDED WITH A NATURAL GAS POWERED STANDBY GENERATOR AND AUTOMATIC TRANSFER SWITCH. THE STANDBY GENERATOR SHALL BE RATED FOR 460 VOLTS, THREE PHASE, 4 WIRE, 60 HERTZ. FINAL DESIGN OF STANDBY GENERATOR TO BE DESIGNED BY PROFESSIONAL ELECTRICAL ENGINEER.

COLD BROOK CROSSING
QUARRY NORTH ROAD, LLC
SUDBURY, MASSACHUSETTS
 WATER RESOURCE RECOVERY FACILITY
 HYDRAULIC PROFILE & DESIGN CALCULATIONS



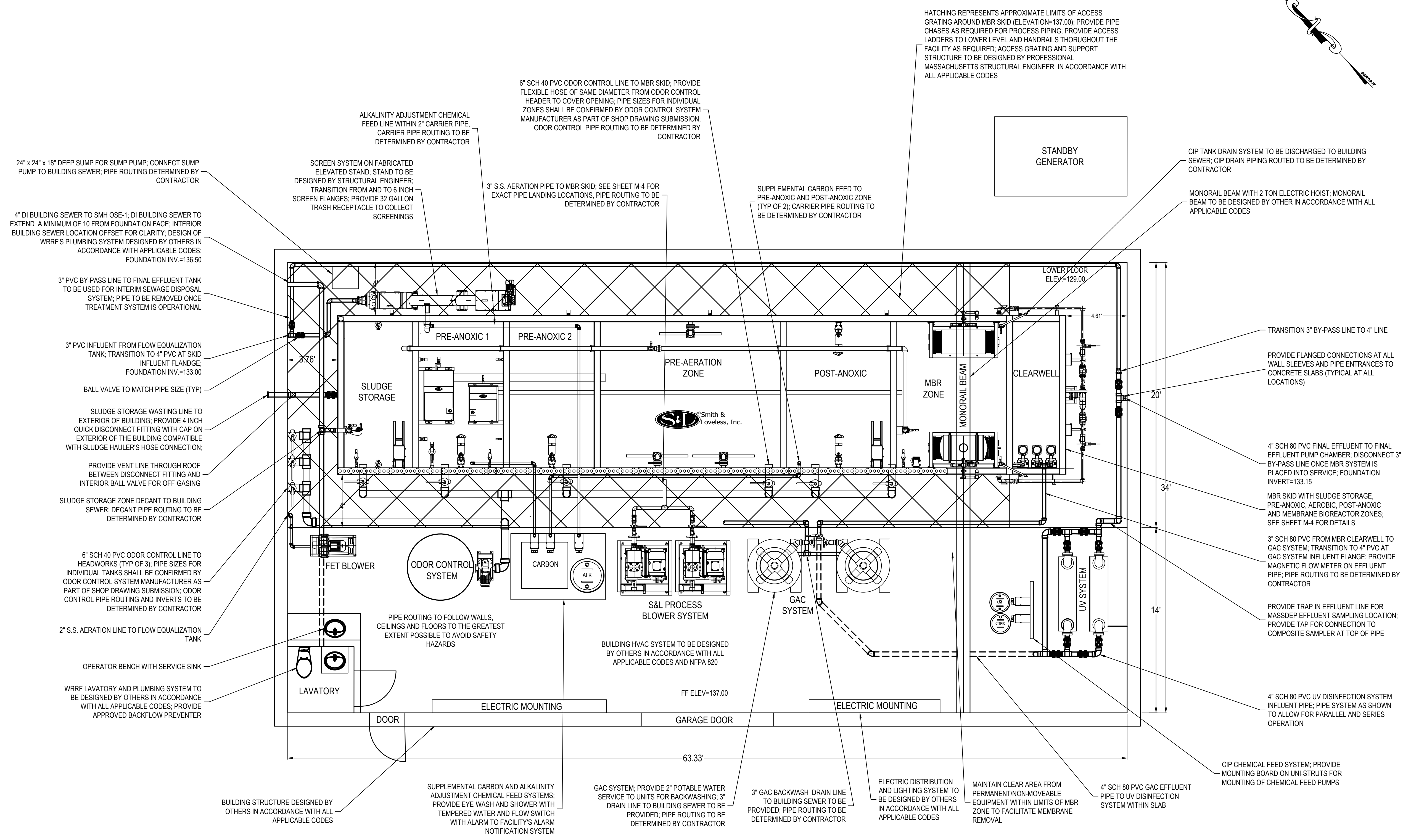
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REV	DATE	DESCRIPTION

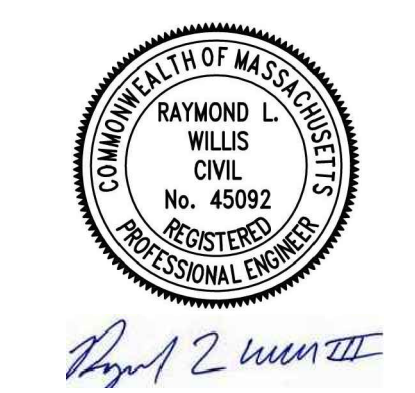
PROJECT NO.: 01536
 DATE: MARCH 2020
 SCALE: N.T.S.
 SHEET: 6 OF 9
 DRAWN BY: RLW DESIGNED BY: RLW
 CHECKED BY: DCF APPROVED BY: DCF

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**COLD BROOK CROSSING
QUARRY NORTH ROAD, LLC
SUDBURY, MASSACHUSETTS**
WATER RESOURCE RECOVERY FACILITY
WRRF FLOOR PLAN



WRRF FLOOR PLAN
SCALE: 1/4" = 1'



**MASSDEP REVIEW
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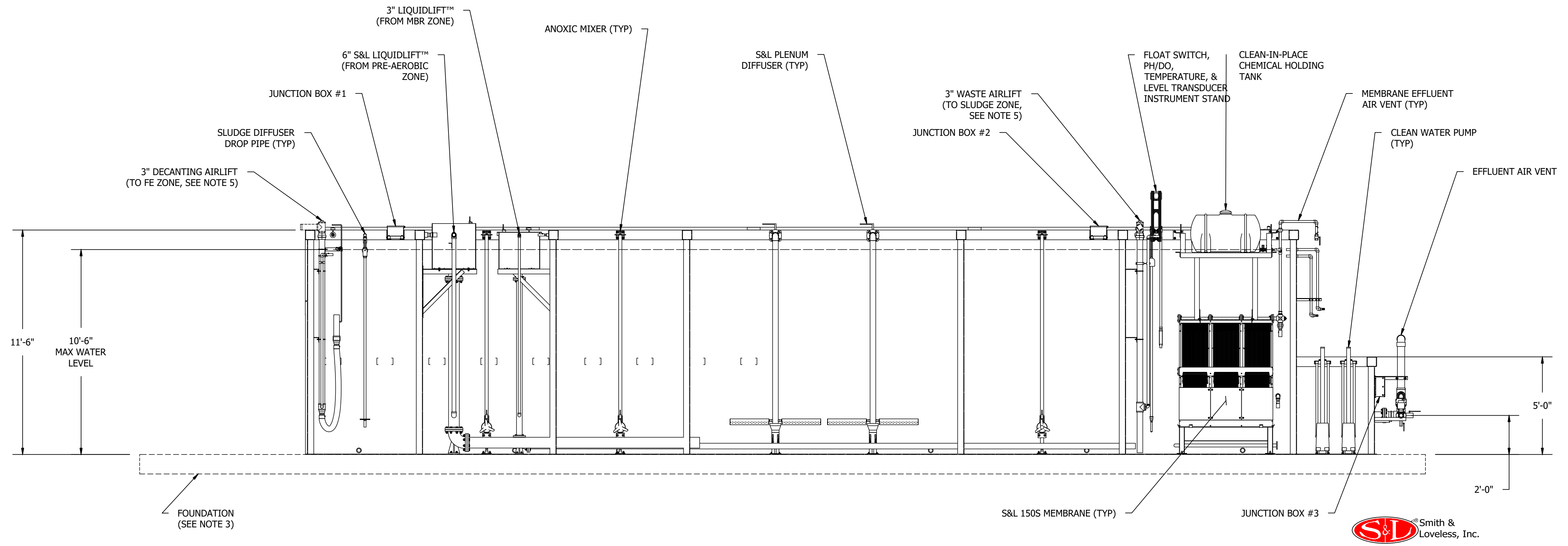
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PROJECT NO.: 01536
DATE: MARCH 2020
SCALE: 1/4"=1"
SHEET: 7 OF 9
DRAWN BY: RLW DESIGNED BY: RLW
CHECKED BY: DCF APPROVED BY: DCF

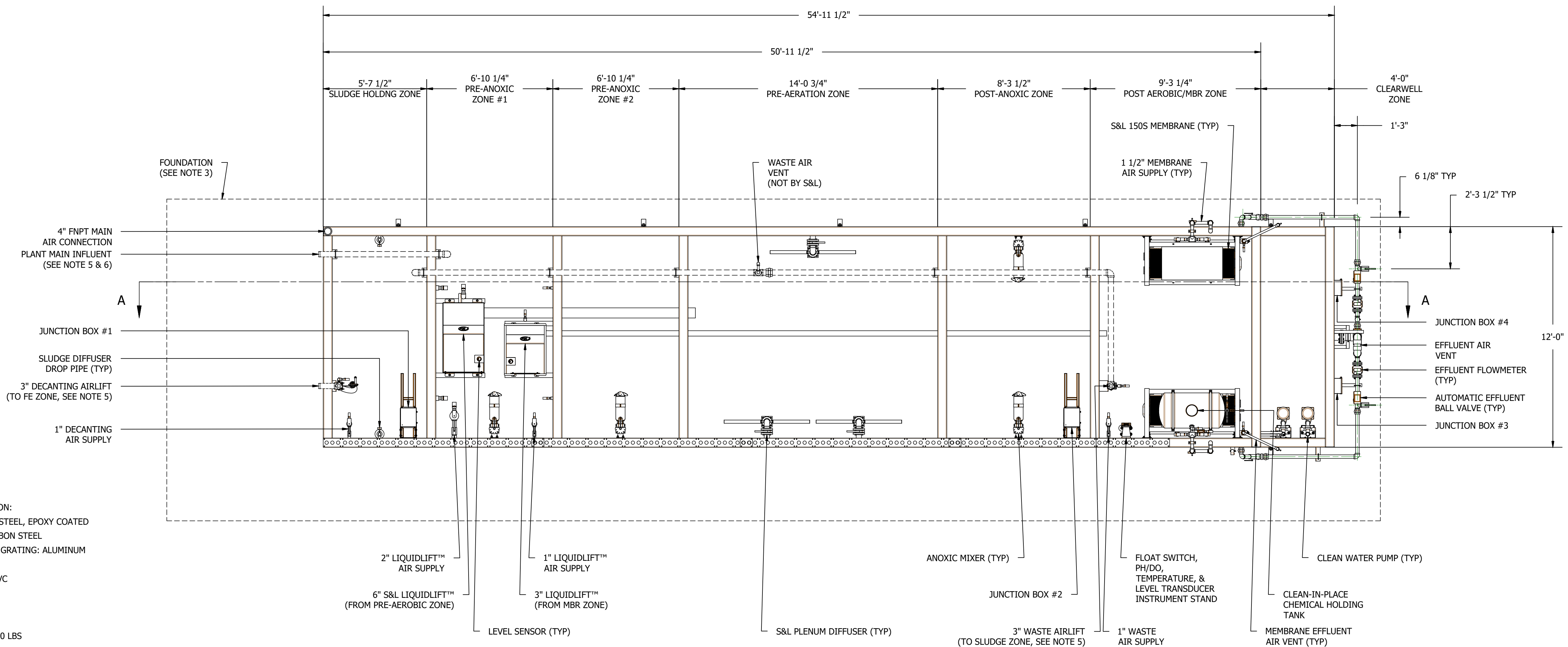
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**COLD BROOK CROSSING
QUARRY NORTH ROAD, LLC
SUDBURY, MASSACHUSETTS**

WATER RESOURCE RECOVERY FACILITY
MEMBRANE BIOREACTOR DETAILS

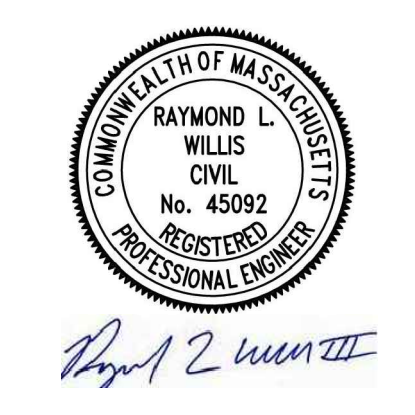


MEMBRANE BIOREACTOR DETAIL - PROFILE VIEW
SCALE: N.T.S.



MEMBRANE BIOREACTOR DETAIL - PLAN VIEW
SCALE: N.T.S.

- S&L INSTALLATION NOTES:**
- MATERIALS OF CONSTRUCTION:**
TANK STRUCTURE: CARBON STEEL, EPOXY COATED
WALKWAY STRUCTURE: CARBON STEEL
HANDRAIL, TOE PLATE, AND GRATING: ALUMINUM
MEMBRANE FRAME: 304 SST
AIR AND WATER PIPING: CPVC
CABLE TRAY: 316 SST
 - EQUIPMENT WEIGHT:**
DRY WEIGHT: 58,000 LBS
OPERATING WEIGHT: 465,000 LBS
 - FOUNDATION NOT BY S&L.
 - WATER TABLE MUST BE BELOW SLAB WHEN TANK IS DEWATERED. IF NOT, ADDITION BOTTOM REINFORCEMENT AND ANCHORS ARE REQUIRED. ANCHOR BOLTS NOT BY S&L.
 - FIELD PIPING NOT BY S&L.
 - ACTUAL POSITION AND SIZE WILL VARY BASED ON PROJECT REQUIREMENTS.
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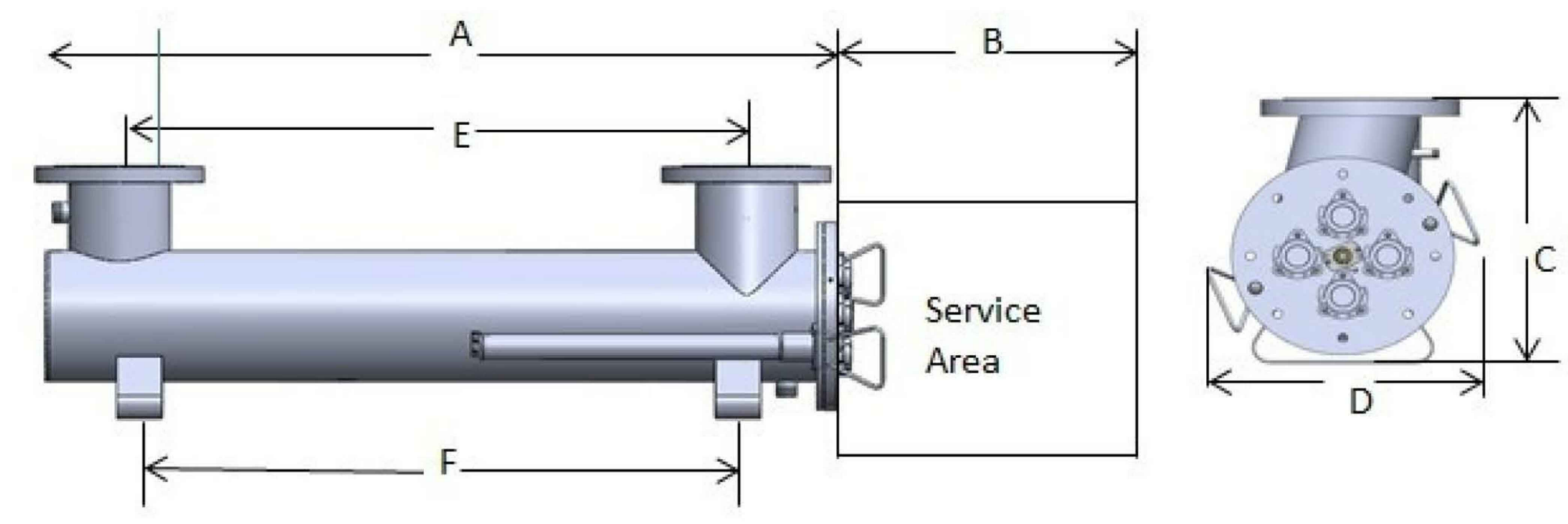
PROJECT NO.: 01536
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**COLD BROOK CROSSING
QUARRY NORTH ROAD, LLC
SUDBURY, MASSACHUSETTS**

WATER RESOURCE RECOVERY FACILITY
SCREEN, GAC AND UV SYSTEM DETAILS

UV Reactor

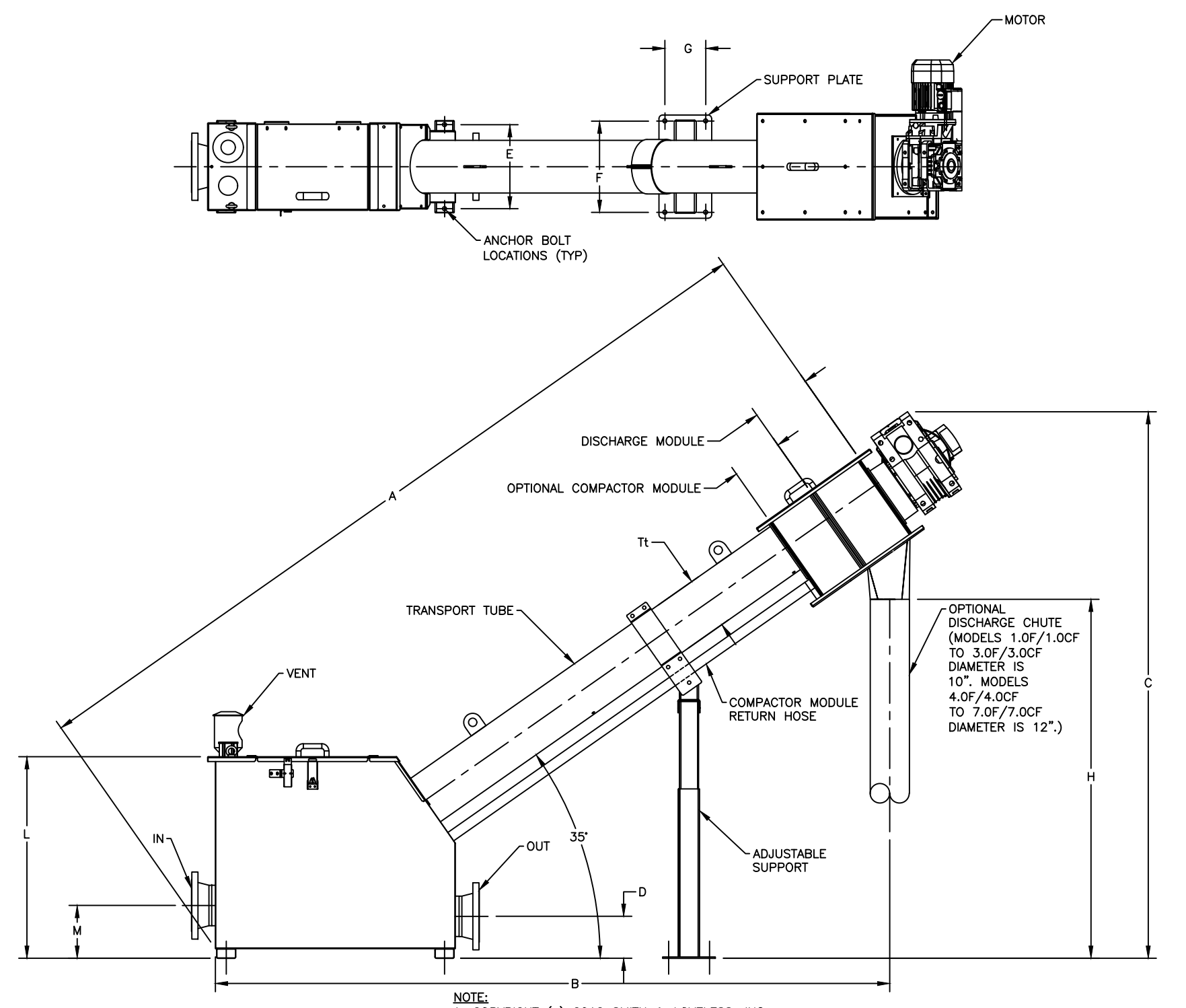
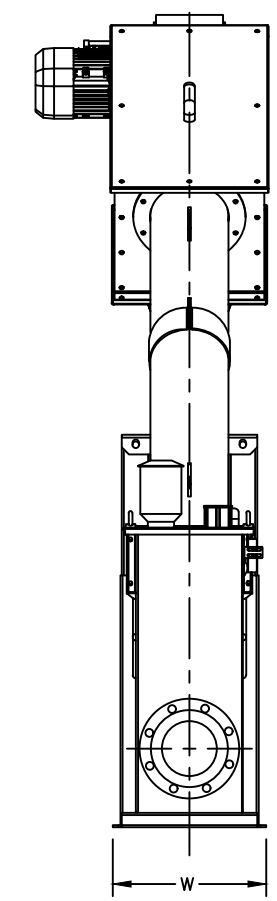


AmaLine 100 R	A	B	C	D	E	F
Dimensions (inches)	67.3	59	16.5	14.8	55.8	51.6

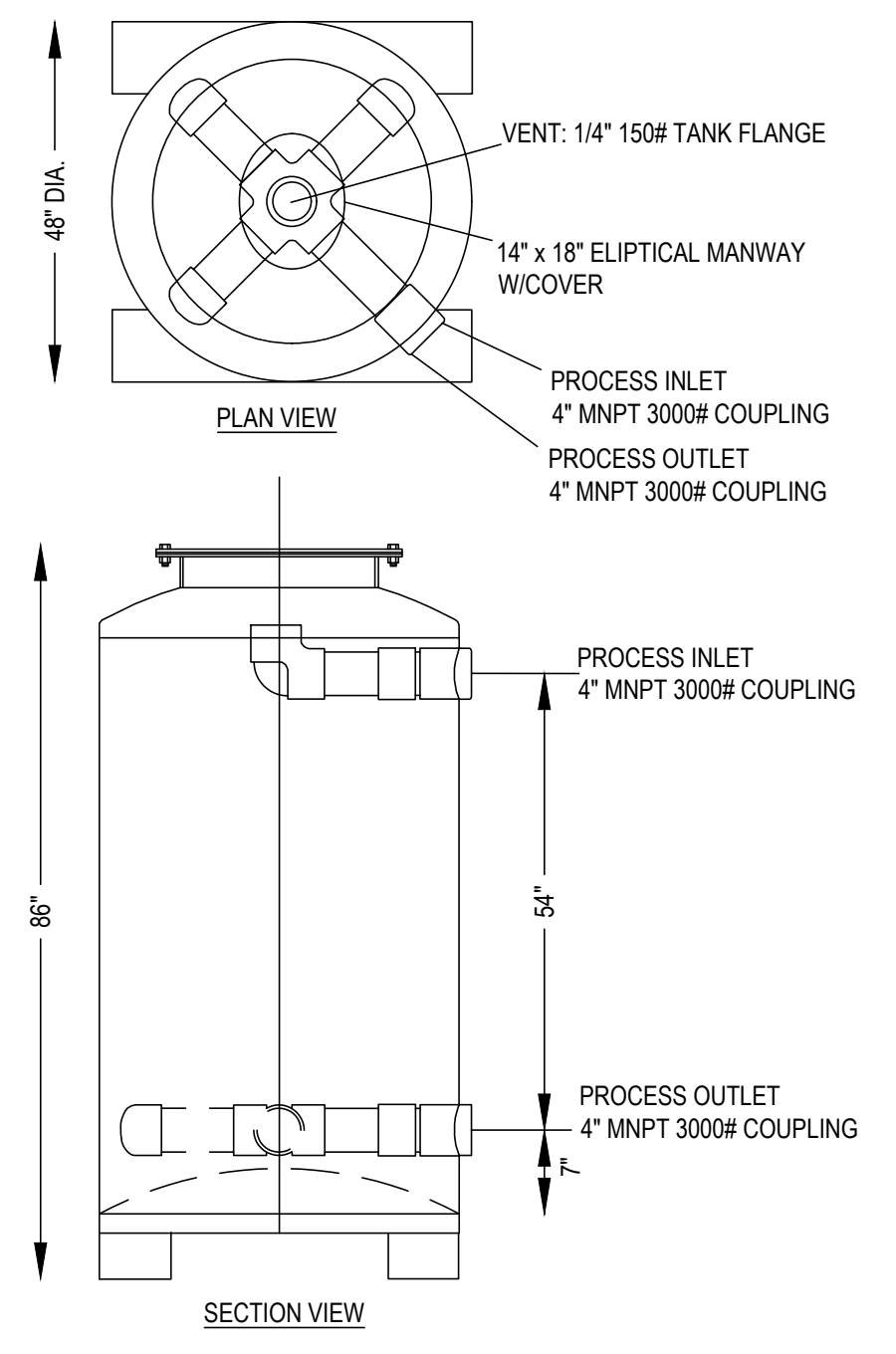
UV SYSTEM DETAIL
SCALE: N.T.S.

DIMENSION TABLE

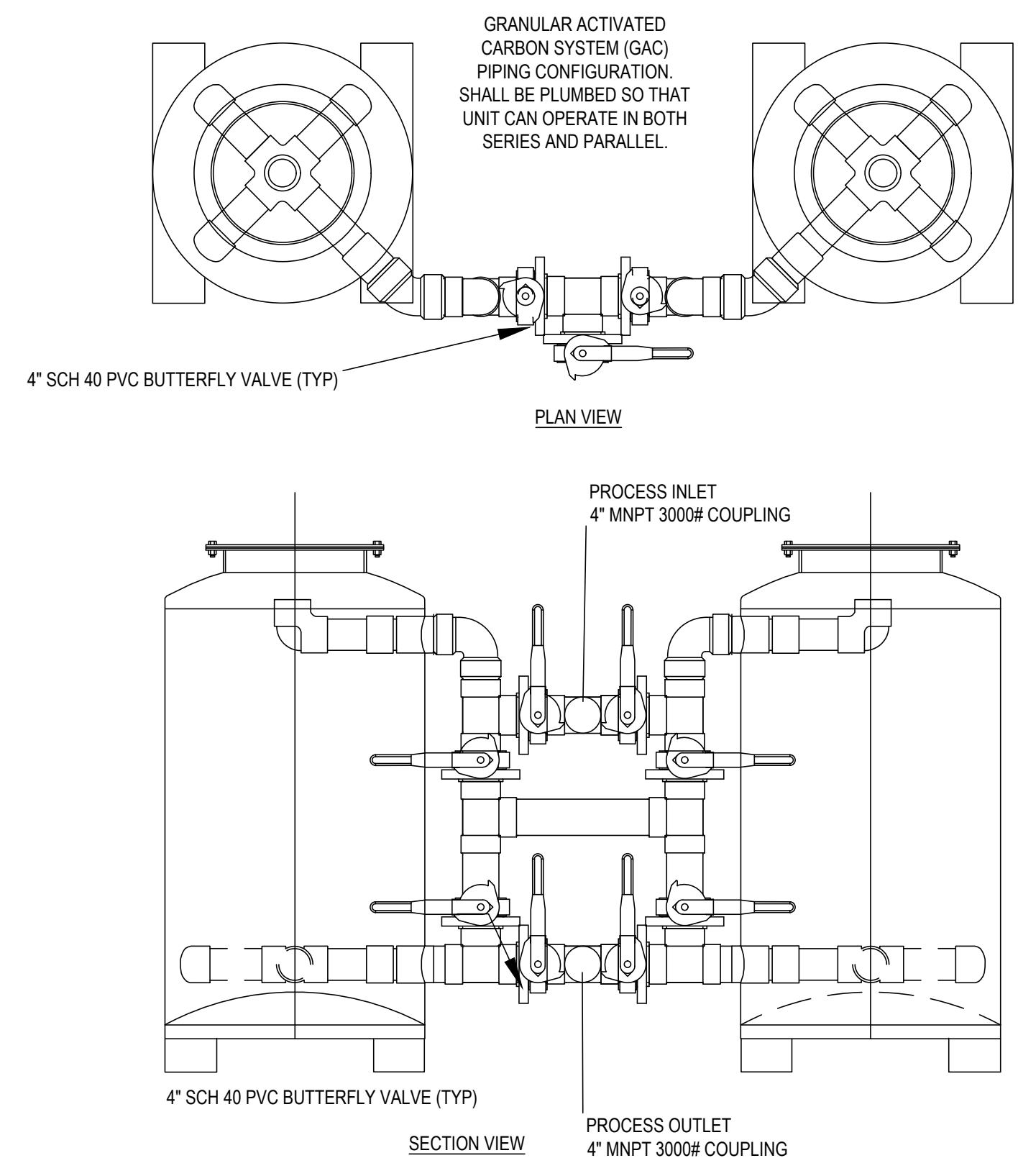
	1.0F/1.0QF
A	11'-11 3/4"
C	7'-4 9/16"
H (35°)	4'-11 1/16"
D	6 7/8"
B	9'-7 5/16"
M	8 5/8"
L	2'-7 7/16"
Tl	8 5/8"
IN (DIA)	6"
OUT (DIA)	6"
W	1'-3 3/4"
SCREEN DIA.	7 11/16"
E	1'-1 3/4"
F	2'-11 7/16"
G	11 13/16"
hp/kW	1.0/0.75



SCREEN SYSTEM DETAIL
SCALE: N.T.S.



GAC DETAIL & PIPE SCHEMATIC
SCALE: N.T.S.



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PROJECT NO.: 01536
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