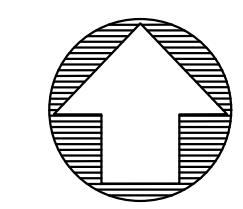
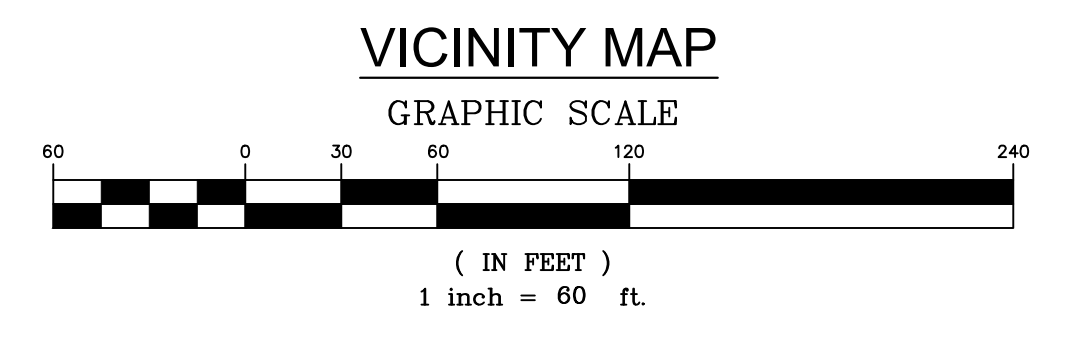


LOCATION MAP
1" = 200'



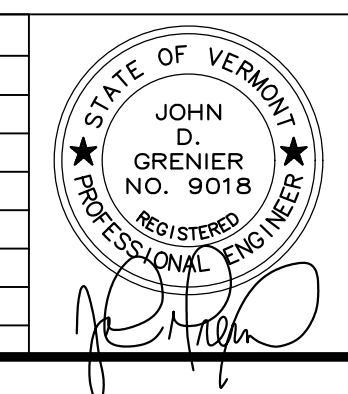
SHEET INDEX	
SHEET NUMBER	SHEET TITLE
T-1	COVER SHEET
C-1	PROPOSED SITE PLAN
C-2	SITE DETAILS
C-3	SEWER DETAILS
C-4	PUMP STATION DETAILS
C-5	WATER DETAILS
SW-1	STORMWATER PLAN
SW-2	STORMWATER DETAILS
SW-3	STORMWATER DETAILS



NOTE: ORIGINAL PLAN 24" x 36". OTHER SIZES NOT TO SCALE

No.	Date	Revision	By

4/17/2023
PERMIT SET



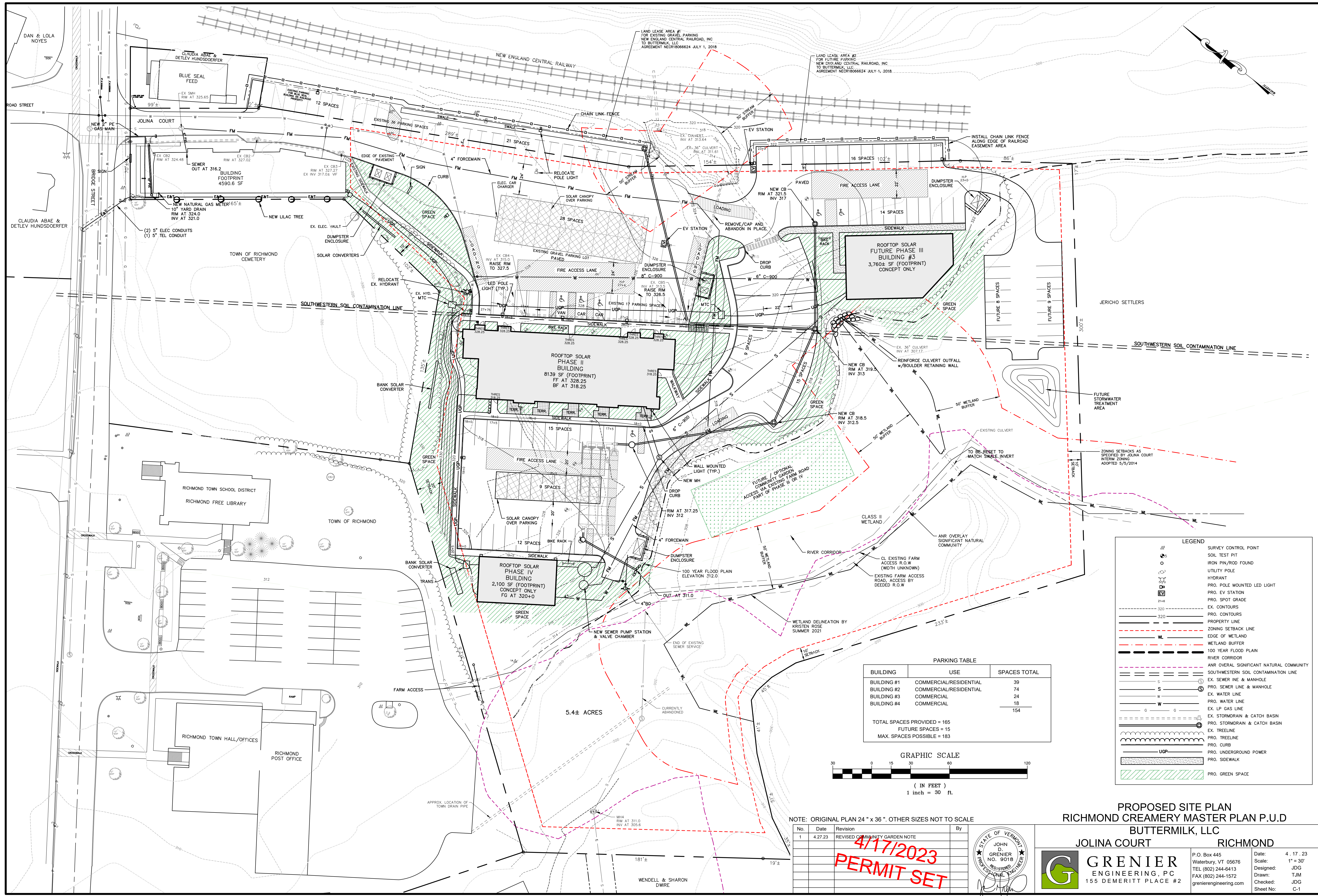
GRENIER
ENGINEERING, PC
155 DEMERITT PLACE #2

JOLINA COURT RICHMOND

P.O. Box 445
Waterbury, VT 05676
TEL (802) 244-6413
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grenierengineering.com

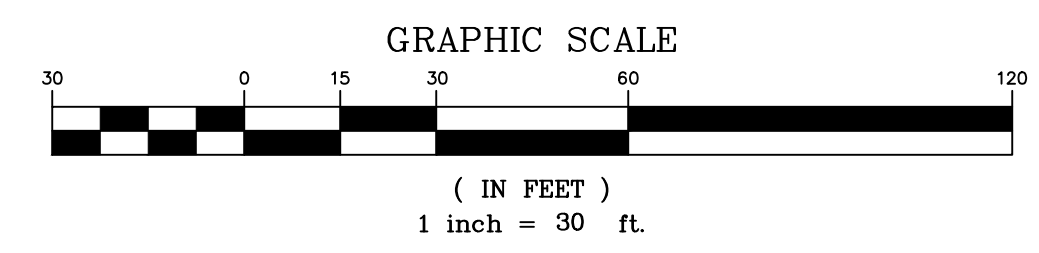
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Designed: JDG
Drawn: TJM
Checked: JDG
Sheet No: T-1

COVER SHEET
RICHMOND CREAMERY MASTER PLAN P.U.D
BUTTERMILK, LLC



PARKING TABLE

BUILDING	USE	SPACES TOTAL
BUILDING #1	COMMERCIAL/RESIDENTIAL	39
BUILDING #2	COMMERCIAL/RESIDENTIAL	74
BUILDING #3	COMMERCIAL	24
BUILDING #4	COMMERCIAL	18
TOTAL SPACES PROVIDED = 155		
FUTURE SPACES = 15		
MAX. SPACES POSSIBLE = 183		

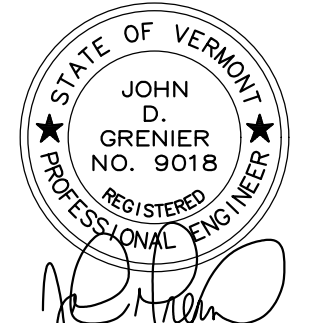


LEGEND

- SURVEY CONTROL POINT
- SOIL TEST PIT
- IRON PIN/ROD FOUND
- UTILITY POLE
- HYDRANT
- PRO. POLE MOUNTED LED LIGHT
- PRO. EV STATION
- PRO. SPOT GRADE
- EX. CONTOURS
- PRO. CONTOURS
- PROPERTY LINE
- ZONING SETBACK LINE
- EDGE OF WETLAND
- WETLAND BUFFER
- 100 YEAR FLOOD PLAIN
- RIVER CORRIDOR
- ANR OVERLAY SIGNIFICANT NATURAL COMMUNITY
- SOUTHWESTERN SOIL CONTAMINATION LINE
- EX. SEWER INE & MANHOLE
- PRO. SEWER LINE & MANHOLE
- EX. WATER LINE
- PRO. WATER LINE
- EX. LP GAS LINE
- PRO. STORMDRAIN & CATCH BASIN
- EX. TREELINE & CATCH BASIN
- PRO. TREELINE
- PRO. CURB
- PRO. UNDERGROUND POWER
- PRO. SIDEWALK
- PRO. GREEN SPACE

NOTE: ORIGINAL PLAN 24" x 36". OTHER SIZES NOT TO SCALE

No.	Date	Revision	By
1	4.27.23	REVISED COMMUNITY GARDEN NOTE	



PROPOSED SITE PLAN
RICHMOND CREAMERY MASTER PLAN P.U.D
BUTTERMILK, LLC

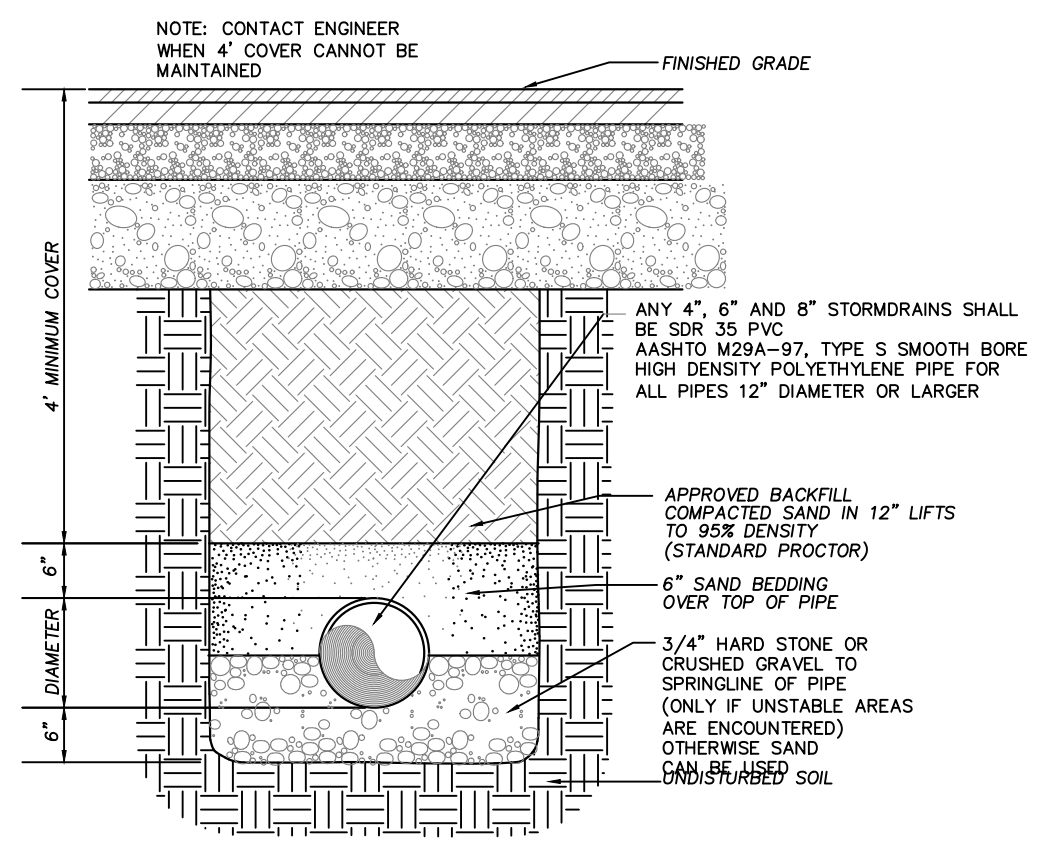
JOLINA COURT RICHMOND

GRENIER ENGINEERING, PC
155 DEMERITT PLACE #2

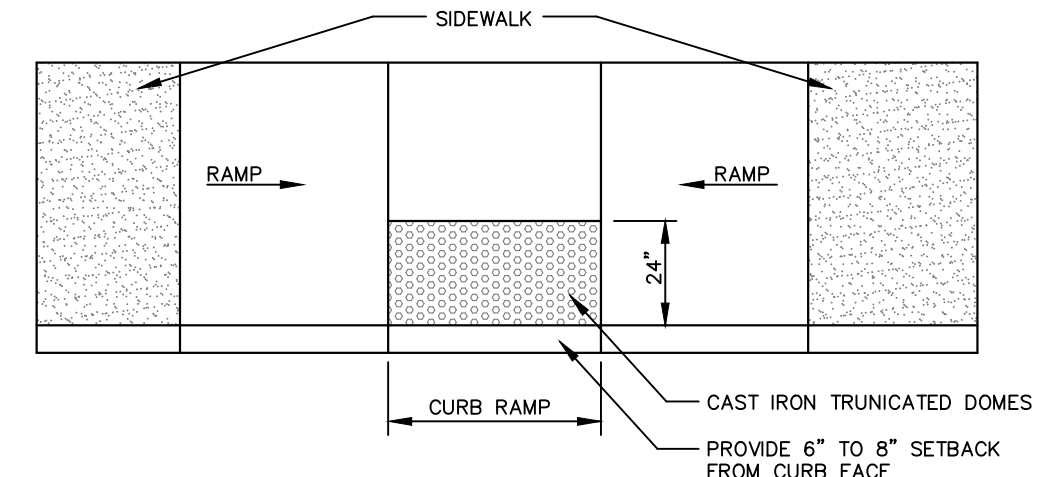
P.O. Box 445
Waterbury, VT 05676
TEL (802) 244-6413
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grenierengineering.com

Date: 4.17.23
Scale: 1" = 30'
Designed: JDG
Drawn: TJM
Checked: JDG
Sheet No: C-1

4/17/2023 PERMIT SET

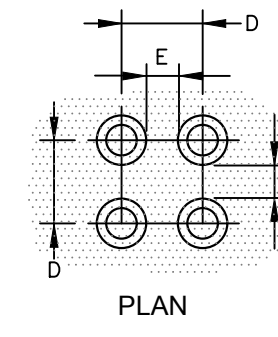


TYPICAL STORMDRAIN TRENCH
NTS

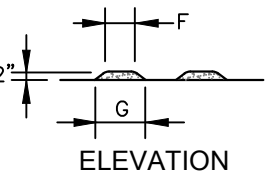


NOTES:
ASPHALT
ASPHALT SURFACES SHALL BE COMPOSED OF OIL BASED BITUMEN, COAL TAR ASPHALT IS NOT ACCEPTABLE, NOR WARRANTED. ASPHALT MUST CURE MINIMUM 20 DAYS PRIOR TO INSTALLATION TO INSURE PROPER BONDING OF ALL SURFACES. THIS ALLOWS TENSILE STRENGTH PROPERTIES OF BOTH MATERIALS TO MORE CLOSELY APPROXIMATE EACH OTHER. ANY ASPHALT AREAS REQUIRING DETECTABLE WARNING INSTALLATIONS SHALL BE COMPACTED WITH VIBRATORY ROLLERS OR APPROVED COMPACTION EQUIPMENT IN ADDITION TO STANDARD LOCAL CONDITIONS TO PROVIDE MAXIMUM COMPACTION OF ASPHALT ALLOWING THE GREATEST ADHESION.
SEAL COAT
SEAL COAT SHALL NOT BE PLACED ON ASPHALT OR COAL TAR SEALERS. IF SURFACE HAS BEEN SEALED, GRIND ENTIRE AREA TO BE INSTALLED TO REMOVE ALL SEALERS.
CONCRETE
MINIMUM COMPRESSIVE STRENGTH 3000 PSI. CONCRETE MUST CURE FOR 15 DAYS PRIOR TO INSTALLATION TO INSURE PROPER BONDING. ALL CONCRETE COLORING/ADDITIVES SHALL BE INTEGRAL, NOT SURFACE APPLIED. ALL "SURFACE CURING" COMPOUNDS OR SEALERS SHALL BE REMOVED BY METHOD OF GRINDING ON ANY CONCRETE THAT IS LESS THAN 6 MONTHS OLD BEFORE PRODUCTS ARE INSTALLED. SURFACE FINISH SHOULD BE MEDIUM BROOM FINISH FOR MAXIMUM ADHESION.
SURFACES
ALL SURFACES TO BE CLEAN AND DRY. TRUNCATED DOMES AND ALL RELATED INSTALLED SURFACES TO BE INSTALLED ACCORDING TO MANUFACTURERS SPECIFICATIONS. ALL DETECTABLE WARNING SURFACE INSTALLATIONS SHALL BE A MINIMUM, AT LEAST AS NON SKID AS THE SURROUNDING PEDESTRIAN SURFACES.

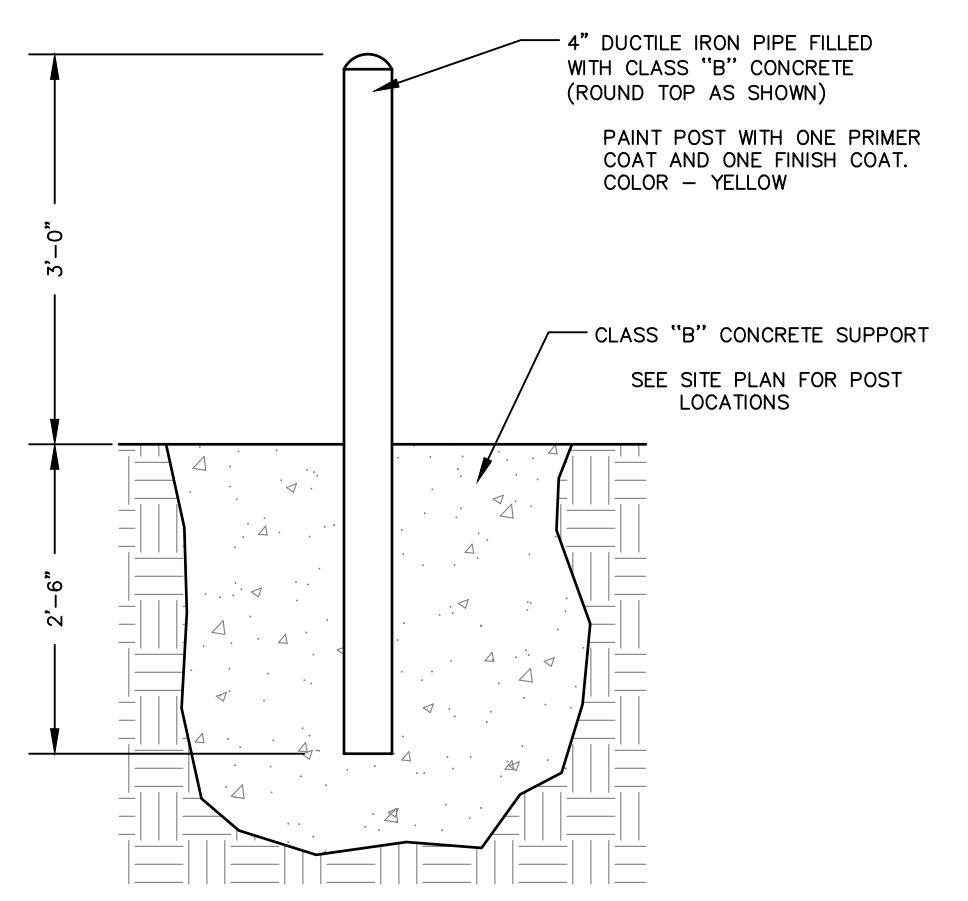
WARNING TEXTURE DETAIL
NTS



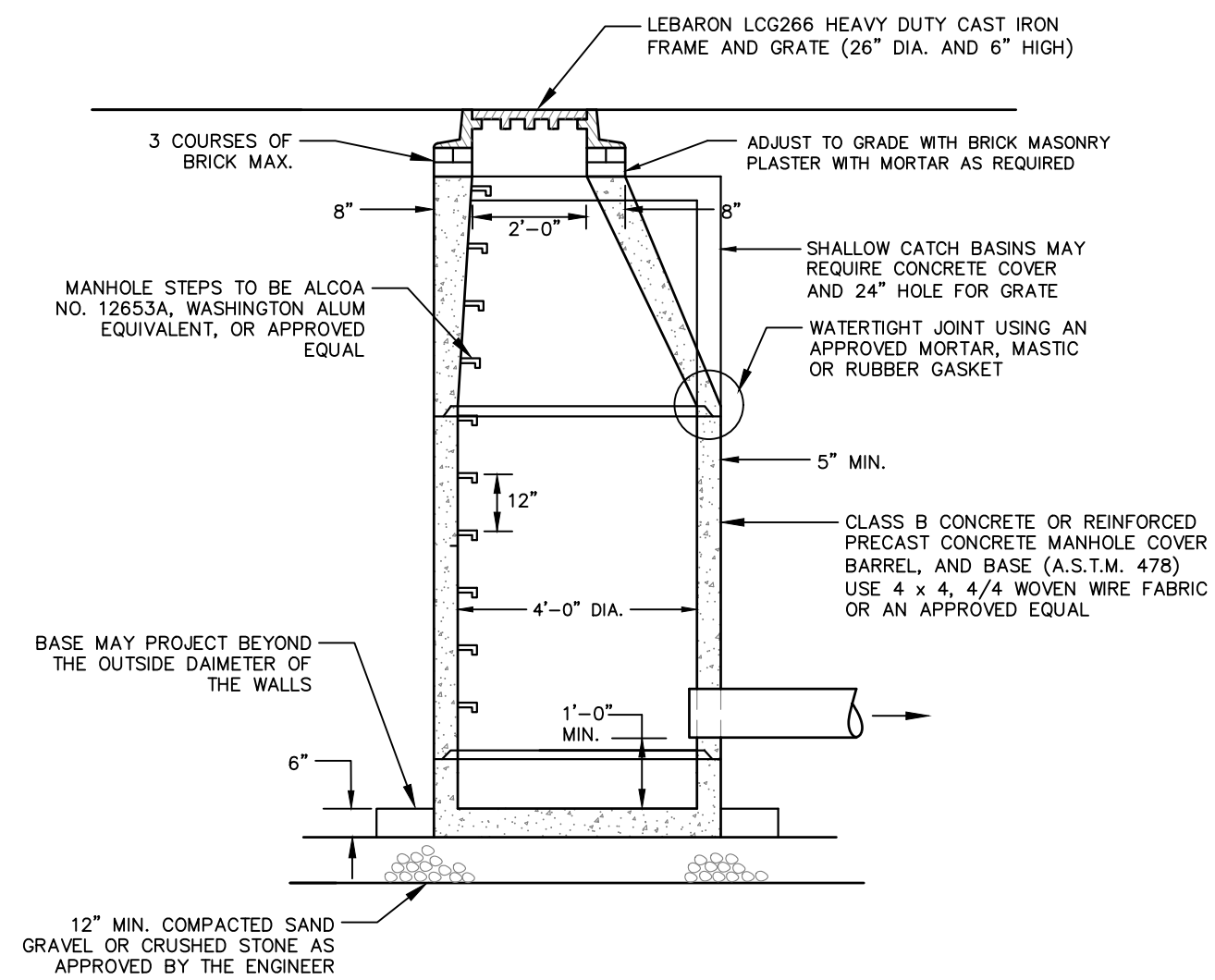
	MIN.	MAX.
D	1.60"	2.40"
E	.65"	1.50"
F	.45"	.80"
G	.90"	1.40"



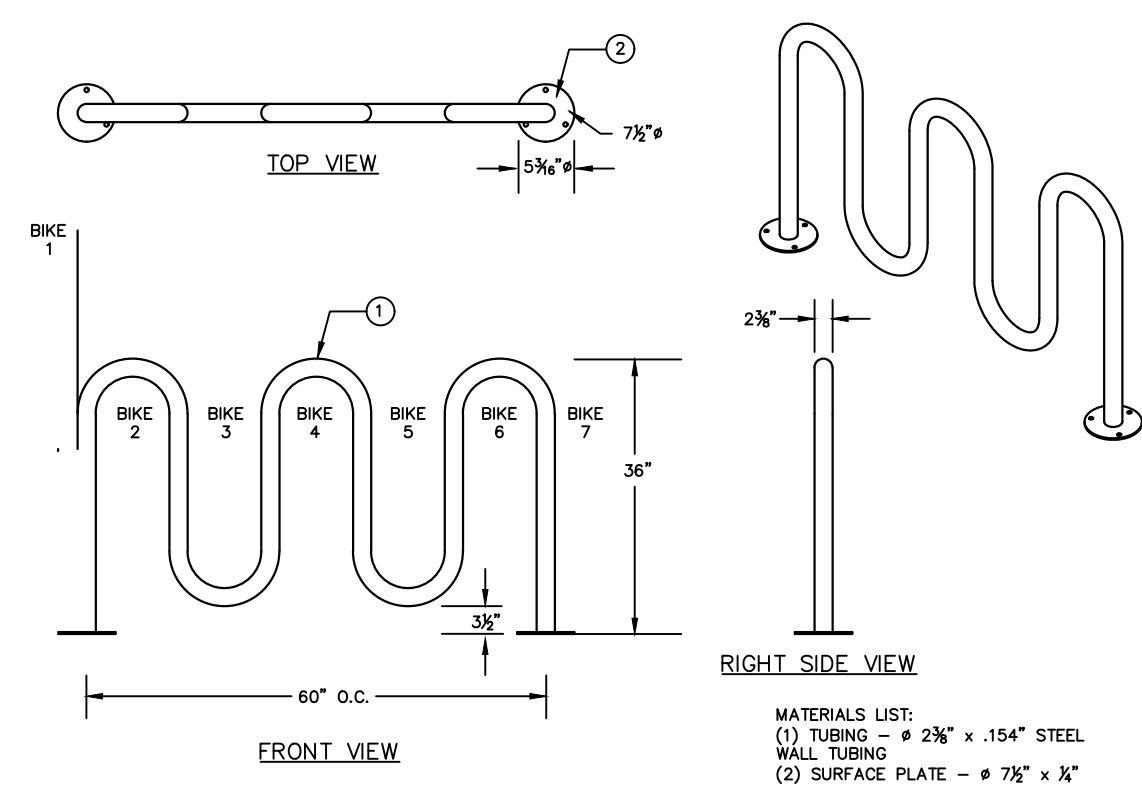
ELEVATION
TRUNCATED DOME
DETECTABLE
WARNING DETAIL



BOLLARD DETAIL
NTS

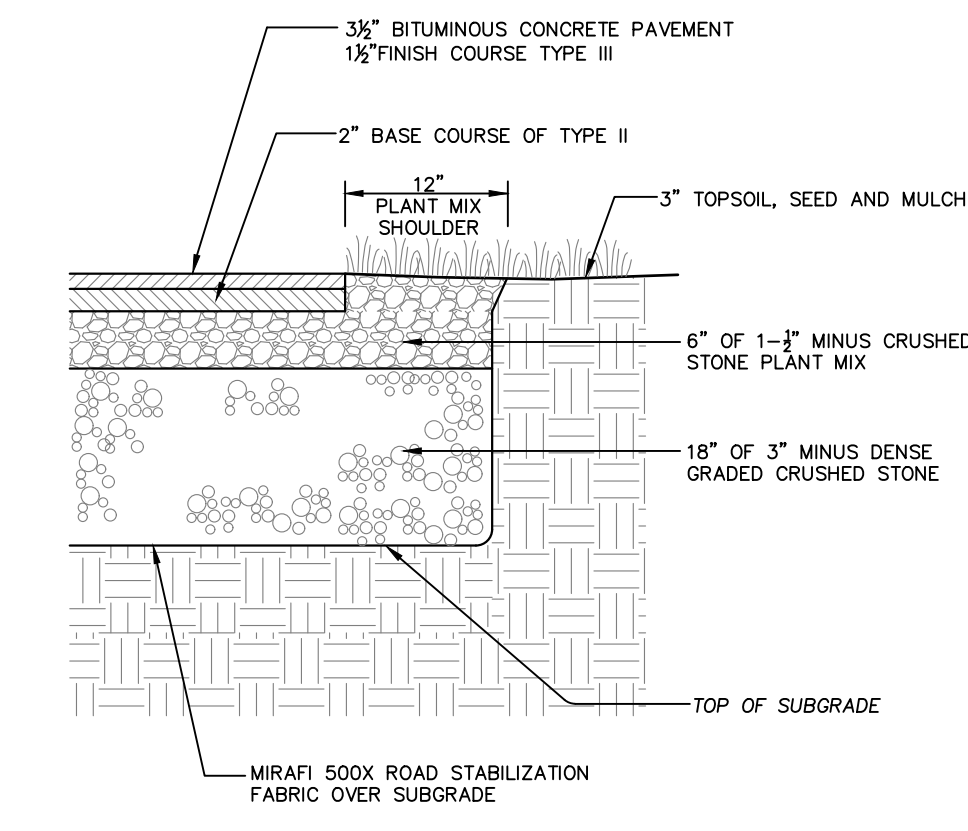


TYPICAL CATCH BASIN DETAIL
NTS

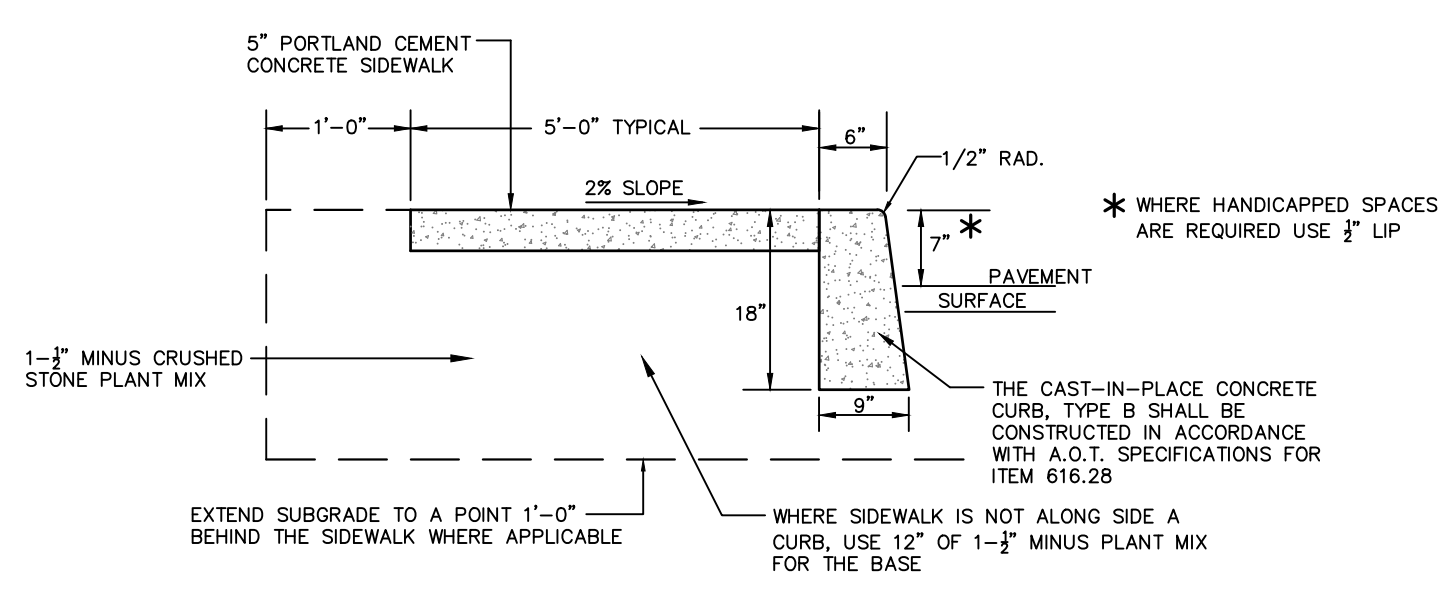


BIKE RACK DETAIL
NTS

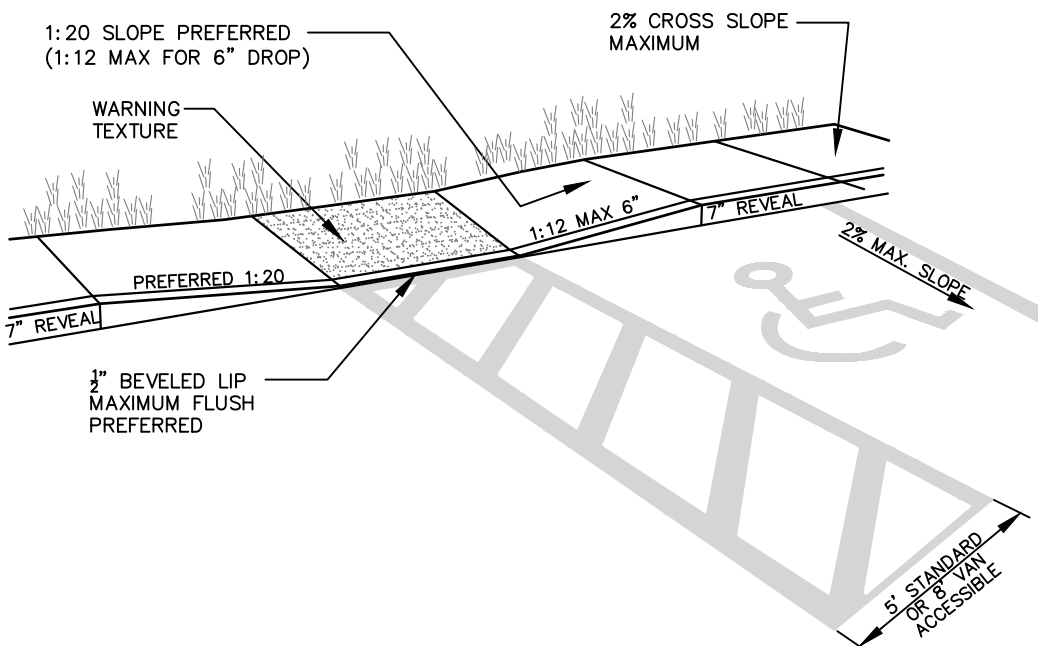
- MATERIALS LIST:
(1) TUBING - # 2 1/2" x .154" STEEL WALL TUBING
(2) SURFACE PLATE - # 7/8" x 1/2" THICK STEEL PLATE WITH THREE # 3/8" MOUNTING HOLES
(3) MOUNTED WITH SIX # 3/8" x 4-5" STAINLESS STEEL ANCHOR BOLTS



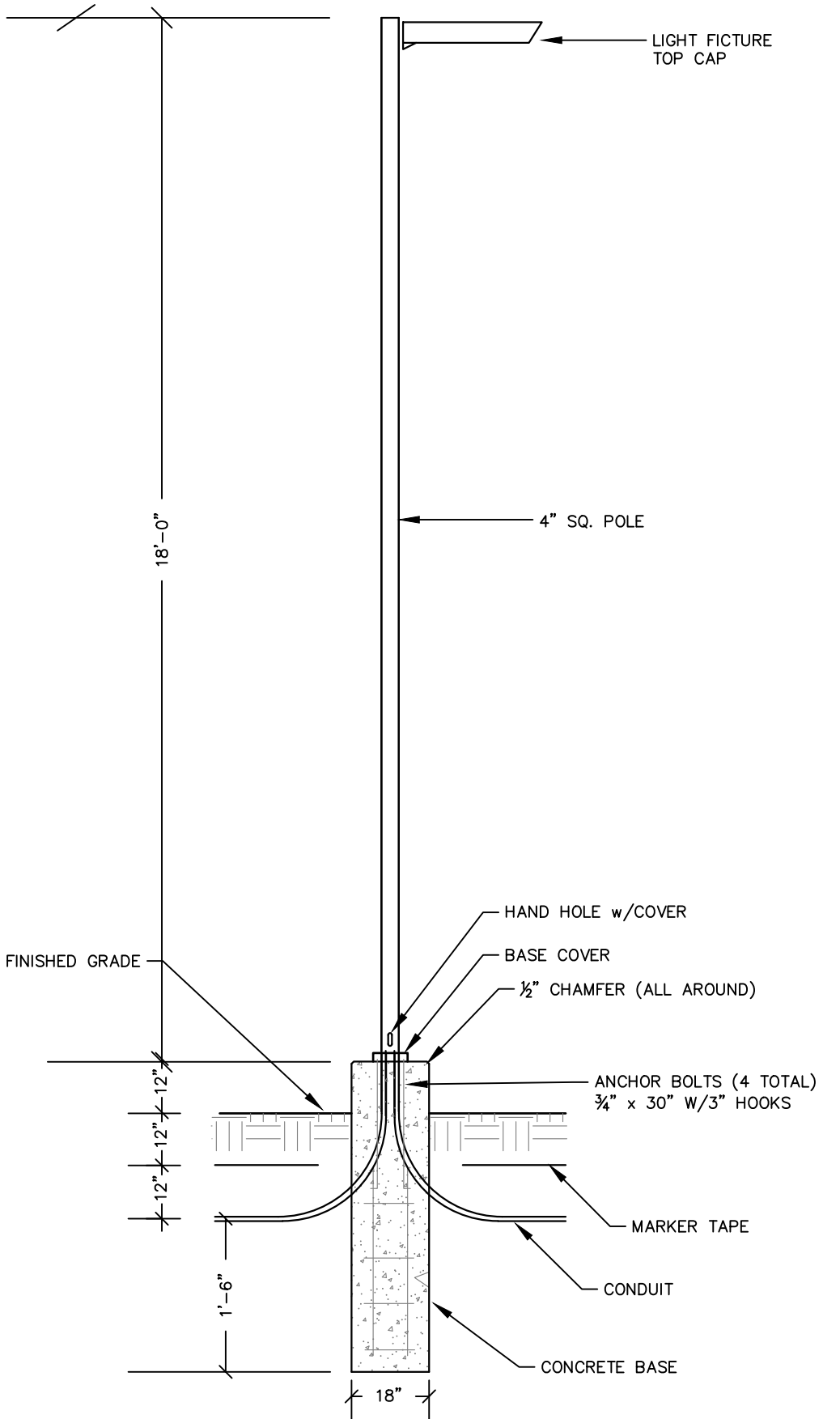
TYPICAL PARKING LOT DETAIL
NTS



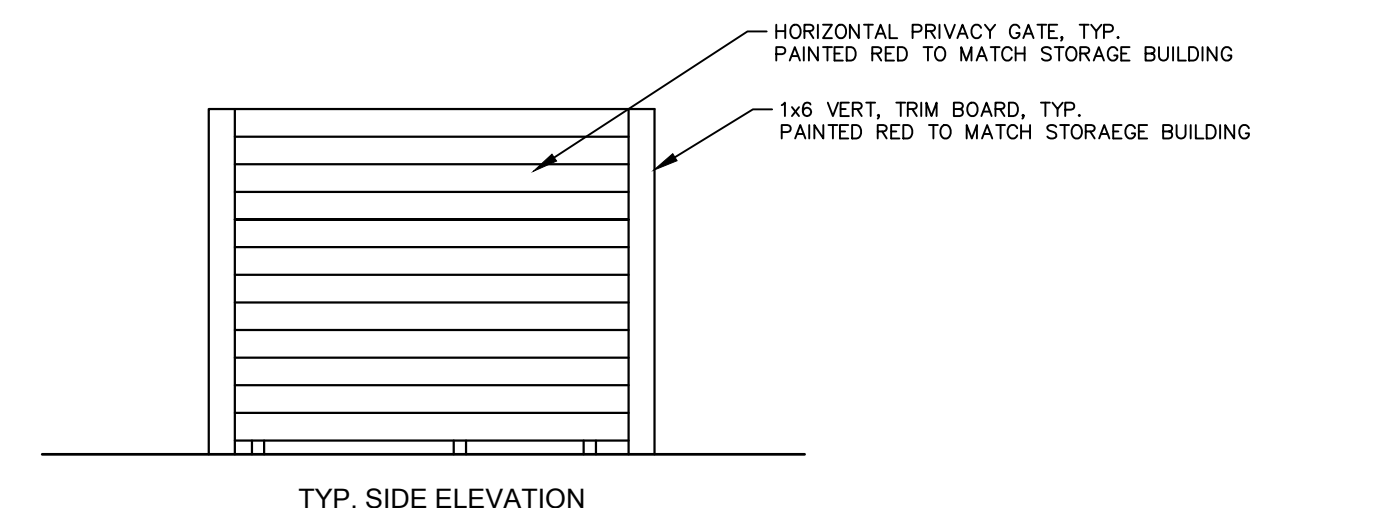
SIDEWALK & CAST-IN-PLACE CONCRETE CURB, TYPE B
NTS



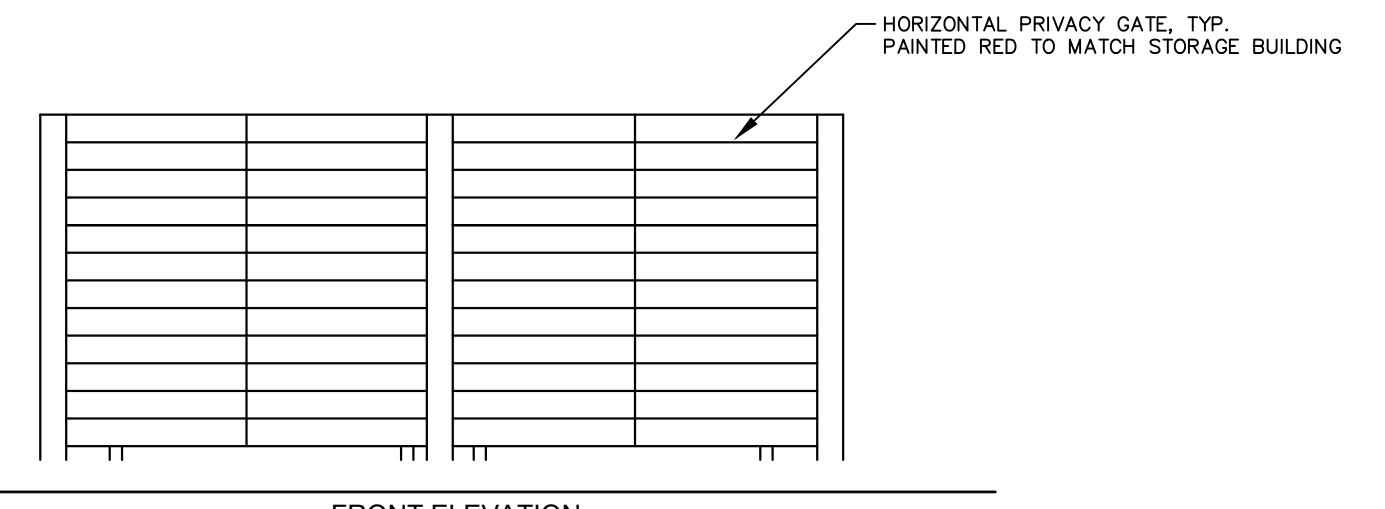
HANDICAP ACCESS RAMP
NTS



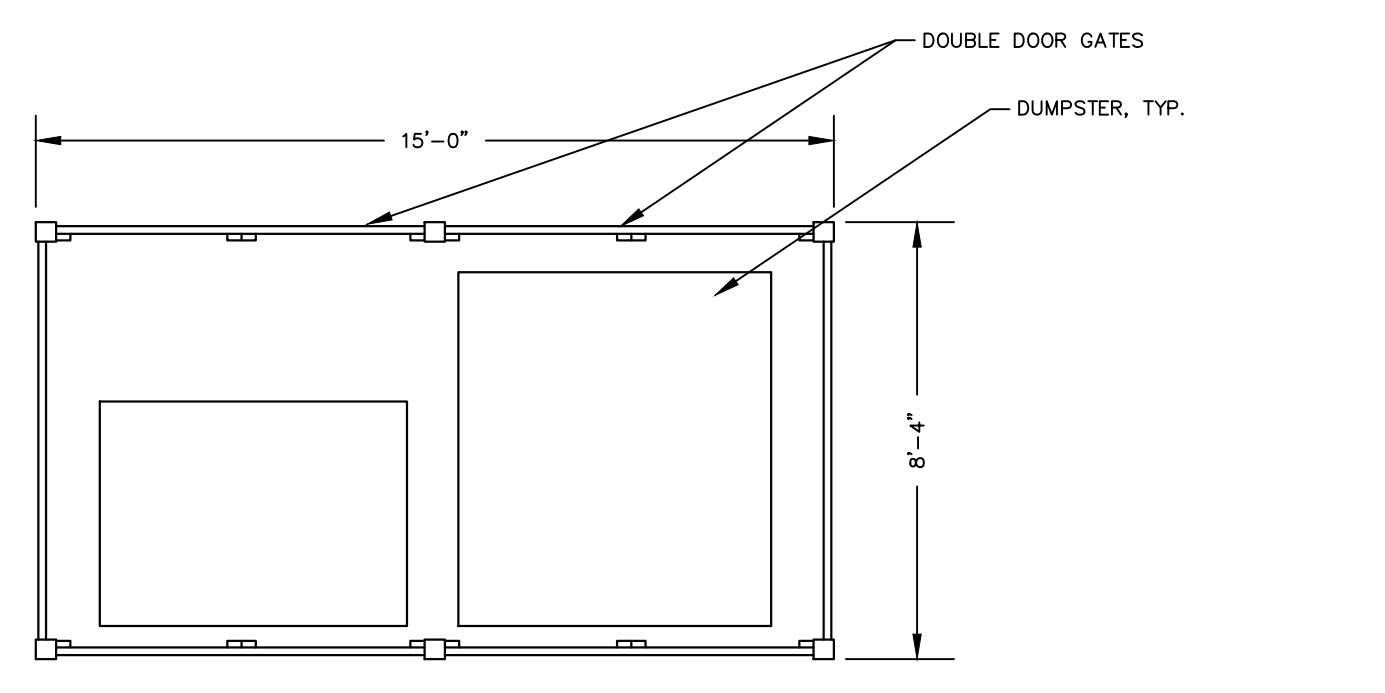
PARKING LOT LIGHTING POLE TYPE FIXTURE A
WITH CONCRETE LIGHT POLE BASE
NTS



TYP. SIDE ELEVATION

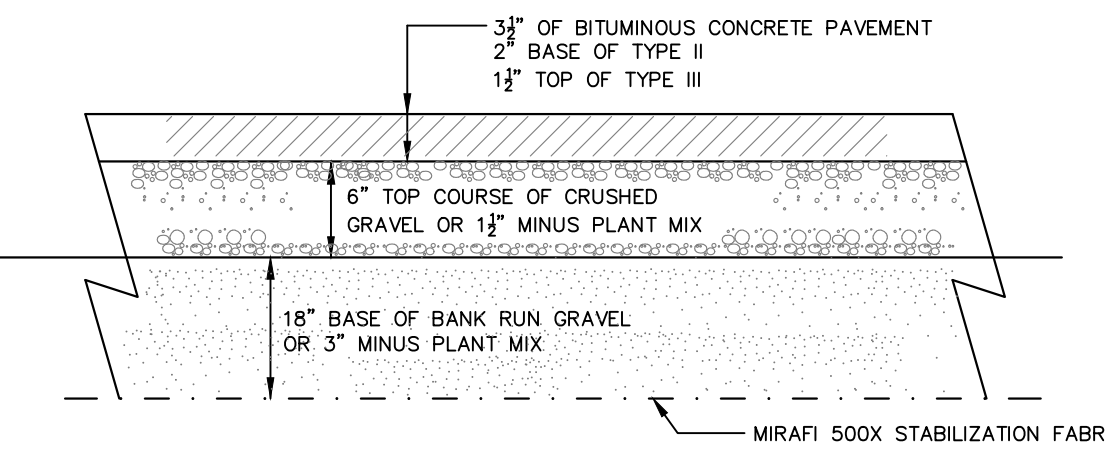


FRONT ELEVATION

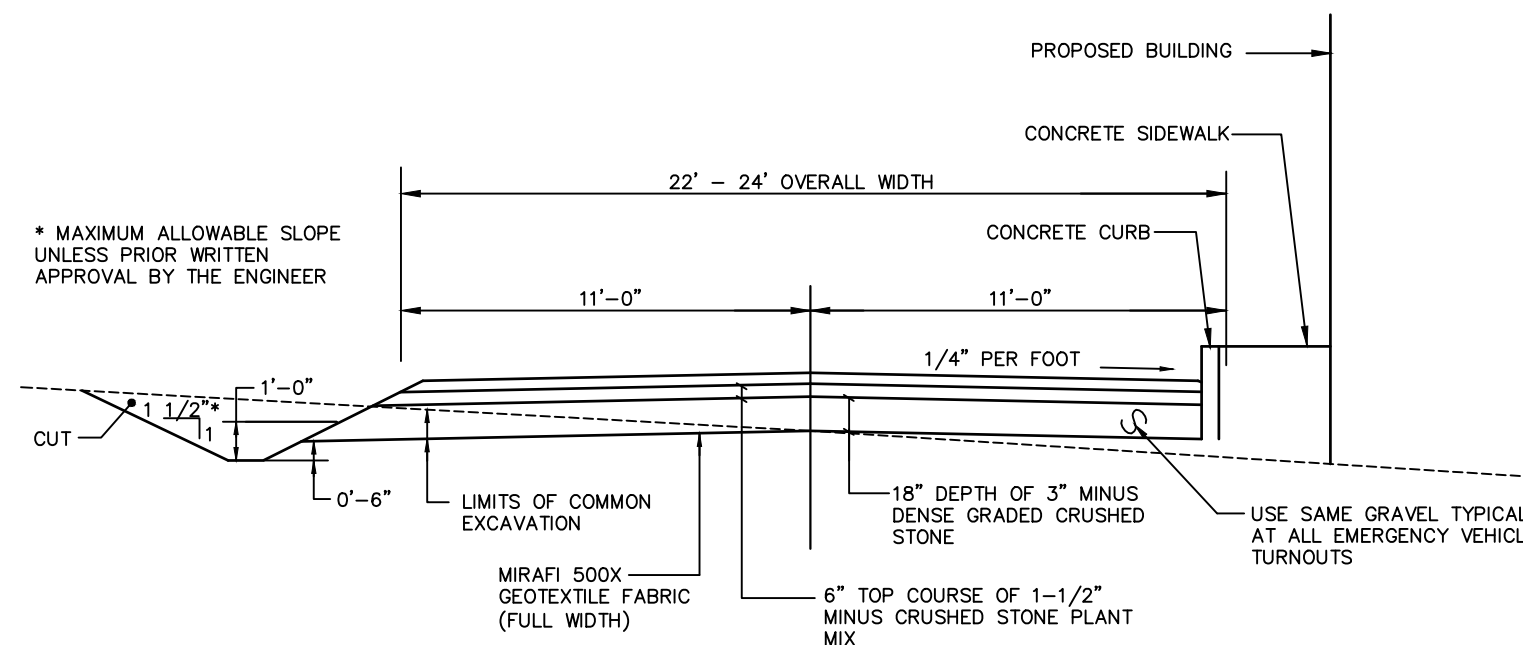


PLAN VIEW

TRASH ENCLOSURE DETAIL
NTS



TYPICAL NEW PARKING LOT CROSS SECTION
NTS

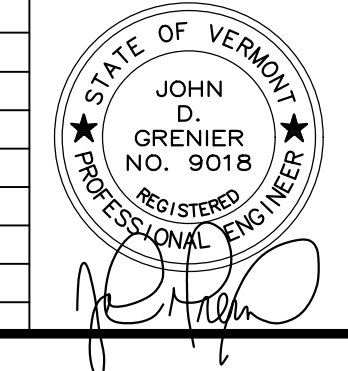


PRIVATE LOCAL ROADWAY SECTION
NTS

NOTE: ORIGINAL PLAN 24" x 36". OTHER SIZES NOT TO SCALE

No.	Date	Revision	By

4/17/2023
PERMIT SET



SITE DETAILS
RICHMOND CREAMERY MASTER PLAN P.U.D
BUTTERMILK, LLC

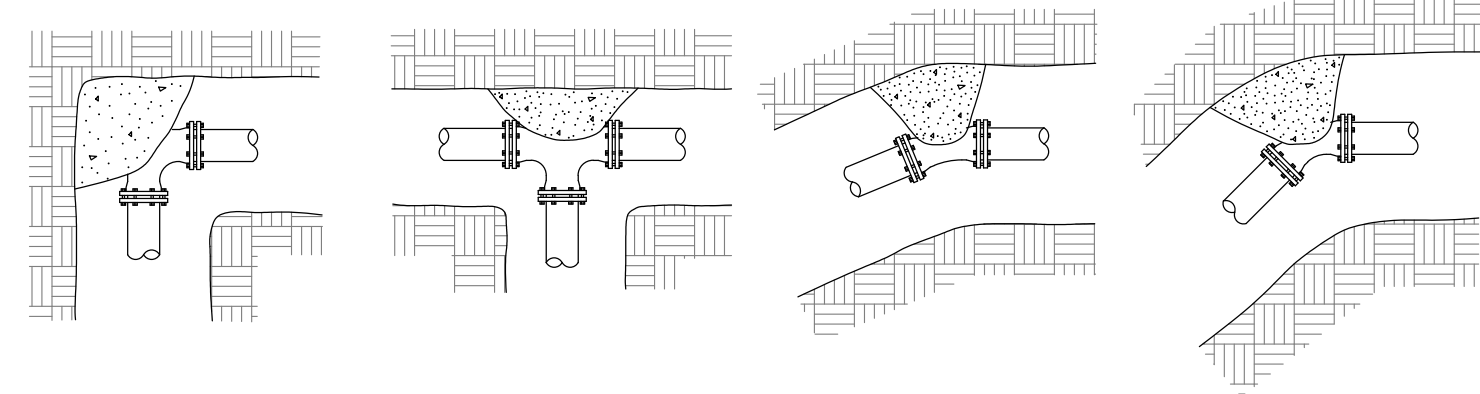
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Date: 4.17.23
Scale: A/N
Designed: JDG
Drawn: TJM
Checked: JDG
Sheet No: C-2

USE CLASS D (2500 PSI) CONCRETE FOR THRUST BLOCKS. PLACE 4 MIL. POLYETHYLENE BETWEEN FITTING AND THRUST BLOCK. PLACE THRUST BLOCK AGAINST UNDISTURBED TRENCH WALL - CONCRETE BEARING AREA ON FITTING TO BE A MINIMUM OF 1/2 SQUARE FOOT. THRUST BLOCKS BASED ON 50 PSI TEST PRESSURE IF CHANGE IN ELEVATION BETWEEN ANY 2 POINTS IN THE LINE IS GREATER THAN 110' THRUST BLOCKS WILL HAVE TO BE ENLARGED.

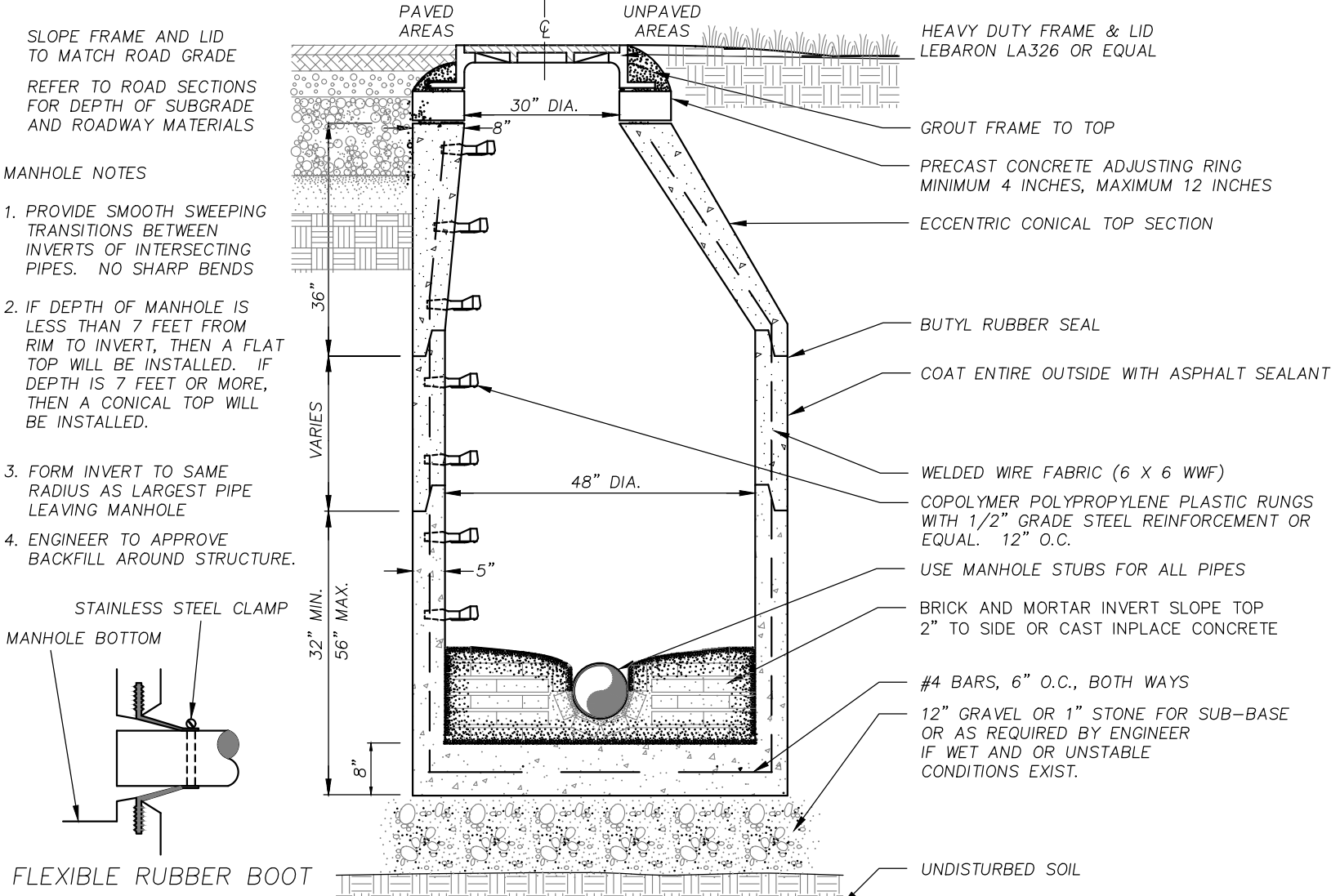


MINIMUM BEARING AREA IN SQUARE FEET ON UNDISTURBED TRENCH WALL

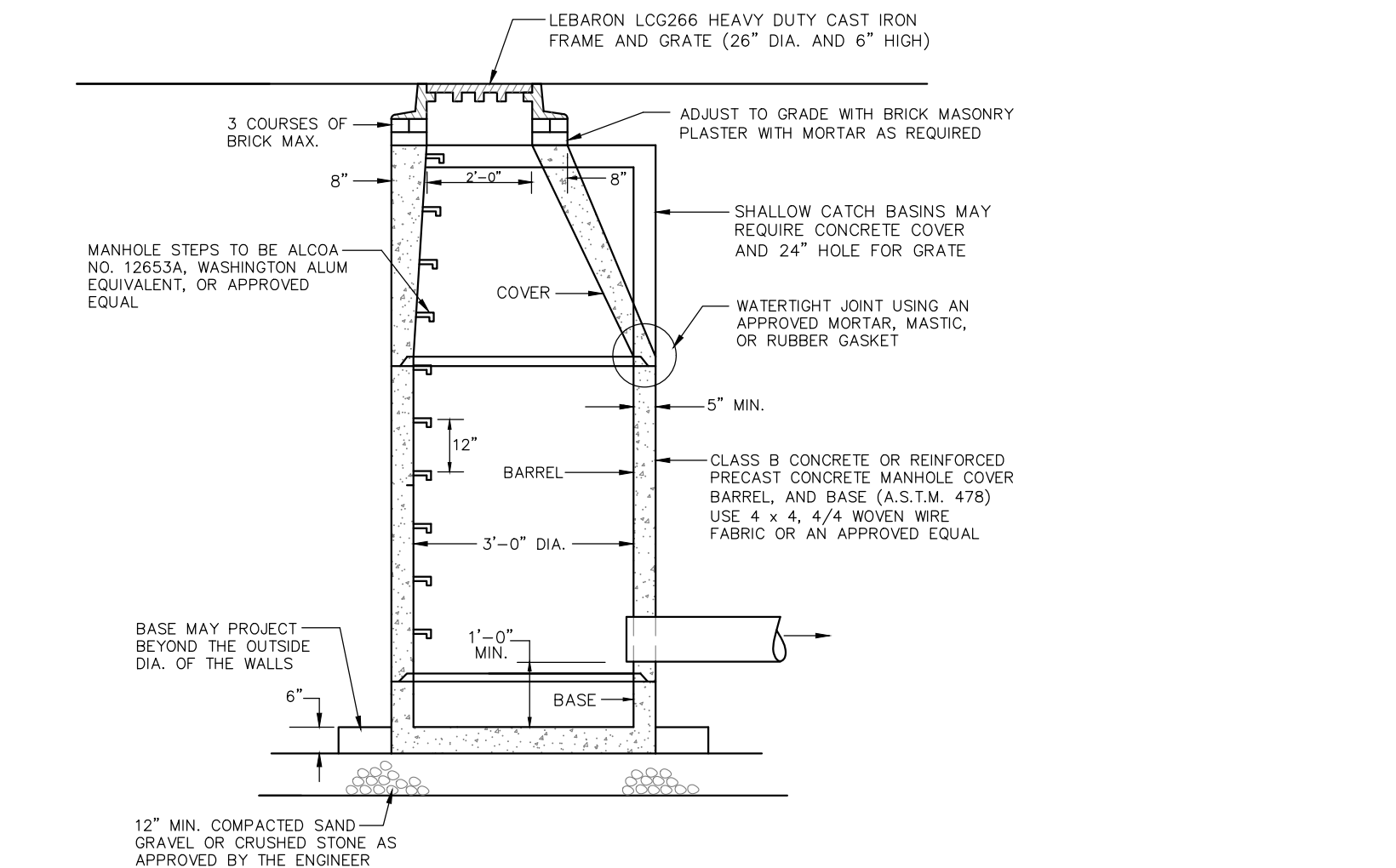
SOIL TYPE	SAFE BEARING LOAD, LBS/FT ²	2"		2 1/2"		3"		4"		6"	
		TEE	90°	TEE	90°	TEE	90°	TEE	90°	TEE	90°
CLAY	1000	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8	0.9	1.5
SAND	2000	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.8
GRAVEL	3000	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
TILL	4000	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
SHALE	10000	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5

NOTE: ENGINEER TO OBSERVE ALL THRUST BLOCKS PRIOR TO BACKFILL.

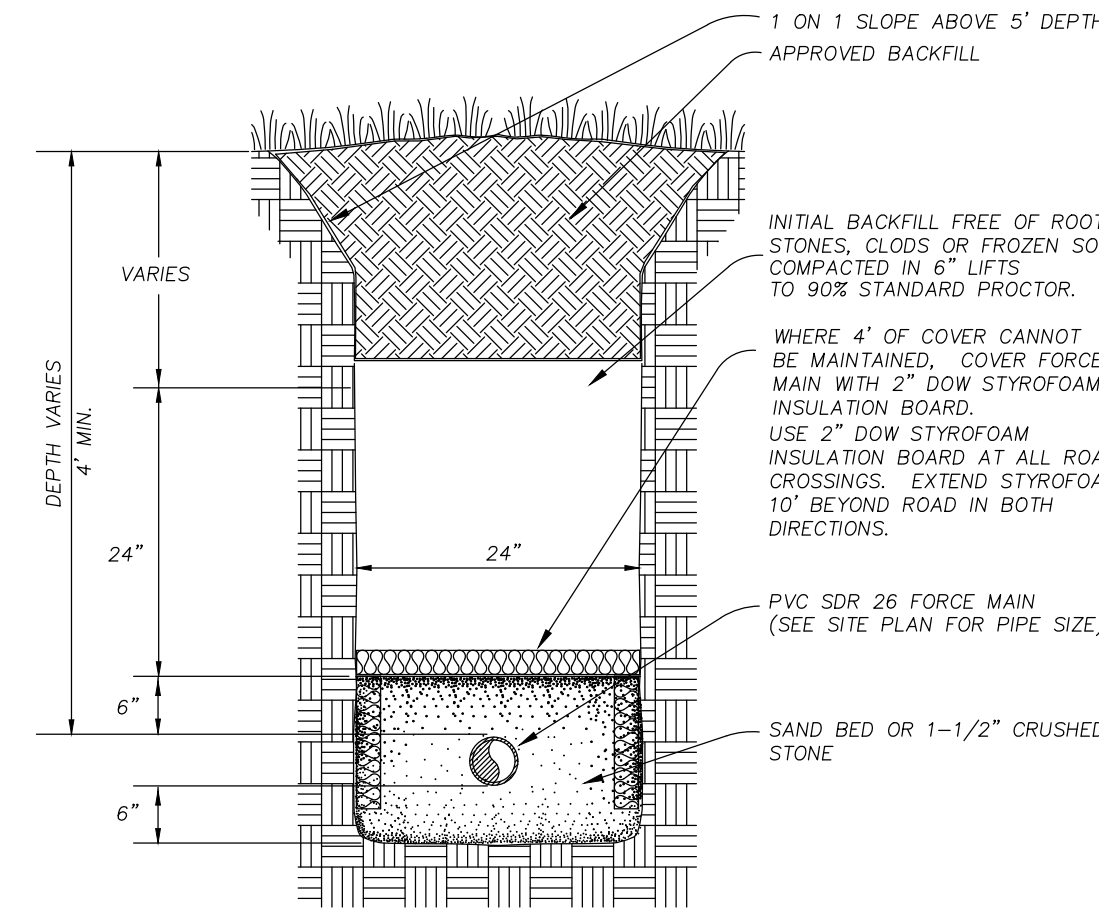
FORCEMAIN THRUST BLOCK SPECIFICATIONS
NTS



TYPICAL SEWER MANHOLE with 30" COVER
NTS

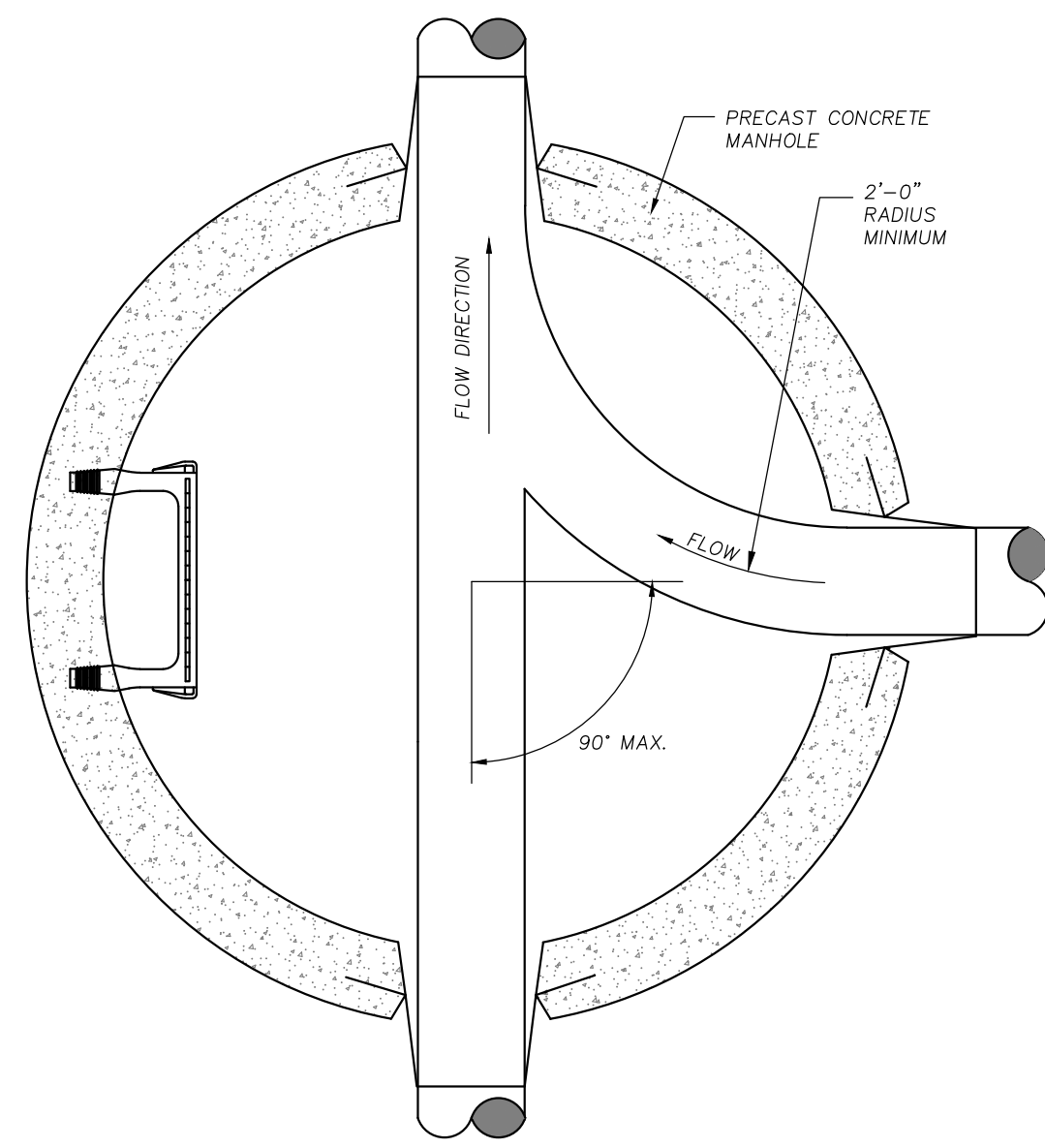


TYPICAL 36" DIAMETER CATCH BASIN
NTS

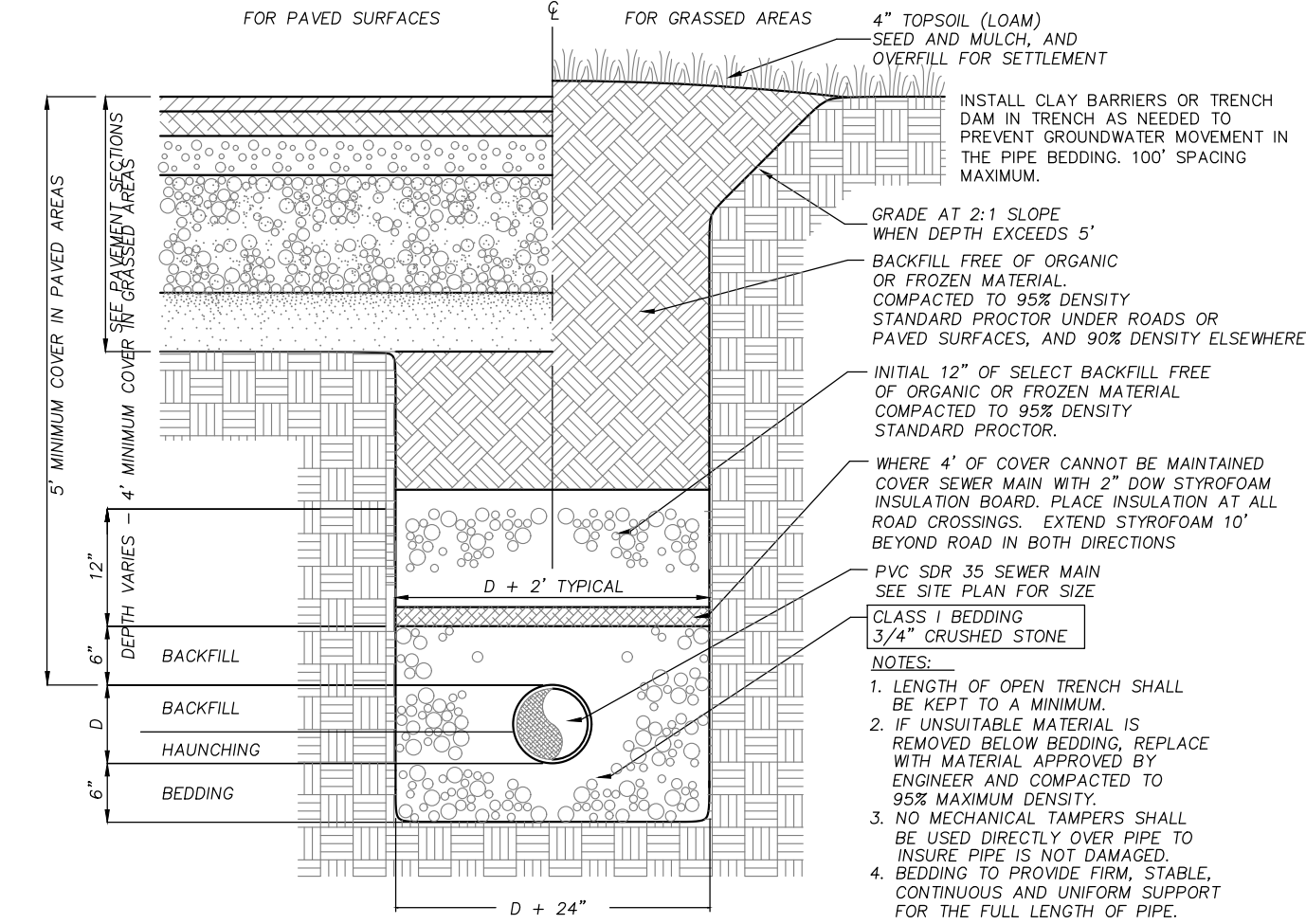


INSTALL FORCE MAIN AT A CONSTANT GRADE (NO HIGH POINTS OR LOW POINTS).
INSTALL CLAY BARRIERS IN TRENCH AS NEEDED TO PREVENT GROUNDWATER MOVEMENT IN THE PIPE BEDDING. 100' SPACING MAXIMUM.

FORCEMAIN TRENCH DETAIL
NTS

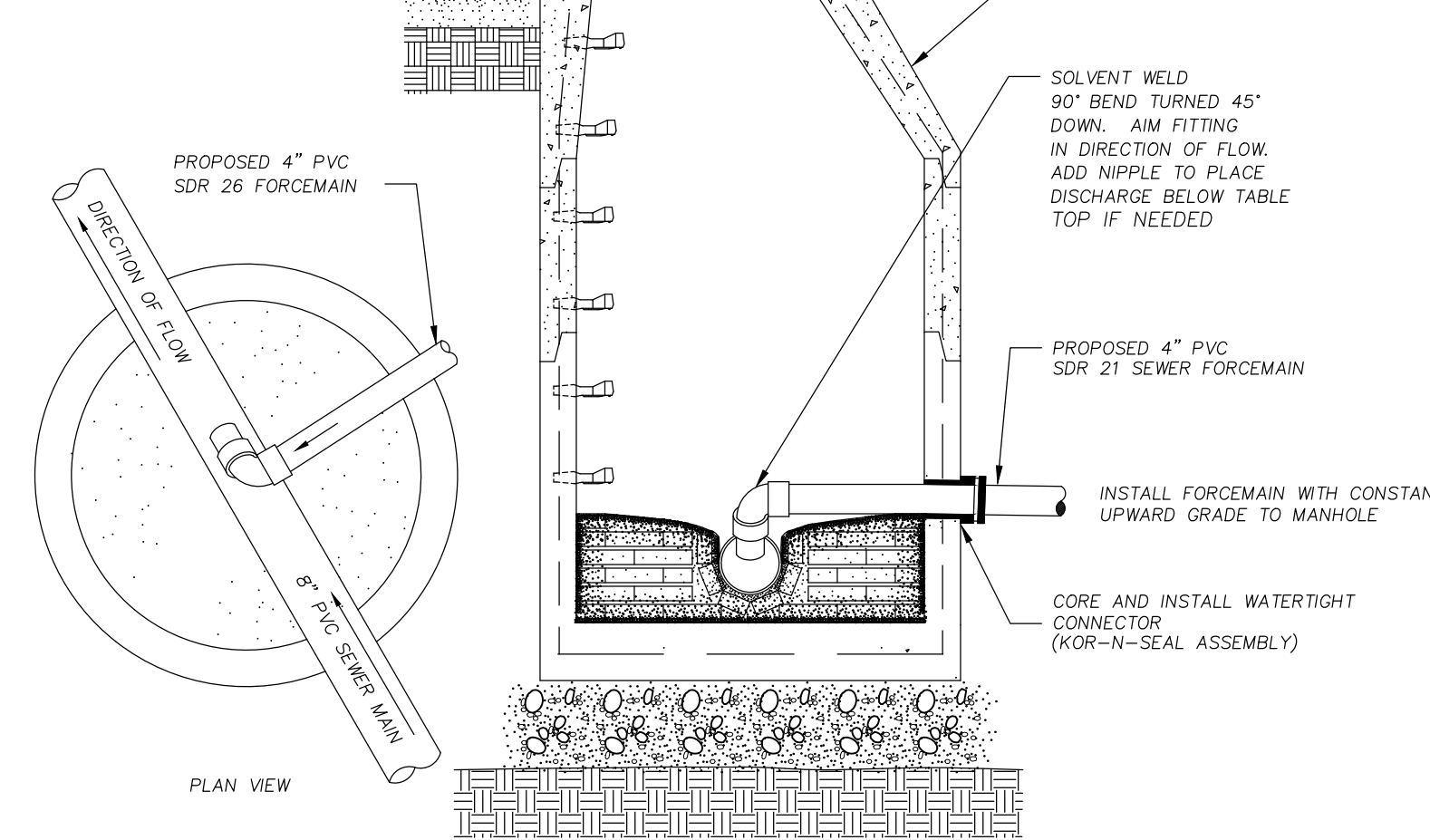


MANHOLE CHANNEL
NTS

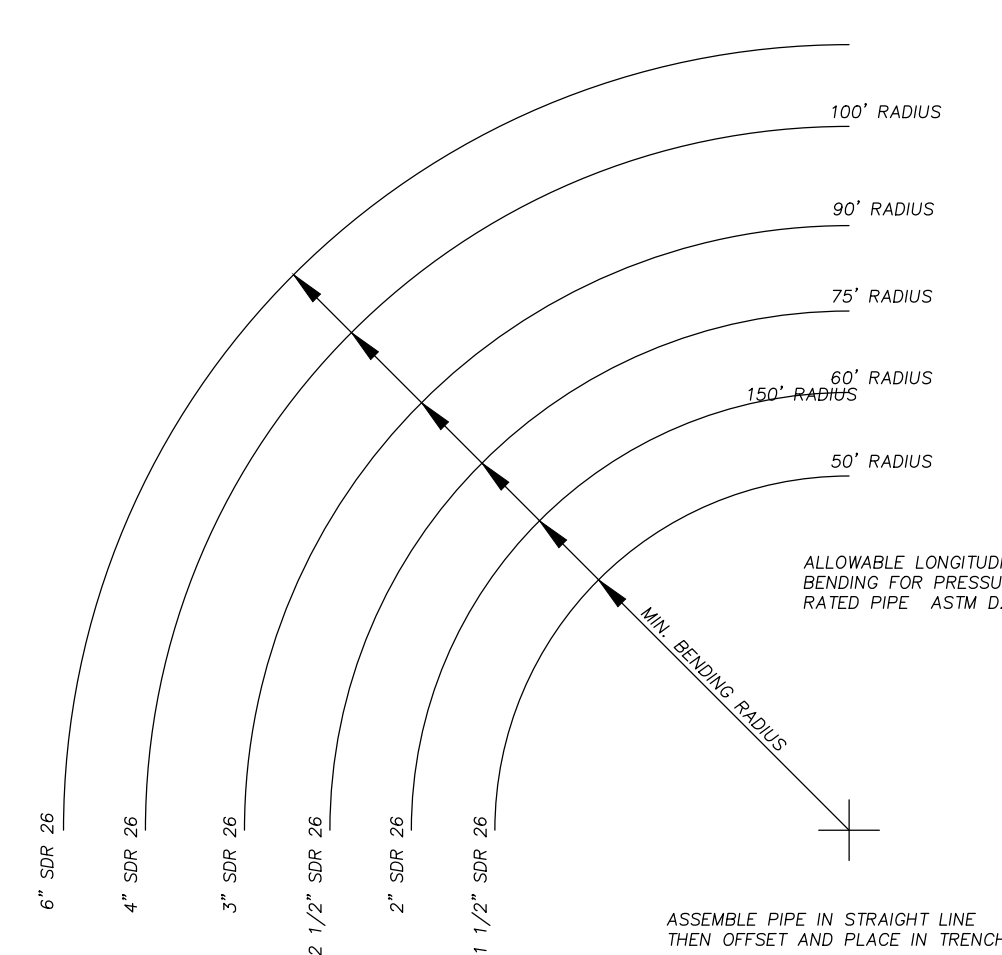


TYPICAL SEWER TRENCH
NTS

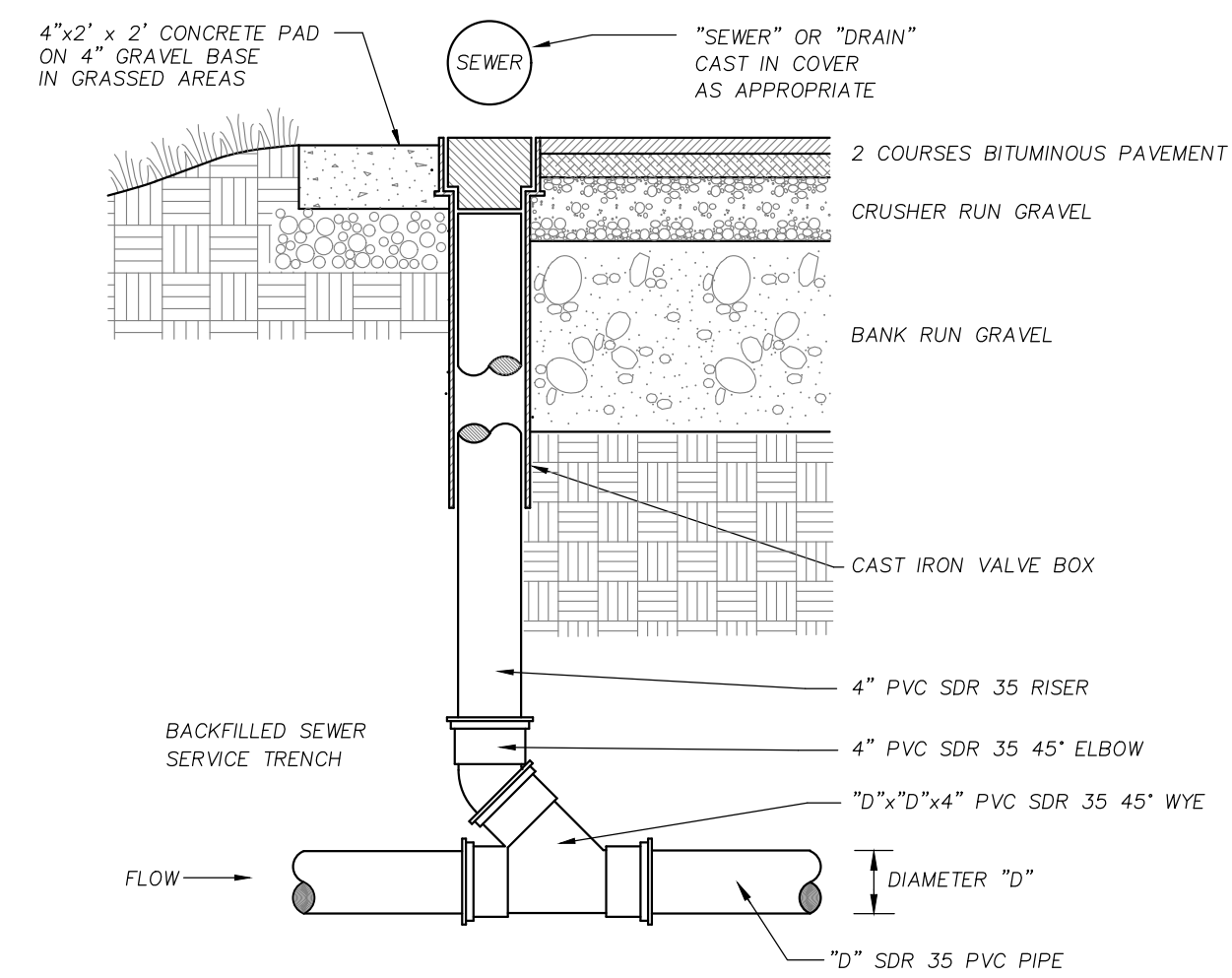
MANHOLE NOTES
1. PROVIDE STAINLESS STEEL PIPE CLAMPS TO SECURE FORCEMAIN USE STAINLESS STEEL EXPANSION ANCHOR BOLTS IN EXISTING TABLE TOP.



FORCEMAIN CONNECTION TO EXISTING MANHOLE
NTS



ALLOWABLE BENDING FOR PVC PIPE
NTS



TYPICAL SEWER CLEANOUT
NTS

NOTE: ORIGINAL PLAN 24" x 36". OTHER SIZES NOT TO SCALE

No.	Date	Revision	By

4/17/2023
PERMIT SET

TESTING SEWER MANHOLES

- EACH MANHOLE SHALL BE TESTED BY MEANS OF A WATER TEST OR VACUUM TEST. IN ANY CASE, THERE SHALL BE NO VISIBLE LEAKAGE INTO THE BASE OR WAYS OF A COMPLETED MANHOLE.
- AFTER THE MANHOLE HAS BEEN ASSEMBLED IN PLACE, ALL LIFTING HOLES AND THOSE EXTERIOR JOINTS WITHIN 6 FEET OF THE GROUND SURFACE SHALL BE FILLED AND POINTED WITH AN APPROVED NON-SHRINKING MORTAR. THE TEST SHALL BE MADE PRIOR TO PLACING THE SHELVE AND INVERT. IF THE GROUNDWATER TABLE HAS BEEN ALLOWED TO RISE ABOVE THE BOTTOM OF THE MANHOLE, THE ENGINEER MAY DIRECT IT TO BE LOWERED FOR THE DURATION OF THE TEST. ALL PIPES AND OTHER OPENINGS INTO THE MANHOLE SHALL BE SUITABLY PLUGGED AND THE PLUGS BRACED TO PREVENT BLOWOUT.
- IF THE CONTRACTOR ELECTS TO BACKFILL PRIOR TO WATER TESTING, FOR ANY REASON, IT SHALL BE AT HIS OWN RISK AND IT SHALL BE INCUMBENT UPON THE CONTRACTOR TO DETERMINE THE REASON FOR ANY FAILURE OF THE TEST AND ADJUSTMENT IN THE LEAKAGE ALLOWANCE WILL BE MADE FOR UNKNOWN CAUSES SUCH AS LEAKAGE OF PLUGS, ABSORPTION, ETC. IT WILL BE ASSUMED THAT ALL LOSS OF WATER DURING THE TEST IS A RESULT OF LEAKS THROUGH THE JOINTS OR THROUGH THE CONCRETE. FURTHERMORE, THE CONTRACTOR SHALL TAKE ANY STEPS NECESSARY TO ASSURE THE ENGINEER THAT THE WATER TABLE IS BELOW THE BOTTOM OF THE MANHOLE THROUGHOUT THE TEST.
- IF THE GROUNDWATER TABLE IS ABOVE THE HIGHEST JOINT IN THE MANHOLE, AND IF THERE IS NO LEAKAGE INTO THE MANHOLE AS DETERMINED BY THE ENGINEER, SUCH A TEST CAN BE USED TO EVALUATE THE WATER TIGHTNESS OF THE MANHOLE. HOWEVER, IF THE ENGINEER IS NOT SATISFIED, THE CONTRACTOR SHALL LOWER THE WATER TABLE AND CARRY OUT THE TEST AS DESCRIBED HEREIN BEFORE.
- WATER TEST: THE MANHOLE SHALL THEN BE FILLED WITH WATER TO THE TOP OF THE CONE SECTION. A PERIOD OF ONE HOUR WILL BE PERMITTED TO ALLOW FOR ABSORPTION. AT THE END OF THIS PERIOD, THE MANHOLE SHALL BE REFILLED TO THE TOP OF THE CONE. IF NECESSARY, AND THE MEASURING TIME OF AT LEAST 6 HOURS BEGIN. AT THE END OF THE TEST PERIOD, THE MANHOLE SHALL BE REFILLED TO THE TOP OF THE CONE MEASURING THE VOLUME OF WATER ADDED. THIS AMOUNT SHALL BE CONVERTED TO A 24 HOUR RATE AND THE LEAKAGE DETERMINED ON THE BASIS OF DEPTH. THE LEAKAGE FOR EACH MANHOLE SHALL NOT EXCEED ONE GALLON PER VERTICAL FOOT FOR A 24 HOUR PERIOD. REPAIRS BY APPROVED METHODS MAY BE MADE, AS DIRECTED BY THE ENGINEER, TO BRING THE LEAKAGE WITHIN ALLOWABLE RATE OF ONE GALLON PER FOOT PER DAY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO UNCOVER THE MANHOLE, AS NECESSARY, AND TO DISASSEMBLE, RECONSTRUCT OR REPLACE IT AS DIRECTED BY THE ENGINEER. THE MANHOLE SHALL THEN BE RETESTED.
- VACUUM TEST: THE CONTRACTOR SHALL FURNISH THE MANHOLE CONE SEAL, VACUUM PUMP, ALL NECESSARY GAUGES, HOSES, AND EQUIPMENT TO PERFORM THE TEST.
- FILL ALL LIFTING HOLES AND EXTERIOR JOINTS WITH APPROVED NON-SHRINKING MORTAR AND PLUG ALL OTHER OPENINGS INTO THE MANHOLE TO PREVENT DISPLACEMENT.
- INSTALL AN INFLATABLE RUBBER RING THE SIZE OF THE TOP OF THE MANHOLE BY INFLATING THE RING WITH AIR, TO A PRESSURE ADEQUATE TO PREVENT LEAKAGE OF AIR BETWEEN THE RING AND THE MANHOLE WALL.
- PUMP THE AIR OUT OF THE MANHOLE THROUGH AN OPENING IN THE TEST PLATE UNTIL A VACUUM IS CREATED INSIDE THE MANHOLE EQUAL TO 10 INCHES OF MERCURY USING AN APPROVED VACUUM GAUGE. THEN STOP THE REMOVAL OF AIR AND BEGIN THE TEST.
- THE VACUUM CAN NOT DROP BELOW 9 INCHES OF MERCURY WITHIN A 2 MINUTE TEST PERIOD. IF MORE THAN A 1 INCH DROP OCCURS WITHIN 2 MINUTES, THE MANHOLE HAS FAILED THE TEST, AND IT SHALL BE REPAIRED OR RECONSTRUCTED AND THEN RETESTED UNTIL IT PASSES AT NO EXPENSE TO OWNER.
- BACKFILL AROUND THE MANHOLE UPON SATISFACTORY TEST RESULTS.

TESTING SEWERS

- TEST THE "GRAVITY" SEWER BY A PRESSURIZED AIR TEST BETWEEN CONSECUTIVE MANHOLES. PLUG THE TWO ENDS OF THE PIPE AND CONNECT THE AIR CONTROL EQUIPMENT TO THE TAPPED END.
- SUPPLY AIR SLOWLY TO THE PIPE UNTIL REACHING A CONSTANT PRESSURE OF 3.5 PSI, THROTTLE THE AIR SUPPLY SO THAT THE PRESSURE REMAINS ABOVE 3.0 PSI FOR AT LEAST 5 MINUTES TO ALLOW TEMPERATURE STABILIZATION IN THE PIPE. MONITOR PRESSURE WITH A GAUGE HAVING A RANGE FROM 0 TO 5 PSI. THE GAUGE SHOULD HAVE MINIMUM DIVISIONS OF 0.1 PSI AND AN ACCURACY OF ± 0.04 PSI. REGULATE THE AIR PRESSURE TO PREVENT IT FROM EXCEEDING 5.0 PSI.
- AFTER STABILIZATION, ADJUST PRESSURE TO 3.5 PSI AND SHUT OFF AIR SUPPLY. WHEN THE PRESSURE REACHES 3.0 PSI START THE STOP WATCH AND RECORD THE TIME IT TAKES TO REACH 2.5 PSI. THE TIME REQUIRED FOR THE PIPE SIZE MUST BE AT LEAST:

PIPE DIAMETER	MINUTES	SECONDS	PIPE DIAMETER	MINUTES	SECONDS
4"	2	33	18"	9	35
6"	3	50	20"	11	34
8"	5	06	22"	12	45
10"	6	22	24"	13	30
12"	7	39			

- IF LATERALS ARE INCLUDED IN THE TESTING, THE AVERAGE OF THE PIPES (USING DIAMETER AND LENGTH) WILL BE CALCULATED AND MULTIPLIED BY 38.2 SECONDS PER INCH DIAMETER TO OBTAIN THE REQUIRED TIME.
- IF THERE IS GROUND WATER ABOVE THE SEWER LINE THE AIR TEST PRESSURE WILL BE INCREASED BY 0.5 PSI FOR EACH FOOT OF WATER ABOVE THE INVERT OF THE PIPE. DIFFERENCES DUE TO AIR TEMPERATURE AND BAROMETRIC PRESSURE WILL BE CONSIDERED NEGLIGIBLE.
- IF THE TEST TIME IS LESS THAN THAT REQUIRED IN THE ABOVE TABLE, THE PIPE WILL HAVE FAILED AND ADEQUATE REPAIRS AND RETESTING WILL BE REQUIRED AT NO EXPENSE TO OWNER.
- FOR 8" AND SMALLER PIPES: IF DURING THE 5 MINUTE SATURATION PERIOD, THE PRESSURE DROP IS LESS THAN 0.5 PSI AFTER THE INITIAL STABILIZATION AND AIR HAS NOT BEEN ADDED, THE PIPE SECTION UNDERGOING THE TEST SHALL HAVE PASSED.

TESTING FORCEMAINS

- PRESSURE TEST
UPON COMPLETION OF CONSTRUCTION OF A FORCE MAIN, THE LINE SHALL BE PRESSURE AND LEAKAGE TESTED IN ACCORDANCE WITH THE FOLLOWING PROCEDURE:
AFTER THE PIPE HAS BEEN LAID, ALL NEWLY LAID PIPE OR ANY VALVED SECTION THEREOF SHALL BE SUBJECTED TO A HYDROSTATIC PRESSURE OF AT LEAST 1.5 X THE HIGHEST WORKING PRESSURE IN THE SECTION.
- TEST PRESSURE RESTRICTIONS. TEST PRESSURES SHALL:
 - NOT BE LESS THAN 50 PSI AT THE HIGHEST POINT ALONG THE TEST SECTION.
 - NOT EXCEED PIPE OR THRUST RESTRAINT DESIGN PRESSURES.
 - BE OF AT LEAST 2 (TWO) HOUR DURATION.
 - NOT VARY BY MORE THAN ± 3 PSI.
 - NOT EXCEED TWICE THE RATED PRESSURE OF THE VALVES WHEN THE PRESSURE BOUNDARY OF THE TEST SECTION INCLUDES CLOSED GATE VALVES.
 - PRESSURIZATION
EACH VALVED SECTION OF PIPE SHALL BE FILLED WITH WATER SLOWLY AND THE SPECIFIED TEST PRESSURE, BASED ON THE ELEVATION OF THE LOWEST POINT IN THE LINE OR SECTION UNDER TEST AND CORRECTED TO THE ELEVATION OF THE TEST GAUGE, SHALL BE APPLIED BY MEANS OF A PUMP CONNECTED TO THE PIPE.
 - AIR REMOVAL
AFTER APPLYING THE SPECIFIED TEST PRESSURE, AIR SHALL BE EXPULSED COMPLETELY FROM THE PIPE VALVES.
 - EXAMINATION
ALL EXPOSED PIPE FITTINGS, VALVES, AND JOINTS SHALL BE EXAMINED CAREFULLY DURING THE TEST. ANY DAMAGED OR DEFECTIVE PIPE, FITTINGS, OR VALVES, THAT ARE DISCOVERED FOLLOWING THE PRESSURE TEST SHALL BE REPAIRED OR REPLACED WITH SOUND MATERIAL AND THE TEST SHALL BE REPEATED.
 - LEAKAGE TEST
A LEAKAGE TEST SHALL BE CONDUCTED CONCURRENTLY WITH THE PRESSURE TESTS.
 - LEAKAGE SHALL BE DEFINED AS THE QUANTITY OF WATER THAT MUST BE SUPPLIED INTO THE NEWLY LAID PIPE, OR ANY VALVED SECTION THEREOF, TO MAINTAIN PRESSURE WITHIN 5 PSI OF THE SPECIFIED TEST PRESSURE AFTER THE AIR IN THE PIPELINE HAS BEEN EXPULSED AND THE PIPE HAS BEEN FILLED WITH WATER.
 - ALLOWABLE LEAKAGE: NO PIPE INSTALLATION WILL BE ACCEPTED IF THE LEAKAGE IS GREATER THAN THAT DETERMINED BY THE FOLLOWING FORMULA:

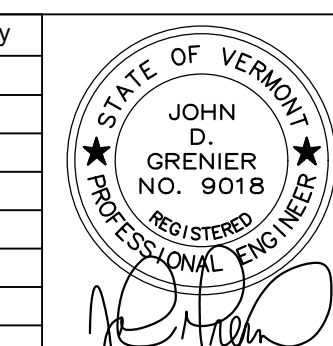
$$L = \frac{ND\sqrt{P}}{7400}$$

WHERE: L IS THE ALLOWABLE LEAKAGE, IN GALLONS PER HOUR; N IS THE NUMBER OF JOINTS IN THE LENGTH OF PIPELINE TESTED; D IS THE NOMINAL DIAMETER OF THE PIPE, IN INCHES; AND P IS THE AVERAGE TEST PRESSURE DURING THE LEAKAGE TEST, IN POUNDS PER SQUARE INCH GAGE.

SEWER DETAILS
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CONSTRUCTION NOTES

1. PRIOR TO CONSTRUCTION OF THE PUMP STATION AND VALVE PIT, MEET WITH THE ENGINEER TO DISCUSS THE PLANS.
2. CONTACT DIOSAFE (1-800-344-7233) AND THE OWNER PRIOR TO ANY EXCAVATION ACTIVITIES.
3. SUBMIT SHOP DRAWINGS TO THE ENGINEER FOR ALL MATERIALS AND EQUIPMENT, PRIOR TO ORDERING.
4. THE CONTRACTOR SHALL COMPLY WITH THE LATEST RULES OF THE VERMONT OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (VOSH).
5. CONSTRUCTION INSTALLATION OF THE PUMP STATION AND RELATED SHALL BE OBSERVED BY THE ENGINEER. THE MEANS, METHOD AND SAFETY OF THE INSTALLATION ARE THE RESPONSIBILITY OF THE CONTRACTOR(S).
6. THE PUMP STATION SHALL BE LEAKAGE TESTED PRIOR TO BACKFILLING. THE LEAKAGE TEST SHALL CONSIST OF FILLING THE PUMP STATION WITH WATER, ALLOWING FOR STABILIZATION AND THEN MEASURING THE DROP OVER A 24 HOUR PERIOD. THE ALLOWABLE LEAKAGE SHALL BE 0.5% OF THE TOTAL VOLUME MEASURED OVER A 24 HOUR PERIOD. THE CONTRACTOR WILL MAKE ANY NECESSARY REPAIRS AND RETEST IF SATISFACTORY RESULTS ARE NOT OBTAINED.
7. AFTER INSTALLATION OF ALL PUMPING EQUIPMENT, APPURTENANCES AND ELECTRICAL CONTROLS THE CONTRACTOR, MANUFACTURER, ENGINEER AND OWNER SHALL MEET FOR START-UP AND TESTING OF THE PUMP STATION. EACH PUMP WILL BE OPERATIONALLY TESTED ALONG WITH ALL CONTROLS.
8. THE MANUFACTURER WILL RECORD THE PUMPING RATES OF EACH PUMP TO VERIFY COMPLIANCE WITH OPERATING REQUIREMENTS.
9. THE MANUFACTURER SHALL PROVIDE ASSISTANCE TO THE OWNER FOR INSTALLATION, START-UP, AND ADVISING OPERATING PERSONNEL IN THE OPERATION AND MAINTENANCE OF THE EQUIPMENT. THE MANUFACTURER SHALL SUPPLY FIVE OPERATION AND MAINTENANCE MANUALS AFTER APPROVAL OF THE SHOP DRAWINGS. THE MANUFACTURER SHALL PROVIDE WRITTEN CERTIFICATION THAT THE EQUIPMENT WAS INSTALLED AND IS OPERATING CORRECTLY.
10. A ONE YEAR GUARANTEE SHALL BE PROVIDED ON ALL EQUIPMENT. THE GUARANTEE WILL COVER THE REPAIR OR REPLACEMENT OF A FAULTY CONDITION CAUSED BY NORMAL OPERATION OF THE EQUIPMENT. THE ONE YEAR GUARANTEE BEGINS UPON THE ENGINEER'S ACCEPTANCE (THE WRITTEN CERTIFICATION). IN THE EVENT OF FAULTY EQUIPMENT, THE PERIOD IS EXTENDED ONE YEAR BEYOND ANY REPAIRS.
11. THE CONTRACTOR/SUPPLIER SHALL COORDINATE AND CONFIRM WITH THE POWER COMPANY ON ELECTRICAL REQUIREMENTS PRIOR TO ORDERING ANY EQUIPMENT.
12. PRIOR TO CASTING ACCESS HATCHES, THE CONTRACTOR SHALL VERIFY SIZE AND LOCATION OF OPENINGS ARE ADEQUATE FOR PUMP REMOVAL AND SLIDE RAIL SYSTEM.

EQUIPMENT SPECIFICATIONS SUMMARY

1. PRECAST CONCRETE PUMP STATION (10' DIA), VALVE PIT (5' INSIDE DIA)
2. PUMPS - BARNES AXHVASONA EXPLOSION PROOF VORTEX SOLIDS HANDLING PUMP, 5 HP, 460/60/3, 1750 RPM PUMPS WITH 4" DISCHARGE TO PROVIDE 150 GPM @ 27' TOTAL HEAD LOSS AND CAPABLE OF HANDLING 3" SOLIDS PUMPS SUPPLIED WITH DOUBLE MECH SEAL AND SEAL LEAK SENSOR. REFER TO SPECIFICATIONS FOR MORE INFORMATION.
3. SLIDE RAIL SYSTEM - INCLUDES BASE, ELBOW, BARNES BAF-4 CAST IRON SLIDE RAIL, DISCONNECT AND UPPER RAIL SUPPORT BRACKET (OR EQUAL).
4. US FILTER CONTROL SYSTEMS FP-2, NEMA 3R (OUTDOOR) DUPLEX CONTROL PANEL FOR OPERATION OF ABOVE PUMPS. TO INCLUDE 152 "VIEW AT A GLANCE" PUMP CONTROLLER AND A1000 SUBMERSIBLE LEVEL TRANSDUCER. THE UNIT WILL BE COMPLETE WITH CIRCUIT BREAKERS, MAGNETIC CONTACTORS, OVERLOADS, H-O-A SWITCHES, LEAK SENSOR LIGHTS, ELAPSED TIME METERS, AND RUN LIGHTS FOR EACH PUMP. PROVIDE FLASHING RED LIGHT AND ALARM (OR EQUAL).
5. LEVEL TRANSDUCER/TRANSMITTER: SIEMENS INTRALINK CL150 PUMP CONTROL UNIT WITH US FILTER A1000 LOOP POWERED 14-20 MA SUBMERSIBLE LEVEL TRANSMITTER. REFER TO SPECIFICATION FOR ADDITIONAL INFO.
6. STAINLESS STEEL EYE HOOK TRANSDUCER HANGER.
7. SUMP PUMP IN VALVE PIT WITH JUNCTION BOX AND ON/OFF/ALARM FLOAT WIRE TO CONTROL PANEL. USE BARNES 1/3 HP BP314 OR EQUAL, 115 VOLT AND SINGLE PHASE, OR EQUAL.

ELECTRICAL NOTES

1. CONDUIT SEALING FITTINGS SHALL BE FILLED WITH A LISTED COMPOUND PRIOR TO COMMISSIONING AS PER NEC 501.
2. ALL CONDUIT TO BE GRC UNLESS NOTED OTHERWISE.
3. CONDUIT SIZES TO BE FIELD VERIFIED BY EC PRIOR TO INSTALLATION.

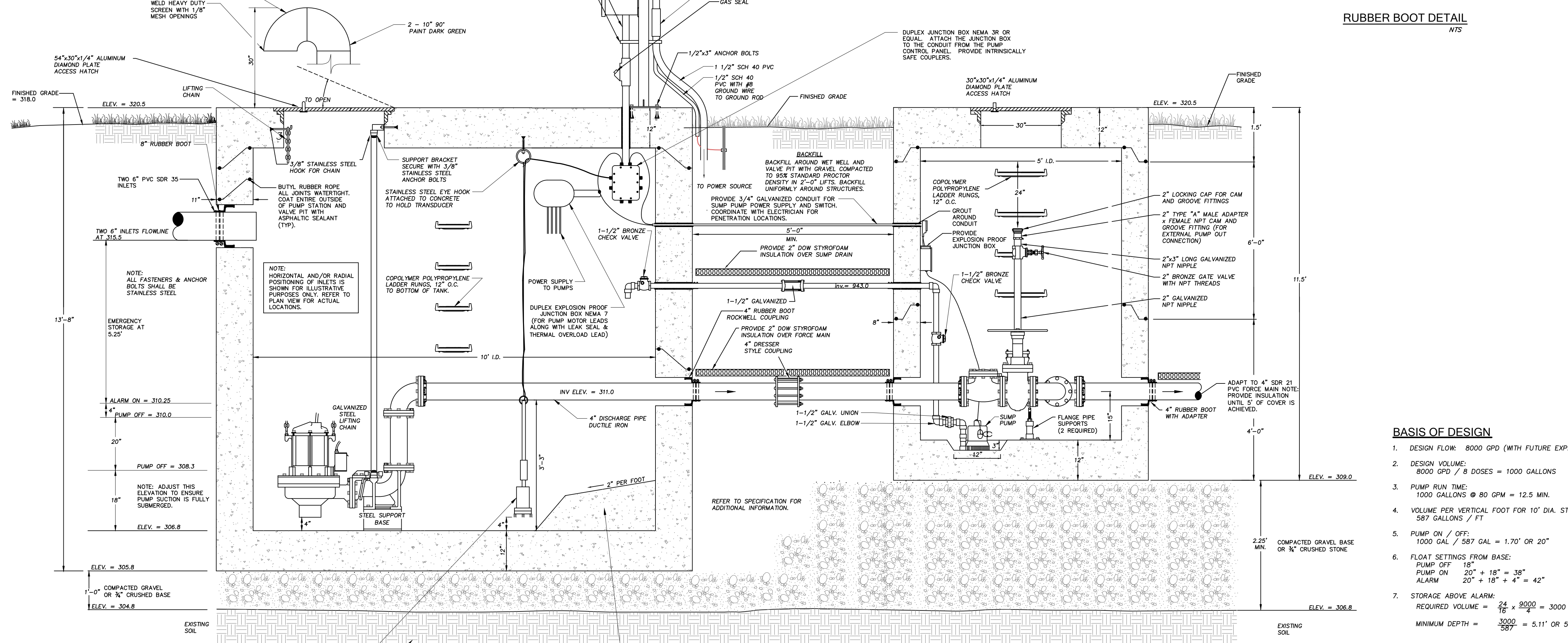
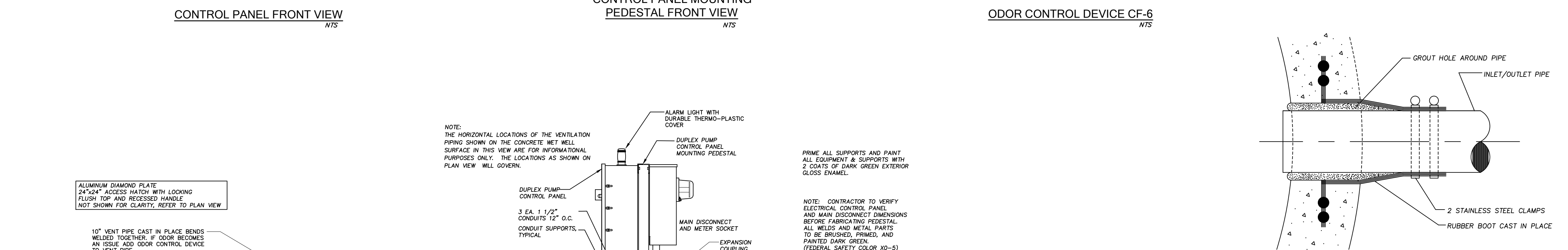
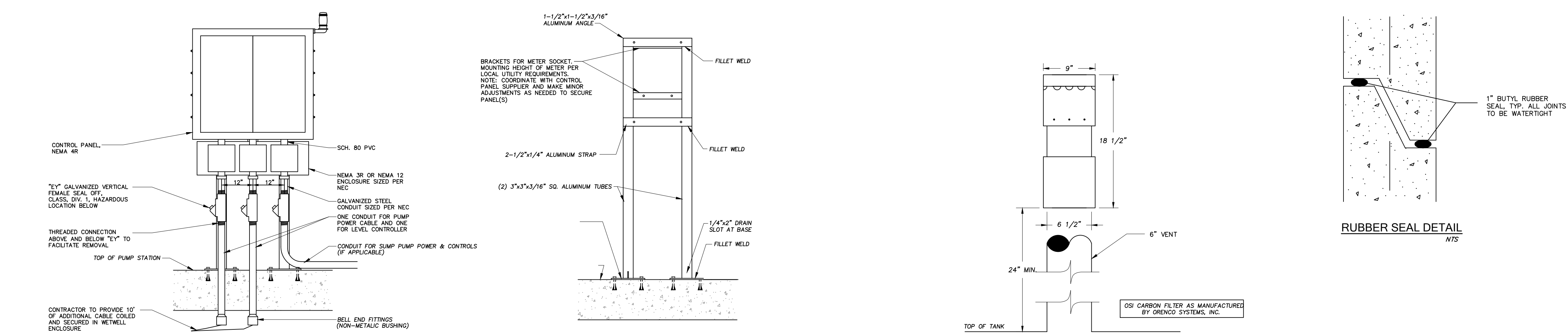
PRIME ALL SUPPORTS AND PAINT ALL EQUIPMENT & SUPPORTS WITH 2 COATS OF DARK GREEN EXTERIOR GLOSS ENAMEL.

NOTE: CONTRACTOR TO VERIFY ELECTRICAL CONTROL PANEL AND MAIN DISCONNECT DIMENSIONS BEFORE FABRICATING PEDESTAL. ALL WELDS AND METAL PARTS TO BE BRUSHED, PRIMED, AND PAINTED DARK GREEN. (FEDERAL SAFETY COLOR X0-5).

BACKFILL AROUND WET WELL AND VALVE PIT WITH 3/4" STONE COMPACTED TO 95% STANDARD PROCTOR DENSITY IN 2'-0" LIFTS. BACKFILL UNIFORMLY AROUND STRUCTURES.

HORIZONTAL AND/OR NOTE: RADIAL POSITIONING OF INLETS IS SHOWN FOR ILLUSTRATIVE PURPOSES ONLY. REFER TO PLAN VIEW FOR ACTUAL LOCATIONS.

FOR BOTH INTERIOR AND EXTERIOR SUMP PUMPS PROVIDE 3/4" GALV. CONDUIT FOR SUMP PUMP POWER SUPPLY AND SWITCH



BASIS OF DESIGN

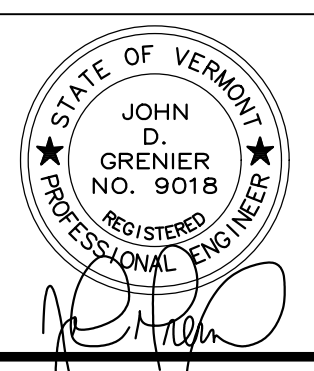
1. DESIGN FLOW: 8000 GPD (WITH FUTURE EXPANSION)
2. DESIGN VOLUME: 8000 GPD / 8 DOSES = 1000 GALLONS
3. PUMP RUN TIME: 1000 GALLONS @ 80 GPM = 12.5 MIN.
4. VOLUME PER VERTICAL FOOT FOR 10' DIA. STATION: 587 GALLONS / FT
5. PUMP ON / OFF: 1000 GAL / 587 GAL = 1.70' OR 20"
6. FLOAT SETTINGS FROM BASE:
PUMP OFF 18"
PUMP ON 20" + 18" = 38"
ALARM 20" + 18" + 4" = 42"
7. STORAGE ABOVE ALARM:
REQUIRED VOLUME = $\frac{24}{16} \times 8000 = 3000$ GALLONS
MINIMUM DEPTH = $\frac{3000}{587} = 5.11'$ OR 5'-3" MIN.



NOTE: ORIGINAL PLAN 24" x 36". OTHER SIZES NOT TO SCALE

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PUMP STATION DETAILS
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TESTING WATERMAINS & HYDRANTS

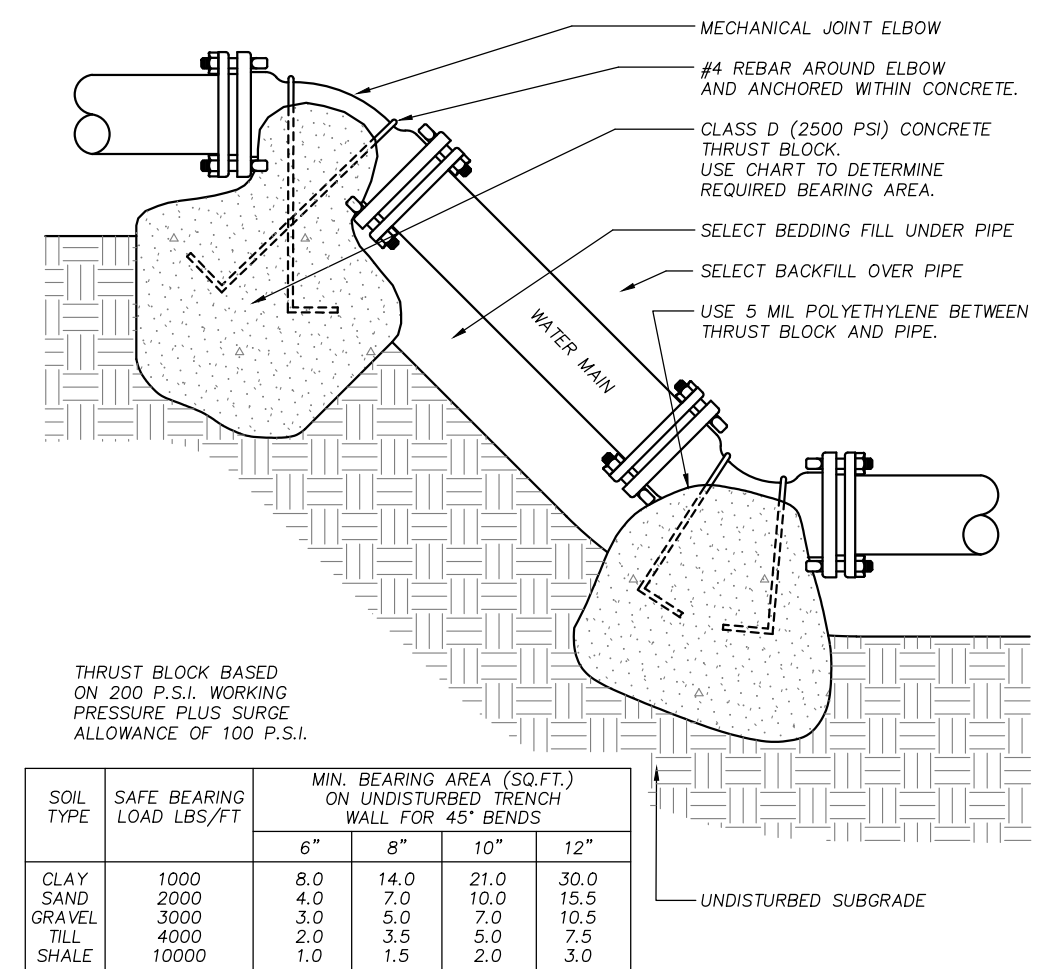
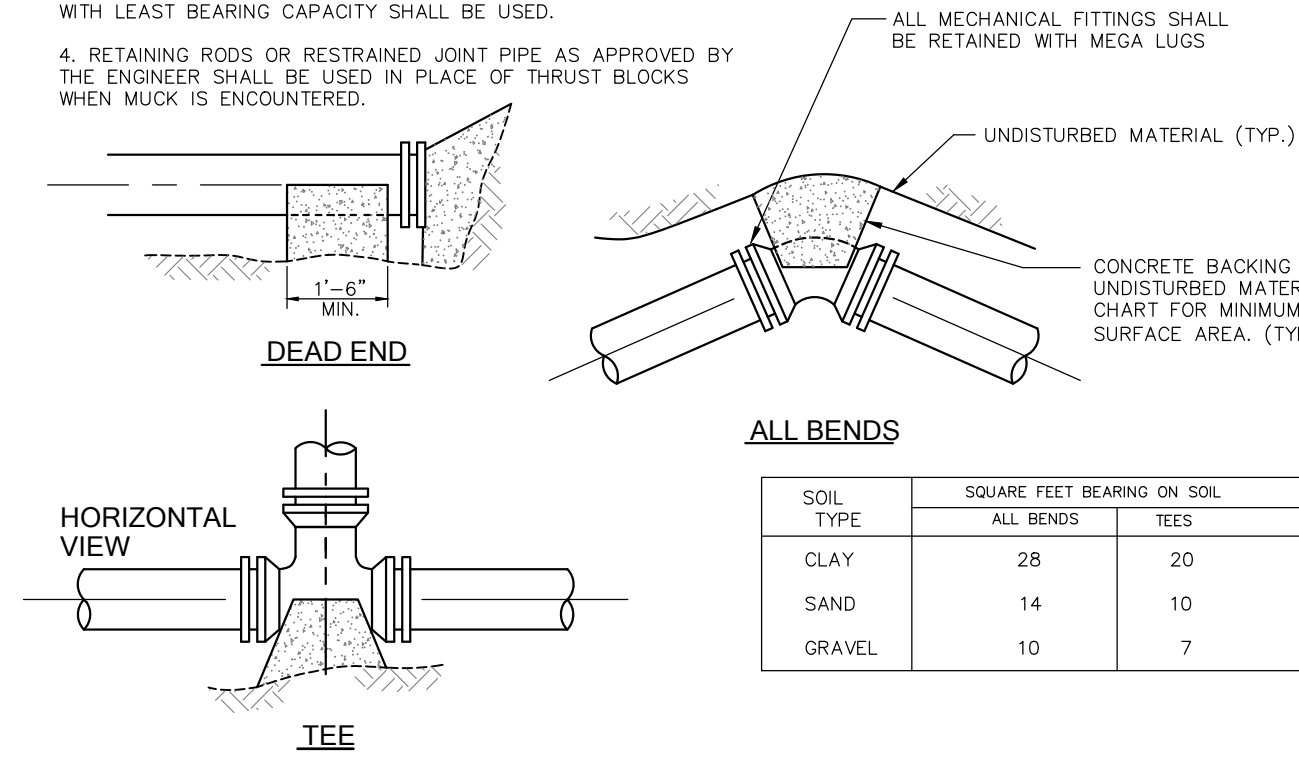
- A. AFTER THE PIPE HAS BEEN LAID AND 7 DAYS AFTER THE CONCRETE THRUST BLOCKS AND ANCHORS HAVE BEEN PLACED, THE WATER MAIN SHALL BE HYDROSTATICALLY TESTED ACCORDING TO THE LATEST EDITION OF THE AWWA SPECIFICATION C-600.
- B. CONTRACTOR SHALL SUPPLY ALL NECESSARY APPARATUS TO PERFORM THE HYDROSTATIC TEST.
- C. TEST PRESSURE SHALL BE 200 POUNDS PER SQUARE INCH OR 1.5 TIMES THE WORKING PRESSURE MEASURED AT OR NEAR THE HIGH POINT IN THE SYSTEM, WHICHEVER IS GREATER. TEST SHALL BE A MINIMUM OF 2 HOURS IN DURATION. TESTING ALLOWANCE SHALL BE DEFINE AS THE QUANTITY OF MAKEUP WATER THAT MUST BE SUPPLIED INTO THE NEWLY LAID PIPE OR ANY VALVED SECTION THEREOF TO MAINTAIN PRESSURE WITHIN 5 PSI (34.5 LPS) OF THE SPECIFIED TEST PRESSURE AFTER THE PIPE HAS BEEN FILLED WITH WATER AND THE AIR HAS BEEN EXPELLED. TESTING ALLOWANCE SHALL NOT BE MEASURED BY A DROP IN PRESSURE IN A TEST SECTION OVER A PERIOD OF TIME. THE PROJECT ENGINEER AND THE MUNICIPALITY SHALL BE CONTACTED 48 HOURS PRIOR TO TESTING.
- D. ALL VALVES SHOULD BE VERIFIED AS BEING OPEN OR CLOSED AS APPROPRIATE FOR THE PORTION E. OF THE WATER MAIN BEING TESTED.
- F. ALLOWABLE LEAKAGE SHALL BE COMPUTED BY THE FORMULA: $L = (S \times D \times P) / 133,200$ WHERE L IS LEAKAGE IN GALLONS PER HOUR, S IS THE LENGTH OF PIPE TESTED IN FEET, D IS THE NOMINAL DIAMETER OF THE PIPE IN INCHES AND P IS THE AVERAGE TEST PRESSURE IN POUNDS PER SQUARE INCH DURING THE TEST. LEAKAGE CALCULATION IS $1100' \times 10" \times 200 \div 133,200$ OR 1.17 GALLONS PER HOUR
- G. REPLACE AND RETEST ANY WORK FOUND TO BE DEFECTIVE AT NO EXPENSE TO OWNER.

DISINFECTION OF WATER SYSTEM

- A. PRIOR TO BEING PUT INTO SERVICE, WATERMAINS SHALL BE DISINFECTED ACCORDING TO THE LATEST EDITION OF AWWA SPECIFICATIONS C-651. THE TABLET METHOD IN AWWA STANDARD 651 IS NOT ACCEPTABLE.
- B. THE NEW LINE SHALL BE FLUSHED AT A VELOCITY OF NOT LESS THAN 2.5 PER SECOND (OPEN 2-1/2 INCH HYDRANT CONNECTION) FLUSH FOR A PERIOD DETERMINED BY THE ENGINEER FOR THE LENGTH OF MAIN TO BE DISINFECTED.
- C. CHLORINATION SHALL BE ACCOMPLISHED BY INTRODUCING A HYPOCHLORITE SOLUTION WITH A CONCENTRATION OF GREATER THAN 25 PARTS PER MILLION OF FREE CHLORINE.
- D. USING A NOZZLE AT EACH END HYDRANT, CONTROL THE RATE OF FLOW INTO THE NEW MAIN AND PROPORTIONALLY FEED HYPOCHLORITE SOLUTION INTO THE MAIN. AFTER THE CHLORINE HAS REACHED ALL POINTS IN THE SYSTEM, CLOSE THE VALVE SUPPLYING WATER FROM THE EXISTING MAIN AND THE END HYDRANTS. MAINTAIN THE HEAVILY CHLORINATED WATER IN THE MAIN FOR 24 HOURS DURING WHICH TIME ALL MAIN LINE VALVES SHOULD BE OPERATED. AFTER 24 HOURS THE MINIMUM CHLORINE RESIDUAL MUST BE AT LEAST 10 PARTS PER MILLION.
- E. FLUSH HEAVILY CHLORINATED WATER FROM THE LINE AND REFILL THE LINE FOR SERVICE (USE CHLORINE DIFFUSER). TAKE AND SUBMIT TWO BACTERIOLOGICAL SAMPLES OF THE WATER TO THE STATE OF VERMONT OR A STATE APPROVED TESTING LABORATORY. IF THE RESULTS ARE UNSATISFACTORY, THE DISINFECTION PROCEDURE WILL BE REPEATED UNTIL SATISFACTORY RESULTS ARE OBTAINED.

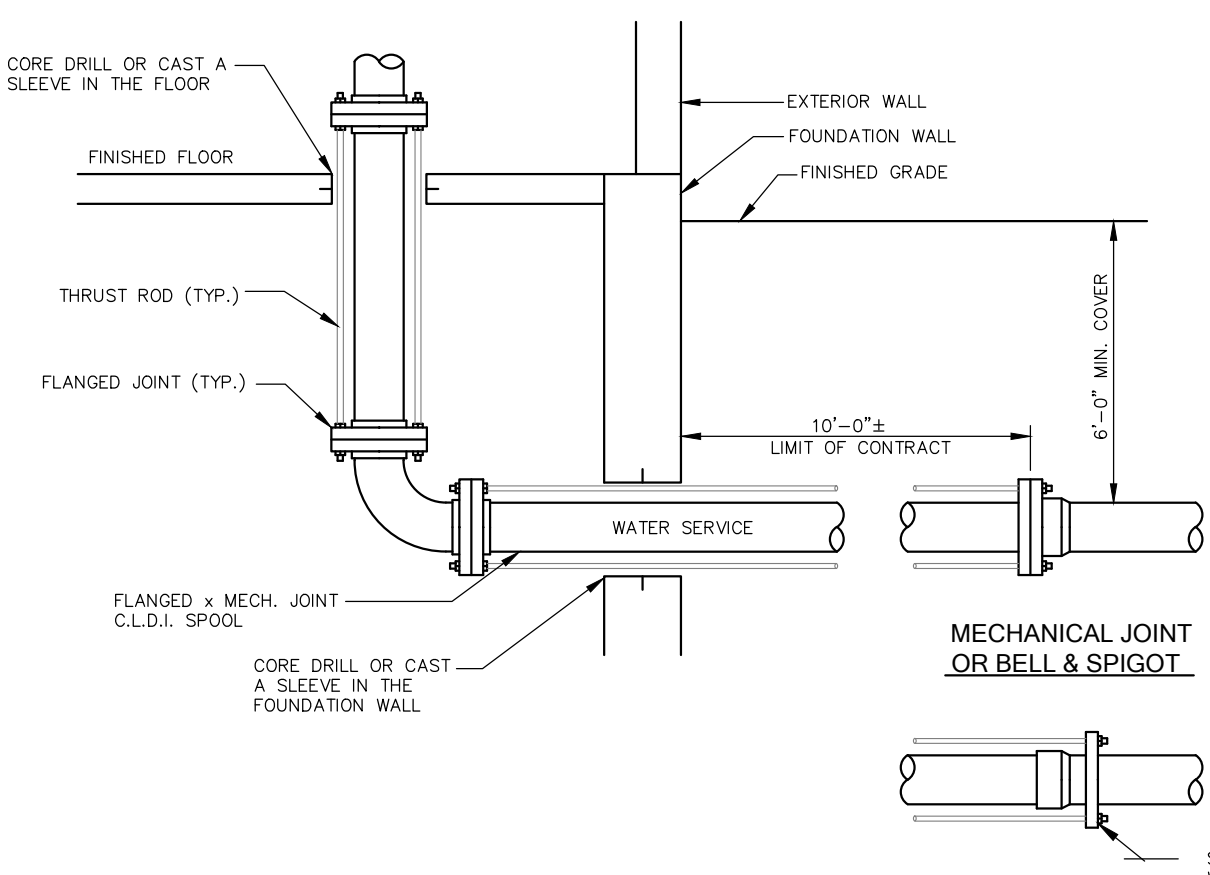
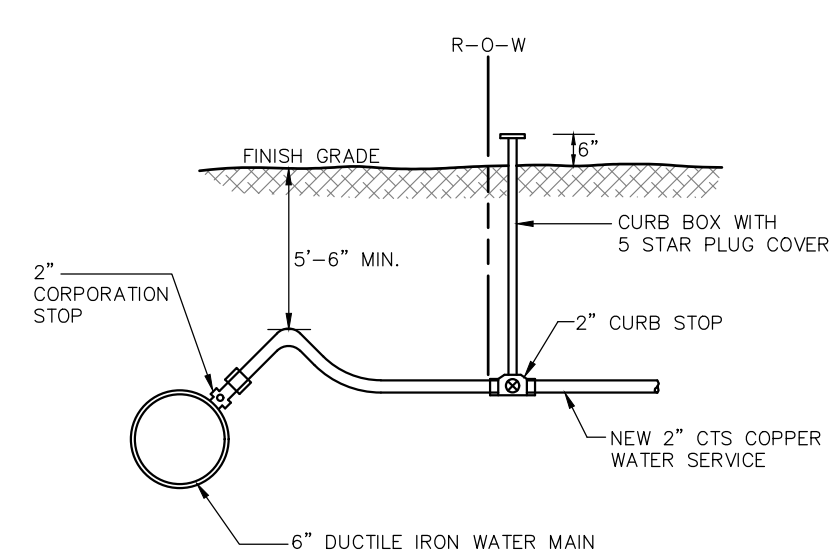
NOTES

- 1. FIGURES BASED ON 300 P.S.I.
- 2. CONCRETE FOR THRUST BLOCKS SHALL BE 1500 P.S.I. MINIMUM. THRUST BLOCKS TO BE PLACED AGAINST UNDISTURBED EARTH.
- 3. WHEN MORE THAN ONE SOIL TYPE IS ENCOUNTERED, THE ONE WITH LEAST BEARING CAPACITY SHALL BE USED.
- 4. RETAINING RODS OR RESTRAINED JOINT PIPE AS APPROVED BY THE ENGINEER SHALL BE USED IN PLACE OF THRUST BLOCKS WHEN MUCK IS ENCOUNTERED.



THRUST BLOCK BASED ON 200 P.S.I. WORKING PRESSURE PLUS SURGE ALLOWANCE OF 100 P.S.I.

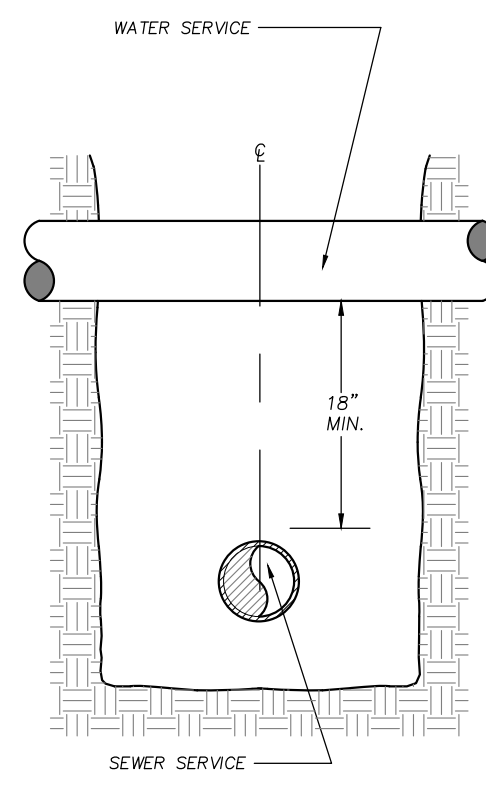
SOIL TYPE	SAFE BEARING LOAD LBS/FT	MIN. BEARING AREA (SQ.FT.) ON UNDISTURBED TRENCH WALL FOR 45° BENDS			
		6"	8"	10"	12"
CLAY	1000	8.0	14.0	21.0	30.0
SAND	2000	4.0	7.0	10.0	15.0
GRAVEL	3000	3.0	5.0	7.0	10.0
TILL	4000	2.0	3.5	5.0	7.5
SHALE	10000	1.0	1.5	2.0	3.0



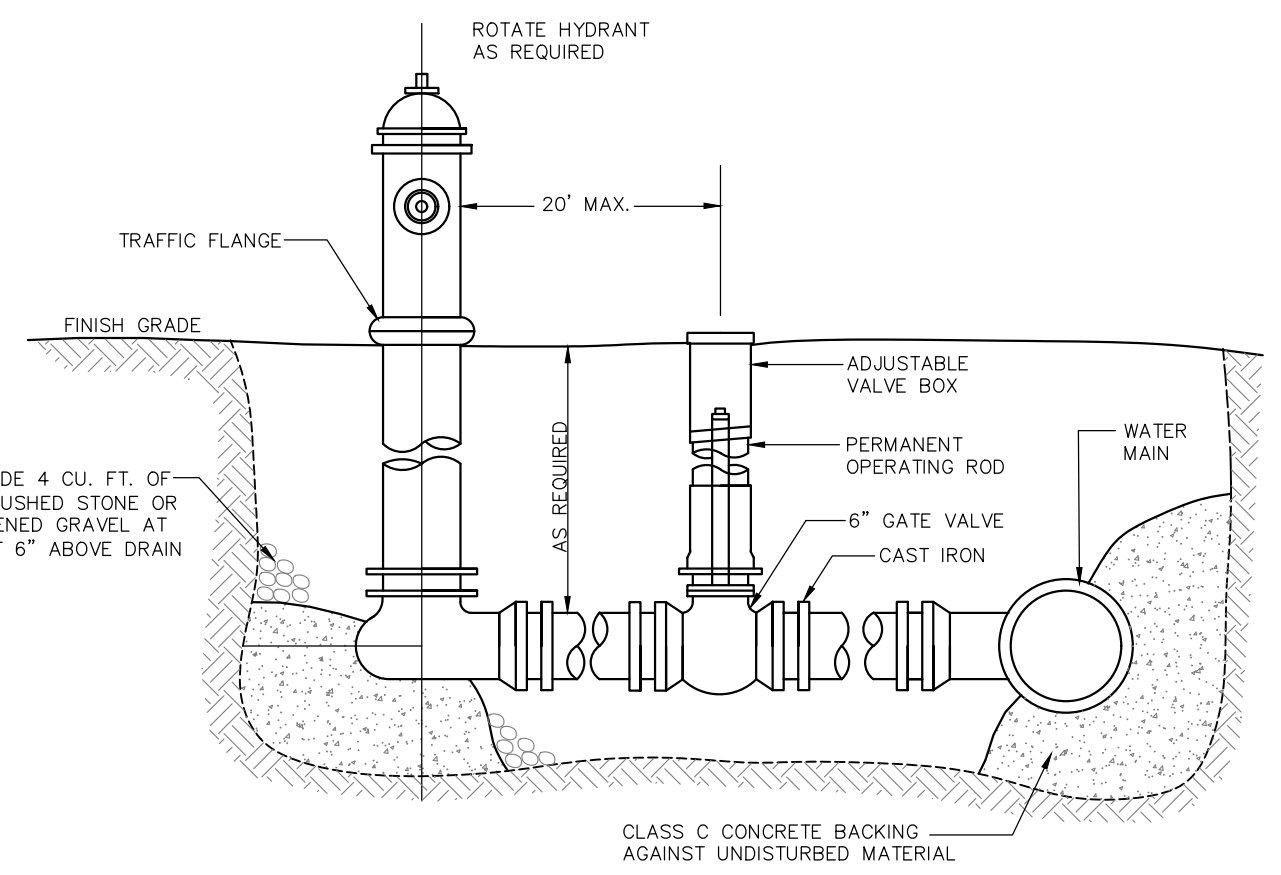
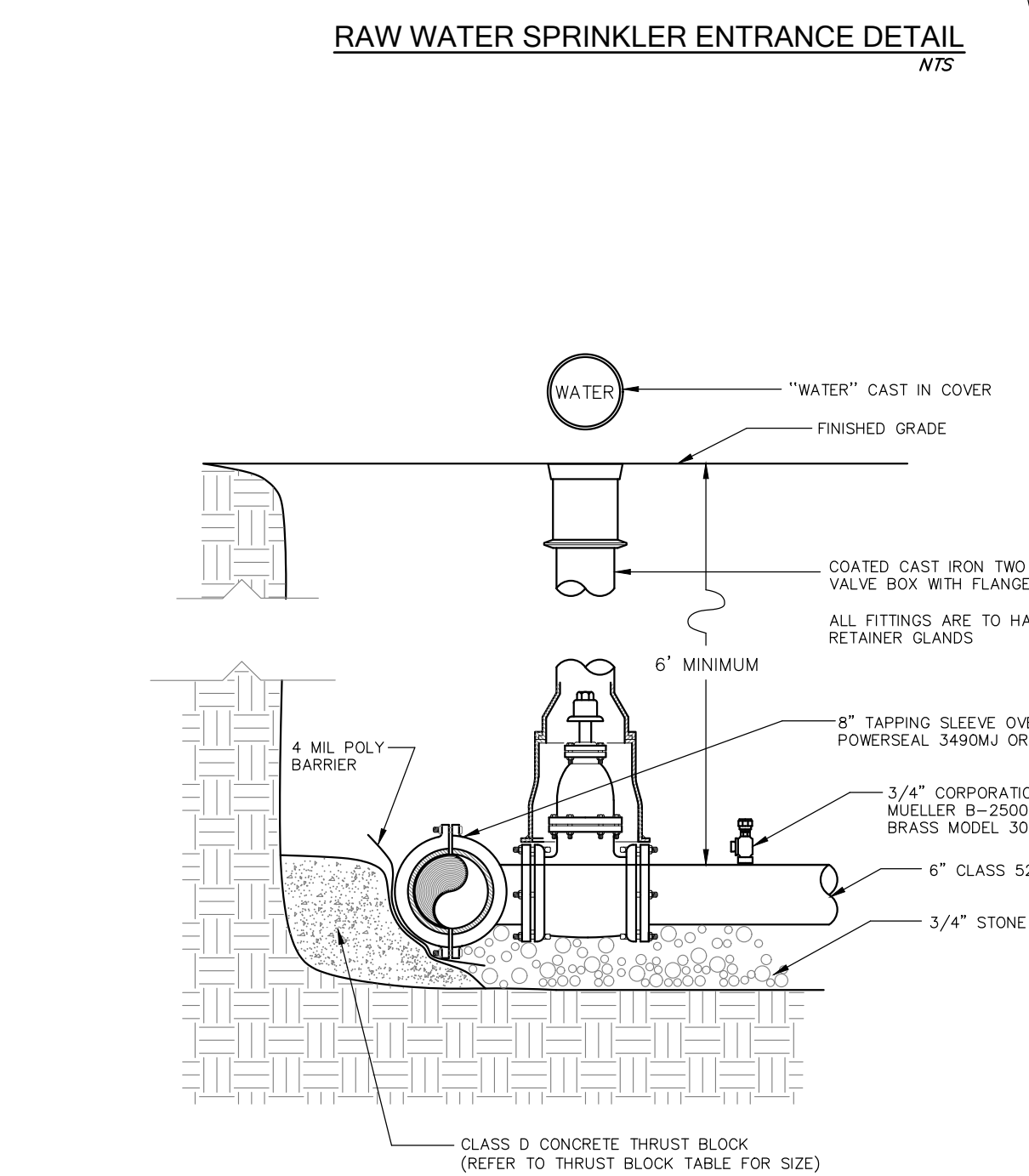
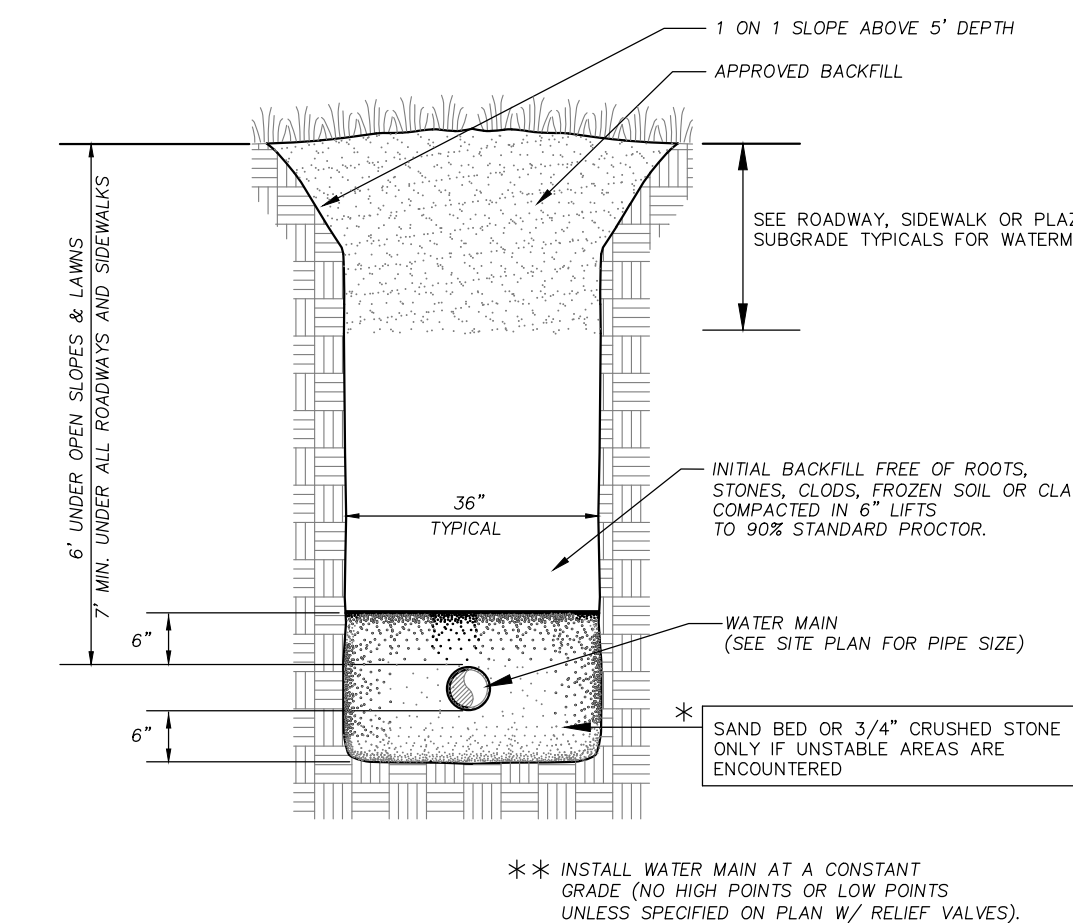
- NOTES:**
- 1. ALL INSTALLATIONS SHALL BE IN COMPLIANCE WITH NFPA 24, 13, (AND 20 WHERE THE SERVICE SUPPLIES A FIRE PUMP).
 - 2. ALTERNATE METHODS OF RESTRAINT ARE ACCEPTABLE, PENDING THEIR COMPLIANCE WITH THE ABOVE REFERENCED STANDARDS.
 - 3. SOCKET CLAMP ASSEMBLIES SHALL INCLUDE WASHERS, GRINNELL FIGS. 595 AND 594 OR APPROVED EQUAL.
 - 4. AFTER INSTALLATION, ALL DURED RESTRAINT DEVICES SHALL BE CLEANED AND COATED WITH A BITUMINOUS OR OTHER CORROSION RETARDING MATERIAL.

NOMINAL PIPE SIZE (IN)	NUMBER & SIZE OF THRUST RODS	SOCKET CLAMP SIZE (IN)	SLEEVE/CORE SIZE (IN)
4	(2) 1/2"	1/2" x 2"	8
6	(2) 3/4"	3/4" x 2"	10
8	(2) 1"	1" x 2-1/2"	12
10	(4) 1 1/4"	N/A	14
10 @	(2) 1 1/2"	1 1/2" x 2-1/2"	14

- NOTES:**
- 1. MECHANICAL JOINT APPLICATION
 - 2. BELL & SPIGOT APPLICATION
 - 3. CLAMPS REQUIRED FOR BELL & SPIGOT APPLICATION ONLY

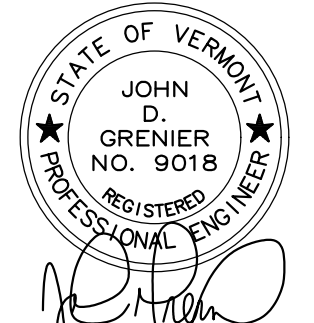


- CROSSINGS: SEWERS CROSSING WATER MAINS SHALL BE LAID BENEATH THE WATER MAIN WITH AT LEAST 18 INCHES VERTICAL CLEARANCE BETWEEN THE OUTSIDE OF THE SEWER AND THE OUTSIDE OF THE WATER MAIN, WHEN IT IS IMPOSSIBLE TO MAINTAIN THE 18\"/>
 - 1) THE CROSSING SHALL BE ARRANGED SO THAT ONE FULL LENGTH OF SEWER IS CENTERED ABOVE OR BELOW THE WATER LINE WITH SEWER JOINTS AS FAR AS POSSIBLE FROM WATER JOINTS.
 - 2) THE SEWER PIPE MUST BE CONSTRUCTED TO WATER MAIN STANDARDS FOR A MINIMUM DISTANCE OF 20 FEET EITHER SIDE OF THE CROSSING OR A TOTAL OF THREE PIPE LENGTHS, WHICHEVER IS GREATER.
 - 3) THE SECTION CONSTRUCTED TO WATER MAIN STANDARDS MUST BE PRESSURE TESTED TO MAINTAIN 50 PSI FOR 15 MINUTES WITHOUT LEAKAGE PRIOR TO BACKFILLING BEYOND ONE FOOT ABOVE THE PIPE TO ASSURE WATER TIGHTNESS.
 - 4) WHERE A WATER MAIN CROSSES UNDER A SEWER, ADEQUATE STRUCTURAL SUPPORT SHALL BE PROVIDED FOR THE SEWER TO PREVENT DAMAGE TO THE WATER MAIN.**



NOTE: ORIGINAL PLAN 24" x 36". OTHER SIZES NOT TO SCALE

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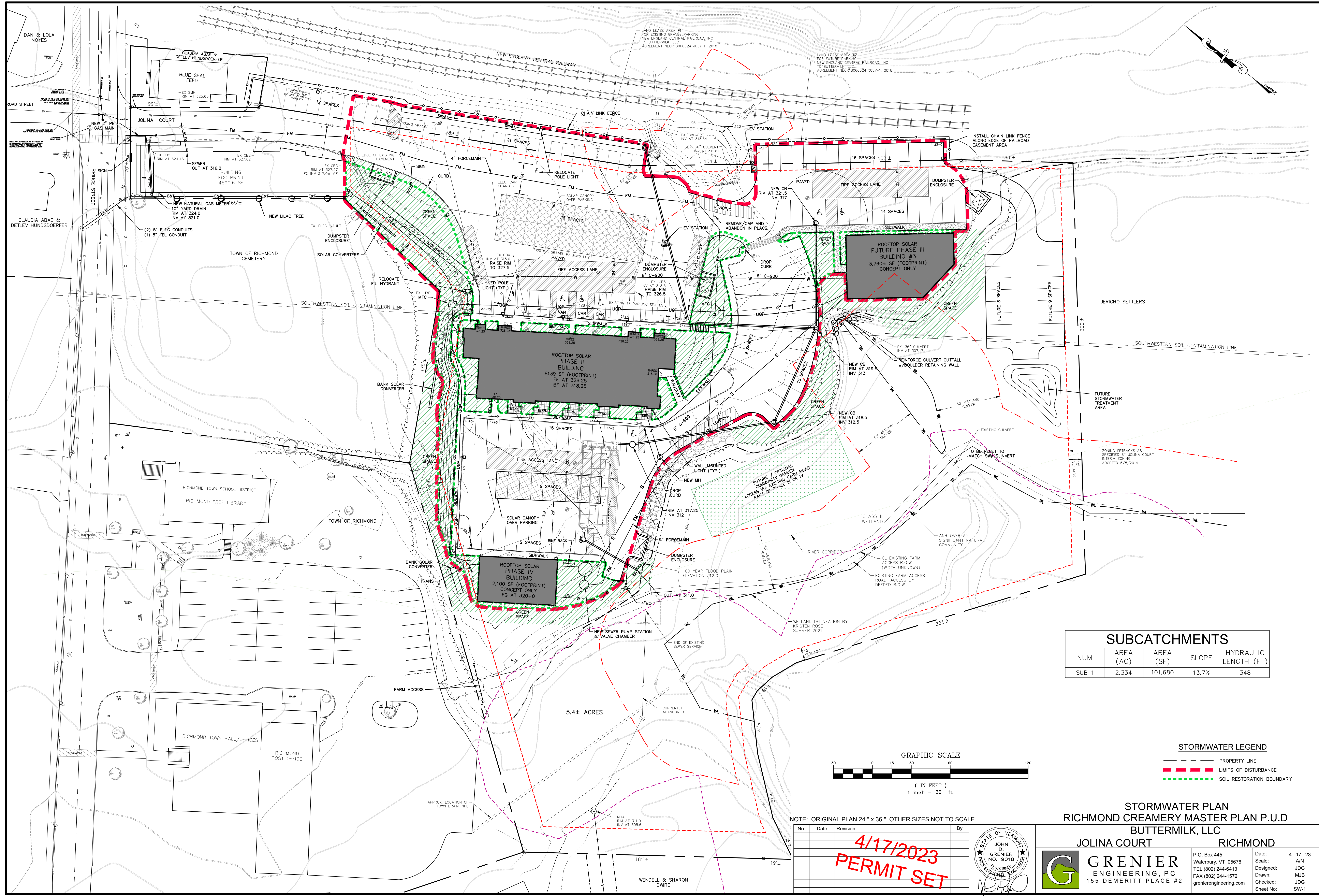


WATER DETAILS
RICHMOND CREAMERY MASTER PLAN P.U.D
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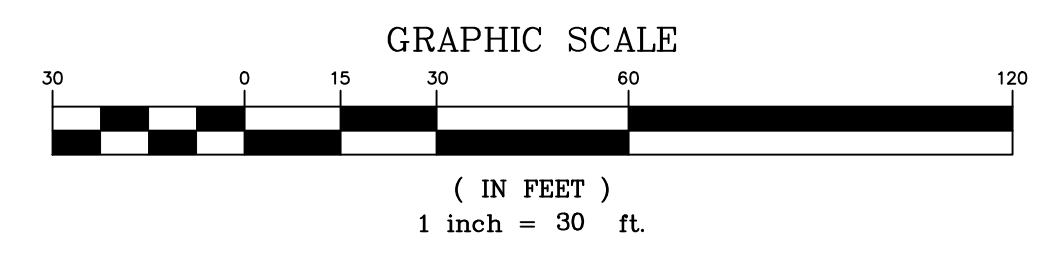
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SUBCATCHMENTS				
NUM	AREA (AC)	AREA (SF)	SLOPE	HYDRAULIC LENGTH (FT)
SUB 1	2.334	101,680	13.7%	348



STORMWATER LEGEND	
	PROPERTY LINE
	LIMITS OF DISTURBANCE
	SOIL RESTORATION BOUNDARY

**STORMWATER PLAN
RICHMOND CREAMERY MASTER PLAN P.U.D
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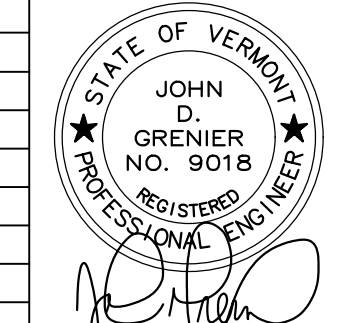
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