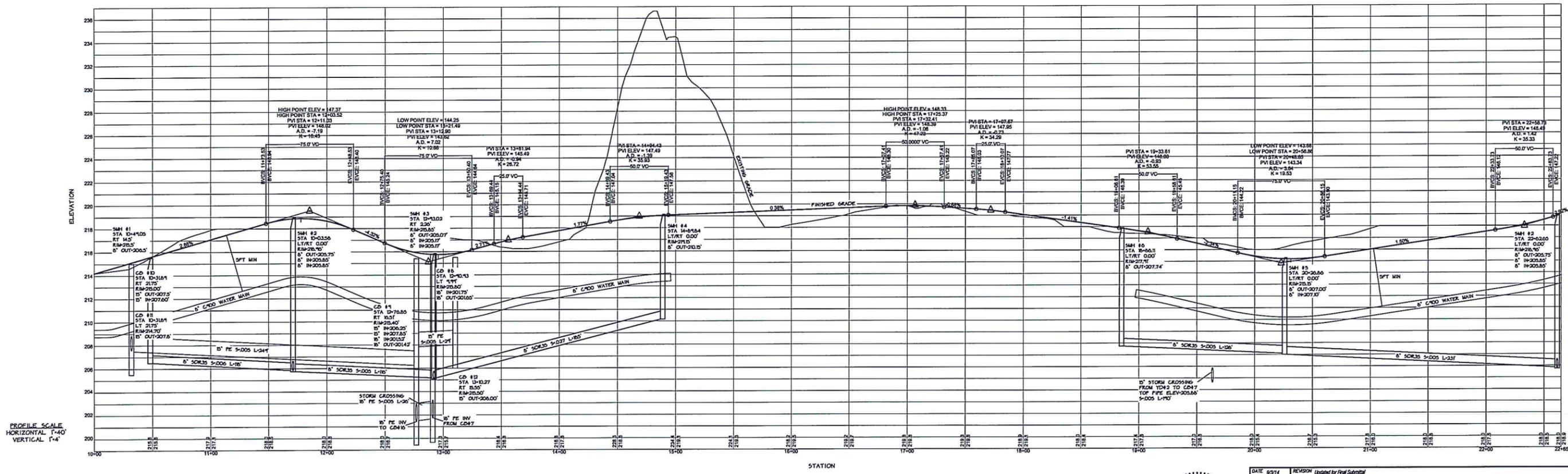
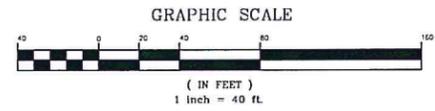


Legend

- PROJECT BOUNDARY
- CONTOUR LINE (U.S.G.S. DATUM)
- PROPOSED FINISH GRADE CONTOUR
- EDGE OF WOODED AREA
- PROPOSED SEWERLINE
- PROPOSED STORMLINE
- PROPOSED WATERLINE
- PROPOSED HYDRANT
- GRASSSED SWALE WITH UNDERDRAIN
- RETAINING WALL
- PROPOSED PAVEMENT
- PROPOSED BUILDING
- PROPOSED DUMPSTER PAD LOCATION
- SOIL TYPE + BOUNDARY

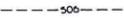


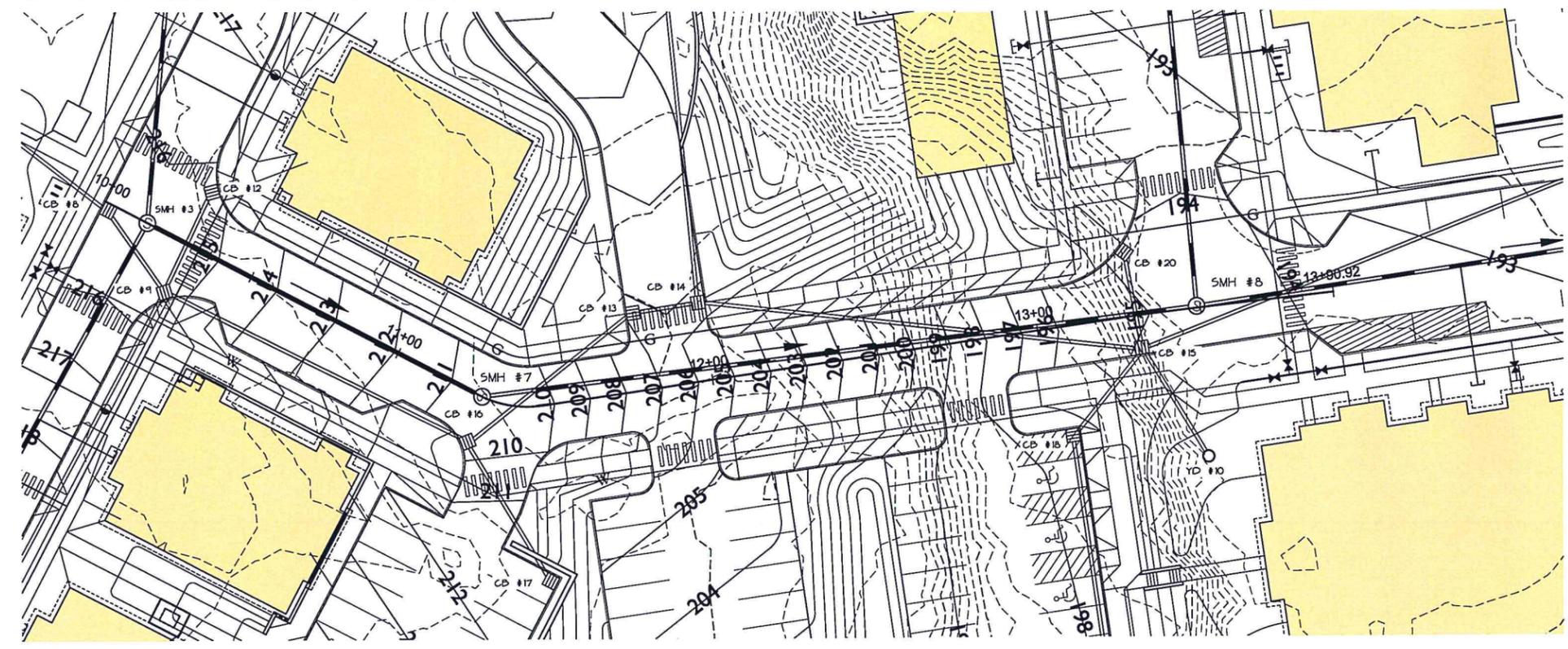
PROFILE SCALE
HORIZONTAL 1"=40'
VERTICAL 1"=4'



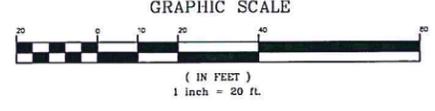
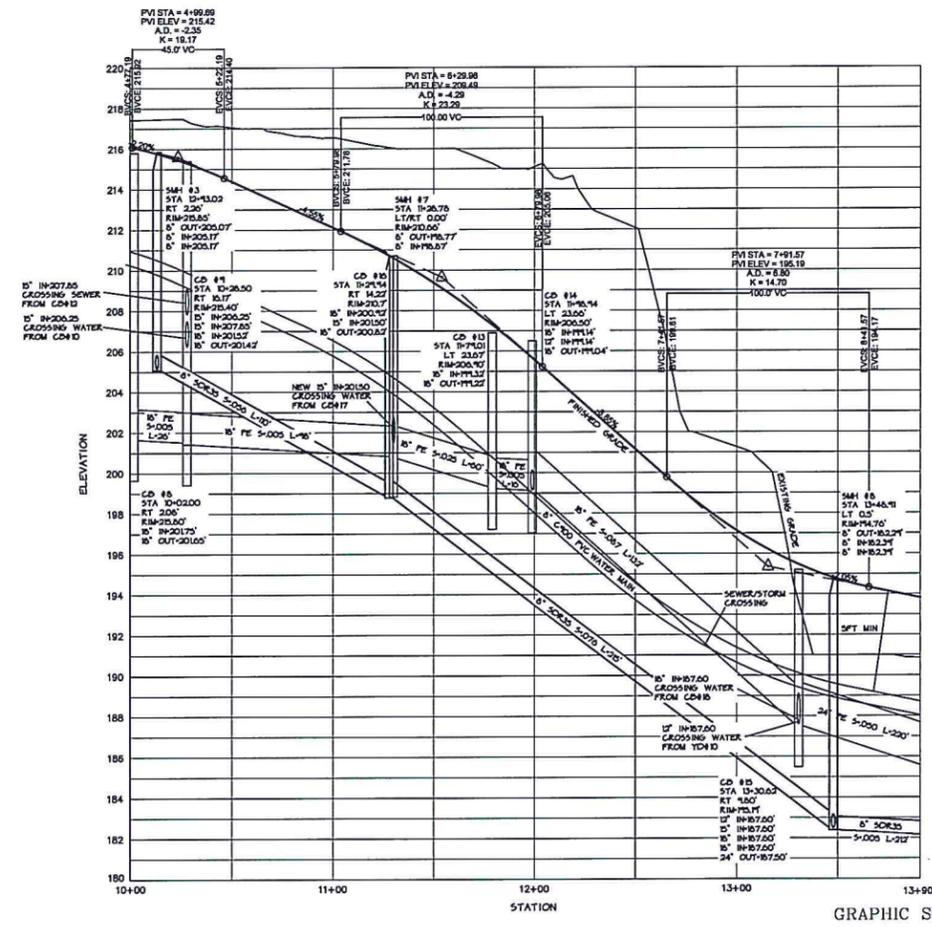
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SURVEY: OBCA	DESIGN: BWC	DATE: 7-23-14
DRAWN: BWS/BWC	CHECKED: FAD	JOB#: 2011-52
SCALE: 1"=40'		PLAN SHEET #
O'LEARY-BURKE CIVIL ASSOCIATES, PLC 1 CORPORATE DRIVE, SUITE 1 ESSEX, VT 05501 PHONE: 878-9990 FAX: 878-9998 E-MAIL: paul@o'b-burke.com		IRELAND PROPERTY Drive Street Burlington, VT PLAN SHEET # S10

Legend

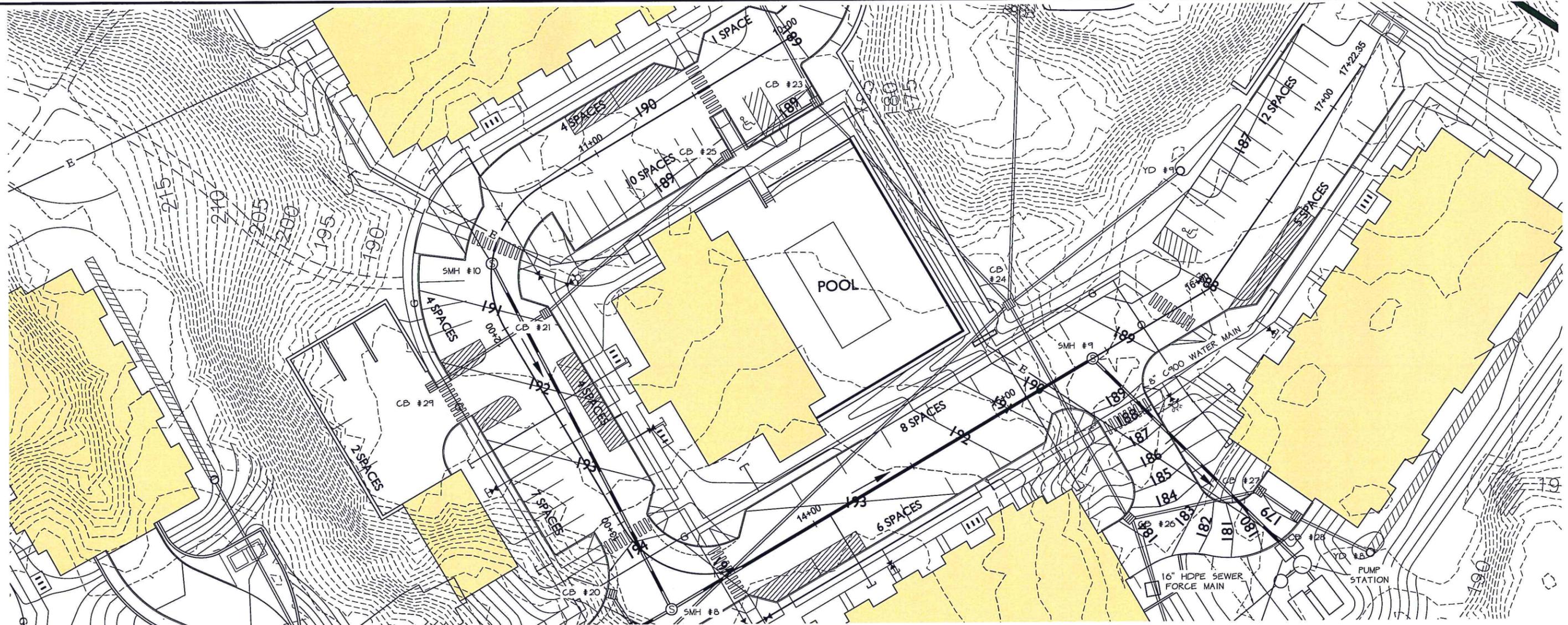
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-  CONTOUR LINE (U.S.G.S. DATUM)
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-  EDGE OF WOODED AREA
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-  GRASSSED SWALE WITH UNDERDRAIN
-  RETAINING WALL
-  PROPOSED PAVEMENT
-  PROPOSED BUILDING
-  PROPOSED DUMPSTER PAD LOCATION
-  SOIL TYPE + BOUNDARY



PROFILE SCALE
HORIZONTAL 1"=40'
VERTICAL 1"=4'



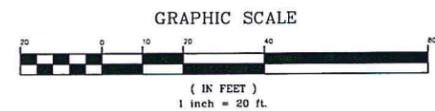
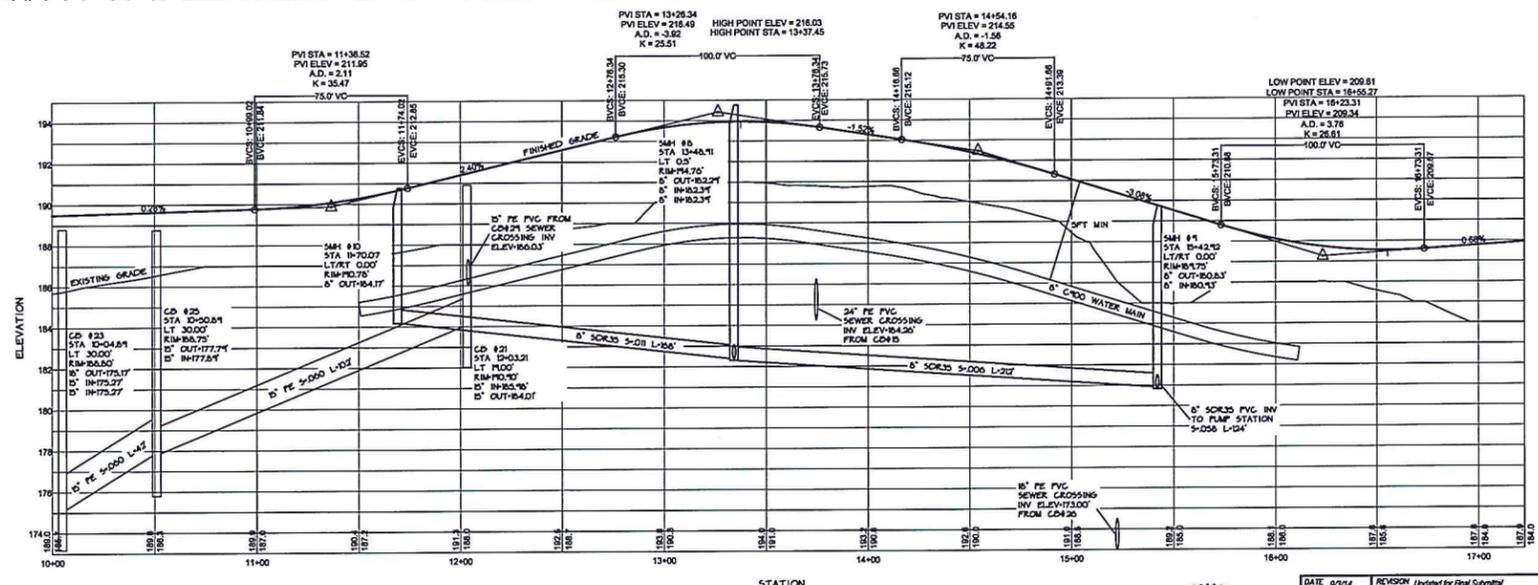
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DRAWN: JLB/BWC	O'LEARY-BURKE CIVIL ASSOCIATES, PLC 1 CORPORATE DRIVE, SUITE 1 ESSEX JCT., VT PHONE: 878-9880 FAX: 878-9888 E-MAIL: poleary@olearyburke.com	
CHECKED: FLD	IRELAND PROPERTY Grove Street Burlington, VT	
SCALE: 1"=20'	SEWER PLAN & PROFILE PLAN SHEET # S11	



Legend

- PROJECT BOUNDARY
- CONTOUR LINE (U.S.G.S. DATUM)
- PROPOSED FINISH GRADE CONTOUR
- EDGE OF WOODED AREA
- PROPOSED SEWERLINE
- PROPOSED STORMLINE
- PROPOSED WATERLINE
- PROPOSED HYDRANT
- GRASSSED SWALE WITH UNDERDRAIN
- RETAINING WALL
- PROPOSED PAVEMENT
- PROPOSED BUILDING
- PROPOSED DUMPSTER PAD LOCATION
- SOIL TYPE + BOUNDARY

PROFILE SCALE
HORIZONTAL 1"=40'
VERTICAL 1"=4'



DATE: 9/3/14	REVISION: Updated for Final Submittal	BY: BWC
SURVEY: GBCA	<input checked="" type="checkbox"/> RECORD DRAWING	DATE: 7-23-14
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CHECKED: BWC		S12
SCALE: 1"=20'		

IRELAND PROPERTY

O'LEARY-BURKE CIVIL ASSOCIATES, PLC

SEWER PLAN & PROFILE

1 CORPORATE DRIVE, SUITE 1
ESSEX, VT 05733
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GENERAL SEWER SPECIFICATIONS

GENERAL:

THIS ITEM SHALL CONSIST OF THE EXCAVATION AND BACKFILLING REQUIRED FOR THE COMPLETE CONSTRUCTION OF GRAVITY SANITARY SEWERS, FORCE MAINS, AND ALL APPURTENANT CONSTRUCTION RELATED THERETO, INCLUDING CHIMNEYS, SERVICE CONNECTIONS, THRUST BLOCKS, AND OTHER ITEMS NECESSARY FOR A COMPLETE SANITARY SEWER SYSTEM AS INDICATED ON THE DRAWINGS.

MATERIALS:

A. TYPES OF PIPE

TYPES OF PIPE WHICH SHALL BE USED FOR THE VARIOUS PARTS OF WORK ARE AS FOLLOWS:
GRAVITY SEWERS SHALL BE PVC SOLID WALL PIPE MEETING ASTM SPECIFICATIONS D-3034 OR F879.

B. PVC SEWER PIPE

PVC SEWER PIPE SHALL CONFORM IN ALL RESPECTS TO THE LATEST REVISION OF ASTM SPECIFICATIONS D-3034 OR F879, TYPE PSM POLYVINYL CHLORIDE (PVC) SEWER PIPE AND FITTINGS, SDR33. WALL THICKNESS OF ALL PVC SHALL MEET ASTM SPECIFICATIONS FOR SDR33 PIPE. ALL PIPE AND FITTINGS SHALL BE CLEARLY MARKED AS FOLLOWS:

MANUFACTURER'S NAME AND TRADEMARK
NOMINAL PIPE SIZE
MATERIAL DESIGNATION 125434 PVC
LEGEND "TYPE PSM SDR33 PVC SEWER PIPE" OR
"TYPE 44 PVC SEWER PIPE"
DESIGNATION ASTM D-3034 OR F879

JOINTS SHALL BE PUSH-ON TYPE USING ELASTOMERIC GASKETS AND SHALL CONFORM TO ASTM D-3212. THE GASKETS SHALL BE FACTORY INSTALLED.

THE PIPE SHALL BE FURNISHED IN NOMINAL 13 FOOT LENGTHS. SUFFICIENT NUMBERS OF SHORT LENGTHS AND FULL MACHINE FITTINGS SHALL BE PROVIDED FOR USE AT MANHOLES, CHIMNEYS, AND CONNECTIONS. ALL CONNECTIONS OF MANUFACTURED FITTINGS, FIELD FABRICATED, SADDLE-TYPE CONNECTIONS WILL NOT BE CONSIDERED ACCEPTABLE.

ANY PIPE OR FITTING HAVING A CRACK OR OTHER DEFECT OR WHICH HAS RECEIVED A SEVERE BLOW SHALL BE MARKED REJECTED AND REMOVED AT ONCE FROM THE WORK SITE. ALL FIELD CUTS ARE TO BE MADE WITH SAW AND 90 DEGREE MITRE BOX. BEVEL THE CUT END TO THE SAME AS THE FACTORY BEVEL AND REMOVE ALL INTERIOR BURRS. MEASURE AND PLACE A HAND MARK ON THE PIPE BEFORE ASSEMBLING.

THE PIPE INSTALLED UNDER THIS SPECIFICATION SHALL BE INSTALLED SO THAT THE INITIAL DEFLECTION, MEASURED AS DESCRIBED BELOW, SHALL BE LESS THAN FIVE PERCENT (5%).

DEFLECTION TESTS SHALL BE PERFORMED ON ALL FLEXIBLE PIPE AFTER THE FINAL BACKFILL HAS BEEN IN PLACE FOR AT LEAST 30 DAYS. THE DEFLECTION TEST SHALL BE RUN USING A ROAD BALL OR HANDROL HAVING A DIAMETER EQUAL TO 85 PERCENT OF THE INSIDE DIAMETER OF THE PIPE. NO MECHANICAL PULLING DEVICES SHALL BE USED DURING THE DEFLECTION TESTS. ALL PIPE NOT MEETING THE DEFLECTION TEST SHALL BE REEXCAVATED AND REPLACED AT THE CONTRACTOR'S EXPENSE.

THE MANHOLE WATER STOP GASKET AND STAINLESS STEEL CLAMP ASSEMBLY MUST BE APPROVED BY THE ENGINEER PRIOR TO THE INSTALLATION OF ANY PIPE.

THE CONTRACTOR WILL SUBMIT CERTIFICATION THAT THE MATERIALS OF CONSTRUCTION HAVE BEEN SAMPLED, TESTED, AND INSPECTED, AND THAT THEY MEET ALL THE REQUIREMENTS—INCLUDING WALL THICKNESS—IN ACCORDANCE WITH ASTM C-3034 OR ASTM F879 FOR ALL PIPE AND FITTINGS TO BE INCLUDED IN THE PROJECT WORK.

PVC PIPE SHALL NOT BE INSTALLED WHEN THE TEMPERATURE DROPS BELOW 32 DEGREES FAHRENHEIT OR GOES ABOVE 100 DEGREES FAHRENHEIT. DURING COLD WEATHER, THE FLEXIBILITY AND IMPACT RESISTANCE OF PVC PIPE IS REDUCED.

EXTRA CARE IS REQUIRED WHEN HANDLING PVC PIPE DURING COLD WEATHER. PVC PIPE SHALL NOT BE STORED OUTSIDE AND EXPOSED TO PROLONGED PERIODS OF SUNLIGHT AS PIPE DISCOLORATION AND REDUCTION IN PIPE IMPACT STRENGTH WILL OCCUR. CANVAS OR OTHER OPAQUE MATERIAL SHALL BE USED TO COVER PVC PIPE STORED OUTSIDE.

C. MANHOLES

THE CONTRACTOR SHALL CONSTRUCT REINFORCED CONCRETE MANHOLES AND DROP MANHOLES TO THE DIMENSIONS AT THE LOCATIONS SHOWN ON THE CONTRACT DRAWINGS. ALL PRECAST REINFORCED CONCRETE MANHOLE SECTIONS SHALL CONFORM TO THE LATEST VERSION OF THE ASTM SPECIFICATIONS C478. THE EXTERIOR OF THE MANHOLE SHALL BE COATED WITH A WATERPROOF SEALANT.

THE FOOTING SHALL BE CLASS B PRECAST CONCRETE AND SHALL CONFORM TO THE DIMENSIONS INDICATED ON THE PLANS.

SHELVES SHALL BE CONSTRUCTED WITH HARDENED RED SEWER BRICK. ALL BRICK SHALL BE TYPE SS MEETING THE STANDARDS IN ASTM C32. INVERTS FOR SEWER MANHOLES SHALL BE AS SHOWN ON THE PLANS AND DETAILS.

INVERTS SHALL HAVE THE EXACT SHAPE OF THE SEWER TO WHICH THEY ARE CONNECTED, AND ANY CHANGE IN SIZE OR DIRECTION SHALL BE GRADUAL AND EVEN.

ALL CONSTRUCTION OF SEWER MANHOLES MUST BE CARRIED OUT TO ENSURE WATER TIGHT WORK. ANY LEAKS IN MANHOLES SHALL BE CAULKED AND COMPLETELY REPAIRED TO THE SATISFACTION OF THE ENGINEER OR THE ENTIRE STRUCTURE SHALL BE REMOVED AND REBUILT. REPAIRS SHALL ONLY BE ALLOWED TO THE EXTERIOR OF THE MANHOLE.

ALL MANHOLES ARE TO BE PROVIDED WITH COPOLYMER POLYPROPYLENE PLASTIC RINGS WITH STEEL REINFORCEMENT TWELVE INCHES (12") ON CENTER. ALL MANHOLES SHALL BE PROVIDED WITH TONGUE, GRAY, CAST IRON MANHOLE FRAMES AND COVERS. ALL IRON CASTINGS SHALL BE THOROUGHLY CLEANED AND THEN COATED WITH HOT TAR BEFORE BEING DELIVERED. FRAMES AND COVERS SHALL BE LEADRAK LC 266 TYPE C, OR AN APPROVED EQUAL, AND HAVE A MINIMUM WEIGHT OF 400 POUNDS. MANHOLE COVERS SHALL HAVE THE WORD SEWER PRINTED ON THEM.

PRECAST RISERS AND BASES FOR MANHOLES SHALL CONFORM TO ASTM SPECIFICATIONS C-361. THE PIPE OPENING IN THE PRECAST MANHOLE RISER SHALL HAVE A CAST-IN-PLACE FLEXIBLE GASKET OR AN EQUIVALENT SYSTEM FOR PIPE INSTALLATION AS APPROVED BY THE ENGINEER. JOINTS BETWEEN MANHOLE RISERS SHALL BE RUBBER "O" RING SEALS OR SOFT BUTYL JOINT SEALER (ROPE FORT).

THE MANHOLE COVER FRAMES SHALL BE SET TO FINAL GRADE ONLY AFTER THE BASE COURSE PAVING HAS BEEN COMPLETED. MANHOLES SHALL BE CONSTRUCTED TO GRADE WITH AT LEAST TWO, AND NOT MORE THAN FIVE, COURSES OF BRICK WITH THE EXCEPTION OF INVERTS. ALL SURFACES OF MANHOLE BRICKWORK SHALL BE PLASTERED WITH CEMENT MORTAR, THE PLASTER BEING CARRIED UP AS THE BRICKWORK PROGRESSES, AND ALL MANHOLE LIFT HOLES SHALL BE GROUTED INSIDE AND OUT WITH EXPANDABLE GROUT.

MANHOLES SHALL BE PLACED AT ALL CHANGES IN SLOPE, SIZE, ALIGNMENT OF PIPE, AT THE ENDS OF EACH LINE, AND AT LEAST EVERY 300 FEET.

D. MASONRY

EACH BRICK SHALL BE WETTED AND COMPLETELY BEDDED IN MORTAR AT ITS BOTTOM, SIDES, AND ENDS IN ONE OPERATION WITH CARE BEING TAKEN TO FILL EVERY JOINT. BRICKWORK SHALL BE WELL-BONDED, AND JOINTS SHALL BE AS CLOSE AS PRACTICABLE. NO BRICK MASONRY SHALL BE LAID IN WATER NOR SHALL ANY WATER BE ALLOWED TO RISE ON OR AROUND ANY BRICK MASONRY UNTIL IT HAS SET AT LEAST 24 HOURS. NO MASONRY SHALL BE LAID IN FREEZING WEATHER.

THE BRICK FOR ORDINARY BRICKWORK SHALL BE COMMON HARD-BURNED CLAY BRICK. ALL BRICK SHALL BE REGULAR AND UNIFORM IN SHAPE AND SIZE WITH FLAT, PARALLEL BEDS, AND FACES. ORDINARY BRICK SHALL CONFORM TO ASTM SPECIFICATION C-32, LATEST EDITION, AND SHALL BE GRADE SS.

BRICK MASONRY SHALL BE LAID IN PORTLAND CEMENT MORTAR COMPOSED OF ONE PART PORTLAND CEMENT AND TWO PARTS OF SAND, MEASURED BY VOLUME, TO WHICH NOT MORE THAN 10 POUNDS OF LIME SHALL BE ADDED FOR EACH BAG OF CEMENT. WATER FOR MORTAR SHALL BE CLEAN AND ONLY AN AMOUNT SUFFICIENT TO PRODUCE A WORKABLE MORTAR SHALL BE USED. MORTAR SHALL BE USED WITHIN ONE HOUR FROM THE TIME THE CEMENT WAS ADDED TO THE MIX.

THE SAND FOR MORTAR FOR BRICK MASONRY SHALL BE UNIFORMLY GRADED, CLEAN, SHARP, AND CONTAIN NO GRADES LARGER THAN WILL PASS A ONE-EIGHTH INCH (1/8") MESH SCREEN.

CONSTRUCTION METHODS:

A. EXCAVATION:

EXCAVATIONS SHALL BE MADE TO A POINT AT LEAST SIX INCHES (6") BELOW THE PIPE INVERT TO ACCOMMODATE THE BEDDING MATERIAL. ALL EXCAVATIONS ARE TO BE KEPT DRY WHILE PIPE IS BEING LAID AND UNTIL EACH JOINT AND PIPE HAS BEEN INSPECTED BY THE ENGINEER AND APPROVAL GIVEN TO COMMENCE BACKFILLING OPERATIONS.

B. LAYING SEWER PIPE:

THE BELL END OF THE PIPE SHALL FACE UPGRADE AT ALL TIMES AND BE PLACED IN SUCH A POSITION AS TO MAKE THE INVERT EVEN WHEN THE SUCCEEDING SECTION IS ASSEMBLED. WHERE REQUIRED BY ADVERSE GRADING CONDITIONS, THE CONTRACTOR SHALL FILL ANY GULLY TO MAKE A SMOOTH BEDDING FOR THE SEWER PIPE. THE FILL SHALL BE PRESUMPTIVELY COMPACTED TO A 95 PERCENT DRY DENSITY (BY THE AASHTO-T-99, METHOD A (STANDARD PROCTOR) TEST, UPON WHICH THE SIX INCHES (6") OF BEDDING MATERIAL SHALL BE PLACED.

ANY PIPE WHICH IS NOT LAID TO GRADE AND ALIGNMENT SHALL BE RELIED TO THE SATISFACTION OF THE ENGINEER. THE BEDDING MATERIAL SHALL BE PLACED AND COMPACTED ON EACH SIDE OF THE PIPE TO A HEIGHT EQUAL TO ONE-HALF THE PIPE DIAMETER AND FOR THE FULL WIDTH OF THE EXCAVATED TRENCH AND AS SHOWN ON THE ACCEPTED PLANS.

C. BACKFILL:

BACKFILL SHALL CONSIST OF APPROVED MATERIAL PLACED IN SIX INCH (6") LAYERS WITH EACH LAYER BEING THOROUGHLY COMPACTED TO NOT LESS THAN 95 PERCENT OF MAXIMUM DRY DENSITY AS DETERMINED BY THE AASHTO-T-99 STANDARD PROCTOR BY MEANS APPROVED BY THE ENGINEER.

THE BACKFILL SHALL BE BROUGHT UP EVENLY ON BOTH SIDES OF THE PIPE FOR ITS FULL LENGTH. WALKING OR WORKING ON THE COMPLETED PIPELINE, EXCEPT AS MAY BE NECESSARY IN TAMPING OR BACKFILLING, SHALL NOT BE PERMITTED UNTIL THE TRENCH HAS BEEN BACKFILLED TO A HEIGHT OF AT LEAST TWO FEET (2') ON THE TOP OF THE PIPES. DURING CONSTRUCTION, ALL OPENINGS TO THE PIPELINES SHALL BE PROTECTED FROM THE ENTERING OF EARTH OR OTHER MATERIALS.

D. CONCRETE GRADE AND ENCASEMENT FOR PIPE:

WHERE REQUIRED ON THE PLANS OR AS DIRECTED BY THE ENGINEER, A CONCRETE GRADE SHALL BE USED TO BOLSTER AND STRENGTHEN PIPE. WHERE REQUIRED ON THE PLANS OR AS DIRECTED BY THE ENGINEER, CONCRETE ENCASEMENT OR SEWER WILL BE MADE TO PROTECT NEARBY WELLS OR WATERLINES FOR STREAM CROSSINGS OR FOR SIMILAR PURPOSES. ALL COSS IS AS DEFINED IN THE VERMONT STANDARD SPECIFICATIONS FOR CONSTRUCTION, SECTION 501, AND WILL MEET THE REQUIREMENTS OF THAT SECTION.

E. FROST PROTECTION FOR SHALLOW SEWERS:

SEWERS WITH LESS THAN FIVE AND ONE-HALF FEET (5 1/2') OF COVER OVER THE CROWN OR WHERE INDICATED ON THE PLANS SHALL BE PROTECTED AGAINST FREEZING BY INSTALLATION OF TWO, 2" THICK (4" TOTAL) STYROFOAM SM INSULATING SHEETS WITH A TOTAL WIDTH OF FOUR FEET (4') OR TWICE THE PIPE DIAMETER, WHICHEVER IS GREATER. THE SHEETS SHALL BE PLACED SIX INCHES (6") ABOVE THE CROWN OF THE SEWER AFTER COMPACTION OF THE SIX INCH LIFT IMMEDIATELY ABOVE THE CROWN. CARE SHALL BE EXPRESSED BY THE CONTRACTOR DURING BACKFILL, AND COMPACTION OVER THE STYROFOAM SM SHEETS SHALL MEET THE COMPRESSIVE STRENGTH REQUIREMENTS OF ASTM D1921-73 AND SHALL BE AS MANUFACTURED BY BOW CHEMICAL COMPANY, MILWAUKEE, WISCONSIN, OR EQUAL. IN NO CASE SHALL THE SEWER LINES HAVE LESS THAN FOUR (4') FEET OF COVER OVER THE TOP OF THE PIPE.

F. LEAKAGE TESTS AND ALLOWANCES FOR GRAVITY SEWERS:

THE LOW PRESSURE AIR TEST WILL BE USED TO SIMULATE INFILTRATION OR EXFILTRATION RATES INTO OR OUT OF ALL GRAVITY SEWERS. THE CONTRACTOR WILL FURNISH ALL FACILITIES AND PERSONNEL FOR CONDUCTING THE TEST.

FINAL ACCEPTANCE OF THE SEWER SHALL DEPEND UPON THE SATISFACTORY PERFORMANCE OF THE SEWER UNDER TEST CONDITIONS. THE TEST SHALL BE PERFORMED ON PIPE BETWEEN ADJACENT MANHOLES AFTER BACKFILLING HAS BEEN COMPLETED AND COMPACTED.

ALL WYES, TEES, LATERALS, OR END-OF-SIDE SEWER STUBS SHALL BE PLUGGED WITH FLEXIBLE-JOINT CAPS, OR AN ACCEPTABLE ALTERNATE, SECURELY FASTENED TO WITHSTAND THE INTERNAL TEST PRESSURE. SUCH PLUGS OR CAPS SHALL BE READILY REMOVABLE AND THEIR REMOVAL SHALL PROVIDE A SOCKET SUITABLE FOR MAKING A FLEXIBLE-JOINTED LATERAL CONNECTION OR EXTENSION.

PRIOR TO TESTING FOR ACCEPTANCE, THE PIPE SHOULD BE CLEANED BY PASSING THROUGH THE PIPE A FULL GAUGE SQUEEGEE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THE PIPE CLEANED. IMMEDIATELY FOLLOWING THE PIPE CLEANING, THE PIPE INSTALLATION SHALL BE TESTED WITH LOW-PRESSURE AIR.

AIR SHALL BE SLOWLY SUPPLIED TO THE PLUGGED AIR INSTALLATION UNTIL THE INTERNAL AIR PRESSURE REACHES FOUR POUNDS PER SQUARE INCH (4.0 PSI) GREATER THAN THE AVERAGE BACK PRESSURE OF ANY GROUNDWATER THAT MAY SURROUND THE PIPE. AT LEAST TWO MINUTES SHALL BE ALLOWED FOR TEMPERATURE STABILIZATION BEFORE PROCEEDING FURTHER.

THE PIPELINE SHALL BE CONSIDERED ACCEPTABLE WHEN TESTED AT AN AVERAGE PRESSURE OF THREE POUNDS PER SQUARE INCH (3.0 PSI) GREATER THAN THE AVERAGE BACK PRESSURE OF ANY GROUNDWATER THAT MAY SURROUND THE PIPE IF:

1. THE TOTAL RATE OF AIR LOSS FROM ANY SECTION TESTED IN ITS ENTIRETY BETWEEN MANHOLE AND CLEANOUT STRUCTURES DOES NOT EXCEED 2.0 CUBIC FEET PER MINUTE; OR
2. THE SECTION UNDER TEST DOES NOT LOSE AIR AT A RATE GREATER THAN 0.0030 CUBIC FEET PER MINUTE PER SQUARE FOOT OF INTERNAL PIPE SURFACE.

THE REQUIREMENTS OF THIS SPECIFICATION SHALL BE CONSIDERED SATISFIED IF THE TIME REQUIRED IN SECONDS FOR THE PRESSURE TO DECREASE FROM 3.5 OR 2.5 PSI GREATER THAN THE AVERAGE BACK PRESSURE OF ANY GROUNDWATER THAT MAY SURROUND THE PIPE IS NOT LESS THAN THAT COMPUTED ACCORDING TO THE FOLLOWING TABLE:

DIAMETER (INCHES)	TIME (SEC./100 FT.)
3	10
4	18
6	40
8	70
10	110
12	158
18	248
24	356
30	485
36	634
42	785
48	931
54	1078
60	1226
66	1375
72	1524

THE TABLE GIVES THE REQUIRED TEST TIME IN SECONDS PER 100 FOOT LENGTH OF PIPE FOR A GIVEN DIAMETER. IF THERE IS MORE THAN ONE PIPE SIZE IN THE SECTION OF LINE BEING TESTED, COMPUTE THE TIME FOR EACH DIAMETER, AND SUM THE TIMES TO FIND THE TOTAL REQUIRED TEST TIME.

IF THE PIPE INSTALLATION FAILS TO MEET THESE REQUIREMENTS, THE CONTRACTOR SHALL DETERMINE AT HIS OR HER OWN EXPENSE THE SOURCE OR SOURCES OF LEAKAGE AND SHALL REPAIR (IF THE EXTENT AND TYPE OF REPAIRS PROPOSED BY THE CONTRACTOR ARE REASONABLE) OR RECONSTRUCT OR REPLACE DEFECTIVE MATERIALS OR WORKMANSHIP. THE COMPLETED PIPE INSTALLATION SHALL MEET THE REQUIREMENTS OF THIS TEST BEFORE BEING CONSIDERED ACCEPTABLE.

SINCE THIS TEST DOES NOT DETERMINE THE TIGHTNESS OF MANHOLES, THEY SHALL BE TESTED SEPARATELY. THE EXFILTRATION LEAKAGE ALLOWANCE OUT OF MANHOLES SHALL BE NO GREATER THAN ONE GALLON PER DAY PER VERTICAL FOOT TO DEPTH. THE MANHOLE SHALL BE FILLED WITH WATER TO A POINT ONE FOOT (1') ABOVE THE HIGHEST POINT BETWEEN MANHOLE SECTIONS. IN AREAS OF HIGH GROUNDWATER, THERE SHALL BE NO VISIBLE LEAKAGE DUE TO INFILTRATION. IF A VACUUM TEST IS DESIRED, THE FOLLOWING PROCEDURE SHALL BE FOLLOWED: (THIS PREFERRED METHOD OF TESTING MANHOLES FOR LEAKAGE INVOLVES THE USE OF A DEVICE FOR SEALING THE TOP OF THE MANHOLE CONE SECTION AND PUMPING AIR OUT OF THE MANHOLE, CREATING A VACUUM AND HOLDING THIS VACUUM FOR A PRESCRIBED PERIOD OF TIME.)

1. ALL LIFTING HOLES AND EXTERIOR JOINTS SHALL BE FILLED AND POINTED WITH AN APPROVED NON-SHRINKING MORTAR. THE COMPLETED MANHOLE SHALL NOT BE BACKFILLED PRIOR TO TESTING. MANHOLES WHICH HAVE BEEN BACKFILLED SHALL BE EXCAVATED TO EXPOSE THE ENTIRE EXTERIOR PORT TO VACUUM TESTING OR THE MANHOLE SHALL BE TESTED FOR LEAKAGE BY MEANS OF A HYDROSTATIC TEST. REPAIRS SHALL ONLY BE MADE TO THE EXTERIOR OF THE MANHOLE.
2. ALL PIPE AND OTHER OPENINGS INTO THE MANHOLE SHALL BE SUITABLY PLUGGED IN A MANNER TO PREVENT DISPLACEMENT.
3. A PLATE WITH AN INFLATABLE RUBBER RING THE SIZE OF THE TOP OF THE MANHOLE SHALL BE INSTALLED BY INFLATING THE RING WITH AIR TO PRESSURE ADEQUATE TO PREVENT LEAKAGE OF AIR BETWEEN THE RUBBER RING AND MANHOLE WALL.

AIR SHALL THEN BE PUMPED OUT OF THE MANHOLE THROUGH AN OPENING IN THE PLATE UNTIL A VACUUM IS CREATED INSIDE OF THE MANHOLE EQUAL TO TEN INCHES (10") OF MERCURY ON AN APPROVED VACUUM GAUGE. THE REMOVAL OF AIR SHALL THEN BE STOPPED AND THE TEST TIME BEGUN.

THE VACUUM MUST NOT DROP TO BELOW NINE INCHES (9") OF MERCURY WITH A TWO MINUTE TEST PERIOD. IF MORE THAN A ONE INCH (1") DROP IN VACUUM OCCURS WITHIN THE TWO MINUTE TEST PERIOD, THE MANHOLE HAS FAILED AND SHALL BE REPAIRED OR RECONSTRUCTED AND THEN RETESTED.

FOLLOWING SATISFACTORY TEST RESULTS, THE MANHOLE MAY BE BACKFILLED.

IT IS NOTED THAT ALL EXISTING SANITARY SEWERS SHALL BE KEPT OPERATIONAL UNTIL NEW WORK HAS BEEN TESTED AND APPROVED BY THE ENGINEER. AT SUCH TIME, EXISTING SEWERS AND SEWER SERVICES SHALL BE CONNECTED TO THE NEW SEWERS.

G. LEAKAGE AND PRESSURE TESTING FOR FORCE MAIN

ALL PIPELINES SHALL BE TESTED IN ACCORDANCE WITH THE VERMONT DEPARTMENT OF WATER RESOURCES ENVIRONMENTAL PROTECTION RULES, LATEST EDITION. A LEAKAGE AND PRESSURE TEST SHALL BE PERFORMED CONCURRENTLY.

THE HYDROSTATIC TEST PRESSURE SHALL BE A MINIMUM OF 50 PSI AT THE HIGHEST POINT ALONG THE TEST SECTION AND SHALL NOT VARY BY MORE THAN FIVE PSI DURING THE ENTIRE TWO HOUR TEST. IF AND WHEN TESTING OR THE MANHOLE SHALL BE TESTED FOR LEAKAGE BY MEANS OF A HYDROSTATIC TEST. REPAIRS SHALL ONLY BE MADE TO THE EXTERIOR OF THE MANHOLE.

AT THE END OF THE TWO HOUR TEST, THE PRESSURE SHALL BE RETURNED TO THE TEST PRESSURE AND THE ADDITIONAL VOLUME OF WATER MEASURED. THE TOTAL AMOUNT OF WATER USED DURING AND AT THE END OF THE TEST SHALL CONSTITUTE THE ACTUAL LEAKAGE. THE MAXIMUM ALLOWABLE LEAKAGE SHALL BE DETERMINED BY THE FOLLOWING FORMULA:

$$L = 50(p)^2 / 133,200$$

WHERE: L = LEAKAGE IN GALLONS PER HOUR

D = DIAMETER OF PIPE IN INCHES

P = AVERAGE TEST PRESSURE IN PSI

S = LENGTH OF PIPE BEING TESTED

H. CLEANING PIPELINES AND APPURTENANCES:

UPON COMPLETION OF CONSTRUCTION, ALL DIRT AND OTHER FOREIGN MATERIAL SHALL BE REMOVED FROM PIPELINES AND THEIR APPURTENANT CONSTRUCTIONS. NO MATERIALS SHALL BE LEFT IN THE PIPELINES TO IMPIDE NORMAL FLOW THROUGH THEM.

I. SEWER SERVICE CONNECTIONS:

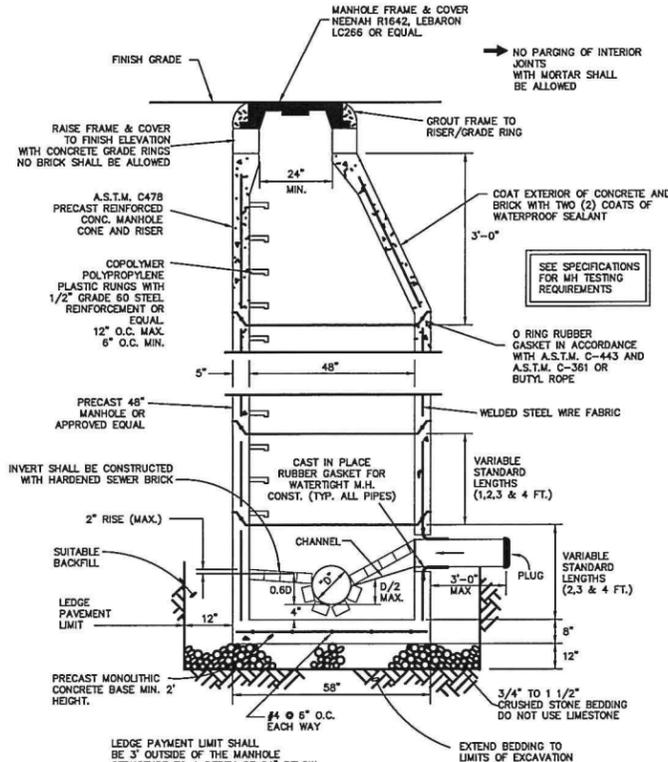
WHERE REQUIRED ON THE PLANS, SEWER SERVICE CONNECTIONS FOR ONE HOUSE SHALL BE CONSTRUCTED OF SIX INCH (6") PIPE UNLESS OTHERWISE NOTED ON THE PLANS OF THE TYPE MATERIAL SPECIFIED UNDER THIS SECTION. THE PIPE SHALL BE LAID AND ITS JOINTS MADE AS REQUIRED FOR SEWER CONSTRUCTION IN THIS SPECIFICATION.

OPEN ENDS OF PIPES SHALL BE PROPERLY SEALED TO PREVENT DAMAGE AND INTERUSION OF FOREIGN MATTER WHERE HOOKUP TO THE BUILDING SEWER IS NOT CONCOMITANT WITH SEWER MAIN CONSTRUCTION. ADDITIONALLY, THE CONTRACTOR WILL PROVIDE A PVC PIPE TEMPORARY MARKER APPROVED BY THE ENGINEER FROM THE SEWER SERVICE INVERT UP TO TWENTY-FOUR INCHES (24") ABOVE THE FINISHED GRADE. THE MARKER SHALL BE SEALED SECURELY INTO THE GROUND FOR EASE IN RELOCATING THE END OF SEWER SERVICE CONNECTION FOR HOOKUP TO THE BUILDING SEWER.

IN THE CASE OF RECONNECTION OF EXISTING SERVICES, SUCH RECONNECTIONS WILL BE MADE ONLY AFTER THE NEW SEWER MAIN HAS BEEN COMPLETED, TESTED, AND ACCEPTED. THE EXCAVATION, BEDDING MATERIAL, INSTALLATION, AND BACKFILL FOR SERVICE CONNECTIONS SHALL BE THE SAME AS FOR SEWER MAINS.

J. CLEANOUTS FOR SEWERS:

CLEANOUTS FOR GRAVITY SEWERS AND FORCE MAINS SHALL BE PROVIDED EVERY 100 FT OR WHERE THE SUM OF BENDS = 45 DEGREES. CLEANOUT FRAMES SHALL BE OF TONGUE GRAY CAST IRON. CASTINGS SHALL BE TRUE TO PATTERN AND FREE FROM FLAWS. THE BEARING SURFACE OF CLEANOUT FRAMES AND COSSINGS AGAINST EACH OTHER SHALL BE MACHINED TO GIVE CONTINUOUS CONTACT THROUGHOUT THEIR CIRCUMFERENCE. ALL IRON CASTINGS SHALL BE THOROUGHLY CLEANED AND THEN COATED WITH HOT COAL TAR BEFORE BEING DELIVERED.



SEWAGE FLOWS:

THE SEWAGE FLOWS ARE BASED ON THE STATE OF VERMONT - ENVIRONMENTAL PROTECTION RULES, WHICH REQUIRE 210 GAL/DAY/RESIDENTIAL UNIT REGARDLESS OF THE NUMBER OF BEDROOMS (SINGLE BEDROOMS REQUIRE 140 GAL/DAY/RESIDENTIAL UNIT) WHEN CONNECTING TO A MUNICIPAL SEWER SYSTEM WITH > 50,000 GAL/DAY CAPACITY.

DAMP STATION FLOWS:

232 TOTAL UNITS (66% ONE BEDROOM UNITS)
154 SINGLE BEDROOM UNITS X 140 GAL/DAY/UNIT = 21,560 GAL/DAY
78 TWO BEDROOM UNITS X 210 GAL/DAY/UNIT = 16,380 GAL/DAY

1 COMMUNITY CENTER
100 USERS X 5 GAL/DAY/USER = 500 GAL/DAY

1 MAINTENANCE GARAGE
2 WORKERS X 50 GAL/DAY/WORKER = 100 GAL/DAY

INFILTRATION: 300 GAL/INCH/MILE/DAY X
16" PIPE X (1,000 LF /
5,280/MILE) = 726 GAL/DAY

TOTAL: 39,268 GAL/DAY
39,268 GAL/DAY > 2,000 GAL/DAY:
THEREFORE A DUAL PUMP STATION IS REQUIRED.

PUMP STATION DATA

- A. DAILY FLOW = 39,268 GPD (SEE SEWAGE FLOW INFORMATION ABOVE)
- B. AVERAGE DAILY FLOW (ADF)
39,268 GPD
16 HR/DAY X 60 MIN/HR = 40.9 GPM
MINIMUM PUMPING RATE = 5 TIMES THE ADF (205 GPM) OR THE
MINIMUM PUMPING RATE FOR A 6" FV (183 GPM)
USE A PUMPING RATE OF 212 GPM
- C. HEAD LOSSES: ELEVATION HEAD = 49 FT
FRICTION LOSSES (8" LINE) = 3.0 FT
MISC. LOSSES = 0 FT
TOTAL DYNAMIC HEAD: 52 FT
- D. PUMP REQUIREMENTS - 2 PUMPS EACH CAPABLE OF PUMPING A
MINIMUM OF 205 GPM AT 57' TDH
THREE-PHASE, MINIMUM 4" DISCHARGE, CAPABLE
OF PASSING MINIMUM 3" SOLIDS. PUMPS
SHALL BE EMP/COOR/NL, METERS, HYDROMATIC
OR AN APPROVED EQUAL.
- E. CONTROLS: NEMA 4 DUPLEX UL LISTED CONTROL PANEL; SIEMENS/VEVOQUA LC150 DUPLEX
PUMP CONTROLLER WITH A1000 PRESSURE TRANSDUCER AND BACKUP FLOAT;
AUTOMATIC PUMP ALTERNATOR; 115 VAC CONTROL CIRCUIT; 115 VAC ALARM
LIGHT AND HORN MOUNTED ON TOP OF PANEL; PHASE MONITOR IF THREE PHASE
PUMPS ARE USED; 115 VAC DUPLEX CONDUIT; PANEL HEATER WITH
THERMOSTAT; INDIVIDUAL CIRCUIT BREAKERS FOR EACH PUMP, CONTROL CIRCUIT,
DUPLEX OUTLET, TRANSFORMER IF REQUIRED, HEATER, AND ONE SPARE;
INDIVIDUAL ELASTIC TIGHT METERS MOUNTED. ALL ELECTRIC WIRING
SHALL MEET THE REQUIREMENTS OF THE NATIONAL ELECTRIC CODE.
CONTROLS SHALL BE SCADA COMPATIBLE.
CONTROL PANEL SHALL INCLUDE AN AUXILIARY POWER HOOKUP FOR FUTURE
GENERATOR.
PUBLIC PUMP STATIONS WILL BE EQUIPPED WITH TELEMETRY SYSTEM WITH
BATTERY BACK-UP, TIED TO THE BURLINGTON SYSTEM.
A MISSION COMMUNICATIONS M-8000 REAL TIME MONITORING SYSTEM BE INSTALLED
WIRED TO TEMPORARILY DESERTE THE PUMP STATION WHEN A SIGNAL IS RECEIVED
FROM CSO MANHOLE R1-12 ON COLCHESTER AVE. WITH ITS BUILT IN DIGITAL AND
ANALOG HORN, ADD WET WELL LEVEL, PUMP STATUS/RUNTIMES, HIGH AND LOW
WET WELL ALARMS, AND POWER FAILURES.
- F. FLOATS: PRIMARY PRESSURE TRANSDUCER WATER LEVEL CONTROLLER WITH EMERGENCY
FLOAT BACK-UP TO BE COMPLETELY SEALED, MADE OF CORROSION RESISTANT
SOLUTION. ELECTRICAL CABLE TO BE FLEXIBLE TWO CONDUCTOR WITH
NEOPRENE JACKET.
- G. EMERGENCY STORAGE
39,268 GPD
16 HR/DAY
TWO CONCRETE 4,500 GAL STORAGE TANKS AND 2,940 GAL CAPACITY IN PUMP STATION
- H. SUBMITTALS REQUIRED: PUMPS, ACCESS LID, WETWELL, VALVE PIT,
FLOATS AND FLOAT HANGER BRACKET, CHECK VALVES, GATE
VALVES, SOLID SLEEVE COUPLINGS, AND OPERATION AND
MAINTENANCE MANUALS.

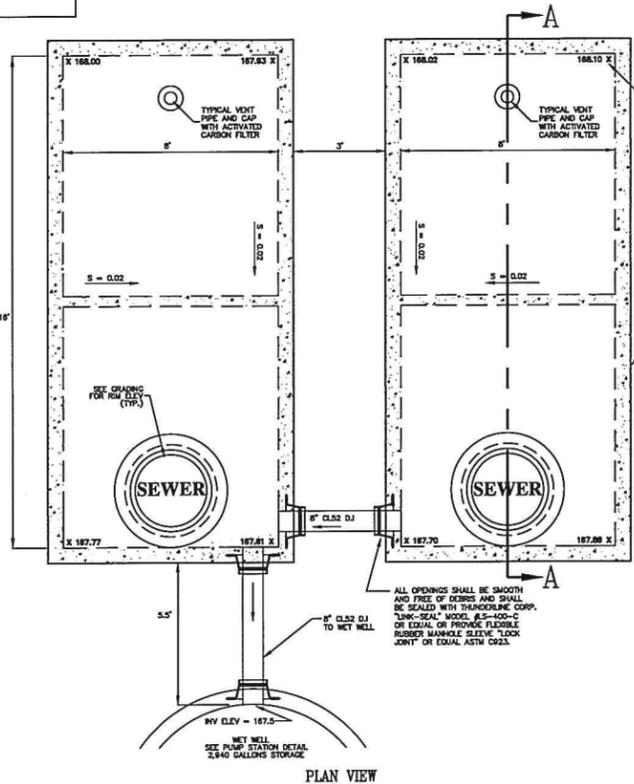
TESTING DATA

- A. FORCE MAIN PRESSURE TEST: ALL FORCE MAINS SHALL BE PRESSURE TESTED TO NOT
LESS THAN 50 PSI AT THE HIGHEST POINT OF THE TEST
SECTION. THE TEST SHALL BE OF A TWO HOUR DURATION
AND THE TEST PRESSURE SHALL NOT VARY BY MORE THAN
+/- 5 PSI. A LEAKAGE TEST SHALL BE PERFORMED
CONCOMITANTLY WITH THE PRESSURE TEST. THE ALLOWABLE
LEAKAGE SHALL BE DETERMINED BY THE FOLLOWING
FORMULA:
$$L = \frac{NP^2}{7400}$$

WHERE L = THE ALLOWABLE LEAKAGE IN GALLONS PER HOUR,
N IS THE NUMBER OF JOINTS, D IS THE NOMINAL
DIAMETER OF THE PIPE IN INCHES, AND P IS THE AVERAGE
TEST PRESSURE IN PSI.
- B. VALVE PIT AND PUMP
STATION TEST: THE STRUCTURES SHALL BE TESTED IN THE PRESENCE OF
THE ENGINEER FOR INFILTRATION BY FILLING THE STRUCTURES
TO 1' BELOW THE ACCESS LID. A STABILIZATION PERIOD OF
1 HR SHALL BE PROVIDED TO ALLOW FOR ABSORPTION. AT
THE END OF THE STABILIZATION PERIOD THE STRUCTURES
SHALL BE REFILLED IF NECESSARY AND THE TEST PERIOD OF
48 HOURS SHALL BEGIN. AT THE END OF THE TEST PERIOD,
THE VOLUME OF WATER CHANGE SHALL BE MEASURED.
THERE SHALL BE NO VISIBLE OR MEASURABLE EXFILTRATION
OR INFILTRATION ON THE TEST FAILS. IF THE TEST FAILS,
THE CONTRACTOR SHALL REPAIR OR WATERPROOF AND
RETEST.
- C. PUMP STATION: AN AUTHORIZED REPRESENTATIVE OF THE PUMP MANUFACTURER OR AN
ELECTRICIAN FAMILIAR WITH THE OPERATION AND SETTING OF THE PUMP
STATION SHALL BE PRESENT DURING STARTUP. AMPERAGE READINGS ON
EACH MOTOR LEAD SHALL BE MEASURED AND RECORDED. THE CONTRACTOR
SHALL PROVIDE A WATER SOURCE TO PERFORM A FULL OPERATIONAL CHECK
OF THE STATION INCLUDING ALL FLOAT FUNCTIONS, ALARM TESTING,
INDICATOR LIGHTS, HORN, SWITCHES, PUMP ALTERNATOR, AND
PHASE MONITOR IF THREE-PHASE PUMPS ARE USED. THE CONTROL SYSTEM SHALL
BE CYCLED THROUGH MORE THAN ONCE TO INSURE PROPER SOUNDING
AND OPERATION OF THE PUMPS. EACH PUMP SHALL BE FIELD TESTED
TO INSURE THE PUMPING CAPACITY MEETS THE PROJECT REQUIREMENTS.

TANK SPECIFICATIONS

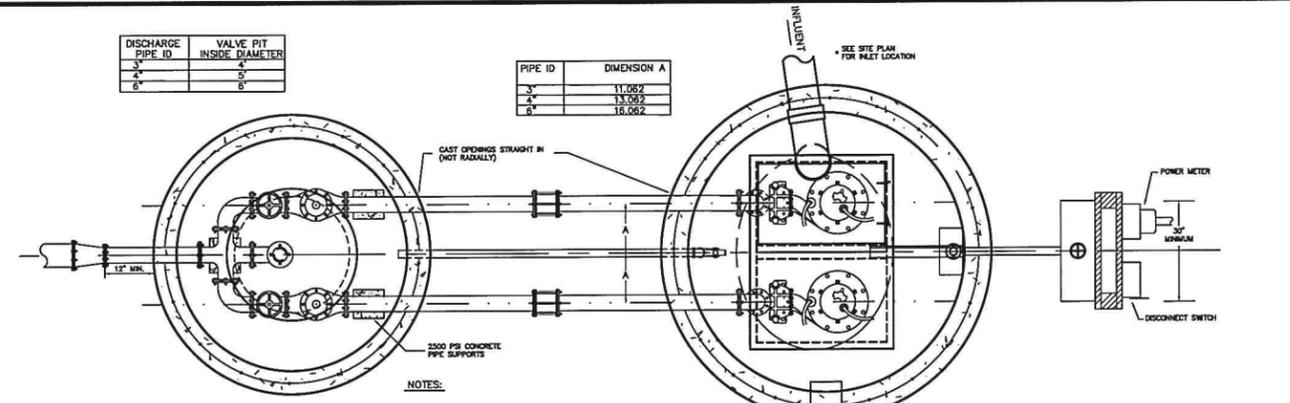
- A) THE STRUCTURE PROVIDED FOR EMERGENCY STORAGE FOR THE PUMPING
STATION SHALL BE TWO 4,500 GALLON, STEEL REINFORCED, 3000 PSI PRECAST
CONCRETE HOLDING TANK STRUCTURE. THE STRUCTURE SHALL BE DESIGNED
BY AN ENGINEER LICENSED IN THE STATE OF VERMONT TO WITHSTAND
AASHTO H-20 WHEEL LOADINGS AT THE DEPTH SHOWN ON THIS PLAN
- B) INSIDE TANK DIMENSIONS SHALL BE 16' X 8' X 16' 10"
- C) EXTERNALLY COAT ALL CONCRETE STRUCTURES WITH TWO COATS OF
BITUMINOUS WATERPROOFING AND TEST FOR WATER-TIGHTNESS. SEE
SHEET #18 FOR STRUCTURES TESTING SPECIFICATIONS.
- D) ALL BACKFILL MATERIAL AROUND THE TANK SHALL BE GRANULAR
MATERIAL THOROUGHLY COMPACTED TO NOT LESS THAN 95% OF
MAXIMUM DRY DENSITY AS DETERMINED BY THE AASHTO T-99
STANDARD PROCTOR.
- E) BACKFILL SIDES AND TOP OF TANK WITH SAND AND/OR GRAVEL.
- F) PRIOR TO CONSTRUCTION, ALL MATERIALS SHALL BE APPROVED BY THE
ENGINEER.
- G) THE CONTRACTOR SHALL PROVIDE THE OWNER AND ENGINEER WITH
"AS-BUILT" INFORMATION AND CERTIFICATION THAT THE SYSTEM WAS
INSTALLED IN ACCORDANCE WITH PLANS AND ALL PERTINENT APPROVALS
AND PERMITS ISSUED FOR THE PROJECT.
- H) THE CONTRACTOR SHALL ERECT AND MAINTAIN A CONTINUOUS SNOW
FENCE BARRIER AND LIGHTED BARRICADES AROUND ALL EXCAVATION LEFT
OVER NIGHT OR ON WEEKENDS.



STORAGE TANKS

DISCHARGE PIPE ID	VALVE PIT INSIDE DIAMETER
3"	4"
4"	5"
6"	8"

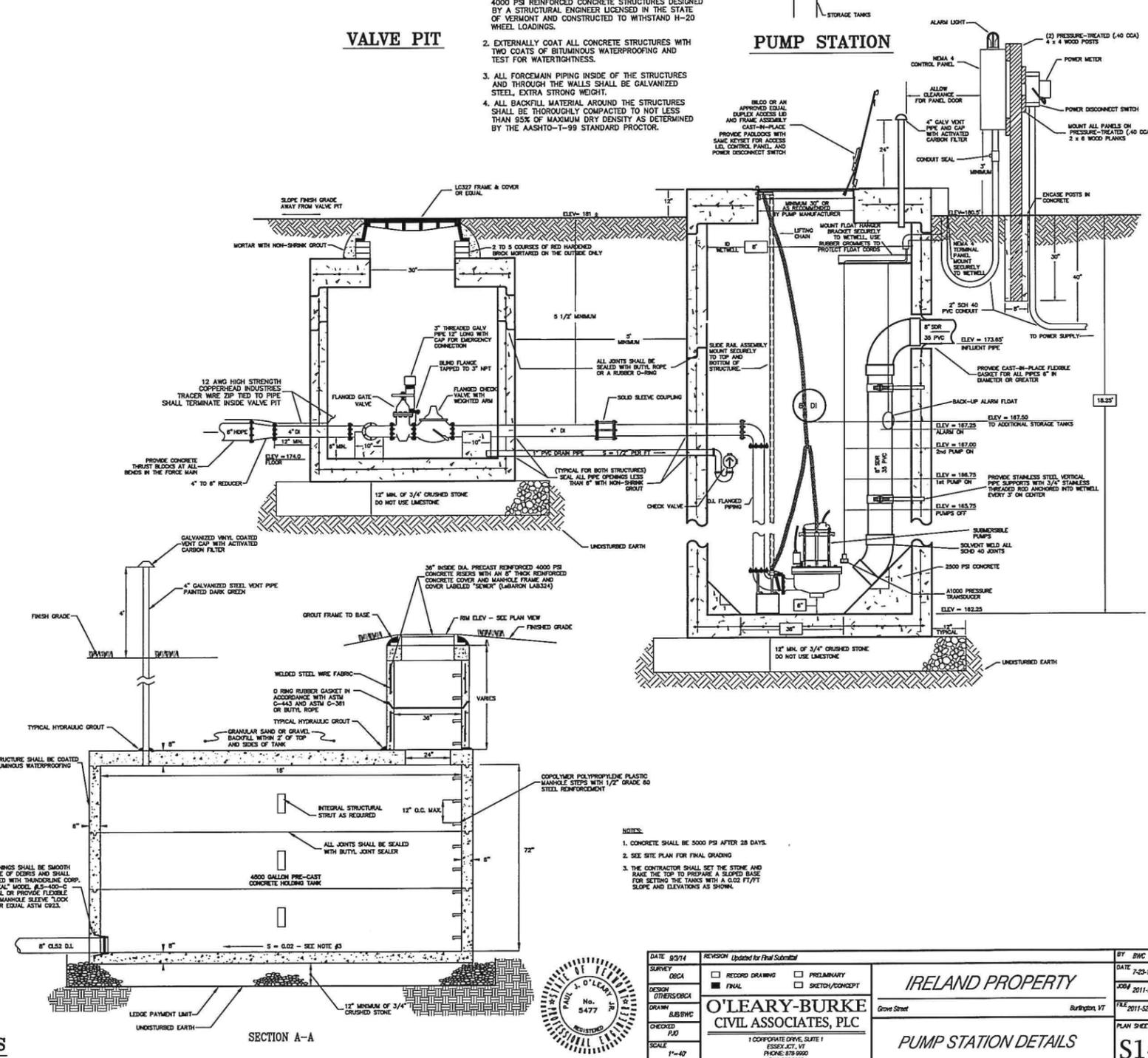
PIPE ID	DIMENSION A
3"	11.062
4"	13.062
6"	16.062



VALVE PIT

PUMP STATION

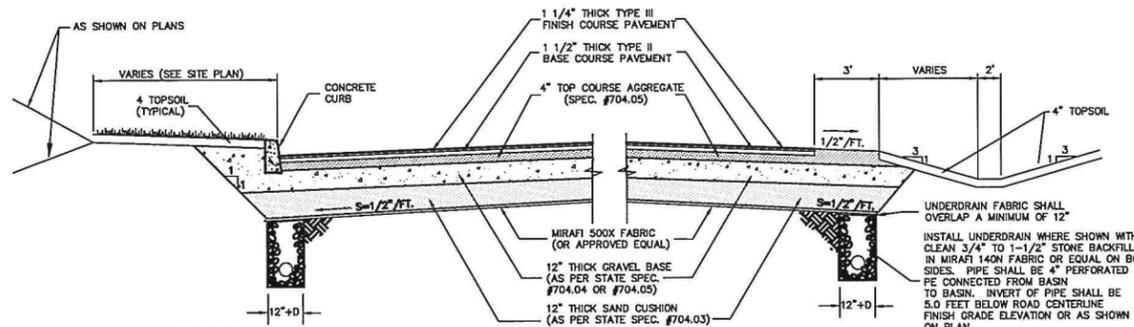
- NOTES:**
1. WETWELL AND VALVE PIT SHALL BE PRE-ENGINEERED 4000 PSI REINFORCED CONCRETE STRUCTURES DESIGNED BY A STRUCTURAL ENGINEER LICENSED IN THE STATE OF VERMONT AND CONSTRUCTED TO WITHSTAND H-20 WHEEL LOADINGS.
 2. EXTERNALLY COAT ALL CONCRETE STRUCTURES WITH TWO COATS OF BITUMINOUS WATERPROOFING AND TEST FOR WATER-TIGHTNESS.
 3. ALL FORCEMAIN PIPING INSIDE OF THE STRUCTURES AND THROUGH THE WALLS SHALL BE GALVANIZED STEEL, EXTRA STRONG WEIGHT.
 4. ALL BACKFILL MATERIAL AROUND THE STRUCTURES SHALL BE THOROUGHLY COMPACTED TO NOT LESS THAN 95% OF MAXIMUM DRY DENSITY AS DETERMINED BY THE AASHTO-T-99 STANDARD PROCTOR.



SECTION A-A



DATE: 9/2/14	REVISION: Updated for Final Submittal	BY: BWC
SURVEY: OBCA	RECORD DRAWING: []	DATE: 7-23-14
DESIGN: OTHERS/OBCA	FINAL: []	JOB#: 2011-52
DRAWN: SUB/BWC	PRELIMINARY: []	FILE: 2011-52-S3
CHECKED: FJD	SKETCH/CONCEPT: []	PLAN SHEET #
SCALE: 1"=40'	<p>O'LEARY-BURKE CIVIL ASSOCIATES, PLLC</p> <p>1 CORPORATE DRIVE, SUITE 1 ESSEX, VT 05733 PHONE: 878-9500 FAX: 878-9509 EMAIL: polary@olearyburke.com</p>	
<p>IRELAND PROPERTY</p> <p>Grove Street Burlington, VT</p>		<p>PUMP STATION DETAILS</p> <p>S14</p>

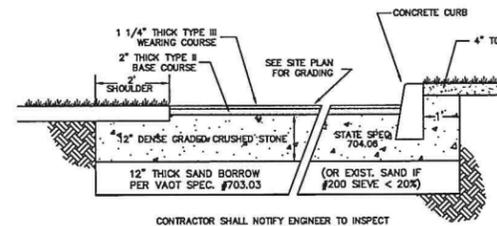


NOTES:

1. THE CONTRACTOR SHALL CLEAR, GRUB & EXCAVATE FOR THE DRIVES, PARKING AREAS AND UTILITIES IN ACCORDANCE WITH DIVISION 200- EARTHWORK OF THE VERMONT DEPARTMENT OF HIGHWAYS STANDARD SPECIFICATIONS.
2. EMULSION SHALL BE PLACED ON THE FACE OF THE CURB WHERE IT WILL BE IN CONTACT WITH THE PAVEMENT.
3. EMULSION WILL BE PLACED BETWEEN THE BASE AND FINISH COATS OF PAVEMENT WHEN THE FINISHED CURB IS NOT PLACED WITH A REASONABLE AMOUNT OF TIME OF THE BASE COURSE PLACEMENT.
4. UNDERDRAINS SHALL BE INSTALLED BY THE CONTRACTOR AS REQUESTED BY THE PROJECT ENGINEER FOLLOWING ROUGH GRADING OF THE SUBGRADE SOILS AND THE ENGINEERING SOIL ANALYSIS.

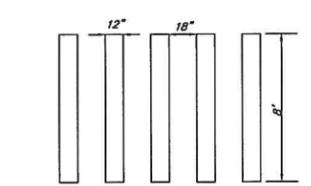
TYPICAL ROAD + PARKING AREA CROSS-SECTIONS

NTS



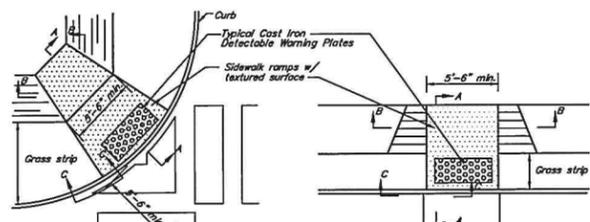
CAR PARKING/ROADWAY AREA DETAIL

NTS



CROSSWALK MARKING

NTS



SECTION A-A

SECTION C-C

SECTION B-B

SECTION D-D

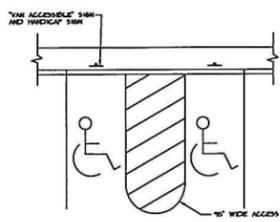
NOTES:

1. CURBING SHALL BE CONSTRUCTED IN 10' SECTIONS WITH 1/8" JOINT BETWEEN SECTIONS.
2. CURBING EXPANSION JOINTS SHALL BE CONSTRUCTED EVERY 20' AND SHALL BE CONSTRUCTED OF MATERIAL CONFORMING TO ASPHALT DESIGNATION H-153 (1/2" SPONGE RUBBER OR CORK.)
3. ALL EXPOSED SURFACES TO RECEIVE 2 COATS OF AN ANTI-SPALLING COMPOUND.

GRADATION REQUIREMENTS

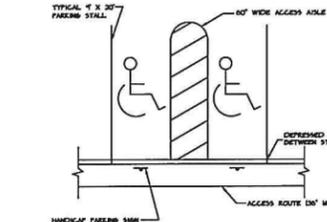
MATERIAL	SEIVE SIZE	PERCENT (NO PASSING)
SAND CUSHION - VT SPEC 703.03	2"	100 %
	1 1/2"	90-100 %
	1/2"	70-100 %
	#4	60-100 %
	#100	0-20 %
GRAVEL FOR SUBBASE - VT SPEC 704.04	#4	20-60 %
	#100	0-12 %
	#200	0-8 %
CRUSHED GRAVEL FOR SUBBASE VT SPEC 704.05	2"	100 %
	1 1/2"	90-100 %
	#4	30-60 %
	#100	0-12 %
	#200	0-8 %
DENSE GRADED CRUSHED STONE VT SPEC 704.06	3 1/2"	100 %
	3"	90-100 %
	2"	75-100 %
	1"	50-80 %
	1/2"	30-60 %
	#4	15-40 %

CONCRETE CURB



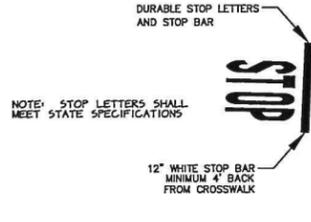
VAN-ACCESSIBLE PARKING

NTS



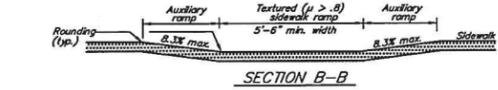
CAR-ACCESSIBLE PARKING

NTS



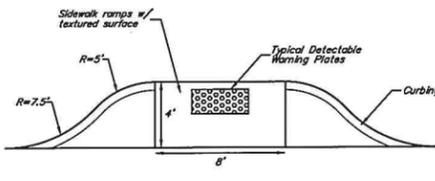
STOP SIGN, BAR, + LETTERING

NTS



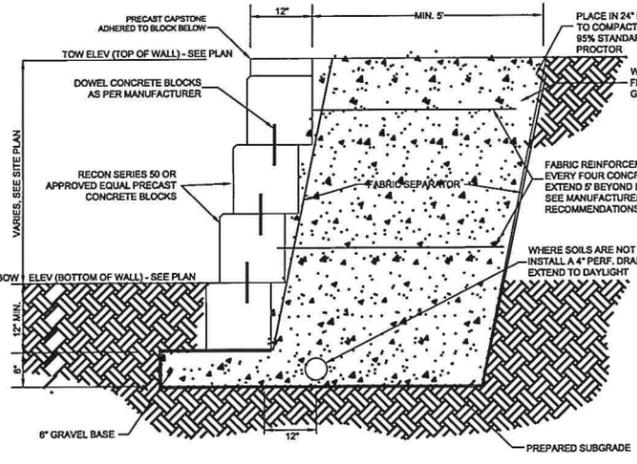
SIDEWALK RAMP

N.T.S. VT. SHT. C-3A



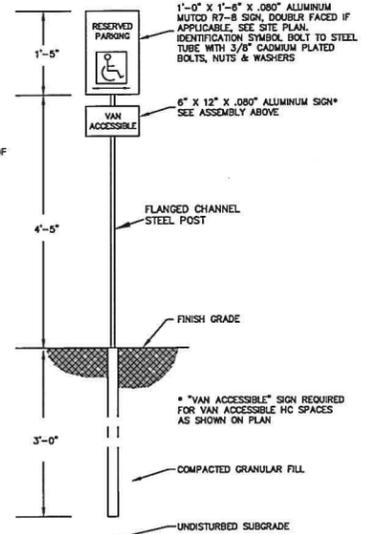
GROVE ST BUMP OUT

NTS



RETAINING WALL DETAIL

NTS



BOLLARD HANDICAP SIGN

NTS

THE CONTRACTOR SHALL NOTIFY "DIGSAFE" AT 1-800-225-4977 PRIOR TO ANY EXCAVATION.

GENERAL CONSTRUCTION SPECIFICATIONS

1. ALL WORK AND MATERIALS SHALL BE APPROVED BY AND IN ACCORDANCE WITH THE LATEST VERMONT AGENCY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, CITY SPECIFICATIONS AND REQUIREMENTS, THE WRITTEN TECHNICAL SPECIFICATIONS, AND THESE PLANS.
2. THE CONTRACTOR SHALL CONTACT ALL UTILITIES BEFORE EXCAVATION TO VERIFY THE LOCATION OF ANY UNDERGROUND LINES. THE CONTRACTOR SHALL NOTIFY "DIGSAFE" AT 1-888-344-7233 AND THE CITIES PUBLIC WORKS DEPARTMENT PRIOR TO ANY EXCAVATION.
3. UTILITIES INFORMATION SHOWN HEREON WERE OBTAINED FROM BEST AVAILABLE SOURCE AND MAY OR MAY NOT BE EITHER ACCURATE OR COMPLETE. CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF EXISTING UTILITIES AND SHALL BE RESPONSIBLE FOR ANY DAMAGE TO ANY UTILITY, PUBLIC OR PRIVATE, SHOWN OR NOT SHOWN HEREON. CONTRACTOR SHALL CONNECT OR RECONNECT ALL UTILITIES TO THE NEAREST SOURCE THROUGH COORDINATION WITH UTILITY OWNER.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DEMOLITION AND REMOVAL OF ALL EXISTING VEGETATION, PAVEMENT AND STRUCTURES NECESSARY TO CONSTRUCT THIS PROJECT UNLESS OTHERWISE NOTED ON THESE PLANS. THE CONTRACTOR SHALL REMOVE ALL EXCESS MATERIAL, DEBRIS AND TRASH FROM THE SITE UPON COMPLETION OF CONSTRUCTION, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
5. THE CONTRACTOR SHALL BE RESPONSIBLE AT HIS OWN EXPENSE FOR ENSURING THAT THE DUST CREATED AS A RESULT OF CONSTRUCTION DOES NOT CREATE A NUISANCE OR A SAFETY HAZARD. WHERE AND WHEN DEEMED NECESSARY BY THE ENGINEER, THE CONTRACTOR SHALL BE REQUIRED TO WET SECTIONS OF THE CONSTRUCTION AREA WITH WATER, APPLY CALCIUM CHLORIDE OR SWEEP ASPHALT ROADS WITH A POWER BROOM AS DUST CONTROL.
6. ANY SURFACES, LINES, OR STRUCTURES WHICH HAVE BEEN DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE RESTORED TO THE CONDITION AT LEAST EQUAL TO THAT IN WHICH THEY WERE FOUND IMMEDIATELY PRIOR TO THE BEGINNING OF OPERATIONS.
7. THE DESIGN ON THESE PLANS SHALL BE INSPECTED BY O'LEARY-BURKE CIVIL ASSOCIATES, ESSEX JUNCTION, VERMONT, TO ENSURE COMPLIANCE WITH THE PLANS AND REQUIREMENTS. O'LEARY-BURKE WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS THAT MAY ARISE FROM THE FAILURE OF THE CONTRACTOR TO FOLLOW THESE PLANS, SPECIFICATIONS AND THE DESIGN INTENT THAT THE PLANS CONVEY, AND FROM FAILURE TO HAVE BEEN NOTIFIED TO INSPECT THE WORKS AND TESTS IN PROGRESS.
8. FOR ANY WORK WITHIN THE HIGHWAY RIGHT-OF-WAY A MINIMUM OF ONE-WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES. CONTINUOUS TWO-WAY TRAFFIC WILL BE REQUIRED AT NIGHT, DURING PEAK HOURS, AND WHENEVER POSSIBLE DURING ACTUAL CONSTRUCTION ACTIVITIES. UNIFORMED TRAFFIC CONTROL OFFICERS SHALL DIRECT TRAFFIC DURING PEAK HOURS WHEN THERE IS ONE-WAY TRAFFIC OR WHEN DEEMED NECESSARY BY THE CITY OR STATE. TEMPORARY CONSTRUCTION SIGNS AND TRAFFIC CONTROL SIGNS SHALL BE ERECTED BY THE CONTRACTOR IN ACCORDANCE WITH STATE AND TOWN STANDARDS.
9. TO ENSURE COMPLIANCE WITH THE PLAN(S), THE CONTRACTOR SHALL NOTIFY THE ENGINEER AND THE CITIES PUBLIC WORKS DEPARTMENT 24 HOURS IN ADVANCE OF STARTING ANY WORK, CUTTING THE PAVEMENT, BEGINNING THE INSTALLATION OF ANY UTILITIES, BRINGING IN ANY NEW GRAVEL FOR THE NEW BASE, PAVING, AND FINAL INSPECTION.
10. THE HORIZONTAL AND VERTICAL SEPARATION FOR SEWER AND WATER LINES SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE "TEN STATE STANDARDS - RECOMMENDED STANDARDS FOR WATER."
11. TOPSOIL SHALL BE STOCKPILED, SEEDED, AND MULCHED UNTIL REUSED. SILT FENCES SHALL BE PLACED AND STAKED CONTINUOUSLY AROUND THE BOTTOM OF THE TOPSOIL PILES.
12. HEALTHY EXISTING TREES ON AND ADJACENT TO THE SITE SHALL BE SAVED AND PROTECTED AS ORDERED BY THE ENGINEER.
13. OPEN CUT AREAS SHALL BE MULCHED OUTSIDE OF ACTUAL WORK AREAS, AND BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED TO CONFINE SHEET WASH AND RUNOFF TO THE IMMEDIATE OPEN AREA AS ORDERED BY THE ENGINEER. THE CONTRACTOR SHALL REFERENCE ALL STORMWATER BMP'S PROVIDED BY THE STATE OF VERMONT.
14. AT COMPLETION OF GRADING, SLOPES, DITCHES, AND ALL DISTURBED AREAS SHALL BE SMOOTH AND FREE OF POCKETS WITH SUFFICIENT SLOPE TO ENSURE DRAINAGE.
15. FINISH SLOPES, DITCHES AND DISTURBED AREAS SHALL RECEIVE A MINIMUM OF 4 INCHES OF TOPSOIL AND BE FERTILIZED, SEEDED, LIMED, AND MULCHED. TURF ESTABLISHMENT SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 651 OF THE VERMONT HIGHWAY DEPARTMENT SPECIFICATIONS AND THE SPECIFICATIONS INCLUDED ON THESE PLANS.
16. ALL FILL SHALL BE PLACED IN 6 INCH LIFTS AND THOROUGHLY COMPACTED TO 95% OF MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D698 STANDARD PROCTOR, UNLESS OTHERWISE SPECIFIED.
17. DRAINAGE COURSES AND STREAMS SHALL BE CONTROLLED IN DISTURBED CONSTRUCTION AREAS BY THE FOLLOWING METHODS:
 - A) PRESERVING NATURAL VEGETATION WHENEVER POSSIBLE;
 - B) AVOIDING UNNECESSARY DISTURBANCE OF SOILS;
 - C) EARLY INSTALLATION OF STORM PIPES AND DITCHES;
 - D) SEEDING AND MULCHING DIRECTLY UPON COMPLETION OF CONSTRUCTION;
 - E) CONSTRUCTION OF EROSION CONTROL DEVICES AS DIRECTED BY THE ENGINEER.
18. THE SILT FENCES, DITCHES, AND OTHER EROSION CONTROL DEVICES, SHALL BE INSPECTED, MAINTAINED AND REPAIRED BY THE CONTRACTOR AFTER EVERY RAINFALL OR AS ORDERED BY THE ENGINEER UNTIL ALL DISTURBED AREAS HAVE BEEN GRASSED AND APPROVED BY THE ENGINEER. THE MAINTENANCE OF THE EROSION CONTROL DEVICES WILL INCLUDE REMOVAL OF ANY ACCUMULATED SEDIMENTATION.
19. PRIOR TO CONSTRUCTION, ALL MATERIALS SHALL BE APPROVED BY THE ENGINEER. ALL MATERIALS TO BE TAKEN OVER BY THE CITY SHALL BE APPROVED BY THE PUBLIC WORKS DEPARTMENT.

STUMP DISPOSAL SPECIFICATIONS

ALL SUITABLE TREES THAT MUST BE CUT WILL BE USED AS FUELWOOD OR TIMBER. THE STUMPS, BRUSH, AND EXCESS UNSUITABLE EARTH WILL BE DISPOSED OF AT THE LOCATION DESIGNATED BY THE ENGINEER AS STUMP DISPOSAL AREA WELL ABOVE THE SEASONAL HIGH GROUNDWATER OR HAILED OFF-SITE TO A STATE-APPROVED LANDFILL. IF ON-SITE STUMP DISPOSAL IS IMPLEMENTED, THE FOLLOWING GUIDELINES SHALL BE MET:

1. WHENEVER POSSIBLE, STUMP DISPOSAL SITES SHOULD BE LOCATED ON NEARLY LEVEL TO MODERATELY SLOPING LANDS (SLOPES LESS THAN 12%).
2. DISPOSAL SITES WILL NOT BE LOCATED IN OR WITHIN 100 FEET OF FLOWING WATERCOURSES OR STREAMS OR IN ACTIVELY ERODING GULLIES.
3. DISPOSAL SITES SHALL NOT BE LOCATED IN FLOODED OR FLOOD-PRONE LANDS, MARSHES, OR OTHER AQUIFER RECHARGE AREAS.
4. STUMPS WILL BE PLACED ON THE SITE IN A SINGLE LIFT PRIOR TO BACKFILLING. WHEN ADDITIONAL STUMPS ARE TO BE DEPOSITED ON THE SAME SITE, EACH SUCCESSIVE LAYER OR LIFT OF STUMPS WILL BE BACKFILLED.
5. STUMPS DEPOSITED IN DRAINAGEWAYS OR DEPRESSIONS SHALL BE BACKFILLED AND BERMED SO AS TO DIVERT OVERLAND FLOWS FROM THE DISPOSAL AREA.
6. A MINIMUM OF TWO FEET (2') OF OVERBURDEN WILL BE PLACED OVER ALL DISPOSAL SITES.
7. THE TWO FEET OF OVERBURDEN WILL BE COVERED WITH A MINIMUM OF FOUR INCHES (4") OF TOPSOIL, GRADED, SEEDED, AND MULCHED IN ACCORDANCE WITH THE SPECIFICATIONS.

LANDSCAPING SPECIFICATIONS

ALL DISTURBED AREAS SHALL BE STABILIZED WITH SEEDING AND MULCHING PRIOR TO NOVEMBER 15 OF EACH YEAR. ANY DISTURBED AREAS SHALL BE IMMEDIATELY SEEDED AND MULCHED WITHIN 15 DAYS. ANY WORK PERFORMED AFTER NOVEMBER 1 OF EACH YEAR SHALL BE STABILIZED WITH MULCH OR NETTING SUFFICIENT TO PREVENT EROSION AND SHALL BE IMMEDIATELY SEEDED AND MULCHED AS SOON AS WEATHER PERMITS IN THE SPRING. ALL DISTURBED AREAS SHALL RECEIVE A MINIMUM OF 4" OF TOPSOIL AND BE SEEDED, FERTILIZED, LIMED, AND MULCHED IN ACCORDANCE WITH THE FOLLOWING:

1. SEED MIXTURE IN ALL AREAS SHALL BE URBAN MIX CONFORMING TO THE TABLE SHOWN ON THESE PLANS. FOR SEEDING BETWEEN SEPTEMBER 1 AND NOVEMBER 1, WINTER RYE SHALL BE USED AT AN APPLICATION RATE OF 100 POUNDS PER ACRE.
2. FERTILIZER SHALL BE STANDARD COMMERCIAL GRADE CONFORMING TO THE STATE FERTILIZER LAW AND TO THE STANDARDS OF THE ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS. DRY FERTILIZER, IF USED, SHALL BE APPLIED AT THE RATE OF 500 POUNDS PER ACRE. LIQUID FERTILIZER, IF USED, SHALL BE APPLIED IN A 1-2-1 RATIO WITH THE MINIMUM RATE TO INCLUDE 100 POUNDS OF NITROGEN, 200 POUNDS OF PHOSPHATE, AND 100 POUNDS OF POTASH PER ACRE.
3. LIMESTONE SHALL CONFORM TO ALL STATE AND FEDERAL REGULATIONS AND TO THE STANDARDS OF THE ASSOCIATION OF OFFICIAL AGRICULTURAL CHEMISTS. THE LIMESTONE SHALL BE APPLIED AT A RATE OF TWO TONS PER ACRE OR AS DIRECTED.
4. WITHIN 24 HOURS OF APPLICATION OF FERTILIZER, LIME, AND SEED, THE SURFACE SHALL BE MULCHED WITH A HAY MULCH. MULCH SHALL BE SPREAD UNIFORMLY OVER THE AREA AT A RATE OF TWO TONS PER ACRE OR AS ORDERED BY THE ENGINEER.

URBAN MIX GRASS SEED

% BY WEIGHT	LBS. LIVE SEED PER ACRE	TYPE OF SEED
37.5	45	CREeping RED FESCUE
31.25	37.5	KENTUCKY BLUEGRASS
31.25	37.5	WINTER HARDY, PERENNIAL RYE
100	120 #	LIVE SEED PER ACRE

TYPICAL SIDEWALK SECTION ADJACENT TO BUILDING

NTS

ALL EXPOSED SURFACES TO RECEIVE 2 COATS OF AN ANTI-SPALLING COMPOUND.

24" SAND BASE (VT. SPEC. 703.03)

5" THICK 3500 P.S.I. CONCRETE WALK

4" TOPSOIL

VARIES SEE PLAN

2" THICK DOW STYROFOAM SM OR EQUAL INSULATION BOARD

12" SAND CUSHION (VT. SPEC. 703.03)

CONCRETE CURB

4" TOPSOIL

12" SAND CUSHION (VT. SPEC. 703.03)



DATE: 9/27/14
 SURVEY: ORCA
 DESIGN: OTHERS ORCA
 DRAWN: B.B./BWC
 CHECKED: PJD
 SCALE: 1"=40'

REVISION: Updated for Final Submittal
 RECORD DRAWING
 FINAL
 PRELIMINARY
 SKETCH/CONCEPT

O'LEARY-BURKE CIVIL ASSOCIATES, P.L.C.
 1 CORPORATE DRIVE, SUITE 1
 ESSEX, VT. 05750
 PHONE: 878-8888
 FAX: 878-8889
 E-MAIL: poburke@olearyburke.com

IRELAND PROPERTY

Grove Street, Burlington, VT

PARKING DETAILS

BY	DATE
BWC	7-23-14
JOB	2011-52
FILE	2011-52-59
PLAN SHEET #	S15

WATER SPECIFICATIONS

1.1 GENERAL:

This item shall consist of the labor, equipment, and material required for the complete construction of the watermain and services which shall include excavation, backfilling, pipe, valves, tees, hydrants, elbows, reducers, and all other appurtenances necessary for a complete watermain system as indicated on the accepted drawings. All materials and installations shall be approved by the local municipal water authority.

1.2 WATER PIPE MATERIALS:

PVC PIPE

Pipe shall be C900 DR14 (305 psi) PVC pipe with a minimum diameter of eight inches (8") and conform to current AWWA C110 or ANSI Specification A21.10. Push-on joint pipe shall be minimum thickness Class 52. Push-on joint accessories shall conform to applicable requirements of AWWA C111 or ANSI Specification A21.11.

Pipe shall be cement mortar-lined on the inside in accordance with AWWA C104 or ANSI Specification A21.4 except that the cement-lining thickness shall not be less than three-sixteenths inch (3/16"). A plus tolerance of one-eighths inch (1/8") will be permitted.

1.2 FITTINGS:

Fittings shall be molded C907 PVC. Mechanical joint nuts and bolts shall be high strength low alloy steel per ANSI A-21.11.

Mechanical joint glands or an approved equal shall be used on all vertical bend and as shown on the plans.

1.4 GATE VALVE RESILIENT SEAT:

Valves shall be manufactured in North America to meet all requirements of AWWA Specifications C-506. Valves twelve inches (12") and smaller shall be bubble-tight, zero leakage at 250 PSI working pressure. Valves shall have non-rising stems, open counter-clockwise, and be provided with a two inch (2") square operating nut with arrow cast in metal to indicate direction of opening.

Each valve shall have maker's name, pressure rating, and year in which manufactured cast on the body. Prior to shipment from the factory, each valve shall be tested by hydrostatic pressure equal to twice the specified working pressure. Buried valves shall be installed with a valve box.

1.5 VALVE BOXES:

Cast iron three-piece slide-type; five and one-fourths inch (5 1/4") shaft; six foot (6') trench depth.

Cast iron cover marked "WATER" and indicating direction of opening.

1.6 FIRE HYDRANTS:

All hydrants are to be 3-way, 5" minimum diameter and limited to the following make: Kennedy Guardian K-81A.

Main Valve Opening: 5 1/4 inches
 Nozzle Arrangement: Two 2 1/2 inch hose nozzles with (5) threads per inch. One 4 1/2 inch pump nozzle with (4) threads per inch. 5" Storz connection
 Inlet Connection: 6 inch mechanical joint
 Operating Nut: Standard 1 inch pentagon
 Direction of Opening: Counter-clockwise
 Color: Enamelled hydrant yellow body, top color as determined by Town.
 Depth of Bury: Hydrant shall be installed to the manufacturer's instructions with nozzles about 18" above finish grade.

1.7 HYDRANT BRANCHES:

Hydrant assemblies shall consist of a six inch (6") mechanical joint gate valve conforming to AWWA C-509; a four foot (4') length of six inch (6") Class 52 ductile iron pipe with a cement-lining; and the fire hydrant.

The hydrant shall have (18"-21") clearance between the center of the steamer cap and the ground. For single-family house subdivisions, there will be at least one hydrant at each intersection and a maximum of 500 feet (500') between hydrants with a minimum water flow of 500 gallons per minute with a 20 psi residual pressure from each hydrant.

1.8 WATER SERVICE CONNECTION:

A. GENERAL REQUIREMENTS

The Contractor shall install six inch (6") ductile iron water services as indicated on the Contract Drawings or as directed by the Engineer. Each service shall include a 6 inch (6") gate valve located at the property line.

1.9 CONSTRUCTION METHODS

A. INSPECTION AND TESTING

All pipe and fittings shall be inspected and tested in accordance with the manufacturer's specifications and the aforementioned AWWA Specifications. The Contractor shall furnish for approval certification from the pipe manufacturer that all tests have been performed with satisfactory results. Pipe shall not be installed without the Engineer's or Water Authority's approval.

B. INSTALLATION

Pipes, fittings, and accessories shall be carefully handled to avoid damage. Prior to the date of acceptance of the project work by the Owner, the Contractor shall replace any new pipe or accessory found to be defective at any time, including after installation, at no expense to the Owner. All installation and testing shall be done in accordance with AWWA Standard C-600 and ANSI Specification A21.11.

All pipes showing cracks shall be rejected. If cracks occur in the pipe, the Contractor may, at his own expense and with the approval of the Engineer, cut off the cracked portions at a point at least twelve inches (12") from the visible limits of the crack and use the sound portion of the pipe. All pipes and fittings shall be cleared of all foreign matter and debris prior to installation and shall be kept clean until the time of acceptance by the Owner.

At all times, when the pipe laying is not actually in progress, the open ends of the pipe shall be closed by temporary watertight plugs or by other approved means. If water is in the trench when work is resumed, the plug shall not be removed until all danger of water entering the pipe has passed. The pipe shall be installed in trenches and at the line and grade shown on the Contract Drawings.

Any deflection joints shall be within the limits specified by the manufacturer. All piping and appurtenances connected to the equipment shall be supported so that no strain will be imposed on the equipment. If the equipment manufacturer's specifications include that piping loads are not to be transferred, the Contractor shall submit certification of compliance.

Concrete thrust blocks shall be installed on all plugs, tees, and bends deflecting 11 1/4 degrees or more. Care shall be taken to ensure that concrete will not come in contact with flanges, joints, or bolts. The required area of thrust blocks are indicated on the plans or shall be as approved by the Engineer.

Whenever sewers cross under watermain, the watermain shall be laid at such an elevation that the bottom of the watermain is at least 18 inches above the top of the sewer. This vertical separation shall be maintained for that portion of the watermain located within ten feet (10') horizontally of any sewer it crosses.

There shall be no physical connection between the distribution system and any pipes, pumps, hydrants, or tanks which are supplied or may be supplied with a water that is, or may be, contaminated. In instances where the use of different types of pipe require joining, the Contractor shall furnish and install all necessary adapters.

All trenching safety standards shall be in conformance with all applicable State and Federal Guidelines and as specified on the Plans.

The Contractor shall, at all times, keep the trenches entirely free of water until all work is finished and ready for backfilling. After the various pipelines have been installed, the trenches and areas to be filled shall be backfilled to subgrade with, wherever possible, material excavated from the trench. No backfilling will be allowed until any concrete masonry has set sufficiently, as determined by the Engineer.

All material for backfilling shall be free of roots, stumps, and frost. Materials used for backfilling trenches shall be free of stones weighing over 30 pounds. No stones measuring over one and one-half inches (1 1/2") in the longest dimension shall be placed within one foot (1') of the pipeline being backfilled.

Backfill for all pipelines shall be placed in six inch (6") layers, each layer being thoroughly compacted to not less than the minimum dry density as determined by the AASHTO-T-99 Standard Proctor. Particular precautions shall be taken in the placement and compaction of the backfill in order not to damage the pipe or structure. The backfill shall be brought up evenly. All watermain shall be installed with a minimum cover depth of six (6').

Surplus excavated materials not used for backfill shall be disposed of in a manner satisfactory to the Engineer. All surplus material or spoil shall be removed promptly and disposed of so as not to be objectionable to abutters or to the general public.

Valve boxes are to be installed on all buried valves. The boxes shall be cast iron with a minimum five and one-fourths inch (5 1/4") diameter and long enough to extend from the valve to finished grade. The boxes shall enclose the operating nut and stuffing box of the valve. Valve boxes shall not transfer loads into the valve. Covers shall be close fitting and dirt-tight with the top of the cover flush with the top of the box rim. Covers shall be marked "Water" with an arrow indicating the direction of opening. Valve boxes shall be three piece slip-type.

The contractor shall provide a stable, temporary PVC marker approved by the Engineer at all gate valves, curb stops, and at the end of waterlines to a point six inches (6") above finish grade. The marker shall be setted securely into the ground.

C. FIELD TESTING

Except as otherwise directed, all pipelines shall be tested. Pipelines laid in excavation or bedded in concrete shall be tested prior to backfilling or the placing of concrete, and any exposed piping shall be tested prior to field painting. The Contractor shall furnish all gauges, testing plugs, caps, and all other necessary equipment and labor to perform leakage and pressure test in sections of an approved length. Each valve section or a maximum of one thousand feet (1,000') of the pipe shall be tested. All water required for testing shall be potable. All testing shall be conducted in the presence of the Engineer.

For the pressure test, the Contractor shall develop and maintain 200 pounds per square inch for two hours. Failure to hold the designated pressure for the two-hour period constitutes a failure of the section tested. The leakage test shall be performed concurrently with the pressure test. During the test, the Contractor shall measure the quantity of water required to maintain the test pressure. Leakage shall not exceed the quantity given by:

$$L = SD (\text{Square root of } P) / 148,000$$

where:
 L = Leakage in gallons/hour
 S = Length of pipeline tested
 D = Diameter of pipe in inches
 P = Average test pressure in psi

All testing shall be conducted in accordance with AWWA C-600 latest revision. Should any section of the pipe fail either the pressure or leakage tests, the Contractor shall do everything necessary to locate and repair or replace the defective pipe, fittings, or joints at no expense to the Owner.

D. DISINFECTING:

Chlorination of the watermain shall be conducted only after the main has been flushed and a clear stream is obtained as determined by the Engineer.

The Contractor shall furnish all labor, equipment, materials, and tools necessary to disinfect the pipe and appurtenances in accordance with the AWWA Standard for Disinfecting Watermain, C-651, with the exception of the tablet method.

The method of disinfection shall be by the continuous feed method unless otherwise approved by the Engineer. After filling, flushing, and the addition of chlorine solution, the free chlorine concentration within the pipe shall be at least 25 mg/L. The chlorinated water shall remain in the main for a period of at least 24 hours. At the end of this period, the treated water in all portions of the main shall not have a residual of less than 10 mg/L of free chlorine. All disinfection shall be performed under the supervision of the Engineer. The disinfection process shall be deemed acceptable only after (2) samples of water from the flushed, disinfected main taken by the Engineer and tested at an approved laboratory show no evidence of bacteriological contamination. Disinfection shall conform to the latest AWWA C-651 revision.

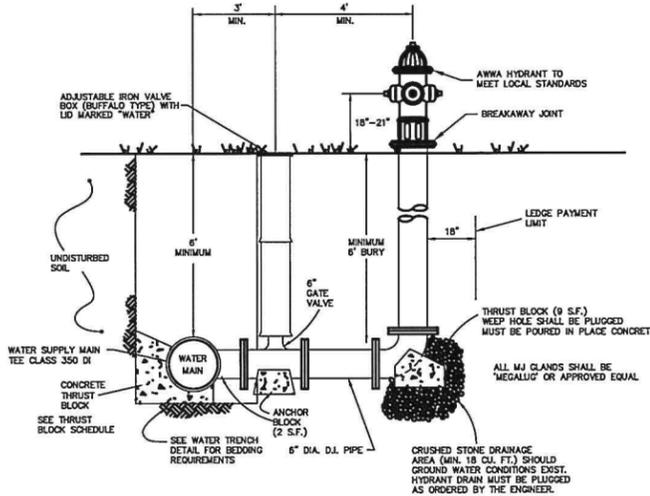
The pipeline and appurtenances shall be maintained in an uncontaminated condition until final acceptance. Disinfection shall be repeated when and where required at no expense to the Owner until final acceptance by the Owner.

E. FROST PROTECTION OF SHALLOW WATERLINES

Waterlines with less than six feet six inches (6'6") of cover over the crown, or where indicated on the plans, shall be protected against freezing by installation of four inch (4") thick Styrofoam SM insulating sheets with a total width of four feet (4') or twice the pipe diameter, whichever is greater. The sheets shall be placed six inches (6") above the crown of the main after completion of the six inch (6") lift immediately above the crown. Care shall be exercised by the Contractor during backfill and compaction over the styrofoam sheets to prevent damage to the sheets. Styrofoam SM sheets shall meet the compressive strength requirements of ASTM D1621-73 and shall be as manufactured by Dow Chemical Company, Midland, Michigan, or equivalent. In no case shall the waterlines have less than five feet (5') of cover over the top of the pipe, or as approved by the Engineer.

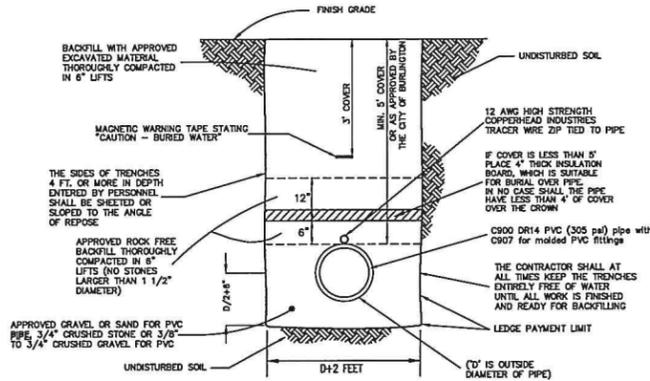
NOTE:

CURB STOPS AND/OR GATE VALVES SHALL NOT BE PLACED IN PAVEMENT, CURB OR SIDEWALK.



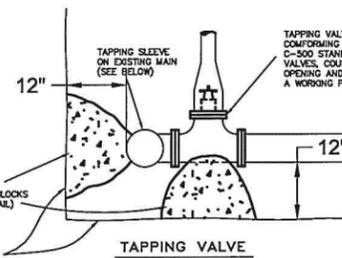
HYDRANT DETAIL

NTS



WATER TRENCH

NTS



NOTES:

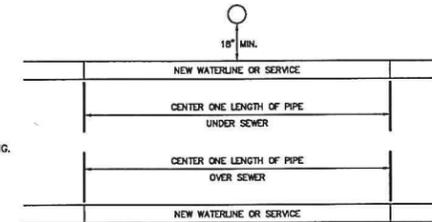
- SLEEVES SHALL HAVE WORKING PRESSURE OF 150 PSI.
- ALL EXTERIOR EXPOSED SURFACES SHALL BE FUSION BOUNDED, EPOXY-COATED TO A MIN. 10 MIL THICKNESS.
- BOLTS AND NUTS SHALL BE TYPE 302 OR 304 STAINLESS STEEL.
- UPON FINAL TIGHTENING AND TESTING ALL BOLTS SHALL BE BRUSH COATED WITH BITUMASTIC COLD APPLIED MATERIAL TO ALL EXPOSED NUTS & BOLTS.
- ALL WET TAPS WILL BE WITNESSED BY A REPRESENTATIVE FROM BOTH THE CITY OF BURLINGTON PUBLIC WORKS DEPT. AND THE CHAMPLAIN WATER DISTRICT.

TAPPING VALVE and SLEEVE DETAIL

NTS

NOTES:

IF 18" OF VERTICAL SEPARATION CAN NOT BE MAINTAINED, THE SEWER LINE SHALL BE CONSTRUCTED TO WATERLINE STANDARDS, A MINIMUM OF 20 FEET BEYOND EACH SIDE OF 20 FEET BEYOND EACH SIDE OF THE CROSSING.



SEWER / WATER SEPARATION DETAIL FOR CROSSINGS

NTS

SOIL TYPE - SAND				
SIZE FITTING	6"	8"	12"	
1 1/4" & 2 1/2"	2	2	5	
4 1/2"	2	4	9	
90"	4	8	17	
TEES OR END CAPS	3	6	12	
VALVES	2	2	2	

SQ FT BEARING AREA

BASED ON 100 PSI WORKING PRESSURE PLUS 100 PSI SURGE ALLOWANCE AND BEARING CAPACITY OF 2000 LBS/SQ FT

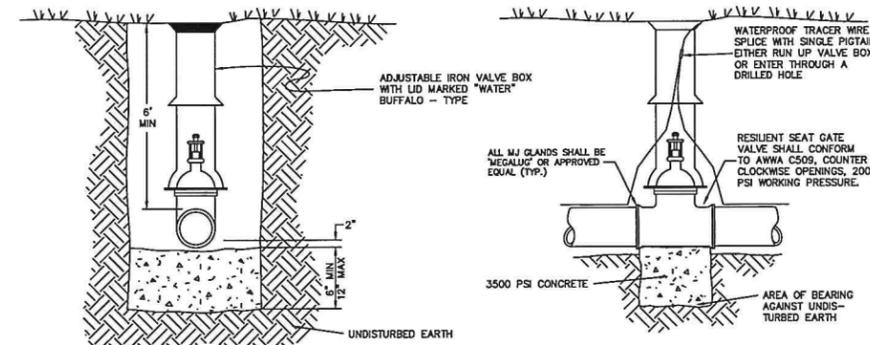
TYPICAL TEES-DEADENDS-CAPS

NOTE: PLACE 4 mil POLYETHYLENE BETWEEN FITTING AND THRUST BLOCK

TYPICAL BENDS

THRUST BLOCK END AREA

NTS



SECTION

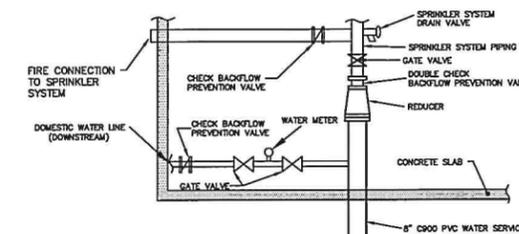
ELEVATION

NOTES:

- AREA OF BEARING AGAINST UNDISTURBED EARTH SHALL BE AS PER THRUST BLOCK SCHEDULE.
- UPON FINAL TIGHTENING, ALL EXPOSED NUTS AND THREADED BAR SHALL BE BRUSH COATED WITH COLD APPLIED BITUMASTIC MATERIAL.
- SEE WRITTEN SPECIFICATIONS FOR FURTHER REQUIREMENTS.

GATE VALVE DETAIL

NTS



WATER / SPRINKLER CONNECTION

NTS

THE CONTRACTOR SHALL NOTIFY "DIGSAFE" AT 1-800-225-4977 PRIOR TO ANY EXCAVATION.



DATE	REVISION	BY
9/27/14	Updated for Final Submittal	SHC
8/26/14	RECORD DRAWING	SHC
8/26/14	FINAL	SHC
8/26/14	PRELIMINARY	SHC
8/26/14	SKETCH/CONCEPT	SHC

DRAWN: EJB/SHC
 CHECKED: SHC
 SCALE: 1"=40'
 O'LEARY-BURKE CIVIL ASSOCIATES, P.C.
 1 CORPORATE DRIVE, SUITE 1
 BURLINGTON, VT 05403
 PHONE: 878-0900
 FAX: 878-6666
 E-MAIL: o'burb@oburke.com

IRELAND PROPERTY

Grove Street Burlington, VT

WATER DETAILS

DATE: 7-23-14
 JOB: 2011-52-59
 FILE: 2011-52-59
 PLAN SHEET # S16