240 MECHANIC STREET, SUITE 100
LEBANON, NEW HAMPSHIRE 03766
(603) 448-2200 • FAX: (603) 448-1221

PATHWAYS CONSULTING, LLC
PLANNING • ENGINEERING • SURVEYING • CONSTRUCTION ASSISTANCE

CONSTRUCTION DRAWINGS FOR

TOWN OF ENFIELD
NH ROUTE 4A SEWER EXTENSION PROJECT
SHAKER LANDING PUMP STATION REPLACEMENT (RE-BID)

ENFIELD, NEW HAMPSHIRE

GRAFTON COUNTY

NHDES CWSRF PROJECT NUMBER: CS-330167-04

JULY 7, 2017

TOWN OF ENFIELD:

BOARD OF SELECTMAN: JOHN W. KLUGE
B. FRED CUMMINGS
MEREDITH C. SMITH

TOWN MANAGER: RYAN AYLESWORTH
ASSISTANT TOWN MANAGER: ALISA BONNETTE

DEPARTMENT OF PUBLIC WORKS DIRECTOR: JIM TAYLOR

SHAKER LANDING HOMEOWNER'S ASSOCIATION BOARD OF DIRECTORS:

JORDAN ORR, PRESIDENT
BEVERLY SLETTON
WALTER WYLAND
SUSAN BROADHURST
BOB CHORNEY

ISSUED FOR BIDDING
JULY 31, 2017

PATHWAYS CONSULTING PROJECT NO. 10068-05

APPLICANT:
TOWN OF ENFIELD
DEPARTMENT
OF PUBLIC WORKS
74 LOCKEHAVEN ROAD
ENFIELD, NEW HAMPSHIRE 03748
603-632-4605

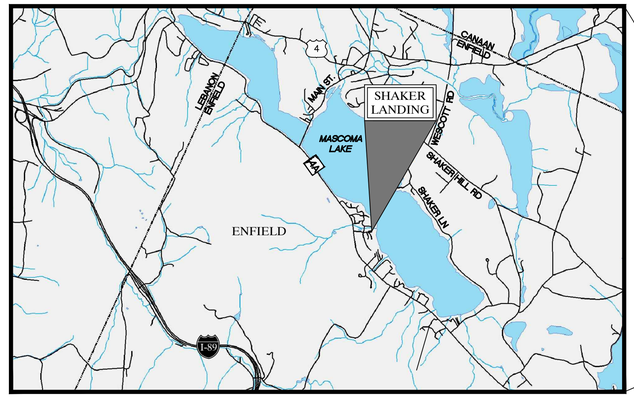
OWNER OF RECORD:
SHAKER LANDING
HOMEOWNER'S ASSOCIATION
ENFIELD, NH 03748
PROPERTY MANAGEMENT COMPANY:
MOSELEY ASSOCIATES, LTD.
P.O. BOX 706
48 STAGECOACH ROAD, WHITE RIVER JCT, VT 05001
802-296-2600

ELECTRICAL ENGINEER:
LEE CARROLL ELECTRICAL
CONSULTANTS
P.O. BOX 357
1 MADISON AVE, GORHAM, NEW HAMPSHIRE 03581
(603) 466-5065

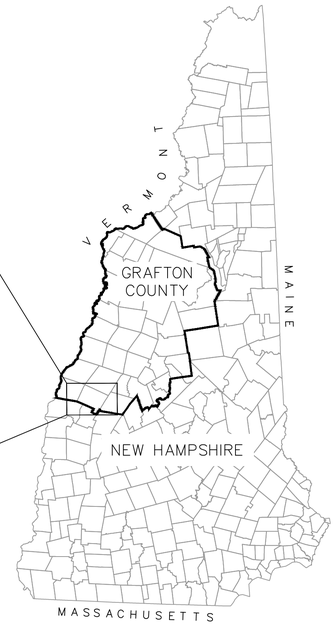
CIVIL ENGINEER/SURVEYOR:
PATHWAYS CONSULTING, LLC
240 MECHANIC STREET
SUITE 100 LEBANON, NEW HAMPSHIRE 03766
(603) 448-2200

STATE OF NEW HAMPSHIRE
RODRICK FINLEY
No. 7468
LICENSED
PROFESSIONAL ENGINEER

INDEX OF SHEETS



LOCATION MAP
N.T.S



VICINITY MAP
N.T.S.

PROJECT AREA:

SHAKER LANDING: LANDING ROAD

LEGEND: EXISTING

- CONTOUR
- EDGE GRAVEL
- RIGHT–OF–WAY/EASEMENT
- STONE WALL
- GUARDRAIL
- DRAINAGE PIPE
- FLOW DIRECTION
- DRAINAGE MANHOLE
- CATCH BASIN
- WASTEWATER PIPE–GRAVITY
- WASTEWATER PIPE–FORCEMAIN
- WASTEWATER SERVICE CONNECTION (APPROX)
- SANITARY MANHOLE
- WASTEWATER MANHOLE
- WASTEWATER VENT
- CLEAN–OUT
- WATERLINE (APPROX.)
- HYDRANT
- WATER VALVE
- WATER STOP VALVE
- UNDERGROUND ELECTRICAL
- UNDERGROUND COMMUNICATIONS
- UNDERGROUND ELECTRICAL/COMMUNICATIONS
- TRANSFORMER
- ELECTRIC POST
- ELECTRIC BOX
- GROUND LIGHT/LIGHT POLE
- ELECTRIC METER
- UTILITY POLE
- TELEPHONE PEDESTOOL
- CABLE TV BOX
- GAS METER
- TREELINE
- HARDWOOD TREE
- SOFTWOOD TREE
- BUSH
- BUILDING
- WETLANDS
- VERNAL POOL
- EDGE WATER
- 250' SHORELAND BUFFER
- FENCE–CHAINLINK
- FENCE–STOCKADE
- FENCE–SPLIT RAIL
- SIGN
- PROPANE TANK
- MAILBOX
- MANHOLE
- STAND PIPE
- LEDGE OUTCROP
- TEMPORARY BENCHMARK (VERTICAL CONTROL)
- TRAVERSE POINT (HORIZONTAL CONTROL)

LEGEND: PROPOSED

- WASTEWATER FORCEMAIN
- WASTEWATER GRAVITY SEWER
- WASTEWATER GRAVITY SEWER MANHOLE
- WASTEWATER FORCEMAIN PUMP STATION
- PROPOSED WORK
- INVESTIGATION TEST PIT
- PROPOSED GRADE

LEGEND: PROPOSED ELECTRICAL

- UNDERGROUND UTILITY PRIMARY POWER
- UNDERGROUND SECONDARY POWER/CONTROLS
- UNDERGROUND TELEPHONE SERVICE
- UNDERGROUND LP GAS LINE
- LED LIGHT FIXTURE; LETTER INDICATES TYPE
- EMERGENCY LIGHT FIXTURE; LETTER INDICATES TYPE
- DUPLEX RECEPTACLE; 36" AFF
- SIMPLEX RECEPTACLE; 36" AFF; "C" INDICATES CORROSION RESISTANT
- SINGLE POLE SWITCH; 48" AFF
- DISCONNECT OR ENCLOSED C/B
- CONNECTION TO FIXED EQUIPMENT
- THERMOSTAT; A INDICATES LOW TEMPERATURE ALARM, EF INDICATES FAN CONT
- MOTOR
- UTILITY METER
- HAND–OFF AUTO SWITCH
- ABOVE FINISHED FLOOR — AFF
- ABOVE FINISHED GRADE — AFG
- AUTOMATIC TRANSFER SWITCH — ATS
- CHEMICAL FEED PUMP — CFP
- GROUND FAULT CIRCUIT INTERRUPTER — GFI
- WATER PROOF — wP
- ELECTRIC UNIT HEATER — EUH
- MOTOR OPERATED DAMPER — MOD
- MANUAL TRANSFER SWITCH — MTS
- PUMP CONTROL PANEL — PCP
- FLOW METER — FM
- EXPLOSION PROOF SWITCH

LEGEND: EROSION CONTROL

- SILT FENCE & EROSION CONTROL SOCK (DOUBLE ROW)
- SILT FENCE OR EROSION CONTROL SOCK (SINGLE ROW)
- EROSION CONTROL SOCK (SINGLE ROW)
- CHECK DAM
- BLOCK & STONE INLET SEDIMENT CONTROL
- SILTSACK–INLET FILTER BAG
- LIMIT OF DISTURBANCE
- 50' NATURAL BUFFER
- DIRECTION OF FLOW ARROW

ISSUED FOR BIDDING
JULY 31, 2017

REVISION NO.	DATE	DESCRIPTION	MADE BY	CHECKED BY	APPROVED BY

INDEX OF SHEETS, CONTEXT PLAN, & LEGEND FOR

TOWN OF ENFIELD - NH ROUTE 4A SEWER EXTENSION

SHAKER LANDING PUMP STATION REPLACEMENT

LANDING ROAD, ENFIELD, NEW HAMPSHIRE

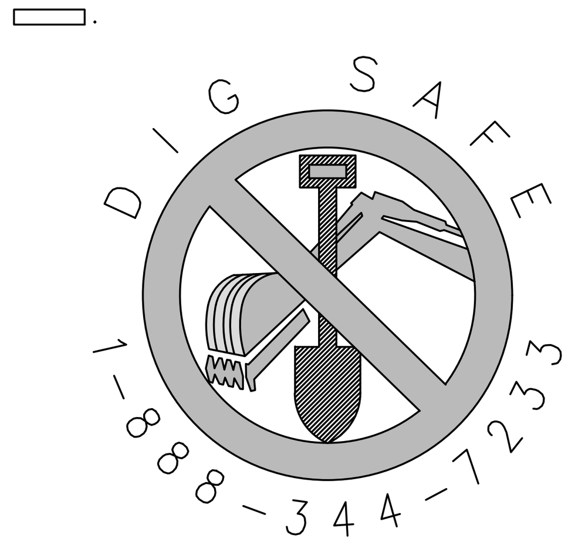
PATHWAYS CONSULTING, LLC

240 MECHANIC STREET, SUITE 100
LEBANON, NEW HAMPSHIRE 03766
(603) 448–2200

SCALE: AS SHOWN	2
DESIGNED BY: ISM	
DRAWN BY: DPM/CRM	
CHECKED BY: RJF	
DATE: 07–07–17	
PROJ. NO. 10068–05	SHEET 2 OF 11

GENERAL CONSTRUCTION NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION CONSTRUCTION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2016; THE NEW HAMPSHIRE ADMINISTRATIVE RULES ENV-WQ 700 STANDARDS OF DESIGN AND CONSTRUCTION FOR SEWERAGE AND WASTEWATER TREATMENT FACILITIES; ALL PROJECT PERMITS AND CONDITIONS; AND ALL LOCAL, STATE, AND FEDERAL LAWS AND REGULATIONS UNLESS OTHERWISE SPECIFIED OR DIRECTED.
2. WRITTEN DIMENSIONS HAVE PRECEDENCE OVER SCALED DIMENSIONS. THE CONTRACTOR SHALL USE CAUTION WHEN SCALING REPRODUCED PLANS. IN CASE OF CONFLICT BETWEEN THIS PLAN SET AND ANY OTHER DRAWINGS AND SPECIFICATION. THE RESIDENT PROJECT REPRESENTATIVE OR OWNER SHALL BE NOTIFIED IMMEDIATELY FOR CLARIFICATIONS.
3. THE CONTRACTOR IS RESPONSIBLE FOR THE MEANS AND METHODS OF CONSTRUCTION AND FOR CONDITIONS AT THE SITE. THESE PLANS PREPARED BY PATHWAYS CONSULTING, LLC DO NOT EXTEND TO OR INCLUDE SYSTEMS PERTAINING TO THE SAFETY OF THE CONSTRUCTION CONTRACTOR OR THEIR EMPLOYEES, AGENTS OR OWNER'S REPRESENTATIVES IN THE PERFORMANCE OF THE WORK. THE SEAL OF THE SURVEYOR OR ENGINEER HEREON DOES NOT EXTEND TO ANY SUCH SAFETY SYSTEMS THAT MAY OR HEREAFTER BE INCORPORATED INTO THESE PLANS. THE CONSTRUCTION CONTRACTOR SHALL PREPARE OR OBTAIN THE APPROPRIATE SAFETY SYSTEMS WHICH MAY BE REQUIRED BY THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA), LOCAL REGULATIONS, AND/OR THE BOARD OF LABOR.
4. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE HIMSELF WITH THE PROJECT AREA AND ALL EXISTING CONDITIONS SURROUNDING IT AND THEREON.
5. THE CONTRACTOR SHALL MAINTAIN EMERGENCY ACCESS TO ALL AREAS AFFECTED BY THEIR WORK AT ALL TIMES.
6. ANY SURFACE OR SUBSURFACE FEATURES DAMAGED BY THE CONTRACTOR DURING CONSTRUCTION SHALL BE RESTORED TO A CONDITION AT LEAST EQUAL TO THAT IN WHICH THEY WERE FOUND IMMEDIATELY PRIOR TO THE BEGINNING OF CONSTRUCTION. ALL COSTS ASSOCIATED WITH THE RESTORATION SHALL BE AT THE CONTRACTORS SOLE EXPENSE.
7. NO BLASTING SHALL OCCUR ON THIS PROJECT WITHOUT PRIOR COMPLETION OF A PRE-CONSTRUCTION SURVEY AND PROOF OF ADDITIONAL INSURANCES TO BE PROVIDED TO THE OWNER.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING AND UNDERSTANDING ALL APPLICABLE ENVIRONMENTAL PERMITS AND ENSURE THAT ALL CONSTRUCTION REQUIREMENTS ARE MET.
9. NO WORK BEYOND THE LIMITS OF CONSTRUCTION SHOWN ON THESE DRAWINGS SHALL BE ALLOWED. WORKING OUTSIDE OF THESE LIMITS MAY TRIGGER ADDITIONAL PERMITTING REQUIREMENTS, WHICH WILL BE THE CONTRACTOR'S RESPONSIBILITY.
10. TYPICAL CROSS SECTIONS ARE MEANT FOR GUIDANCE ONLY. FIELD CONDITIONS MAY VARY AND MUST BE VERIFIED BY THE CONTRACTOR.
11. WETLANDS WERE DELINEATED BY TIMOTHY F. McCORMICK, STATE OF NEW HAMPSHIRE CERTIFIED WETLAND SCIENTIST NO. 081.
12. PUBLIC WORKS PERSONNEL SHALL BE NOTIFIED A MINIMUM OF 72 HOURS PRIOR TO ANY UTILITY CONSTRUCTION. UTILITY CONSTRUCTION MAY ONLY BEGIN AFTER AUTHORIZATION FROM PUBLIC WORKS PERSONNEL.
13. OWNER SHALL BE NOTIFIED PRIOR TO ANY WORK REQUIRING TRAFFIC IMPEDANCE, ROADWAY OR DRAINAGE STRUCTURE DISTURBANCE. CONSTRUCTION MAY ONLY BEGIN AFTER AUTHORIZATION FROM TOWN PERSONNEL OR THE ENGINEER.
14. THE ENGINEER SHALL BE NOTIFIED PRIOR TO CONSTRUCTION IF THERE ARE ANY DISCREPANCIES IN PLANS OR EXISTING DATA. CONSTRUCTION SHALL NOT PROCEED WITHOUT WRITTEN PERMISSION FROM THE ENGINEER.
15. ELECTRICAL, CABLE TELEVISION AND TELEPHONE SERVICE CONNECTIONS ARE SHOWN SCHEMATICALLY ON THESE PLANS. DISCREPANCIES OR CHANGES AS A RESULT OF THESE SERVICES MUST BE APPROVED BY THE ENGINEER IN WRITING PRIOR TO CONSTRUCTION.
16. GRADING SHALL BE DIRECTED TOWARD CATCH BASINS UNLESS OTHERWISE SHOWN ON PLANS OR DIRECTED BY THE ENGINEER IN WRITING.
17. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR CONSTRUCTION ON THIS SITE.
18. THE ENGINEER MAY PROVIDE THE CONTRACTOR WITH EXISTING CONTROL POINTS IF AVAILABLE. THE CONTRACTOR MAY UTILIZE THE PROVIDED CONTROL POINTS AND BENCH MARKS ESTABLISHED BY THE ENGINEER TO SET UP WHATEVER SPECIFIC DETAIL CONTROLS HE MAY NEED FOR ESTABLISHING NORTHINGS, EASTINGS, AND ELEVATIONS FOR THE PROJECT COMPONENTS. CONTROL POINT AND BENCH MARK ACCURACY WOULD HAVE BEEN VERIFIED AT THE TIME OF SURVEY AND IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE ACCURACY OF THESE POINTS PRIOR TO USING THEM FOR CONSTRUCTION OR RECORDING RECORD INFORMATION. IF THE CONTRACTOR FINDS ANY POINT PROVIDED TO BE INACCURATE, THE CONTRACTOR MUST NOTIFY THE ENGINEER IMMEDIATELY IN WRITING. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR LAYOUT OF THE WORK AT THE PROJECT SITE.
19. TEMPORARY GRAVEL BELOW TEMPORARY PAYMENT TO BRING TO GRADE SHALL BE INCIDENTAL TO THE CONTRACT.
20. NEW WORK IDENTIFIED BY ▭.



CONTACT DIG SAFE 72 HOURS PRIOR TO CONSTRUCTION

THE LOCATION OF ANY UTILITY INFORMATION SHOWN ON THIS PLAN IS APPROXIMATE. PATHWAYS CONSULTING, LLC. MAKES NO CLAIM TO THE ACCURACY OR COMPLETENESS OF UTILITIES SHOWN. 72 HOURS PRIOR TO ANY EXCAVATION ON SITE, THE CONTRACTOR SHALL CONTACT DIG-SAFE AT 1-888-DIG-SAFE.

EXISTING UTILITY NOTES

1. UTILITY INFORMATION SHOWN HEREON WAS OBTAINED FROM THE 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 THE UTILITY OWNER. EXPLORATORY EXCAVATION SHALL BE REQUIRED TO VERIFY LOCATION AND SIZE OF EXISTING UTILITIES AND APPURTENANCES.
2. THE CONTRACTOR SHALL NOT DISTURB ANY EXISTING UTILITY SERVICE (PRIVATE OR PUBLIC) WITHOUT WRITTEN AUTHORIZATION FROM THE OWNER.
3. SUBSURFACE FEATURES SUCH AS ELECTRIC AND TELEPHONE LINES, WATER LINES, SEWER LINES, STORM DRAIN AND CULVERTS, ETC., ENCOUNTERED IN THE CONSTRUCTION OF THE PROJECT SHALL BE PROTECTED, SUPPORTED, OR REMOVED AND REPLACED BY THE CONTRACTOR UNLESS OTHERWISE NOTED ON THE PLANS. THE COST OF THIS WORK SHALL BE INCIDENTAL TO THE CONTRACT UNLESS PAYMENT IS SPECIFICALLY NOTED AS A SEPARATE PAY ITEM. THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES AND/OR HIGHWAY DEPARTMENTS WHEN THE WORK INVOLVES THEIR RESPECTIVE FACILITIES.THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING AND DETERMINING THE LOCATION, SIZE AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO START OF ANY CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES FOUND INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION AGREED TO BY THE ENGINEER BEFORE PROCEEDING WITH THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING"DIG-SAFE" (886-DIG-SAFE) AT LEAST 72 HOURS PRIOR TO DIGGING.
4. THE CONTRACTOR SHALL HIRE A PRIVATE LOCATING COMPANY TO LOCATE ALL UTILITIES IN THE PROJECT LIMITS PRIOR TO START OF CONSTRUCTION.
5. THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES OWNING UTILITIES, EITHER OVERHEAD OR UNDERGROUND, WITHIN THE CONSTRUCTION AREA. THE PROTECTION OR RELOCATION OF UTILITIES IS ULTIMATELY THE RESPONSIBILITY OF THE CONTRACTOR.
6. THE CONTRACTOR SHALL COORDINATE MATERIALS AND INSTALLATION SPECIFICATIONS WITH THE INDIVIDUAL UTILITY AGENCIES/COMPANIES, AND ARRANGE FOR ALL INSPECTIONS.
7. ALL MANHOLES IN PAVEMENT SHALL HAVE RIMS SET TO 1/4" BELOW FINISH GRADE REGARDLESS OF ANY ELEVATIONS OTHERWISE SHOWN.
8. THE CONDITION OF EXISTING NHDOT DRAINAGE STRUCTURES AND PIPES IN NH ROUTE 4A WILL NEED TO BE DOCUMENTED BY THE CONTRACTOR BY VIDEO AND PHOTOGRAPHS PRIOR TO THE WORK. DOCUMENTATION SHALL BE PROVIDED TO THE ENGINEER AND NHDOT PRIOR TO THE WORK.

GRAVITY SEWER INFRASTRUCTURE GENERAL NOTES

1. SANITARY SEWER GRAVITY LINES AND MAINS GENERAL:
   A. COORDINATE WITH THE ENGINEER A MINIMUM OF 72 HOURS PRIOR TO SCHEDULING SEWER MAIN OR MANHOLE TESTING. THE ENGINEER WILL COORDINATE DIRECTLY WITH THE OWNER FOR ALL SCHEDULING.
   B. CONTRACTOR SHALL CONFORM TO GUIDELINES DETAILED IN THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES CHAPTER ENV-Wq 700. CONTRACTOR IS RESPONSIBLE FOR READING AND FOLLOWING THE FULL COMPLETE EDITION PROVIDED BY THE STATE OF NEW HAMPSHIRE.
2. SANITARY SEWER GRAVITY PIPE AND TRENCH:
   A. PIPE SHALL BE LAID WITH BELL ENDS FACING UP-GRADIENT, AND LAYING SHALL START AT THE DOWN-GRADIENT END OF THE LINE.
   B. THE SIZE OF THE SANITARY SEWER PIPES SHALL BE AS DEPICTED ON THESE DRAWINGS.
   C. PIPE ALIGNMENT: WITH THE EXCEPTION OF DIRECTION CHANGES MADE WITH APPROVED MANHOLES, ALL PIPE WILL BE INSTALLED STRAIGHT BETWEEN POINTS. PIPING WILL BE INSTALLED WITH A LASER AND TRANSIT FOR HORIZONTAL AND VERTICAL PIPE ALIGNMENT. ON ALL SERVICES LATERALS ONLY NO MORE THAN (2) 22 ½ DEGREE BENDS OR (1) 45 DEGREE BEND MAY BE INSTALLED WITH A SERVICE CLEANOUT FITTING DIRECTLY UP GRADIENT OF THE INSTALLED BEND. ADDITIONAL BENDS AND FITTINGS IN SERVICE LINES SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
   D. TRENCH DIMENSIONS: FOR SEWER PIPES LESS THAN 15 INCHES IN DIAMETER, THE ALLOWABLE TRENCH WIDTH AT A PLANE 12 INCHES ABOVE THE PIPE SHALL BE NO MORE THAN 35 INCHES, FOR SEWER PIPE 15 INCHES AND LARGER, THE ALLOWABLE TRENCH WIDTH SHALL BE EQUAL TO THE PIPE OUTSIDE DIAMETER PLUS 24 INCHES.
   E. BEDDING MATERIAL AND FILL MATERIAL FOR EXCAVATION BELOW GRADES SHALL BE CRUSHED STONE TO ASTM C3-03 STONE SIZE NO. 67.
   F. PIPE BEDDING MATERIAL SHALL EXTEND FROM A HORIZONTAL PLANE THROUGH THE PIPE AXIS TO SIX INCHES BELOW THE BOTTOM OF OUTSIDE SURFACE OF THE PIPE IN SOIL AND TWELVE INCHES IN LEDGE.
   G. THE PIPE BLANKET MATERIAL SHALL BE WELL GRADED SAND FREE FROM ORGANIC MATERIALS, GRADED SUCH THAT 100% PASSES THE ½ INCH SIEVE AND A MAXIMUM OF 15% PASSES A #200 SIEVE.
   H. IN LIEU OF THE SAND BLANKET AS SPECIFIED ABOVE, A STONE BLANKET 6 INCH THICK COMPLETELY AROUND THE PIPE USING APPROVED BEDDING MATERIAL. STONE REQUIRED TO BE 12 INCHES BELOW PIPE IN LEDGE.
   I. PIPE BLANKET MATERIAL SHALL COVER THE PIPE A MINIMUM OF 11 INCHES ABOVE THE CROWN OF THE OUTSIDE SURFACE.
   J. COMPACTION SHALL BE IN 12-INCH LAYERS FOR BEDDING AND BLANKET MATERIALS.
   K. TRENCH BACKFILL MATERIAL FOR THE REMAINDER OF TRENCH SHALL BE NATURAL MATERIALS EXCAVATED FROM THE TRENCH DURING CONSTRUCTION, EXCLUDING, DEBRIS AND GARBAGE, PIECES OF PAVEMENT, ORGANIC MATTER, TOP SOIL, WET OR SOFT MUCK, PEAT OR CLAY, EXCAVATED LEDGE MATERIAL, ROCKS 6-INCHES IN LARGEST DIMENSION, AND ANY MATERIAL NOT APPROVED BY ENGINEER OR OWNER.
   L. WHENEVER SEWERS MUST CROSS WATER MAINS, THE SEWER SHALL BE CONSTRUCTED AS FOLLOWS:
      a. VERTICAL SEPARATION OF THE SEWER AND WATER MAIN SHALL BE NOT LESS THAN 18 INCHES, WITH WATER ABOVE SEWER, AND
      b. SEWER PIPE JOINTS SHALL BE LOCATED AT LEAST 6 FEET HORIZONTALLY FROM THE WATER MAIN.
3. SANITARY SEWER GRAVITY MANHOLES:
   A. MANHOLE SUB-GRADE: MANHOLES WILL BE INSTALLED ON CRUSHED STONE (ASTM C33-03 No. 67 STONE) TO A MINIMUM THICKNESS OF 6 INCHES OR SUFFICIENT DEPTH TO STABILIZE THE MANHOLE SUB-GRADE. THE EXCAVATION MUST BE PROPERLY DEWATERED WHILE PLACING BEDDING MATERIAL AND SETTING BASE.
   B. HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE BARRELS SHALL BE OF AN OVERLAPPING TYPE, SEALED FOR WATER-TIGHTNESS USING A DOUBLE ROW OF AN ELASTOMERIC OR MASTIC TYPE SEALANT.
   C. MANHOLES SHALL HAVE A BRICK PAVED SHELF AND INVERT CONSTRUCTED TO CONFORM TO THE SIZE OF PIPE AND FLOW. AT CHANGES IN DIRECTION, THE INVERTS SHALL BE LAID OUT IN CURVES OF THE LONGEST RADIUS POSSIBLE TANGENT TO THE CENTERLINE OF THE SEWER PIPES. SHELVES SHALL BE CONSTRUCTED TO THE ELEVATION OF THE HIGHEST PIPE CROWN AND SLOPED TO DRAIN THROUGH CHANNEL. UNDERLAYMENT OF INVERT AND SHELF SHALL CONSIST OF BRICK MASONRY. INVERTS AND SHELVES SHALL BE INSTALLED AFTER TESTING IS COMPLETE.
   D. BRICK MASONRY FOR SHELF, INVERT AND GRADE ADJUSTMENT SHALL COMPLY WITH ASTM C32-05, CLAY OR SHALE, FOR GRADE SS HARD BRICK.
4. SANITARY SEWER GRAVITY MAIN TESTING:
   A. ALL GRAVITY SEWER PIPING SHALL BE TESTED WITH A LOW-PRESSURE AIR TEST IN ACCORDANCE WITH ENV-WQ 704.06.
   B. ALL NEW GRAVITY SEWERS SHALL BE CLEANED AND VISUALLY INSPECTED USING A LAMP TEST AND BY INTRODUCING WATER TO DETERMINE THAT THERE IS NO STANDING WATER IN THE SEWER, AND THAT THE LINES HAVE TRUE LINE AND GRADE FOLLOWING INSTALLATION AND PRIOR TO USE. ALL GRAVITY SEWERS SHALL BE VISUALLY INSPECTED AND DEFLECTION TESTED NOT LESS THAN 30 DAYS NOR MORE THAN 90 DAYS FOLLOWING INSTALLATION.
   C. THE MAXIMUM ALLOWABLE DEFLECTION SHALL BE 5% OF AVERAGE INSIDE DIAMETER. A RIGID BALL OR MANDREL WITH A DIAMETER OF AT LEAST 95% OF THE AVERAGE INSIDE PIPE DIAMETER SHALL BE USED FOR TESTING PIPE DEFLECTION. THE DEFLECTION TEST SHALL BE CONDUCTED WITHOUT MECHANICAL PULLING DEVICES.
5. SANITARY SEWER GRAVITY MANHOLE TESTING:
   A. MANHOLES SHALL BE TESTED FOR LEAKAGE IN ACCORDANCE WITH ENV-WQ704.17.
   B. MANHOLES SHALL BE TESTED FOR LEAKAGE USING A VACUUM TEST IN ACCORDANCE WITH THE ASTM C1244 STANDARD IN EFFECT WHEN THE TESTING IS PERFORMED (AVAILABLE AS NOTED IN APPENDIX D OF ENV-WQ 700 ADMINISTRATIVE RULES). A MANHOLE MAY BE BACKFILLED PRIOR TO PERFORMING A VACUUM TEST, BUT IF THE MANHOLE FAILS THE VACUUM TEST, BACKFILL SHALL BE REMOVED SO REPAIRS TO THE MANHOLE CAN BE MADE FROM THE OUTSIDE OF THE MANHOLE PRIOR TO RETESTING.
   C. THE MANHOLES SHALL BE REPAIRED AND RETESTED IF THE TEST HOLD TIMES FAIL TO ACHIEVE THE ACCEPTANCE LIMITS SPECIFIED THE MANHOLE SHALL BE REPAIRED AND RETESTED. SEALING OF MANHOLE JOINTS WITH HYDRAULIC CEMENT IS NOT ACCEPTABLE FOR STRUCTURE REPAIR. THE CONTRACTOR MAY SEAL ALL LIFTING HOLES AND LADDER RUNGS AS NECESSARY WITH HYDRAULIC CEMENT. IF STRUCTURE IS LEAKING AT THE SEAMS, THE STRUCTURE MUST BE DISASSEMBLED AND RESET WITH NEW ELASTOMERIC OR MASTIC JOINTS AND RETESTED. IF THE CONCRETE STRUCTURE IS FOUND TO BE POROUS, OR CANNOT MEET THE TESTING REQUIREMENTS SPECIFIED, IT SHALL BE REMOVED AND REPLACED AT THE CONTRACTORS EXPENSE. INVERTS AND SHELVES SHALL NOT BE INSTALLED UNTIL AFTER SUCCESSFUL TESTING IS COMPLETED.
   D. HYDROSTATIC TESTING IS NOT ACCEPTABLE AS A SUBSTITUTE FOR VACUUM TESTING OF SEWER MANHOLES.
   E. IMMEDIATELY FOLLOWING COMPLETION OF THE LEAKAGE TESTING, THE FRAME AND COVER SHALL BE PLACED ON THE TOP OF THE MANHOLE OR SOME OTHER MEANS USED TO PREVENT ACCIDENTAL ENTRY BY UNAUTHORIZED PERSONS, CHILDREN, OR ANIMALS, UNTIL THE CONTRACTOR IS READY TO MAKE THE FINAL ADJUSTMENTS TO GRADE.

FORCEMAIN SEWER INFRASTRUCTURE GENERAL NOTES

1. SANITARY SEWER FORCEMAIN GENERAL:
   A. COORDINATE WITH THE ENGINEER A MINIMUM OF 72 HOURS PRIOR TO SCHEDULING SEWER MAIN OR MANHOLE TESTING. THE ENGINEER WILL COORDINATE DIRECTLY WITH THE OWNER FOR ALL SCHEDULING.
   B. CONTRACTOR SHALL CONFORM TO GUIDELINES DETAILED IN THE NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES CHAPTER ENV-Wq 700. CONTRACTOR IS RESPONSIBLE FOR READING AND FOLLOWING THE FULL COMPLETE EDITION PROVIDED BY THE STATE OF NEW HAMPSHIRE.
2. SANITARY SEWER FORCEMAIN:
   A. THE FORCEMAIN PIPE SHALL BE INSTALLED BY OPEN EXCAVATION. OPEN EXCAVATION.
   B. FORCEMAIN CONSTRUCTION MUST COMPLY WITH ENV-WQ 704.8.
3. PUMP STATION AND WET WELLS:
   A. PRECAST CONCRETE STRUCTURES SHALL COMPLY WITH SECTIONS ENV-WQ. 704.12 THROUGH ENV-WQ. 704.17.
   B. PUMP STATION STRUCTURES AND WET WELLS WILL BE INSTALLED ON ¾" CRUSHED STONE (ASTM C33-03 No. 67 STONE) TO A MINIMUM THICKNESS OF 11" OR SUFFICIENT DEPTH TO STABILIZE THE MANHOLE SUB-GRADE. THE EXCAVATION MUST BE PROPERLY DEWATERED WHILE PLACING BEDDING MATERIAL AND SETTING BASE.
   C. HORIZONTAL JOINTS BETWEEN SECTIONS OF PRECAST CONCRETE SHALL BE OF AN OVERLAPPING TYPE, SEALED FOR WATER-TIGHTNESS USING A DOUBLE ROW OF AN ELASTOMERIC OR MASTIC TYPE SEALANT.
   D. ALL COMPONENT PARTS OF THESE STRUCTURES SHALL HAVE THE STRENGTH, LEAK RESISTANCE, AND SPACE NECESSARY FOR THE INTENDED SERVICE.
4. FORCEMAIN TESTING:
   A. FORCEMAINS SHALL BE TESTED IN ACCORDANCE WITH SECTION 5 OF THE AWWA C600, "INSTALLATION OF CAST IRON WATER MAINS AND THEIR APPURTENANCES" STANDARD IN EFFECT WHEN THE TEST IS CONDUCTED. TEST SHALL BE AT A PRESSURE EQUAL TO THE GREATER OF 150 PERCENT OF THE DESIGN OPERATING TOTAL DYNAMIC HEAD OR AT LEAST 100 PSI.
5. WET WELL TESTING:
   A. TESTING SHALL BE IN ACCORDANCE WITH ENV-WQ 705.02(i). WET WELLS SHALL BE TESTED PRIOR TO OPERATION USING EXFILTRATION TESTING METHOD ACI 350.1 METHOD HST-NMI IN AFFECT AT THE TIME THE WET WELL IS INSTALLED, COPY AVAILABLE IN PROJECT SPECIFICATIONS. ANY VISIBLE SIGNS OF LEAKAGE SHALL BE REPAIRED AND RETESTED PRIOR TO PLACING THE WET WELL IN SERVICE.

EXISTING WASTEWATER DECOMMISSIONING NOTES

1. FOLLOWING COMPLETION AND ACTIVATION OF THE PUMP STATION UPGRADES AT SHAKER LANDING, ALL EXISTING PUMP STATIONS AND STORAGE TANKS (TO BE DECOMMISSIONED) ARE TO BE ABANDONED IN PLACE. ALL PIPING AND COMPONENTS ARE TO BE REMOVED FROM THE STRUCTURES AND DISPOSED OF OFF-SITE. ELECTRICAL CONNECTIONS ARE TO BE TERMINATED AT THE SOURCE BY A LICENSED ELECTRICIAN, WITH ALL PANELS AND ALARMS TO BE REMOVED FROM THE SITE. STRUCTURES CONCRETE TOPS, RISERS, AND COVERS ARE TO BE REMOVED AND DISPOSED OF OFF-SITE AND THE STRUCTURES ARE TO BE FILLED WITH SAND AND COMPACTED TO THE TOP OF THE CONCRETE STRUCTURE. STRUCTURES ARE TO BE DEMOLISHED AND ABANDONED A MINIMUM OF 1' BELOW FINISH GRADE.
2. THE CONTRACTOR SHALL PROVIDE AND PERFORM WASTEWATER PUMPING SERVICES FOR ALL STRUCTURES (SOLIDS AND LIQUIDS) TO REMOVE ALL WASTEWATER FROM THE STRUCTURES PRIOR TO DECOMMISSIONING. ALL FORCE MAIN LINES SHALL BE DRAINED BACK INTO THE TANKS PRIOR TO PUMPING.
3. ALL PIPE PENETRATIONS ENTERING OR EXITING STRUCTURES SHALL BE CAPPED WITH A GASKETED CAP MEETING THE PIPE SIZE AND TYPE.
4. ALL AREAS DISTURBED BY DECOMMISSIONING EFFORTS SHALL BE RESTORED TO THE EXISTING CONDITION.
5. WORK FOR DECOMMISSIONING OF THE EXISTING WASTEWATER SYSTEM COMPONENTS ARE TO BE PAID FOR AT A LUMP SUM PRICE IN ACCORDANCE WITH THE CONTRACT. PAYMENT FOR THE WORK WILL BE MEASURED BASED ON THE PERCENTAGE OF THE WORK COMPLETE AND ACCEPTED BY THE ENGINEER.

CONSTRUCTION SEQUENCE/REQUIREMENTS

1. ONCE THE CONTRACT IS SIGNED, THE PRIME CONTRACTOR IS RESPONSIBLE FOR PROVIDING A DETAILED CONSTRUCTION SCHEDULE TO THE ENGINEER AND OWNER FOR REVIEW PRIOR TO THE PRE-CONSTRUCTION MEETING.
2. THE CONTRACTOR SHALL ATTEND A PRE-CONSTRUCTION MEETING FOR THE PROJECT WITH THE TOWN, ENGINEER, STATE, AND OTHER PROJECT PARTIES PRIOR TO MOBILIZING TO THE SITE AND STARTING CONSTRUCTION. THE PRIME CONTRACTOR'S MAJOR SUBCONTRACTORS ON THE PROJECT MUST ATTEND THE PRE-CONSTRUCTION MEETING.
3. THE CONTRACTOR SHALL SUBMIT ALL MATERIAL SUBMITTALS AND SHOP DRAWINGS TO THE ENGINEER FOR APPROVAL PRIOR TO ANY MATERIALS BEING DELIVERED TO THE PROJECT SITE.
4. THE CONTRACTOR SHALL SUBMIT A STAGING LOCATION PLAN FOR THE CONSTRUCTION SITE STAGING. IF STAGING IS OCCURRING ON PRIVATE OR STATE PROPERTY, THE CONTRACTOR IS REQUIRED TO PROVIDE WRITTEN DOCUMENTS SIGNED BY THE PROPERTY OWNER OR STATE OFFICIAL WITH THE SUBMITTED PLAN. THIS PLAN SHALL ALSO SHOW THE LOCATION OF THE PROPOSED LABOR COMPLIANCE BULLETIN BOARD, AND THE PROJECT FUNDING CONSTRUCTION SIGN REQUIRED BY NHDES CWSRF.
5. THE PRIME CONTRACTOR SHALL INSTALL ALL NECESSARY EROSION CONTROLS WITHIN THE PROJECT LIMITS PRIOR TO START OF EARTHWORK IN ACCORDANCE WITH THE EPA CONSTRUCTION GENERAL PERMIT (AS APPLICABLE) AND THE STORMWATER POLLUTION AND PREVENTION PLAN (SWPPP) AS APPLICABLE. A NOTICE OF INTENT (NOI) MUST BE FILED AND ACCEPTED BY THE EPA 14 DAYS PRIOR TO STARTING WORK IF THIS PROJECT REQUIRES AN EPA CGP.
6. THE PRIME CONTRACTOR SHALL COMPLETE A PRE-CONSTRUCTION VIDEO OR PHOTO LOG SURVEY WITHIN THE ENTIRE PROJECT LIMITS AND OFF-SITE STAGING AREAS PRIOR TO CONSTRUCTION. COPIES OF THIS SURVEY MUST BE PROVIDED TO THE TOWN AND ENGINEER PRIOR TO CONSTRUCTION. THIS SURVEY WILL BE A RESOURCE TO RESOLVE DISPUTES THAT MAY OCCUR DURING AND AFTER CONSTRUCTION. A DATE STAMP MUST BE INCLUDED IN THE PHOTOS OR VIDEO COLLECTED.
7. THE GRAVITY MAINS AND FORCEMAINS, SEWER MANHOLES, VALVE MANHOLE, PUMP STATION, AND MISCELLANEOUS COMPONENTS SHALL BE TESTED IN ACCORDANCE WITH THE NHDES ENV-WQ 700 NEW HAMPSHIRE CODE OF ADMINISTRATIVE RULES REQUIREMENTS PRIOR TO DISCHARGING ANY WASTEWATER FLOWS TO THE SYSTEM. PASSING TEST REPORTS SHALL BE RECORDED AND KEPT BY THE ENGINEER AS RECORD ON THE PROJECT.
8. ALL LAWNS AND GREEN SPACE MUST BE RE-VEGETATED TO 70% AS DETERMINED BY THE ENGINEER PRIOR TO FINAL COMPLETION ON THE PROJECT.
9. ALL STAGING AND LAYDOWN AREAS MUST BE RESTORED TO ORIGINAL CONDITION OR BETTER PRIOR TO FINAL COMPLETION ON THE PROJECT.
10. ALL TEMPORARY EROSION CONTROL COMPONENTS (I.E. SILT FENCE) MUST BE REMOVED AND DISPOSED OF OFF SITE FOLLOWING PERMANENT STABILIZATION AS DETERMINED BY THE ENGINEER.
11. RECORD COORDINATES AND ELEVATIONS MUST BE PROVIDED TO THE ENGINEER IN ACCORDANCE WITH THE PROJECT RECORD REQUIREMENTS PRIOR TO FINAL COMPLETION AND ACCEPTANCE OF THE WORK.

GENERAL EARTHWORK NOTES

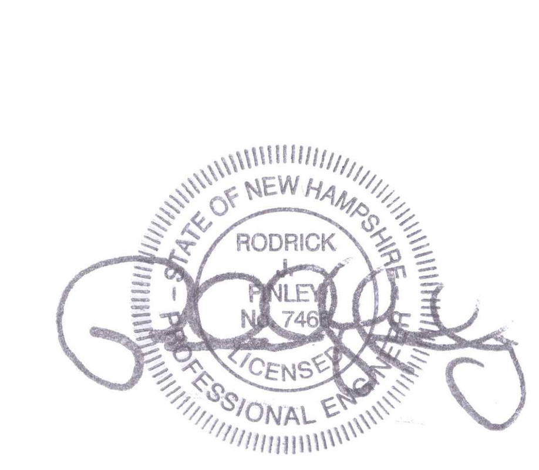
1. GENERAL EARTHWORK:
   A. ALL MATERIAL SPECIFIED, BUT NECESSARY REVIEW FOR COMPLETION OF THE WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NHDOT STANDARDS AND SPECIFICATIONS FOR ROADWAY AND BRIDGE CONSTRUCTION.
   B. COMMON EXCAVATION SHALL CONSIST OF ALL EXCAVATION OTHER THAN ROCK AND BOULDER EXCAVATION THAT IS NOT SPECIFICALLY CLASSIFIED.
   C. EXCAVATION TO SUBGRADE SHALL BE DONE SO THAT THE SUBGRADE MATERIAL DOES NOT BECOME SATURATED WITH WATER OR CONTAMINATED WITH ORGANIC MATTER TO A DEGREE THAT SUBGRADE IS UNSTABLE.
   D. SUBGRADE SOILS MADE UNSTABLE BY ERROR OR NEGLIGENCE OF THE CONTRACTOR SHALL BE REMOVED AND REPLACED BY SELECT BACKFILL AT THE CONTRACTOR'S EXPENSE.
   E. UNSUITABLE MATERIAL SHALL CONSIST OF DEPOSITS OF SATURATED OR UNSATURATED MIXTURES OF SOILS AND ORGANIC MATTER NOT SUITABLE FOR FOUNDATION MATERIAL REGARDLESS OF MOISTURE CONTENT. UNSUITABLE MATERIALS ENCOUNTERED DURING ROADWAY EXCAVATION SHALL BE REMOVED AND REPLACED BY COMMON OR SELECT BACKFILL, AS DIRECTED BY THE ENGINEER.
   F. SUBGRADE SURFACES SHALL BE DRY AND FIRM BEFORE PLACING GRANULAR SURFACE MATERIALS. SUBGRADE MATERIAL DISTURBED DURING EXCAVATION SHALL BE THOROUGHLY COMPACTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
   G. ALL FILL MATERIAL SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER.
   H. BASE COURSE MATERIAL SHALL BE PLACED IN 8" MAXIMUM LIFTS AND THOROUGHLY COMPACTED AS REQUIRED PRIOR TO SUCCESSIVE LIFTS. CARE SHALL BE TAKEN TO PREVENT SEPARATION OF GRANULAR MATERIALS DURING PLACEMENT. SEGREGATED MATERIALS SHALL BE REMOVED AND REPLACED USING METHODS CALCULATED TO REDUCE THE SEPARATION OF AGGREGATES.
2. PAVING
   A. ALL PAVING SHALL CONFORM TO THE REQUIREMENTS OF THE NHDOT STANDARDS AND SPECIFICATIONS FOR ROADWAY AND BRIDGE CONSTRUCTION, AS WELL AS APPLICABLE TOWN STANDARDS.
   B. PAVEMENT SHALL NOT BE INSTALLED WHEN THE OUTSIDE AIR TEMPERATURE IS BELOW 45 DEGREES FAHRENHEIT, NOR WHEN THE ROAD BASE TEMPERATURE IS BELOW 40 DEGREES FAHRENHEIT. PAVEMENT SHALL NOT FALL BELOW 185 DEGREES FAHRENHEIT PRIOR TO COMPLETION OF THE ROLLING PROCESS. PAVEMENT SHALL NOT BE INSTALLED WHEN THE SUBGRADE IS FROZEN OR THE GRADES ARE INCORRECT. TRAFFIC SHALL NOT BE ALLOWED ONTO NEWLY PAVED SURFACES UNTIL COMPACTION IS COMPLETED AND PAVEMENT SURFACE TEMPERATURE IS LESS THAN 150 DEGREES FAHRENHEIT.
3. COMPACTION
   A. MATERIAL DENSITY REQUIREMENTS SHALL BE FIELD DETERMINED IN ACCORDANCE WITH AASHTO T191 (SAND CONE) OR ASTM D2922/AASHTO T238-239 (NUCLEAR METHOD). MAXIMUM DENSITY SHALL BE DETERMINED BY ASTM D1557 MODIFIED PROCTOR. COMPACTION OF BACKFILL MATERIAL BELOW FOUNDATIONS, ABOVE THE BOTTOM OF FOUNDATIONS, AND BELOW PAVEMENT AND BUILDING SLABS SHALL BE 95% OF THE MAXIMUM DENSITY.
   B. FREQUENCY OF TESTING SHALL BE DETERMINED BY THE ENGINEER BASED UPON THE CONTRACTOR'S NOTIFICATION OF COMPLETED AREAS.
   C. MATERIAL DENSITY TESTS WHICH INDICATE DEFICIENT MATERIAL OR INSUFFICIENT COMPACTION FOLLOWING A FIRST FAILURE SHALL BE PAID FOR BY THE CONTRACTOR. DENSITY TESTS RESULTING FROM A MATERIALS CHANGE BY THE CONTRACTOR OR REPEATED FAILURES SHALL BE PAID FOR BY THE CONTRACTOR.
   D. MATERIAL WHICH DOES NOT MEET THE MINIMUM DENSITY REQUIREMENTS SHALL BE REWORKED IN ACCORDANCE WITH THE NHDOT SPEC. OR REMOVED AND REPLACED, AT THE CONTRACTOR'S EXPENSE, WITH ACCEPTABLE MATERIAL.
   D. THE TAKING OF SAMPLES AND THE PERFORMING OF FIELD COMPACTION DENSITY TESTS SHALL BE DONE BY AN INDEPENDENT TESTING LABORATORY.
   E. CONTRACTOR SHALL PROVIDE AT LEAST ONE QUALIFIED PERSON WHO SHALL BE PRESENT AT ALL TIMES DURING THE SOIL COMPACTION OPERATIONS AND WHO SHALL BE THOROUGHLY FAMILIAR WITH THE VARIOUS TYPES OF COMPACTION EQUIPMENT, PROPER COMPACTING TECHNIQUES AND METHODS, AND SOILS BEHAVIOR, AND WHO SHALL DIRECT THE COMPACTION OPERATIONS.
   F. COMPACTION SHALL NOT TAKE PLACE IN FREEZING WEATHER OR WHEN MATERIALS TO BE COMPACTED ARE FROZEN, TOO WET OR MOIST, OR TOO DRY.
   G. MOISTEN OR DRY EACH LAYER OF MATERIAL TO ACHIEVE OPTIMUM MOISTURE CONTENT. UNLESS OTHERWISE SPECIFIED OR DIRECTED BY ENGINEER. COMPACT EACH LAYER OF MATERIAL TO THE SPECIFIED REQUIREMENTS.
   H. ROADS – ONE TEST FOR EACH LAYER OF COMPACTED FILL AND BASE MATERIAL AT INTERVALS OF APPROXIMATELY 300' ALONG THE ROADWAY.
   I. TRENCHES – ONE TEST FOR TWO FEET OF BACKFILL AT INTERVALS OF APPROXIMATELY 300' ALONG THE TRENCH IN ROADWAYS.

PROJECT RECORDS

1. THE CONTRACTOR MUST PROVIDE PROPER INSTRUMENTATION TO RECORD ACCURATE COORDINATES AS WELL AS ELEVATIONS TO WITHIN 0.01' FOR ALL PIPE (INVERTS), FITTINGS, CLEANOUTS, CROSSINGS, STRUCTURES (RIM AND INVERTS), PROPANE TANK, AND BUILDING CORNERS. THIS INFORMATION MUST BE SUBMITTED IN AUTOCAD (.DWG) FORMAT TO THE ENGINEER PRIOR TO FINAL COMPLETION AND ACCEPTANCE ON THE PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR CHECKING THE ACCURACY OF THIS INFORMATION THROUGHOUT CONSTRUCTION. IF THE CONTRACTOR IS NOT CAPABLE OF COMPLETING THE RECORD WORK LISTED ABOVE, THEY MUST CONTRACT THIS WORK TO AN APPROPRIATE PARTY THAT HAS THE CAPABILITY AS SUBSIDIARY TO THIS WORK. FINAL COMPLETION WILL NOT BE AWARDED IF THIS IS NOT COMPLETED AND THE CONTRACTOR WILL BE SUBJECT TO LIQUIDATED DAMAGES.
2. THE CONTRACTOR SHALL PROVIDE FOUR (4) COPIES OF EACH MANUFACTURER'S DETAILED INSTRUCTIONS FOR MAINTENANCE AND OPERATION OF ALL MAJOR EQUIPMENT, MACHINERY, INSTRUMENTATION AND MONITORING DEVICES, CONTROLS AND INCIDENTALS PROVIDED UNDER THE CONTRACT. PREPARE ALL SUCH MANUALS IN ACCORDANCE WITH THE PROJECT CLOSEOUT REQUIREMENTS OF THE CONTRACT. SUCH MANUALS MUST BE PROVIDED PRIOR TO STARTUP AND ACTIVATION OF THE SYSTEMS WITH THE TOWN. SEWERAGE PUMP STATION OPERATION AND MAINTENANCE MANUALS SHALL COMPLY WITH THE REQUIREMENTS OF ENV-WQ. 705.10.

PLANIMETRIC AND DATUM NOTES

1. TOPOGRAPHIC AND PLANIMETRIC INFORMATION COMPLETED BY PATHWAYS CONSULTING, LLC. IN APRIL-AUGUST 2016.
2. HORIZONTAL DATUM IS NH STATE PLAN NAD83 & VERTICAL DATUM IS NGVD29.
3. RIGHT OF WAY INFORMATION WAS APPROXIMATED BASED ON NH ROUTE 4A BEING A 66-FOOT WIDE RIGHT-OF-WAY BEING CENTERED ON THE CENTERLINE OF THE ROAD.
4. RIGHT-OF-WAY LINES SHOWN ON THESE PLANS ARE BELIEVED TO BE ACCURATE BASED UPON EXISTING PHYSICAL FEATURES ONLY. THESE LINES SHALL NOT BE RELIED UPON FOR PURPOSES UNRELATED TO THE ACQUISITION OF LAND AND RIGHTS TO CONSTRUCT THIS PROJECT.



ISSUED FOR BIDDING
JULY 31, 2017

REVISION NO.	DATE	DESCRIPTION	MADE BY	CHECKED BY	APPROVED BY

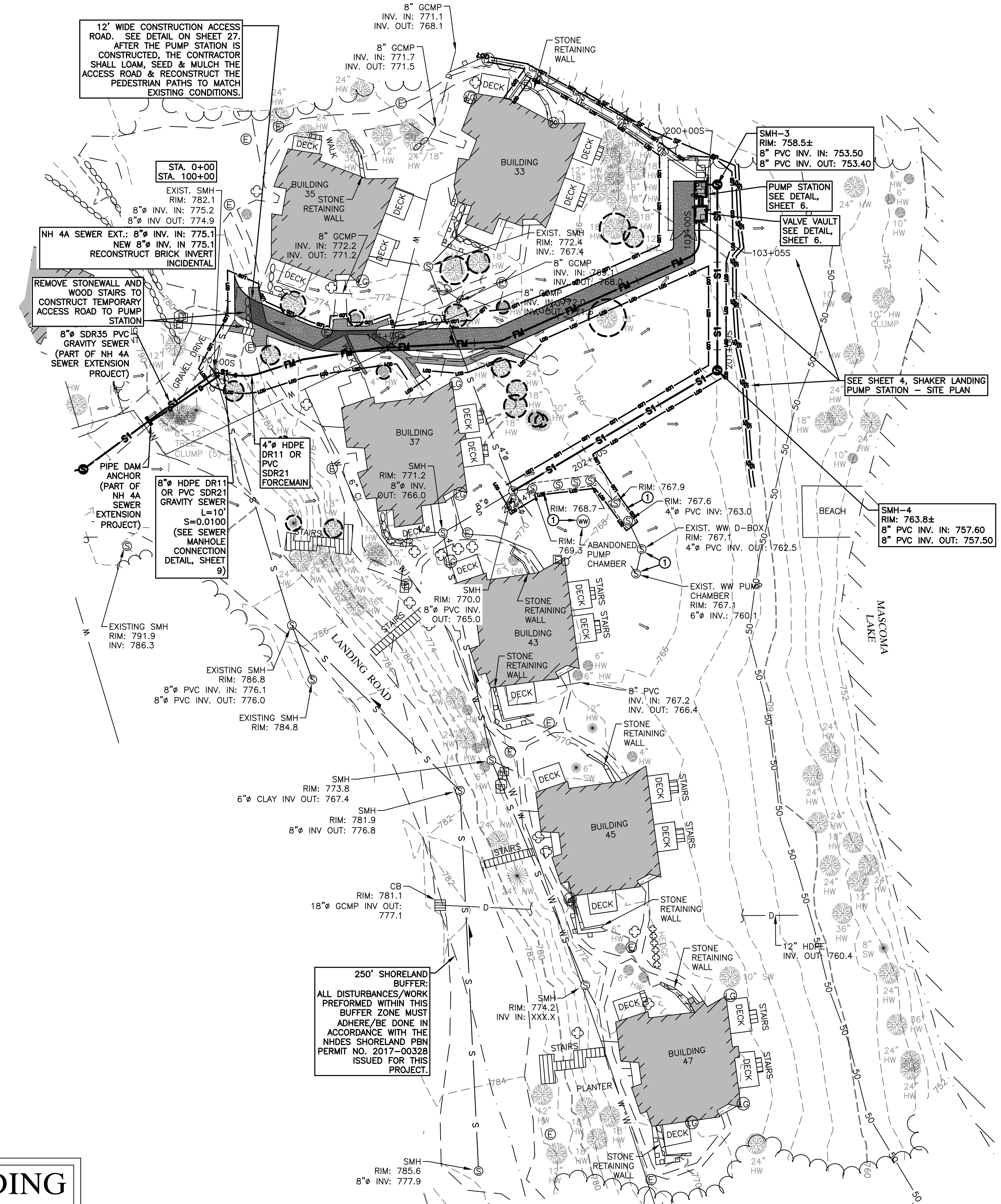
GENERAL NOTES FOR

TOWN OF ENFIELD - NH ROUTE 4A SEWER EXTENSION
SHAKER LANDING PUMP STATION REPLACEMENT

LANDING ROAD, ENFIELD, NEW HAMPSHIRE

PATHWAYS CONSULTING, LLC
240 MECHANIC STREET, SUITE 100
LEBANON, NEW HAMPSHIRE 03766
(603) 448-2200

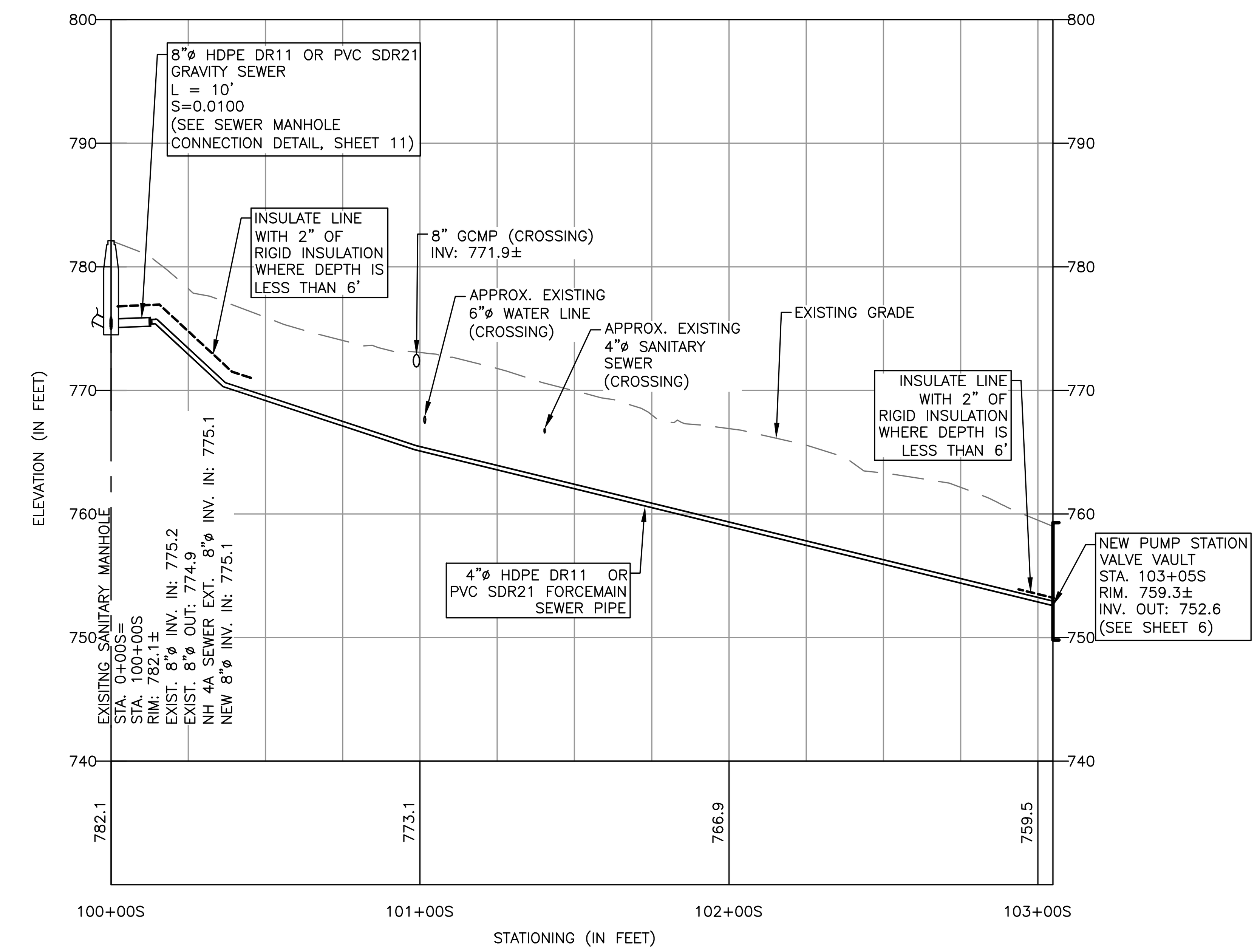
SCALE: AS SHOWN	3
DESIGNED BY: RJF	
DRAWN BY: JDD/DPM	
CHECKED BY: RJF	
DATE: 07-07-17	
PROJ. NO. 10068-05	SHEET 3 OF 11



SHAKER LANDING PLAN

FORCEMAIN SEWER STA. 100+00S TO 103+07S
GRAVITY SEWER STA. 200+00S TO 202+47S

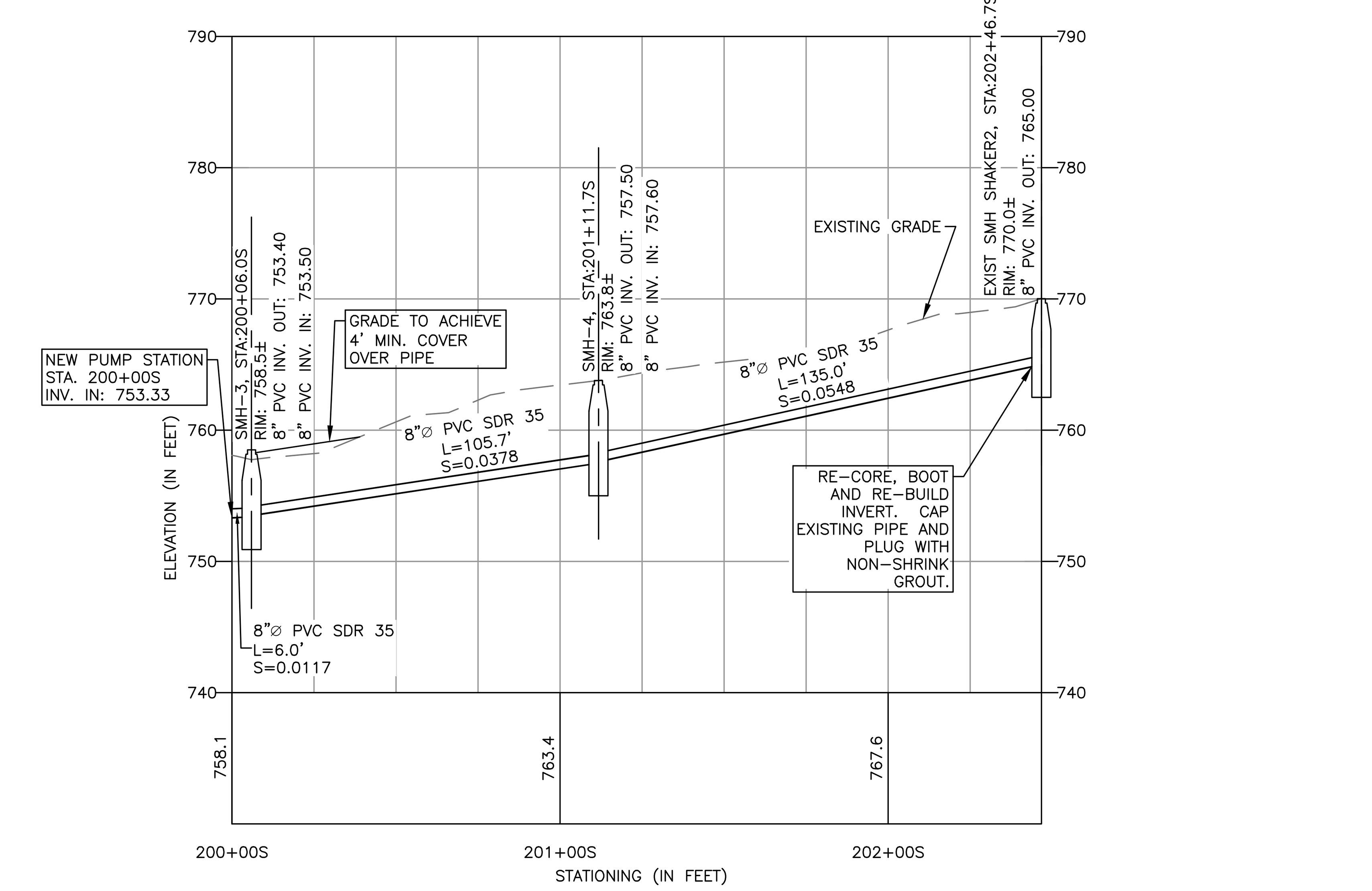
0 40 80 120 160 200 IN FEET



PROFILE
FORCEMAIN SEWER STA. 100+00S TO 103+07S

VERTICAL: 0 10 20 IN FEET

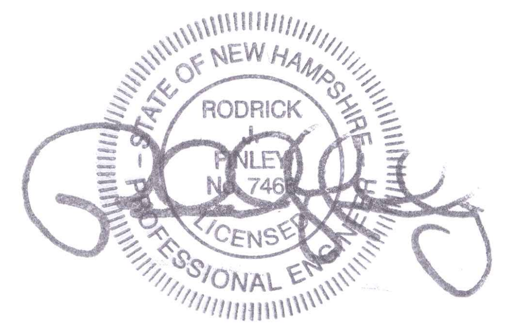
HORIZONTAL: 0 40 80 IN FEET



PROFILE
GRAVITY SEWER STA. 200+00S TO 202+47S

VERTICAL: 0 10 20 IN FEET

HORIZONTAL: 0 40 80 IN FEET



ISSUED FOR BIDDING
JULY 31, 2017

GENERAL NOTES:

1. DECOMMISSION GRAVITY WASTEWATER SYSTEMS IN ACCORDANCE WITH EXISTING WASTEWATER DECOMMISSIONING NOTES ON SHEET 3. D-BOXES NEED TO BE LOCATED BY CONTRACTOR.

REVISION NO.	DATE	DESCRIPTION	MADE BY	CHECKED BY	APPROVED BY

SHAKER LANDING SITE PLAN FOR

TOWN OF ENFIELD - NH ROUTE 4A SEWER EXTENSION
SHAKER LANDING PUMP STATION REPLACEMENT

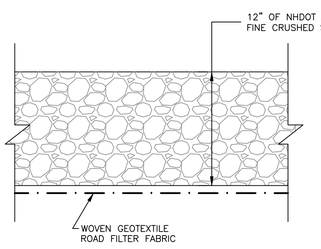
LANDING ROAD, ENFIELD, NEW HAMPSHIRE

PATHWAYS CONSULTING, LLC
240 MECHANIC STREET, SUITE 100
LEBANON, NEW HAMPSHIRE 03766
(603) 448-2200

SCALE: AS SHOWN	4
DESIGNED BY: ISM	
DRAWN BY: DPM/CRM	
CHECKED BY: RJF	
DATE: 07-07-17	
PROJ. NO. 10068-05	SHEET 4 OF 11

GENERAL NOTES:

1. CONTRACT DOCUMENTS ARE IN PART DIAGRAMMATIC, INTENDED TO CONVEY SCOPE & GENERAL ARRANGEMENT, DESIGN INTENT AND EXTENT OF THE WORK. VERIFY ALL SPACES IN WHICH WORK WILL BE PERFORMED BY ON-SITE MEASUREMENTS. THEY ARE NOT INTENDED TO BE SCALED FOR ROUGHING-IN MEASUREMENTS OR TO SERVE AS SHOP DRAWINGS DO NOT SCALE DRAWINGS.
2. DETAILS SHOWN ON ANY DRAWING ARE TO BE CONSIDERED TYPICAL FOR ALL SIMILAR CONDITIONS, UNLESS OTHERWISE INDICATED.
3. CONTRACTOR SHALL VISIT THE SITE TO ASCERTAIN EXISTING CONDITIONS.
4. WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE LATEST IMC, NEC, NFPA, IBC, ICC, ASHRAE GUIDE, SMACNA, ANY GOVERNING ENERGY CODES, UNDERWRITERS LABORATORIES, AND ALL MUNICIPAL, STATE AND OTHER AUTHORITIES, PUBLIC AND PRIVATE HAVING JURISDICTION. REPORT ALL DISCREPANCIES WITH SUCH REGULATIONS TO THE ENGINEER AND DO NOT PROCEED WITH ANY WORK UNTIL WRITTEN AUTHORIZATION IS RECEIVED FROM THE ENGINEER.
5. ALL WORK SHALL CONFORM TO ALL FEDERAL, STATE, AND LOCAL CODES AND STANDARDS INCLUDING, BUT NOT LIMITED TO, NFPA, IBC, UL, SMACNA, OSHA, AND NEC.
6. ALL SYSTEMS SHALL COMPLY WITH SMACNA, NFPA, ASME, UL AND ASHRAE STANDARDS.
7. WORKMANSHIP SHALL BE OF THE BEST QUALITY AND DONE BY COMPETENT MECHANICS SKILLED IN THEIR TRADES. UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND EQUIPMENT UNDER THIS DIVISION SHALL BE NEW AND EACH ARTICLE OF ITS KIND SHALL BE THE STANDARD PRODUCT OF A SINGLE MANUFACTURER.
8. THE WORKMANSHIP AND MATERIALS COVERED BY THESE SPECIFICATIONS WILL CONFORM TO ALL ORDINANCES AND REGULATIONS OF ALL AUTHORITIES HAVING JURISDICTION (AHJ), INCLUDING BUT NOT LIMITED TO, ALL APPLICABLE REGULATIONS OF THE TOWN, COUNTY AND STATE.
9. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AS THERE MAY BE VARIOUS CONDITIONS AT THE SITE WHICH DO NOT SHOW ON THE ACCOMPANYING DRAWINGS, OR WHICH ARE AT VARIANCE WITH THE CONDITIONS INDICATED ON THE DRAWINGS. IT IS IMPORTANT THAT EACH BIDDER VISIT THE SITE TO BECOME ACQUAINTED WITH THE EXISTING CONDITIONS AND TO TAKE THESE CONDITIONS INTO CONSIDERATION WHEN PREPARING THEIR PROPOSAL. EACH BIDDER SHALL OBTAIN ALL INFORMATION OR MAKE ALL MEASUREMENTS DESIRED ON SITE. LACK OF KNOWLEDGE RELATIVE TO THE EXISTING SITE CONDITION WILL NOT BE ALLOWED AS A BASIS FOR EXTRA COMPENSATION.
10. COORDINATE ALL WORK WITH EXISTING CONDITIONS TO AVOID INTERFERENCE. NO CHANGE IN CONTRACT PRICE WILL BE ALLOWED BECAUSE OF ANY WORK MADE NECESSARY BY FAILURE TO DO THE REQUIRED COORDINATION.
11. CONTRACTOR AND SUBCONTRACTORS SHALL PROTECT THE WORK SITE, SURROUNDING AREAS AND OCCUPANTS FROM DAMAGE AND INJURY.
12. CONTRACTOR AND ALL SUBCONTRACTORS SHALL FAMILIARIZE THEMSELVES WITH THE CONTRACT DOCUMENTS. ALL DRAWINGS OF ANY PARTICULAR TRADE SHALL BE USED IN CONJUNCTION WITH DRAWINGS OF ALL OTHER TRADES TO COORDINATE ALL CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE AFFECTED WORK. ANY PROPOSED CHANGES, VARIATIONS, OR SUBSTITUTIONS MUST BE REVIEWED AND ACCEPTED BY THE ENGINEER PRIOR TO IMPLEMENTATION.
13. COORDINATE WORK WITH TRADES PRIOR TO EQUIPMENT INSTALLATION.
14. TAKE ALL NECESSARY MEASUREMENTS AT THE SITE AND FABRICATE THE DUCTWORK AND PIPING ON SITE IF REQUIRED, TO ENSURE AN APPROVABLE AND ACCEPTABLE INSTALLATION.
15. PROVIDE ALL MATERIALS AND FITTINGS NECESSARY FOR A COMPLETE INSTALLATION. DO NOT SCALE THE DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL DIMENSIONS (AS-BUILT OR OTHERWISE) BEFORE COMMENCING FABRICATION, AND/OR ORDERING MATERIALS.
16. COORDINATE WITH ELECTRICAL CONTRACTOR THE LOCATIONS AND NUMBERS OF ALL DISCONNECTS TO BE MOUNTED ON EQUIPMENT.
17. PROVIDE MOTOR STARTERS FOR HVAC EQUIPMENT TO THE ELECTRICAL CONTRACTOR FOR INSTALLATION BY THE ELECTRICAL CONTRACTOR.
18. ANY SUBSTITUTION FOR THE SCHEDULED EQUIPMENT MUST BE SUBMITTED IN WRITING FOR APPROVAL BY THE ENGINEER PRIOR TO INSTALLATION. SUBSTITUTIONS WILL BE CONSIDERED ONLY IF THE EQUIPMENT CAPACITY AND PERFORMANCE ARE EQUAL TO OR GREATER THAT THE MANUFACTURER SPECIFIED BY THE ENGINEER.
19. IN THE EVENT THE CONTRACTOR ENCOUNTERS MATERIAL REASONABLY BELIEVED TO BE HAZARDOUS WHICH HAS NOT BEEN RENDERED HARMLESS, THE CONTRACTOR SHALL IMMEDIATELY STOP WORK IN THE AREA AFFECTED AND REPORT THE CONDITION TO THE OWNER AND ARCHITECT/ENGINEER IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED UNTIL WRITTEN VERIFICATION BY THE OWNER THAT THE MATERIAL HAS BEEN REMOVED OR OTHERWISE RENDERED HARMLESS.
20. THE CONTRACTOR WILL PROVIDE ALL SUPERVISION, LABOR, EQUIPMENT AND MATERIALS NECESSARY TO COMPLETE THE PUMP STATION.
21. THE CONTRACTOR WILL INSTALL EQUIPMENT IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.
22. EQUIPMENT WILL BE INSTALLED WITH PROPER CLEARANCE FOR MAINTENANCE. FILTERS, COILS, DRIVES, VALVES, AND CONTROLS WILL BE ACCESSIBLE FOR SERVICE AND/OR REPLACEMENT.
23. PROVIDE ADEQUATE SUPPORTS AND HANGERS FOR ALL SUSPENDED EQUIPMENT, PIPING, AND DUCTWORK PER CODES AND STANDARDS PREVIOUSLY LISTED.
24. EQUIPMENT WILL BE STARTED, TESTED, ADJUSTED, BALANCED, AND PLACED IN SATISFACTORY OPERATING CONDITION.
25. THE CONTRACTOR WILL INSTRUCT THE OWNER IN THE PROPER OPERATION OF EQUIPMENT.



CONSTRUCTION ACCESS ROAD DETAIL
N.T.S.

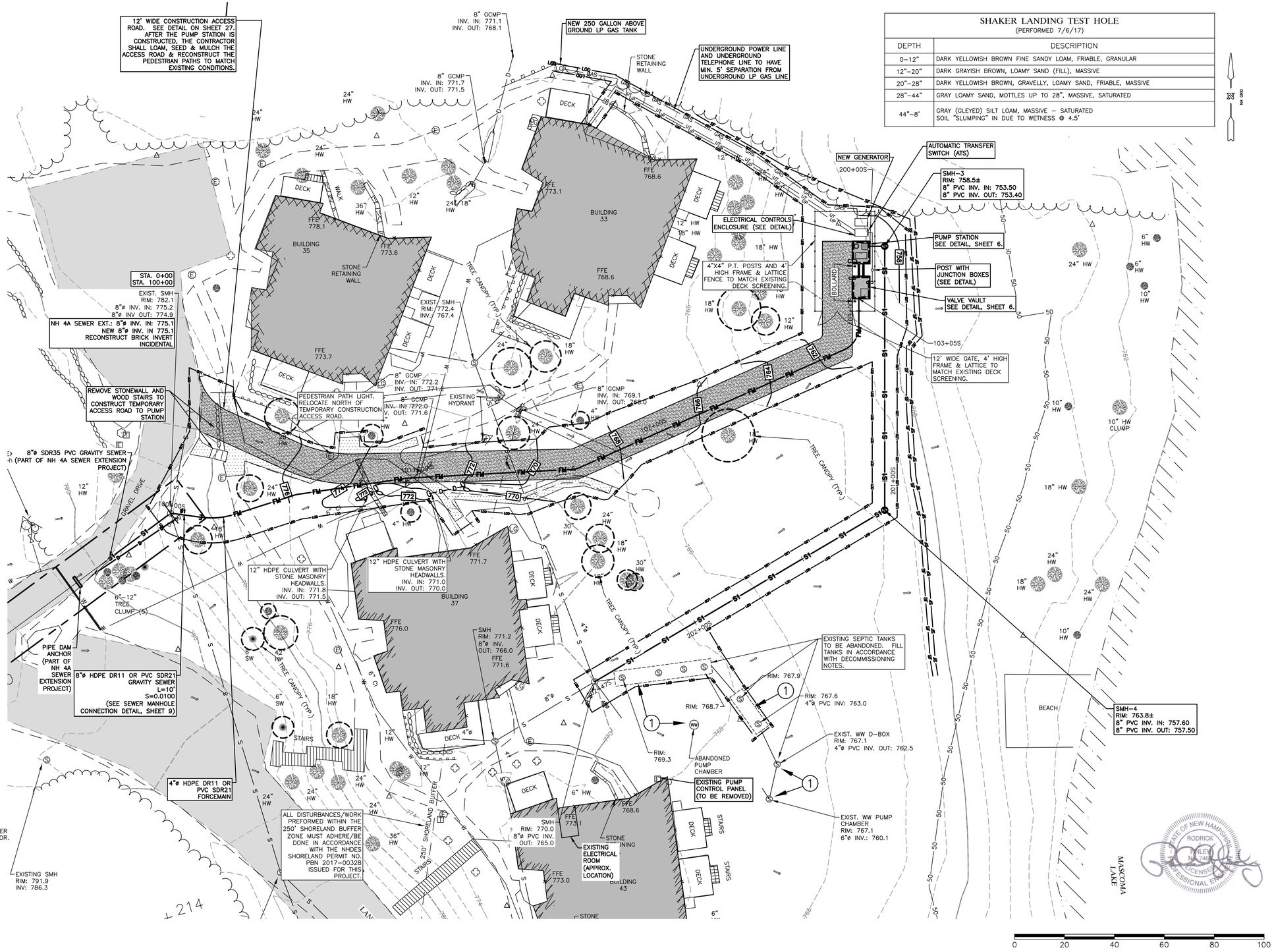
GENERAL NOTES:

① DECOMMISSION GRAVITY WASTEWATER SYSTEMS IN ACCORDANCE WITH EXISTING WASTEWATER DECOMMISSIONING NOTES ON SHEET 3. D-BOXES NEED TO BE LOCATED BY CONTRACTOR.

ISSUED FOR BIDDING
JULY 31, 2017

SHAKER LANDING TEST HOLE
(PERFORMED 7/6/17)

DEPTH	DESCRIPTION
0-12"	DARK YELLOWISH BROWN FINE SANDY LOAM, FRIABLE, GRANULAR
12"-20"	DARK GRAYISH BROWN, LOAMY SAND (FILL), MASSIVE
20"-28"	DARK YELLOWISH BROWN, GRAVELLY, LOAMY SAND, FRIABLE, MASSIVE
28"-44"	GRAY LOAMY SAND, MOTTLES UP TO 28", MASSIVE, SATURATED
44"-8'	GRAY (GLEYED) SILT LOAM, MASSIVE - SATURATED SOIL "SLUMPING" IN DUE TO WETNESS @ 4.5'



REVISION NO.	DATE	DESCRIPTION	MADE BY	CHECKED BY	APPROVED BY

SHAKER LANDING PUMP STATION - SITE PLAN FOR

TOWN OF ENFIELD - NH ROUTE 4A SEWER EXTENSION

SHAKER LANDING PUMP STATION REPLACEMENT

LANDING ROAD, ENFIELD, NEW HAMPSHIRE

PATHWAYS CONSULTING, LLC
240 MECHANIC STREET, SUITE 100
LEBANON, NEW HAMPSHIRE 03766
(603) 448-2200

SCALE: AS SHOWN	
DESIGNED BY: ISM	
DRAWN BY: DPM/CRM	
CHECKED BY: RJF	
DATE: 07-07-17	
PROJ. NO. 10068-05	SHEET 5 OF 11

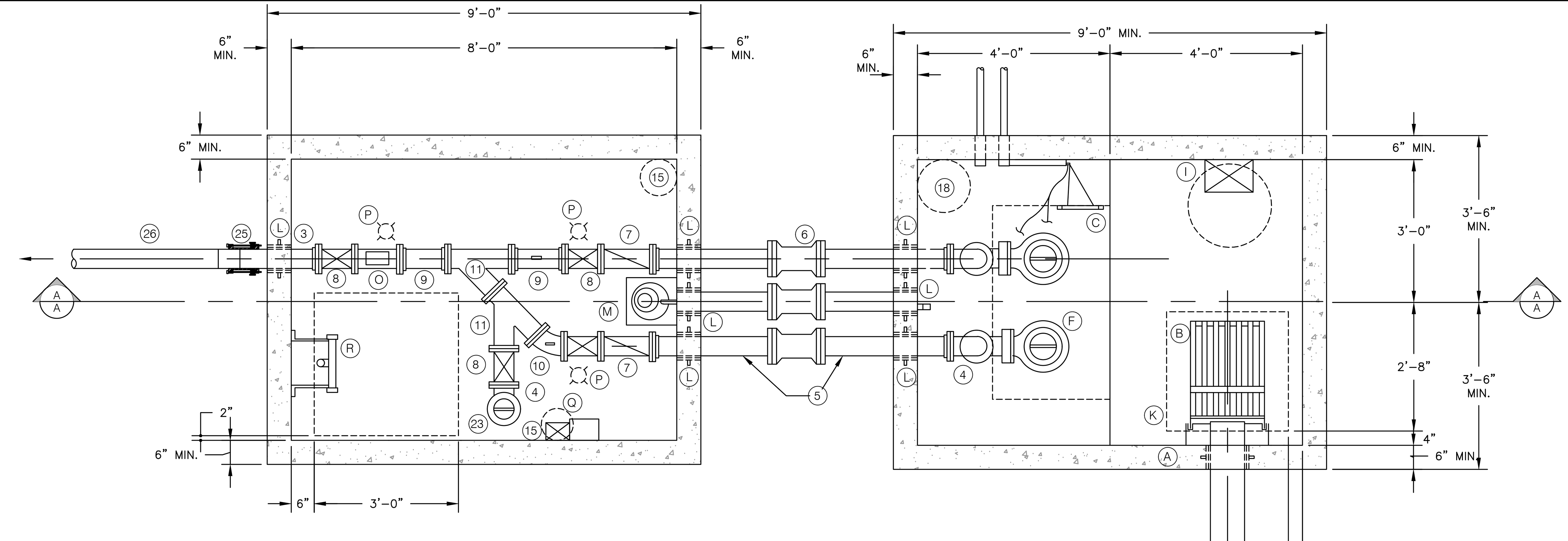
5

PIPING SCHEDULE

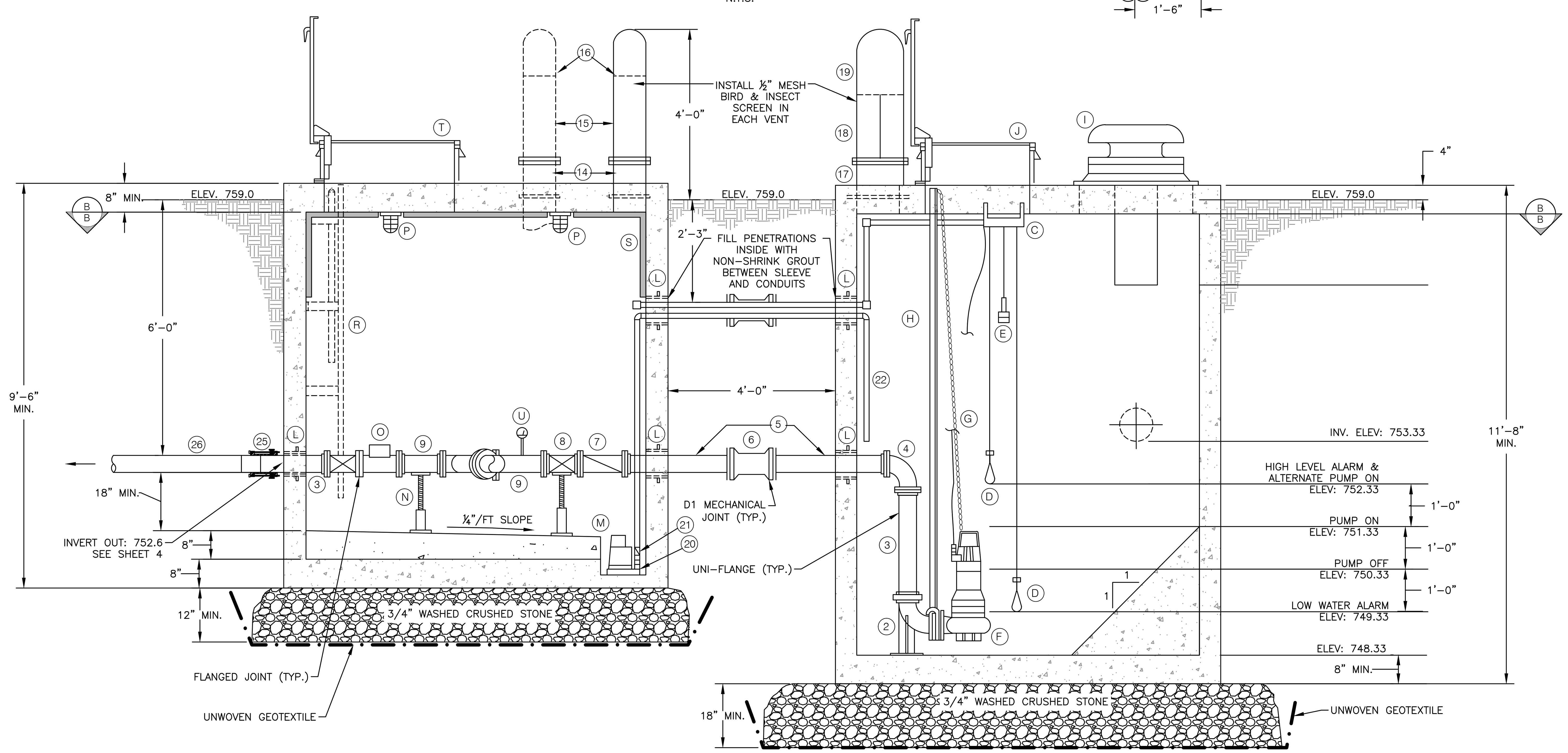
ITEM	QUANTITY	DESCRIPTION
1	1	8" P.E. X P.E. PVC SDR 35 PVC
2	2	4" FLANGED 90° ELBOW WITH BASE
3	3	4" FLANGED X P.E. DI PIPE
4	3	4" FLANGED 90° ELBOW
5	5	4" FLANGED X P.E. DI PIPE
6	3	4" M.J. LONG BODY SOLID SLEEVE
7	2	4" FLG. X FLG. CHECK VALVE W/ LEVER AND SPRING
8	4	4" FLG. X FLG. PLUG VALVE W/ HANDWHEEL
9	AS NECESSARY	4" FLG. X FLG. DI PIPE
10	1	4" FLG. X FLG. 45° DI ELBOW
11	2	4" X 4" FLANGED DI WYE
14	2	4" FLG. X P.E. DI WALL PIPE
15	2	4" FLG. X FLG. DI PIPE
16	4	4" FLANGED 90° DI ELBOW
17	1	8" FLG. X P.E. DI WALL PIPE
18	1	8" FLG. X FLG. DI PIPE
19	2	8" FLANGED 90° DI ELBOW
20	1	1½" UNION
21	1	1½" CHECK VALVE
22	AS NECESSARY	1½" SCHEDULE 40 PVC PIPE
23	1	4" DI QUICK CONNECT/DISCONNECT ADAPTOR, CAP, & CHAIN
25	1	4" DIPS BELL MJ ADAPTOR – DR11 TO DI PIPE
26	1	4" HDPE DR 11 PIPE

EQUIPMENT SCHEDULE

ITEM	QUANTITY	DESCRIPTION
A	1	8" WALL PENETRATION ASSEMBLY (SEE DETAIL THIS SHEET)
B	1	GALVANIZED STEEL STRAINING BASKET W/ 2" CLEAR OPENINGS MAX., HANDLE AND RAILS
C	1	GALVANIZED STEEL FLOAT SWITCH/TRANSDUCER MOUNTING BRACKET
D	2	MERCURY FLOAT SWITCHES
E	1	TRANSDUCER
F	2	3" SOLIDS HANDLING SUBMERSIBLE PUMP W/ QUICK CONNECT/DISCONNECT COUPLING
G	2	GALVANIZED STEEL LIFTING CHAIN
H	4	GALVANIZED STEEL PUMP GUIDE RAILS
I	1	BELT DRIVE CENTRIFUGAL EXHAUST FAN W/ 12" GALVANIZED STEEL DUCT WORK
J	1	2'–6" X 4'–6" GALVANIZED STEEL ACCESS HATCH
K	1	2'–6" X 2'–6" GALVANIZED STEEL ACCESS HATCH
L	7	4" WALL PENETRATION ASSEMBLY (SEE DETAIL THIS SHEET)
M	1	SUMP PUMP W/ FLOAT
N	3	ADJUSTABLE PIPE SUPPORT (GALVANIZED STEEL)
O	1	FLOW METER
P	3	CEILING MOUNTED LIGHT FIXTURE
Q	1	EXHAUST FAN AND DUCTWORK
R	1	ALUMINUM ACCESS LADDER AND SAFETY POST
S	AS NECESSARY	2" THICK CELLULAR GLASS INSULATION
T	1	3'–0" X 3'–0" GALVANIZED STEEL ACCESS HATCH
U	2	GALVANIZED STEEL 4½" 0–100 PSI PRESSURE GAUGE



PLAN VIEW SECTION B–B
N.T.S.



PROFILE VIEW SECTION A–A
N.T.S.

WET WELL NOTES:

1. WET WELL SHALL BE EXFILTRATION TESTED (LEAKAGE TESTED) AND PASS TEST BEFORE CONCRETE INFILL OR PUMPS ARE INSTALLED.
2. BACKFILL AROUND WET WELL AND STRUCTURE FOUNDATION SHALL MEET NHDOT REQUIREMENTS FOR SAND NHDOT 304.1. EXCAVATED SOIL MAY BE USED IF IT COMPLIES WITH GRAVEL NHDOT 304.2. BACKFILL AROUND WET WELL AND BENEATH STRUCTURE SHALL BE COMPACTED TO 95 PERCENT IN ACCORDANCE WITH ASTM D–1557. AS AN ALTERNATE, FLOWABLE FILL MEETING REQUIREMENTS OF NHDOT CONCRETE, CLASS F, FLOWABLE FILL, EXCAVATABLE MAY BE USED. NO ADDITIONAL COMPENSATION WILL BE PAID IF CONTRACTOR ELECTS TO USE FLOWABLE FILL.
3. VENTILATION OF THE WET WELL SHALL BE PROVIDED AS SHOWN ON MECHANICAL PLANS.
4. A PERMANENT SIGN SHALL BE ATTACHED ON THE UNDERSIDE OF BOTH THE WET WELL PUMP ACCESS HATCHES (2) AND THE VALVE VAULT ACCESS HATCH (1) WHICH READS "WARNING HAZARDOUS AREA – ENTER ONLY WITH PROPER EQUIPMENT" OR "CONFINED SPACE, ENTRY BY PERMIT ONLY" (PER ENV–WQ 705.08).
5. CONTRACTOR SHALL FOLLOW PUMP MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION OF PUMPS, RAILS, AND BRACING. CONTRACTOR SHALL ENSURE WET WELL COVER OPENING IS CONFIGURED TO MEET PUMP MANUFACTURER'S REQUIREMENTS FOR PUMP REMOVAL. CONTRACTOR SHALL SUBMIT FULL SHOP DRAWINGS OF THE WET WELL AND PUMP INSTALLATION.
6. ALL WET WELL AND VAULT PENETRATIONS SHALL BE WATERTIGHT. LEAKAGE TESTING SHALL BE CONDUCTED WITH PIPE PENETRATIONS IN PLACE.

SHAKER LANDING PUMP STATION DESIGN CALCULATIONS:

6 BUILDINGS, 3 UNITS EACH

18 UNITS X 3 $\frac{\text{BEDS}}{\text{UNIT}}$ X 150 $\frac{\text{GPD}}{\text{BED}}$ = 8,100 GPD

ADF = 8,100 $\frac{\text{GAL}}{\text{DAY}}$ $\left(\frac{\text{1 DAY}}{\text{24 HOURS}}\right)$ $\left(\frac{\text{1 HR}}{\text{60 MIN}}\right)$ = 5.6 GPM

ASSUME PEAKING FACTOR = 6

PEAK FLOW = 5.6 GPM X 6 = 34 GPM

4" DIAMETER FORCEMAIN

120 GPM = 3.0 FPS

HIGH POINT = 775.2 FT

PUMP OFF = – 750.3 FT

24.9 FT STATIC

C = 120

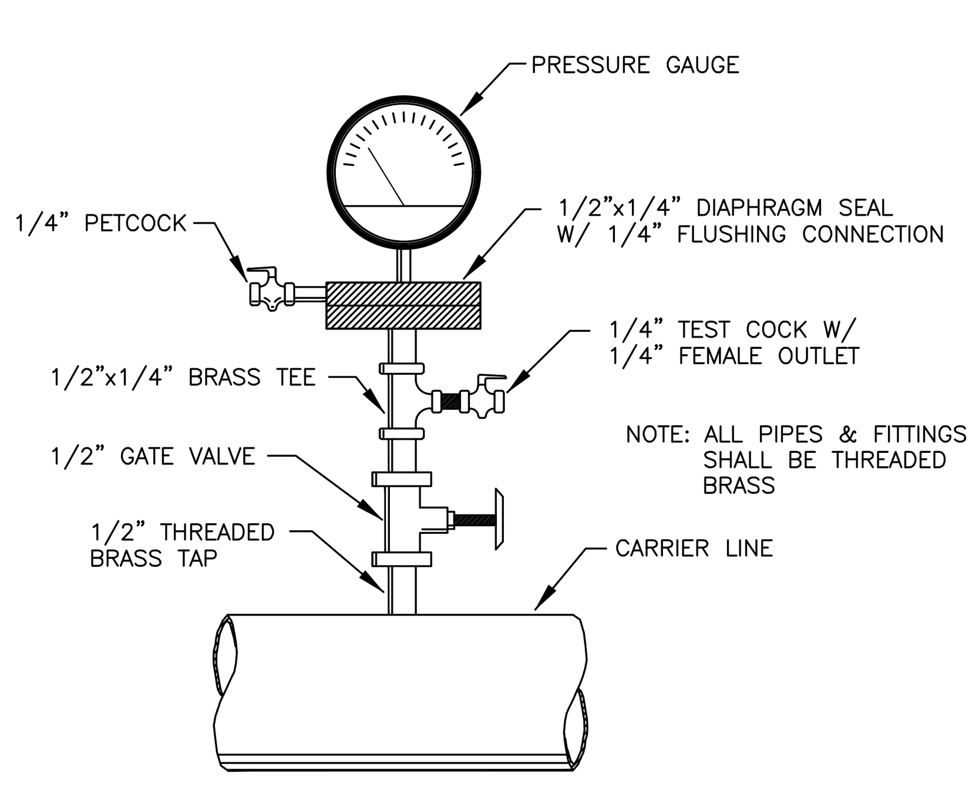
h_f = 12.2 FT/1000 FT

LENGTH FORCEMAIN = 315 FT

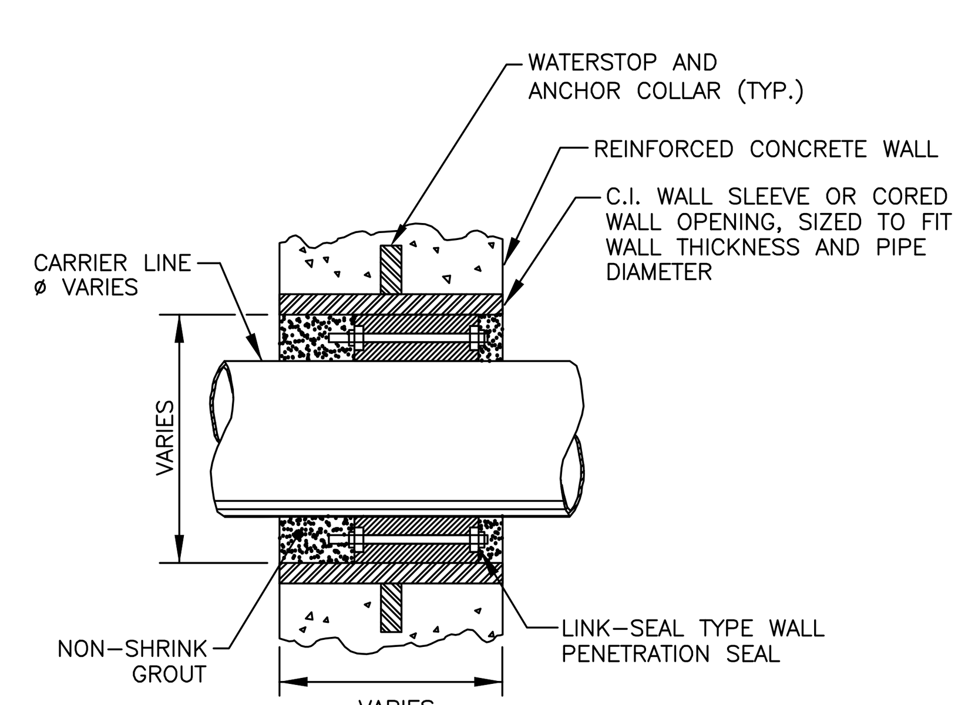
(12.2 FT/1000 FT) X 315 FT = 3.8 FT FRICTION LOSS

TOTAL DYNAMIC HEAD = 24.9 FT STATIC + 3.8 FT DYNAMIC = 28.7 FT

PUMP DESIGN POINT 120 GPM @ 28.7 FT TDH



PRESSURE GAUGE CONNECTION
N.T.S.



WALL PENETRATION ASSEMBLY DETAIL
N.T.S.

STATE OF NEW HAMPSHIRE RODRICK J. FINLEY No. 7468 LICENSED PROFESSIONAL ENGINEER

ISSUED FOR BIDDING
JULY 31, 2017

REVISION NO.	DATE	DESCRIPTION	MADE BY	CHECKED BY	APPROVED BY

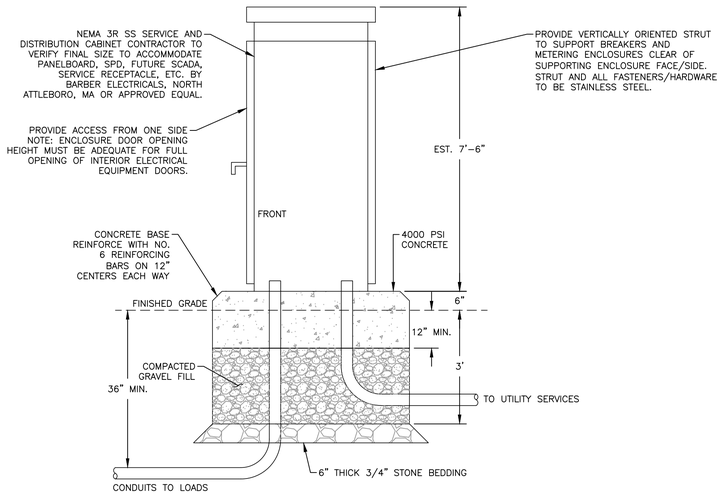
SHAKER LANDING PUMP STATION – MECHANICAL DETAILS FOR

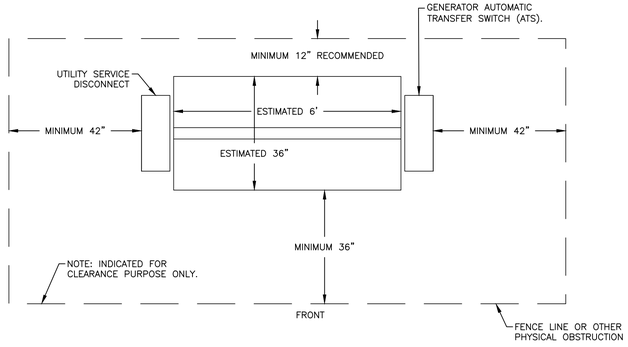
TOWN OF ENFIELD - NH ROUTE 4A SEWER EXTENSION
SHAKER LANDING PUMP STATION REPLACEMENT

LANDING ROAD, ENFIELD, NEW HAMPSHIRE

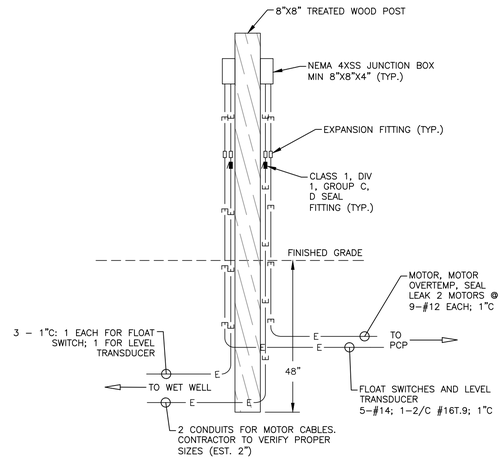
PATHWAYS CONSULTING, LLC
240 MECHANIC STREET, SUITE 100
LEBANON, NEW HAMPSHIRE 03766
(603) 448–2200

SCALE: AS SHOWN
DESIGNED BY: ISM
DRAWN BY: CRM
CHECKED BY: RJF
DATE: 07–07–17
PROJ. NO. 10068–05





ELECTRICAL EQUIPMENT ENCLOSURE ELEVATION AND PLAN DETAIL
N.T.S.



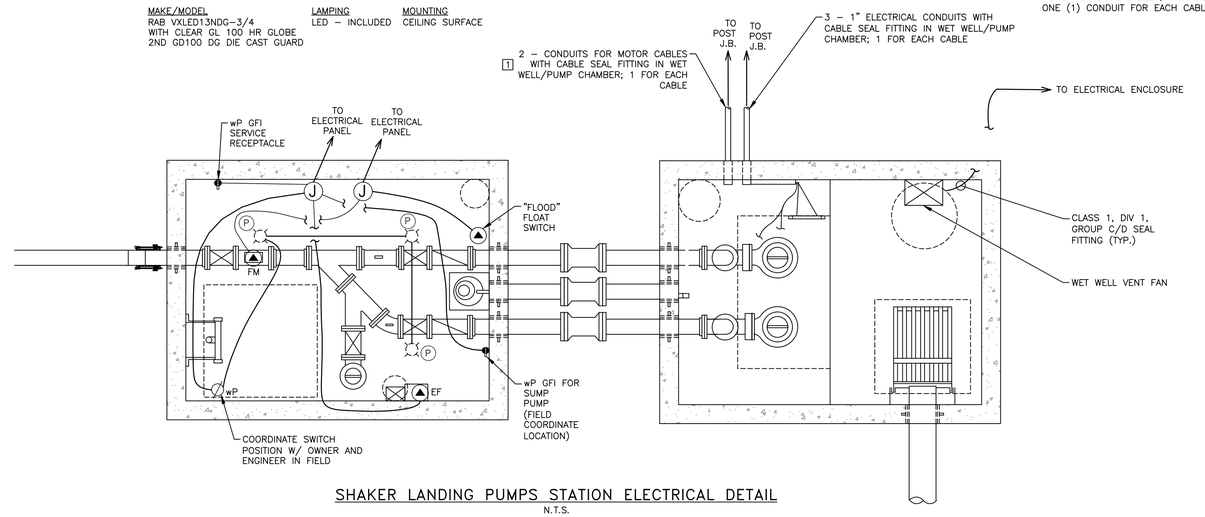
- CONDUIT TO WET WELL TO BE PVC COATED RIGID GALVANIZED STEEL.
- CONDUITS TO PCP TO BE RIGID GALVANIZED STEEL.

TYPICAL POST DETAIL NEAR PUMP STATION/WET WELL DETAIL
N.T.S.

(P) CEILING MOUNTED LIGHT FIXTURE

MAKE/MODEL	LAMPING	MOUNTING
RAB VXLED13NDG-3/4 WITH CLEAR GL 100 HR GLOBE 2ND GD100 DG DIE CAST GUARD	LED - INCLUDED	CEILING SURFACE

[1] BASED ON 1 CABLE PER PUMP. SIZE FOR CABLE ON PUMP. IF MORE INDIVIDUAL CABLES, PROVIDE ONE (1) CONDUIT FOR EACH CABLE



SHAKER LANDING PUMPS STATION ELECTRICAL DETAIL
N.T.S.

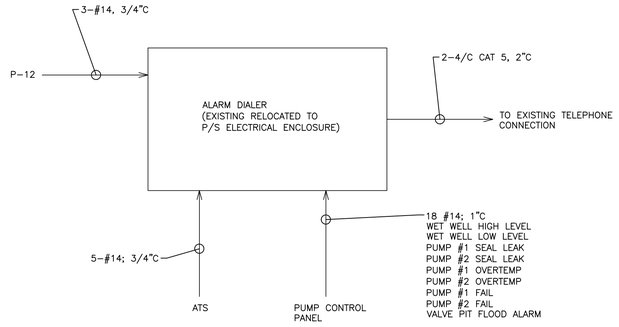
ISSUED FOR BIDDING
JULY 31, 2017

REVISION NO.	DATE	DESCRIPTION	MADE BY	CHECKED BY	APPROVED BY

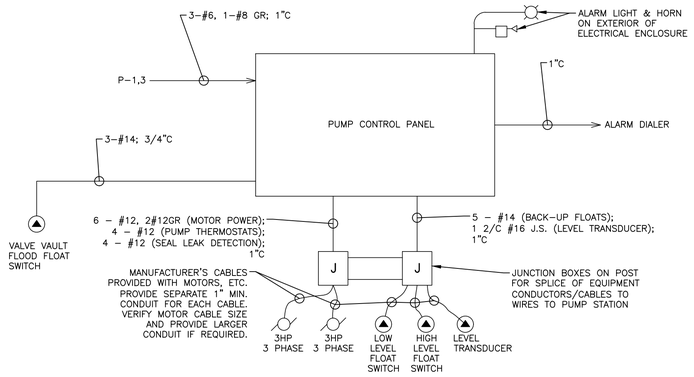
SHAKER LANDING PUMP STATION - ELECTRICAL DETAILS FOR
TOWN OF ENFIELD - NH ROUTE 4A SEWER EXTENSION
SHAKER LANDING PUMP STATION REPLACEMENT
LANDING ROAD, ENFIELD, NEW HAMPSHIRE

PATHWAYS CONSULTING, LLC
240 MECHANIC STREET, SUITE 100
LEBANON, NEW HAMPSHIRE 03766
(603) 448-2200

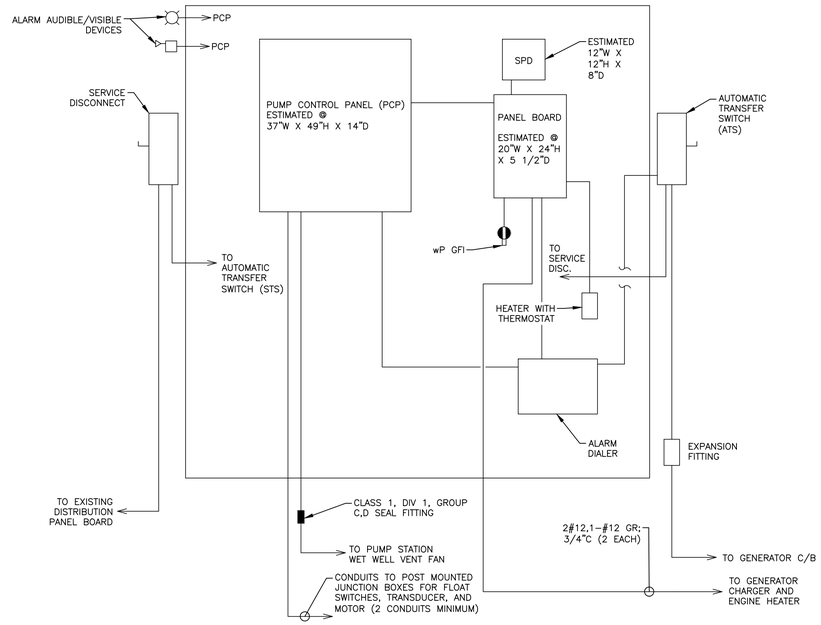
SCALE: AS SHOWN	7
DESIGNED BY: LC	
DRAWN BY: DPM	
CHECKED BY: RJF	
DATE: 07-07-17	
PROJ. NO. 10068-05	SHEET 7 OF 11



ALARM INTERCONNECTION DIAGRAM
N.T.S.

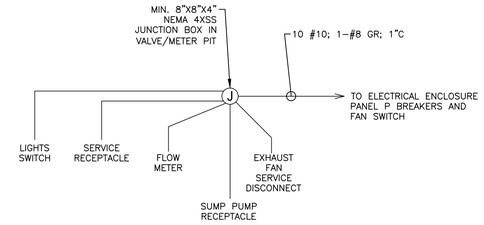


PUMP CONTROL PANEL INTERCONNECTION DIAGRAM
N.T.S.

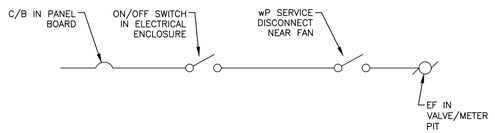


TYPICAL ELECTRICAL EQUIPMENT ENCLOSURE LAYOUT DETAIL
(FLOW INDICATING TOTALIZER NOT SHOWN)
N.T.S.

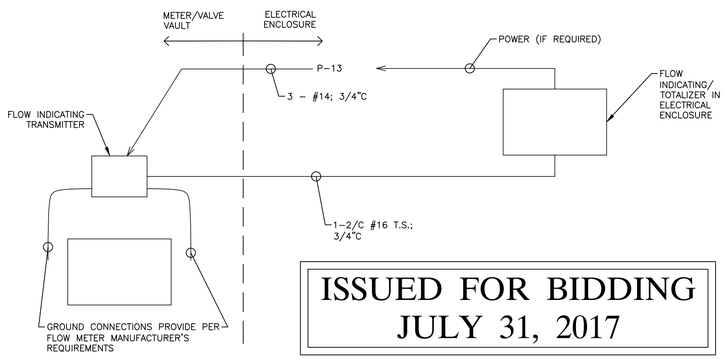
PANEL P SURFACE MOUNTED 100 AMP MLO, 240/120 VOLT, 1 PHASE, 3 WIRE, 60 HERTZ				
CIRCUIT NO.	NO. POLES	RATING	DESCRIPTION	LOAD
1, 3	2	60*	PCP FEEDER	4.2
2, 4	2	**	SPD	––
5	1	15*	VALVE/METER PIT LIGHTS	0.1
6	1	20	WET WELL VENT FAN	0.72
7	1	20	VALVE/METER PIT VENT FAN	0.72
8	1	20*	VALVE/METER PIT SUMP PUMP	0.9
9	1	20	VALVE/METER PIT RECEPTACLE	0.2
10	1	20	ELECTRICAL ENCLOSURE RECEPTACLE	0.2
11	1	15	ELECTRICAL ENCLOSURE HEATER	0.5
12	1	15*	DIALER	0.3
13	1	15*	FIT	EST. 0.2
14	1	20	GENERATOR ENGINE HEATER	1.5
15	1	20	GENERATOR BATTERY CHARGER	
16–18	1	20	SPARE	
19–20	1	––	SPARE	
* PROVIDE HANDLE LOCK ON CIRCUITS				
** BREAKER RATING PER SPD MANUFACTURER RECOMMENDATION				



TYPICAL POWER JUNCTION BOX AT VALVE/METER PIT
N.T.S.

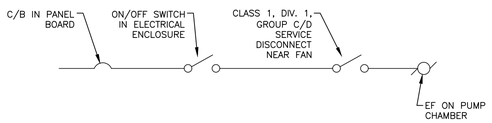


TYPICAL INTERCONNECTION DIAGRAM
VALVE/METER PIT EXHAUST FAN
N.T.S.

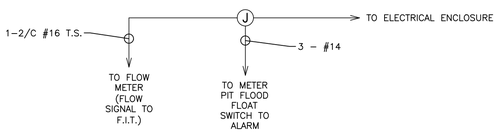


ISSUED FOR BIDDING
JULY 31, 2017

FLOW METER INTERCONNECTION DIAGRAM
N.T.S.

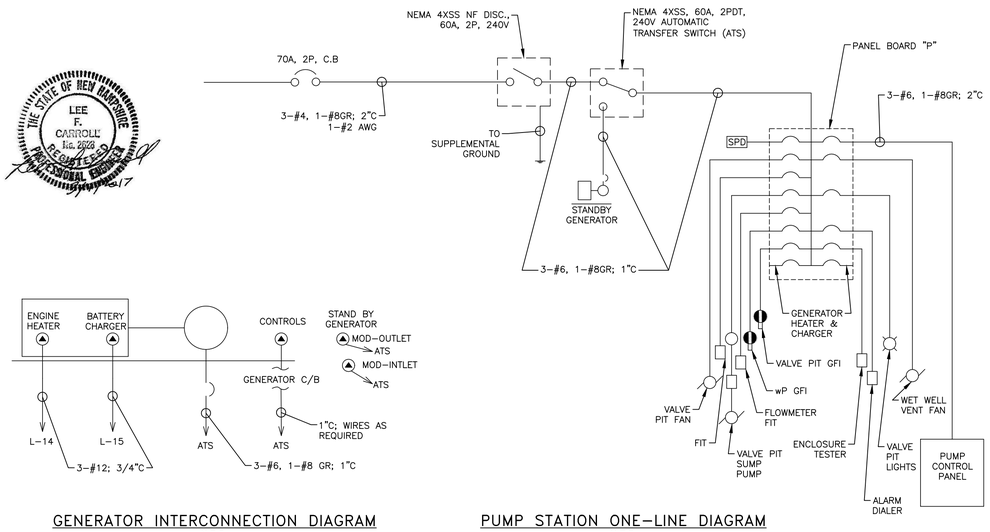


TYPICAL INTERCONNECTION DIAGRAM
PUMP CHAMBER/WET WELL
EXHAUST FAN
N.T.S.



TYPICAL SIGNAL JUNCTION BOX AT VALVE/METER PIT
N.T.S.

GENERATOR INTERCONNECTION DIAGRAM
N.T.S.



PUMP STATION ONE–LINE DIAGRAM
N.T.S.

REVISION NO.	DATE	DESCRIPTION	MADE BY	CHECKED BY	APPROVED BY

SHAKER LANDING PUMP STATION – ELECTRICAL DETAILS FOR

TOWN OF ENFIELD - NH ROUTE 4A SEWER EXTENSION

SHAKER LANDING PUMP STATION REPLACEMENT

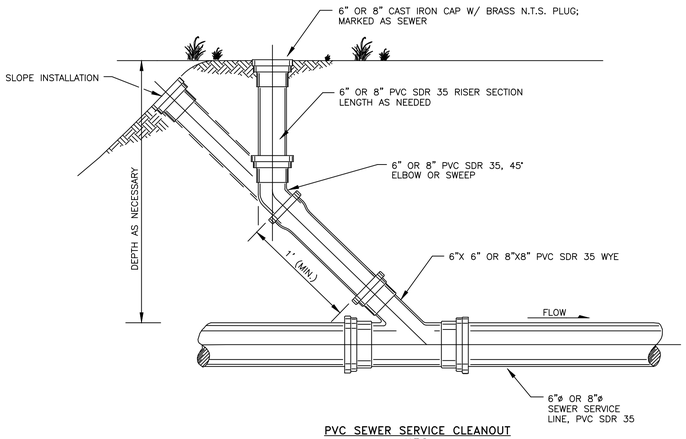
LANDING ROAD, ENFIELD, NEW HAMPSHIRE

PATHWAYS CONSULTING, LLC

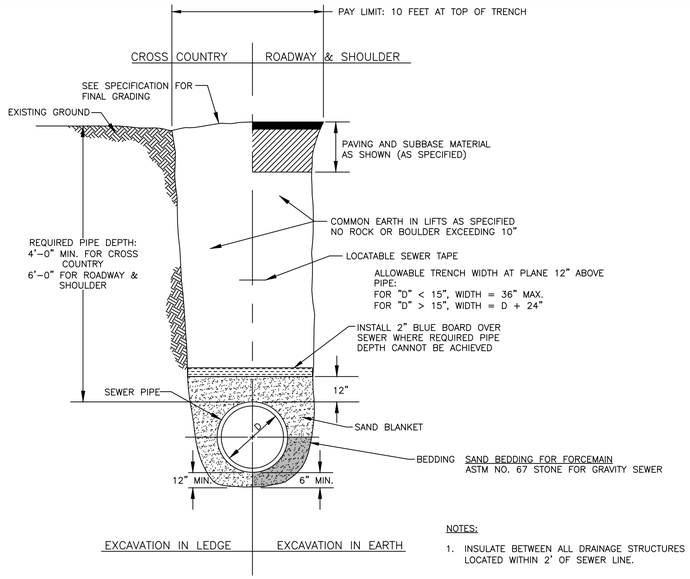
240 MECHANIC STREET, SUITE 100
LEBANON, NEW HAMPSHIRE 03766
(603) 448–2200

SCALE: AS SHOWN	
DESIGNED BY: LC	
DRAWN BY: DPM	
CHECKED BY: RJF	
DATE: 07–07–17	
PROJ. NO. 10068–05	SHEET 8 OF 11

8



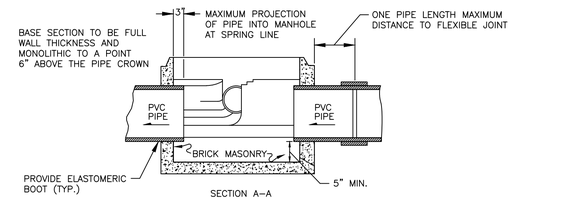
PVC SEWER SERVICE CLEANOUT
N.T.S.



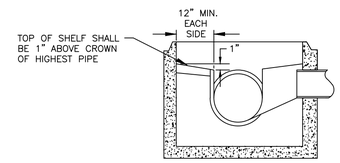
NOTES:

1. INSULATE BETWEEN ALL DRAINAGE STRUCTURES LOCATED WITHIN 2' OF SEWER LINE.

OPEN EXCAVATION
SEWER TRENCH DETAIL
N.T.S.



SECTION A–A

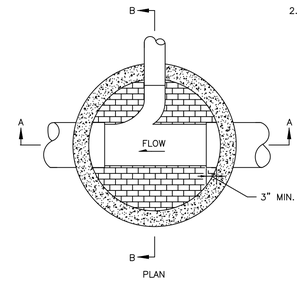


SECTION B–B

NOTE: CARE SHALL BE TAKEN TO ENSURE THAT THE BRICK INVERT IS A SMOOTH CONTINUATION OF THE SEWER INVERT. INVERT CHANNEL BRICKS SHALL BE LAID ON EDGE. INVERT BRICK TYPE SS HARD WATERSTRUCK BRICK ASTM C-32-(84).

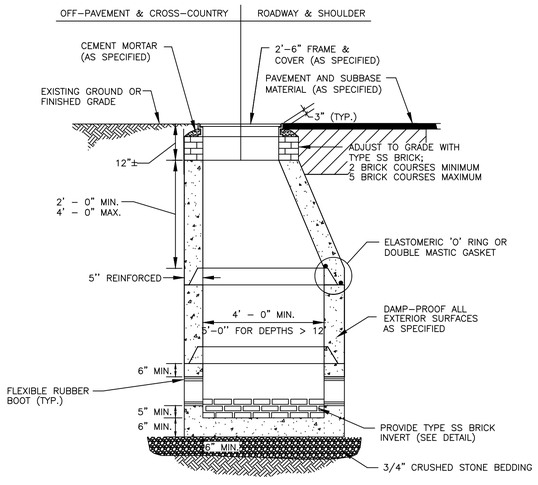
NOTES:

1. INVERT AND SHELF TO BE PLACED AFTER LEAKAGE TEST.
2. LEAKAGE TEST SHALL BE CONDUCTED PRIOR TO BACKFILLING AROUND THE MANHOLE.

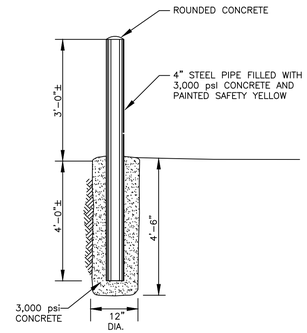


PLAN

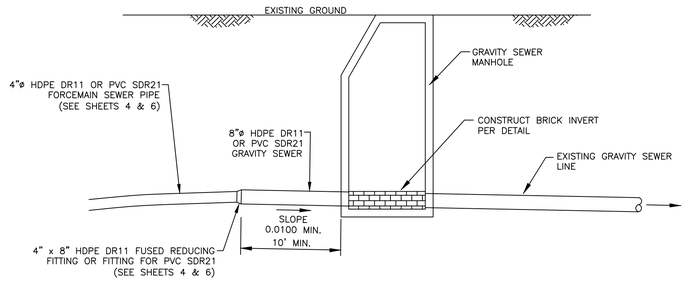
BRICK SEWER INVERT PLAN DETAIL
N.T.S.



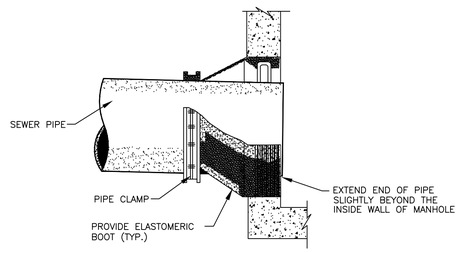
TYPICAL GRAVITY SEWER MANHOLE
N.T.S.



BOLLARD
N.T.S.



SEWER MANHOLE FORCEMAIN CONNECTION DETAIL
N.T.S.



ELASTOMERIC BOOT DETAIL
N.T.S.

ISSUED FOR BIDDING
JULY 31, 2017

REVISION NO.	DATE	DESCRIPTION	MADE BY	CHECKED BY	APPROVED BY

SEWER/MISCELLANEOUS DETAILS FOR

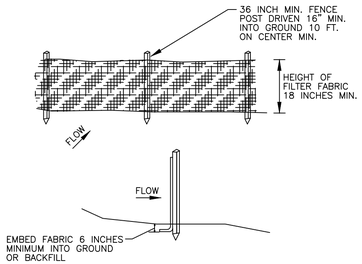
TOWN OF ENFIELD - NH ROUTE 4A SEWER EXTENSION

SHAKER LANDING PUMP STATION REPLACEMENT

LANDING ROAD, ENFIELD, NEW HAMPSHIRE

PATHWAYS CONSULTING, LLC
240 MECHANIC STREET, SUITE 100
LEBANON, NEW HAMPSHIRE 03766
(603) 448-2200

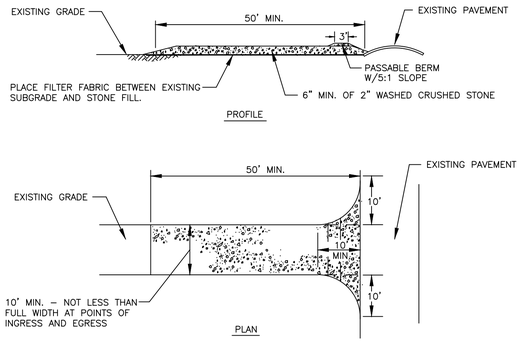
SCALE: AS SHOWN	
DESIGNED BY: ISM	
DRAWN BY: CRM	
CHECKED BY: RJF	
DATE: 07-07-17	
PROJ. NO. 10068-05	SHEET 9 OF 11



CONSTRUCTION SPECIFICATIONS

1. SILT FENCE MAY BE EITHER PREMANUFACTURED OR PREPARED ON SITE. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
2. SILT FENCE SHALL BE LOCATED AS SHOWN ON THE PLAN AND WHEREVER CONSTRUCTION ACTIVITIES MAY RESULT IN A TEMPORARY RUNOFF TO A STREAM OR WETLAND WHICH MAY CARRY SILT OR SEDIMENT.
3. THE TRENCH SHALL BE TOED IN PLACE BY PLACEMENT IN A 6 INCH TRENCH AND BACKFILLING WITH A SUITABLE MATERIAL.
4. WHEN A TRENCH CANNOT BE CONSTRUCTED, THE FABRIC MAY BE FOLDED AT THE BASE IN A MANNER SUCH THAT A MINIMUM OF 6 INCHES OF FABRIC LIES ON THE GROUND TOWARD THE DIRECTION OF FLOW. THE FOLDED FABRIC SHALL BE COVERED TO A DEPTH OF 6 INCHES WITH SUITABLE MATERIAL EXTENDING A MINIMUM OF 4 INCHES BEYOND THE FABRIC.
5. SUPPORTING STAKES SHALL BE PLACED NO MORE THAN 10 FEET APART.
6. MAINTENANCE SHALL BE PERFORMED AS NEEDED. FENCING SHALL BE REPLACED WHEN TORN, WHEN TRENCHING IS DISTURBED, WHEN THE FENCE DISPLAYS PLUGGING AS EVIDENCED BY SILT-LADEN APPEARANCE, WHEN WATER IS EXCESSIVELY RETARDED BY THE FENCE, OR WHENEVER "BULGES" APPEAR.

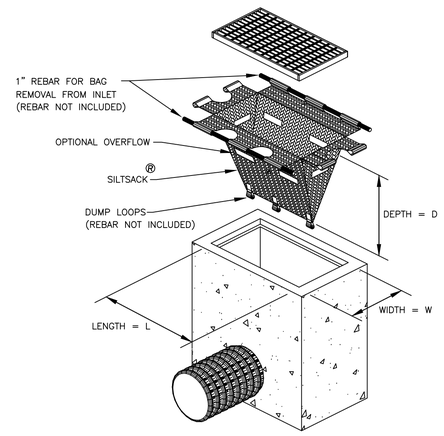
SILT FENCE
N.T.S.

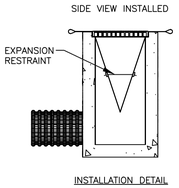


NOTES:

1.) MAINTAIN ENTRANCE TO PREVENT TRACKING OF SEDIMENT INTO PUBLIC R.O.W. REDUCE TRACKING OF SOIL ONTO PUBLIC R.O.W. BY CLEANING OR TOP DRESSING STONE FILL.
2.) PROVIDE SEPARATE WHEEL CLEANING AREA WITH SUITABLE SEDIMENTATION BASIN.

STABILIZED CONSTRUCTION ENTRANCE
N.T.S.





SILTSACK-INLET FILTER BAG
N.T.S.

SILTSACK®
SPECIFICATIONS

NOTE: THE SILTSACK WILL BE MANUFACTURED FROM A WOVEN POLYPROPYLENE FABRIC THAT MEETS OR EXCEEDS THE FOLLOWING SPECIFICATIONS.

REGULAR FLOW SILTSACK®
(FOR AREAS OF LOW TO MODERATE PRECIPITATION AND RUN-OFF)

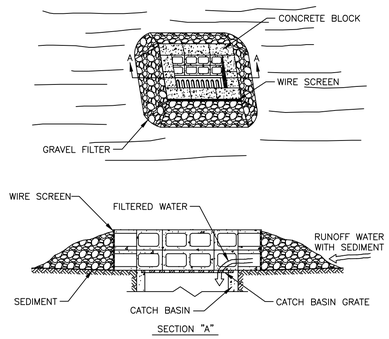
PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	300 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	20 %
PUNCTURE	ASTM D-4833	120 LBS
MULLEN BURST	ASTM D-3786	800 PSI
TRAPEZOID TEAR	ASTM D-4533	120 LBS
UV RESISTANCE	ASTM D-4355	80 %
APPARENT OPENING SIZE	ASTM D-4751	40 US SIEVE
FLOW RATE	ASTM D-4491	40 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	0.55 SEC -1

HI-FLOW SILTSACK®
(FOR AREAS OF MODERATE TO HEAVY PRECIPITATION AND RUN-OFF)

PROPERTIES	TEST METHOD	UNITS
GRAB TENSILE STRENGTH	ASTM D-4632	265 LBS
GRAB TENSILE ELONGATION	ASTM D-4632	20 %
PUNCTURE	ASTM D-4833	135 LBS
MULLEN BURST	ASTM D-3786	420 PSI
TRAPEZOID TEAR	ASTM D-4533	45 LBS
UV RESISTANCE	ASTM D-4355	90 %
APPARENT OPENING SIZE	ASTM D-4751	20 US SIEVE
FLOW RATE	ASTM D-4491	200 GAL/MIN/SQ FT
PERMITTIVITY	ASTM D-4491	1.5 SEC -1

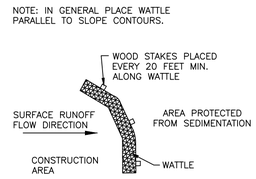
OIL-ABSORBANT SILTSACK®
(FOR AREAS WHERE THERE IS A CONCERN FOR OIL RUN-OFF OR SPILLS)

DEPENDING ON YOUR PARTICULAR APPLICATION, THE SILTSACK CAN BE MADE FROM EITHER ONE OF THE ABOVE FABRICS WITH AN OIL-ABSORBANT PILLOW INSERT OR, MADE COMPLETELY FROM AN OIL-ABSORBANT SILTSACK ® WITH A WOVEN PILLOW INSERT.

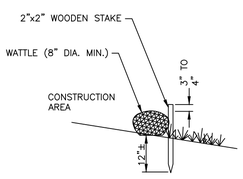


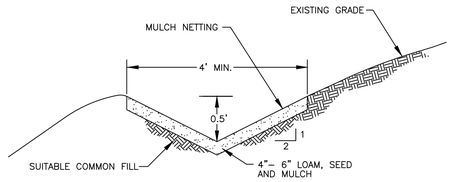
BLOCK & STONE INLET SEDIMENT FILTER DETAIL
N.T.S.

ISSUED FOR BIDDING
JULY 31, 2017

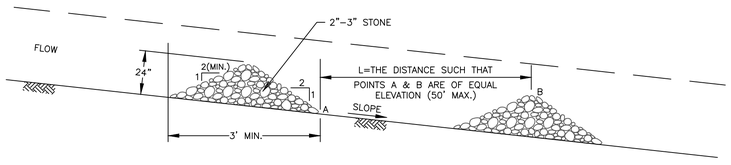


STRAW/COMPOST WATTLE (TYP.)
N.T.S.

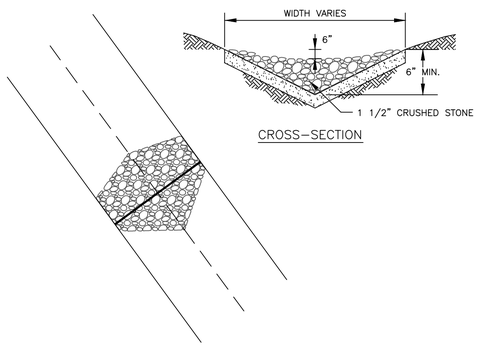




DIVERSION DITCH
N.T.S.

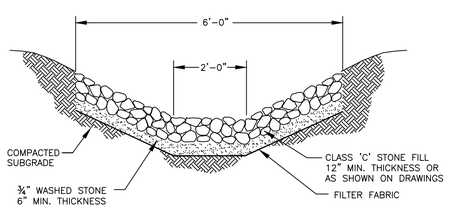


PROFILE

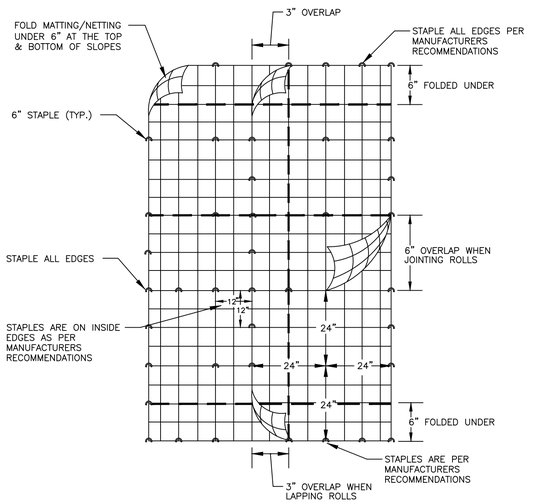


CROSS-SECTION

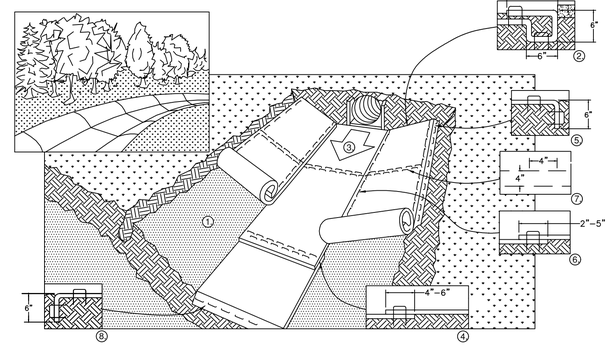
STONE CHECK DAMS
N.T.S.



STONE LINED DITCH
N.T.S.

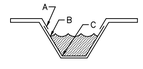


MULCH NETTING & TURF RE-INFORCEMENT MATTING
N.T.S.



1. PREPARE SOIL BEFORE INSTALLING ROLLED EROSION CONTROL PRODUCTS (RECP's), INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE RECP's IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF RECP's EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE RECP's WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF RECP's BACK OVER SEED AND COMPACTED SOIL. SECURE RECP's OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" ACROSS THE WIDTH OF THE RECP's.
3. ROLL CENTER RECP's IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. RECP's WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL RECP's MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM , STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. PLACE CONSECUTIVE RECP's END OVER END (SHINGLE STYLE) WITH A 4" - 6" OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER TO SECURE RECP's.
5. FULL LENGTH EDGE OF RECP's AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
6. ADJACENT RECP's MUST BE OVERLAPPED APPROXIMATELY 2" - 5" (DEPENDING ON RECP's TYPE) AND STAPLED.
7. IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" APART AND 4" ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
8. THE TERMINAL END OF THE RECP's MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN A 6" DEEP X 6" WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.

NOTE: *IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY ANCHOR THE RECP's.



CRITICAL POINTS
A. OVERLAPS AND SEAMS
B. PROJECTED WATER LINE
C. CHANNEL BOTTOM/SIDE SLOPE VERTICES

NOTE:
* HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.
** IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY ANCHOR THE RECP's.

EROSION CONTROL BLANKETS - CHANNEL/DITCH/SWALE INSTALLATION
N.T.S.

REVISION NO.	DATE	DESCRIPTION	MADE BY	CHECKED BY	APPROVED BY

EROSION AND SEDIMENT CONTROL DETAILS FOR

TOWN OF ENFIELD - NH ROUTE 4A SEWER EXTENSION

SHAKER LANDING PUMP STATION REPLACEMENT

LANDING ROAD, ENFIELD, NEW HAMPSHIRE

PATHWAYS CONSULTING, LLC
240 MECHANIC STREET, SUITE 100
LEBANON, NEW HAMPSHIRE 03766
(603) 448-2200

SCALE: AS SHOWN	
DESIGNED BY: ISM	
DRAWN BY: CRM	
CHECKED BY: RJF	
DATE: 07-07-17	
PROJ. NO. 10068-05	SHEET 10 OF 11

10

EROSION CONTROL SPECIFICATIONS

1. SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN ACCORDANCE WITH "NEW HAMPSHIRE STORMWATER MANAGEMENT", VOLUMES 1, 2, & 3, DECEMBER 2008 (OR LATEST EDITION). THE CONTRACTOR SHALL HAVE REFERENCE TO THESE PUBLICATIONS.
2. IMMEDIATE ATTENTION TO EROSION CONTROL PRACTICES DRAMATICALLY IMPROVES SOIL AND MOISTURE CONSERVATION AND REDUCES NEGATIVE IMPACTS ON WATER QUALITY. THE CONTRACTOR SHALL GIVE PRIORITY TO THE TIMELY INSTALLATION OF BOTH TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL MEASURES.
3. THE EROSION AND SEDIMENT CONTROL PRACTICES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIRED FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, THESE PRACTICES SHALL BE UPGRADED AS NEEDED FOR UNEXPECTED STORM EVENTS AND MODIFIED TO ACCOUNT FOR CHANGING SITE CONDITIONS.
5. THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT SHALL NOT EXCEED 5 ACRES AT ANY ONE TIME BEFORE STABILIZATION. A CONSTRUCTION SEQUENCE HAS BEEN DEVELOPED TO FACILITATE INSTALLATION OF EROSION CONTROL MEASURES AND THE COMPLETION OF GRADING, SEEDING, AND LANDSCAPING AS SOON AS POSSIBLE WITHIN A DISTURBED AREA.
6. PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO EARTH MOVING OPERATIONS.
7. ALL PONDS AND SWALES SHALL BE INSTALLED EARLY ON IN THE CONSTRUCTION SEQUENCE (PRIOR TO ROUGH GRADING THE SITE).
8. THE BOUNDARIES OF THE CLEARING LIMITS SHOWN ON THE PLANS SHALL BE CLEARLY FLAGGED BY SURVEY TAPE OR FENCING, IF REQUIRED, PRIOR TO CONSTRUCTION. DURING THE CONSTRUCTION PERIOD, NO DISTURBANCE BEYOND THE CLEARING LIMITS SHALL BE PERMITTED. THE CLEARING LIMITS SHALL BE MAINTAINED FOR THE DURATION OF CONSTRUCTION.
9. STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AT THE BEGINNING OF CONSTRUCTION AND MAINTAINED FOR THE DURATION OF THE PROJECT. ADDITIONAL MEASURES, SUCH AS CONSTRUCTED WHEEL WASH SYSTEMS OR WASH PADS, MAY BE REQUIRED TO ENSURE THAT ALL PAVED AREAS ARE KEPT CLEAN AND TRACK OUT TO ROAD RIGHT OF WAY DOES NOT OCCUR FOR THE DURATION OF THE PROJECT. ANY SEDIMENT TRACKED ONTO PAVED AREAS SHALL BE REMOVED BY THE END OF THE SAME WORK DAY IT IS NOTED, AND IF NOTED ON A NON-WORK DAY, NOT LATER THAN THE END OF THE NEXT WORK DAY.
10. EARTH STOCKPILES SHALL BE SEEDED AND MULCHED AND HAVE A SILT FENCE INSTALLED ON THE DOWNSLOPE SIDE, AT A MINIMUM. STOCKPILES SHALL BE COVERED WITH IMPERVIOUS TARPS AND/OR STABILIZED WITH TEMPORARY SEED AND MULCH TO PROTECT MATERIALS IN THE EVENT THAT THEY WILL REMAIN FOR LONGER THAN 1 MONTH.
11. INSTALL EROSION CONTROL MEASURES AS SHOWN. CLEAN ACCUMULATED SEDIMENT AS NECESSARY. LEAVE IN PLACE UNTIL DISTURBED AREAS HAVE BEEN ADEQUATELY STABILIZED. DISTURBED AREAS RESULTING FROM SILT FENCE REMOVAL SHALL BE PERMANENTLY SEEDED.
12. CUT AND FILL SLOPES CALL FOR INTENSIVE EROSION CONTROL MEASURES. INSTALL MULCH NETTING AS SHOWN ON ALL SLOPES 3:1 (1 RISE ON 3 RUN) AND STEEPER. ALL CUT AND FILL SLOPES SHALL BE SEEDED AND MULCHED WITHIN 72 HOURS OF THEIR CONSTRUCTION.
13. ALL DISTURBED AREAS SHALL BE TEMPORARILY STABILIZED WITH MULCH AND/OR MULCH NETTING BEFORE THE END OF EACH WORK DAY.
14. ROADWAYS/PARKING LOTS SHALL BE STABILIZED WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
15. WHEN WORK IS SUSPENDED WITHIN THE GROWING SEASON, ALL DISTURBED AREAS SHALL BE TEMPORARILY STABILIZED WITH SEED AND MULCH WITHIN 14 DAYS. OUTSIDE THE GROWING SEASON, ALL DISTURBED AREAS SHALL BE TEMPORARILY STABILIZED WITH MULCH; MULCH AND TACK ON SLOPES STEEPER THAN 3:1; OR EROSION MATTING ON SLOPES STEEPER THAN 2:1 AND MAINTAINED IN THAT CONDITION UNTIL PERMANENT MEASURES CAN BE INSTALLED IN THE FOLLOWING PLANTING SEASON.
16. TEMPORARY STABILIZATION OF DISTURBED AREAS:

SEED BED PREPARATION:	TILL THREE INCHES DEEP MIXING IN FERTILIZER. APPLY 2 TONS/ACRE (100#/1,000 SQ. FT.)
FERTILIZE:	UNIFORMLY APPLY NOT LESS THAN 300#/ACRE (7#/1,000 SQ. FT.) OF 10-20-20 OR EQUIVALENT.
SEEDING:	SELECT APPROPRIATE SEEDING MIXTURE FROM TABLE 1 BELOW. SPREAD SEED UNIFORMLY. FIRM SOIL BY ROLLING OR PACKING; IF NOT FEASIBLE, THEN RAKE LIGHTLY TO COVER SEEDS.
MULCHING:	MULCH ALL DISTURBED AREAS WITH 1-½ TO 2 TONS OF HAY OR STRAW PER ACRE (70-90#/1,000 SQ. FT.). ANCHOR ON ALL SLOPES 3:1 OR STEEPER AND ON SLOPES SUBJECT TO WASH OR WIND BLOWN CONDITIONS. JUTE OR OTHER BIODEGRADABLE NETTING, STAKING AND STABLING MAY BE REQUIRED.

PLANT SELECTION AND SEEDING RATES

SPECIES	PER ACRE	PER 1,000 SQ.FT.	REMARKS
WINTER RYE	2 BU OR 112 LBS.	2.5 LBS.	BEST FOR FALL SEEDING. SEED AUGUST 15 TO SEPTEMBER 15 FOR BEST COVER. SEED TO DEPTH OF ONE INCH.
OATS	2 1/2 BU OR 80 LBS.	2 LBS.	BEST FOR SPRING SEEDINGS. LATER THAN MAY 15 FOR SUMMER PROTECTION. SEED TO DEPTH OF ONE INCH.
ANNUAL RYE	40 LBS.	1 LB.	GROWS QUICKLY, BUT IS OF SHORT GRASS DURATION. USE WHERE APPEARANCES ARE IMPORTANT, COVER SEED WITH NO MORE THAN 1/4 INCH OF SOIL. WITH MULCH, SEEDING MAY BE DONE THROUGHOUT GROWING SEASON. OTHERWISE SEED EARLY SPRING OR BETWEEN AUGUST 15 & SEPTEMBER 15.

15. PERMANENT STABILIZATION OF DISTURBED AREAS:

SEED BED PREPARATION:	TOPSOIL (SANDY LOAM, LOAM, OR SILT LOAM), FRIABLE, FREE OF STUMPS, WOOD, AND ROOTS. STONES MORE THAN 1-½ INCHES IN DIAMETER OR LENGTH SHALL BE PLACED OVER ALL DISTURBED AREAS IN A 4" (MINIMUM) THICK LAYER. TOPSOIL SHALL BE FREE OF HERBICIDES AND TOXIC MATERIALS. TILL THREE INCHES DEEP, MIXING IN THE FERTILIZER AND LIME.
FERTILIZE:	UNIFORMLY APPLY NOT LESS THAN 500#/ACRE (12#/1,000 SQ. FT.) OF 10-20-20 OR EQUIVALENT.
SEEDING:	SPREAD SEED UNIFORMLY. FIRM SOIL BY ROLLING OR PACKING; IF NOT FEASIBLE, THEN RAKE LIGHTLY TO COVER SEEDS.
MULCHING:	MULCH ALL DISTURBED AREAS WITH 1-½ TO 2 TONS OF HAY OR STRAW PER ACRE (70-90#/1,000 SQ. FT.). ANCHOR ON ALL SLOPES 3:1 OR STEEPER AND ON SLOPES SUBJECT TO WASH OR WIND BLOWN CONDITIONS. JUTE OR OTHER BIODEGRADABLE NETTING, STAKING AND STABLING MAY BE REQUIRED.

GRASS MATERIALS (SHADY GENERAL LAWN MIX)

GRASS SEED SHALL BE FRESH, CLEAN, NEW-CROP SEED AND SHALL MEET THE PROVISIONS OF THE NEW HAMPSHIRE AGRICULTURAL AND VEGETABLE SEEDS LAW. SEED SPECIFIED IN THIS SECTION SHALL MEET THE FOLLOWING ANALYSIS:

	LBS/ACRE
CHEWING FESCUE 'SR 5000'	40
CHAMPION PERENNIAL RYE GRASS	30
HARD FESCUE 'SR 3000'	25
RED FESCUE - 'PENNLAWN'	25
BLUEGRASS - 'GLADE'	10
	130 LBS/ACRE

OTHER SEED MIXTURES AND SEEDING RATES AS RECOMMENDED BY THE USDA - SOIL CONSERVATION SERVICE AND APPROVED BY OWNER MAY BE UTILIZED ONLY UPON PRIOR WRITTEN PERMISSION FROM THE ENGINEER.

16. SEEDING MIXTURES FOR GRASSED SWALES AS SPECIFIED BY THE USDA SOIL CONSERVATION SERVICE, WOODSVILLE, N.H. ARE:

SEEDING RATES

MIXTURE	POUNDS PER ACRE	POUNDS PER 1,000 SQ.FT.
A. TALL FESCUE	20	0.45
CREEPING RED FESCUE	20	0.45
RED TOP	2	0.05
TOTAL	42	0.95

17. MAINTENANCE: REGULAR MAINTENANCE SHALL OCCUR DURING THE CONSTRUCTION PERIOD UNTIL SUCH TIME AS PERMANENT STABILIZATION IS ESTABLISHED. MINOR MAINTENANCE ACTIVITIES RECOMMENDED ON REGULAR INSPECTION REPORTS SHALL BE ADDRESSED BY THE END OF THE NEXT WORK DAY. ADDITIONAL MAINTENANCE MAY INCLUDE:
   A. DISTURBED AREAS WILL BE FERTILIZED AND RESEEDED, WHERE NECESSARY.
   B. CATCH BASINS WILL BE CHECKED AND CLEANED AS NECESSARY.
   C. DRAINAGE AND GRASS TREATMENT SWALES SHALL BE CHECKED FREQUENTLY AND CLEANED AS REQUIRED.
   D. THE SILT FENCES AND HAYBALE DIKES WILL BE CHECKED ON A REGULAR BASIS AND REPAIRED AS NECESSARY TO CORRECT ANY DAMAGE, DETERIORATION, AND SHORT CIRCUITING. SEDIMENT WILL BE REMOVED WHEN IT REACHES ON-THIRD OF THE HEIGHT OF SILT FENCE AND ONE-HALF THE HEIGHT OF OTHER BMP'S SUCH AS EROSION CONTROL SOCKS.
   E. THE BOTTOM OF SEDIMENT BASINS SHALL BE PERIODICALLY CLEANED, WITH THE SEDIMENT REMOVED TO A SECURE LOCATION.
18. SITE VISITS: THE SWPPP MONITOR SHALL BE CONTACTED ON A REGULAR BASIS TO OBSERVE THE INSTALLATION AND MAINTENANCE OF EROSION AND SEDIMENT CONTROL PRACTICES, AND IN THE EVENT OF ANY EROSION, SEDIMENTATION OR TURBIDITY ISSUES THAT ARISE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT THE APPROVED SWPPP AND EROSION CONTROL PLANS ARE KEPT UPDATED REGULARLY.
19. ALL PERMANENT DITCHES, SWALES AND DRAINAGE STRUCTURES SHALL BE STABILIZED USING THE VEGETATIVE AND NON-STRUCTURAL BMPS PRIOR TO DIRECTING RUNOFF TO THEM.
20. THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROLS DAILY AND PRIOR TO ANY ANTICIPATED RAIN EVENTS. THE SWPPP MONITOR SHALL INSPECT ALL EROSION CONTROLS AT LEAST WEEKLY OR ONCE EVERY 14 DAYS AND WITHIN 24 HOURS OF ANY RAINFALL EVENT OF 0.25" OR GREATER RAINFALL THAT OCCURS WITHIN A 24 HOUR PERIOD. ALL DAMAGED SILT FENCES SHALL BE REPAIRED. SEDIMENT DEPOSITS SHALL BE REMOVED AS NECESSARY.
21. STABILIZATION MEASURES MUST BE INITIATED AS SOON AS PRACTICABLE IN PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY CEASED, BUT IN NO CASE MORE THAN 14 DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY CEASED.
22. AN AREA SHALL BE CONSIDERED PERMANENTLY STABILIZED IF ONE OF THE FOLLOWING HAS OCCURRED:
   A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
   B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
   C. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED;
   D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED; OR
   E. NON-VEGETATIVE COVER, SUCH AS HYDROMULCH AND EROSION CONTROL BLANKETS, RIPRAP, STONE FILL, GABIONS AND/OR GEOTEXTILES HAVE BEEN PROPERLY INSTALLED.
23. WINTER CONSTRUCTION NOTES:
   A. TEMPORARY SEEDING SHALL OCCUR PRIOR TO SEPTEMBER 15TH.
   B. ALL PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH NETTING SHALL OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS;
   C. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15TH, OR WHICH ARE DISTURBED AFTER OCTOBER 15TH, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS; AND
   D. AFTER NOVEMBER 15TH, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL PER NHDOT ITEM 304.3.
24. FUGITIVE DUST:
FUGITIVE DUST SHALL BE CONTROLLED IN ACCORDANCE WITH ENV-A 1002.

SOURCES OF FUGITIVE DUST MAY INCLUDE (1) CONSTRUCTION OR RENOVATION OF BUILDINGS, BRIDGES OR OTHER STRUCTURES, INCLUDING PAVING, SWEEPING, TRENCHING, EXCAVATING, FILLING, OR OTHER ACTIVITY ASSOCIATED WITH THE BUILDING OF STREETS, ROADS, HIGHWAYS, PARKING LOTS, PUBLIC WALKWAYS, SHOPPING CENTERS, HOUSING DEVELOPMENTS, OR OTHER CENTERS OF BUSINESS OR RESIDENTIAL DEVELOPMENT; (2) DEMOLITION, INCLUDING THE TEARING DOWN OF BUILDINGS, BRIDGES, OR OTHER STRUCTURES; AND (3) OUTDOOR STORAGE AND MATERIAL STOCKPILES, INCLUDING THE UNLOADING, REDISTRIBUTION, AND MAINTENANCE OF MATERIALS.

THE CONTRACTOR SHALL TAKE PRECAUTIONS THROUGHOUT THE DURATION OF CONSTRUCTION TO PREVENT, ABATE, AND CONTROL THE EMISSION OF FUGITIVE DUST. THIS SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:
   A. THE USE OF WATER OR HYDROPHILIC MATERIAL ON OPERATIONS OR SURFACES, OR BOTH;
   B. THE APPLICATION OF ASPHALT, WATER OR HYDROPHILIC MATERIAL, OR TARPS OR OTHER SUCH COVERS TO MATERIAL STOCKPILES;
   C. THE USE OF HOODS, FANS, FABRIC FILTERS, OR OTHER DEVISES TO ENCLOSE AND VENT AREAS WHERE MATERIALS PRONE TO PRODUCING FUGITIVE DUST ARE HANDLED;
   D. THE USE OF CONTAINMENT METHODS FOR SANDBLASTING OR SIMILAR OPERATIONS; AND
   E. THE USE OF VACUUMS OR OTHER SUCTION DEVICES TO COLLECT AIRBORNE PARTICULATE MATTER.
25. INVASIVE SPECIES:
THE PROJECT SHALL BE MANAGED TO MEET THE REQUIREMENTS AND INTENT OF RSA 430:53 AND AGR 3800 RELATIVE TO INVASIVE SPECIES INCLUDING THE FOLLOWING REQUIREMENTS:

NO PERSON SHALL COLLECT, TRANSPORT, IMPORT, EXPORT, MOVE, BUY, SELL, DISTRIBUTE, PROPAGATE OR TRANSPLANT ANY LIVING AND VIABLE PORTION OF ANY PLANT SPECIES, WHICH INCLUDES ALL OF THEIR CULTIVARS AND VARIETIES, LISTED IN TABLE 3800.1 OF AGR 3800, NEW HAMPSHIRE PROHIBITED INVASIVE SPECIES LIST.

NO PERSON SHALL COLLECT, TRANSPORT, IMPORT, EXPORT, MOVE, BUY, SELL, DISTRIBUTE, PROPAGATE OR RELEASE ANY LIVING INSECT SPECIES LISTED IN TABLE 3800.1, NEW HAMPSHIRE PROHIBITED INVASIVE SPECIES LIST.

***SEE SEPARATE SWPPP NARRATIVE FOR DETAILED WORK PHASES, CONSTRUCTION SEQUENCING AND RELATED EROSION CONTROLS.

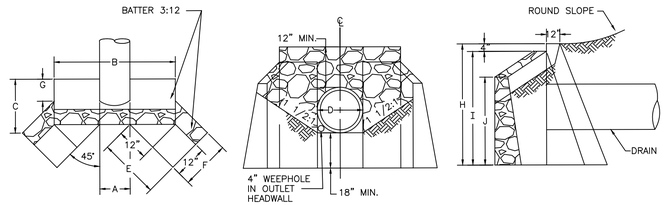
ISSUED FOR BIDDING
JULY 31, 2017

TABLE 3800.1 NEW HAMPSHIRE PROHIBITED INVASIVE SPECIES LIST

SCIENTIFIC NAME	COMMON NAME
M	
Acer platanoides	Norway maple
Ailanthus altissima	tree of heaven
Alliaria petiolata	garlic mustard
Berberis thunbergii	Japanese barberry
Berberis vulgaris	European barberry
Celastrus orbiculatus	Oriental bittersweet
Centaurea biebersteinii	spotted knapweed
Cynanchum nigrum	black swallow-wort
Cynanchum rossicum	pale swallow-wort
Elaeagnus umbellata	autumn olive
Euonymus alatus	burning bush
Heracleum mantegazzianum	giant hogweed
Hesperis matronalis	dame's rocket
Iris pseudacorus	water-flag
Lepidium latifolium	perennial pepperweed
Ligustrum obtusifolium	blunt-leaved privet
Lonicera bella	showy bush honeysuckle
Lonicera japonica	Japanese honeysuckle
Lonicera morrowii	Morrow's honeysuckle
Lonicera tatarica	Tatarian honeysuckle
Microstegium vimineum	Japanese stilt grass
Polygonum cuspidatum	Japanese knotweed
Polygonum perfoliatum	mile-a-minute vine
Reynoutria × bohemica	bohemia knotweed
Rhamnus cathartica	common buckthorn
Rhamnus frangula	glossy buckthorn
Rosa multiflora	multiflora rose
INSECTS	
Acarapis woodi	honeybee tracheal mite
Adelges tsugae	hemlock woolly adelgid
Aeolesthes sarta	city longhorn beetle
Agrilus planipennis	emerald ash borer
Anoplophora glabripennis	Asian longhorned beetle
Callidiellum rufipenne	cedar longhorned beetle
Dendrolimus sibiricus	Siberian silk moth
Hylurgus lingniperda	redhaired bark beetle
Ips typographus	European spruce bark beetle
Lymantria dispar	Asian gypsy moth
Popillia japonica	Japanese beetle
Pyrrhalta viburni	viburnum leaf beetle
Rhizotrogus majalis	European chafer
Symantria monacha	nun moth
Tetropium fuscum	brown spruce longhorned beetle
Varroa destructor	varroa mite

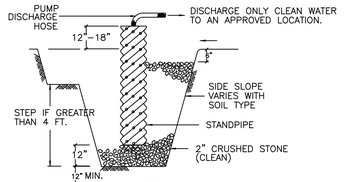
CONSTRUCTION SEQUENCE

1. INSTALL SILT FENCE DOWN GRADIENT OF ALL PROPOSED SITE DISTURBANCES.
2. FELL AND CLEAR TREES FOR ROAD AND UTILITIES.
3. INSTALL SILT FENCE AT ALL OTHER LOCATIONS INDICATED ON PLAN AND AT OTHER LOCATIONS AS DETERMINED BY ENGINEER. INSTALL OTHER TEMPORARY AND PERMANENT EROSION AND SEDIMENT CONTROL MEASURES AS EARTHWORK PROCEEDS AND AS DETERMINED NECESSARY BY THE ENGINEER.
4. GRUB SITE, CHIP STUMPAGE AND BRUSH FOR USE AS ADDITIONAL EROSION CONTROL MEASURES, OR DISPOSE OF STUMPAGE AND BRUSH DEBRIS OFF-SITE.
5. STOCKPILE TOPSOIL AND INSTALL ASSOCIATED EROSION CONTROL MEASURES, I.E., SILT FENCE, AND MULCH AT A LOCATION APPROVED BY ENGINEER.
6. INSTALL TEMPORARY CULVERTS AS REQUIRED WITH SILT FENCE AND STONE CHECK DAMS.
7. GRADE ACCESS ROADS. STABILIZE CONSTRUCTION ENTRANCES AND TEMPORARY ACCESS ROADS WITH COARSE AGGREGATE 4 INCHES (MINIMUM) OVER COMPACTED FILL AREAS TO PREVENT OFF-SITE TRACKING BY VEHICLES AND EQUIPMENT.
8. AS WORK PROCEEDS FROM WORK UNIT TO WORK UNIT, CONSTRUCT UNDERGROUND UTILITIES, ROADS AND PARKING AREAS.
9. PREPARE, SEED, AND MULCH (TEMPORARY AND PERMANENT) IMMEDIATELY AFTER GRADING.
10. INSPECT ALL DISTURBED AREAS ON A DAILY BASIS. FOLLOWING THIS DAILY INSPECTION, INSTALL AS REQUIRED ANY AND ALL TEMPORARY DRAINAGE, EROSION, AND SEDIMENT CONTROL PRACTICES AS INDICATED, I.E., DIVERSION CHANNELS, BERMS, DRAINS, DITCHES, SILT FENCES, SEED AND MULCH OR OTHER PRACTICES AS RECOMMENDED AND SPECIFIED IN THE "STORMWATER MANAGEMENT AND EROSION AND SEDIMENT CONTROL HANDBOOK FOR DEVELOPING AREAS OF NEW HAMPSHIRE" (DURHAM: USDA - SOIL CONSERVATION SERVICE).
11. FINISH PAVING ALL ROADWAYS BY WORK UNIT AS CONSTRUCTION PROGRESSES.
12. PLACE TOPSOIL, COMPLETE PERMANENT FERTILIZING, LIMING, SEEDING AND MULCHING, INSTALL LANDSCAPE PLANTING.
13. CLEAN AND RESTORE SILT DETENTION SITES AND DRAINAGE STRUCTURES. REMOVE OTHER EROSION CONTROL PRACTICES ON A TIMELY BASIS AS PERMANENT MEASURES TAKE HOLD. SPOT FERTILIZE, SEED, AND MULCH AS REQUIRED.
14. INSPECT AND MAINTAIN GRADING, EROSION CONTROL AND SEDIMENT CONTROL PRACTICES WEEKLY AND IMMEDIATELY AFTER ALL STORMS OF MORE THAN 1/2" IN 24 HOURS.
15. REFER TO EROSION AND SEDIMENT CONTROL PLAN FOR ADDITIONAL DETAILS RELATIVE TO THE REQUIRED CONSTRUCTION SEQUENCE.
16. MAINTENANCE OF ALL EROSION AND SEDIMENT CONTROL COMPONENTS AND INSTALLATION OF ADDITIONAL EROSION AND SEDIMENT CONTROL COMPONENTS SHALL BE AN ONGOING PRACTICE AND IN STRICT ACCORDANCE WITH THE APPROVED "EROSION & SEDIMENT CONTROL AND STORMWATER MANAGEMENT PLAN" AND SWPPP.
17. STORMWATER FLOWS SHALL NOT BE DIRECTED TO THE INFILTRATION AREAS UNTIL CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.



DIA. D INCHES	DIMENSIONS								
	A	B	C	E	F	G	H	I	J
12"	1'-3"	4'-0"	2'-2"	2'-4"	1'-10"	0'-7"	4'-0"	3'-8"	3'-0"
15"	1'-6"	4'-3"	2'-2"	2'-4"	1'-10"	0'-7"	4'-0"	3'-8"	3'-0"
18"	1'-9"	4'-6"	2'-2"	2'-4"	1'-10"	0'-7"	4'-0"	3'-8"	3'-0"

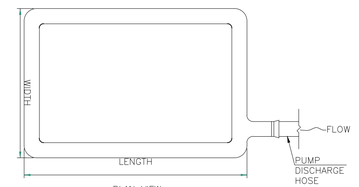
STONE MASONRY HEADWALL DETAILS
N.T.S.



INSTALLATION NOTES

1. PIT DIMENSIONS ARE VARIABLE.
2. THE STANDPIPE SHOULD BE A PERFORATED 12" TO 24" DIAMETER CORRUGATED METAL, PVC OR HDPE PIPE.
3. A BASE OF 2" CLEAN CRUSHED STONE SHOULD BE PLACED IN THE PIT TO A DEPTH OF 11". AFTER INSTALLING THE STANDPIPE, THE PIT SURROUNDING THE STANDPIPE SHOULD THEN BE BACKFILLED WITH 2" CRUSHED STONE.
4. THE STANDPIPE SHOULD EXTEND 12" - 18" ABOVE THE LIP OF THE PIT.
5. IF DISCHARGE WILL BE PUMPED DIRECTLY INTO THE WETLAND OR STREAM CHANNEL, THE STANDPIPE SHOULD BE WRAPPED WITH FILTER FABRIC BEFORE INSTALLATION. IF DESIRED, 1/4" - 1/2" HARDWARE CLOTH MAY BE PLACED AROUND THE STANDPIPE, PRIOR TO ATTACHING THE FILTER FABRIC, THIS WILL INCREASE THE RATE OF WATER SEEPAGE INTO THE PIPE.

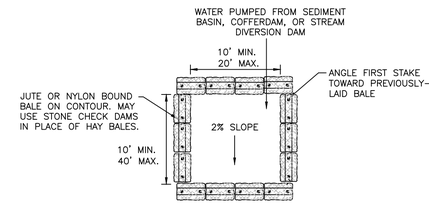
DEWATERING STRUCTURE
N.T.S.

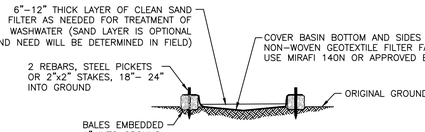


CONSTRUCTION SPECIFICATIONS

1. THE PRIMARY PURPOSE OF FILTER BAG IS TO RETAIN SILT, SAND, AND FINES DURING DEWATERING OPERATIONS.
2. FILTER BAGS SHALL BE INSTALLED ON A VEGETATED SLOPE GRADED TO ALLOW INCOMING WATER TO FLOW THROUGH THE BAG.
3. FILTER BAGS MAY ALSO BE PLACED ON COARSE AGGREGATE, STONE, OR HAYBALES TO INCREASE FILTRATION EFFICIENCY.
4. FILTER BAGS SHALL BE LOCATED A MINIMUM OF 50' FROM WATERS OF THE STATE UNLESS OTHERWISE APPROVED BY THE ENGINEER.
5. THE NECK OF THE FILTER BAG SHALL BE STRAPPED TIGHTLY TO THE DISCHARGE HOSE.
6. A FILTER BAG IS FULL WHEN IT NO LONGER CAN EFFICIENTLY FILTER SEDIMENT OR ALLOW WATER TO PASS AT A REASONABLE RATE.
7. FILTER BAG SHALL BE DISPOSED OF AS APPROVED IN THE SWPPP PLAN OR AS DIRECTED BY THE ENGINEER.

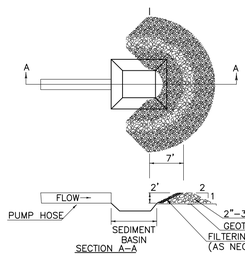
FILTER BAG
N.T.S.





NOTE:
1. GOAL IS FOR ALL CONTAMINATED WATER TO FLOW THROUGH NON-WOVEN FABRIC, AND SAND LAYER AS DEEMED NECESSARY, PRIOR TO EXITING BASIN.
2. BASIN SIZE TO VARY BASED ON EXPECTED VOLUME OF WASHWATER, BUT SHOULD NOT EXCEED LIMITS INDICATED ABOVE.
3. CONTRACTOR MAY USE MULTIPLE CELLS TO INCREASE TREATMENT CAPACITY.
4. DETAIL AS SHOWN IS INTENDED TO PROMOTE INFILTRATION INTO GROUND BELOW BASIN. WHERE INFILTRATION IS NOT DESIRED DUE TO UNSUITABLE SOIL CONDITIONS, CLOSE PROXIMITY TO SENSITIVE RESOURCES, OR OTHER CONDITIONS, CONTRACTOR SHALL USE IMPERVIOUS PLASTIC LINER ON BOTTOM AND THREE SIDES WITH NON-WIVEN FABRIC ON DOWN GRADIENT END TO ALLOW WATER TO EXIT BASIN IN DESIRED DIRECTION AWAY FROM SENSITIVE RESOURCES.
5. LOCATE BASIN A MINIMUM OF 20 FEET FROM ANY SURFACE WATERS, WETLANDS, DRAINAGE FEATURES WITH A MINIMUM OF 20 FEET OF UNDISTURBED VEGETATED BUFFER DOWN-GRDIENT OF DISCHARGE POINT.

SETTLING BASIN/SAND FILTER FOR DEWATERING CONTROL
N.T.S.



SECTION A-A

CONSTRUCTION SPECIFICATIONS

1. USE 2" TO 3" STONE. FILTERING STONE SHALL BE 3/4".
2. PLACE STONE OVER GEOTEXTILE.
3. ONCE PUMPING IS COMPLETE FOR THE PROJECT, THE SEDIMENT TRAPPED BEHIND THE DAM SHALL BE DISPOSED OF IN AN APPROVED WASTE AREA.
4. THE CHECK DAM(S) SHALL BE REMOVED AND THE AREA STABILIZED AND RESTORED TO NEAR PRE-CONSTRUCTION CONDITION.

CHECK DAM FOR HOSE OUTLET PROTECTION
N.T.S.

REVISION NO.	DATE	DESCRIPTION	MADE BY	CHECKED BY	APPROVED BY

EROSION AND SEDIMENT CONTROL DETAILS FOR

TOWN OF ENFIELD - NH ROUTE 4A SEWER EXTENSION
SHAKER LANDING PUMP STATION REPLACEMENT

LANDING ROAD, ENFIELD, NEW HAMPSHIRE

PATHWAYS CONSULTING, LLC
240 MECHANIC STREET, SUITE 100
LEBANON, NEW HAMPSHIRE 03766
(603) 448-2200

SCALE: AS SHOWN	
DESIGNED BY: ISM	
DRAWN BY: CRM	
CHECKED BY: RJF	
DATE: 07-07-17	
PROJ. NO. 10068-05	SHEET 11 OF 11

11