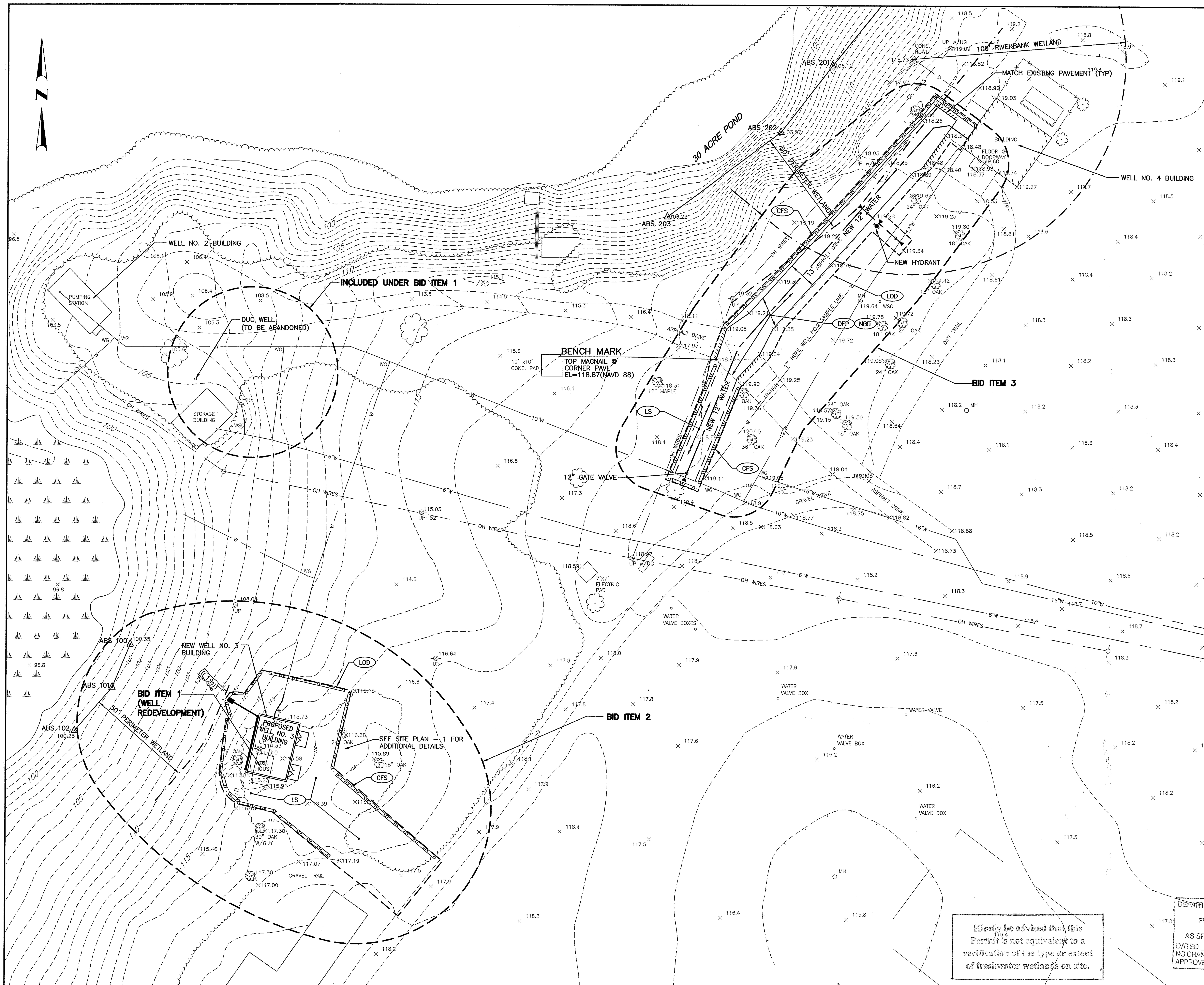


Kindly be advised that this Permit is not equivalent to a verification of the type or extent of freshwater wetlands on site.

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
FRESHWATER WETLANDS PROGRAM
APPROVED WITH CONDITIONS
AS SPECIFIED IN THE LETTER OF APPROVAL
DATED JUL 18 2016 FILE # 15-0163
NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL
APPROVED PLANS MUST BE AT CONSTRUCTION SITE

PROJECT

WELL REDEVELOPMENT
WELL STATION NO. 3

KINGSTON, RHODE ISLAND

TODD A. RAVENELLE No. 5928 REGISTERED PROFESSIONAL ENGINEER

CLIENT

UNIVERSITY OF RHODE ISLAND

Gordon R. Archibald, Inc.
Civil and Environmental Engineers
Pawtucket, Rhode Island

DRAWING TITLE

OVERALL SITE PLAN

REVISIONS

NO.	DATE	REVISIONS	BY
1	6/20/16	ELIMINATION OF PERIMETER PEASTONE, NEW DOWNSPOUT OUTLET	KMN

PROJECT NO.: 1574

DATE: JULY 2015

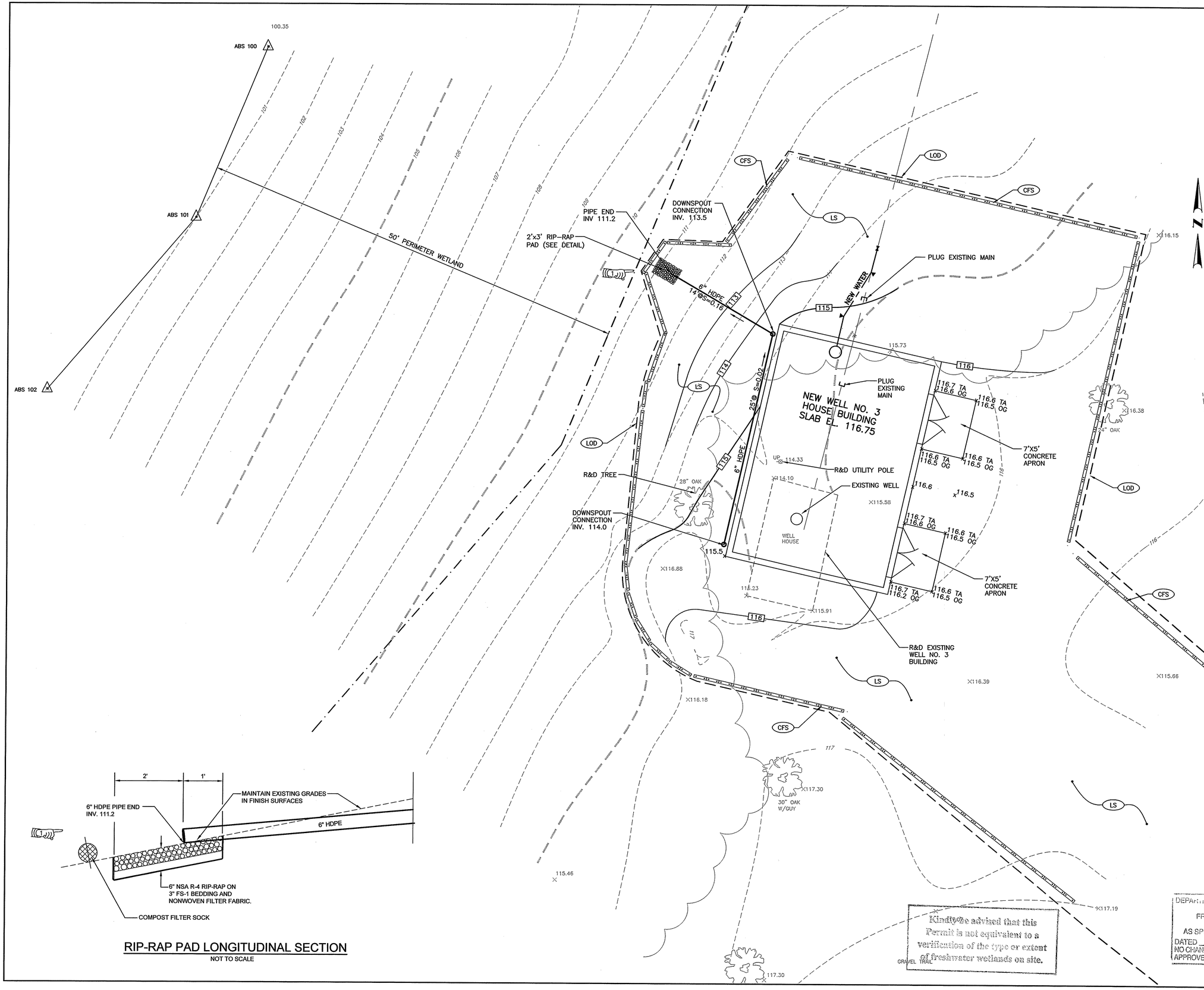
SCALE: 1" = 20'

DRAWN BY: TAP

CHECKED BY: TAR

DRAWING NUMBER
3

SHEET 3 OF 7



RIP-RAP PAD LONGITUDINAL SECTION

NOT TO SCALE

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DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
FRESHWATER WETLANDS PROGRAM
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AS SPECIFIED IN THE LETTER OF APPROVAL
DATED JUL 18 2016 FILE # 15-0113
NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL
APPROVED PLANS MUST BE AT CONSTRUCTION SITE

JUN 27 2016

PROJECT
WELL REDEVELOPMENT
WELL STATION NO. 3
KINGSTON, RHODE ISLAND

TODD A. RAVENELLE
No. 5928
REGISTERED
PROFESSIONAL ENGINEER

CLIENT
UNIVERSITY OF RHODE ISLAND

Gordon R. Archibald, Inc.
Civil and Environmental Engineers
Pawtucket, Rhode Island

DRAWING TITLE
SITE PLAN - 1

NO.	DATE	REVISIONS	BY
1	6/20/16	ELIMINATION OF PERIMETER PEASTONE. NEW DOWNSPOUT OUTLET	KMN

PROJECT NO.: 1574

DATE: JULY 2015

SCALE: 1" = 5'

DRAWN BY: TAP

CHECKED BY: TAR

DRAWING NUMBER
4

SHEET 4 OF 7

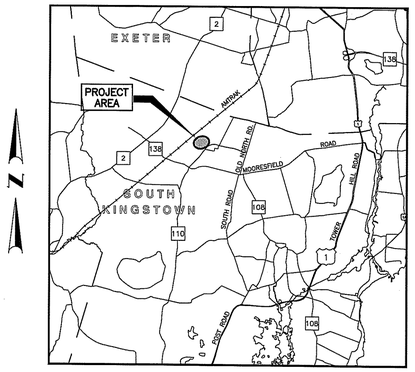
F:\FILES\CAD\1574\Plans\1574-SITEPLAN - 1.dwg, 6/23/2016 8:22:37 AM, USERNT, 1:1

INDEX

SHEET NO.	DESCRIPTION
1	COVER SHEET
2	LEGEND, NOTES AND DETAILS
3	OVERALL SITE PLAN
4	SITE PLAN - 1
5	PLANS, SECTIONS & ELEVATIONS
6	WATER NOTES
7	WATER DETAILS

UNIVERSITY OF RHODE ISLAND
Office of Capital Projects

PLANS AND DETAILS OF PROPOSED
WELL REDEVELOPMENT
WELL STATION NO. 3
KINGSTON, RHODE ISLAND



LOCATION MAP
SCALE: 1" = 2 Miles

UNIVERSITY OF
Rhode Island

TODD A. RAVENELLE
No. 5928
REGISTERED PROFESSIONAL ENGINEER
6/17/15

Gordon R. Archibald, Inc.
Civil and Environmental Engineers

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
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JULY 2015
WETLAND PERMIT
SUBMISSION

RECEIVED JUL 23 2015

Number of Sheet 1
Total Sheets 7

GENERAL NOTES

1. REFERENCE IS MADE TO THE LATEST EDITIONS OF THE RHODE ISLAND DEPARTMENT OF TRANSPORTATION (RIDOT) "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" (AMENDED DECEMBER 2010, INCLUDING ALL SUBSEQUENTLY ISSUED SUPPLEMENTS, REVISIONS, AND ADDENDA) AND THE "RHODE ISLAND STANDARD DETAILS" (1998, INCLUDING ALL SUBSEQUENT REVISIONS, ADDITIONS AND DELETIONS ISSUED BY THE RIDOT). ALL PROJECT SITE IMPROVEMENTS SHALL CONFORM TO THE APPLICABLE STANDARDS SET FORTH IN THESE DOCUMENTS (AND THE SUB-REFERENCES INCORPORATED THEREIN) UNLESS OTHERWISE INDICATED IN THE CONTRACT DOCUMENTS .
2. THE PROJECT LIMITS OF CLEARING AND SURFACE DISTURBANCE MUST BE STRICTLY ADHERED TO IN ALL AREAS. IN ADDITION TO THOSE AREAS SPECIFICALLY DESIGNATED ON THE PLANS, THE CONTRACTOR WILL BE RESPONSIBLE FOR RESTORING (THROUGH PROVISION AND PLACEMENT OF LOAM AND SEED) ANY UNPAVED AREAS OUTSIDE OF THE PROJECT LIMITS OF DISTURBANCE IMPACTED BY CONSTRUCTION OPERATIONS. ANY REQUIRED RESTORATION OUTSIDE THE PROJECT LIMITS OF DISTURBANCE SHALL BE COMPLETED TO THE SATISFACTION OF THE ENGINEER AND AT THE CONTRACTOR'S EXPENSE.
3. ANY DAMAGE CAUSED BY THE CONTRACTOR TO EXISTING CURBING, SIDEWALKS, PAVEMENTS, FENCES, OR OTHER SITE FEATURES TO REMAIN IN PLACE SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISPOSAL OF ALL EXCESS EXCAVATED PAVEMENTS, CURBING, SIDEWALKS, CURB STOPS, AND OTHER CONSTRUCTION WASTE IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS.
5. THE CONTRACTOR SHALL MAINTAIN ALL EXCAVATION IN A DRY CONDITION. NO SEPARATE PAYMENT OR ALLOWANCE SHALL BE MADE FOR DEWATERING.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING SEDIMENTS FROM DEWATERING OPERATION DISCHARGES THROUGH THE USE OF STILLING BASINS, FILTER FABRIC DEVICES, AND/OR OTHER SUITABLE MEANS AS APPROVED BY THE ENGINEER.
7. FILL REQUIRED FOR EMBANKMENTS SHALL CONFORM TO THE REQUIREMENTS FOR COMMON BORROW SET FORTH IN SECTION M.01.01 OF THE RIDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION.
8. THE CONTRACTOR SHALL PROVIDE CONTINUOUS DUST CONTROL (USING WATER AND/OR CALCIUM CHLORIDE OR OTHER APPROVED METHODS) FOR ALL EARTH STOCKPILES, EARTH PILED ALONG EXCAVATIONS AND SURFACES OF BACK FILLED TRENCHES, IN ACCORDANCE WITH THE RIDOT STANDARD SPECIFICATIONS AND AS DIRECTED BY THE ENGINEER.
9. THE CONTRACTOR SHALL PROVIDE ALL REQUIRED NOTICES AND COMPLY WITH ALL PERMITS, LAWS, ORDINANCES, RULES AND REGULATIONS BEARING ON THE CONDUCT OF THE WORK AS DRAWN AND SPECIFIED IN THE CONTRACT DOCUMENTS.
10. EXISTING UTILITIES HAVE BEEN PLOTTED FROM BEST AVAILABLE DATA AND ARE APPROXIMATE ONLY. IN ACCORDANCE WITH CURRENT STATE "DIG SAFE" LAWS AND RULES, THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL EXISTING DRAINAGE SYSTEM ELEMENTS AND UTILITIES (BOTH UNDERGROUND AND OVERHEAD) BEFORE ANY EXCAVATION MAY COMMENCE. THE CONTRACTOR IS ADVISED THAT (A) NOT ALL UTILITY PROVIDERS SUBSCRIBE TO THE DIG SAFE PROGRAM, AND (B) IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY ALL POTENTIALLY AFFECTED UTILITY COMPANIES AND ENSURE THAT ALL UTILITIES HAVE BEEN MARKED PRIOR TO THE COMMENCEMENT OF WORK. EXCAVATION SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE STATUTES, ORDINANCES, RULES AND REGULATIONS OF ANY MUNICIPAL, STATE OR FEDERAL AGENCY OR AUTHORITY HAVING JURISDICTION OVER THE WORK. ANY DAMAGE TO EXISTING UTILITIES MARKED IN THE FIELD OR UNMARKED UTILITIES (AS A RESULT OF FAILING TO CONTACT THE APPROPRIATE UTILITY COMPANY) SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR AT NO COST TO THE OWNER.
11. THE CONTRACTOR IS ADVISED THAT WORK UNDER EXISTING OVERHEAD UTILITIES IS REQUIRED, AND THAT MINIMUM CLEARANCES SHALL BE MAINTAINED AT ALL TIMES IN ACCORDANCE WITH UTILITY COMPANY REQUIREMENTS. THIS MAY REQUIRE SPECIAL MEANS AND METHODS IN ORDER TO PROPERLY COMPLETE THE WORK. SHOULD THE CONTRACTOR ELECT TO RELOCATE EXISTING OVERHEAD UTILITIES, THEN THE CONTRACTOR SHALL CONDUCT ALL COORDINATION WITH THE AFFECTED UTILITY COMPANIES AND BEAR ALL COSTS ASSOCIATED WITH UTILITY RELOCATIONS NOT INCLUDED IN THE CONTRACT .
12. PRIOR TO DRAINAGE AND UTILITY CONSTRUCTION, THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE LOCATION (HORIZONTAL AND VERTICAL) OF ALL EXISTING PIPES AND/OR STRUCTURES WHICH ARE TO BE CONNECTED OR REMOVED. ANY VARIATION FROM THE PLANS MUST BE BROUGHT TO THE ENGINEER'S ATTENTION PRIOR TO DRAINAGE AND UTILITY CONSTRUCTION, WHEREUPON WORK CAN COMMENCE ONLY UPON THE ENGINEER'S AUTHORIZATION.
13. ALL EXISTING PIPE, SUBSURFACE STRUCTURES, PAVEMENTS, EXCESS EXCAVATED MATERIALS AND MISCELLANEOUS MATERIALS REMOVED IN THE COURSE OF UTILITY WORK (INSTALLATION OF DRAINAGE, WATER AND SEWER PIPING, ETC.) SHALL BE LEGALLY DISPOSED OF BY THE CONTRACTOR AT AN OFFSITE LOCATION .
14. WHERE UNDERGROUND UTILITY CROSSINGS ARE REQUIRED, AT LEAST TWO (2) TEST PITS SHALL BE DUG TO DETERMINE THE LOCATION/DEPTH AND MATERIAL OF THE EXISTING UTILITY.
15. UTILITY SERVICES TO EXISTING BUILDINGS AND FACILITIES SHALL BE MAINTAINED AT ALL TIMES FOR THE DURATION OF CONSTRUCTION.
16. THE CONTRACTOR SHALL ADJUST ALL UTILITY BOXES, FRAMES, AND COVERS AS REQUIRED TO MATCH FINISH GRADE.

LEGEND

CFS	COMPOST FILTER SOCK
DFP	DISPOSE FLEXIBLE PAVEMENT
LOD	LIMIT OF DISTURBANCE
NBIT	NEW BITUMINOUS PAVEMENT (SEE DETAIL)
LS	4" LOAM AND SEED

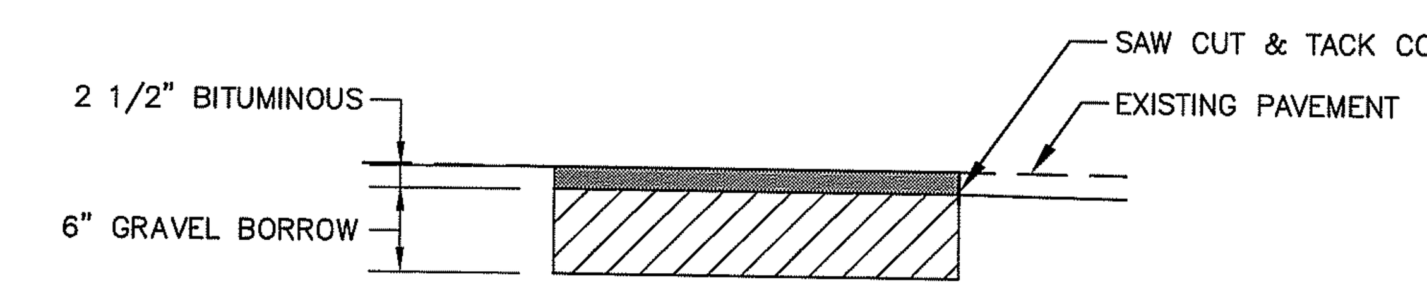
ELEV	PROPOSED CONTOUR LINE
x ELEV.	PROPOSED SPOT GRADE
ELEV.	EXISTING CONTOUR LINE
x ELEV.	EXISTING SPOT GRADE
	COMPOST FILTER SOCK

EROSION AND SEDIMENT CONTROL NOTES

1. SOIL EROSION AND SEDIMENTATION CONTROL MEASURES TO BE EMPLOYED ON THE PROJECT ARE INDICATED ON THE PLANS. CONTROL MEASURES SHALL BE FURNISHED, INSTALLED, MAINTAINED FOR THE DURATION OF CONSTRUCTION, AND SUBSEQUENTLY REMOVED, ALL IN ACCORDANCE WITH THE RIDOT STANDARD SPECIFICATIONS, THE LATEST EDITION OF THE "RHODE ISLAND SOIL EROSION AND SEDIMENT CONTROL HANDBOOK" (REVISED 2014), AND ANY SITE-SPECIFIC EROSION AND SEDIMENT CONTROL / POLLUTION PREVENTION PLAN INCLUDED IN THE CONTRACT DOCUMENTS.
2. ALL CLEARING, GRADING AND EARTHWORK ACTIVITIES SHALL REMAIN STRICTLY WITHIN THE LIMITS OF DISTURBANCE (LOD) DEPICTED ON THE PLANS AND SHALL BE RESTRICTED TO ACTIVITIES NECESSARY FOR COMPLETION OF THE WORK. THE CONTRACTOR SHALL ENSURE THAT ALL AREAS OUTSIDE THE LIMITS OF DISTURBANCE REMAIN UNDISTURBED AND PROTECTED FROM CONSTRUCTION IMPACTS .
3. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE ROUTINELY INSPECTED AND MAINTAINED IN ACCORDANCE WITH THE RIDOT STANDARD SPECIFICATIONS, THE RHODE ISLAND SOIL EROSION AND SEDIMENT CONTROL HANDBOOK, AND THE APPLICABLE CONDITIONS OF ANY REGULATORY/ENVIRONMENTAL PERMITS ISSUED FOR THE PROJECT.
4. PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES, EROSION AND SEDIMENTATION CONTROLS SHALL BE INSTALLED AT LOCATIONS AND AREAS SHOWN ON THE PLANS. CLEARING MAY OCCUR PRIOR TO INSTALLATION OF SUCH CONTROLS; HOWEVER NO GRUBBING, GRADING, FILLING, OR OTHER SOIL DISTURBANCE SHALL OCCUR PRIOR TO INSTALLATION.
5. PERIMETER EROSION CONTROL BARRIERS (STAKED COMPOST FILTER SOCK, SILT FENCE, OR OTHER DEVICES AS INDICATED) SHALL BE INSTALLED IN CONTINUOUS UNINTERRUPTED RUNS AT THE LOCATIONS INDICATED ON THE PLANS AND MAINTAINED IN EFFECTIVE CONDITION UNTIL ALL DISTURBED AREAS HAVE BEEN STABILIZED WITH VEGETATION. FOLLOWING SUCCESSFUL STABILIZATION OF DISTURBED AREAS, ALL PERIMETER EROSION CONTROL BARRIERS SHALL BE REMOVED. PRIOR TO REMOVAL OF THE DEVICES, ALL ACCUMULATED SEDIMENT AND DEBRIS TRAPPED BY THE BARRIERS SHALL BE REMOVED AND DISPOSED OF LEGALLY AT A SUITABLE OFFSITE LOCATION .
6. THE TOE OF ANY FILL SLOPE IS TO REMAIN AT LEAST ONE (1) FOOT INSIDE OF ALL PERIMETER EROSION CONTROL BARRIERS. UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR COVER ANY PORTION OF THE EROSION CONTROL MEASURES WITH MATERIAL. ANY MATERIAL THAT IS PLACED ON ANY EROSION CONTROLS BY THE CONTRACTOR (OR ANY AGENT OF THE CONTRACTOR) SHALL BE IMMEDIATELY REMOVED, AND ANY NECESSARY REPAIRS TO THE EROSION CONTROLS SUBSEQUENTLY IMPLEMENTED AT NO COST TO THE OWNER .
7. UNTIL VEGETATIVE COVER IS ESTABLISHED AND DISTURBED AREAS ARE FULLY STABILIZED, TRAPPED SEDIMENTS SHALL BE PERIODICALLY REMOVED FROM PERIMETER EROSION CONTROL BARRIERS. AT A MINIMUM, MATERIAL SHALL BE REMOVED ONCE THE DEPTH OF ACCUMULATED SEDIMENT REACHES SIX (6) INCHES OR ONE-HALF THE BARRIER HEIGHT, WHICHEVER IS LESS. ALL REMOVED MATERIAL SHALL BE DISPOSED OF LEGALLY AT A SUITABLE OFFSITE LOCATION.
8. ALL MATERIAL STOCKPILES SHALL BE LOCATED WITHIN THE LIMITS OF DISTURBANCE (LOD) DEPICTED ON THE PLANS AND SHALL BE SURROUNDED BY A SECURED PERIMETER OF COMPOST FILTER SOCK.
9. ALL EXISTING AND CONSTRUCTED DRAINAGE SYSTEM INLETS SHALL BE PROVIDED WITH INLET PROTECTION DEVICES (FILTER BAGS/SILT SACKS, SANDBAGS, WATTLES, ETC.) AS INDICATED ON THE PLANS. ALL INLET PROTECTION DEVICES SHALL BE INSTALLED, MAINTAINED, AND CLEANED FOR THE DURATION OF CONSTRUCTION AND UNTIL ALL STORMWATER CONTROLS ARE FULLY STABILIZED AND ONLINE, AT WHICH TIME THEY SHALL BE REMOVED.
10. DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING DRAINAGE AND RUNOFF FLOW DURING STORMS AND PERIODS OF RAINFALL.
11. EROSION CONTROL DEVICES SHOULD BE INSPECTED WEEKLY AND AFTER RAINFALL EVENTS EXCEEDING ONE HALF INCH (½") IN ANY 24-HOUR PERIOD. WHERE AND WHEN REQUIRED, MAINTENANCE AND REPAIRS SHALL BE COMPLETED WITH 24 HOURS OF THE INSPECTION.
12. DENUDED/UNVEGETATED SLOPES SHALL NOT BE LEFT UNATTENDED OR EXPOSED FOR PERIODS IN EXCESS OF 2 WEEKS OR THROUGH THE INACTIVE WINTER SEASON.
13. ALL DISTURBED SLOPES EITHER NEWLY CREATED OR EXPOSED PRIOR TO OCTOBER 15 SHALL BE SEEDED OR PROTECTED BY THAT DATE FOR ANY WORK COMPLETED DURING EACH CONSTRUCTION YEAR.
14. TEMPORARY SURFACE STABILIZATION TREATMENTS SHALL CONSIST OF A HAY, STRAW, OR FIBER MULCH OR PROTECTIVE COVERS SUCH AS FIBER MESH, EROSION CONTROL BLANKETS, OR OTHER MATTING. THEY SHALL BE INCORPORATED INTO THE WORK AS WARRANTED OR AS DIRECTED BY THE ENGINEER. HAY OR STRAW APPLICATIONS SHOULD BE IN THE AMOUNT OF 3,000-4,000 POUNDS PER ACRE (1.9-2.5 POUNDS PER SQUARE YARD). IF NEEDED, TEMPORARY SEEDING (PROVIDED IN ACCORDANCE WITH APPLICABLE SECTIONS OF THE STANDARD SPECIFICATIONS AND EROSION AND SEDIMENT CONTROL GUIDANCE) MAY BE EMPLOYED TO FURTHER MINIMIZE EROSION.
15. TOPSOIL SHALL HAVE A SANDY LOAM TEXTURE, FREE OF SUBSOIL, STONES, ROCKS, ROOTS, BRUSH, REFUSE, CONSTRUCTION DEBRIS AND OTHER DELETERIOUS MATERIALS AND SHALL CONFORM TO SUBSECTION M.18.01 OF THE RIDOT STANDARD SPECIFICATIONS.
16. THE SEEDED MIX SHALL BE INOCULATED WITHIN 24 HOURS, BEFORE MIXING AND PLANTING, WITH APPROPRIATE INOCULUM FOR EACH VARIETY.
17. THE DESIGN MIX SHALL BE COMPRISED OF THE FOLLOWING AND BE APPLIED AT A SEEDING RATE OF 100 POUNDS PER ACRE:

COMPONENT	% BY WEIGHT
RED FESCUE	70
KENTUCKY BLUEGRASS	15
COLONIAL BENTGRASS	5
PERENNIAL RYEGRASS	10

18. THE NORMAL ACCEPTABLE SEASONAL SEEDING DATES ARE APRIL 1 - JUNE 1 AND AUGUST 15 - OCTOBER 15.
19. STABILIZATION OF ONE FORM OR ANOTHER AS DESCRIBED ABOVE SHALL BE ACHIEVED WITHIN 14 DAYS OF FINAL GRADING. PLANTING OF GRASS SHALL BE ACCOMPLISHED BY THE CONTRACTOR AS EARLY AS POSSIBLE UPON COMPLETION OF GRADING AND CONSTRUCTION.
20. THE CONTRACTOR MUST REPAIR AND OR RESEED ANY AREAS THAT DO NOT DEVELOP WITHIN THE PERIOD OF ONE (1) CALENDAR YEAR AND SHALL DO SO AT NO ADDITIONAL EXPENSE TO THE OWNER.



PAVEMENT STRUCTURE DETAIL
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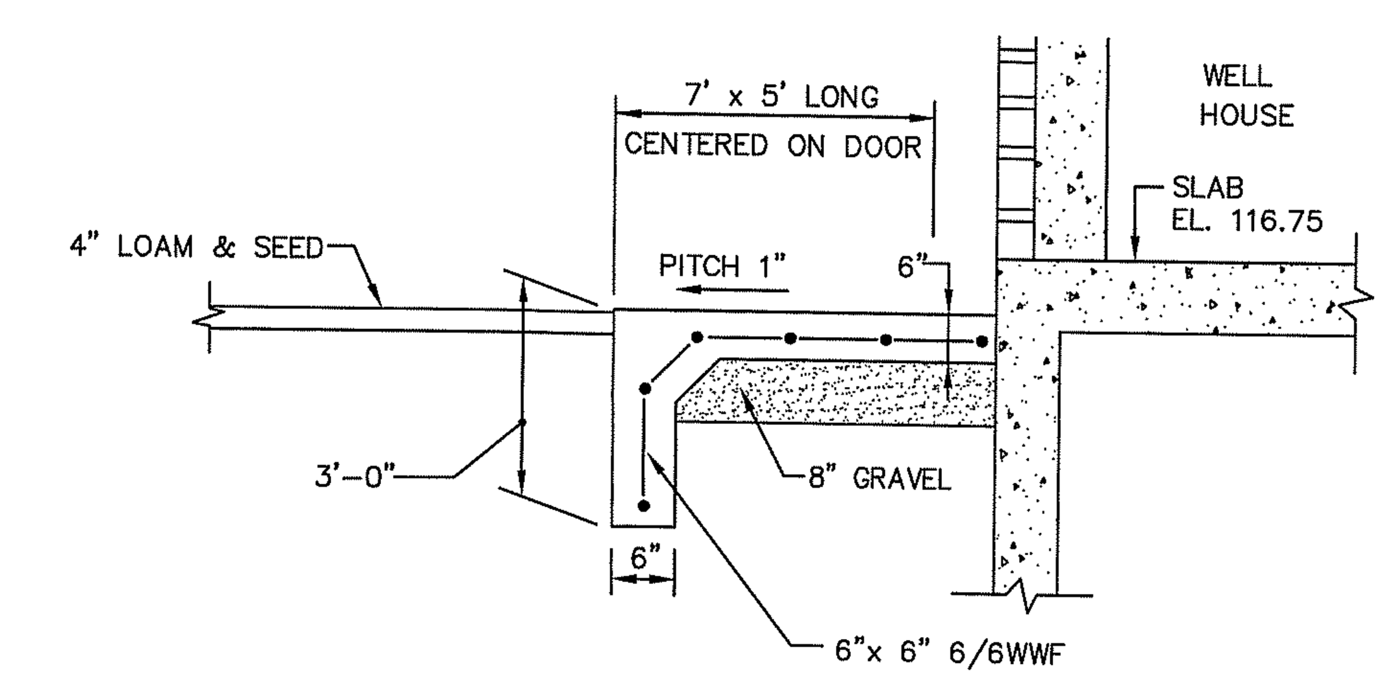
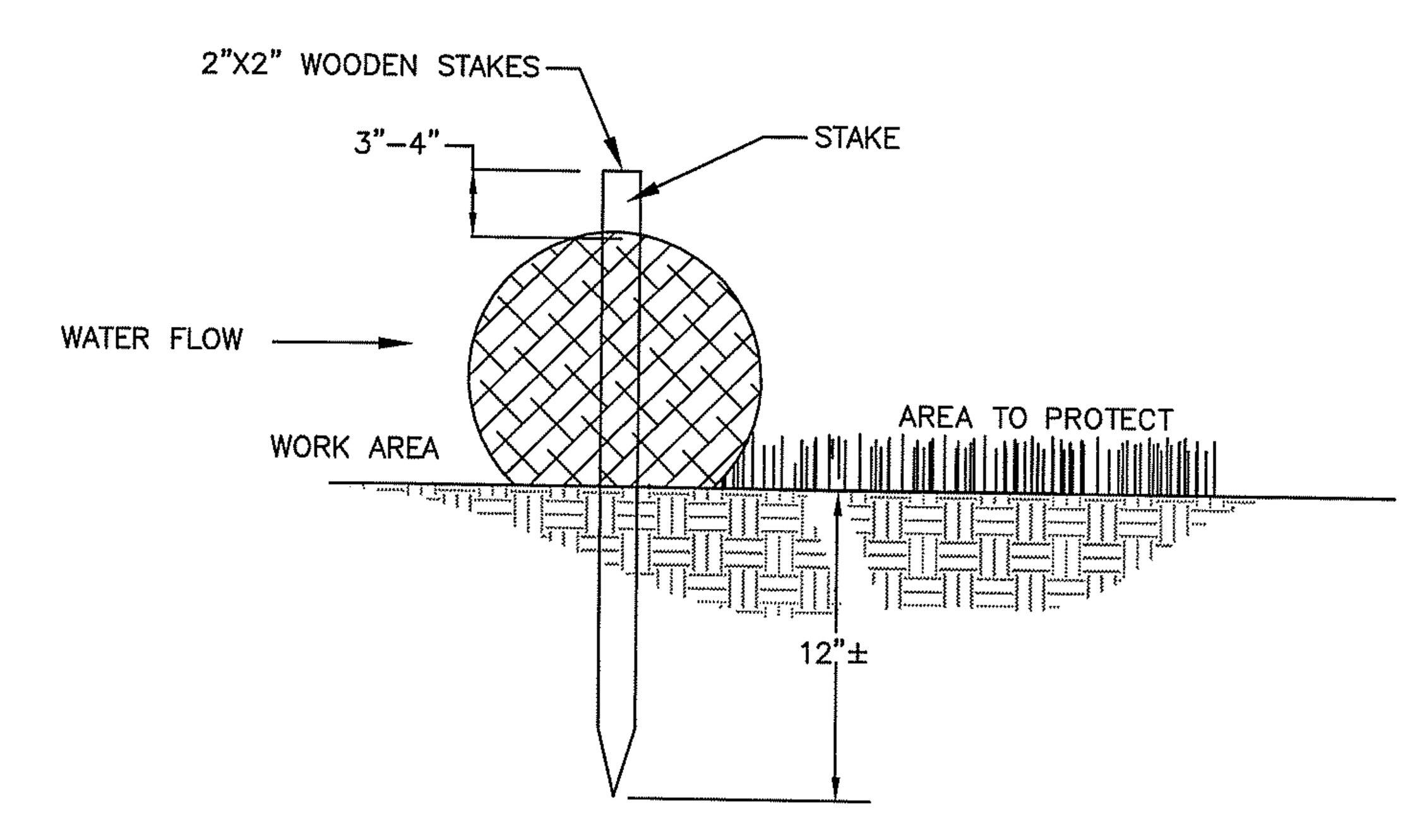


CONCRETE APRON AT ENTRANCE DETAIL
N.T.S.



COMPOST FILTER SOCK
NOT TO SCALE

PROJECT
WELL REDEVELOPMENT
WELL STATION NO. 3
KINGSTON, RHODE ISLAND

TODD A. RAVENELLE
No. 5928
REGISTERED PROFESSIONAL ENGINEER

CLIENT
UNIVERSITY OF RHODE ISLAND

Gordon R. Archibald, Inc.
Civil and Environmental Engineers
Pawtucket, Rhode Island

DRAWING TITLE
LEGEND, NOTES AND DETAILS

NO.	DATE	REVISIONS	BY

PROJECT NO.: 1574

DATE: JULY 2015

SCALE:

DRAWN BY: TAP

CHECKED BY: TAR

DRAWING NUMBER
2

SHEET 2 OF 7

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DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
FRESHWATER WETLANDS PROGRAM
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DATED AUG 2 8 2015 FILE # 15-0163
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JUL 2 3 2015

PROJECT

WELL REDEVELOPMENT
WELL STATION NO. 3
KINGSTON, RHODE ISLAND

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DRAWING TITLE

OVERALL SITE PLAN

NO.	DATE	REVISIONS	BY

PROJECT NO.: 1574

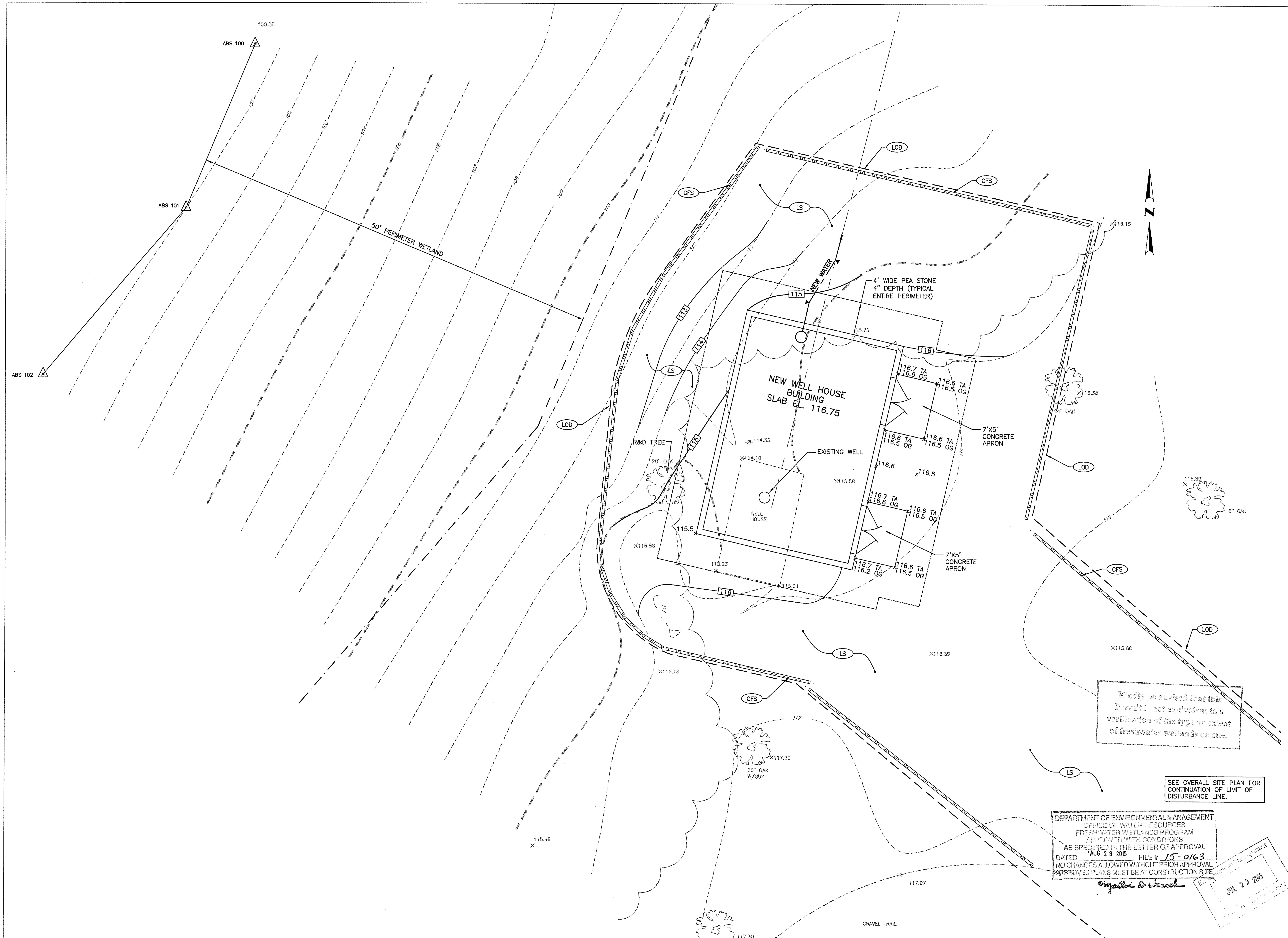
DATE: JULY 2015

SCALE: 1" = 20'

DRAWN BY: TAP

CHECKED BY: TAR

DRAWING NUMBER
3
SHEET 3 OF 7



ABS 100
100.35
ABS 101
ABS 102
50' PERIMETER WETLAND
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
LOD
CFS
LS
NEW WATER
4" WIDE PEA STONE
4" DEPTH (TYPICAL ENTIRE PERIMETER)
NEW WELL HOUSE BUILDING
SLAB EL. 116.75
EXISTING WELL
WELL HOUSE
7'X5' CONCRETE APRON
116.7 TA
116.6 OG
116.6 TA
116.5 OG
116.2 OG
116.6
116.5
R&D TREE
28" OAK
24" OAK
18" OAK
30" OAK W/GUY
115.5
114.33
114.10
115.58
115.73
115.91
116.23
116.88
116.18
116.39
116.38
115.89
115.66
118.15
117.30
117.07
115.46
GRAVEL TRAIL
N
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SEE OVERALL SITE PLAN FOR CONTINUATION OF LIMIT OF DISTURBANCE LINE.

PROJECT

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Civil and Environmental Engineers
Pawtucket, Rhode Island

DRAWING TITLE

SITE PLAN - 1

NO.	DATE	REVISIONS	BY

PROJECT NO.: 1574

DATE: JULY 2015

SCALE: 1" = 5'

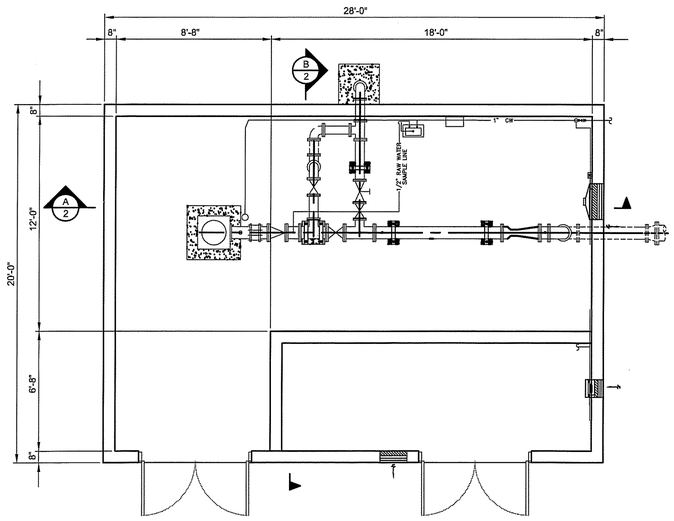
DRAWN BY: TAP

CHECKED BY: TAR

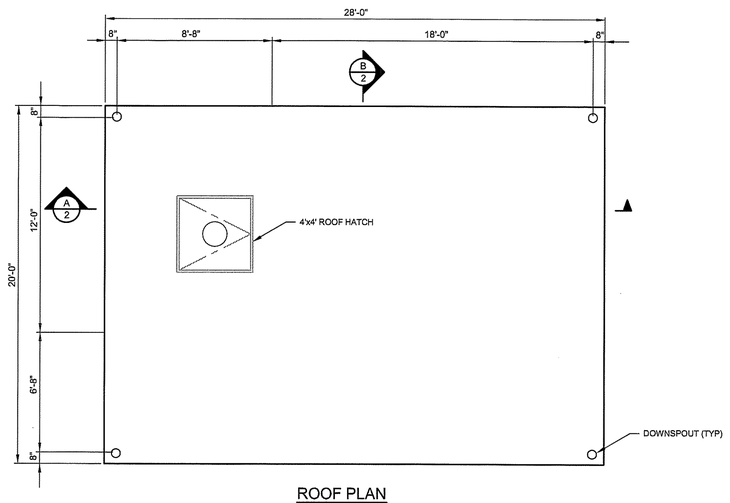
DRAWING NUMBER

4

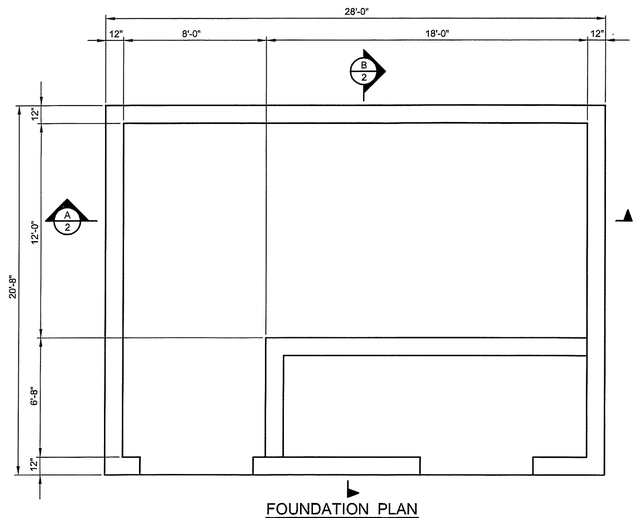
SHEET 4 OF 7



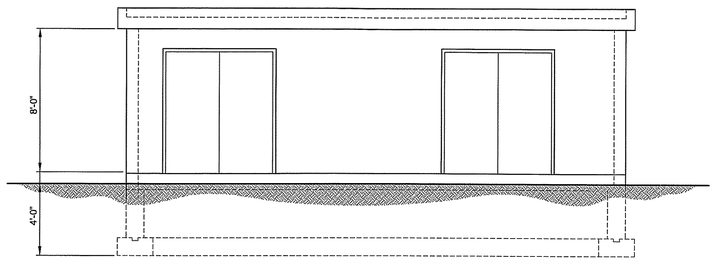
FIRST FLOOR PLAN
SCALE: 1/4"=1'-0"



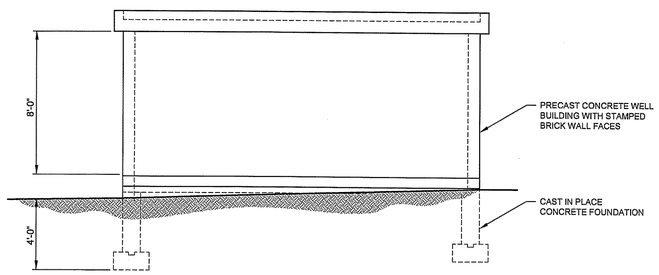
ROOF PLAN
SCALE: 1/4"=1'-0"



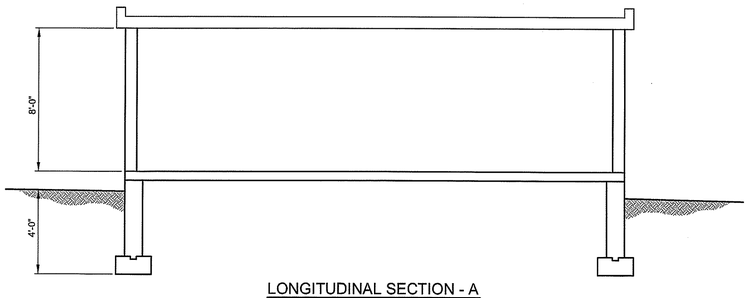
FOUNDATION PLAN
SCALE: 1/4"=1'-0"



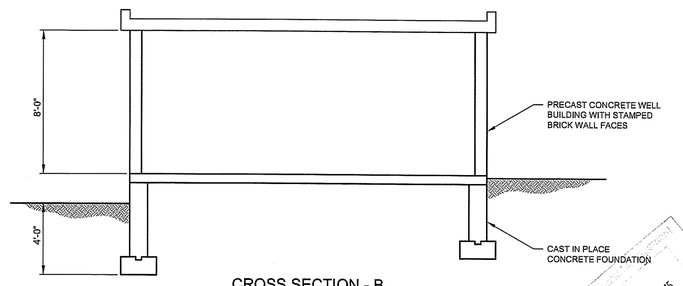
EAST ELEVATION
SCALE: 1/4"=1'-0"



SOUTH ELEVATION
SCALE: 1/4"=1'-0"



LONGITUDINAL SECTION - A
SCALE: 1/4"=1'-0"



CROSS SECTION - B
SCALE: 1/4"=1'-0"

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
FRESHWATER WETLANDS PROGRAM
APPROVED WITH CONDITIONS
AS SPECIFIED IN THE LETTER OF APPROVAL
DATED AUG 28 2015 FILE # 15-0163
NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL
APPROVED PLANS MUST BE AT CONSTRUCTION SITE
Gordon D. Woodcock

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PROJECT
WELL REDEVELOPMENT
WELL STATION NO. 3
KINGSTON, RHODE ISLAND

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CLIENT
UNIVERSITY OF RHODE ISLAND

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DRAWING TITLE
PLANS, SECTIONS & ELEVATIONS

NO.	DATE	REVISIONS	BY

PROJECT NO.: 1574

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SHEET 5 OF 7

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WATER SYSTEM NOTES

GENERAL

1. INSPECTION OF ALL INSTALLATIONS SHALL BE CONDUCTED TO ENSURE COMPLIANCE WITH THE RULES AND REGULATIONS OF THE UNIVERSITY. UNIVERSITY EMPLOYEES SHALL BE GIVEN FULL ACCESS TO THE PROJECT AT ALL TIMES FOR INSPECTION OR OBSERVATION OF CONSTRUCTION IN PROGRESS AS DEEMED NECESSARY. FAILURE TO CONSTRUCT THE NEW EXTENSION OF THE SYSTEM AS PER THE APPROVED DESIGN DRAWINGS OR UNIVERSITY'S RULES AND REGULATIONS WILL CAUSE IMMEDIATE CESSATION OF ALL CONSTRUCTION WORK.
2. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS OF ALL PROPOSED WATER MATERIALS.
3. UPON COMPLETION OF ALL WATER MAIN INFRASTRUCTURE AND APPURTENANCE WORK, THE CONTRACTOR SHALL PROVIDE AS–BUILT DRAWING DOCUMENTING THE RECORD OF ACTUAL CONSTRUCTION. THE AS–BUILT DRAWING SHALL BE ON 24" X 36" SHEETS, PLAN SCALE 1" = 40'. THE DRAWING SHALL BE PROVIDED IN AUTOCAD FORMAT.
4. NO NEW SERVICES, SERVICE PIPES OR EXTENSIONS WILL BE LAID DURING THE MONTHS OF NOVEMBER, DECEMBER, JANUARY, FEBRUARY AND MARCH, EXCEPT AT THE DISCRETION OF THE UNIVERSITY,
5. ALL VALVES IN THE UNIVERSITY SYSTEM ARE THE PROPERTY OF UNIVERSITY AND AS SUCH SHALL NOT BE OPENED BY ANY INDIVIDUAL WITHOUT THE APPROVAL OF AND IN THE PRESENCE OF THE UNIVERSITY'S REPRESENTATIVE.
6. EXISTING SERVICES THAT WILL NOT BE REUSED, RESULTANT FROM DEMOLITION OF A BUILDING, STRUCTURE OR CHANGE IN THE SERVICE SIZE TO CONSTRUCT A NEW BUILDING, STRUCTURE OR CHANGE THE OCCUPANCY REQUIREMENTS SHALL BE DISCONNECTED AND PLUGGED AT THE MAIN.
7. ALL CONTRACTORS ARE STRICTLY FORBIDDEN FROM OPERATING ANY HYDRANTS OR VALVES WITHIN THE UNIVERSITY SYSTEM WITHOUT APPROVAL OF AN ASSIGNED UNIVERSITY EMPLOYEE ON SCENE.
8. NO SIDEWALK OR OTHER PUBLIC PLACE SHALL BE OPENED FOR THE LAYING OF SERVICE PIPES UNTIL URI UTILITIES DEPARTMENT IS NOTIFIED. HYDRANT USE SHALL BE COORDINATED WITH THE UNIVERSITY WITH AN APPROVED BACKFLOW PREVENTOR.
9. A MINIMUM OF TEN–FOOT HORIZONTAL SEPARATION SHALL BE MAINTAINED IN THE PLACEMENT OF WATER MAINS, SERVICES OR APPURTENANCES WITHIN THE VICINITY OF SEWER FACILITIES OR VICE VERSA. WHERE WATER MAINS CROSS SEWER MAINS, THE CROWN OF THE SEWER MAIN SHALL BE AT LEAST 18–INCHES BELOW THE BOTTOM OF THE WATER MAIN. IN CASES WHERE IT IS NOT POSSIBLE TO MAINTAIN A 10–FOOT, HORIZONTAL SEPARATION OR IN THE CASE OF CROSSING THE EIGHTEEN–INCH, VERTICAL SEPARATION, A DEVIATION FROM THIS RESTRICTION MAY BE ALLOWED ON A CASE BY CASE BASIS WITH PRIOR APPROVAL FROM THE UNIVERSITY AS TO THE PROPOSED MATERIALS AND INTERVENTIONS TO BE TAKEN TO PROTECT THE WATER SYSTEM FROM THE POSSIBILITY OF CONTAMINATION. IN ALL CASES, FORCE MAIN SEWER INFRASTRUCTURE MUST BE LOCATED BELOW WATER MAINS.
10. A MINIMUM OF 24–INCHES HORIZONTAL SEPARATION SHALL BE MAINTAINED IN THE PLACEMENT OF WATER MAINS, SERVICES OR APPURTENANCES WITHIN THE PROXIMITY OF OTHER UTILITIES SUCH AS GAS, DRAINAGE, ELECTRICAL OR TELEPHONE. WHERE WATER MAINS CROSS OTHER UTILITIES, THE VERTICAL SEPARATION BETWEEN THE WATER INFRASTRUCTURE AND UTILITY SHALL BE AT LEAST 18– INCHES. THE PLACEMENT OF OTHER UTILITIES IN THE PROXIMITY OF WATER FACILITIES SHALL MAINTAIN THESE SEPARATION DISTANCES. IN CASES WHERE IT IS NOT POSSIBLE TO MAINTAIN THESE SEPARATION DISTANCES, A DEVIATION FROM THIS RESTRICTION MAY BE ALLOWED ON A CASE–BY–CASE BASIS WITH PRIOR APPROVAL FROM THE UNIVERSITY

WATER SERVICES

11. EACH TAP TO THE MAIN SHALL BE BY AN APPROVED METHOD AND EQUIPPED WITH A BRONZE CORPORATION STOP "CTS" COMPRESSION SERVICE SIDE END. EACH SERVICE SHALL BE EQUIPPED WITH A CURB STOP. CURB STOP SHALL BE BRONZE COMPRESSION FITTED AND OF NO DRIP CONFIGURATION. DIRECTION OF OPENING SHALL BE OPEN LEFT. CURB BOX SHALL BE INSTALLED DIRECTLY OVER THE CURB STOP AND BROUGHT TO FINISHED GRADE. BOX SHALL BE "BUFFALO" STYLE 2–1/2 INCH AND SUFFICIENT LENGTH FOR FULL COVERAGE. A 1' X 6" CONCRETE RING OR SLAB SHALL BE INSTALLED TO SUPPORT THE UPPER BOX IN AREAS WHERE THE INSTALLATION OF THE CURB BOX DOES NOT OCCUR WITHIN A PAVED OR CONCRETE SIDEWALK AREA.
12. DEPTH OF SERVICES SHALL BE AT A MINIMUM OF FIVE FEET TO FINISHED GRADE THROUGHOUT INSTALLATION.
13. ALL FITTINGS AND PIPE SHALL BE SWABBED WITH APPROVED CHLORINE SOLUTION AND CLEANED OF ALL FOREIGN MATERIAL PRIOR TO INSTALLATION. THE SERVICE PIPE SHALL BE DISINFECTED AND PRESSURE TESTED.
14. IDENTIFICATION TAPE AS SPECIFIED IN THE MATERIAL FACT SHEET SHALL BE UTILIZED FOR THE FULL LENGTH OF SERVICES AND SET TO A DEPTH FROM FINISHED GRADE OF NO MORE THAN 1'–0".
15. SERVICES 4" AND ABOVE SHALL BE DUCTILE IRON AND CONFORM TO THE REQUIREMENTS FOR MAIN AND VALVE INSTALLATION.
16. SERVICES 3 INCH AND ABOVE SHALL BE DUCTILE IRON AND CONFORM TO THE REQUIREMENTS FOR MAIN MATERIALS AND INSTALLATION.
17. GLAND AND RESTRAINT COMPONENTS MADE FROM DUCTILE IRON AND SHALL HAVE A BITUMINOUS OUTSIDE COATING IN ACCORDANCE WITH ANSI/AWWA C151/A21.51 AND ANSI/AWWA C153/A21.53 RESPECTIVELY. CAPABLE OF BEING USED WITH STANDARDIZED MECHANICAL JOINT BELL CONFORMING TO AWWA C111 AND C153. MULTIPLE WEDGE STYLE RESTRAINT MECHANISM WITH POWDER COATED HEAT–TREATED DUCTILE IRON WEDGES. PROPER ACTUATION ENSURED BY TORQUE LIMITING TWIST OFF NUTS. MINIMUM SAFETY FACTOR 2 TO 1. RESTRAINED JOINTS SHALL BE SUITABLE FOR 150 PSI WORKING PRESSURE AND FABRICATED OF HEAVY SECTION DUCTILE IRON CASTING. GASKETS SHALL MEET THE MATERIAL REQUIREMENTS OF ANSI/AWWA C111 FOR MECHANICAL JOINT GASKETS. BOLTS AND NUTS AS REQUIRED SHOULD BE LOW CARBON STEEL CONFORMING TO ASTM A307, GRADE B.

TAPPING SLEEVES

18. ALL SIZE ON SIZE TAPPING SLEEVES SHALL BE FULL SIZE CAST IRON OR DUCTILE IRON, MECHANICAL JOINT WITH STAINLESS STEEL FASTENERS MADE IN THE NORTH AMERICA, AS APPROVED BY THE UNIVERSITY.
19. SLEEVE COUPLINGS AND ACCESSORIES SHALL BE PRESSURE RATED TO AT LEAST EQUAL THAT OF THE PIPE. COUPLINGS SHALL BE DUCTILE IRON. THE INTERIOR OF THE COUPLING SHALL BE EPOXY–COATED IN ACCORDANCE WITH AMERICAN WATER WORKS ASSOCIATION ASTM & ANSI STANDARDS. COATING SHALL BE THERMOSETTING EPOXY WITH A MINIMUM DRY FILM THICKNESS OF 10 MILS AND A MAXIMUM OF 20 MILS. FABRICATED SLEEVES WILL BE ALLOWED ONLY ON DUCTILE IRON MAINS, CAST IRON MAINS OR PVC MAINS WITH PRIOR APPROVAL BY THE UNIVERSITY.u
20. ALL SLEEVES SHALL BE INSTALLED IN STRICT COMPLIANCE WITH THE MANUFACTURER'S RECOMMENDATIONS; COPIES OF THE INSTALLATION GUIDANCE SHALL BE AVAILABLE ON SITE DURING INSTALLATION.
21. WATER MAIN ON BRANCH SIDE OF TAPPING SLEEVE SHALL BE RESTRAINED IN ACCORDANCE WITH PERTINENT SECTIONS OF THE RULES AND REGULATIONS.

THRUST RESTRAINT

22. RESTRAINING DEVICES SHALL BE UTILIZED ON ALL MAINS. THRUST BLOCKS SHALL BE CONSTRUCTED FROM CONCRETE 3000 PSI AT 28 DAYS, SIZED ACCORDING TO THE SIZE OF PIPELINE, TYPE OF FITTING, WATER PRESSURE AND THE CHARACTERISTICS OF THE SOIL. THE CONCRETE SHALL BE PROPERLY FORMED AS TO SLOPE FOR THE GIVEN APPLICATION AND BEARING WIDTH. THE CONCRETE SHALL BE IN CONTACT ONLY WITH THE FITTING, NOT WITH THE PIPE ITSELF, FASTENERS OR THE JOINT. CONCRETE CURING TIME SHALL BE A MINIMUM OF 7 DAYS.
23. THRUST RESTRAINT MAY BE VIA RESTRAINED JOINT, DUCTILE IRON PIPE MEETING ANSI/AWWA C151/A21.51 AND ANSI/AWWA C11/A21. RESTRAINED JOINT PIPE LENGTHS (RESTRAINED LENGTH) SHALL BE SUFFICIENT TO RESTRAIN THRUST IMPARTED BY 1–1/2 TIMES THE ANTICIPATED WORKING PRESSURE BUT NOT LESS THAN 150 PSI WITH A 1.5 FACTOR OF SAFETY.
24. RESTRAINING DEVICES SHALL BE UTILIZED ON ALL MAINS UNDER THE FOLLOWING CONDITIONS, PIPELINE DIRECTION CHANGES (TEES, BENDS), VERTICAL AND HORIZONTAL, DEAD END LINES (CAPS OR PLUGS), TRANSITION PIECES (REDUCERS), VALVES ON DEAD END LINES, HYDRANTS, TAPPING SLEEVES
25. THRUST BLOCKS SHALL BE DESIGNED TO WITHSTAND THE FORCE IMPARTED BY THE HYDRAULIC INFLUENCE ENCOUNTERED WITHIN THE MAIN. MINIMUM 1–1/2 TIMES THE ANTICIPATED WORKING PRESSURE OF THE MAIN, BUT NOT LESS THAN 150 PSI. MAXIMUM LATERAL BEARING CAPACITY SHALL BE 1500 LB/SF.
26. STONE, TIMBER, CONCRETE BLOCK OR ANY MATERIALS THAT DETERIORATE ARE STRICTLY FORBIDDEN TO USE AS A PERMANENT THRUST BLOCK OR RESTRAINT.
27. APPROVED THRUST RESTRAINT SHALL BE BY AN APPROVED RESTRAINING GLAND SYSTEM UTILIZING IN COMBINATION WITH MECHANICAL JOINT PIPE AND FITTINGS. ALL CALCULATIONS MUST BE CONTAINED IN THE APPLICATION SUBMISSION AND SHALL BE IN CONFORMANCE WITH THE MANUFACTURING REQUIREMENTS FOR LENGTH, FITTING AND TYPE OF RESTRAINT.

WATER PIPE

28. ALL DUCTILE–IRON PIPE AND APPURTENANCES SHALL BE FROM A SINGLE MANUFACTURER SOURCE. APPROVED MANUFACTURERS INCLUDE PACIFIC STATES CAST IRON PIPE COMPANY, UNITED STATES PIPE COMPANY, GRIFFIN PIPE PRODUCTS COMPANY, AMERICAN CAST IRON PIPE COMPANY.
29. FOREIGN PIPE FITTINGS AND GASKETS ARE STRICTLY FORBIDDEN. DUCTILE IRON PIPE SHALL CONFORM TO ANSI/AWWA C151/A21.51, ANSI/AWWA C150/A21.50 CLASS 52 DOUBLE CEMENT MORTAR LINED. GASKETS SHALL CONFORM TO ANSI/AWWA C111/A21.1. ALL PIPES SHALL HAVE A BITUMINOUS OUTSIDE COATING IN ACCORDANCE WITH ANSI/AWWA C151/A21.51 AND ANSI/AWWA C153/A21.53 RESPECTIVELY. ALL PIPES SHALL BE CEMENT–MORTAR LINED AND SEAL COATED IN ACCORDANCE WITH ANSI/AWWA C104/A21.14 EXCEPT THE LINING THICKNESS SHALL BE TWICE THAT SPECIFIED. JOINTS FOR PIPE SHALL BE PUSH–ON (TYTON STYLE ONLY) OR MECHANICAL JOINT CONFORMING TO ANSI/AWWA C111. ALL MECHANICAL JOINT PIPES SHALL BE SUPPLIED WITH ACCESSORIES. RESTRAINED JOINTS SHALL BE SUITABLE FOR 150 PSI WORKING PRESSURE AND FABRICATED OF HEAVY SECTION DUCTILE IRON CASTING. GASKETS SHALL MEET THE MATERIAL REQUIREMENTS OF ANSI/AWWA AND MADE IN THE USA.
30. DUCTILE IRON FITTINGS SHALL CONFORM TO ANSI/AWWA C153/A21.53. FOREIGN FITTINGS, GASKET GLANDS AND ACCESSORIES ARE STRICTLY FORBIDDEN. ALL FITTINGS SHALL HAVE A BITUMINOUS OUTSIDE COATING IN ACCORDANCE WITH ANSI/AWWA C151/A21.51 AND ANSI/AWWA C153/A21.53 RESPECTIVELY. ALL FITTINGS SHALL BE CEMENT–MORTAR LINED AND SEAL COATED IN ACCORDANCE WITH ANSI/AWWA C104/A21.14 EXCEPT THE LINING THICKNESS SHALL BE TWICE THAT SPECIFIED. JOINTS FOR FITTINGS SHALL BE MECHANICAL JOINT CONFORMING TO ANSI/AWWA C111. ALL MECHANICAL JOINT FITTINGS SHALL BE SUPPLIED WITH GLANDS AND ACCESSORIES. TYPE: 4 INCH TO 12 INCH DUCTILE IRON COMPACT MEETING ANSI/AWWA C153/A21.53. PRESSURE CLASS: PIPE FITTINGS SHALL HAVE A PRESSURE RATING OF 350 FOR 24–INCH AND SMALLER AND 250 PSI FOR 30–INCH AND LARGER. FITTINGS SHALL AT A MINIMUM HAVE THE SAME PRESSURE RATING AS THE CONNECTING PIPE. GASKETS: RUBBER MEETING ANSI/AWWA C111/A21.11.

VALVES

31. VALVES SHALL BE CAST IRON OR DUCTILE IRON 250–PSI WORKING PRESSURE. OPERATING STEM SHALL BE PROVIDED WITH A MINIMUM OF TWO (2) O–RING STEM SEALS. BONNET AND GLAND BOLTS/WASHERS SHALL BE STAINLESS STEEL. WEDGES SHALL BE FULLY ENCAPSULATED. THE INTERIOR AND EXTERIOR SURFACES OF ALL CAST IRON OR DUCTILE IRON COMPONENTS SHALL BE FUSION BOND EPOXY COATED, 8 MILS MINIMUM THICKNESS. EPOXY COATING MUST BE UNDAMAGED WITH NO CHIPS OR ABRASIONS. FIELD TOUCH–UP OF INTERIOR COATING IS NOT ALLOWED. FIELD TOUCH–UP OF EXTERIOR SURFACES SHALL BE IN ACCORDANCE WITH MANUFACTURES RECOATING SPECIFICATIONS ONLY. CONTRACTORS SHALL USE SPECIAL HANDLING AND INSTALLATION PRECAUTIONS WITH THE USE OF EPOXY COATED VALVES AS NECESSARY TO ENSURE THAT NO COATING SYSTEM DAMAGE OCCURS. AT A MINIMUM FIBER SLINGS OR BELTS SHALL BE USED FOR ALL HANDLING. ALL EPOXY–COATED VALVES SHALL BE PALLETIZED AND PROPERLY SHRINK–WRAPPED UPON DELIVERY TO ASSURE COATING SYSTEM INTEGRITY IS NOT COMPROMISED. ALL EPOXY VALVES FOUND MISHANDLED AT DELIVERY OR DURING INSTALLATION SHALL BE REJECTED AND REMOVED FROM THE JOB SITE. ALL VALVES SHALL BE MANUFACTURED TO MEET OR EXCEED AWWA C509 AND ISO 9000 ALONG WITH THE DESIGN AND OPERATING CHARACTERISTICS OF THE FOLLOWING DEVICES: RESILIENT SEAT GATE 2 INCH TO 12 INCH: TYPE: BURIED SERVICE NON–RISING STEM OPEN IN A COUNTERCLOCKWISE DIRECTION. ABOVE GRADE SERVICE OR PITS OS & Y WITH HAND WHEEL OR NON–RISING STEM WITH HAND WHEEL. WORKING PRESSURE: 250 PSI. OPENING: LEFT OR RIGHT DEPENDING ON SYSTEM LOCATION. STEM: 420 STAINLESS STEEL OR EQUAL WITH MINIMUM 60,000 PSI YIELD STRENGTH. FASTENERS: STAINLESS STEEL, TYPE 304 FOR ALL OF THE VALVE. COATINGS: INTERNAL & EXTERIOR TO BE COATED WITH FUSE BONDED HOLIDAY FREE EPOXY COATING MINIMUM 8 MILS NOMINAL THICKNESS MEETING OR EXCEEDING AWWA C550. WEDGES: FULLY RUBBER ENCAPSULATED CAST IRON, DUCTILE IRON OR BRONZE GATE MEETING AWWA C509. OPERATING NUT: 2 INCH SQUARE OPERATING NUT WITH HEXAGON STAINLESS STEEL BOLT FASTENER. STEM SEAL: MINIMUM TWO O–RING SEALS. CONNECTION: MECHANICAL JOINT.

TAPPING SLEEVES AND VALVES

32. VALVES SHALL BE FULL BODY AND FULL PORT TAPPING TYPE MEETING THE REQUIREMENTS ABOVE. SLEEVES SHALL BE FULL PORT DUCTILE IRON OR GRADE 18–8 TYPE 304 STAINLESS STEEL. DUCTILE IRON SLEEVES SHALL BE OF THE SAME MANUFACTURER AS OF THE VALVE AND BITUMINOUS COATED. ALL SLEEVES SHALL BE MANUFACTURED TO MEET OR EXCEED THE DESIGN AND OPERATING CHARACTERISTICS OF ONE OF THE FOLLOWING DEVICES: TYPE: RESILIENT SEAT GATE VALVES DESIGNED SPECIFICALLY FOR TAPPING. SEAL: STAINLESS STEEL SLEEVES SHALL USE GRID PATTERN VIRGIN RUBBER ASTM 2000, FULL 360–DEGREE PIPE COVERAGE. DUCTILE IRON SLEEVES SHALL USE MECHANICAL JOINT WITH RUBBER SEALS. MAXIMUM WORKING PRESSURE: 4 INCH–12 INCH 250 PSE, 16 INCH–24 INCH 200 PSI. FASTENER: GRADE 18–8 TYPE 304 STAINLESS STEEL.

VALVE ROAD BOX

33. ALL VALVES (EXCEPT SWING–CHECK) SHALL BE EQUIPPED WITH A CAST IRON "BUFFALO" TYPE, ADJUSTABLE (SLIDING) VALVE ROAD BOX. THE UPPER PORTION SHALL BE 26 INCH LONG AND THE BOTTOM SECTION 48 INCH (MIN). COVERS SHALL BE 5–1/4" IN DIAMETER SOLID RING SEAT WITH THE WORD "WATER" (IN CAPS) CAST UPON IT.
34. THE UPPER PORTION OF THE BOX SHALL BE MANUFACTURED WITH A HEAVY FLANGE HAVING SUFFICIENT BEARING AREA TO PREVENT SETTLEMENT. THE LOWER SECTION SHALL BE CONFIGURED TO ENCLOSE THE VALVE STUFFING BOX WITH AN INSIDE DIAMETER OF AT LEAST 4–1/4 INCH. THE INSTALLED BOX SHALL BE CAPABLE OF VERTICAL ADJUSTMENT OF A MINIMUM OF 6 INCH WHILE MAINTAINING AN OVERLAP OF A LEAST 4 INCH BETWEEN SECTIONS.

SERVICE & GATE BOX

35. CURB BOXES MAY BE MANUFACTURED IN NORTH AMERICA OR SELECTED FOREIGN MADE. SELECTED FOREIGN MADE BOXES MUST RECEIVE PRIOR APPROVAL BASED ON DESIGN AND STYLE SAMPLES TO BE PROVIDED FOR REVIEW. THEY SHALL BE HEAVY PATTERN CAST IRON, BUFFALO STYLE, SLIP ADJUSTABLE TYPE WITH HEAVY CAST IRON COVER AND BRASS BOLT FASTENER TYPE LOCK. THE WORD "WATER" SHALL BE CAST UPON THE COVER IN HEAVY PATTERN RAISED LETTERS. COVERS SHALL BE DROP IN TYPE WITHOUT FINS SOLID RING. BOXES SHALL HAVE A BITUMINOUS INTERNAL AND EXTERNAL COATING IN ACCORDANCE WITH ANSI/AWWA C151/A21.51 AND ANSI/AWWA C153/A21.53 RESPECTIVELY. BOXES SHALL HAVE BARRELS OF NOT LESS THAN 2 ½ INCH IN DIAMETER. THE UPPER SECTION OF EACH BOX SHALL HAVE A BOTTOM FLANGE OF SUFFICIENT BEARING AREA TO PREVENT SETTLING. THE BASE OF THE LOWER SECTION SHALL BE A REINFORCED ARCH CONFIGURATION AND SIZED TO ENCLOSE THE CURB STOP. BOX SECTIONS SHALL BE OF SUFFICIENT LENGTH TO PROVIDE COMPLETE COVERAGE FOR THE DEPTH OF BURY.
36. GATE VALVE BOXES MAY BE EITHER MANUFACTURED IN NORTH AMERICA OR SELECTED FOREIGN MADE. SELECTED FOREIGN MADE BOXES MUST RECEIVE PRIOR APPROVAL BASES ON DESIGN AND STYLE SAMPLES TO BE PROVIDED FOR REVIEW. THEY SHALL BE HEAVY PATTERN CAST IRON, SLIP ADJUSTABLE TYPE AND PROVIDED WITH HEAVY CAST IRON COVER. COVER SHALL HAVE THE WORD "WATER" CAST UPON IN HEAVY PATTERN RAISED LETTERS 5 ¼ INCH DIAMETER. COVER SHALL BE DROP IN TYPE WITHOUT FINS SOLID RING. BOXES SHALL HAVE A BITUMINOUS INTERNAL AND EXTERNAL COATING IN ACCORDANCE WITH ANSI/AWWA C151/A21.51 AND ANSI/AWWA C153/A21.53 RESPECTIVELY. THE UPPER SECTION OF EACH BOX SHALL HAVE A BOTTOM FLANGE OF SUFFICIENT BEARING AREA TO PREVENT SETTLING. THE BOTTOM OF THE LOWER SECTION SHALL BE BELL SHAPED AND SIZED TO ENCLOSE THE STUFFING BOX AND OPERATING NUT OF THE VALVE. BOXES SHALL HAVE BARRELS OF NOT LESS THAN 5" IN DIAMETER. BOX SECTIONS SHALL BE OF SUFFICIENT LENGTH TO PROVIDE COMPLETE COVERAGE FOR THE DEPTH OF BURY. UPPER PORTION SHALL BE 26" LONG AND THE BOTTOM SECTION 48" (MIN) IN LENGTH.

INSTALLATION METHODS

37. INSTALLATION OF ALL WATER CONVEYANCES, MAINS, PIPES OR LINES SHALL BE IN ACCORDANCE WITH THE DUCTILE IRON PIPE RESEARCH ASSOCIATION'S INSTALLATION MANUAL, AWWA, NFPA 24, NSF 61, AND RIDOH.
38. WATER MAIN AND SERVICES SHALL BE INSTALLED WITH A MINIMUM COVER OF 5 FEET TO THE CROWN OF THE PIPE IN AN AMERICAN WATER WORKS ASSOCIATION "TYPE 5 TRENCH". WHERE UNSUITABLE MATERIAL IS FOUND AT OR BELOW THE GRADE OF THE PLACEMENT OF THE PIPE OR FITTING, THE UNDESIRABLE MATERIAL SHALL BE REMOVED TO THE REQUIRED WIDTH AND DEPTH AND REPLACED WITH THOROUGHLY COMPACTED BANK RUN GRAVEL ABOVE THE CROWN OF THE PIPE. MATERIAL SHALL BE DEPOSITED ACROSS THE FULL WIDTH AND LENGTH OF THE TRENCH IN LAYERS OF NOT MORE THAN 12" IN DEPTH BEFORE COMPACTION. EACH LAYER, TO WITHIN 12" OF SUB– GRADE OF THE PERMANENT PATCH, SHALL BE COMPACTED TO 95% STANDARD PROCTOR. THE FINAL 12" SHALL BE PROCESSED GRAVEL COMPACTED IN TWO (2) EQUAL COURSES TO 95% STANDARD PROCTOR
39. EACH LENGTH OF PIPE AND OR FITTING SHALL BE INSPECTED FOR CRACKS, DEFECTS IN COATING ON LINING, CLEANLINESS OR ANY OTHER EVIDENCE OF UNSUITABILITY. PIPING SHALL BE LAID STRAIGHT TRUE TO LINE.
40. WHENEVER PIPE REQUIRES CUTTING TO FIT THE LINE, THE WORK SHALL BE DONE ONLY BY EXPERIENCED (STATE OF RHODE ISLAND, LICENSED CONTRACTOR) OR PLUMBER, AND IN SUCH A MANNER AS TO LEAVE A SMOOTH END AT RIGHT ANGLES TO THE AXIS OF THE PIPE AND ON PIPE THAT IS CENTER ROUNDED DESIGNED SPECIFICALLY FOR FIELD CUTTING. THE CUT ENDS SHALL BE BEVELED TO CONFORM TO THE MANUFACTURED SPIGOT END. PARTICULAR CARE SHALL BE EXERCISED TO PREVENT DAMAGING THE LINING WHEN CUTTING CEMENT–LINED CAST OR DUCTILE IRON PIPE. JOINTING OF PIPE OR FITTINGS SHALL BE MADE ONLY BY PERSONS THOROUGHLY SKILLED IN THIS WORK. FOR PIPE DIAMETERS 16" AND LARGER, PIPE CUTTING SHALL BE DONE BY MACHINE.
41. METALIZED DETECTABLE IDENTIFICATION TAPE 2" IN WIDTH OR GREATER, BLUE IN COLOR AND PRINTED WITH "CAUTION WATER LINE BURIED BELOW" SHALL BE UTILIZED OVER ALL MAINS. SET TO A DEPTH FROM FINISHED GRADE OF NO MORE THAN 1' – 0".
42. AT ALL TIMES, DURING CONSTRUCTION, ALL PIPING AND FITTINGS SHALL BE KEPT FROM BECOMING CONTAMINATED FROM CONSTRUCTION MATERIALS, DIRT, NON POTABLE WATER, YARD WASTE OR SUBSTANCES PRODUCED AS A RESULT OF ANIMALS, RODENTS, AND INSECTS. WITHOUT EXCEPTION, ALL STORED PIPING SHALL BE TIMBER CRIBBED ABOVE GRADE, AND SHALL BE FITTED WITH WATERTIGHT PLUGS OR PLASTIC SHEET SECURELY FASTENED TO THE PIPE. ALL VALVES, FITTINGS, AND APPURTENANCES SHALL BE FITTED WITH CAPS, PLUGS OR PLASTIC SHEET SECURELY FASTENED TO THE FITTING. THE IMPLEMENTATION OF THESE PROTECTIVE MEASURES IS REQUIRED TO REDUCE THE SIGNIFICANT LOSS OF WATER AND LABOR HOURS EXPENDED DURING MULTIPLE ATTEMPTS TO SUFFICIENTLY CLEAN THE NEW MAINS TO MEET THE WATER QUALITY STANDARD SET BY THE US EPA PRIMARY DRINKING WATER REGULATIONS.
43. ADEQUATE, TEMPORARY PROVISIONS SHALL BE MADE TO CARE FOR THE FLOW FROM SEWERS OR DRAINS INTERFERED WITH BY THE WORK. ALL NECESSARY MEASURES SHALL BE TAKEN TO PREVENT SEWAGE OR OTHER CONTAMINATING MATTER FROM ENTERING THE WATER MAIN. ANY BROKEN OR DAMAGED UTILITY CONNECTION OR SERVICES (WATER, SEWER, GAS, TELEPHONE, ELECTRIC, ETC.) SHALL BE FULLY REPAIRED AT THE EXPENSE OF THE PARTY RESPONSIBLE FOR THE DAMAGE. UNDERGROUND STRUCTURES SHALL BE THOROUGHLY SUPPORTED OR OTHERWISE PROTECTED TO MAINTAIN UNINTERRUPTED SERVICE.
44. NO NEW PIPING SYSTEM SHALL BE PERMANENTLY CONNECTED TO AN EXISTING UNIVERSITY MAIN UNTIL AFTER OBTAINING SUCCESSFUL RESULTS FROM WATER QUALITY TESTS FROM A STATE OF RHODE ISLAND CERTIFIED LABORATORY MEETING THE STANDARDS SET BY RI DEPARTMENT OF HEALTH, AND WATER QUALITY TEST INDICATE THAT THE SAMPLES ARE CONSISTENT WITH THE QUALITY OF WATER IN THE UNIVERSITY SYSTEM, INCLUDING HETEROTROPHIC PLATE COUNT RESULTS.
45. TEMPORARY FITTINGS FOR FLUSHING, PRESSURE TESTING AND CHLORINATION ARE REQUIRED FOR ALL NEWLY INSTALLED MAINS. NEW MAINS SHALL BE CAPPED AT EACH END. EACH END SHALL BE FITTED WITH A TEMPORARY RISER OF SUFFICIENT LENGTH TO REACH FINISHED GRADE AND AN ISOLATION VALVE. THE LIVE MAIN TAP SHALL BE FITTED WITH AN ISOLATION VALVE, TWO FEET OF MAIN THAT IS RESTRAINED, RESTRAINED CAP AND TEMPORARY RISER OF SUFFICIENT LENGTH TO REACH FINISHED GRADE AND AN ISOLATION VALVE. RISERS AND ISOLATION VALVES SHALL BE SIZED TO PROVIDE A FLUSHING WATER VELOCITY OF AT LEAST 2.5 FEET PER SECOND BASED ON THE INSTALLED MAIN SIZE. A METER AND TESTABLE BACKFLOW PREVENTER IS REQUIRED TO BE PLACED IN THE JUMPER LINE BETWEEN THE EXISTING AND NEW MAIN PRIOR TO OBTAINING WATER FOR ANY PROCESS. DEPENDING ON THE SIZE OF THE MAIN, MULTIPLE TAPS AND BACKFLOW PREVENTERS MAY BE REQUIRED TO PROVIDE THE REQUIRED VELOCITIES WITHIN THE NEW MAIN.

BACKFILL

46. PIPE BEDDING SHALL BE PROCESSED BORROW GRAVEL, GRANULAR IN NATURE, THE MAJOR PORTION OF WHICH MAY BE SAND OR GRAVEL. IT SHALL BE FREE FROM PEAT, VEGETABLE OR ORGANIC MATTER OR ANY OTHER DEBRIS AND READILY COMPACTABLE. RECYCLED ROAD SWEEPINGS AND CONTAMINATED MATERIAL ARE FORBIDDEN.
47. SELECTED BACKFILL MAY BE FROM EXCAVATED MATERIALS THAT SHALL BE FREE DRAINING, CLEAN, GRANULAR SOIL SUITABLE FOR BACKFILL. IT SHALL BE FREE FROM PEAT, VEGETABLE OR ORGANIC MATTER OR ANY OTHER DEBRIS AND SHALL BE READILY COMPACTABLE TO THE REQUIREMENTS OF KENT COUNTY WATER UNIVERSITY, TYPE 5 TRENCH. RECYCLED ROAD SWEEPINGS AND CONTAMINATED MATERIAL ARE FORBIDDEN. UP TO 20 PERCENT MAY BE ROCK LIKE MATERIAL, NOT TO EXCEED 3 INCH IN LENGTH OR DIAMETER AND MUST BE EVENLY DISTRIBUTED WITHIN THE TOTAL VOLUME OF THE FILL.

PRESSURE TEST

48. ALL SERVICES, WATER MAINS, BYPASS PIPING AND APPURTENANCES MUST BE INSTALLED PRIOR TO COMMENCEMENT OF ANY TEST. A PRESSURE TEST SHALL BE CONDUCTED ON ALL COMPLETED WATER LINES PRIOR TO ACCEPTANCE. THE CONTRACTOR AT NO COST TO THE UNIVERSITY, SHALL ACCOMPLISH THE PRESSURE TEST. AN AUTHORIZED REPRESENTATIVE OF THE UNIVERSITY SHALL WITNESS THE TEST. TESTING SHALL BE IN ACCORDANCE WITH ANSI/AWWA C600 HYDROSTATIC TESTING.
49. EACH VALVE SECTION OF THE MAIN SHALL BE FILLED SLOWLY WITH WATER AT A RATE NO GREATER THAN ONE FOOT OF PIPE SECTION PER SECOND. ALL AIR SHALL BE RELEASED VIA CORPORATION STOPS, HYDRANTS, AND INSTALLED AUTOMATIC AIR RELEASE FITTINGS. ALL AIR MUST BE REMOVED AND THE FULL PIPE SHALL SIT IDLE FOR A PERIOD OF 24 HOURS PRIOR TO COMMENCEMENT OF THE PRESSURE TEST. PIPING INSTALLATIONS GREATER THAN 1,000 FEET SHALL BE ACCOMPLISHED IN SECTIONS NO GREATER THAN L,000 FEET.
50. THE TEST PRESSURE SHALL BE BROUGHT UP TO AT LEAST 50% HIGHER THAN THE NORMAL ANTICIPATED WORKING PRESSURE OR 150 PSI, WHICHEVER IS GREATER, AND MAINTAINED FOR A CONTINUOUS TWO (2) HOUR PERIOD. AN AUTHORIZED REPRESENTATIVE OF THE UNIVERSITY SHALL WITNESS THE TEST. ANY LOSS OF PRESSURE INDICATES A LEAK, AND NO PIPE INSTALLATION WILL BE ACCEPTED WITH ANY LEAKAGE.
51. PROPER THRUSTING OF ALL PIPE FITTINGS, CAPS, HYDRANTS, AND APPURTENANCES SHALL BE PROVIDED TO RESIST THE IMPOSED TEST PRESSURE.

CHLORINATION/DISINFECTION

52. ALL NEW OR REPAIRED POTABLE WATER SYSTEM DISTRIBUTION MAINS, SERVICE PIPE AND THE NECESSARY CONNECTING PIPES, FITTINGS, CONTROL VALVES, AND ALL APPURTENANCES IN OR ADJACENT TO ANY BUILDING OR PREMISES SHALL BE PURGED OF DELETERIOUS MATTER AND SHALL BE DISINFECTED PRIOR TO UTILIZATION OR PERMANENT CONNECTION TO THE UNIVERSITY SYSTEM. THE CONTRACTOR MUST PROVIDE WRITTEN LABORATORY CERTIFIED DOCUMENTATION OF THE DISINFECTION TEST RESULTS TO THE UNIVERSITY BEFORE MAKING ANY PERMANENT CONNECTION TO THE UNIVERSITY SYSTEM OR BEFORE REACTIVATION OF ANY EXISTING WATER SERVICE CAN BE AUTHORIZED.
53. ALL WATER MAIN REPLACEMENTS, EXTENSIONS, FIRE LINES AND SERVICES SHALL BE DISINFECTED PURSUANT TO AWWA SPECIFICATION C651 DISINFECTION OF WATER MAINS, PRIOR TO BEING PLACED INTO SERVICE. THE UNIVERSITY WILL ACCEPT THE CONTINUOUS FEET METHOD OF CHLORINATION FOR ALL WATER MAINS AS SPECIFIED BY AWWA C651. THESE INCLUDE BUT ARE NOT LIMITED TO MAINS, SERVICE PIPING, AND BUILDING SERVED.
54. THE CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH THE DISINFECTION PROCESS OR PROCEDURE.
55. THE DISINFECTION MUST RESULT IN ELIMINATING FROM THE VARIOUS PARTS OF THE NEW PIPE LINE ANY EVIDENCE OF THE EXISTENCE, THEREIN, OF BACTERIA INDICATIVE OF ANY CONTAMINATION, AS DETERMINED BY TESTS OF THE BACTERIAL CONTENT OF SAMPLES OF WATER TAKEN FROM THE NEW WATER MAIN. THE DISINFECTION MAY BE ACCOMPLISHED BY INTRODUCING INTO ALL THE VARIOUS PARTS OF THE NEW WATER MAINS, A LIQUID SOLUTION CONTAINING 1% AVAILABLE CHLORINE IN SUCH VOLUME THAT THE RATE OF DOSAGE TO THE WATER MAINS SHALL BE AT LEAST 50 PARTS PER MILLION OF AVAILABLE CHLORINE. TABLET CHLORINATION IS NOT ALLOWED. THE CONTACT PERIOD FOR THIS DISINFECTION SHALL BE AT LEAST 24 HOURS, AND A LONGER PERIOD WILL BE REQUIRED IF TESTS OF RESIDUAL CHLORINE SHOW IT TO BE NECESSARY FOR PROPER DISINFECTION.
56. THE NEW WATER SYSTEM SHALL BE FLUSHED OUT AFTER DISINFECTION AND REFILLED WITH FRESH WATER. ALL CHLORINATED WATER USED IN THE DISINFECTION PROCESS SHALL BE DE–CHLORINATED PRIOR TO DISCHARGE TO THE SURROUNDING AREA.
57. WATER MUST SIT IN THE MAIN FOR AT LEAST 24 HOURS PRIOR TO TAKING A TEST SAMPLE. WATER UTILIZED FOR THIS PURPOSE, FLUSHING OR PRESSURE TESTING, WHICH IS OBTAINED DIRECTLY FROM THE UNIVERSITY SYSTEM, MUST FLOW THROUGH AN ISOLATED CONNECTION TO THE UNIVERSITY SYSTEM VIA AN APPROVED METER, TESTABLE BACKFLOW PREVENTION DEVICE AND JUMPER LINE. THE CONTRACTOR SHALL MAKE ALL NECESSARY ARRANGEMENTS FOR SECURING THE WATER FOR TEST PURPOSES AND SHALL BEAR THE EXPENSE OF THESE ARRANGEMENTS. THE INSTALLER SHALL FURNISH AND INSTALL SUITABLE TEMPORARY TESTING PLUGS, CAPS, PUMPS, PIPE CONNECTIONS AND OTHER APPURTENANCES, AS NECESSARY, TO OBTAIN SAMPLES AT POINTS NO FURTHER THAN 1,000 FEET APART.
58. AFTER FINAL FLUSHING AND BEFORE THE NEW WATER MAIN IS CONNECTED TO THE DISTRIBUTION SYSTEM, TWO CONSECUTIVE SETS OF ACCEPTABLE SAMPLES FOR COLIFORM BACTERIA AND HETEROTROPHIC PLATE COUNT (HPC), TAKEN 24 HOURS APART, SHALL BE COLLECTED FROM THE TERMINATION OF THE NEW MAIN. AT LEAST ONE SAMPLE SHALL BE COLLECTED EVERY 1000 FT. OF NEW MAIN, PLUS ONE SET OF TWO SAMPLES FROM THE END OF THE LINE. AT LEAST ONE SET OF TWO SAMPLES SHALL BE TAKEN FROM EACH BRANCH. SAMPLES SHALL BE COLLECTED BY THE CONTRACTOR AND TESTED BY A LABORATORY APPROVED BY UNIVERSITY. THE WATER SAMPLE TEST RESULTS MUST INDICATE THAT THE WATER QUALITY IN THE NEW MAIN IS CONSISTENT IN QUALITY WITH THE UNIVERSITY SYSTEM WATER.

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
FRESHWATER WETLANDS PROGRAM
APPROVED WITH CONDITIONS
AS SPECIFIED IN THE LETTER OF APPROVAL
DATED AUG 2 8 2015 FILE # 15-0163
NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL
APPROVED PLANS MUST BE AT CONSTRUCTION SITE

JUL 2 3 2015
Office of Water Resources

PROJECT
WELL REDEVELOPMENT
WELL STATION NO. 3
KINGSTON, RHODE ISLAND

TODD A. RAVENELLE
No. 5928
REGISTERED PROFESSIONAL ENGINEER

CLIENT
UNIVERSITY OF RHODE ISLAND

Gordon R. Archibald, Inc.
Civil and Environmental Engineers
Pawtucket, Rhode Island

DRAWING TITLE
WATER NOTES

REVISIONS

NO.	DATE	BY

PROJECT NO.: 1574

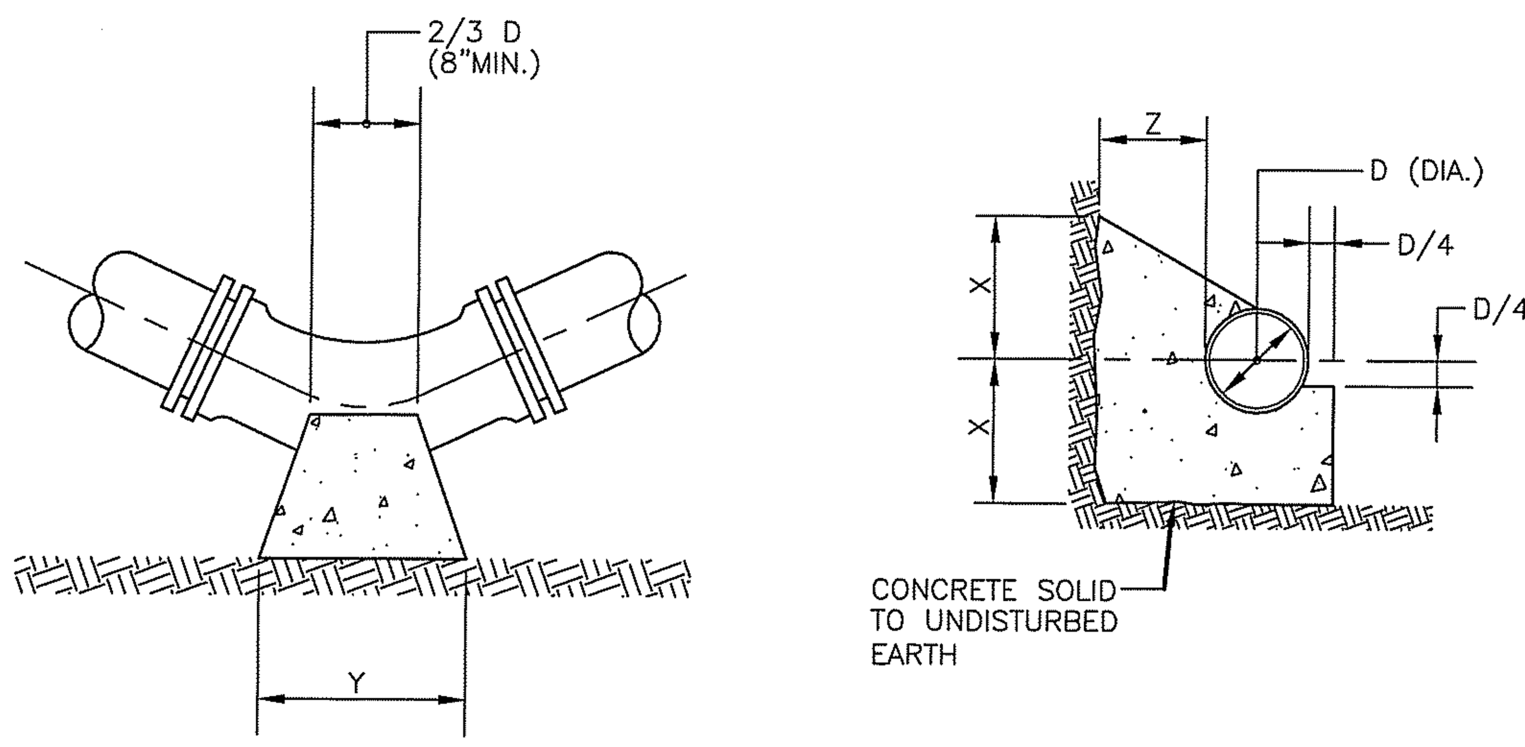
DATE: JULY 2015

SCALE: NONE

DRAWN BY: TAP

CHECKED BY: TAR

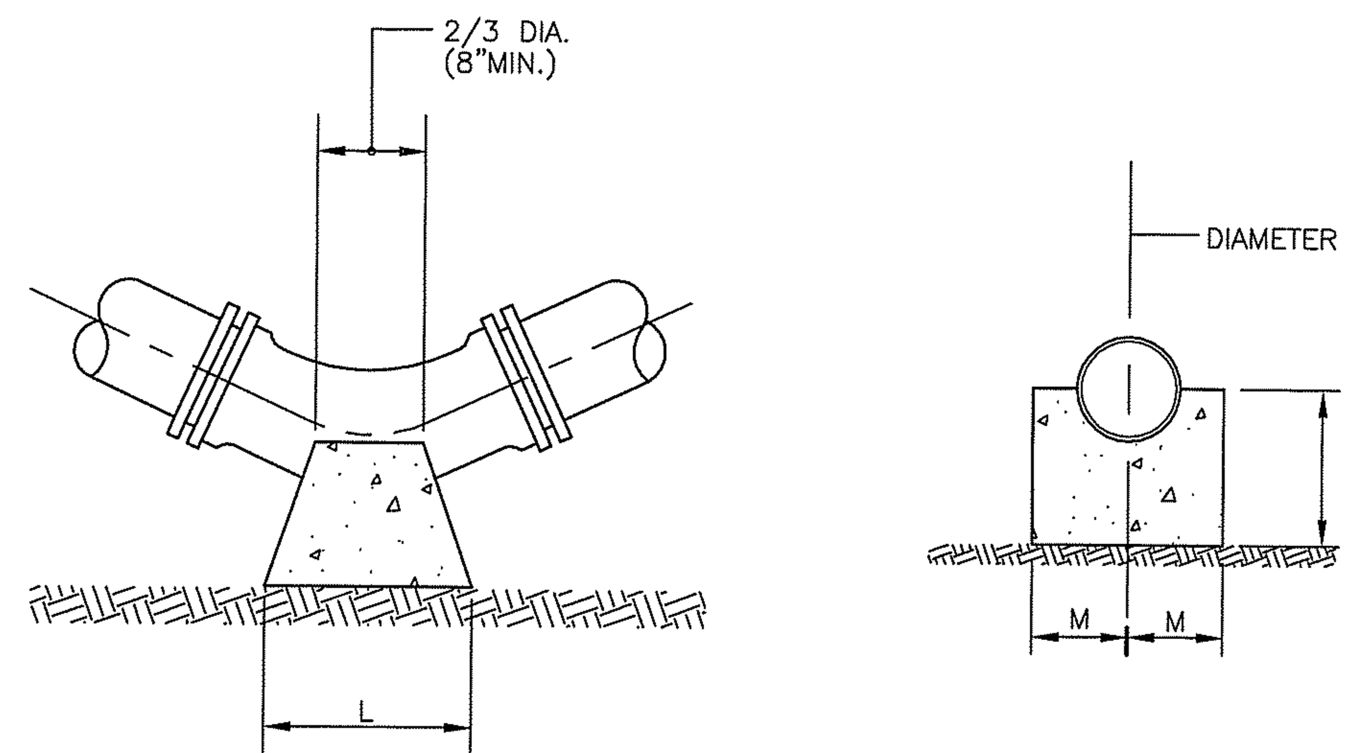
DRAWING NUMBER
6
SHEET 6 OF 7



PLAN

SECTION

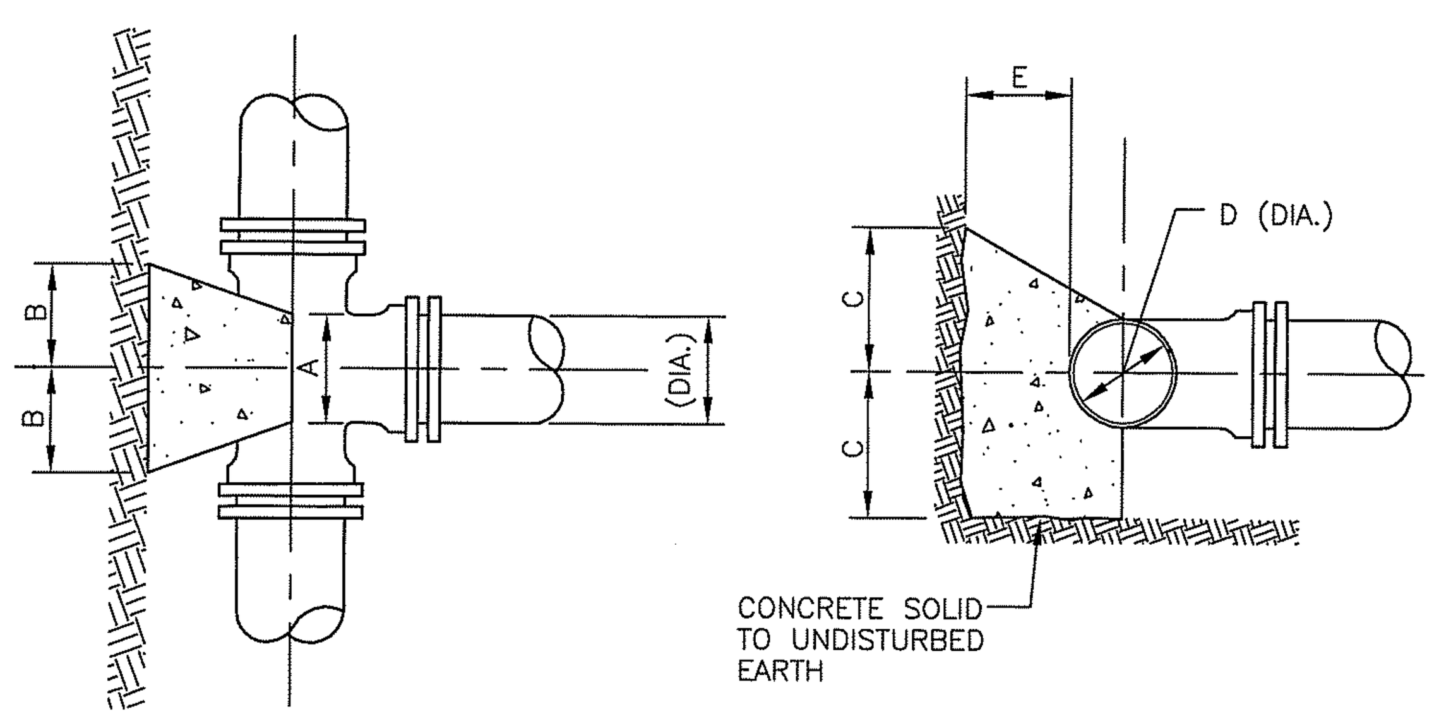
HORIZONTAL BENDS



ELEVATION

SECTION

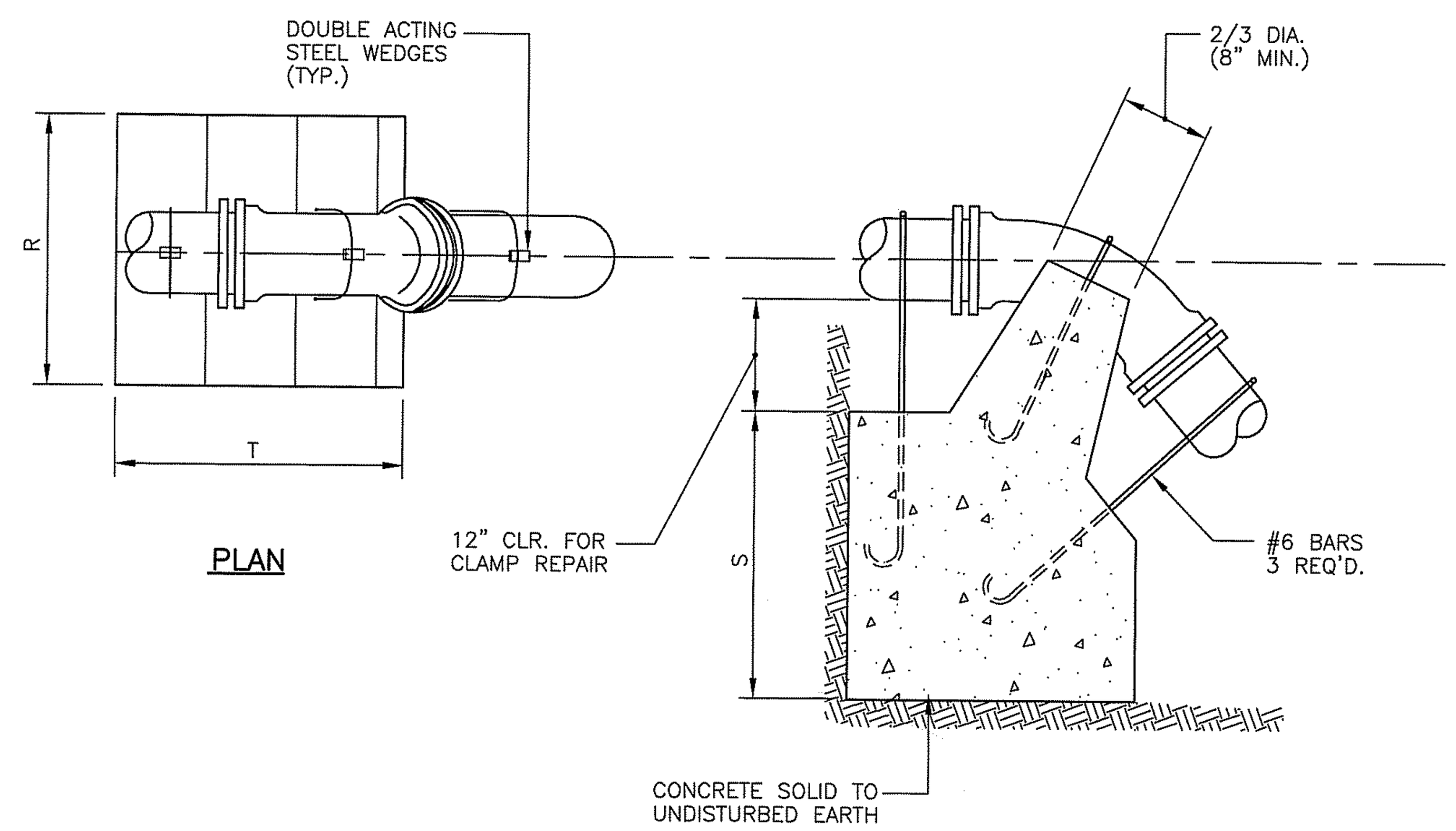
VERTICAL BENDS



PLAN

SECTION

TEES and END CAPS



PLAN

ELEVATION

CONCRETE ANCHORAGE

NOTES:

1. ALL CONCRETE SHALL BE 3000 PSI @ 28 DAYS.
2. CONCRETE THRUST BLOCKS SHALL BEAR AGAINST UNDISTURBED EARTH.
3. ALL FORCE MAIN BENDS, TEES, MAIN TAPS, AND END CAPS SHALL REQUIRE A CONCRETE THRUST BLOCK.

TEES		6"	8"	12"	16"	20"
		PIPE SIZE–D (DIA.)				
	A	8"	10"	1'–0"	1'–3"	1'–6"
	B	8"	10"	1'–2"	1'–4"	1'–6"
	C	10"	1'–0"	1'–3"	1'–6"	1'–8"
	E	8"	10"	1'–2"	1'–6"	1'–10"
END CAPS						
	A	6"	8"	1'–0"	1'–4"	1'–8"
	B	8"	10"	1'–2"	1'–6"	1'–10"
	C	8"	10"	1'–2"	1'–6"	1'–10"
	E	8"	10"	1'–2"	1'–6"	1'–10"

HORIZONTAL BENDS

BEND		6"	8"	12"	16"	20"
		PIPE SIZE–D (DIA.)				
1/8	X	1'–0"	1'–0"	1'–0"	1'–3"	1'–6"
	Y	1'–0"	1'–6"	2'–0"	2'–6"	3'–0"
	Z	8"	10"	1'–2"	1'–4"	1'–6"
1/16	X	1'–0"	1'–0"	1'–0"	1'–3"	1'–6"
	Y	1'–0"	1'–4"	1'–6"	1'–9"	2'–6"
	Z	8"	10"	1'–2"	1'–4"	1'–6"
1/32	X	1'–0"	1'–0"	1'–0"	1'–2"	1'–4"
	Y	1'–0"	1'–0"	1'–2"	1'–4"	1'–6"
	Z	8"	10"	1'–2"	1'–4"	1'–6"

VERTICAL BENDS

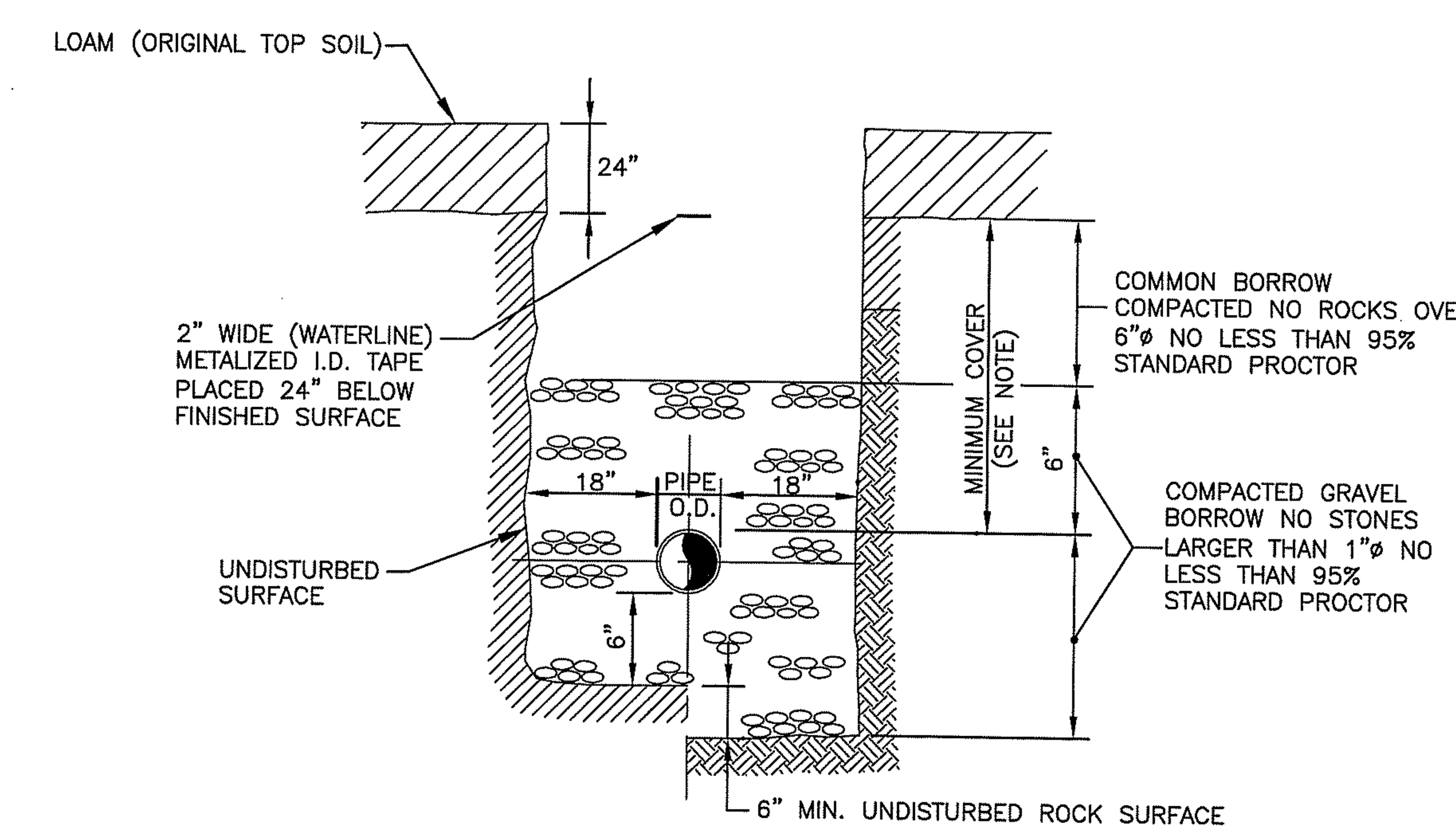
BEND		6"	8"	12"	16"	20"
		PIPE SIZE–D (DIA.)				
1/8	L	1'–3"	1'–8"	2'–6"	3'–6"	4'–8"
	M	7"	8"	11"	1'–4"	1'–6"
	N	7"	8"	11"	1'–4"	1'–6"
1/16	L	9"	1'–0"	1'–9"	2'–6"	3'–0"
	M	7"	7"	10"	1'–0"	1'–2"
	N	7"	7"	8"	10"	1'–0"
1/32	L	6"	8"	1'–0"	1'–4"	1'–9"
	M	7"	7"	10"	1'–0"	1'–2"
	N	7"	7"	8"	10"	1'–0"

ANCHORAGES

BEND		6"	8"	12"	16"	20"
		PIPE SIZE–D (DIA.)				
1/8	R	2'–6"	3'–0"	4'–6"	5'–4"	6'–0"
	S	2'–6"	2'–9"	3'–6"	2'–6"	5'–6"
	T	3'–0"	4'–0"	4'–9"	7'–0"	9'–6"
1/16	R	2'–0"	2'–8"	4'–0"	4'–6"	5'–0"
	S	1'–9"	2'–3"	2'–6"	3'–2"	3'–8"
	T	2'–6"	3'–4"	4'–0"	6'–0"	8'–6"
1/32	R	1'–6"	2'–0"	3'–0"	3'–8"	4'–3"
	S	1'–3"	1'–9"	2'–0"	2'–4"	2'–6"
	T	2'–0"	2'–6"	3'–0"	4'–6"	5'–9"

THRUST BLOCKS

NOT TO SCALE



TYPICAL TRENCH DETAIL FOR WATER MAIN AND SERVICES

NOT TO SCALE

NOTE:

1. THE MINIMUM BURY DEPTH FOR 12" WATER MAIN PIPE SHALL BE 5'–0" TO THE PIPE CROWN.

PROJECT

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WELL STATION NO. 3

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WATER DETAILS

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7