

# PERMIT SUBMISSION SITE PLANS

FOR:

## ROGER WILLIAMS PARK ZOO EDUCATION CENTER & PAVILION

A.P. 90, LOT 157  
1000 ELMWOOD AVENUE  
PROVIDENCE, R.I. 02907

PREPARED FOR:

ROGER WILLIAMS PARK ZOO  
1000 ELMWOOD AVENUE  
PROVIDENCE, R.I. 02907

RI DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF WATER RESOURCES  
FRESHWATER WETLANDS PROGRAM

NOTE PER DEM:

Kindly be advised that this Permit  
is not equivalent to a  
verification of the type or extent  
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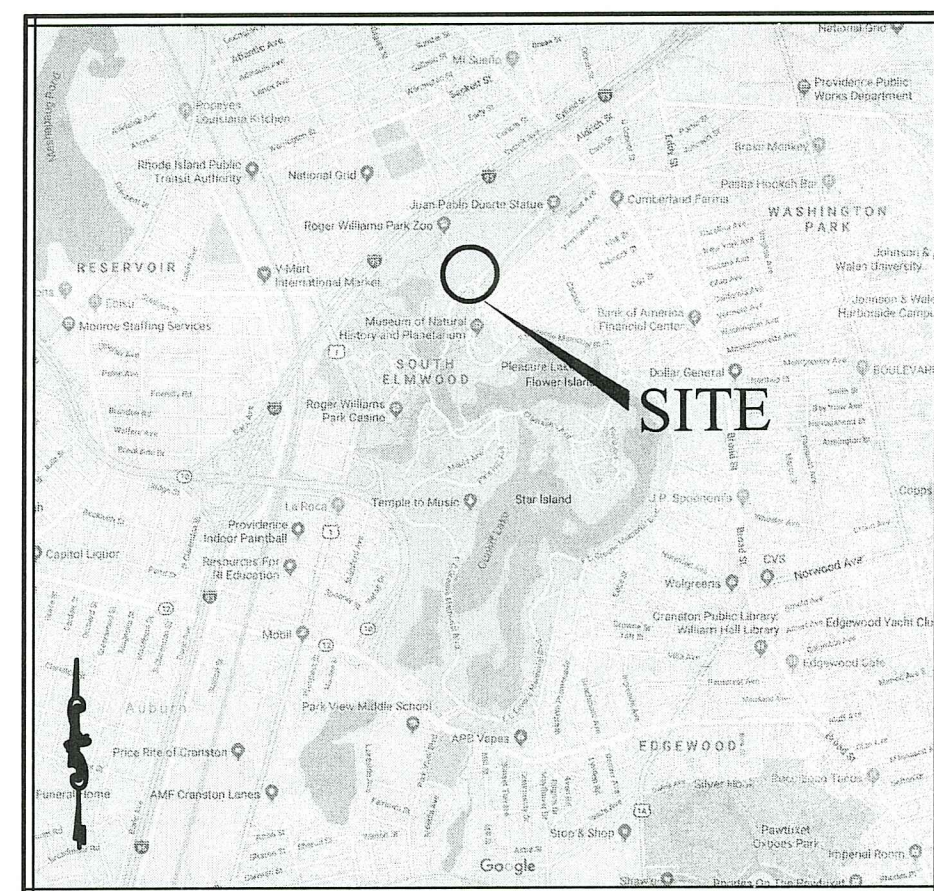
APPROVED WITH CONDITIONS AS

SPECIFIED IN THE LETTER OF APPROVAL

DATED: MAR 28 2023 FILE #: 23-0026

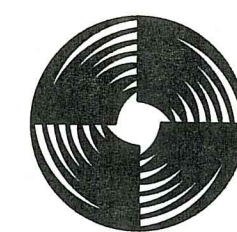
NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL  
APPROVED PLANS MUST BE AT CONSTRUCTION SITE

*Samuel E. Freeman*



LOCUS MAP  
NOT TO SCALE

PREPARED BY:



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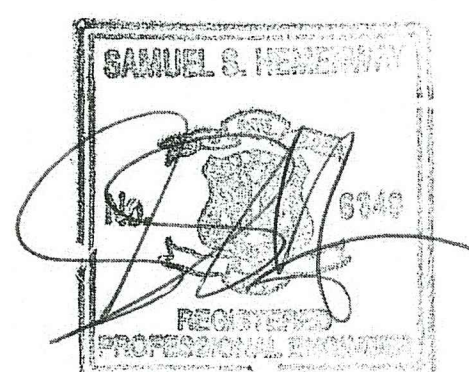
DATED:

JANUARY 27, 2023

(REVISED DATE: MARCH 07, 2023)

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RI Environmental Management  
MAR - 8 2023  
Office of Water Res.

**GENERAL CONSTRUCTION NOTES:**

- AN APPROVED SET OF PLANS AND ALL APPLICABLE PERMITS MUST BE AVAILABLE AT THE CONSTRUCTION SITE TRAILER AT ALL TIMES. DEVIATIONS OR CHANGES WILL NOT BE ALLOWED UNLESS BY WRITTEN APPROVAL FROM THE ENGINEER.
- SITING CONSTRUCTION SHALL NOT COMMENCE UNTIL ALL APPROVALS HAVE BEEN SECURED. REQUIRED PERMITS/APPROVALS FOR THE PROJECT INCLUDE BUT NOT LIMITED TO THE FOLLOWING: SITE PLAN APPROVAL BY THE CITY OF PROVIDENCE/ROGER WILLIAMS PARK ZOO.
- THE CONTRACTOR MUST RETAIN THE SERVICES OF A REGISTERED LAND SURVEYOR IN THE STATE OF RHODE ISLAND TO LAYOUT ON THE GROUND ALL NEW ELEMENTS OF WORK. IF ANY WORK IS INSTALLED PRIOR TO THE ABOVE REQUIREMENT AND IF ANY WORK IS NOT SATISFACTORY TO THE ENGINEER, THE CONTRACTOR MUST REPLACE THE WORK AT NO ADDITIONAL COST TO THE OWNER.
- THE CONTRACTOR SHALL VERIFY THE PROPOSED LAYOUT WITH ITS RELATIONSHIP TO THE EXISTING SITE SURVEY. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, SITE CONDITIONS AND MATERIAL SPECIFICATIONS AND SHALL NOTIFY THE OWNER AND ENGINEER OF ANY ERRORS, OMISSIONS OR DISCREPANCIES BEFORE COMMENCING, INSTALLING OR PROCEEDING WITH WORK.
- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES AND TO TAKE WHATEVER NECESSARY MEASURES NEEDED TO PROVIDE FOR THEIR PROTECTION. THE ENGINEER HAS DILIGENTLY ATTEMPTED TO LOCATE AND INDICATE ALL EXISTING UNDERGROUND UTILITIES AND FACILITIES ON THE DRAWINGS; HOWEVER, THE INFORMATION SHOWN IS FOR THE CONTRACTORS CONVENIENCE ONLY. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THE LOCATIONS OF UTILITIES SHOWN OR NOT SHOWN. THE CONTRACTOR SHALL MAKE EXPLORATORY EXCAVATIONS AND LOCATE ANY EXISTING UTILITIES SUFFICIENTLY AHEAD OF CONSTRUCTION, VERIFY ALL DIMENSIONS, SITE CONDITIONS AND MATERIALS. THE CONTRACTOR MUST CONTACT THE LOCAL UTILITY COMPANIES FOR EXACT LOCATION OF UTILITIES PRIOR TO THE START OF ANY CONSTRUCTION AND SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES BEFORE START OF ANY WORK. IT IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR AND REPLACE ANY AND ALL DAMAGE MADE TO UTILITIES BY THE CONTRACTOR.
- THE CONTRACTOR MUST NOTIFY OPERATORS WHO MAINTAIN UNDERGROUND UTILITIES IN THE AREA OF PROPOSED CONSTRUCTION, EXCAVATION OR BLASTING AT LEAST THREE WORKING DAYS, BUT NOT MORE THAN TEN WORKING DAYS PRIOR TO THE START OF ANY CONSTRUCTION, EXCAVATION OR BLASTING. ALL WATER, SEWER, GAS AND ALL OTHER UTILITIES MUST BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.
- METHODS AND MATERIALS USED IN THE CONSTRUCTION OF IMPROVEMENTS MUST CONFORM TO THE CITY OF PROVIDENCE CURRENT CONSTRUCTION STANDARDS AND SPECIFICATIONS AND THE STATE OF RHODE ISLAND DEPARTMENT OF TRANSPORTATION.
- THE CONTRACTOR IS RESPONSIBLE FOR REPLACING ANY PAVEMENT, DRIVEWAYS, SIDEWALKS, WALL, CURBS, ETC. DAMAGED DURING CONSTRUCTION WITH MATCHING MATERIALS.
- THE CONTRACTOR AGREES THAT HE WILL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE PROJECT SITE CONDITIONS THROUGHOUT CONSTRUCTION, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED IN CONJUNCTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT.
- ALL MATERIALS USED FOR CONSTRUCTION MUST BE NEW AND FREE OF DEFECTS. USED OR SALVAGED MATERIAL WILL NOT BE ALLOWED UNLESS WRITTEN APPROVAL FROM THE OWNER IS OBTAINED BY THE CONTRACTOR.
- AT ALL TIME THE CONTRACTOR MUST MAINTAIN ACCESS FOR EMERGENCY VEHICLES AROUND AND TO ALL BUILDINGS. (I.E. IN TIMES OF RAIN OR SNOW, ROADS MUST BE ABLE TO CARRY A FIRE TRUCK BY BEING PAVED OR HAVING A CRUSHED STONE BASE, ETC.). WIDTH OF EMERGENCY VEHICLE ACCESS MUST BE A MINIMUM OF 20 FEET WIDE. ACCESS TO BUILDINGS THAT HAVE A FIRE SPRINKLER SYSTEM OR STAMPIPE MUST BE WITHIN 40 FEET OF THE FIRE DEPARTMENT CONNECTION (FDC). NFPA 1141 3-1.
- NECESSARY BARRICADES, LIGHTS, SIGNS AND OTHER TRAFFIC CONTROL METHODS AS MAYBE NECESSARY FOR THE PROTECTION AND SAFETY OF THE PUBLIC MUST BE PROVIDED AND MAINTAINED THROUGHOUT CONSTRUCTION BY THE CONTRACTOR.
- HIGH INTENSITY LIGHTING FACILITIES MUST BE SO ARRANGED THAT THE SOURCE OF ANY LIGHT IS CONCEALED FROM PUBLIC VIEW AND FROM ADJACENT RESIDENTIAL PROPERTY AND DOES NOT INTERFERE WITH TRAFFIC. (REFER TO ELECTRICAL SITE PLANS PREPARED BY OTHERS FOR DETAILS.)
- ALL RI HIGHWAY BOUNDS AND PERMANENT SURVEY MARKERS SHALL BE PROTECTED THROUGHOUT CONSTRUCTION.
- ALL WORK WITHIN THE STATE HIGHWAY RIGHT OF WAY SHALL CONFORM TO RIDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2004 EDITION, INCLUDING ALL REVISIONS AND THE RI STANDARD DETAILS.
- ALL TRAFFIC CONTROL SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES 2003 INCLUDING ALL REVISIONS.
- REFER TO ARCHITECTURAL, STRUCTURAL, AND MECHANICAL PLANS FOR ALL BUILDING INFORMATION.
- THERE ARE KNOWN WETLAND AREAS ON OR ADJACENT TO THE PROJECT SITE. THE WETLANDS INDICATED HAVE BEEN FLAGGED IN THE FIELD.
- ALL CURB RADI ARE 3' UNLESS OTHERWISE NOTED ON THE SITE PLAN.
- PRIOR TO THE START OF CONSTRUCTION THE CONTRACTOR IS REQUIRED TO DEVELOP AND IMPLEMENT A PLAN FOR THE TEMPORARY CONTROL OF VEHICULAR AND PEDESTRIAN TRAFFIC FOR WORK WITHIN PUBLIC STREET RIGHT-OF-WAY AT THE SITE EGRESS. CONTRACTOR SHALL OBTAIN APPROVAL OF SAID PLAN FROM APPROPRIATE STATE AND COMMUNITY PUBLIC SAFETY OFFICIALS.
- PRECAST STRUCTURES MAY BE USED AT CONTRACTOR'S OPTION. SHOP DRAWINGS OF PRECAST STRUCTURES SHALL BE REVIEWED BY THE ENGINEER AND APPROVED BEFORE USE.
- IF ANY EXISTING STRUCTURES AND/OR UTILITIES TO REMAIN ARE DAMAGED DURING CONSTRUCTION, EITHER ON THE PROJECT SITE, ADJACENT PROPERTIES, OR WITHIN STATE RIGHT-OF-WAY, IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO REPAIR AND/OR REPLACE THE EXISTING STRUCTURE AS NECESSARY TO RETURN IT TO EXISTING CONDITIONS OR BETTER.

**GENERAL UTILITY NOTES:**

- THE CONTRACTOR SHALL NOTIFY DIG-SAFE (1-888-344-7233) AND ALL LOCAL AUTHORITIES & UTILITY COMPANIES TO VERIFY LOCATIONS OF UTILITIES WITHIN THE AREA 72 HOURS PRIOR TO BEGINNING ANY EXCAVATION OR DEMOLITION FOR THE PURPOSE OF COORDINATING THE MARKING OF UNDERGROUND UTILITIES. LOCATION AND DEPTHS OF EXISTING UTILITIES SHOWN ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY, LOCATE AND PROTECT EXISTING UTILITIES IN THE FIELD WHETHER OR NOT SHOWN ON THE DRAWINGS.
- ALL WORK SHALL BE IN COMPLETE ACCORDANCE WITH ALL APPLICABLE STATE, FEDERAL AND LOCAL CODES, AND ALL NECESSARY LICENSES AND PERMITS SHALL BE OBTAINED BY THE CONTRACTOR AT HIS EXPENSE UNLESS PREVIOUSLY OBTAINED BY THE OWNER/DEVELOPER.
- THE CONTRACTOR SHALL COORDINATE LOCATION AND INSTALLATION OF ALL UNDERGROUND UTILITIES AND APPURTENANCES TO MINIMIZE DISTURBANCE OF CURBING, PAVING AND COMPACTED SUBGRADE. THE CONTRACTOR SHALL NOTIFY THE TOWN ENGINEER & ALL LOCAL UTILITY COMPANIES 48 HOURS BEFORE EACH PHASE OF CONSTRUCTION. THE CONTRACTOR SHALL IMMEDIATELY INFORM THE ENGINEER OF ANY DISCREPANCIES OR ERRORS DISCOVERED IN THE PLANS.
- BEDDING REQUIREMENTS SPECIFIED HEREIN ARE TO BE CONSIDERED AS MINIMUMS FOR RELATIVELY DRY, STABLE EARTH CONDITIONS. ADDITIONAL BEDDING SHALL BE REQUIRED FOR ROCK TRENCHES AND WET AREA. CONTRACTOR SHALL HAVE THE RESPONSIBILITY TO PROVIDE SUCH ADDITIONAL BEDDING AS MAY BE REQUIRED TO PROPERLY CONSTRUCT THE WORK.
- THE CONTRACTOR SHALL REMOVE ANY ABANDONED FOUNDATIONS, UTILITY STRUCTURES, BURIED DEBRIS ETC. WHICH INTERFERE WITH THE INSTALLATION OF THE UTILITY WORK. ALL SUCH STRUCTURES SHALL BE COMPLETELY REMOVED AND THE EXCAVATED AREA SHALL BE BACKFILLED WITH COMPACTED GRAVEL IN 6" LIFTS TO 95% COMPACTION TO 6" BELOW THE BOTTOM OF THE UTILITY AND PIPE.
- COMPACTION OF THE BACKFILL OF ALL TRENCHES SHALL BE COMPACTED TO THE DENSITY OF 95% OF THE THEORETICAL MAXIMUM DRY DENSITY (ASTM D698). BACKFILL MATERIAL SHALL BE FREE FROM ROOTS, STUMPS OR OTHER FOREIGN DEBRIS AND SHALL BE PLACED IN LIFTS NOT TO EXCEED ONE FOOT IN COMPACTED FILL THICKNESS. CORRECTION OF ANY TRENCH SETTLEMENT WITHIN A YEAR FROM THE DATE OF PROJECT APPROVAL WILL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- ALL PIPING LAYOUT INDICATED ON THESE PLANS IS DIAGRAMMATIC ONLY AND DOES NOT SHOW ALL THE REQUIRED FITTINGS FOR PROPER ALIGNMENT. THE CONTRACTOR SHALL PROVIDE ALL REQUIRED FITTINGS TO OBTAIN PROPER ALIGNMENT AND FOR EXISTING UTILITY CONNECTIONS BASED UPON FIELD CONDITIONS.
- IF DURING EXCAVATION THE TRENCH WIDTH EXCEEDS THE SUM OF THE PIPE O.D. PLUS 2"-0", PLACE AND COMPACT THE FILL TO 12" ABOVE THE PIPE AND RE-EXCAVATE TO REQUIRED GRADE.
- ALL WATER SERVICE MATERIALS AND WORKMANSHIP SHALL CONFORM TO PROVIDENCE WATER SUPPLY BOARD REGULATIONS, STANDARDS AND SPECIFICATIONS. NOTIFICATION SHALL BE PROVIDED TO SAID AUTHORITIES AT LEAST 72 HOURS PRIOR TO INITIATING CONSTRUCTION. DOMESTIC WATER SERVICE PIPING SIZE SHOWN IS APPROXIMATE ONLY AND SHALL BE SIZED AND VERIFIED BY A LICENSED PLUMBING ENGINEER.
- ALL FIRE AND PLUMBING FIXTURES MUST CONFORM TO LOCAL SPECIFICATIONS AND AS STIPULATED BY THE LOCAL FIRE MARSHALL AND/OR THE BUILDING OFFICIAL.
- SEWER LINES SHALL BE INSTALLED AT A MINIMUM 10 FOOT HORIZONTAL SEPARATION FROM ANY PROPOSED OR EXISTING WATER LINE. WHENEVER SEWER LINES MUST CROSS WATER LINES, THE SEWER SHALL BE INSTALLED SO THAT THE TOP OF THE SEWER IS AT LEAST 18 INCHES BELOW THE BOTTOM OF THE WATER MAIN. WHERE 18 INCH VERTICAL SEPARATION & 10 FOOT HORIZONTAL SEPARATION CAN NOT BE MET AT WATER AND SEWER CROSSINGS, THE SEWER PIPE SHALL BE ENCASED IN EITHER DUCTILE IRON OR 6900 BLUE BRUTE PIPE FOR A DISTANCE OF 10 FEET ON EACH SIDE OF CROSSING.
- STORM DRAINS 12" AND OVER SHALL BE SMOOTH INTERIOR WALL AND EXTERIOR CORRUGATED HIGH DENSITY POLYETHYLENE (HDPE) PIPE CAPABLE OF WITHSTANDING (H=20) LOAD UNLESS NOTED OTHERWISE. PIPE SHALL BE JOINED USING BELL & SPIGOT JOINTS MEETING OR EXCEED ASTM F2648. THE JOINT SHALL BE SOIL-TIGHT AND GASKETS SHALL MEET OR EXCEED ASTM F477. HDPE PIPE SHALL BE AS MANUFACTURED BY ADVANCED DRAINAGE SYSTEMS INC. (ADS), HANCOR PIPE OR LANE PIPE. ALL STORM DRAINAGE PIPING SHALL BE LAID ON A SMOOTH CONTINUOUS GRADE WITH NO VISIBLE BENDS AT THE JOINTS. WHERE INDICATED ON DRAWINGS REINFORCED CONCRETE PIPE (RCP) PIPE SHALL BE CLASS III RCP WITH "0" RING GASKET JOINTS
- GAS SERVICE FACILITIES SHALL BE DESIGNED BY OTHERS. CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE UTILITY INSTALLATIONS AS REQUIRED TO ENSURE ADEQUATE GAS SERVICE IS PROVIDED AND SHALL BE RESPONSIBLE FOR ALL INSTALLATION PROCEDURES (TRENCHING, LAYING PIPE, ETC.) AS ARE REQUIRED BY THE GAS COMPANY FOR COMPLETE AND IN PLACE CONSTRUCTION.
- ELECTRIC SERVICE FACILITIES SHALL BE DESIGNED BY OTHERS. ELECTRIC SERVICE AND TRANSFORMER PAD SHALL CONFORM TO THE REQUIREMENTS OF THE ELECTRIC COMPANY. CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING ADEQUATE ELECTRIC SERVICE IS PROVIDED AND SHALL BE RESPONSIBLE FOR ALL INSTALLATION PROCEDURES (TRENCHING, LAYING PIPE, ETC.) AS ARE REQUIRED BY THE ELECTRIC COMPANY FOR COMPLETE AND IN PLACE CONSTRUCTION. REFER TO ELECTRICAL DRAWINGS FOR DETAILS ON ALL UNDERGROUND ELECTRIC.
- TEL/CABLE SERVICE FACILITIES SHALL BE DESIGNED BY OTHERS CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING ADEQUATE UTILITY SERVICE IS PROVIDED AND SHALL BE RESPONSIBLE FOR ALL INSTALLATION PROCEDURES (TRENCHING, LAYING PIPE ETC.) AS IS REQUIRED BY THE LOCAL UTILITY CO. FOR COMPLETE AND IN PLACE CONSTRUCTION. REFER TO ELECTRICAL DRAWINGS FOR ALL UNDERGROUND ELECTRIC.
- SITE LIGHTING ELEMENTS ARE SHOWN FOR APPROXIMATE ONLY. SITE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE INSTALLATION WORKING OF LIGHT IN LOCATIONS INDICATED. REFER TO SITE LIGHTING PLANS PLANS FOR INSTALLATION REQUIREMENTS.

**GENERAL DRAINAGE & GRADING NOTES:**

- ALL STORM PIPE ENTERING STRUCTURES SHALL BE GROUTED TO ASSURE CONNECTION AT STRUCTURE IS WATERTIGHT.
- ALL STORM SEWER MANHOLES IN PAVED AREAS SHALL BE FLUSH WITH PAVEMENT, AND SHALL HAVE TRAFFIC BEARING RING & COVERS. MANHOLES IN UNPAVED AREAS SHALL BE 6" ABOVE FINISH GRADE. LIDS SHALL BE LABELED "STORM SEWER".
- CONTRACTOR SHALL ADJUST AND/OR CUT EXISTING PAVEMENT AS NECESSARY TO ASSURE A SMOOTH FIT AND CONTINUOUS GRADE.
- CONTRACTOR SHALL ASSURE POSITIVE DRAINAGE AWAY FROM BUILDINGS FOR ALL NATURAL AND PAVED AREAS.
- ALL UNSURFACED AREAS DISTURBED BY GRADING OPERATION SHALL RECEIVE 4 INCHES OF TOPSOIL. CONTRACTOR SHALL APPLY STABILIZATION FABRIC TO ALL SLOPES 3H:1V OR STEEPER. CONTRACTOR SHALL GRASS DISTURBED AREAS IN ACCORDANCE WITH THE CITY OF PROVIDENCE SPECIFICATIONS UNTIL A HEALTHY STAND OF GRASS IS OBTAINED.
- THE MAXIMUM RUNNING SLOPE ALONG ANY SIDEWALK SHALL BE 5%. THE MAXIMUM CROSS SLOPE ACROSS ANY SIDEWALK SHALL BE 2%. A MINIMUM 5'x5' LANDING SHALL BE PROVIDED IN FRONT OF ALL BUILDING ENTRANCES.
- ALL ADAAG PARKING SPACES AND LOADING SPACES SHALL BE 2% MAXIMUM SLOPE IN ANY DIRECTION.
- INSTALL SILT SACKS AT ALL INLETS AFTER INSTALLATION.

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*Nancy L. Freeman*

**STORMWATER SYSTEM MAINTENANCE NOTES:**

THE DRAINAGE SYSTEMS ARE TO BE MONITORED THROUGHOUT THE ENTIRE CONSTRUCTION PERIOD BY THE CONTRACTOR. UPON COMPLETION OF THE PROJECT THE CONTRACTOR MUST DO A FINAL FULL MAINTENANCE & CLEAN UP OF THE STORMWATER MANAGEMENT SYSTEM AND THE SITE. UPON COMPLETION OF THE CONTRACTOR'S FINAL MAINTENANCE & CLEAN UP OF THE PROJECT, MONITORING OF THE STORMWATER MANAGEMENT SYSTEM SHALL BE THE RESPONSIBILITY OF THE OWNER.

CONSTRUCTION MONITORING/MAINTENANCE PROCEDURES SHALL BE AS FOLLOWS:  
(RESPONSIBILITY OF CONTRACTOR)

- SILT BARRIER:**  
MONITOR SILT BARRIER ON A WEEKLY BASIS AND AFTER EVERY RAIN STORM EVENT AND REPAIR OR REPLACE ANY DAMAGED AREAS IMMEDIATELY. IMMEDIATELY CLEAN THE SILT BARRIER IF SIX INCHES OR MORE OF SEDIMENT HAS ACCUMULATED ON THE HAYBALE & SILT BARRIER.
- PAVED AREAS:**  
PARKING LOTS, PUBLIC & PRIVATE ROADWAYS AND GUTTERS SHALL BE SWEEPED CLEAN OF ALL SEDIMENT & DEBRIS. SWEEPING & REMOVAL OF DEBRIS SHALL BE PERFORMED ON A WEEKLY BASIS AT A MINIMUM.
- CATCH BASINS:**  
ALL CATCH BASINS SHALL BE INSTALLED AS DETAILED AND INSPECTED AFTER EVERY RAIN STORM EVENT. IMMEDIATELY CLEAN THE CATCH BASIN SUMP IF TWO FEET OR MORE OF SEDIMENT HAS ACCUMULATED WITHIN THE CATCH BASIN.
- DRAIN MANHOLES:**  
DRAIN MANHOLES SHALL BE INSTALLED AS DETAILED AND INSPECTED AFTER EVERY RAIN STORM EVENT. IMMEDIATELY CLEAN THE DRAIN MANHOLE IF ONE FOOT OR MORE OF SEDIMENT HAS ACCUMULATED WITHIN THE DRAIN MANHOLE.
- SUBSURFACE INFILTRATION BASIN (STORMTECH INFILTRATION SYSTEMS AND ISOLATOR ROWS):**  
SUBSURFACE INFILTRATION BASIN SHALL BE INSPECTED AFTER EVERY RAIN STORM. CARE SHALL BE TAKEN TO PREVENT SILTATION OF THE BASIN AFTER INSTALLATION. PRETREATMENT BMP'S (DEEP SUMP CATCH BASINS & WATER QUALITY STRUCTURES) MUST BE MAINTAINED AND CLEANED PER THE PROCEDURES LISTED TO ENSURE PROPER FUNCTIONING. SUBSURFACE INFILTRATION BASIN SHALL BE MONITORED FOR ANY PONDING AND ACCUMULATION OF SEDIMENT/DEBRIS. ALL ACCUMULATED SEDIMENT AND DEBRIS MUST BE REMOVED BY A VAC-TRUCK. DISPOSAL OF ALL SEDIMENT AND DEBRIS MUST IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL GUIDELINES & REGULATIONS.

POST CONSTRUCTION MONITORING/MAINTENANCE PROCEDURES SHALL BE AS FOLLOWS:  
(RESPONSIBILITY OF OWNER)

- PAVED AREAS:**  
PARKING LOTS, ROADS AND ALL ACCESS WAYS AND GUTTERS MUST BE SWEEPED CLEAN OF ALL SEDIMENT AND DEBRIS ON BI-ANNUAL BASIS IN SPRING AND FALL OF EACH YEAR. OR AS NECESSARY.
- CATCH BASINS:**  
ALL CATCH BASINS MUST BE INSPECTED AND MAINTAINED ON A BI-ANNUAL BASIS IN MARCH AND OCTOBER OF EACH YEAR. CATCH BASINS MUST BE INSPECTED TO ENSURE THEY HAVE ADEQUATE SUMP CAPACITY, FRAMES AND GRATES ARE NOT DAMAGED, OIL/WATER SEPARATING DEVICES ARE IN PLACE. CATCH BASIN SUMPS ARE TO BE CLEANED OUT DURING BI-ANNUAL INSPECTIONS IN MARCH AND OCTOBER OF EACH YEAR. IMMEDIATELY CLEAN THE CATCH BASIN SUMP IF TWO FEET OR MORE OF SEDIMENT HAS ACCUMULATED WITHIN THE CATCH BASIN.
- DRAIN MANHOLES:**  
ALL DRAIN MANHOLES MUST BE INSPECTED AND MAINTAINED ON A BI-ANNUAL BASIS IN MARCH AND OCTOBER OF EACH YEAR. DRAIN MANHOLES MUST BE INSPECTED TO ENSURE FRAMES AND COVERS ARE NOT DAMAGED AND NO BLOCKAGES HAVE OCCURRED WITHIN THE MANHOLE. DRAIN MANHOLES ARE TO BE CLEANED OUT DURING BI-ANNUAL INSPECTIONS IN MARCH AND OCTOBER OF EACH YEAR IMMEDIATELY CLEAN THE DRAIN MANHOLE IF ONE FOOT OR MORE OF SEDIMENT HAS ACCUMULATED.
- SUBSURFACE INFILTRATION BASINS AND ISOLATOR ROWS:**  
SUBSURFACE INFILTRATION BASIN SHALL BE INSPECTED ON A BI-ANNUAL BASIS, IN MARCH AND OCTOBER OF EACH YEAR. DRAIN MANHOLES MUST BE INSPECTED TO ENSURE FRAMES AND COVERS ARE NOT DAMAGED AND NO BLOCKAGES HAVE OCCURRED WITHIN THE MANHOLE. DRAIN MANHOLES ARE TO BE CLEANED OUT DURING BI-ANNUAL INSPECTIONS IN MARCH AND OCTOBER OF EACH YEAR IMMEDIATELY CLEAN THE DRAIN MANHOLE IF ONE FOOT OR MORE OF SEDIMENT HAS ACCUMULATED.

**INFILTRATION AREA CONSTRUCTION PROTECTION**

FOR THE LONG-TERM FUNCTION OF THE INFILTRATING SYSTEMS, CARE MUST BE TAKEN IN THIS AREA DURING CONSTRUCTION. THE CONTRACTOR SHALL EMPLOY THE FOLLOWING MINIMUM BEST MANAGEMENT PRACTICES (BMP'S):

- THE INFILTRATION AREAS SHALL NOT BE USED AS A CONSTRUCTION SEDIMENTATION SYSTEM.
- CONSTRUCTION EQUIPMENT, VEHICULAR TRAFFIC, PARKING OF VEHICLES, AND STOCKPILING OF CONSTRUCTION AND EARTH MATERIALS SHALL BE OUTSIDE THE LIMITS OF THE INFILTRATION AREA UNTIL INSTALLATION IS COMPLETED. THE SUBGRADE BENEATH THE SYSTEM SHALL NOT BE COMPACTED.
- EXCAVATION FOR CONSTRUCTION OF THE INFILTRATION AREAS SHALL BE PERFORMED MANUALLY OR BY HYDRAULIC EXCAVATOR OR SOME OTHER SIMILAR MEANS TO ENSURE THAT THE EQUIPMENT IS NOT IN DIRECT CONTACT WITH THE NATURAL INFILTRATION EARTH MATERIAL AND DOES NOT CAUSE COMPACTION OF THE MATERIAL AND THE ENTIRE AREA IS TO BE SCARIFIED PRIOR TO INSTALLATION.
- THE CONTRACTOR SHALL INSTALL TEMPORARY CONSTRUCTION FENCING AND EROSION CONTROLS AROUND THE PERIMETER OF THE INFILTRATION AREA TO PREVENT THE USE OF THIS AREA FOR ANY CONSTRUCTION ACTIVITIES THAT MIGHT DAMAGE THE INFILTRATION CAPABILITIES OF THE AREA. THIS FENCING MUST BE REMOVED FOR BACKFILLING AND FINAL CONSTRUCTION.

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

**SITE PLAN LEGEND (RIDOT):**

- (BCP) BITUMINOUS CONCRETE PAVEMENT
- (7.1.0) PRECAST CONCRETE CURB
- (7.6.0P) CURB SETTING DETAIL
- (9.9.0) CONSTRUCTION ACCESS
- (12"W) 12" PAVEMENT MARKINGS-CROSSWALKS & STOP BAR
- (4.3.1.0P) CEMENT CONCRETE SIDEWALK
- (4"W) 4" PARKING PAVEMENT MARKINGS
- (43.3.0) WHEELCHAIR RAMP
- (LS) 4" LOAM AND SEEDING, TYPE 2
- (43.3.1) WHEELCHAIR RAMP FOR LIMITED RIGHT-OF-WAY AREAS
- (6.2.1P) HEAVY - DUTY ROUND FRAME AND COVER
- (48.1.0) DETECTIBLE WARNING PANEL PLACEMENT
- (6.3.2) HIGH CAPACITY FRAME AND GRATE (BICYCLE SAFE)
- (CLF) CHAIN LINK FENCE
- (6.4.0) ROUND FRAME AND GATE
- (DMF) DECORATIVE METAL FENCE

**SITE LEGEND**

EXISTING	NEW	DESCRIPTION
		CENTERLINE (LAYOUT)
		STORM DRAIN
		ELECTRIC (UNDERGROUND)
		FIRE SERVICE
		FOOTING DRAIN
		GAS
		OVERHEAD WIRE
		PROPERTY LINE
		SANITARY SEWER
		SITE LIGHTING SERVICE
		TELEPHONE
		WATER
		CONTOUR
		SPOT GRADE
		SPOT GRADE (BOT. OF CURB)
		SPOT GRADE (TOP OF CURB)
		SPOT GRADE (BOT. OF WALL)
		SPOT GRADE (TOP OF WALL)
		BITUMINOUS CONC. CURB
		CAPE COD BERM
		PRECAST CONC. CURB
		PRECAST SLOPED MOUNT. CURB
		SLOPED GRANITE CURB
		VERTICAL GRANITE CURB
		CHAINLINK FENCE (CLF)
		STOCKADE FENCE (STKF)
		BORING LOCATION
		CATCH BASIN
		DOUBLE GRATE CATCH BASIN
		CONCRETE THRUST BLOCK
		DRAIN MANHOLE
		FLARED END STRUCTURE
		SEWER MANHOLE
		WATER SERVICE
		UTILITY POLE
		FIRE HYDRANT
		GATE VALVE AND CURB BOX
		HANDICAP SYMBOL (PRKG. SPACE)
		SIGN
		WETLAND
		SOIL EVALUATION LOCATION
		TEST PIT LOCATION
		FIRE DEPARTMENT CONNECTION
		POST INDICATOR VALVE (PIV)
		ELECTRIC MANHOLE (EMH)
		TELEPHONE MANHOLE (TMH)
		TRANSFORMER PAD
		GENERATOR PAD
		GROUND CLEANOUT
		SIGHT LIGHT POLE
		TRAFFIC FLOW DIRECTION
		CONTINUOUS ROW OF HAYBALES
		CONTINUOUS ROW OF SILT FENCE
		PAVEMENT SAWCUT & MATCH TO EXISTING
		RIDOT/PROVIDENCE STD DETAIL REFERENCE

**ABBREVIATIONS**

- CI CAST IRON PIPE
- CLDI CEMENT LINED DUCTILE IRON PIPE
- CLF CHAINLINK FENCE
- CTE POINT OF CONNECTION TO EXISTING DUCTILE IRON PIPE
- D.I. DUCTILE IRON PIPE
- ESHWT ESTIMATED SEASONAL HIGH WATER TABLE
- ETR EXISTING TO REMAIN
- EX EXISTING
- F&I FURNISH AND INSTALL
- HDPE HIGH DENSITY POLYETHYLENE PIPE
- INV. INVERT ELEVATION
- MTE MATCH TO EXISTING
- NIC NIC IN CONTRACT
- NTS NOT TO SCALE
- PVC POLYVINYL CHLORIDE PIPE
- RCP REINFORCED CONCRETE PIPE
- VF VERIFY IN FIELD
- WQS WATER QUALITY STRUCTURE



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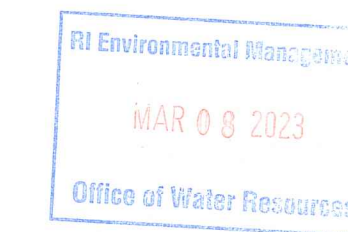
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**Roger Williams Park Zoo**

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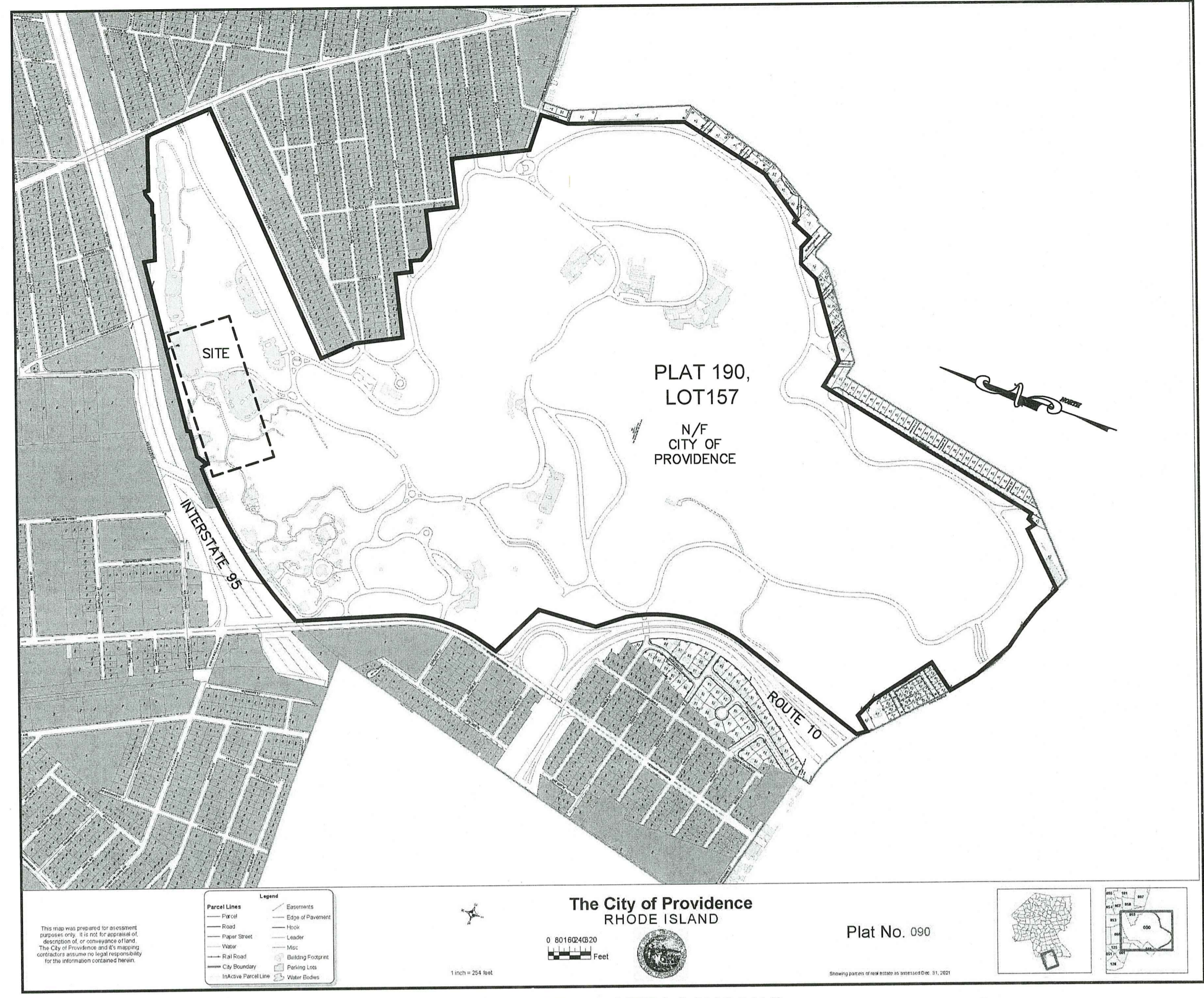
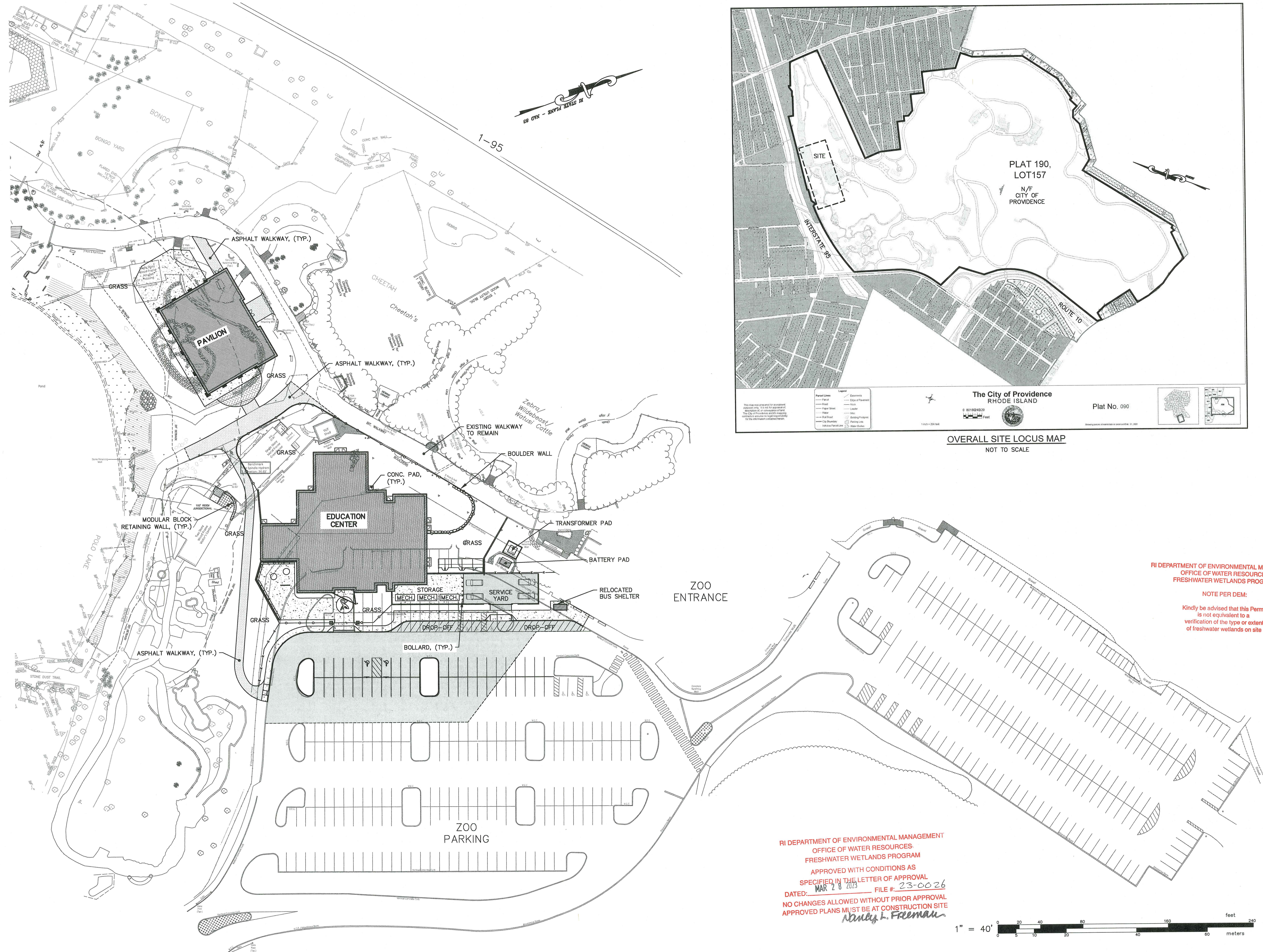
Revision Schedule	
Revision Number	Revision Date



**SHEET TITLE  
GENERAL NOTES & LEGEND**

DRAWN BY: KYY JOB NUMBER: 7213-00  
CHECKED BY: SSH DATE: 06/13/2019

1.0

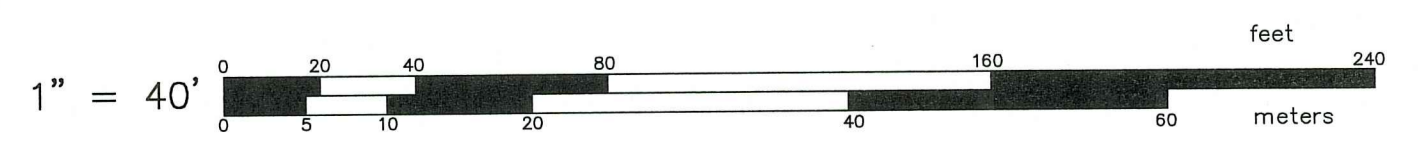


OVERALL SITE LOCIS MAP  
NOT TO SCALE

RI DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF WATER RESOURCES  
FRESHWATER WETLANDS PROGRAM

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APPROVED WITH CONDITIONS AS SPECIFIED IN THE LETTER OF APPROVAL  
DATED: MAR 28 2023 FILE #: 23-0026  
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*Nancy L. Freeman*



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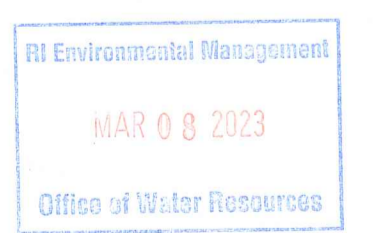
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Revision Schedule	
Revision Number	Revision Date
1	2023-03-07

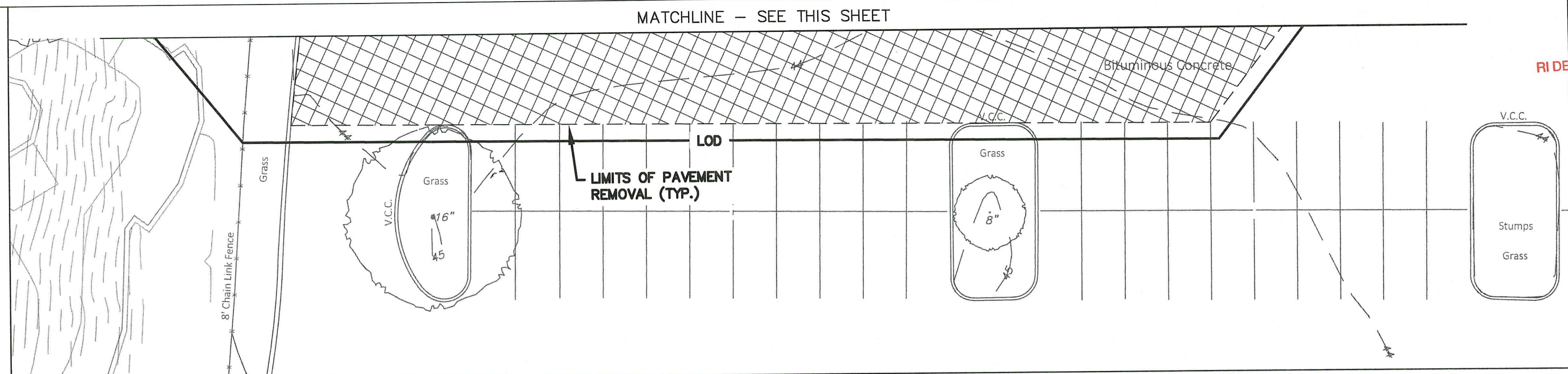
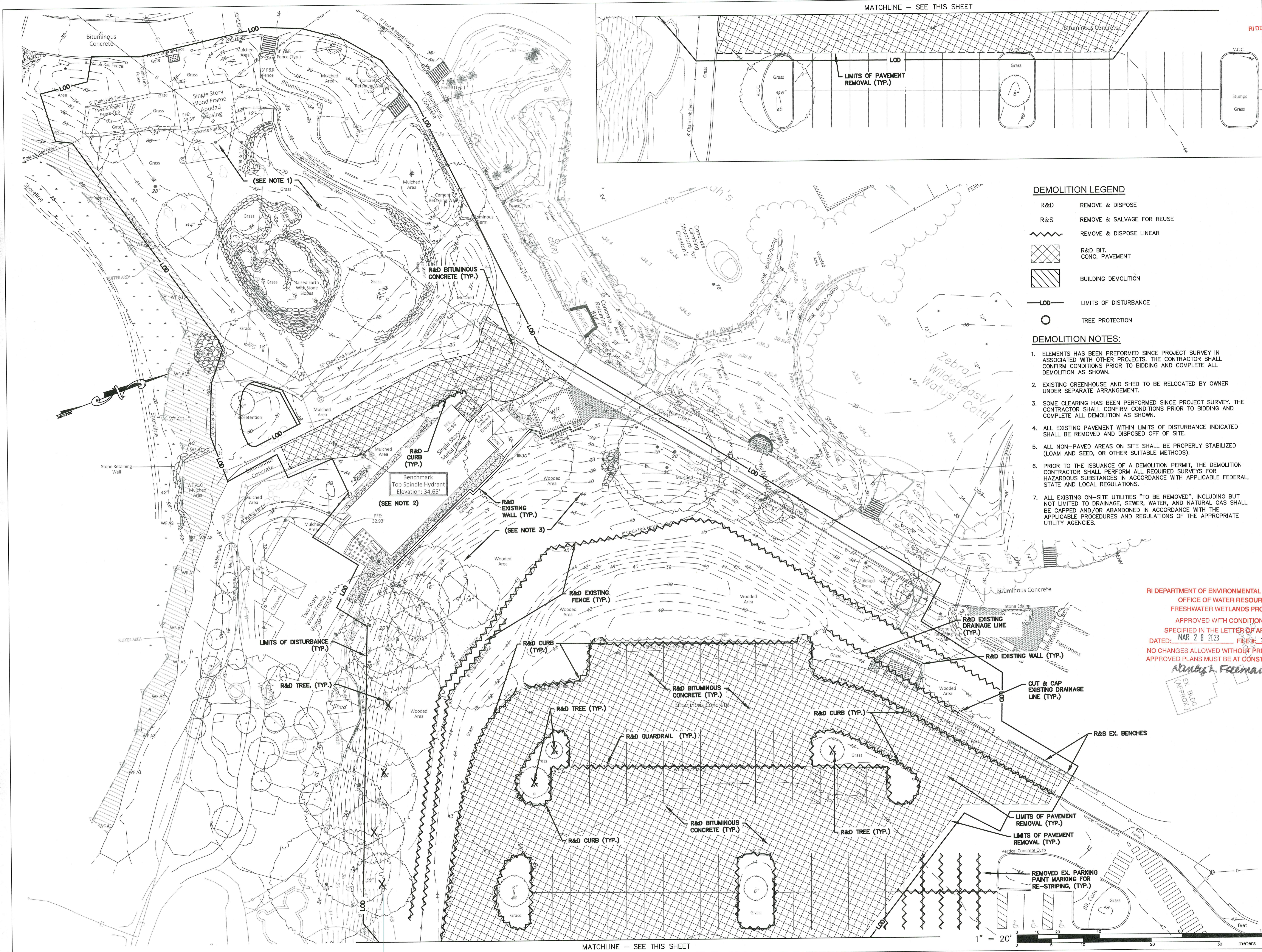
SHEET TITLE  
**OVERALL PLAN**



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CHECKED BY: SSH DATE: 06/13/2019

**2.0**

L:\213-00 Roger Williams Park Zoo (Saccoccio) - Providence, RI\dwg\01-Current\RIDEM DWG\7213-00-base.dwg 03/06/2023 kyngang 10:37



**DEMOLITION LEGEND**

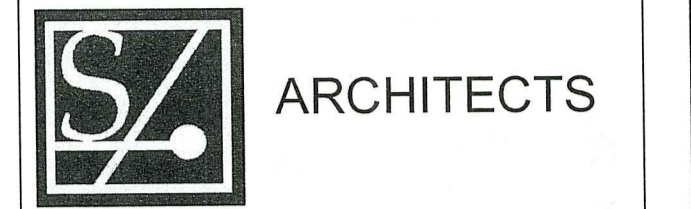
- R&D REMOVE & DISPOSE
- R&S REMOVE & SALVAGE FOR REUSE
- REMOVE & DISPOSE LINEAR
- R&D BIT. CONC. PAVEMENT
- BUILDING DEMOLITION
- LOD LIMITS OF DISTURBANCE
- TREE PROTECTION

**DEMOLITION NOTES:**

1. ELEMENTS HAS BEEN PREFORMED SINCE PROJECT SURVEY IN ASSOCIATED WITH OTHER PROJECTS. THE CONTRACTOR SHALL CONFIRM CONDITIONS PRIOR TO BIDDING AND COMPLETE ALL DEMOLITION AS SHOWN.
2. EXISTING GREENHOUSE AND SHED TO BE RELOCATED BY OWNER UNDER SEPARATE ARRANGEMENT.
3. SOME CLEARING HAS BEEN PERFORMED SINCE PROJECT SURVEY. THE CONTRACTOR SHALL CONFIRM CONDITIONS PRIOR TO BIDDING AND COMPLETE ALL DEMOLITION AS SHOWN.
4. ALL EXISTING PAVEMENT WITHIN LIMITS OF DISTURBANCE INDICATED SHALL BE REMOVED AND DISPOSED OFF OF SITE.
5. ALL NON-PAVED AREAS ON SITE SHALL BE PROPERLY STABILIZED (LOAM AND SEED, OR OTHER SUITABLE METHODS).
6. PRIOR TO THE ISSUANCE OF A DEMOLITION PERMIT, THE DEMOLITION CONTRACTOR SHALL PERFORM ALL REQUIRED SURVEYS FOR HAZARDOUS SUBSTANCES IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.
7. ALL EXISTING ON-SITE UTILITIES "TO BE REMOVED", INCLUDING BUT NOT LIMITED TO DRAINAGE, SEWER, WATER, AND NATURAL GAS SHALL BE CAPPED AND/OR ABANDONED IN ACCORDANCE WITH THE APPLICABLE PROCEDURES AND REGULATIONS OF THE APPROPRIATE UTILITY AGENCIES.

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*Abigail L. Freeman*  
 EX. BLDGS APPROV.

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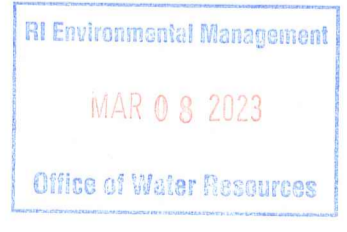
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 DEMOLITION PLAN**

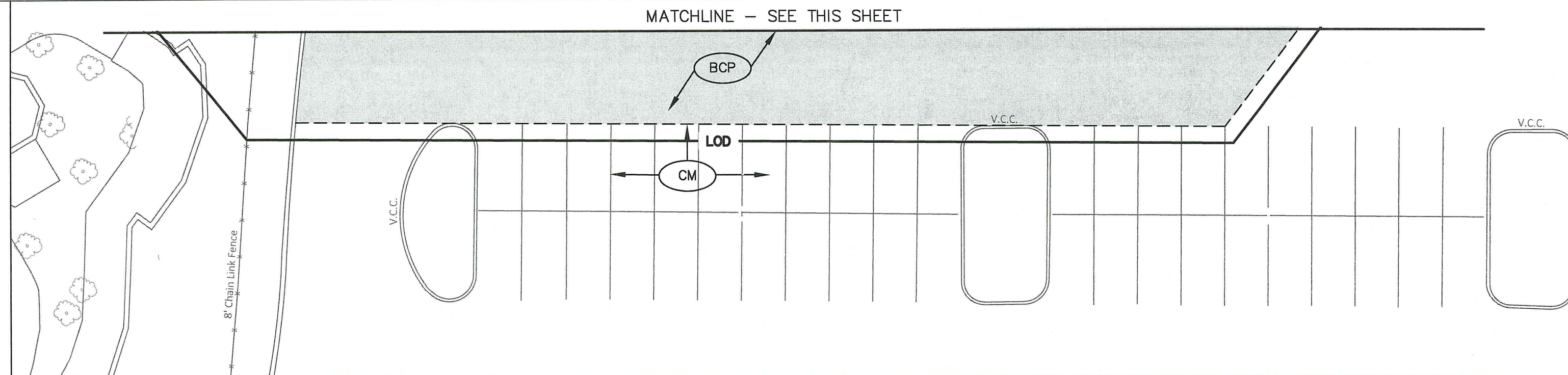
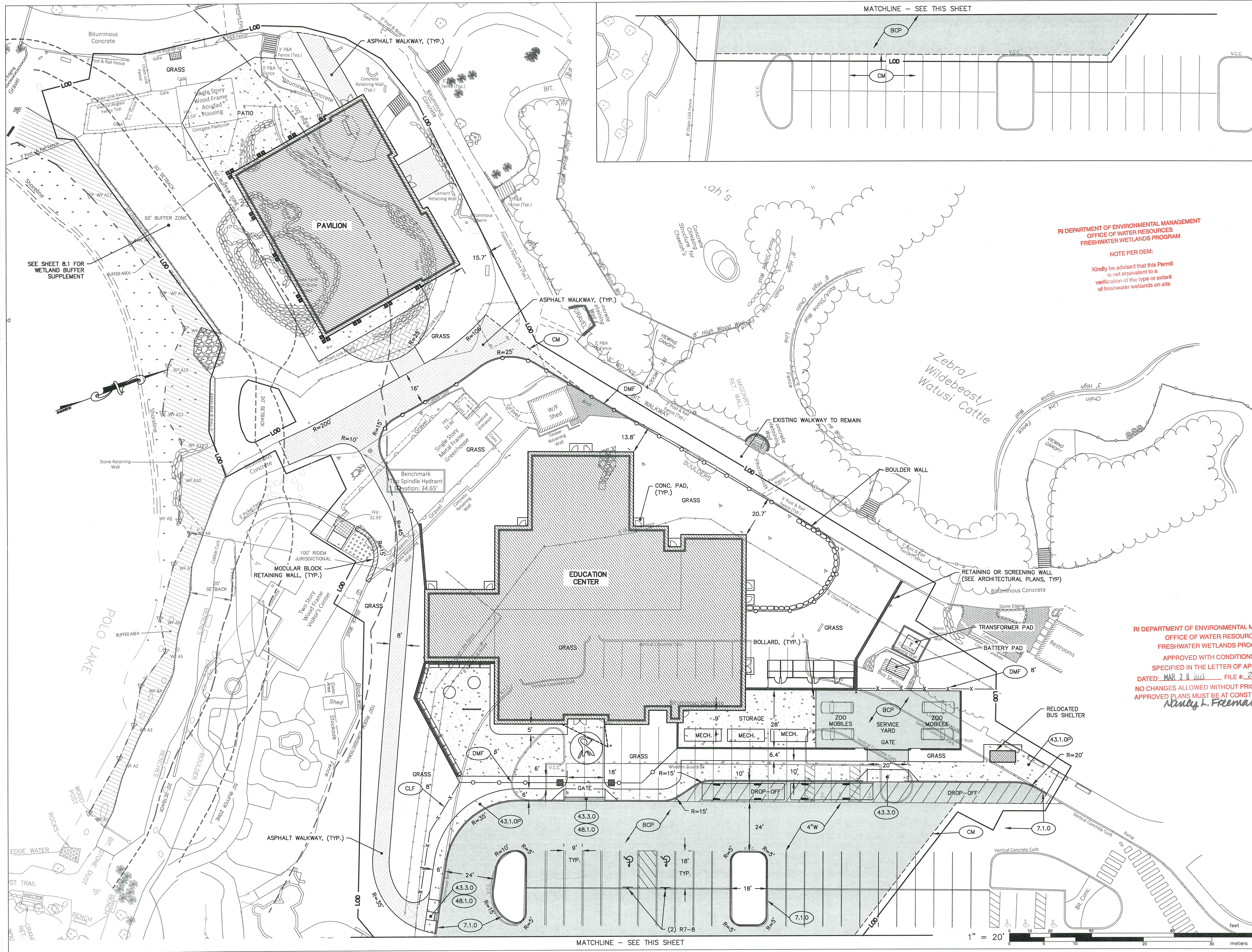


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**3.0**

SHEET: 4 OF: 12

L:\7213-00 Roger Williams Park Zoo (Saccoccio) - Providence, RI\dwg\01-Current\RIDEM DWG5.7213-00-DEMO.dwg 03/08/2023 10:39



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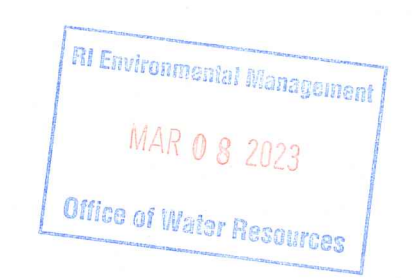
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Revision Schedule	
Revision Number	Revision Date

**SHEET TITLE**  
**SITE PLAN**

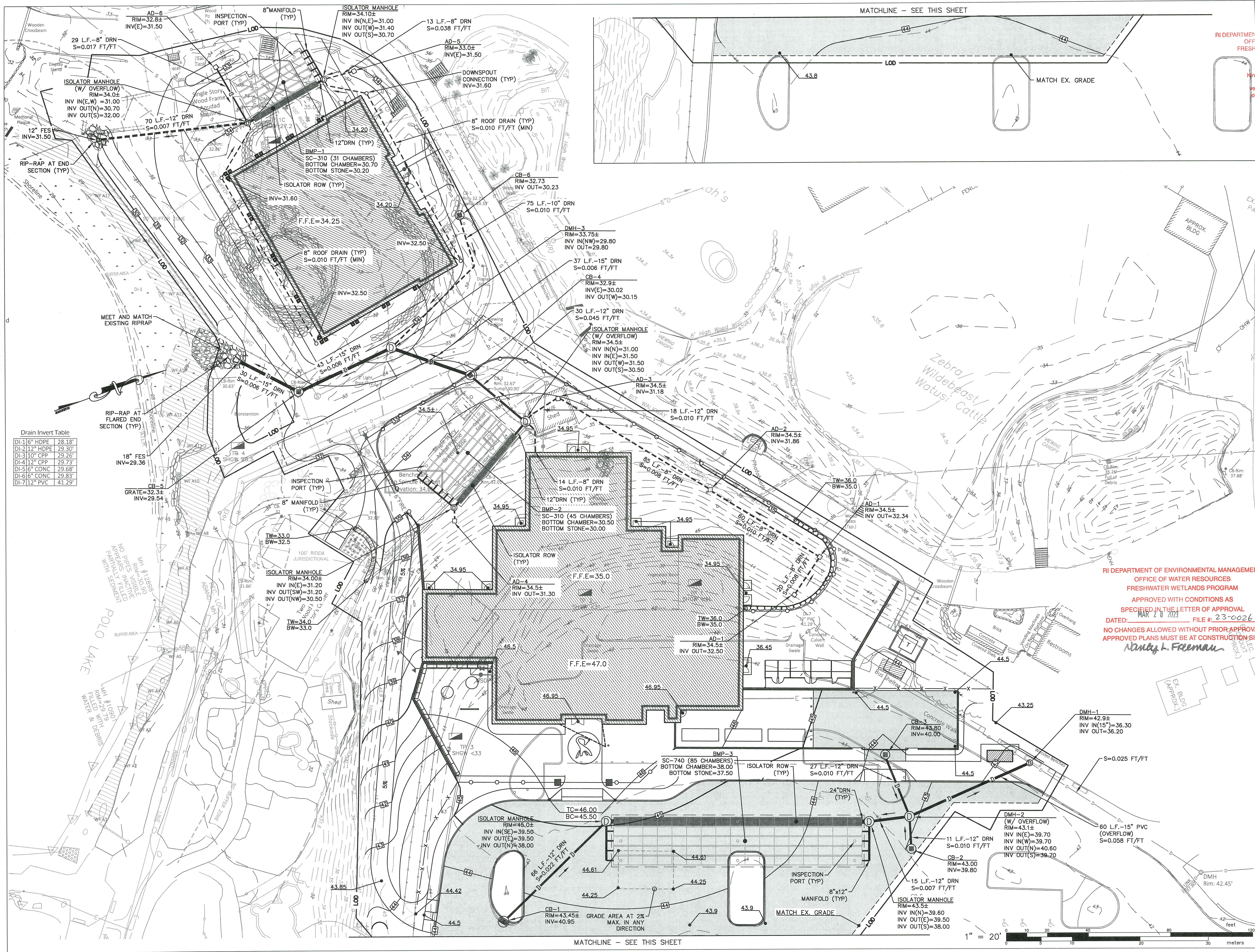


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CHECKED BY: SSH DATE: 06/13/2019

**4.0**

SHEET: 5 OF 12

LV:7213-00 Roger Williams Park Zoo (Saccoccio) - Providence, RI.dwg 01 - Current RIDEM DWGS:7213-00-base.dwg 03/08/2023 by:nygung 10:38



**Drain Invert Table**

DI-1 6" HDPE	28.18'
DI-2 12" HDPE	29.30'
DI-3 10" CPP	29.25'
DI-4 12" CPP	29.73'
DI-5 6" CONC	29.68'
DI-6 6" CONC	29.83'
DI-7 12" PVC	41.29'

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1	2023-03-07

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**SHEET TITLE**  
**GRADING & DRAINAGE PLAN**

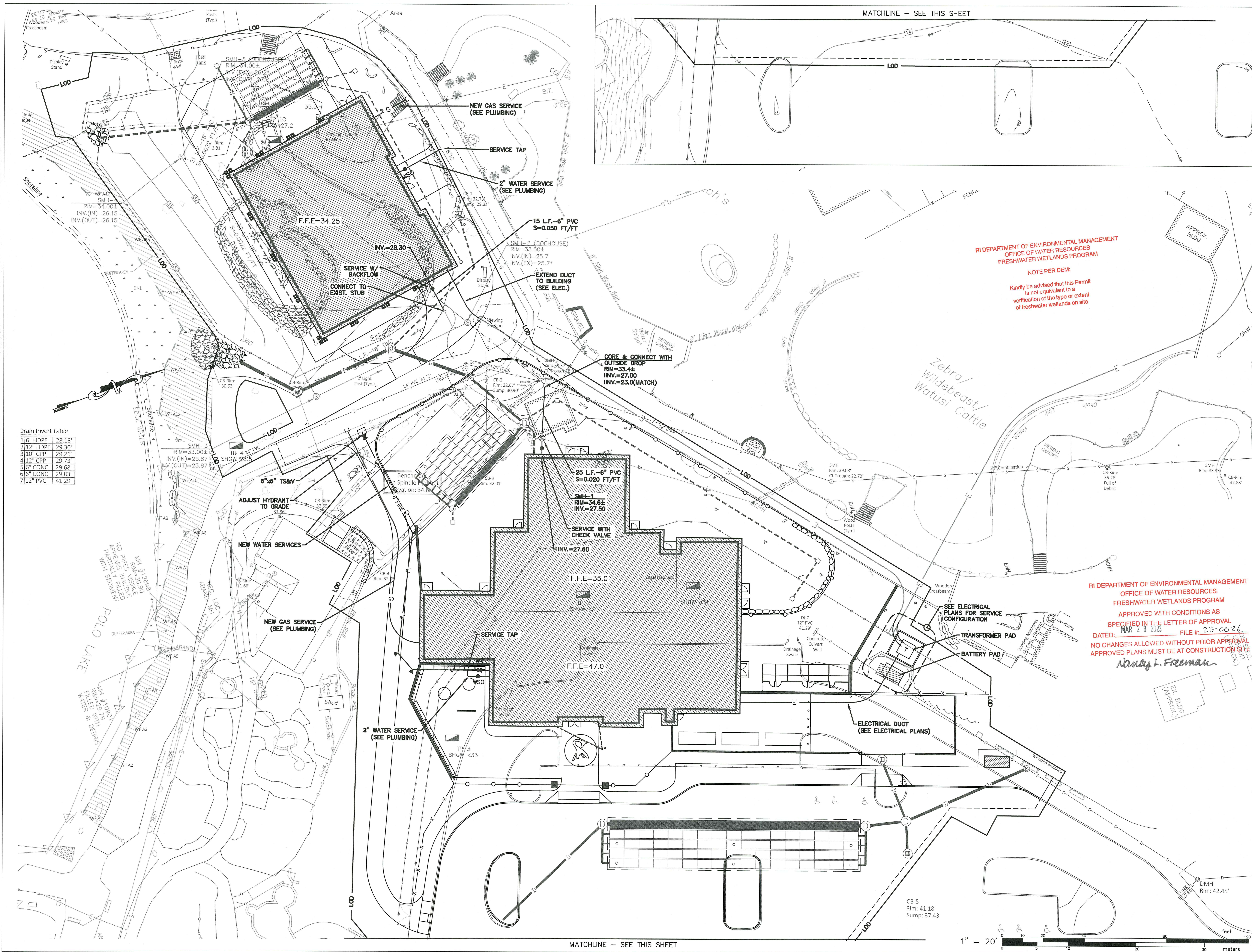
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**5.0**

SHEET: 6 OF 12

LV7213-00 Roger Williams Park Zoo (Saccoccio) - Providence, RI Viny 01 - Current RIDEM DMSV7213-00 - Grading.dwg 03/08/2023 klyngang 10:40



Drain Invert Table

1/6" HDPE	28.18'
2/12" HDPE	29.30'
3/10" CPP	29.26'
4/12" CPP	29.73'
5/6" CONC	29.68'
6/6" CONC	29.83'
7/12" PVC	41.29'

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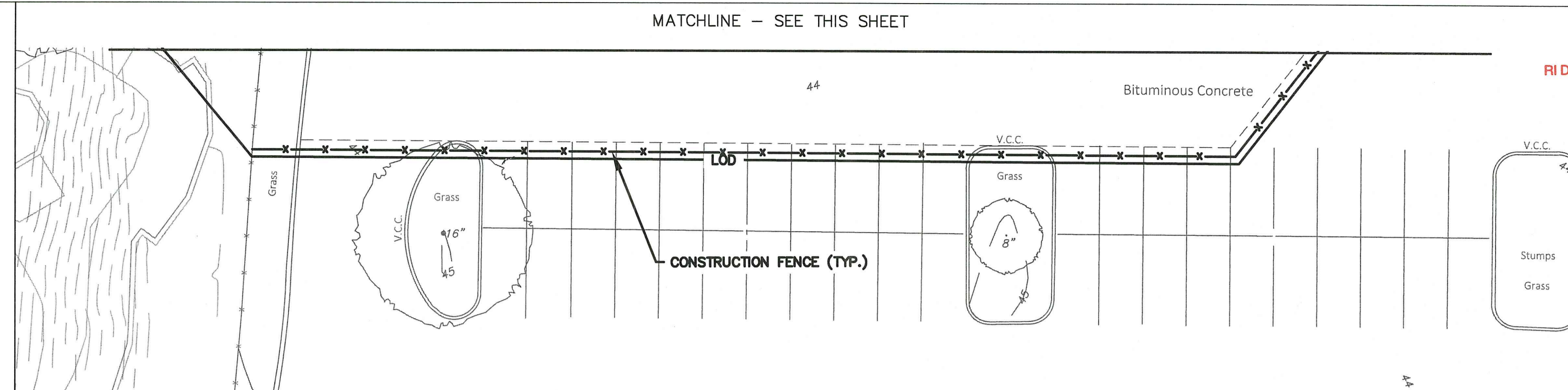
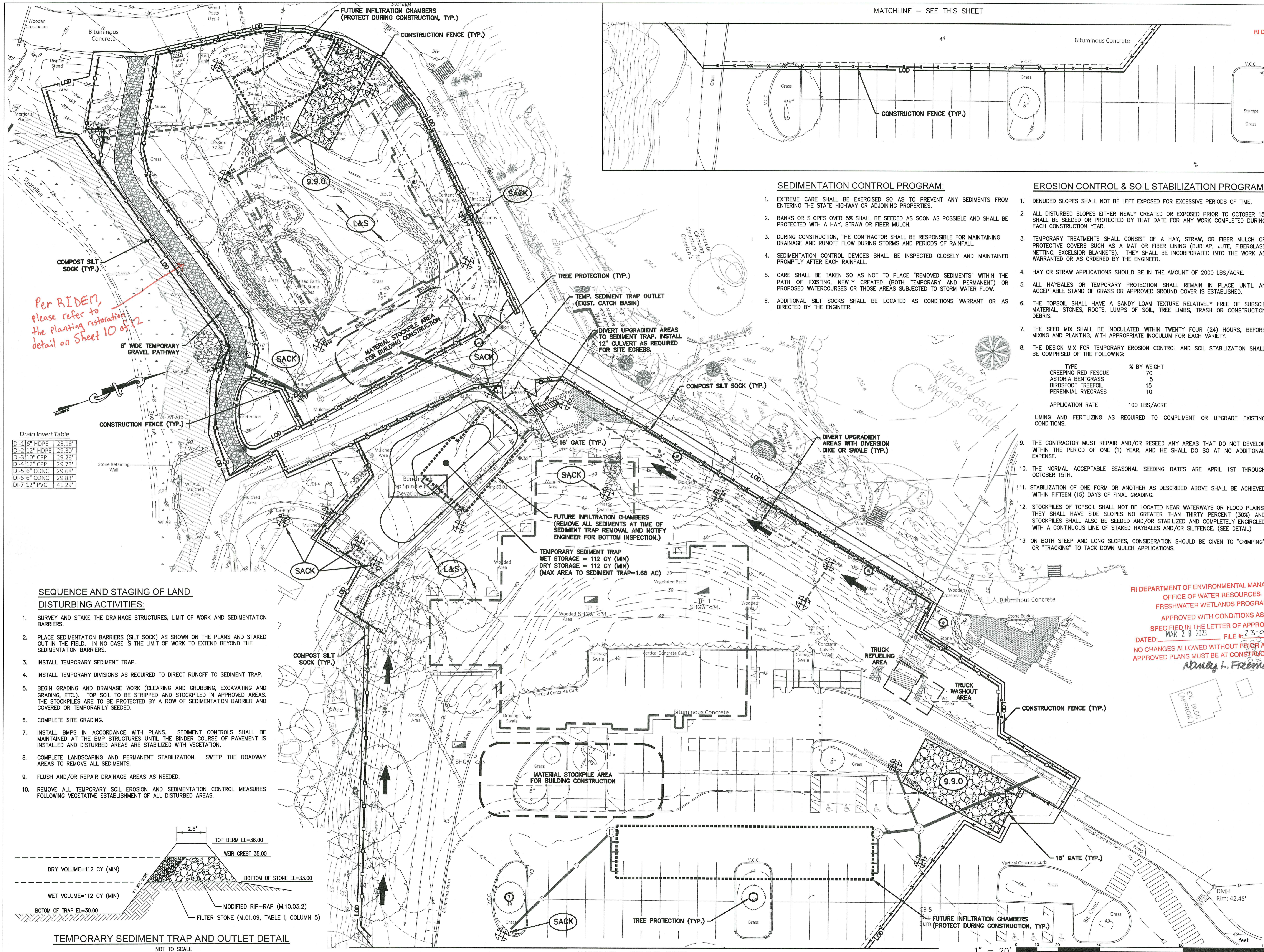
SHEET TITLE  
**UTILITIES PLAN**

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**6.0**

SHEET: 7 OF 12

L:\7213-00 Roger Williams Park Zoo (Saccoccio) - Providence, RI\7213-00-Creding.dwg 03/08/2023 10:41



**SEDIMENTATION CONTROL PROGRAM:**

1. EXTREME CARE SHALL BE EXERCISED SO AS TO PREVENT ANY SEDIMENTS FROM ENTERING THE STATE HIGHWAY OR ADJOINING PROPERTIES.
2. BANKS OR SLOPES OVER 5% SHALL BE SEEDED AS SOON AS POSSIBLE AND SHALL BE PROTECTED WITH A HAY, STRAW OR FIBER MULCH.
3. DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING DRAINAGE AND RUNOFF FLOW DURING STORMS AND PERIODS OF RAINFALL.
4. SEDIMENTATION CONTROL DEVICES SHALL BE INSPECTED CLOSELY AND MAINTAINED PROMPTLY AFTER EACH RAINFALL.
5. CARE SHALL BE TAKEN SO AS NOT TO PLACE "REMOVED SEDIMENTS" WITHIN THE PATH OF EXISTING, NEWLY CREATED (BOTH TEMPORARY AND PERMANENT) OR PROPOSED WATERCOURSES OR THOSE AREAS SUBJECT TO STORM WATER FLOW.
6. ADDITIONAL SILT SOCKS SHALL BE LOCATED AS CONDITIONS WARRANT OR AS DIRECTED BY THE ENGINEER.

**EROSION CONTROL & SOIL STABILIZATION PROGRAM:**

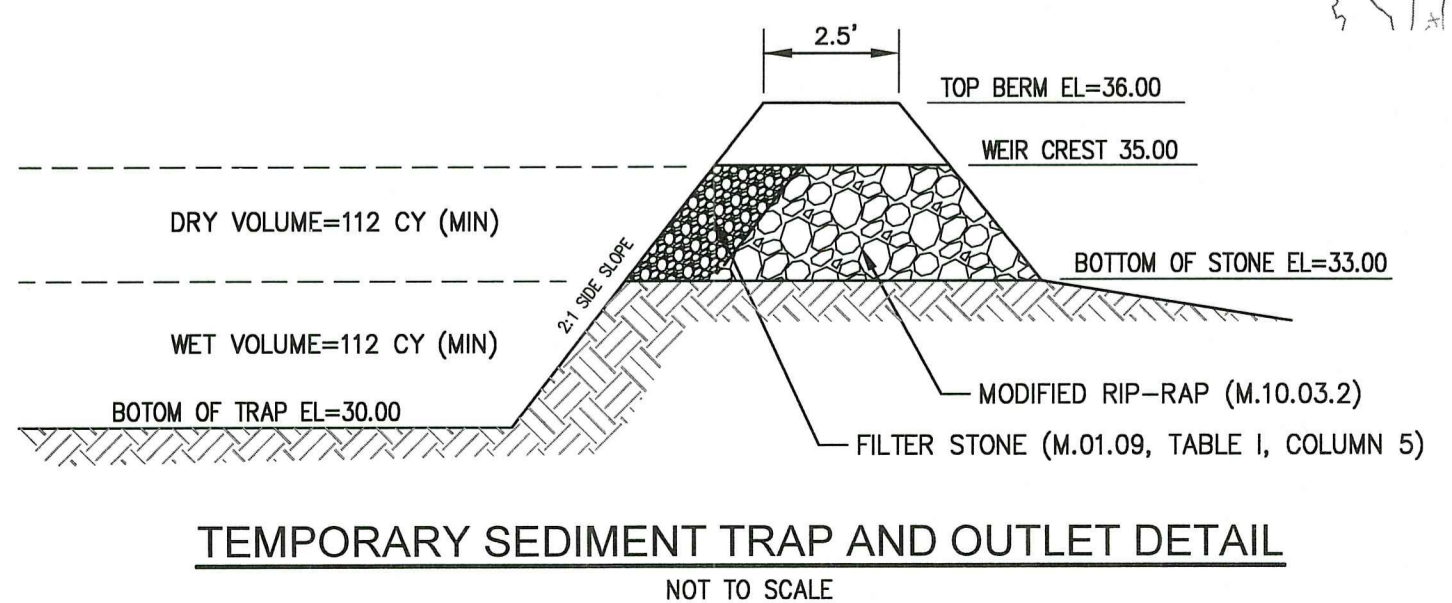
1. DENUDED SLOPES SHALL NOT BE LEFT EXPOSED FOR EXCESSIVE PERIODS OF TIME.
2. ALL DISTURBED SLOPES EITHER NEWLY CREATED OR EXPOSED PRIOR TO OCTOBER 15, SHALL BE SEEDED OR PROTECTED BY THAT DATE FOR ANY WORK COMPLETED DURING EACH CONSTRUCTION YEAR.
3. TEMPORARY TREATMENTS SHALL CONSIST OF A HAY, STRAW, OR FIBER MULCH OR PROTECTIVE COVERS SUCH AS A MAT OR FIBER LINING (BURLAP, JUTE, FIBERGLASS NETTING, EXCELSIOR BLANKETS). THEY SHALL BE INCORPORATED INTO THE WORK AS WARRANTED OR AS ORDERED BY THE ENGINEER.
4. HAY OR STRAW APPLICATIONS SHOULD BE IN THE AMOUNT OF 2000 LBS/ACRE.
5. ALL HAYBALES OR TEMPORARY PROTECTION SHALL REMAIN IN PLACE UNTIL AN ACCEPTABLE STAND OF GRASS OR APPROVED GROUND COVER IS ESTABLISHED.
6. THE TOPSOIL SHALL HAVE A SANDY LOAM TEXTURE RELATIVELY FREE OF SUBSOIL MATERIAL, STONES, ROOTS, LUMPS OF SOIL, TREE LIMBS, TRASH OR CONSTRUCTION DEBRIS.
7. THE SEED MIX SHALL BE INOCULATED WITHIN TWENTY FOUR (24) HOURS, BEFORE MIXING AND PLANTING, WITH APPROPRIATE INOCULUM FOR EACH VARIETY.
8. THE DESIGN MIX FOR TEMPORARY EROSION CONTROL AND SOIL STABILIZATION SHALL BE COMPRISED OF THE FOLLOWING:
 

TYPE	% BY WEIGHT
CREeping RED FESCUE	70
ASTORIA BENTGRASS	5
BIRDSFOOT TREFFOIL	15
PERENNIAL RYEGRASS	10
9. THE CONTRACTOR MUST REPAIR AND/OR RESEED ANY AREAS THAT DO NOT DEVELOP WITHIN THE PERIOD OF ONE (1) YEAR, AND HE SHALL DO SO AT NO ADDITIONAL EXPENSE.
10. THE NORMAL ACCEPTABLE SEASONAL SEEDING DATES ARE APRIL 1ST THROUGH OCTOBER 15TH.
11. STABILIZATION OF ONE FORM OR ANOTHER AS DESCRIBED ABOVE SHALL BE ACHIEVED WITHIN FIFTEEN (15) DAYS OF FINAL GRADING.
12. STOCKPILES OF TOPSOIL SHALL NOT BE LOCATED NEAR WATERWAYS OR FLOOD PLAINS. THEY SHALL HAVE SIDE SLOPES NO GREATER THAN THIRTY PERCENT (30%) AND STOCKPILES SHALL ALSO BE SEEDED AND/OR STABILIZED AND COMPLETELY ENCLOSED WITH A CONTINUOUS LINE OF STAKED HAYBALES AND/OR SILTFENCE. (SEE DETAIL)
13. ON BOTH STEEP AND LONG SLOPES, CONSIDERATION SHOULD BE GIVEN TO "CRIMPING" OR "TRACKING" TO TACK DOWN MULCH APPLICATIONS.

Drain Invert Table

DI-1 16" HDPE	28.18'
DI-2 12" HDPE	29.30'
DI-3 10" CPP	29.26'
DI-4 12" CPP	29.73'
DI-5 6" CONC	29.68'
DI-6 6" CONC	29.83'
DI-7 12" PVC	41.29'

- SEQUENCE AND STAGING OF LAND DISTURBING ACTIVITIES:**
1. SURVEY AND STAKE THE DRAINAGE STRUCTURES, LIMIT OF WORK AND SEDIMENTATION BARRIERS.
  2. PLACE SEDIMENTATION BARRIERS (SILT SOCK) AS SHOWN ON THE PLANS AND STAKED OUT IN THE FIELD. IN NO CASE IS THE LIMIT OF WORK TO EXTEND BEYOND THE SEDIMENTATION BARRIERS.
  3. INSTALL TEMPORARY SEDIMENT TRAP.
  4. INSTALL TEMPORARY DIVISIONS AS REQUIRED TO DIRECT RUNOFF TO SEDIMENT TRAP.
  5. BEGIN GRADING AND DRAINAGE WORK (CLEARING AND GRUBBING, EXCAVATING AND GRADING, ETC.). TOP SOIL TO BE STRIPPED AND STOCKPILED IN APPROVED AREAS. THE STOCKPILES ARE TO BE PROTECTED BY A ROW OF SEDIMENTATION BARRIER AND COVERED OR TEMPORARILY SEEDED.
  6. COMPLETE SITE GRADING.
  7. INSTALL BMPs IN ACCORDANCE WITH PLANS. SEDIMENT CONTROLS SHALL BE MAINTAINED AT THE BMP STRUCTURES UNTIL THE BINDER COURSE OF PAVEMENT IS INSTALLED AND DISTURBED AREAS ARE STABILIZED WITH VEGETATION.
  8. COMPLETE LANDSCAPING AND PERMANENT STABILIZATION. SWEEP THE ROADWAY AREAS TO REMOVE ALL SEDIMENTS.
  9. FLUSH AND/OR REPAIR DRAINAGE AREAS AS NEEDED.
  10. REMOVE ALL TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROL MEASURES FOLLOWING VEGETATIVE ESTABLISHMENT OF ALL DISTURBED AREAS.



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SHEET TITLE  
**SOIL EROSION & SEDIMENT CONTROL PLAN**

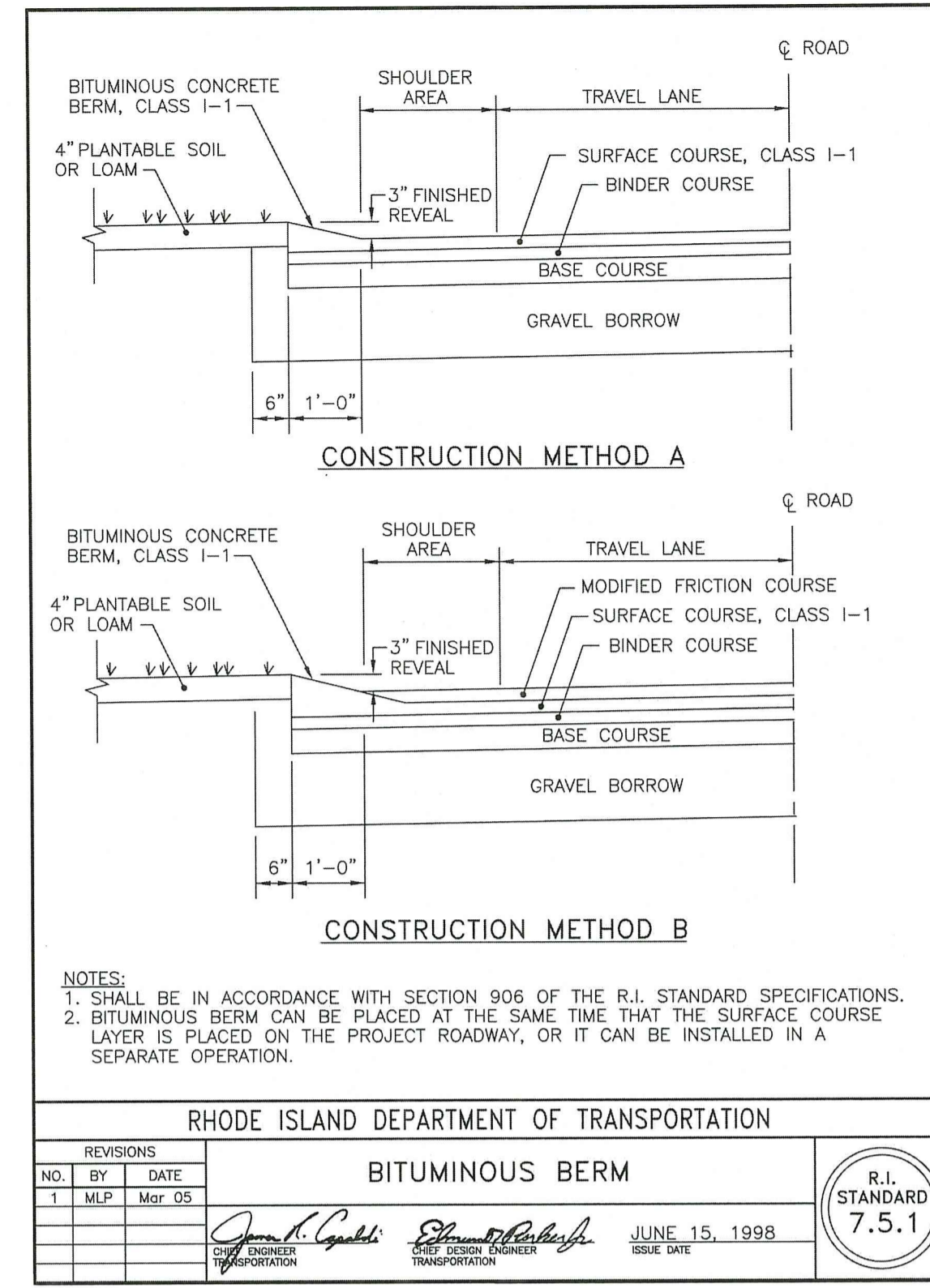
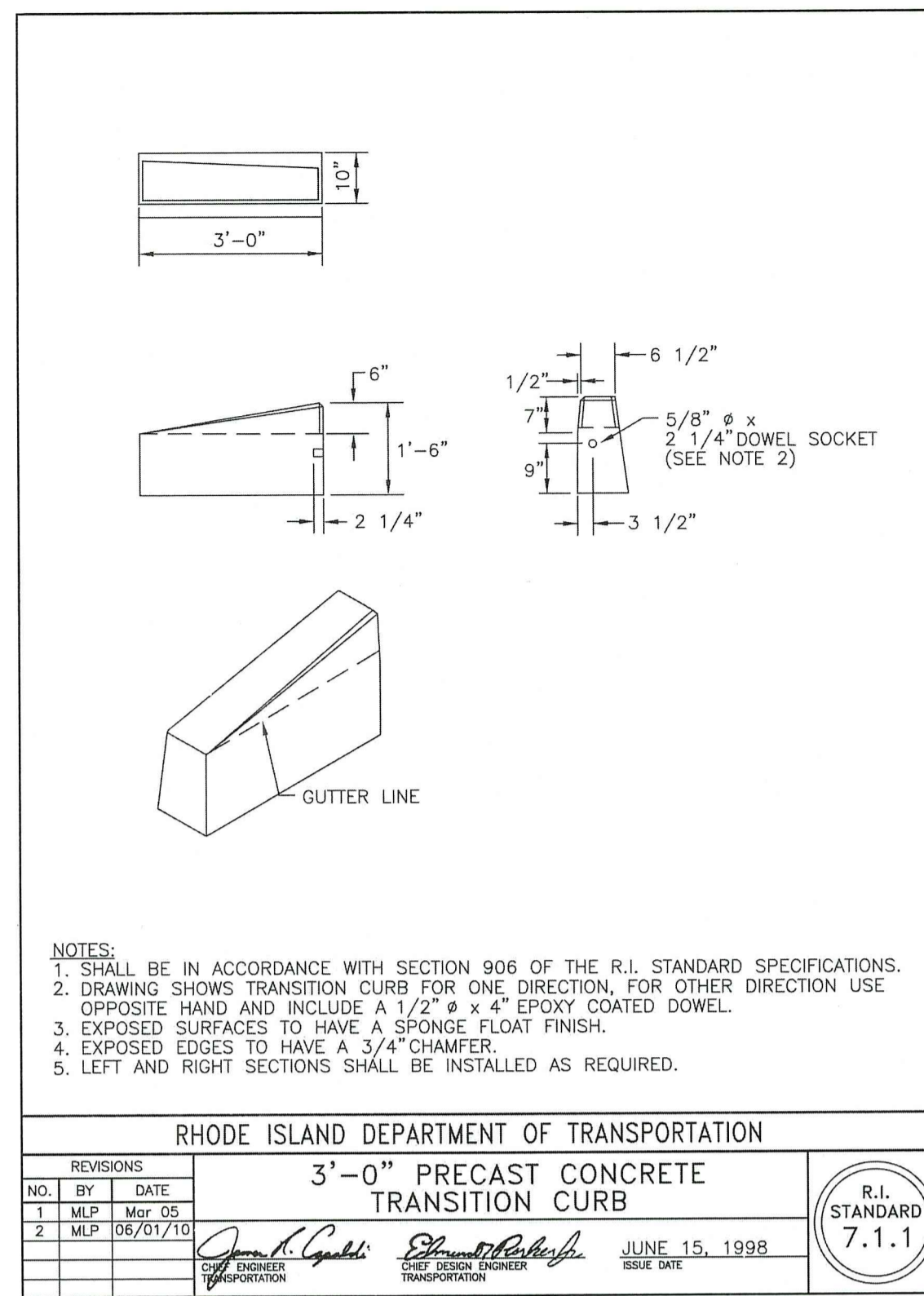
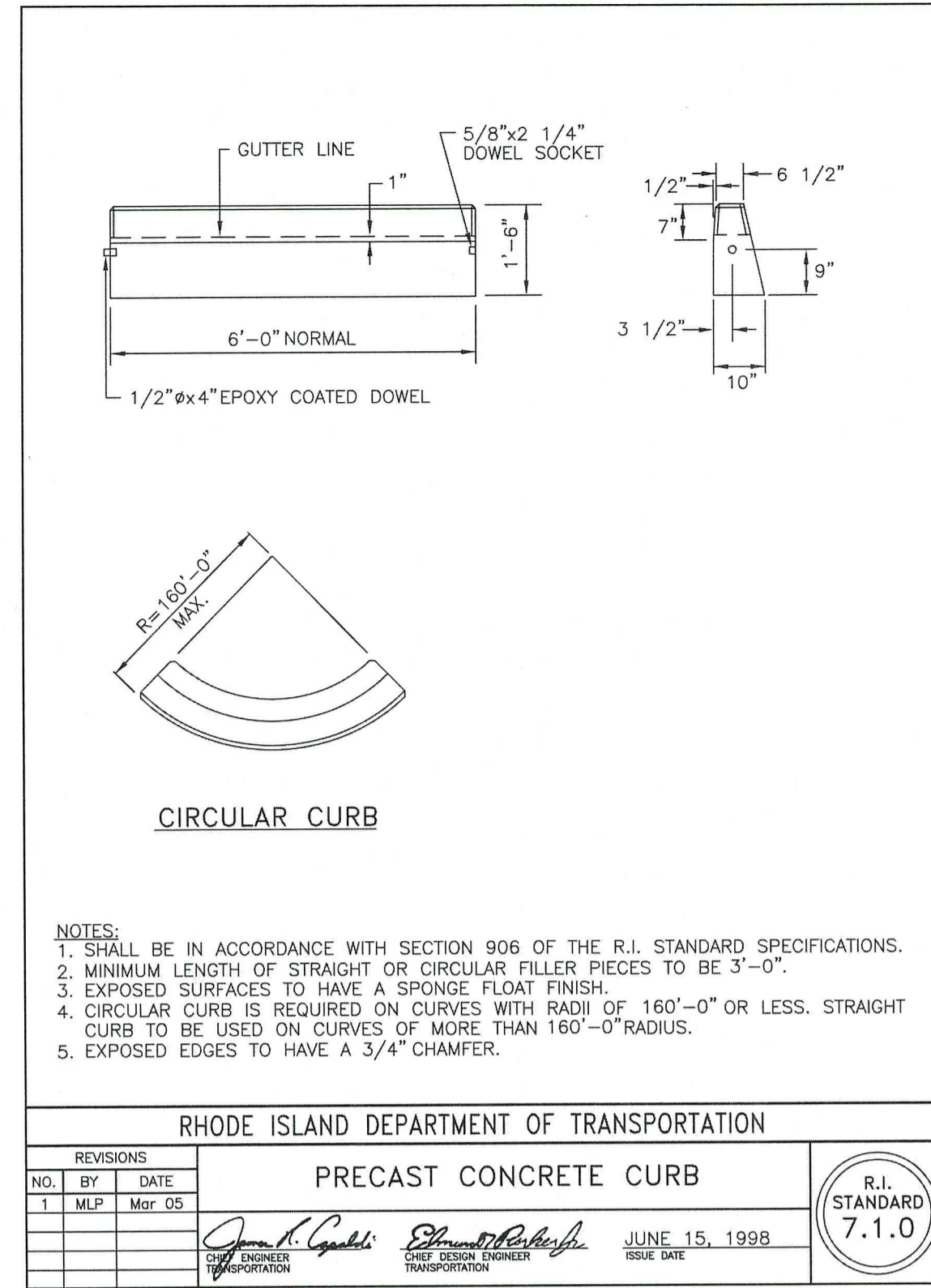
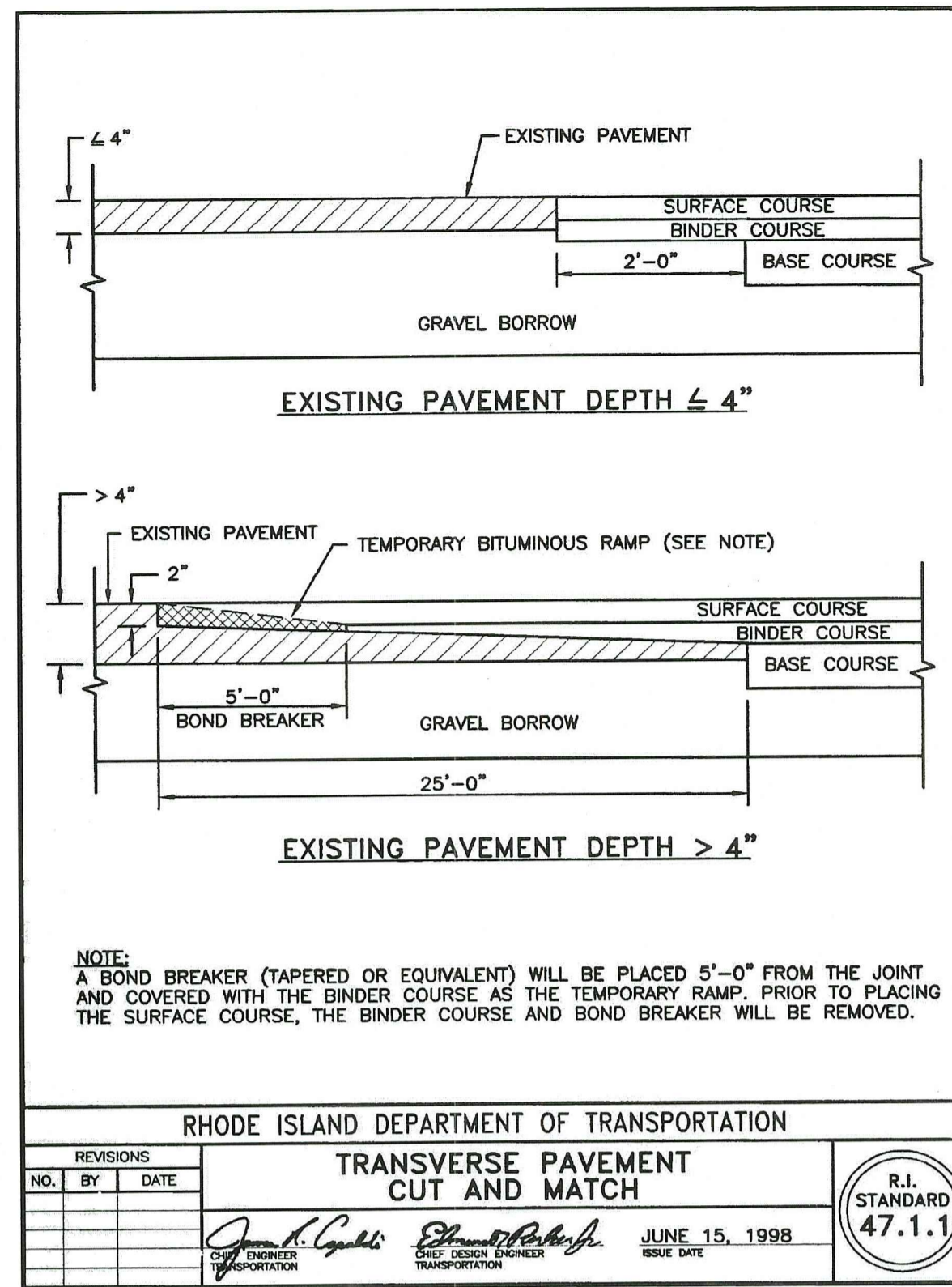
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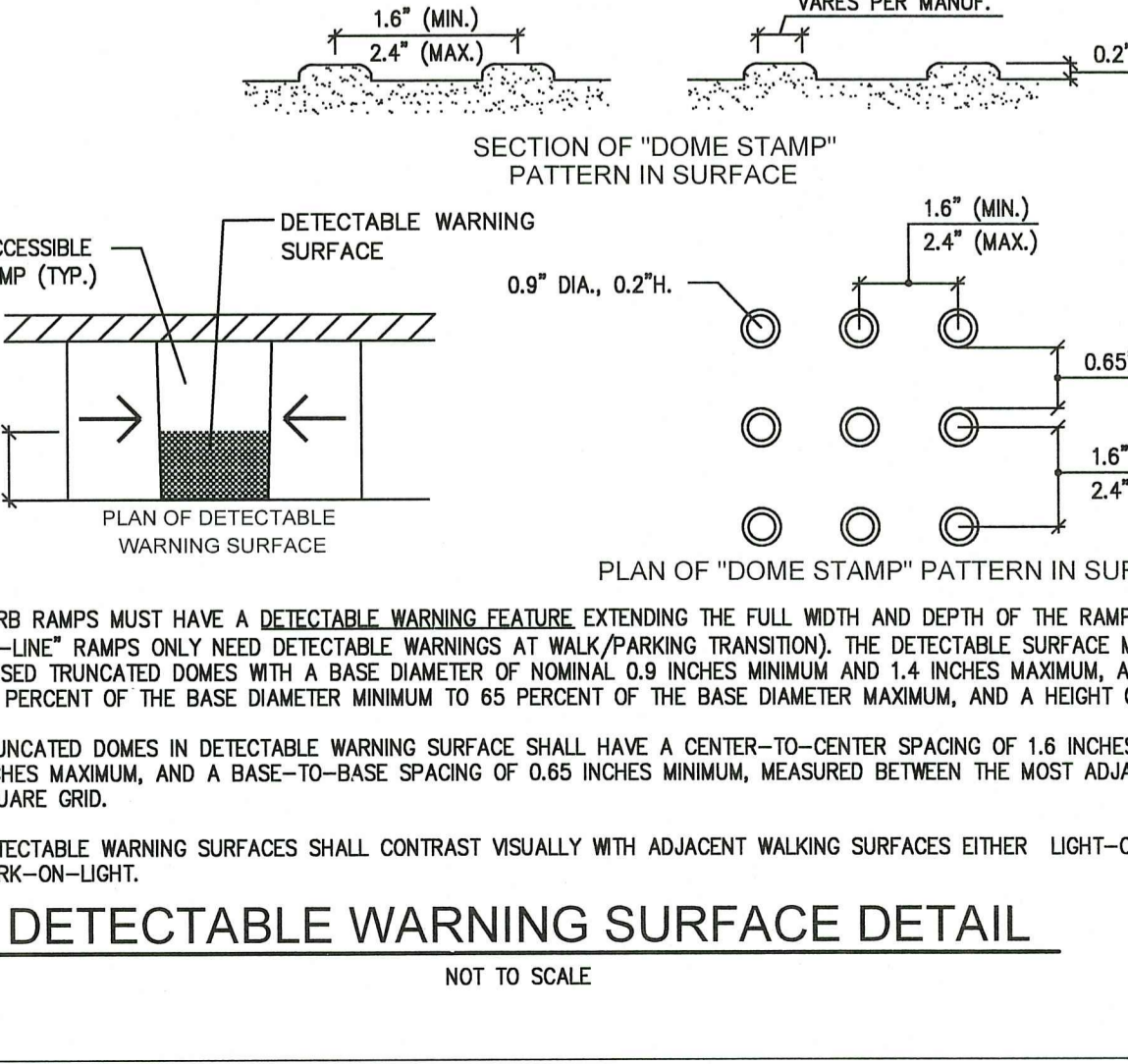
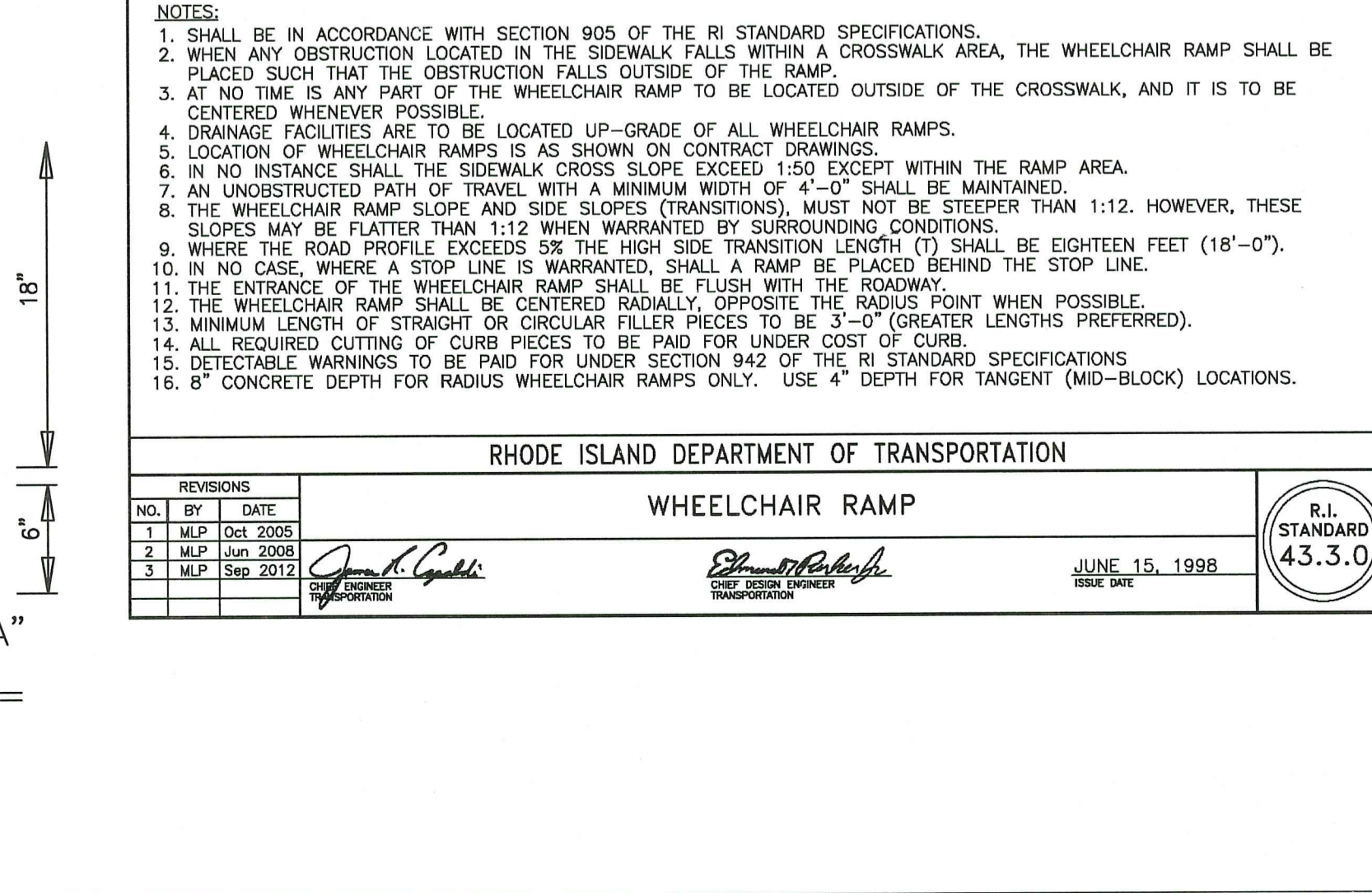
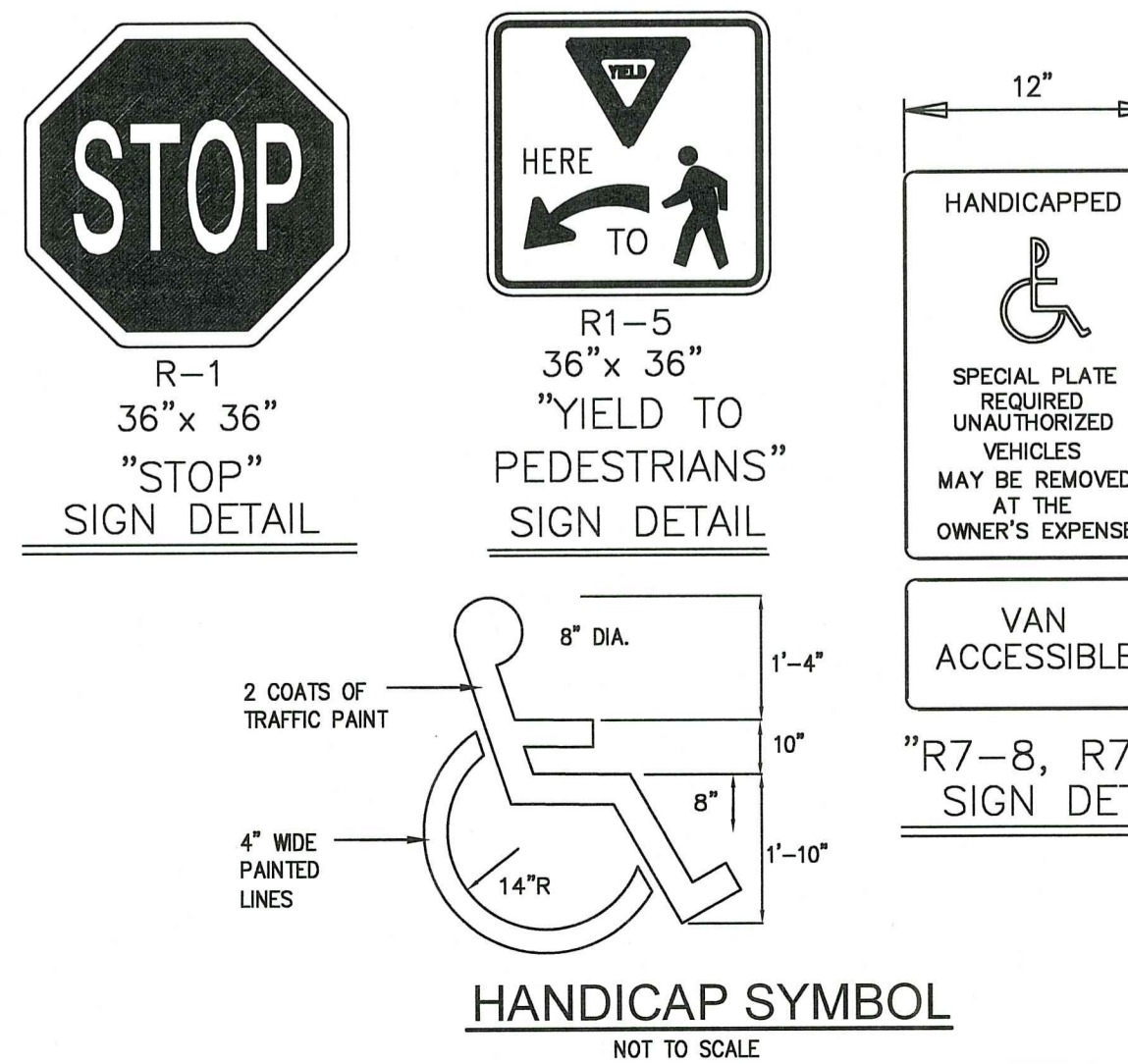
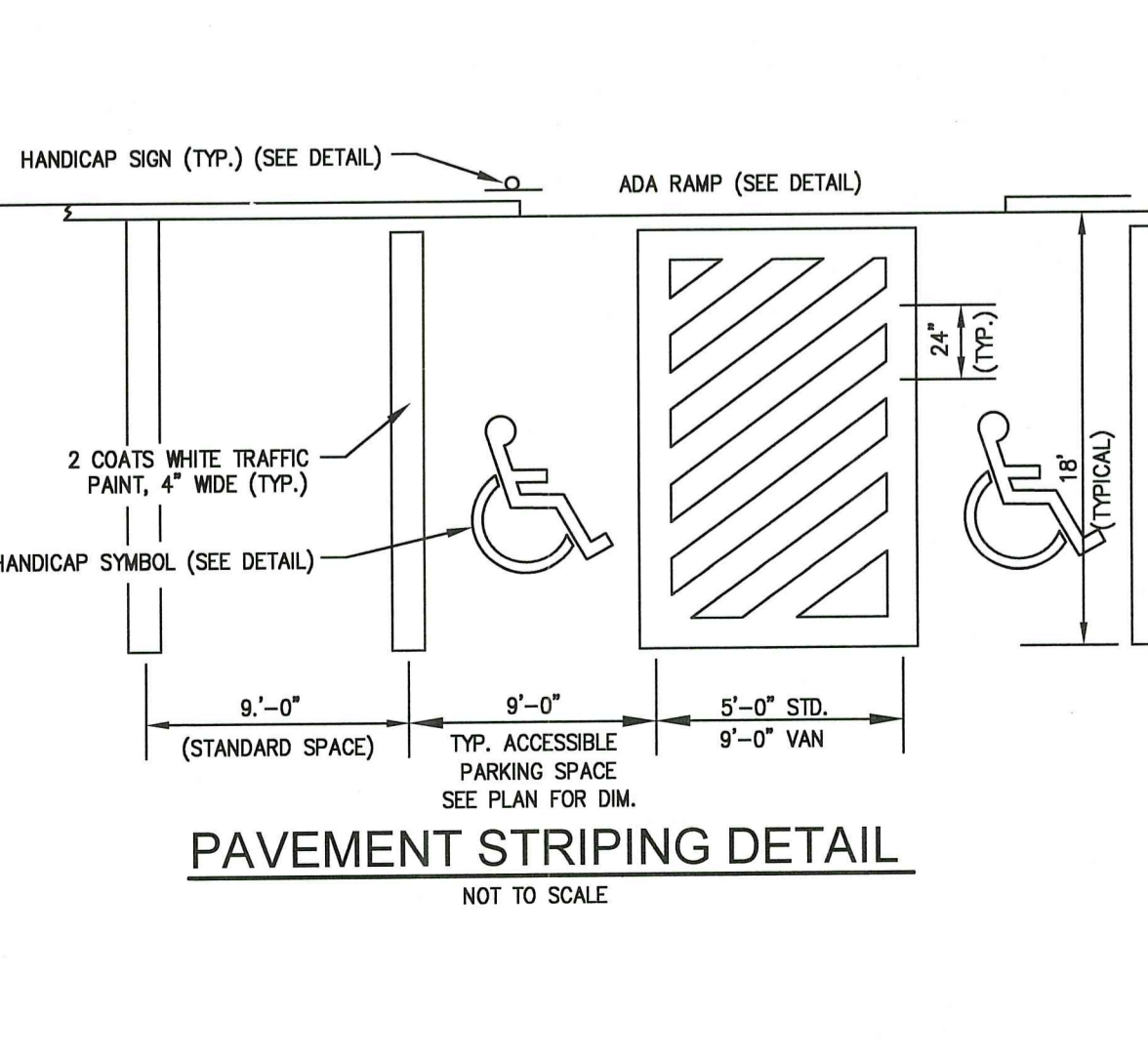
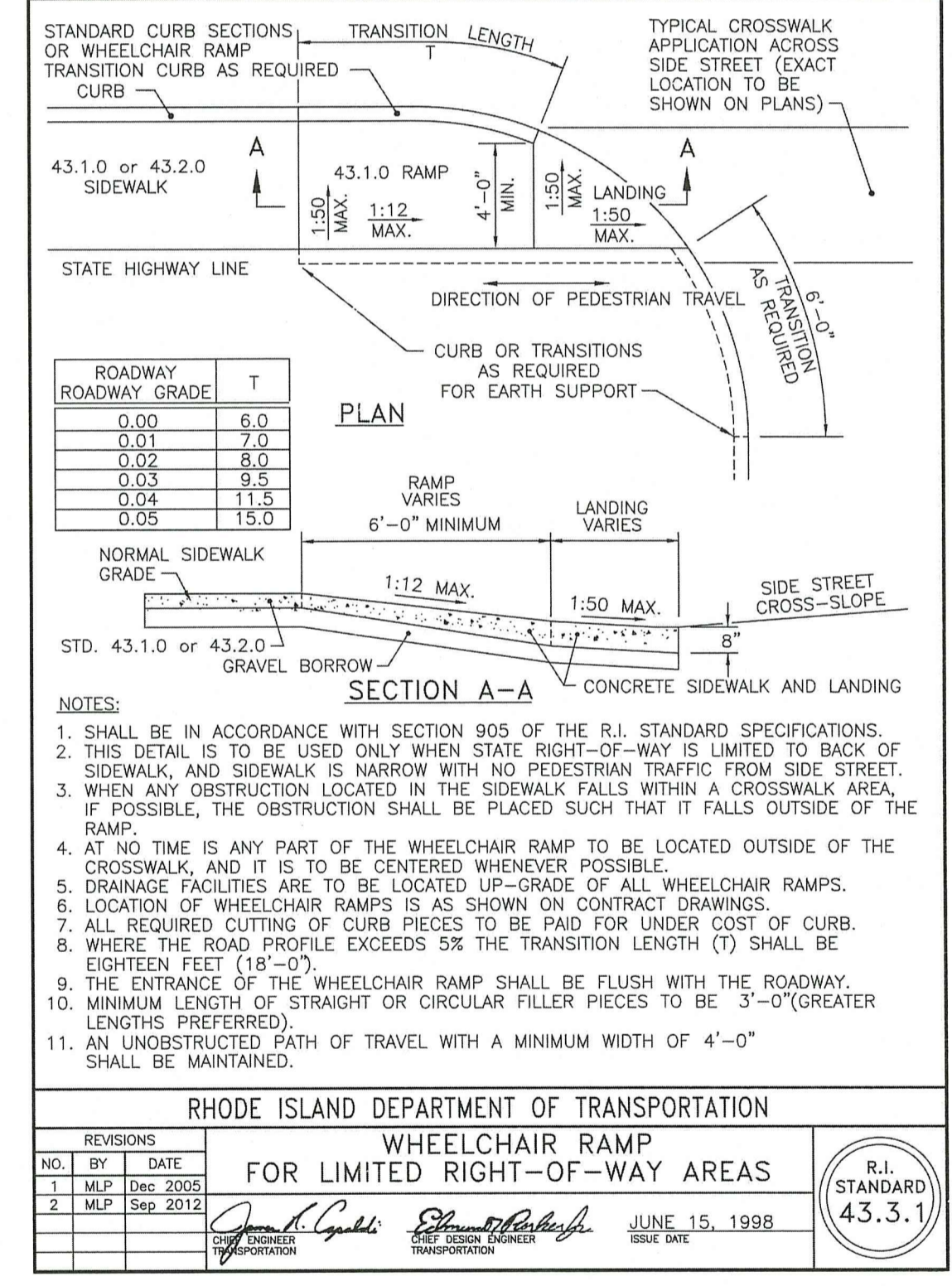
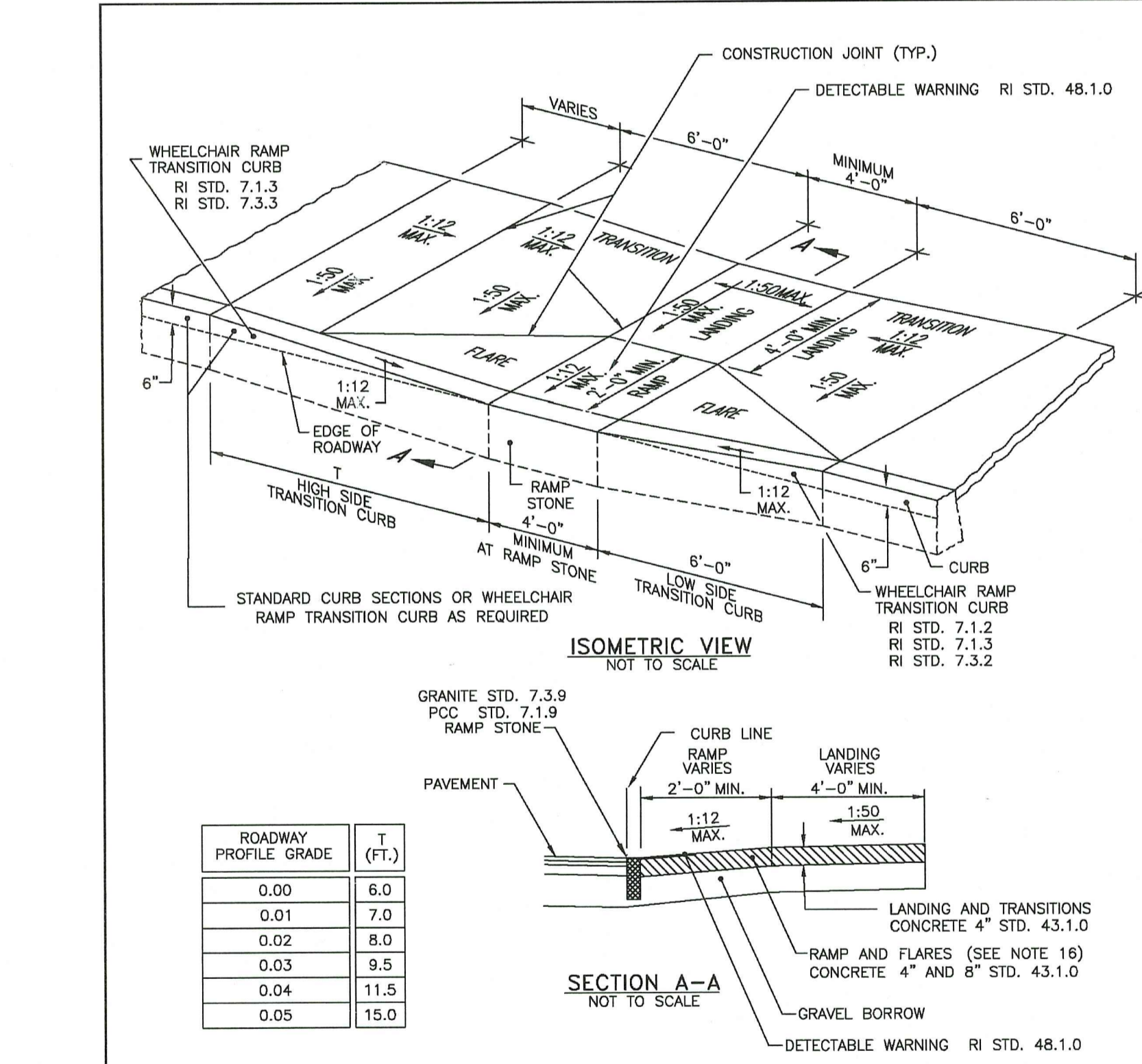
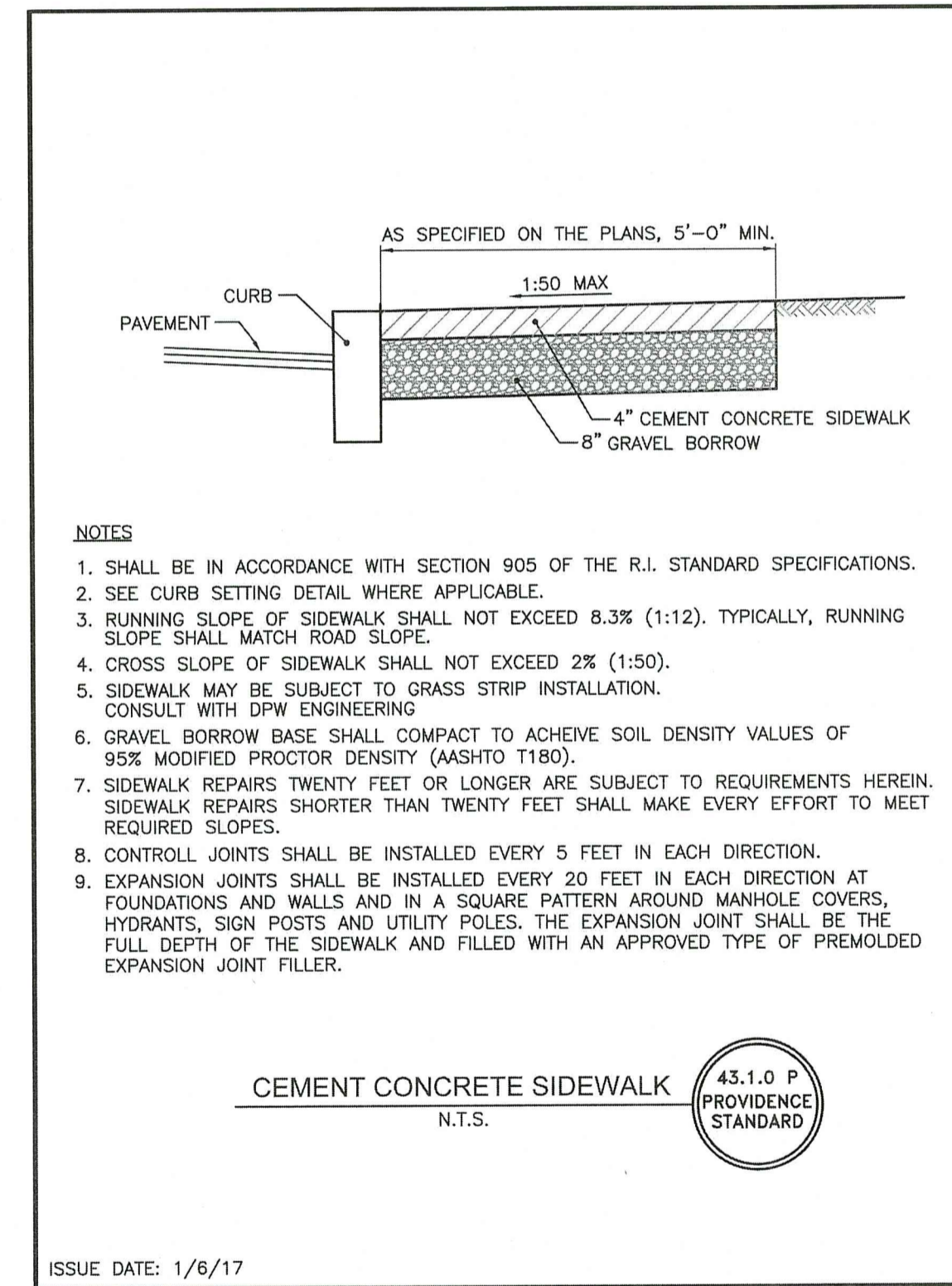
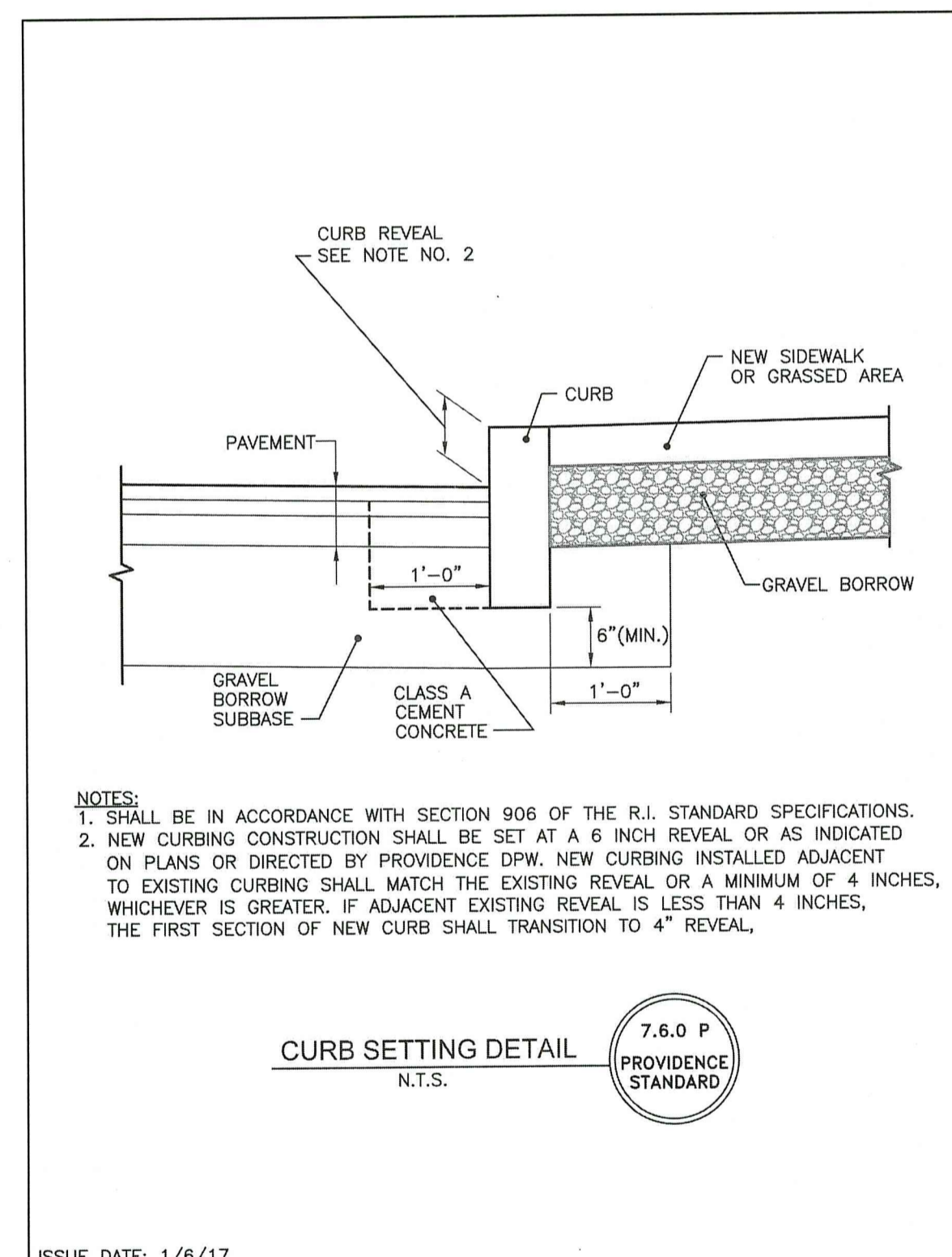
SHEET: 8 OF 12

LV7213-00 Roger Williams Park Zoo (Saccoccio) - Providence, RI (Veg) 01 - Current (RIBEM) DWG57213-00-SESSC.dwg 03/08/2023 by: gyoung 10-41



**RI DEPARTMENT OF ENVIRONMENTAL MANAGEMENT**  
**OFFICE OF WATER RESOURCES**  
**FRESHWATER WETLANDS PROGRAM**

**NOTE PER DEM:**  
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1-401-273-6000

**Education Center & Pavilion**

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ISSUED FOR PERMIT - 2023-01-27

Revision Schedule	
Revision Number	Revision Date

**RI DEPARTMENT OF ENVIRONMENTAL MANAGEMENT**  
**OFFICE OF WATER RESOURCES**  
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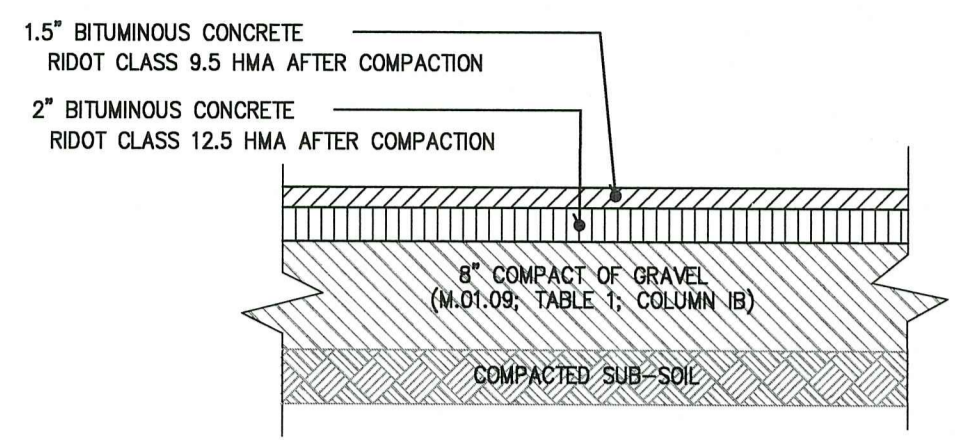
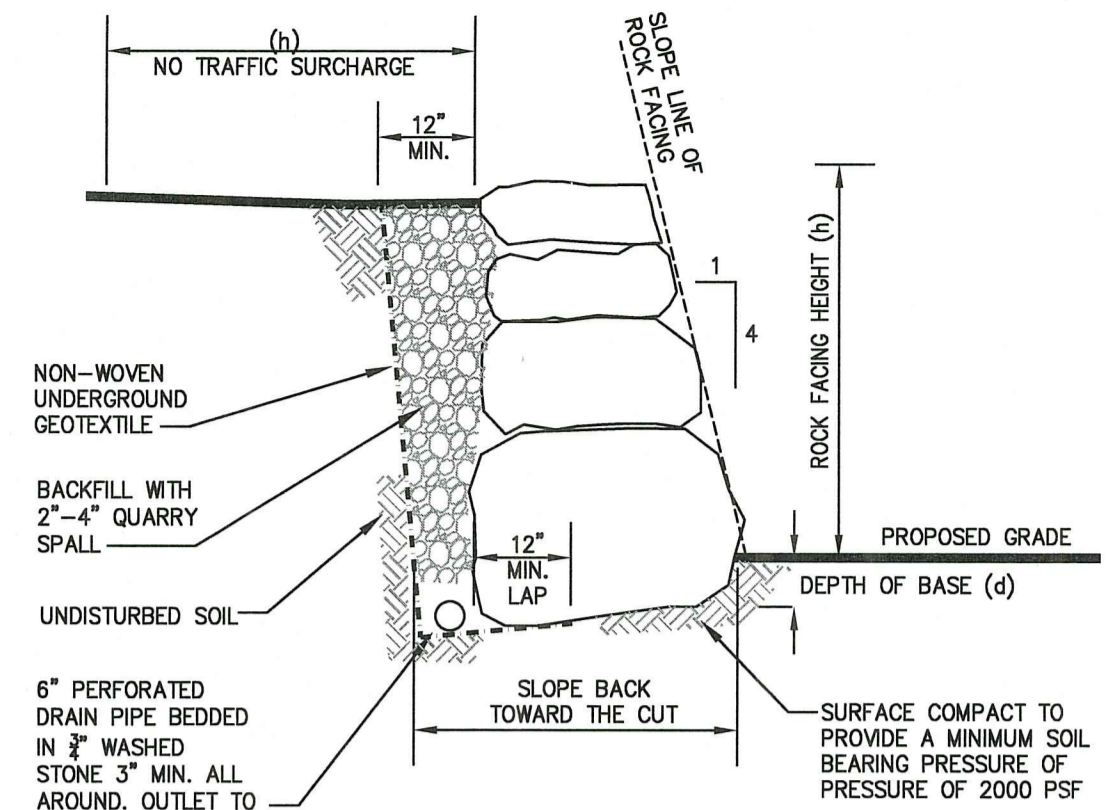
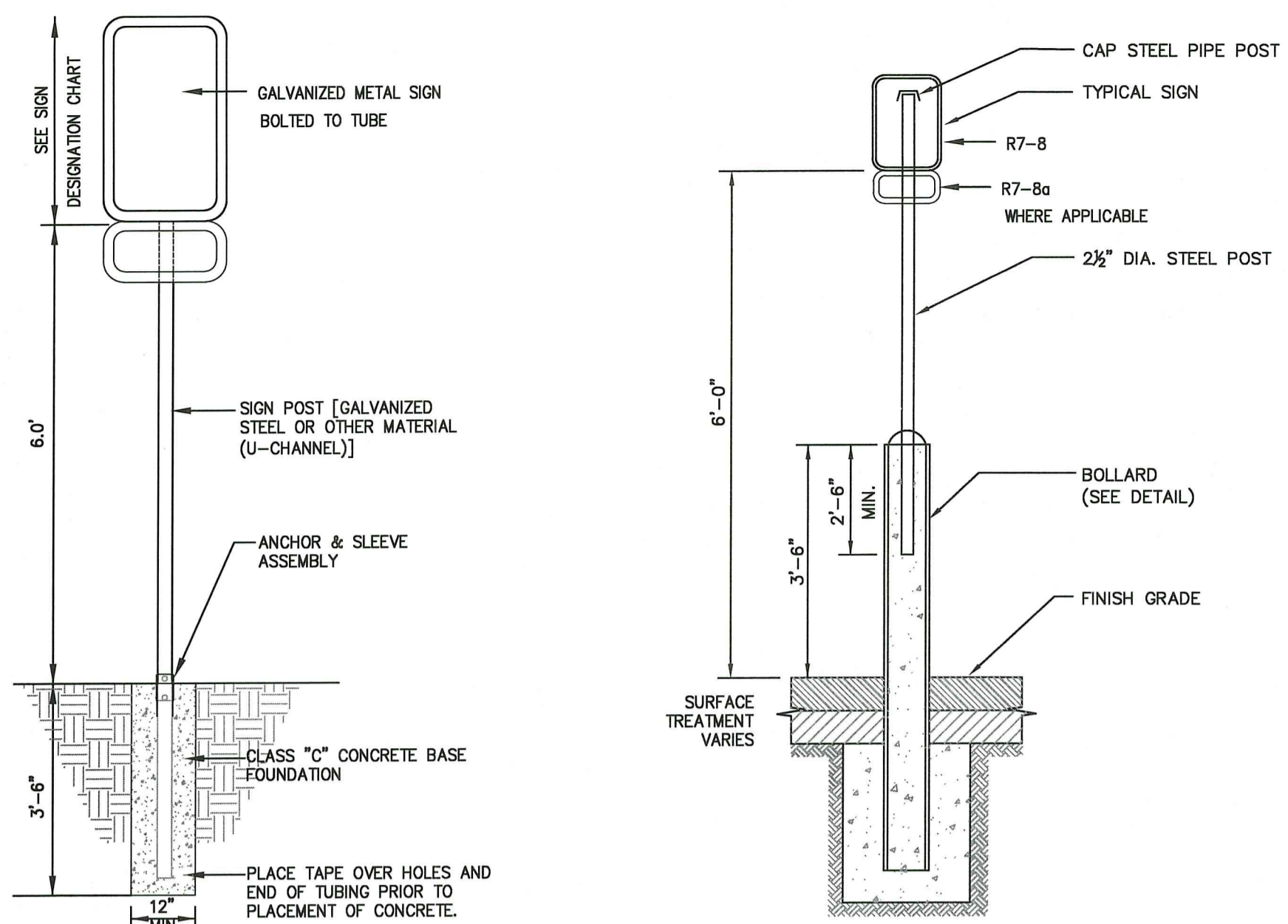
**APPROVED WITH CONDITIONS AS SPECIFIED IN THE LETTER OF APPROVAL**  
DATED: MAR 28 2023 FILE #: 23-0026  
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*Douglas L. Freeman*

**SHEET TITLE**  
**CONSTRUCTION DETAILS-1**

DRAWN BY: KYY JOB NUMBER: 7213-00  
CHECKED BY: SSH DATE: 06/13/2019

**8.0**

SHEET: 9 OF: 12



**DIMENSIONAL TABLE**

(h)	(d)	SIZE (BASE)	SIZE (TOP)
2 FEET	3 INCHES	2-MAN	1-MAN
4 FEET	6 INCHES	3-MAN	2-MAN
6 FEET	9 INCHES	4-MAN	2-MAN
8 FEET	12 INCHES	5-MAN	2-MAN

- NOTES:**
- USE THE FOLLOWING TABLE WHEN REFERRING TO LARGER SIZE ROCKS AND BOULDERS.
- | ROCK SIZE | ROCK WEIGHT      | AVG. DIMENSIONS |
|-----------|------------------|-----------------|
| ONE MAN   | 50 - 200LBS      | 12" - 18"       |
| TWO MAN   | 200 - 700LBS     | 18" - 28"       |
| THREE MAN | 700 - 2,000LBS   | 28" - 36"       |
| FOUR MAN  | 2,000 - 4,000LBS | 36" - 48"       |
| FIVE MAN  | 4,000 - 8,000LBS | 48" - 54"       |
- FOR HEIGHTS LESS THAN OR EQUAL TO 3', PERFORATED DRAIN MAY BE ELIMINATED WHERE FREE DRAINING BACKFILL PROVIDES FOR WATER FLOW THROUGH WALL.

**BOULDER WALL**  
NOT TO SCALE

**PLANT LIST:**

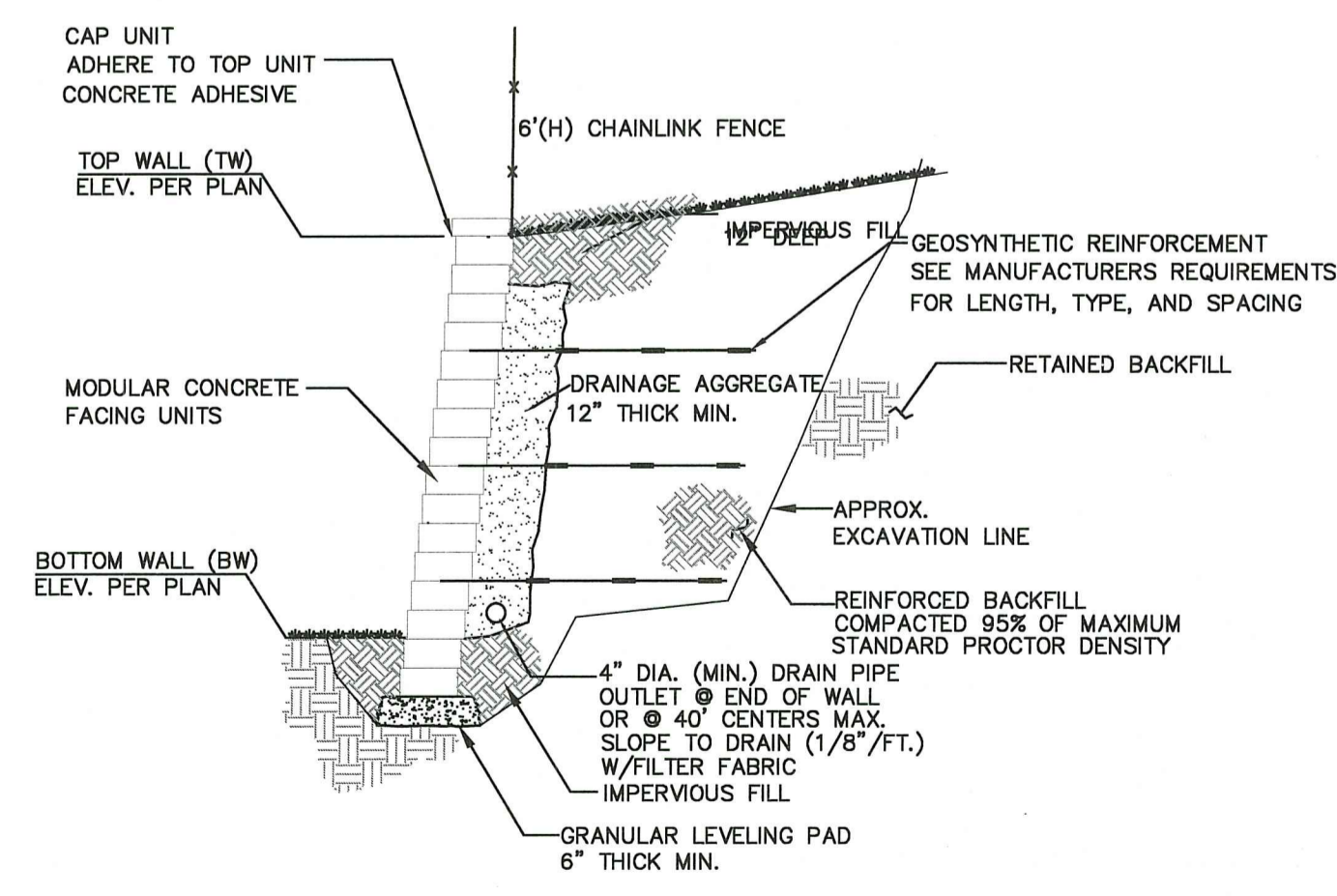
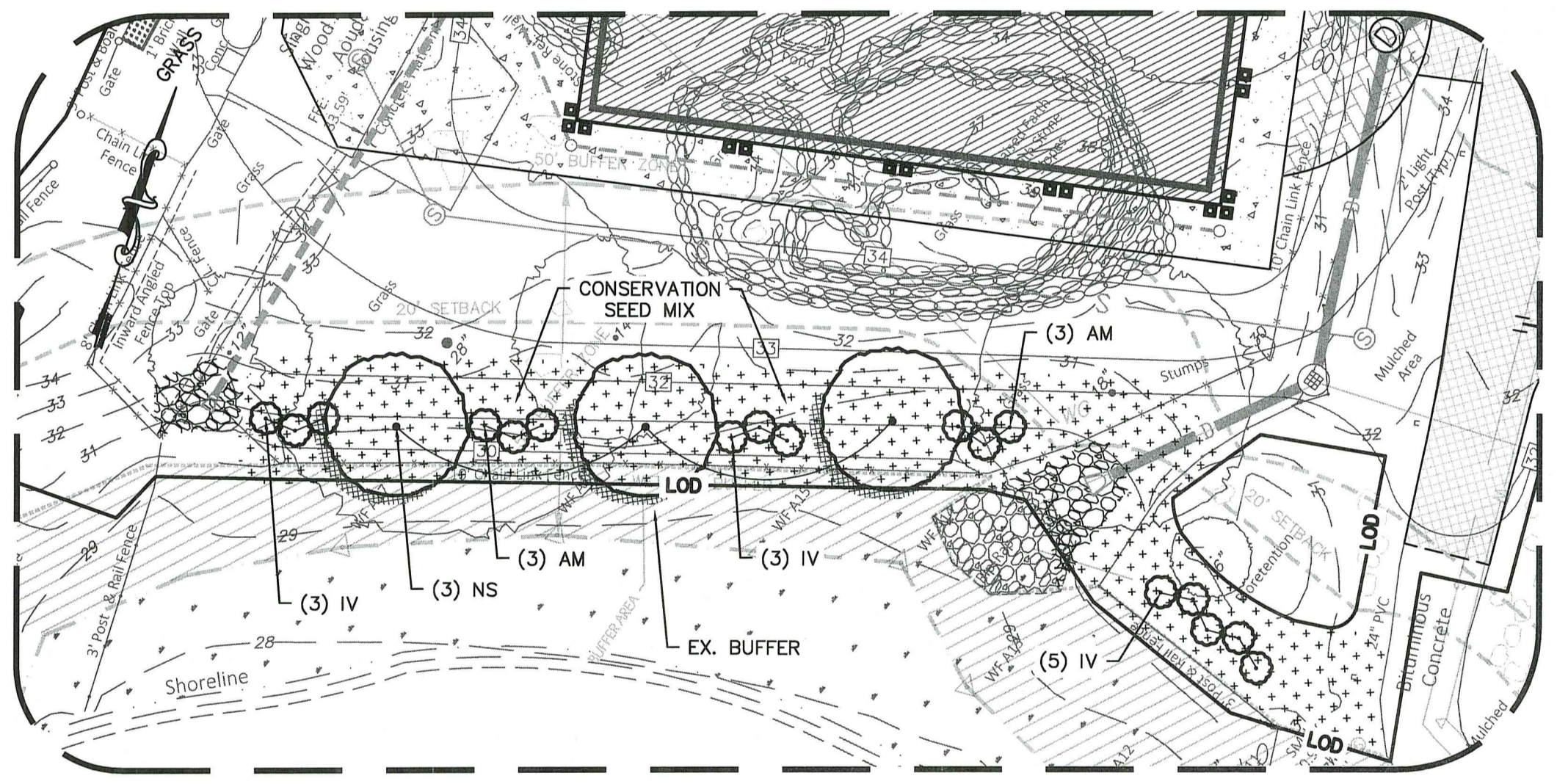
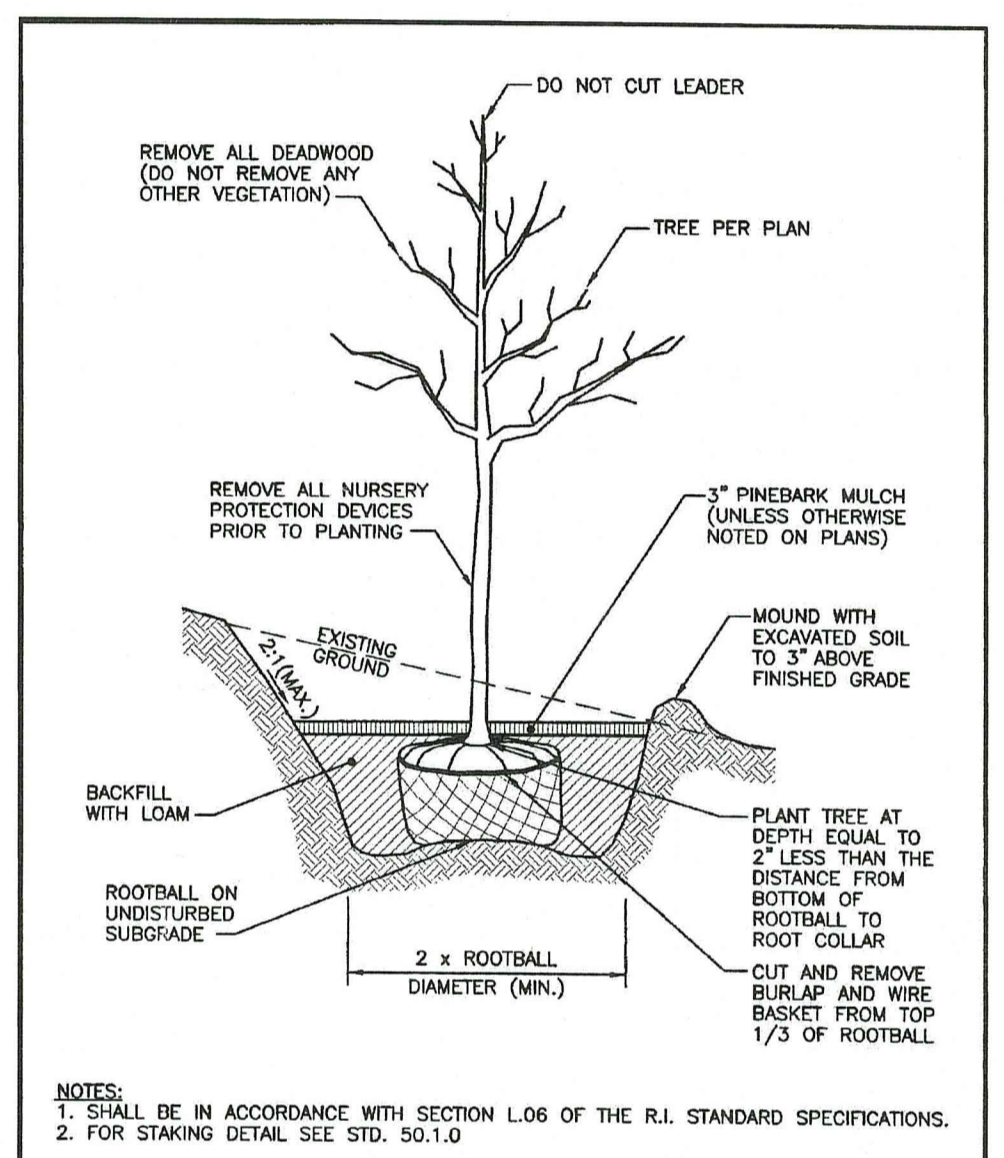
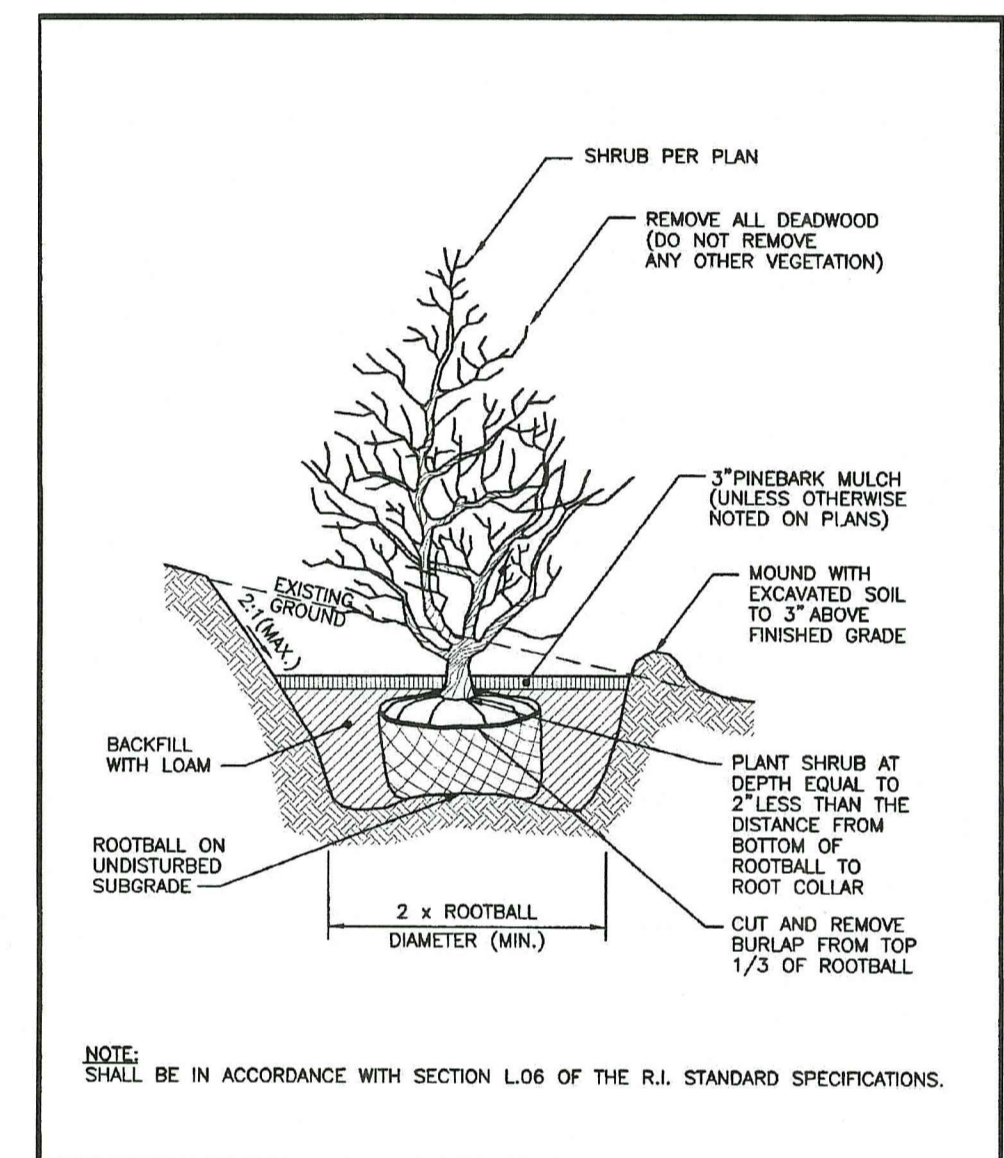
CANOPY TREES				
KEY	BOTANICAL NAME COMMON NAME	QTY.	SIZE	NOTE
NS	NYSSIA SYLVATICA BLACK GUM	3	2"-2.5" CAL.	

DECIDUOUS SHRUBS				
KEY	BOTANICAL NAME COMMON NAME	QTY.	SIZE	NOTE
AM	ARONIA MELANOCARPA BLACK CHOKERBERRY	6	# 5 CONTAINER	
IV	ILEX VERTICILLATA WINTERBERRY HOLLY	11	# 5 CONTAINER	

**NEW ENGLAND CONSERVATION SEED MIX:**

- BOTANICAL NAME / COMMON NAME:
- ANDROPOGON GERARDII / BIG BLUESTEM
  - ASCLEPIAS TUBEROSA / BUTTERFLY MILKWEED
  - ASTER PILOSUS (SYMPHYOTRICHUM PILOSUM) / HEATH (OR HAIRY) ASTER
  - BIDENS FRONDOSA / BEGGAR TICKS
  - CHAMAECRISTA FASCICULATA / PARTRIDGE PEA
  - DESMODIUM CANADENSE / SHOWY TICK TREFOL
  - ELYMUS VIRGINICUS / VIRGINIA WILD RYE
  - EUPATORIUM PURPUREUM ((EUTROCHUM MACULATUM) / PURPLE JOE PYE WEED
  - FESTUCA RUBRA / RED FESCUE
  - PANICUM VIRGATUM / SWITCH GRASS
  - RUBRICKIA HIRTA / BLACK EYED SUSAN
  - SCHIZACHYRIUM SCOPARIUM / LITTLE BLUESTEM
  - SOLIDAGO JUNCEA / EARLY GOLDENROD
  - SORGHASTRUM NUTANS / INDIAN GRASS
- APPLY: 25 LBS/ACRE; 1,750 S.F./LB

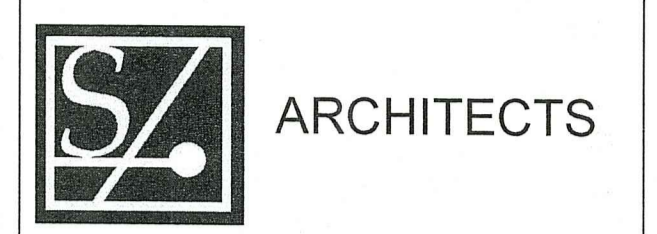


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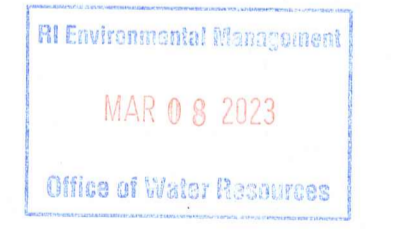
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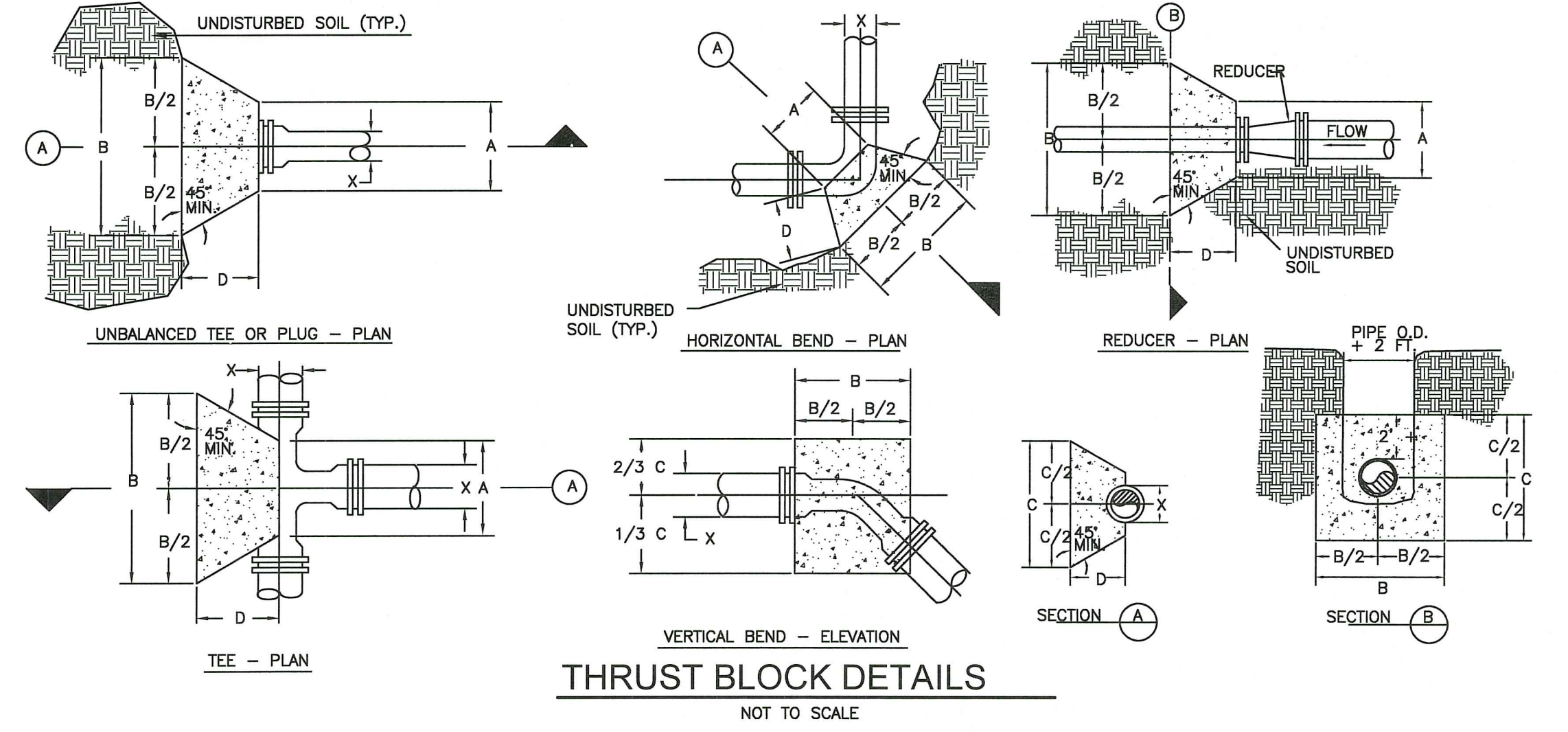
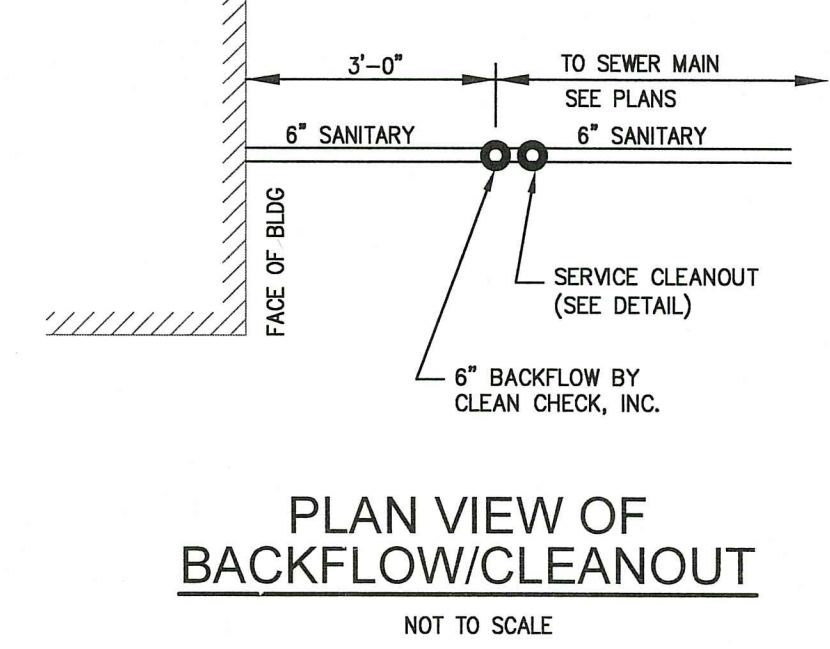
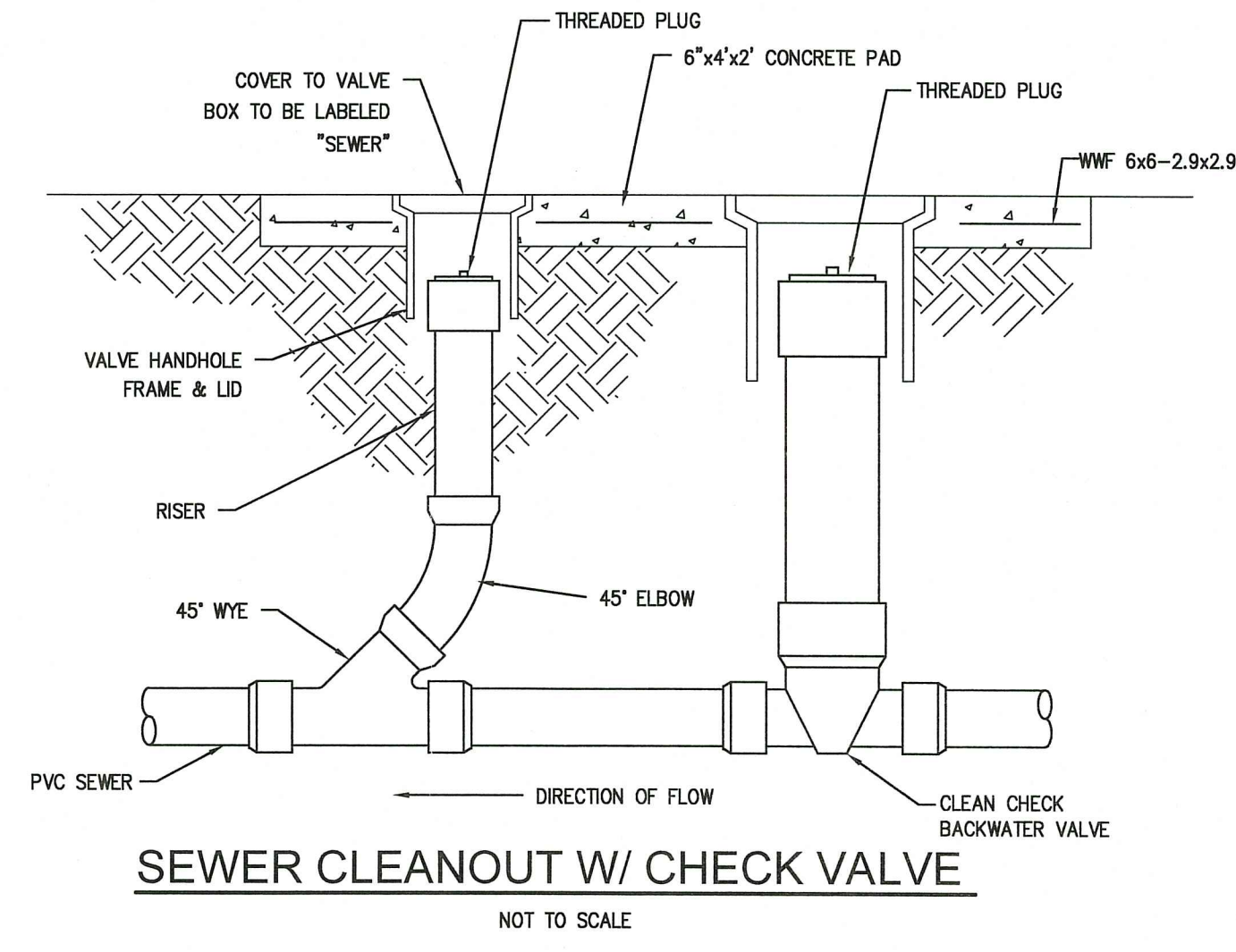
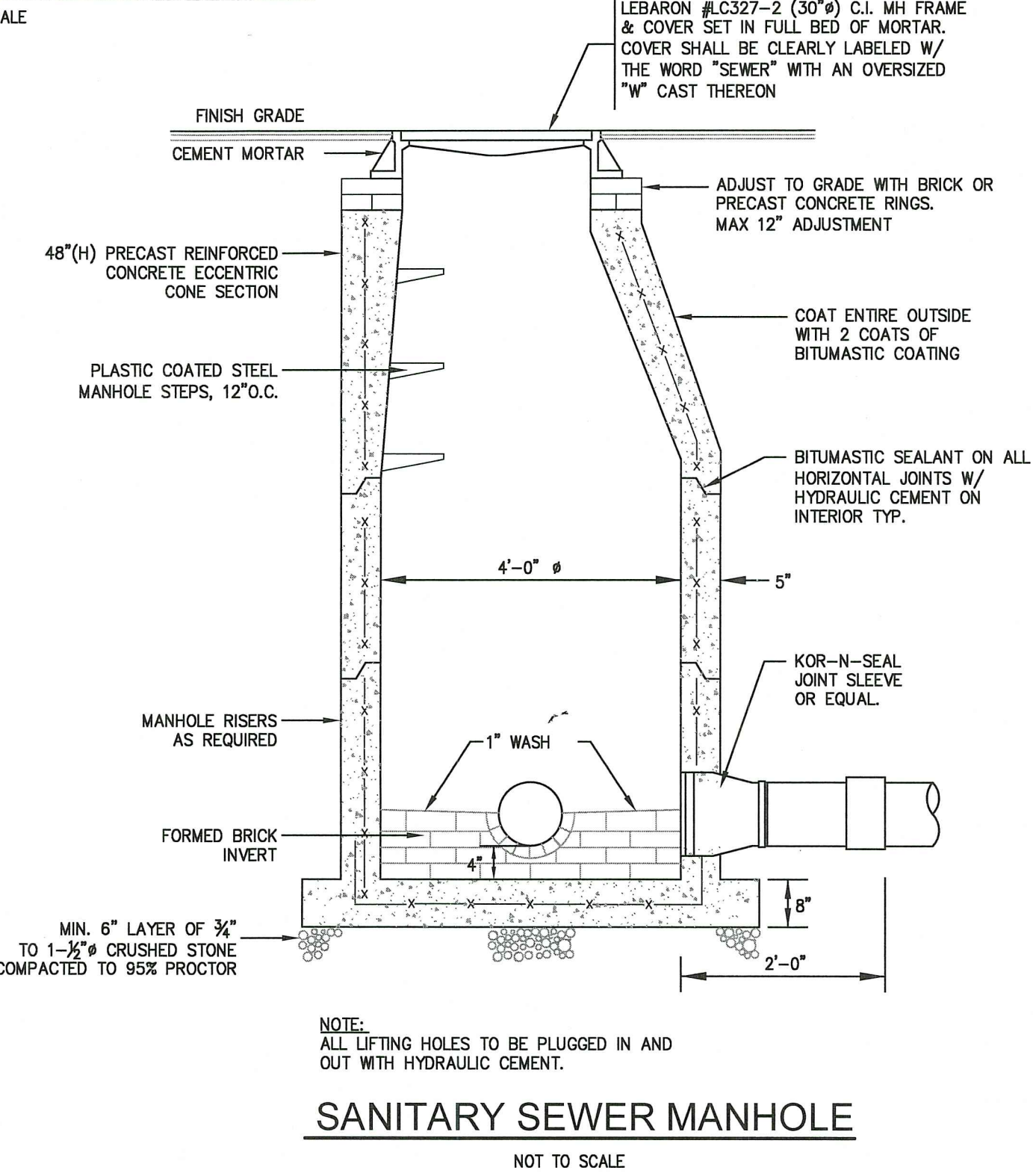
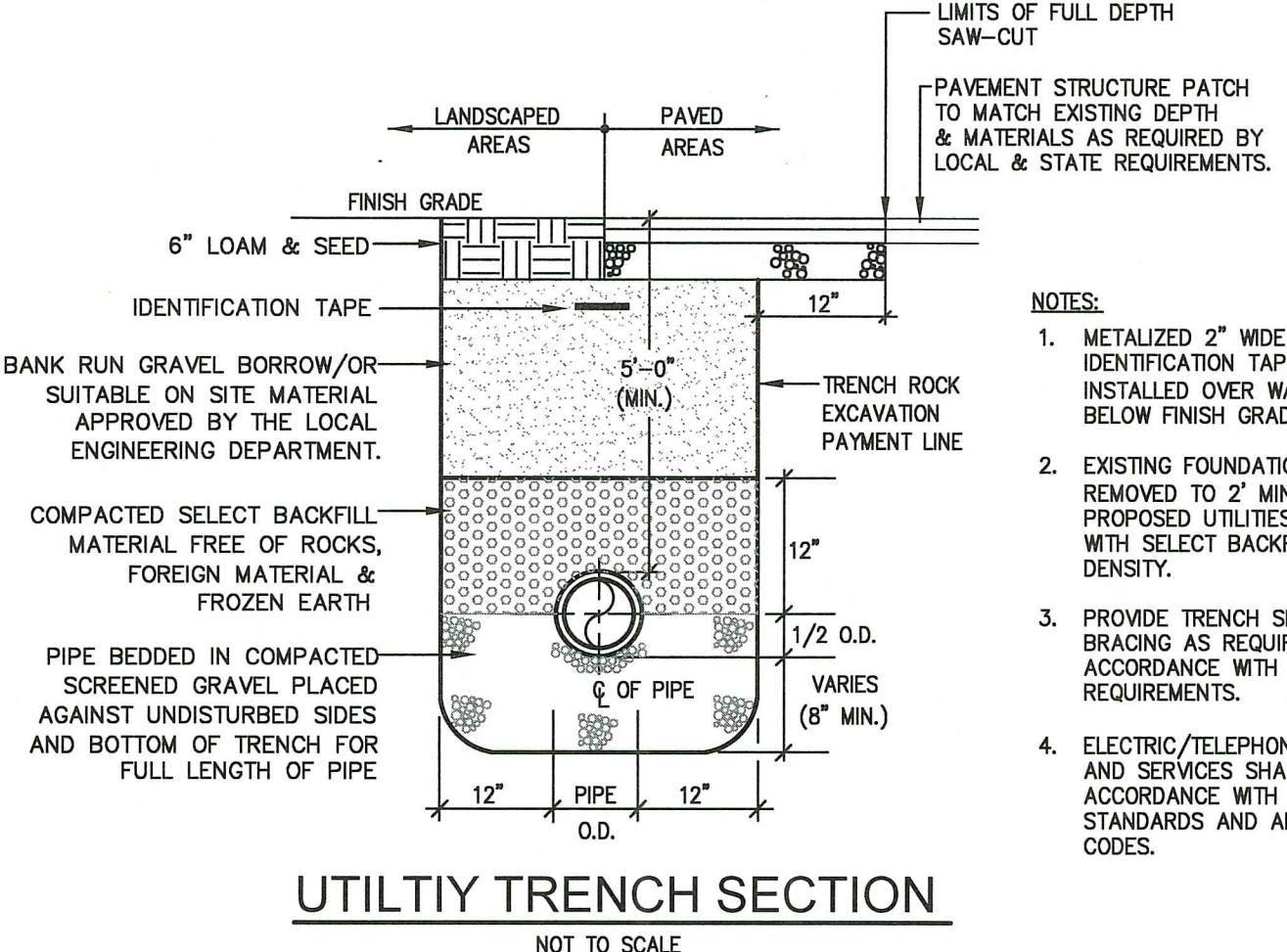
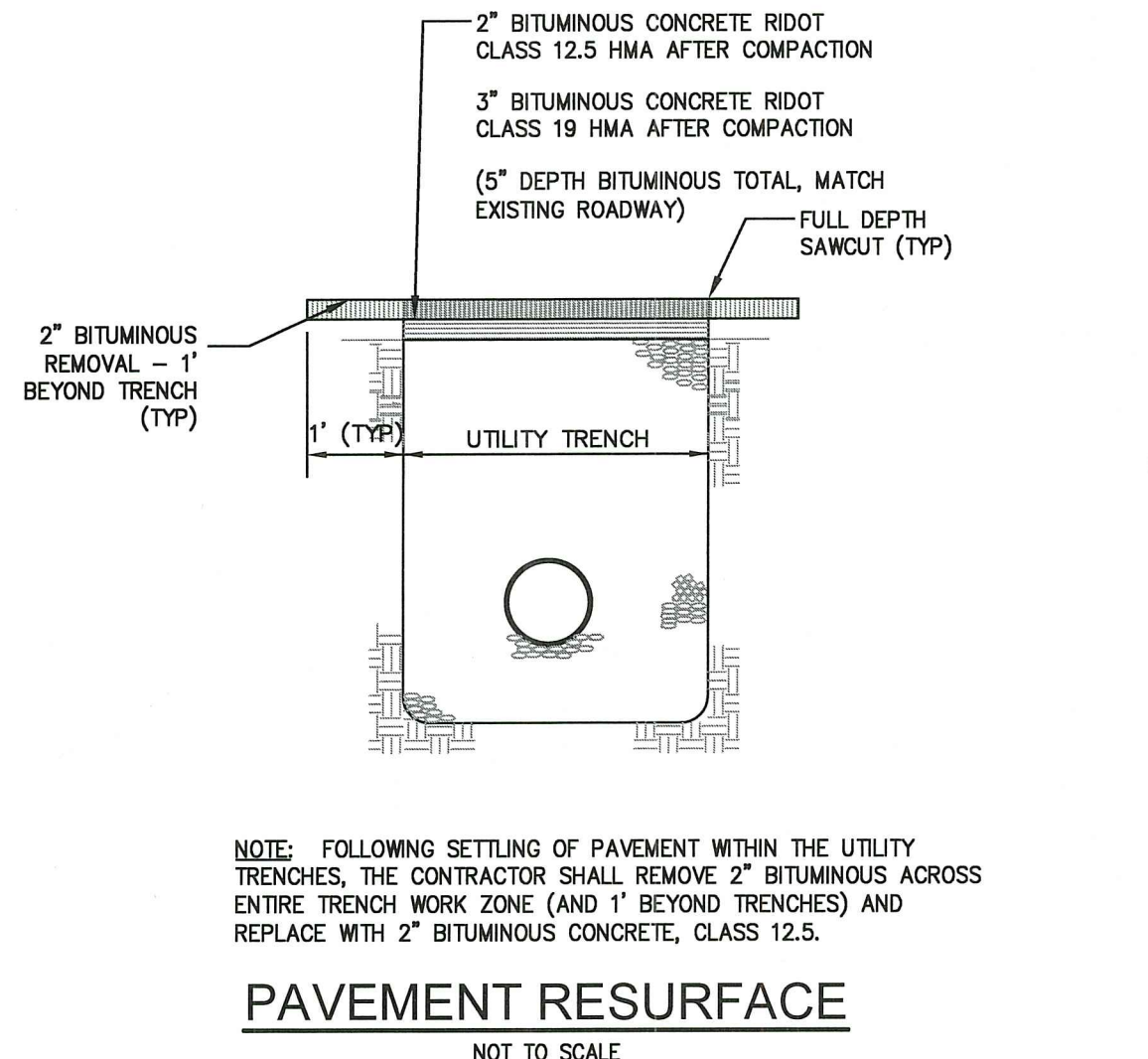
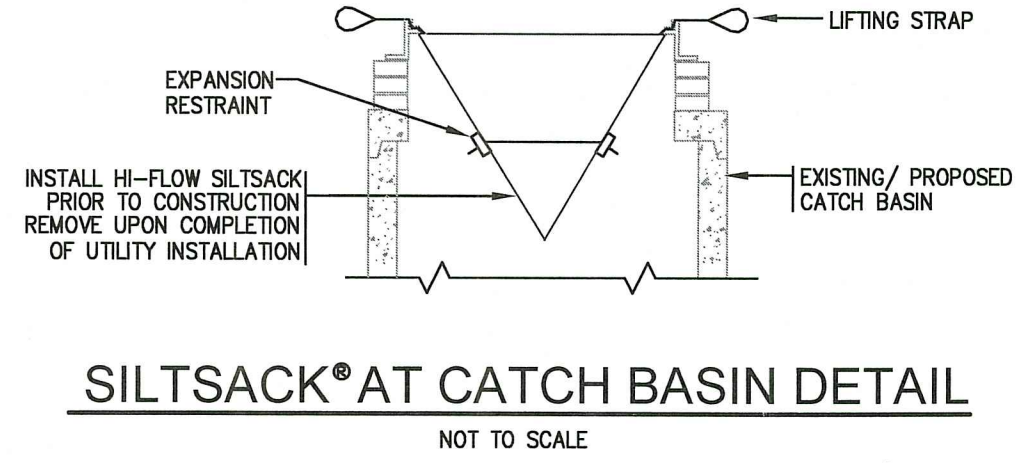
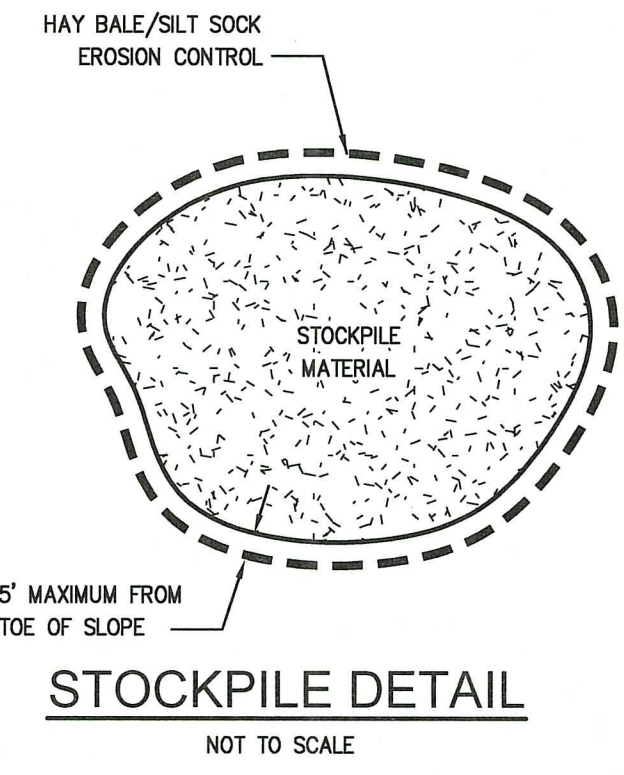
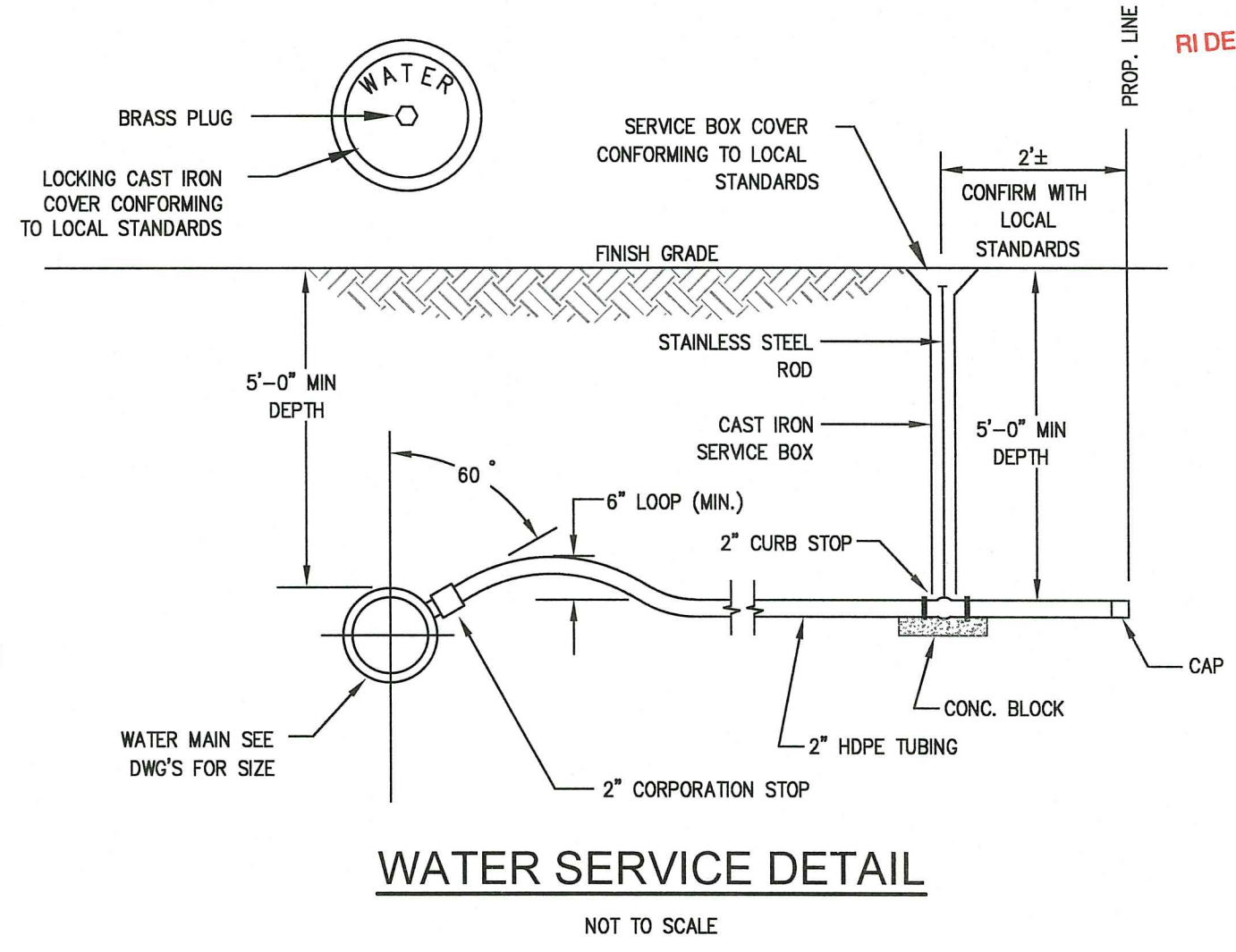
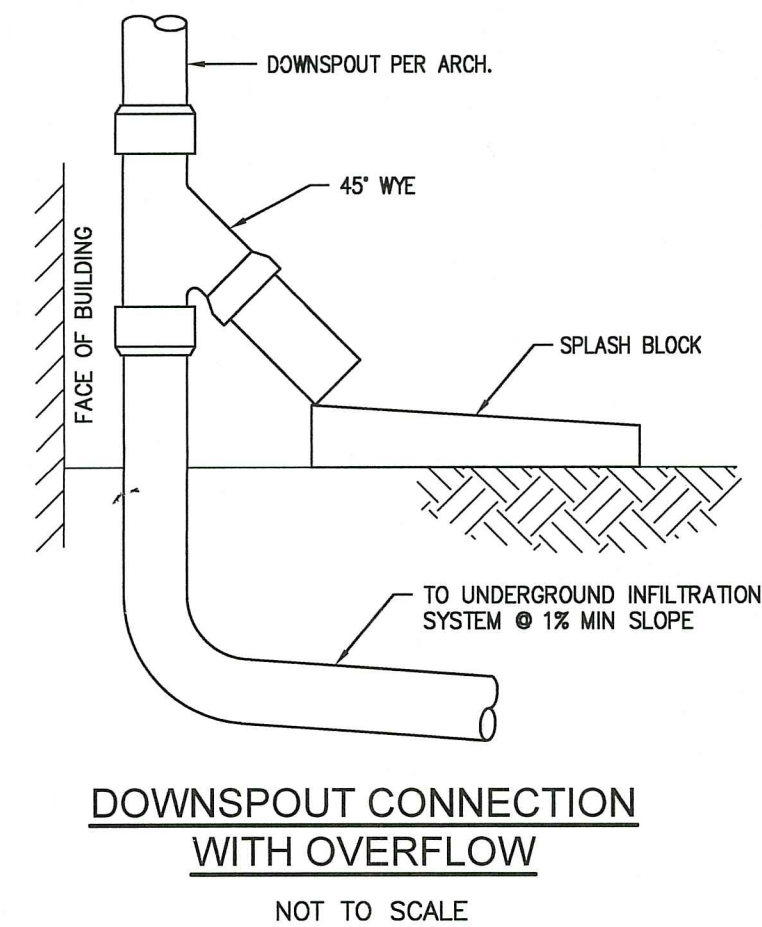
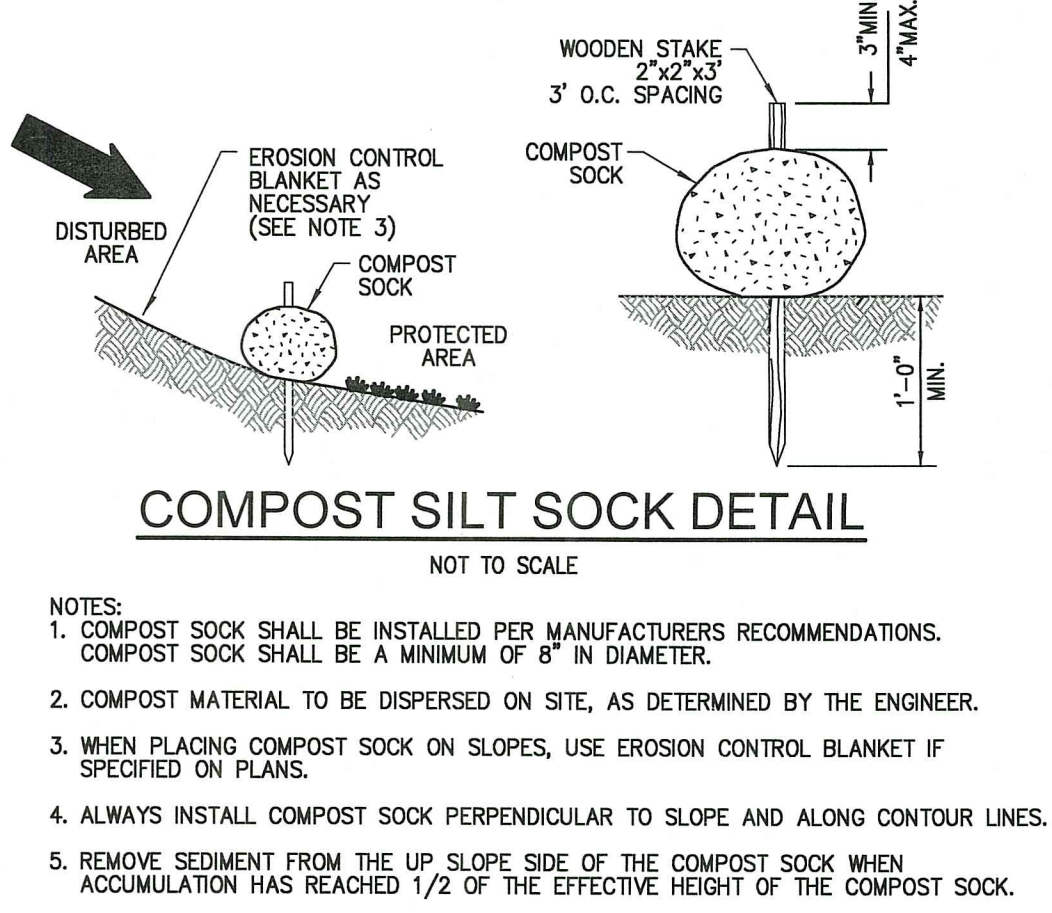
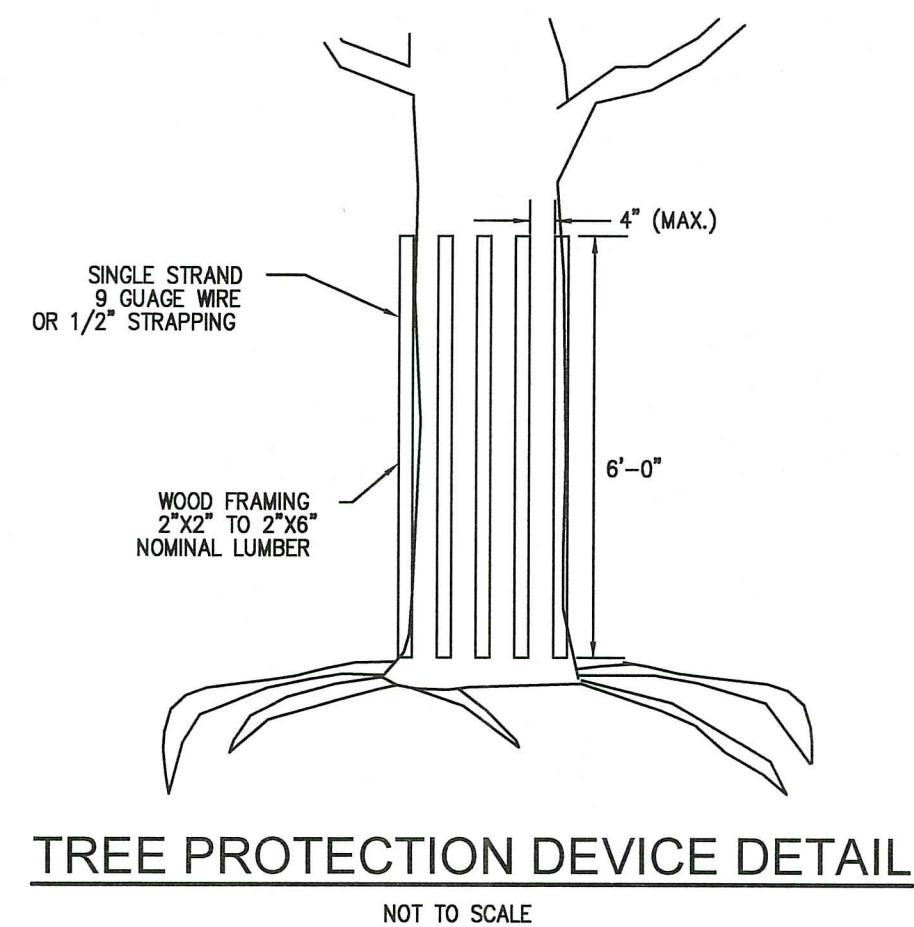
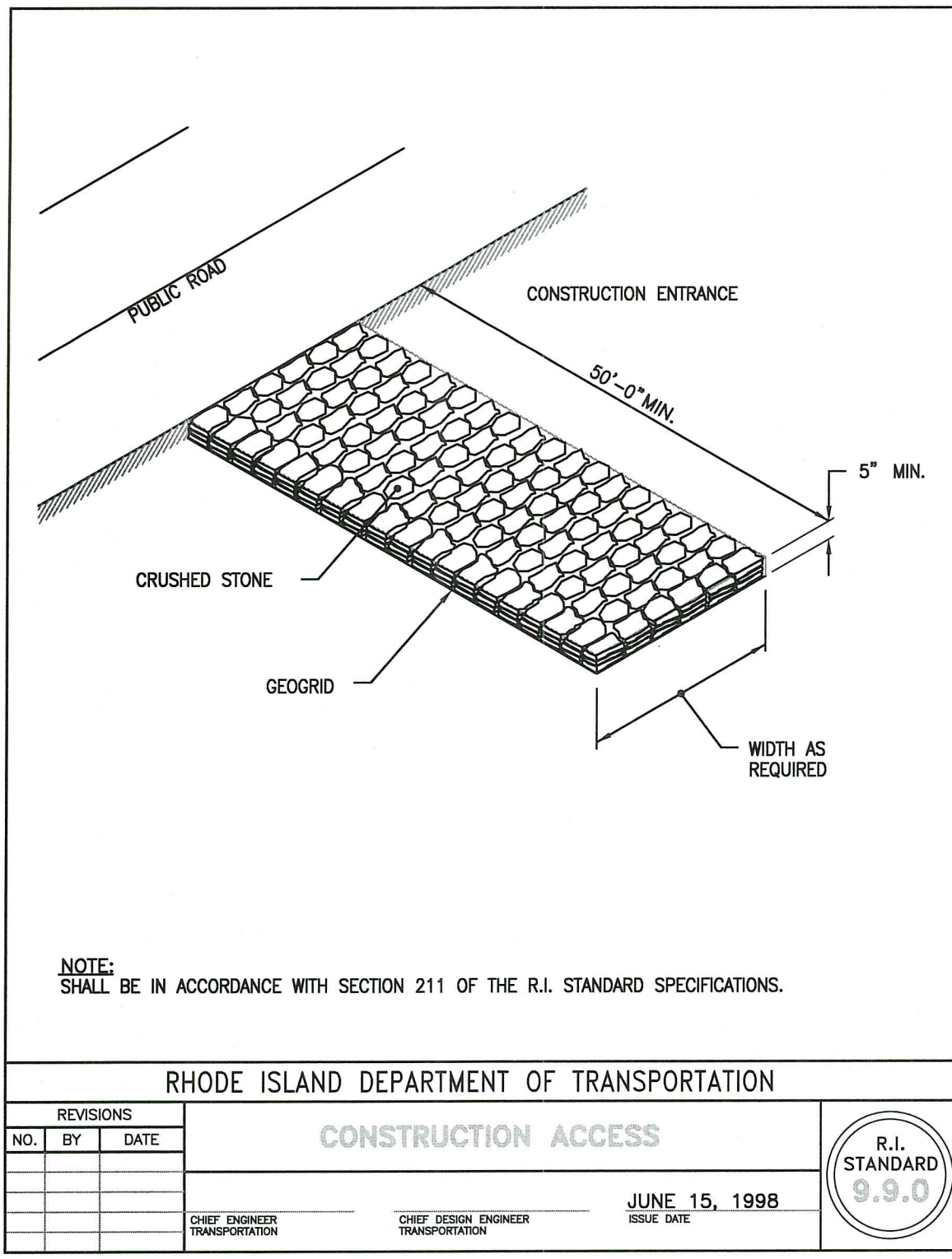
Revision Schedule	
Revision Number	Revision Date
1	2023-03-07



**SHEET TITLE**  
**CONSTRUCTION**  
**DETAILS-2**

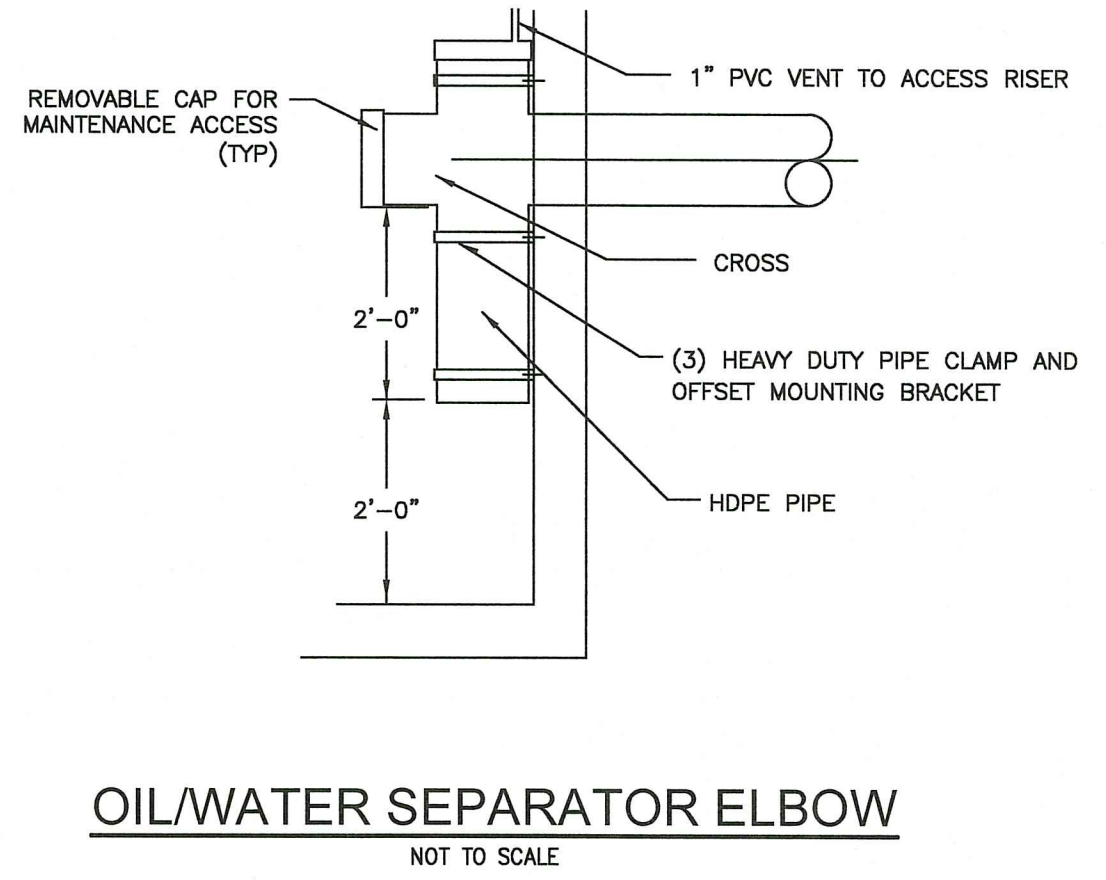
DRAWN BY: KYY JOB NUMBER: 7213-00  
CHECKED BY: SSH DATE: 06/13/2019

**8.1**



**THRUST BLOCK DIMENSIONS**

Pipe Size X	Line Pressure = 150 PSI Soil Pressure = 2000 PSF				VOL. CONC.	Line Pressure = 150 PSI Soil Pressure = 2000 PSF				VOL. CONC.	Line Pressure = 150 PSI Soil Pressure = 2000 PSF				VOL. CONC.		
	A	B	C	D		A	B	C	D		A	B	C	D			
<b>90 DEGREE BEND</b>																	
6"	0'-10"	1'-11"	1'-11"	1'-6"	4± CF	6"	0'-10"	1'-0"	1'-0"	1'-0"	1± CF	6"	0'-10"	1'-8"	1'-8"	1'-3"	3± CF
8"	0'-10"	2'-7"	2'-7"	1'-6"	7± CF	8"	0'-10"	1'-4"	1'-4"	1'-0"	1.5± CF	8"	0'-10"	2'-2"	2'-2"	1'-3"	4± CF
12"	0'-10"	3'-10"	3'-10"	1'-6"	14± CF	12"	0'-10"	2'-0"	2'-0"	1'-0"	3± CF	12"	0'-10"	3'-3"	3'-3"	1'-3"	8± CF
<b>45 DEGREE BEND</b>																	
6"	0'-10"	1'-6"	1'-6"	1'-0"	2± CF	6"	0'-10"	0'-10"	0'-10"	1'-0"	0.7± CF	6"	0'-10"	1'-8"	1'-8"	1'-3"	3± CF
8"	0'-10"	1'-11"	1'-11"	1'-0"	3± CF	8"	0'-10"	1'-0"	1'-0"	1'-0"	1± CF	8"	0'-10"	2'-2"	2'-2"	1'-3"	4± CF
12"	0'-10"	2'-10"	2'-10"	1'-0"	5± CF	12"	0'-10"	1'-6"	1'-6"	1'-0"	2± CF	12"	0'-10"	1'-8"	1'-8"	1'-3"	3± CF
<b>11-1/4 DEGREE BEND</b>																	
6"	0'-10"	1'-6"	1'-6"	1'-0"	2± CF	6"	0'-10"	0'-10"	0'-10"	1'-0"	0.7± CF	6"	0'-10"	1'-8"	1'-8"	1'-3"	3± CF
8"	0'-10"	1'-11"	1'-11"	1'-0"	3± CF	8"	0'-10"	1'-0"	1'-0"	1'-0"	1± CF	8"	0'-10"	2'-2"	2'-2"	1'-3"	4± CF
12"	0'-10"	2'-10"	2'-10"	1'-0"	5± CF	12"	0'-10"	1'-6"	1'-6"	1'-0"	2± CF	12"	0'-10"	1'-8"	1'-8"	1'-3"	3± CF



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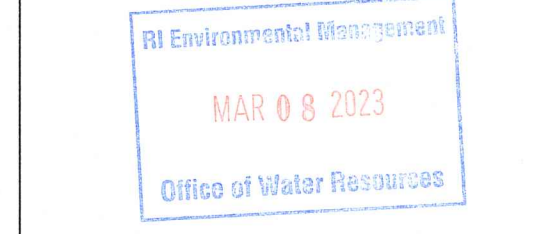
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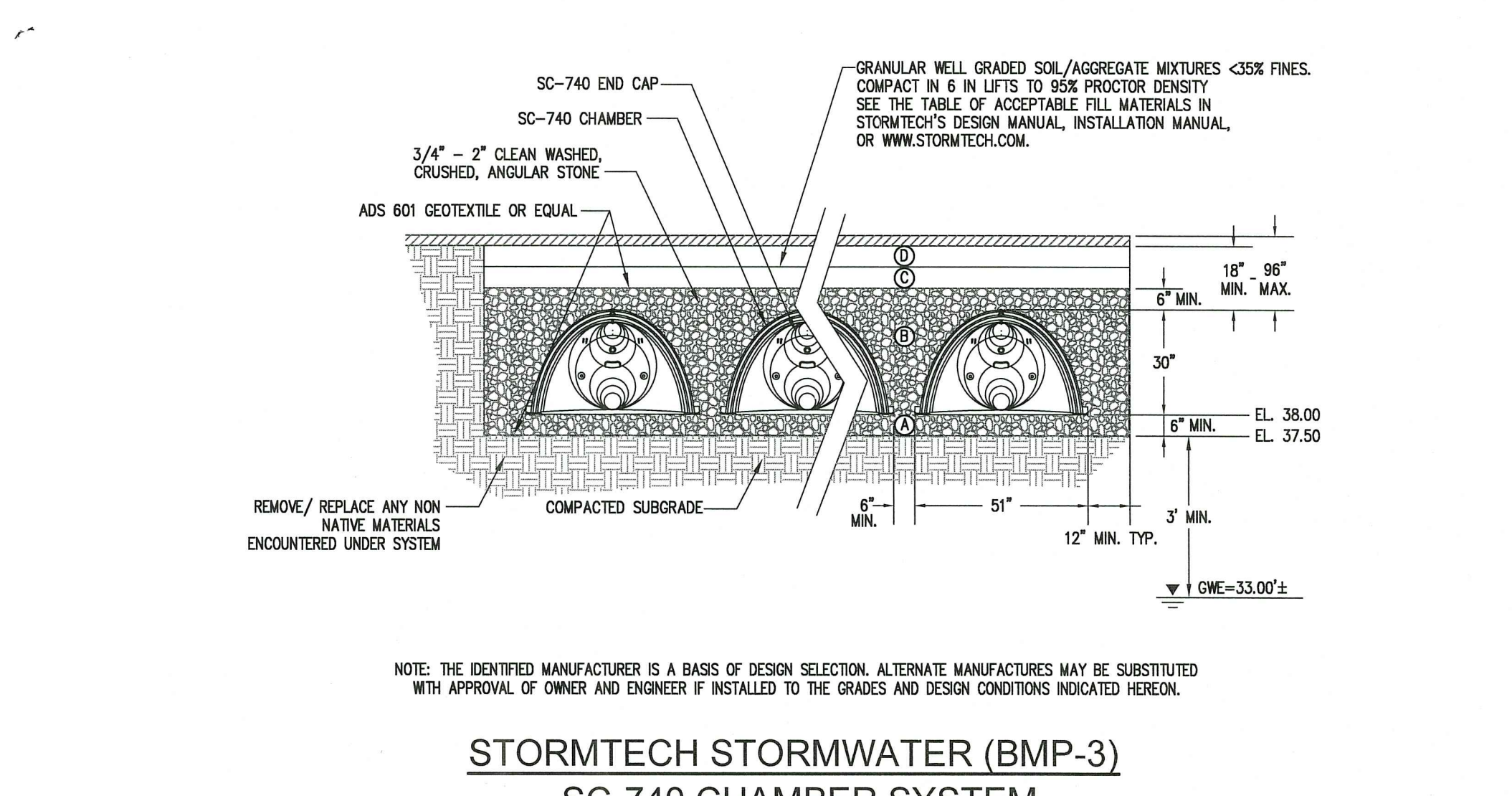
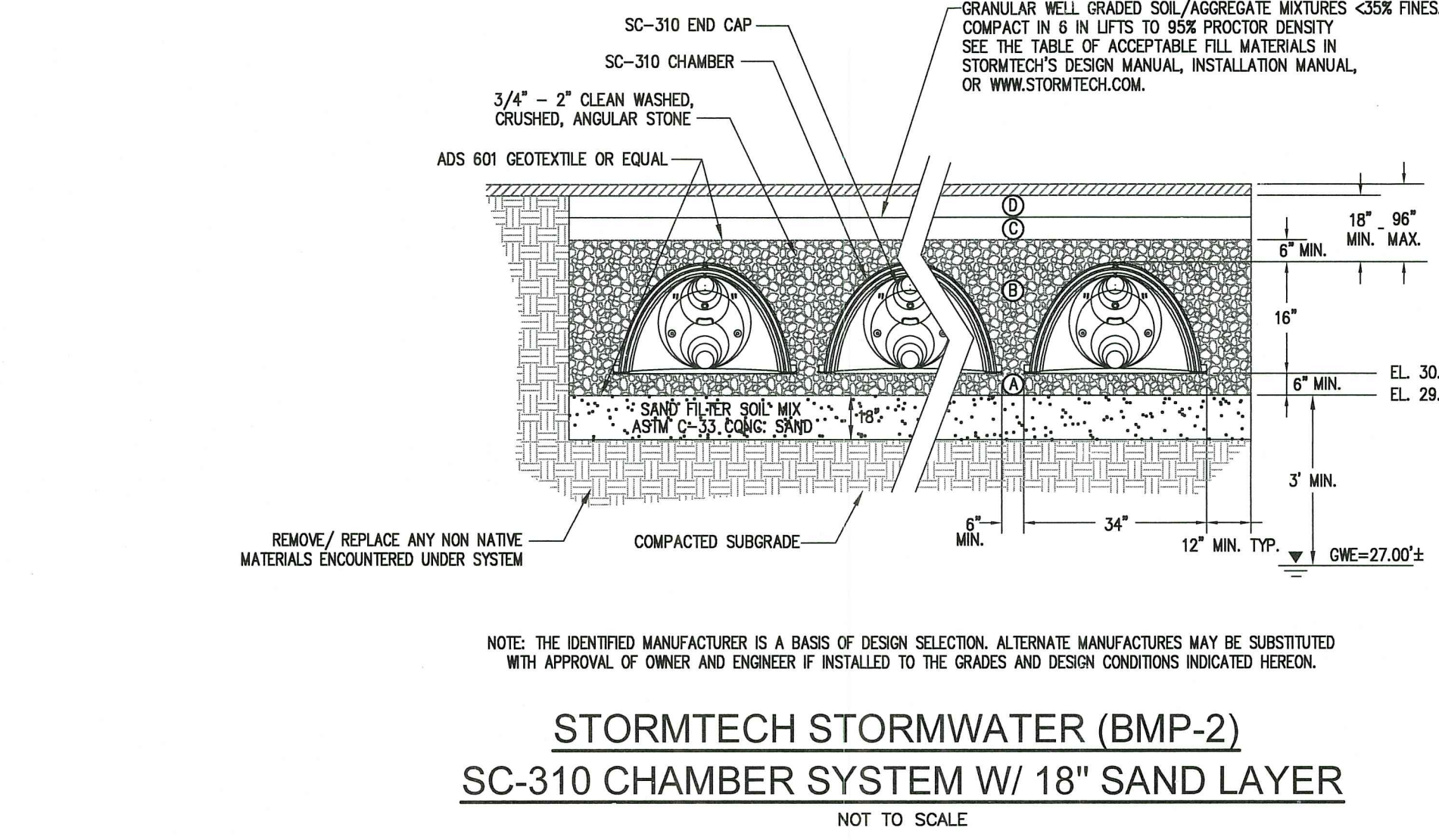
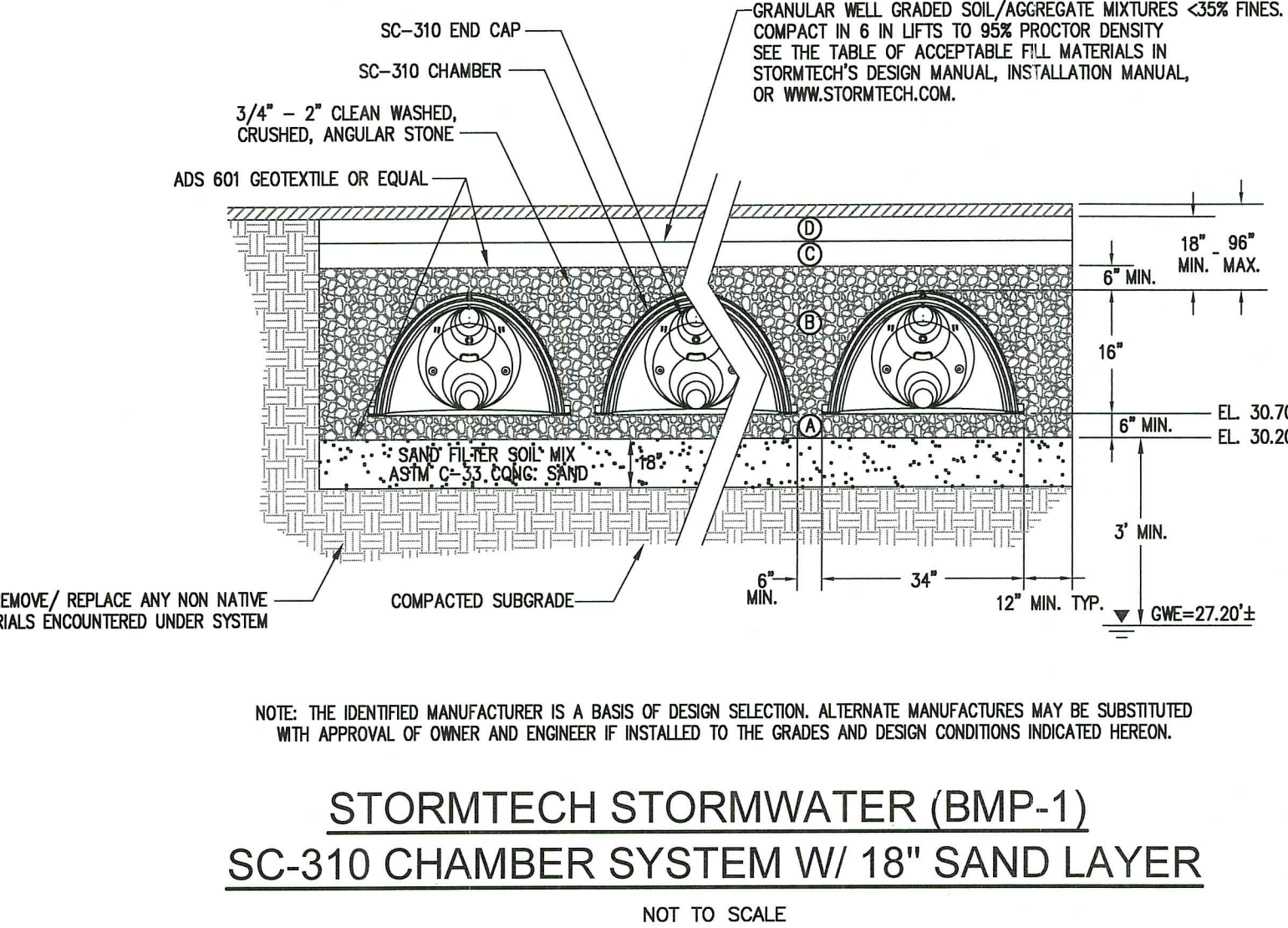
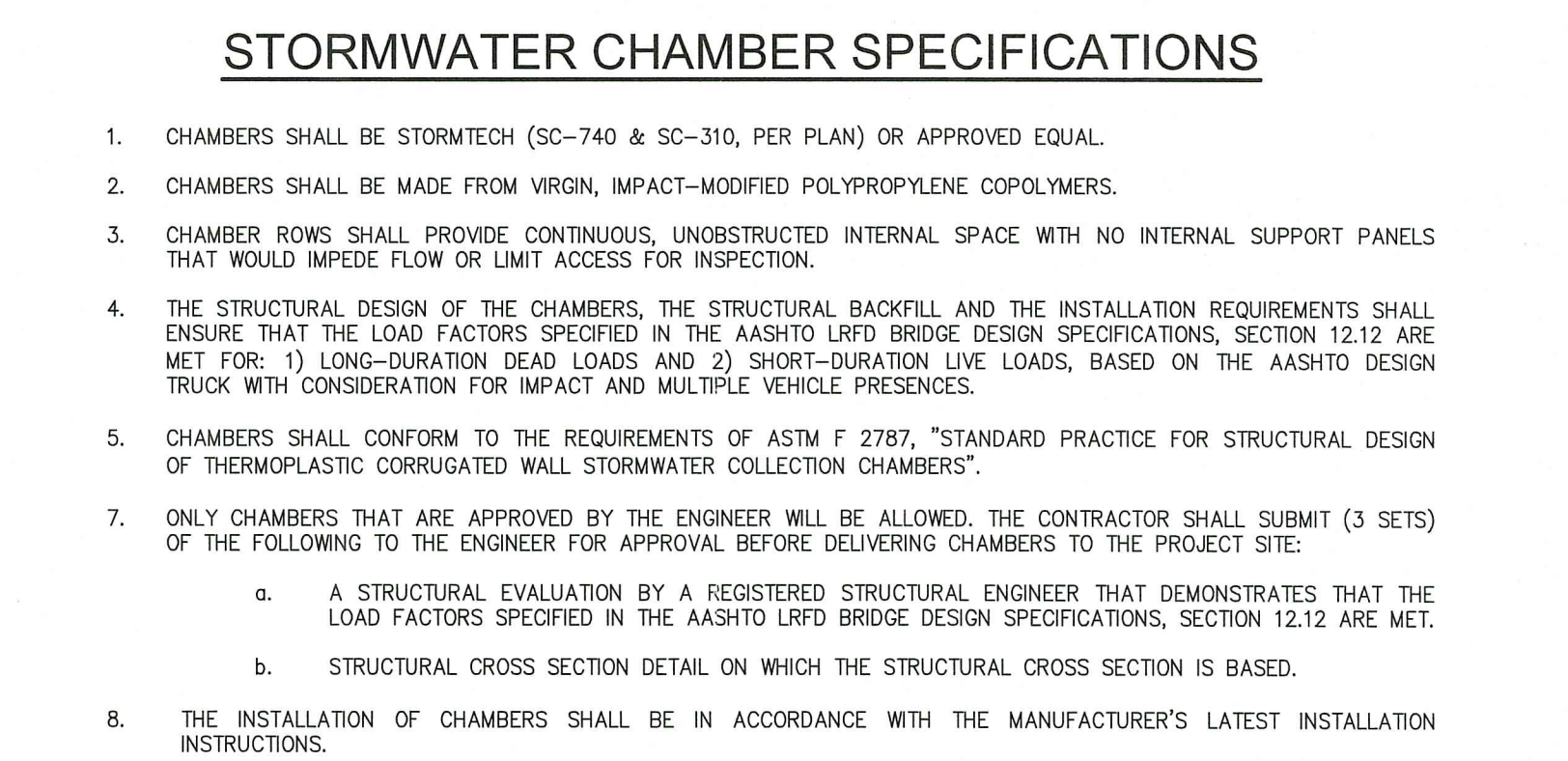
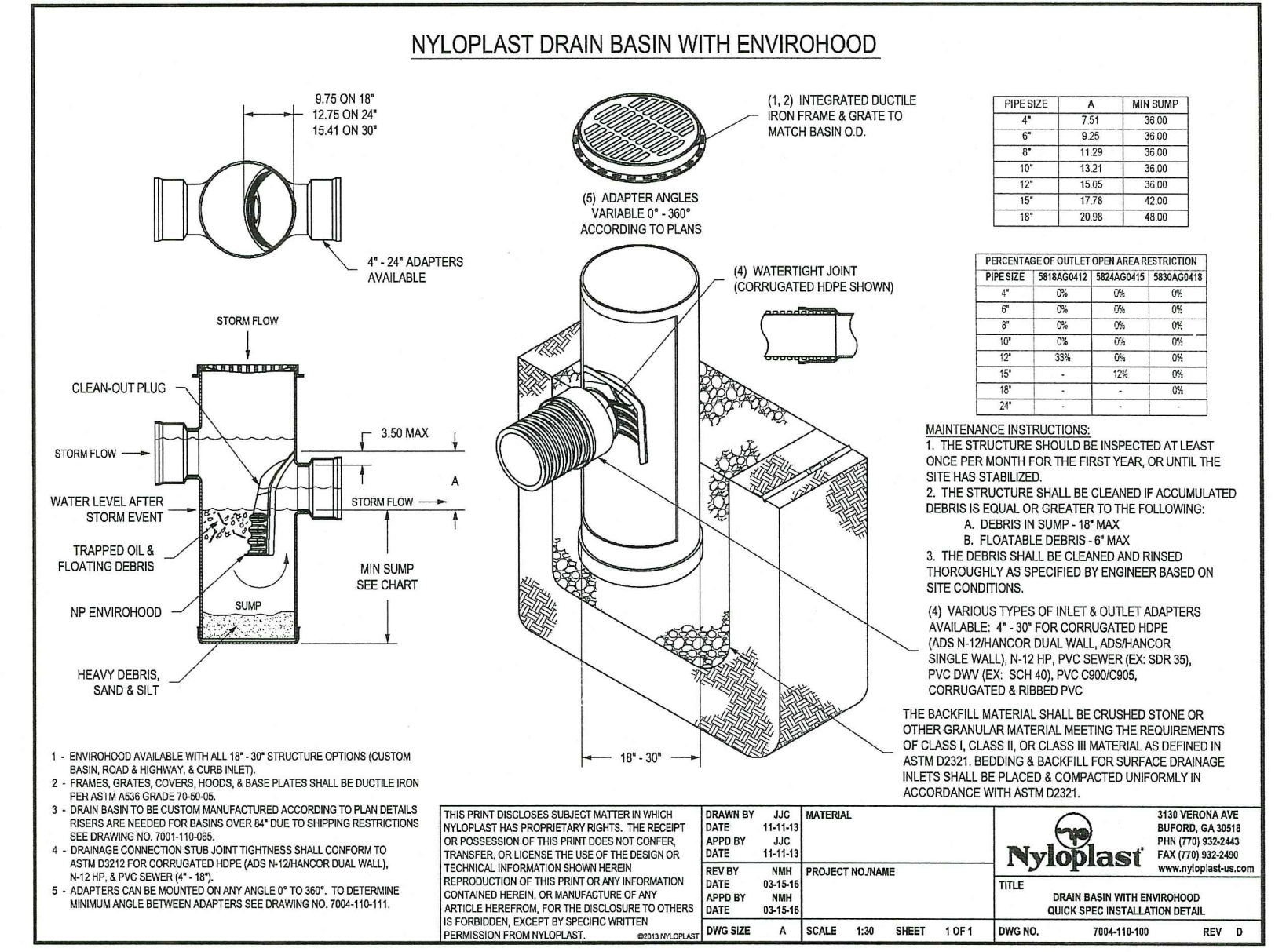
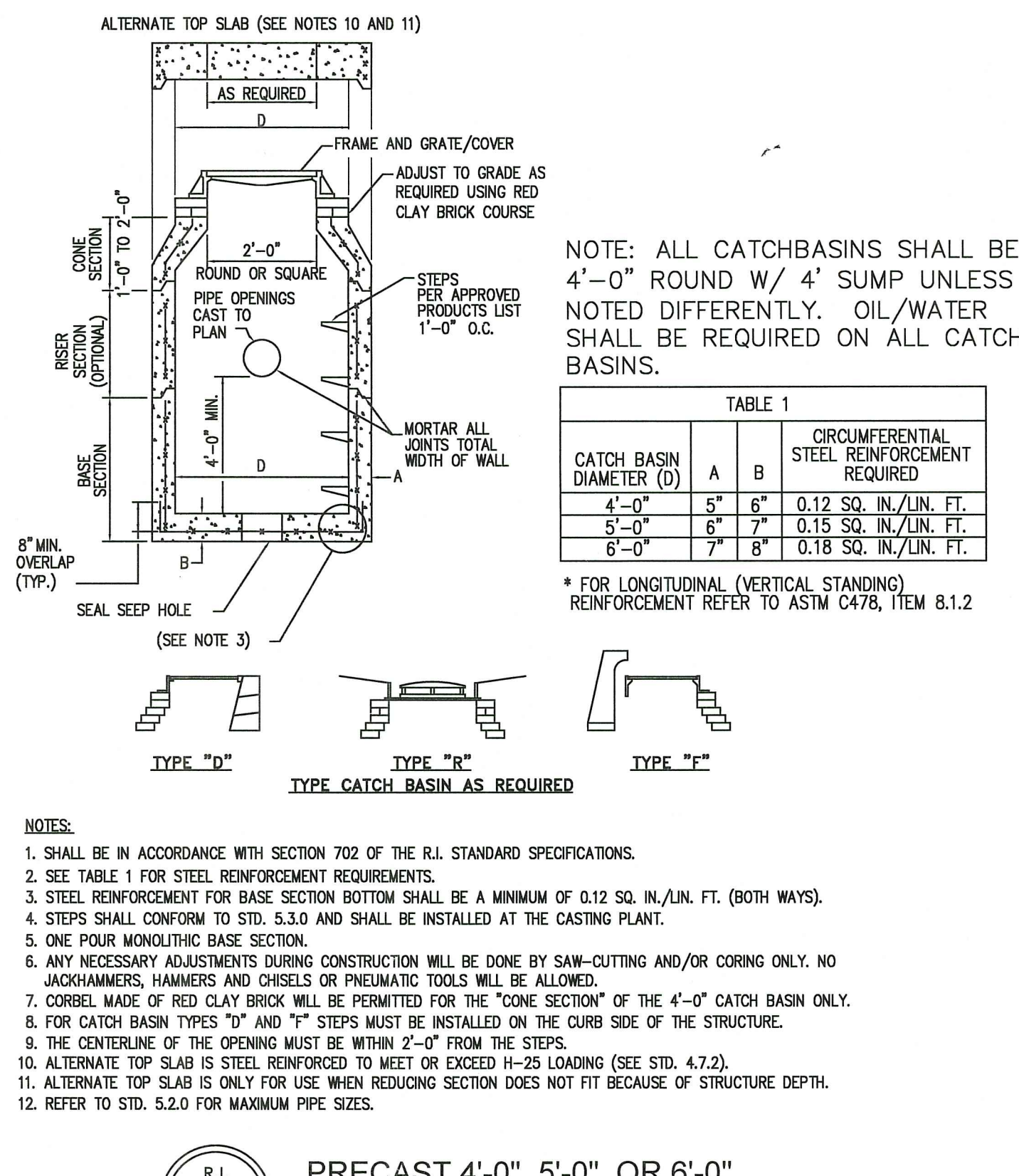
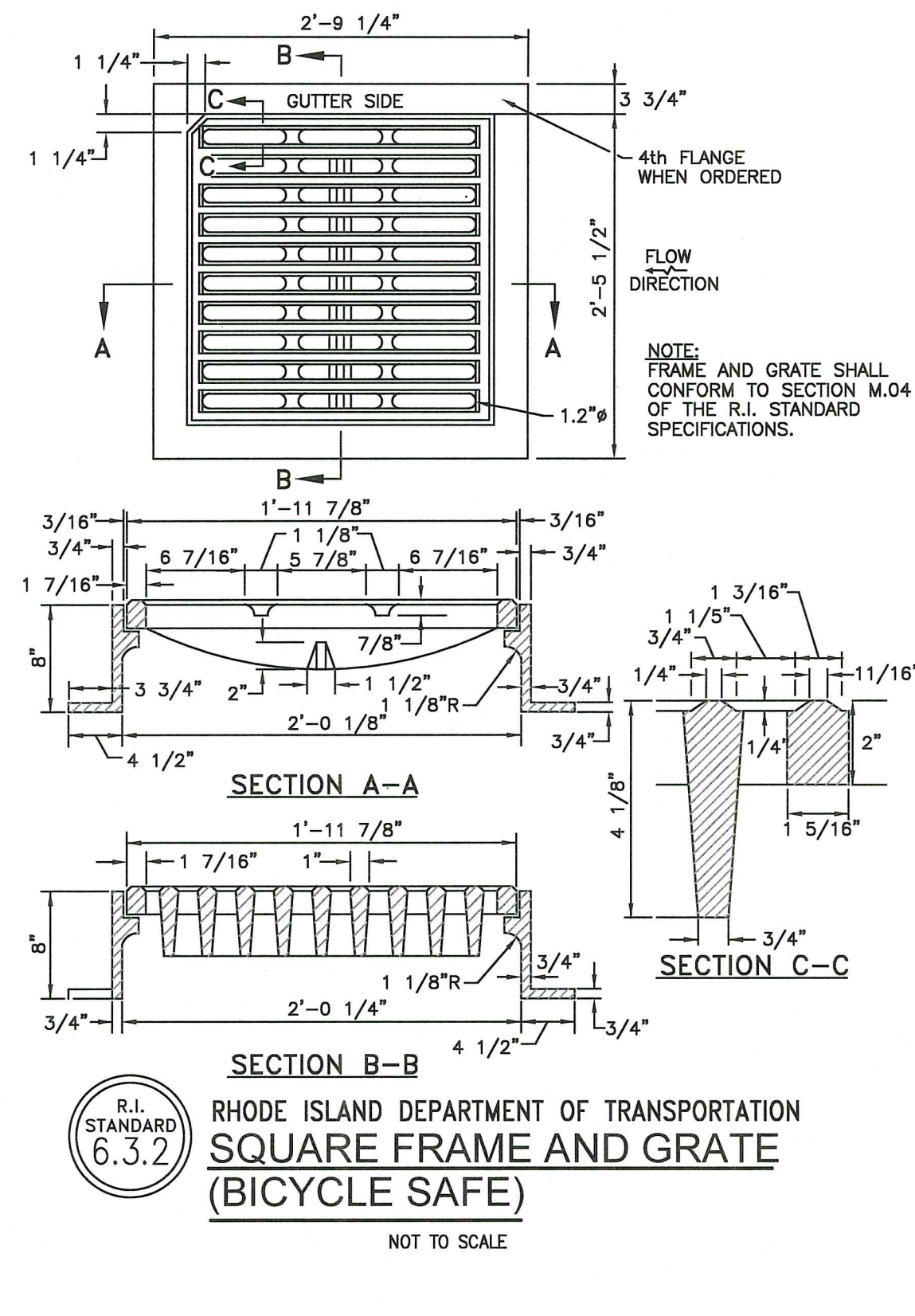
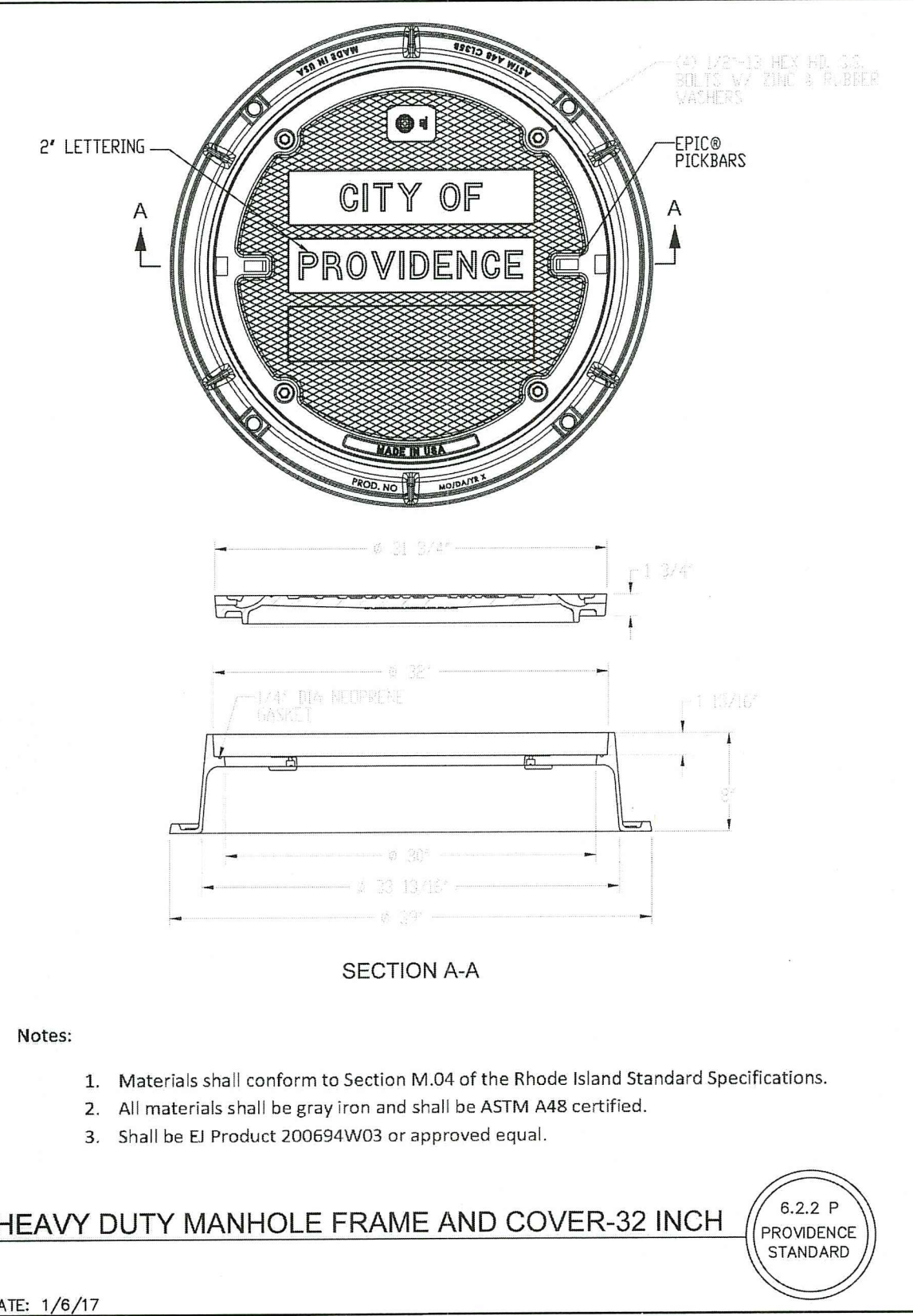
*Nancy L. Freeman*

**SHEET TITLE**  
**CONSTRUCTION DETAILS-3**

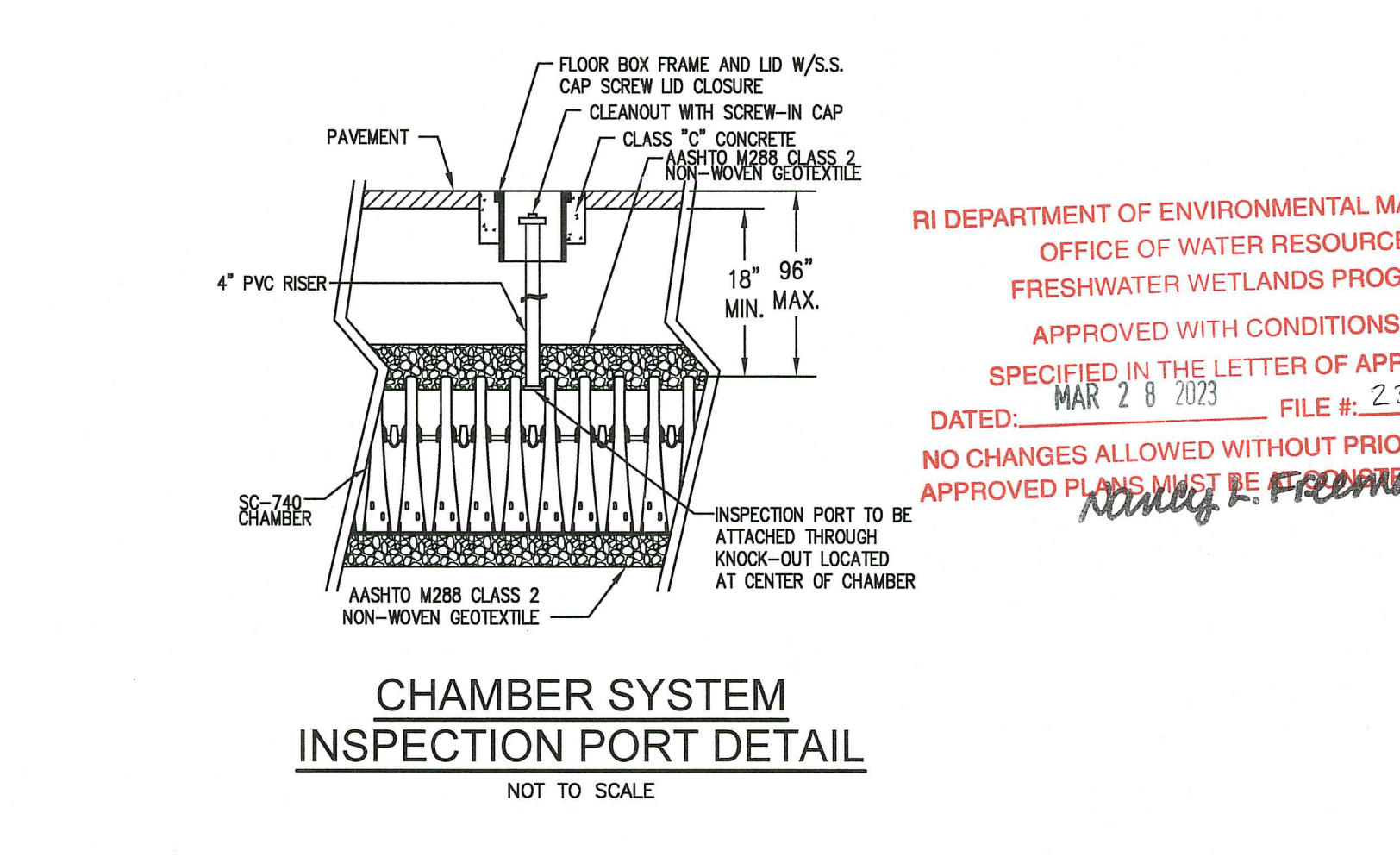
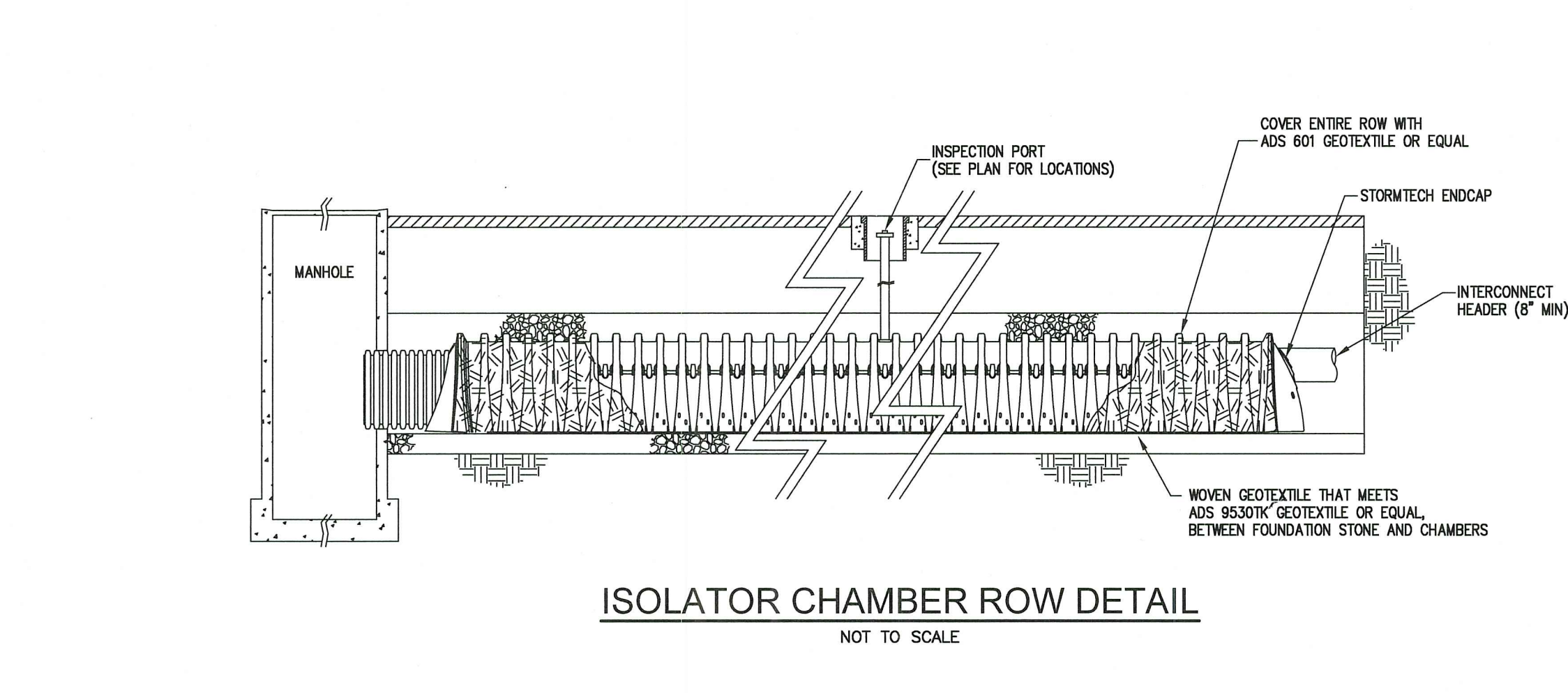


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**8.2**



MATERIAL LOCATION	DESCRIPTION	AASHTO M43 DESIGNATION	COMPACTION/DENSITY REQUIREMENT
① FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISH GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THIS LAYER.	ANY SOIL/ROCK MATERIALS, NATIVE SOILS, OR PER ENGINEER'S PLANS. CHECK PLANS FOR PAVEMENT SUBGRADE REQUIREMENTS.	N/A	PREPARE PER ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
② FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 18" (457 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THIS LAYER.	GRANULAR WELL-GRADED SOIL/AGGREGATE MIXTURES, < 35% FINES. MOST PAVEMENT SUB-BASE MATERIALS CAN BE USED IN LIEU OF THIS LAYER.	3, 357, 4, 467, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTION AFTER 12" (305 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 6" (152 mm) LIFTS TO A MIN. 95% STANDARD PROCTOR DENSITY. ROLLER GROSS VEHICLE WEIGHT NOT TO EXCEED 12,000 lbs (53 kN). DYNAMIC FORCE NOT TO EXCEED 20,000 lbs (89 kN).
③ EMBEDMENT STONE SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE.	CLEAN WASHED, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4 - 2 INCH (19 - 51 mm)	3, 357, 4, 467, 5, 56, 57	NO COMPACTION REQUIRED.
④ FOUNDATION STONE BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER.	CLEAN WASHED, CRUSHED, ANGULAR STONE, NOMINAL SIZE DISTRIBUTION BETWEEN 3/4 - 2 INCH (19 - 51 mm)	3, 35, 4, 467, 5, 56, 57	PLATE COMPACT OR ROLL TO ACHIEVE A 95% STANDARD PROCTOR DENSITY.



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RI Environmental Management  
MAR 08 2023  
Office of Water Resources

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**8.3**

SHEET 12 OF 12