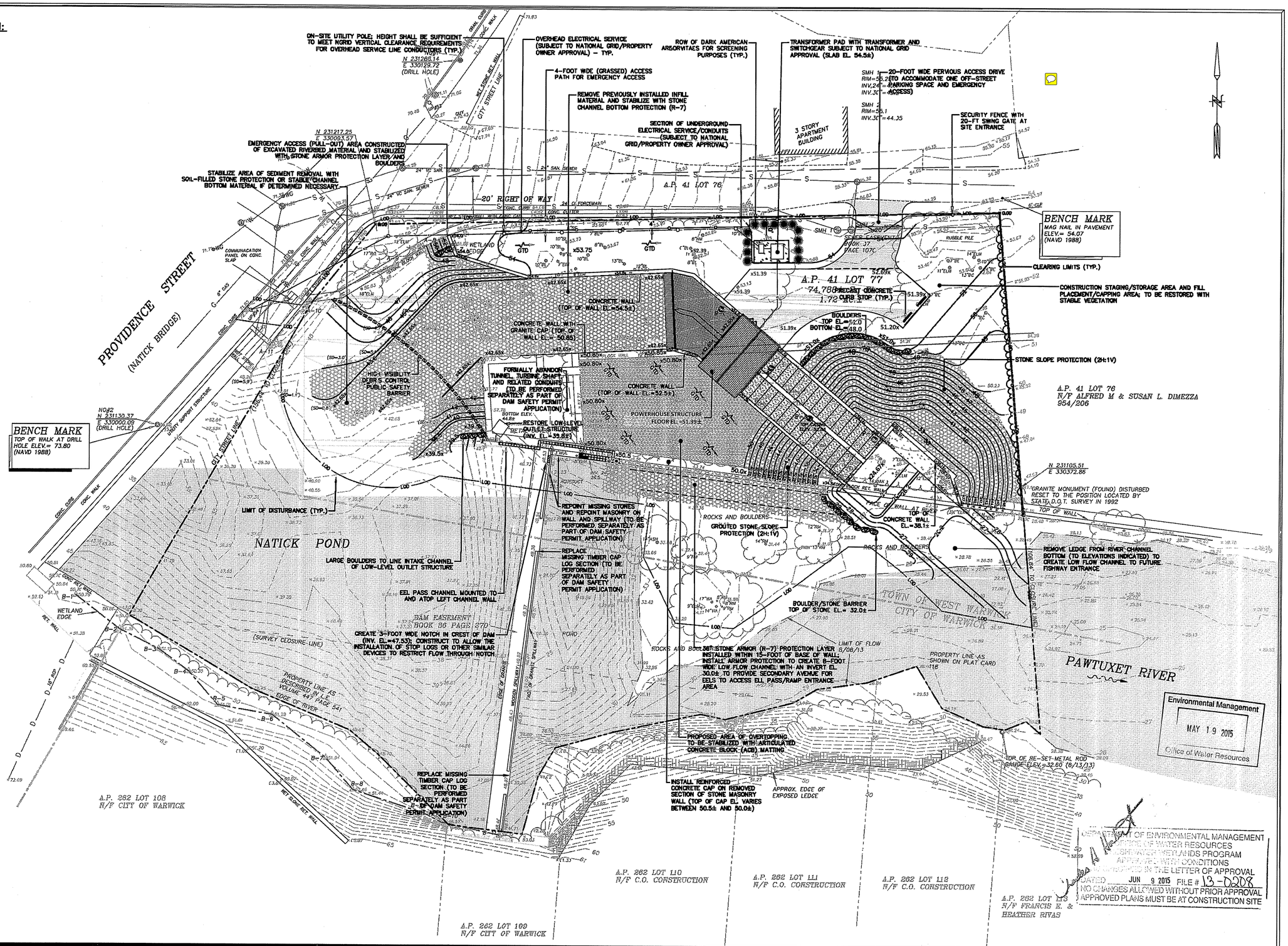
DRAINAGE BASIN CHARACTERISTICS AT NATICK DAM:

Parameter	Value
Drainage area in square miles	182
Stream Density	1.97
10-85 slope in feet per mile based on preprocessed data	
Total stream length in miles	358
Percent of area covered by forest	59.2
Percent of area covered by urban land use	5.39
Percent of area covered by open water (lakes, ponds, reservoirs)	6.06
Percent of area covered by wetland land use	11.7
Average basin elevation in feet	419
Percent of area underlain by surficial geology (stratified drift deposits)	26.7
Percent of area covered by agriculture	4.19
Percent of area as storage (hi-res NHD waterbodies, wetlands)	10.5

NOTE:

1. THE LENGTH OF THE SPILLWAY AT THE NATICK DAM IS APPROXIMATELY 166-FEET.



GENERAL BOULDER SIZE NOTES:

1. BOULDERS PROPOSED WITHIN RIVER CHANNEL (I.E. TO LINE THE LOW-LEVEL INTAKE CHANNEL AND TO FORM THE BOULDER/STONE BARRIER), SHALL HAVE A MINIMUM SIZE OF 4'Lx3'Wx3'H.
2. BOULDER WALL PROPOSED OUTSIDE OF RIVER CHANNEL (ADJACENT TO PERMEABLE DRIVEWAY) SHALL HAVE A MINIMUM SIZE OF 3'Lx2.5'Wx2.5'H.

GENERAL STONE MASONRY WALL REPAIR NOTE:

1. EXISTING STONE MASONRY WALLS TO REMAIN (WITHIN THE LIMIT OF DISTURBANCE) SHALL BE REPOINTED/REPAIRED AS DETERMINED NECESSARY BY ENGINEER.

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.	2/3/2014	REVISIONS PER RIDEM FRESHWATER WETLAND 1/24/14 REVIEW COMMENTS		

SEAL

PHILIP W. MORESCHI — No. 7428 — REGISTERED PROFESSIONAL ENGINEER (CIVIL)

SCALE:
HORZ.: 1"=20'
VERT.:
DATUM:
HORZ.:
VERT.:
20 10 0 20
GRAPHIC SCALE

FUSS & O'NEILL
317 IRON HORSE WAY, SUITE 204
PROVIDENCE, RI
02908
401.861.3070
www.fando.com

WATER STREET LAND, LLC

SITE LAYOUT AND GRADING PLAN

NATICK POND DAM HYDROELECTRIC PROJECT

WEST WARWICK RHODE ISLAND

PROJ.No.: 20121867.B10
DATE: DECEMBER2013

CS-104

SHEET 6 OF 17

NATICK POND DAM HYDROELECTRIC PROJECT

PROVIDENCE STREET · WEST WARWICK · RHODE ISLAND

PERMITTING DRAWING SET

DECEMBER 2013

REVISED FEBRUARY 2014

PREPARED FOR

WATER STREET LAND, LLC
1051 TEN ROD ROAD
NORTH KINGSTOWN, RHODE ISLAND 02852

NEW ENGLAND HYDROPOWER COMPANY
BEVERLY FARMS, MASSACHUSETTS 01915

PREPARED BY

FUSS & O'NEILL
317 IRON HORSE WAY, SUITE 204
PROVIDENCE, RI 02908
401.861.3070
www.fando.com

SHEET INDEX

PROJECT TEAM

POWER FACILITY AND PROPERTY OWNER / PERMIT APPLICANT
WATER STREET LAND, LLC
1051 TEN ROD ROAD
NORTH KINGSTOWN, RI 02852
P: (401) 294-0020

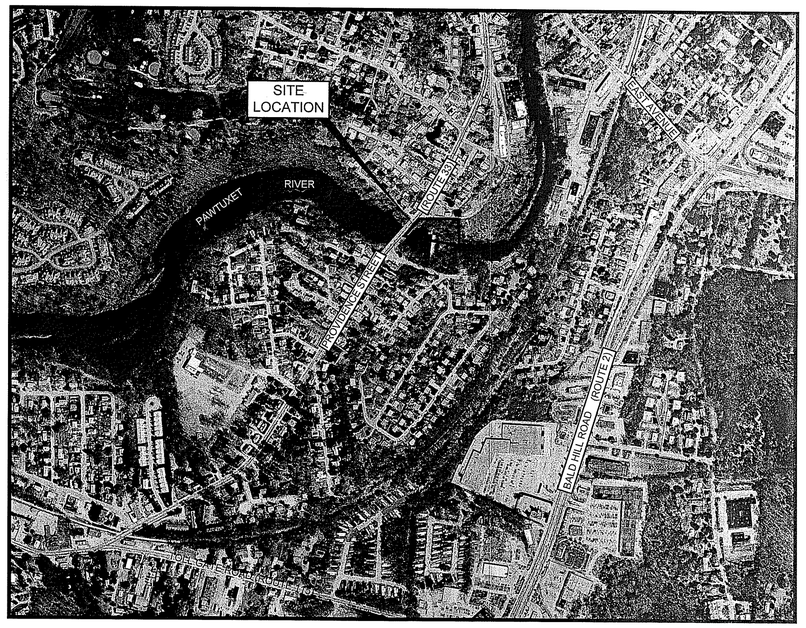
HYDROPOWER FACILITY DESIGNER / OPERATOR
NEW ENGLAND HYDROPOWER COMPANY, LLC
P.O. BOX 5524
BEVERLY FARMS, MA 01915
P: (978) 360-2547

DESIGN ENGINEER
FUSS & O'NEILL, INC.
317 IRON HORSE WAY, SUITE 204
PROVIDENCE, RI 02908
P: 401-861-3070

FISHWAY DESIGN CONSULTANT
DQ ENGINEERING
11 HICKORY LANE
WALPOLE, MA 02081
P: 508-668-9384

PERMITTING BIOLOGIST
NATURAL RESOURCE SERVICES, INC.
P.O. BOX 311
HARRISVILLE, RI 02830
P: 401-568-7390

LAND SURVEYOR
DAVID D. GARDNER & ASSOCIATES, INC.
200 METRO CENTER BOULEVARD
WARWICK, RI 02886
P: (401) 738-3200



LOCATION MAP
SCALE: 1" = 500'

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
FRESHWATER WETLANDS PROGRAM
APPROVED WITH CONDITIONS
AS SPECIFIED IN THE LETTER OF APPROVAL
DATED JUL 2 2014 FILE # 13-0208
NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL
APPROVED PLANS MUST BE AT CONSTRUCTION SITE

Environmental Management
APR - 8 2014
Office of Water Resources

PHILIP W. MORESCHI
No. 7428
REGISTERED PROFESSIONAL ENGINEER (CIVIL)

Date Signed:
February 3, 2014

PROJ. No.: 20121867.B10
DATE: DECEMBER 2013

GI-001
SHEET 1 OF 17

LEGEND

Symbol	Description
⌒⌒⌒⌒⌒	EDGE OF WOODS
—— o ——	CHAIN LINK FENCE
—— W ——	WATER MAIN
—— G ——	GAS MAIN
—— E ——	ELECTRIC
⌒⌒— T ——	COMMUNICATIONS LINE
— — — — —	EXISTING CONTOUR
- - - - - - - -	EDGE OF PAVEMENT
. . . .	OVERHEAD WIRES
⍉	UTILITY POLE
Ⓓ	DRAINAGE MANHOLE
□	CATCHBASIN
Ⓢ	SANITARY SEWER MANHOLE
•WG	GATE VALVE
SD(4.7')	SEDIMENT DEPTH
—— LOD ——	LIMIT OF DISTURBANCE/CONTRACT LIMIT
▬▬▬▬▬	BIODEGRADABLE COIR ROLL
▭▭▭	BULKBAGS

TREE LEGEND

BC	BLACK CHERRY
SYC	SYCAMORE
RO	RED OAK
PO	PIN OAK
WO	WHITE OAK
ELM	AMERICAN ELM
SM	SILVER MAPLE
NM	NORWAY MAPLE
BE	BOX ELDER
WA	WHITE ASH
BL	BLACK LOCUST
BG	BLACK GUM
RM	RED MAPLE
MUL	MULBERRY

GENERAL NOTES:

1. SURVEY:
EXISTING SITE CONDITIONS, INCLUDING TOPOGRAPHIC CONTOURS AND PROPERTY BOUNDARIES WITHIN THE IMMEDIATE PROJECT AREA, ARE BASED UPON AN ON-GROUND SURVEY PERFORMED BY DAVID D. GARDNER & ASSOCIATES, INC IN AUGUST 2013. THIS SURVEY AND PLAN CONFORMS TO A CLASS I STANDARD FOR BOUNDARY AND A CLASS III STANDARD FOR TOPOGRAPHY AS ADOPTED BY THE RHODE ISLAND BOARD OF REGISTRATION FOR PROFESSIONAL LAND SURVEYORS.

2. FLOODZONE:
FLOODPLAIN AND FLOODWAY INFORMATION REFLECTED WITHIN THIS PLAN SET WAS INITIALLY OBTAINED FROM THE D-FIRM DATABASE FOR KENT COUNTY, RHODE ISLAND AS REFLECTED ON FIRM NUMBER 44003C0128G DATED DECEMBER 3, 2010. THE FLOODPLAIN AND FLOODWAY BOUNDARIES WERE THEN ADJUSTED (BY FUSS & O'NEILL) TO CONFORM TO TOPOGRAPHIC (ACTUAL GROUND) ELEVATIONS OBTAINED FROM THE DETAILED SURVEY.

3. WETLANDS:
WETLAND FLAGGING ALONG THE RIVER AND WITHIN THE PROJECT SITE WAS PERFORMED BY NATURAL RESOURCE SERVICES, INC. ON AUGUST 29, 2013 AND SEPTEMBER 4, 2013; AND SUBSEQUENTLY FIELD LOCATED BY DAVID D. GARDNER & ASSOCIATES, INC.

4. UTILITIES:
THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES SHOWN ARE APPROXIMATE ONLY AND HAVE NOT YET BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES PRIOR TO COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MAY BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. THE CONTRACTOR IS TO CONTACT 'DIG SAFE' AT 811, 72-HOURS EXCLUSIVE OF WEEKENDS AND HOLIDAYS PRIOR TO ANY EXCAVATION PERFORMED ON SITE.

5. SUBSURFACE INVESTIGATION:
BORINGS WERE CONDUCTED UNDER THE SUPERVISION OF FUSS & O'NEILL ON JULY 23-26, 2013. A DESCRIPTION OF MATERIALS ENCOUNTERED AND DEPTHS TO LEDGE AS ENCOUNTERED DURING EXCAVATION ARE REFLECTED ON SHEETS CX-101 AND CX-102 "BORING LOG PROFILES."

GENERAL CONSTRUCTION REQUIREMENTS

1. THE CONTRACTOR SHALL VERIFY THE PROPOSED LAYOUT OF WITH ITS RELATIONSHIP TO THE EXISTING SITE SURVEY. THE CONTRACTOR SHALL ALSO VERIFY ALL DIMENSIONS, SITE CONDITIONS, AND MATERIAL SPECIFICATIONS AND SHALL NOTIFY THE OWNER AND ENGINEER OF ANY ERRORS, OMISSIONS OR DISCREPANCIES BEFORE COMMENCING OR PROCEEDING WITH WORK.
2. THE LOCATION OF EXISTING UTILITIES ARE APPROXIMATE, HAVE BEEN PLOTTED FROM THE LATEST AVAILABLE INFORMATION, AND MAY NOT BE ALL INCLUSIVE. THE CONTRACTOR SHALL CHECK AND VERIFY THE LOCATIONS OF ALL EXISTING UTILITIES, BOTH OVERHEAD AND UNDERGROUND, AND "DIG-SAFE" MUST BE NOTIFIED PRIOR TO COMMENCING ANY CONSTRUCTION OPERATIONS. RESTORATION AND REPAIR OF DAMAGE TO EXISTING UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR WITH NO ADDITIONAL COST TO THE OWNER. NO EXCAVATION SHALL COMMENCE UNTIL ALL INVOLVED UTILITY COMPANIES AND/OR TOWN WHOSE FACILITIES MIGHT BE AFFECTED BY ANY WORK TO BE PERFORMED BY THE CONTRACTOR ARE NOTIFIED AT LEAST 72 HOURS IN ADVANCE. RELOCATION OF ANY UTILITIES SHALL BE AT THE OWNERS EXPENSE AND COMPLETED WITH THE UTILITY WORK. THE OWNER SHALL BE NOTIFIED AS TO THE RELOCATIONS REQUIRED PRIOR TO THE START OF CONSTRUCTION.
3. DEVIATIONS OR CHANGES FROM THESE PLANS WILL NOT BE ALLOWED UNLESS APPROVED BY THE ENGINEER/CONTRACT OWNER.
4. THE OWNER AND/OR CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL LOCAL PERMITS, INSPECTIONS, BONDS, ETC. AND OTHER APPROVAL RELATED ITEMS ASSOCIATED WITH THE TOWN OF WEST WARWICK, NATIONAL GRID, THE CITY OF WARWICK, AND RIDOT. NO CONSTRUCTION SHALL COMMENCE UNTIL SUCH PERMITS HAVE BEEN SECURED.
5. METHODS AND MATERIALS USED IN THE CONSTRUCTION OF IMPROVEMENTS FOR THIS PROJECT WITHIN THE STATE RIGHT-OF-WAY (ROUTE 33) SHALL CONFORM TO THE CURRENT CONSTRUCTION STANDARDS AND SPECIFICATIONS OF THE RHODE ISLAND DEPARTMENT OF TRANSPORTATION.
6. THE CONTRACTOR SHALL MAKE EXPLORATORY EXCAVATIONS AND LOCATE ANY EXISTING UTILITIES SUFFICIENTLY AHEAD OF CONSTRUCTION TO PERMIT REVISIONS TO PLANS IF NECESSARY. HOWEVER, EXPLORATORY EXCAVATIONS AND OTHER ACTIVITIES INVOLVING SOIL DISTURBANCES WITHIN THE RIVER OR OTHER ADJACENT WATERCOURSES SHALL BE LIMITED TO THE LOW--FLOW PERIOD (I.E. THE PERIOD FROM JULY 1 TO OCTOBER 31 OF ANY CALENDAR YEAR).
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING, WITH MATCHING MATERIALS, ANY PAVEMENT, WALKS, CURBS, ETC., THAT MUST BE CUT OR THAT ARE DAMAGED DURING CONSTRUCTION.
8. AN APPROVED SET OF PLANS AND ALL APPLICABLE PERMITS MUST BE AVAILABLE AT THE SITE THROUGH THE ENTIRE PERIOD OF CONSTRUCTION.
9. CONTRACTOR AGREES THAT HE/SHE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE CONTRACT OWNER, PROPERTY OWNER (KENYON INDUSTRIES, INC.) AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL AND ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM "THE SOLE NEGLIGENCE OF THE CONTRACT OWNER, PROPERTY OWNER OR THE ENGINEER."
10. VEHICLE FUELING SHALL NOT TAKE PLACE WITHIN REGULATED WETLANDS OR BUFFER ZONE AREAS, OR WITHIN 50-FEET OF ADJACENT STORM DRAIN SYSTEMS.
11. ALL TRAFFIC CONTROL UTILIZED WITHIN THE ROUTE 33 RIGHT-OF-WAY (IF DETERMINED NECESSARY) SHALL CONFORM TO THE LATEST EDITION OF THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (INCLUDING ALL REVISIONS) AND THE LATEST EDITION OF THE RIDOT STANDARD SPECIFICATIONS FOR ROAD BRIDGE CONSTRUCTION (INCLUDING ALL REVISIONS AND CURRENT ADDENDA).

STORMWATER MAINTENANCE PROGRAM

1. REPAIRS OR REPLACEMENT OF THE STORMWATER BEST MANAGEMENT PRACTICES (BMPs) SHALL BE DONE WITHIN 30 DAYS OF DEFICIENCY REPORTS. IF AN EMERGENCY SITUATION IS IMMINENT THEN REPAIR/REPLACEMENT MUST BE DONE IMMEDIATELY TO AVERT FAILURE OR DANGER TO NEARBY RESIDENTS.
2. THE OWNER SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF THE STORMWATER MANAGEMENT SYSTEM ONCE CONSTRUCTION IS COMPLETE.
3. DURING CONSTRUCTION, THE PERMEABLE DRIVEWAY SHALL NEVER SERVE AS A TEMPORARY SEDIMENT CONTROL DEVICE. THE PERMEABLE DRIVEWAY SHALL BE INSTALLED AS NEAR TO THE END OF CONSTRUCTION AS POSSIBLE TO PREVENT CLOGGING. THE CONTRACTOR IS RESPONSIBLE FOR RESTORING THE PERMEABLE DRIVEWAY SHOULD CLOGGING OR DAMAGE OCCUR. FOLLOWING CONSTRUCTION, THE FOLLOWING INSPECTION AND MAINTENANCE PROGRAM IS REQUIRED FOR THE PERMEABLE DRIVEWAY:
   - EXPOSED RINGS: INSPECT THE PERMEABLE DRIVEWAY QUARTERLY FOR THE PURPOSE OF IDENTIFYING AREAS OF MISSING SURFACE MATERIAL. IF THE RINGS OF THE GRAVELPAVE2 SYSTEM BECOME EXPOSED EXCESS GRAVEL IN SURROUNDING AREAS SHOULD BE BROOMED OR RAKED INTO THE AREA WITH POOR COVERAGE. DO NOT REPAVE OR RESEAL WITH IMPERMEABLE MATERIALS.
   - POT HOLES: INSPECT THE PERMEABLE DRIVEWAY QUARTERLY FOR THE PURPOSE OF IDENTIFYING AREAS OF POT HOLES. IF POT HOLES OCCUR DUE TO INADEQUATE BASE PREPARATION OR SETTLEMENT THAN GRAVEL SHOULD BE REMOVED FROM THE AFFECTED SECTION VIA VACUUMING AND THE SNAP FASTENERS SHOULD BE UNFASTENED. THE BASE SHOULD BE BROUGHT UP TO THE PROPER GRADE AND COMPACTION, THE GRAVEPAVE2 PIECES SHOULD BE RESET AND ANCHORED, AND REFILL THE RINGS WITH THE SPECIFIED SURFACE MATERIAL.
   - TIRE OR PLOW DAMAGE: PROPER SNOW PLOWING TECHNIQUES TO BE UTILIZED WITH THE GRAVEPAVE2 SYSTEM CONSIST OF USING A STANDARD TRUCK-MOUNTED SNOW PLOT WITH EITHER SMALL SKIDS ON THE CORNER OF THE BLADES OR ROLLERS TO KEEP THE BLADE OFF THE SURFACE APPROXIMATELY ONE INCH. AVOID LONG-TERM PILEUP OF SNOW ON GRAVELPAVE2 SURFACES TO AVOID CONCENTRATED SEDIMENTATION ACCUMULATION. SHOULD THE GRAVELPAVE2 SYSTEM BE DAMAGED BY VEHICLES OR PLOWING, THE GRAVELPAVE2 SYSTEM MAY BE REUSED IF THE DAMAGE DOES NOT SIGNIFICANTLY AFFECT THE SHAPE AND STRENGTH FO THE PARTS; OTHERWISE NEW PARTS WILL NEED BE USED. TO REPAIR, RE-LEVEL AND COMPACT THE BASE COURSE AND THEN RE-ANCHOR AND REFILL THE RINGS.
   - WINTER SAND/SALT USAGE: MINIMIZE THE USE OF SAND AND/OR SALT IN THE WINTER.
   - MOWING AND SEEDING OF ADJACENT AREAS: MOW UPGRADIENT CONTRIBUTING PERVIOUS DRAINAGE AREAS AND SEED ANY BARE AREAS AT LEAST THREE TIMES PER YEAR DURING THE GROWING SEASON.
   - LEAVE/LITTER REMOVAL: THE GRAVELPAVE2 SURFACE TO BE INSTALLED REQUIRES THAT LEAVES AND/OR GARBAGE BE RAKED OR REMOVED WITH A BLOWER AT A MINIMUM OF EVERY THREE MONTHS (QUARTERLY) AND WHEN ADDITIONALLY NECESSARY AS TO NOT ALLOW THE DECAY OF SUCH MATERIAL ON THE SURFACE WHICH CAN STIMULATE WEED GROWTH AND REDUCE POROSITY. ADDITIONALLY, OCCASIONAL WEEDS SHOULD BE SPRAYED WITH A WEED KILLER AND REMOVED WHEN DEAD.
   - PROPER DRAINAGE (STANDING WATER): MONITOR THE PERMEABLE DRIVEWAY SURFACE TO ENSURE THAT IT IS PROPERLY DRAINING. INSPECT THE SURFACE QUARTERLY FOR THE PRESENCE OF STANDING WATER. DURING THE FIRST SIX MONTHS FOLLOWING CONSTRUCTION, THE PERMEABLE DRIVEWAY MUST BE INSPECTED AT LEAST TWICE (OR MORE) FOLLOWING PRECIPITATION EVENTS OF AT GENERATING AT LEAST 1.0 INCHES OF RAINFALL TO ENSURE THE SYSTEM IS FUNCTIONING PROPERLY. THEREAFTER, INSPECTIONS MUST BE CONDUCTED QUARTERLY AND AFTER STORM EVENTS OF GREATER THAN OR EQUAL THE 1-YEAR, 24-HOUR TYPE III PRECIPITATION EVENT (OR EVENT THAT GENERATES 2.7 INCHES OF RAINFALL OR MORE OVER A 24-HOUR PERIOD).
4. THE FOLLOWING INSPECTION AND MAINTENANCE PROGRAM IS REQUIRED FOR THE VEGETATED FILTER STRIP:

   THE VEGETATED FILTER STRIP SHALL BE INSPECTED AT LEAST QUARTERLY WITH MAINTENANCE BEING PERFORMED AS FOLLOWS:
   - EROSION: EVIDENCE OF EROSION AND CONCENTRATED FLOWS WITHIN THE VEGETATED FILTER STRIP MUST BE CORRECTED IMMEDIATELY. ERODED SPOTS MUST BE RE-VEGETATED IN ACCORDANCE WITH THE SITE RESTORATION PLAN.
   - SEDIMENT REMOVAL: ACCUMULATED SEDIMENTS SHOULD BE REMOVED AT A MINIMUM OF ONCE PER YEAR OR WHEN SEDIMENT DEPOSITION CAUSES A CHANGE IN THE GRADE ELEVATION. RESEEDING MAY BE NECESSARY TO REPAIR AREAS DAMAGED DURING THE SEDIMENT REMOVAL PROCESS.
   - MOWING: THE GRASSED VEGETATED FILTER STRIP MUST BE MOWED THREE TIMES ANNUALLY (DURING THE GROWING SEASON) LEAVING VEGETATION FOUR TO SIX INCHES IN HEIGHT.
   - LEAVE/LITTER REMOVAL: LEAVES AND/OR GARBAGE SHALL BE RAKED OR REMOVED WITH A BLOWER AT A MINIMUM OF EVERY THREE MONTHS (QUARTERLY) AND WHEN ADDITIONALLY NECESSARY.
5. THE FOLLOWING MAINTENANCE IS REQUIRED FOR THE STONE RIPRAP SLOPE PROTECTION:
ONCE RIPRAP HAS BEEN INSTALLED, IT SHOULD REQUIRE VERY LITTLE MAINTENANCE. RIPRAP SHALL BE INSPECTED QUARTERLY TO DETERMINE IF HIGH FLOWS HAVE CAUSED SCOUR BENEATH THE RIPRAP OR DISLODGED ANY OF THE STONE. IN LOCATIONS WHERE GROUT HAS BEEN APPLIED TO THE RIPRAP SLOPE PROTECTION, CHECK CONDITION OF GROUT FOR DAMAGE/CRACKING. REPAIRS SHOULD BE ACCOMPLISHED IMMEDIATELY. ADDITIONALLY, THE GROUTED RIPRAP SLOPE PROTECTION AREA REQUIRES THE INSTALLATION OF UNDERDRAINS/WEEP HOLES TO RELIEVE HYDROSTATIC PRESSURE. THE OUTLETS OF THESE PIPES SHOULD BE INSPECTED TO ENSURE THAT THERE ARE NO BLOCKAGES. IF BLOCKAGES ARE NOTED, THE DEBRIS/BLOCKAGE MUST BE REMOVED IMMEDIATELY.

   THE CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE AND INSPECTION UNTIL CONSTRUCTION IS COMPLETED OR UNTIL IT IS ACCEPTED BY THE OWNER. THE OWNER IS RESPONSIBLE THEREAFTER.
6. DISPOSAL OF THE ACCUMULATED SEDIMENT AND HYDROCARBONS MUST BE IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, AND FEDERAL GUIDELINES AND REGULATIONS.

GENERAL SITE DEMOLITION AND WATER CONTROL CONSTRUCTION NOTES

1. PROPOSED IMPROVEMENTS SHALL TAKE PLACE IN THE SEQUENCE OUTLINED IN THE PROPOSED SEQUENCE OF CONSTRUCTION ON THE "WATER CONTROL & CONSTRUCTION SEQUENCING PLAN."
2. IT IS ANTICIPATED THAT CONSTRUCTION WILL BEGIN IN MAY OF 2014 AND END IN NOVEMBER 2014. ALL WORK WITHIN THE RIVER (I.E. SOIL DISTURBANCES WITHIN THE WATERCOURSE) SHALL BE PERFORMED WITHIN THE SEASONAL LOW-FLOW PERIOD (JULY 1 – OCTOBER 31). RIDEM SHALL BE NOTIFIED IF ANY IN-CHANNEL WORK BEFORE OR AFTER THIS PERIOD IS REQUIRED AT LEAST 10 CALENDAR DAYS BEFORE SUCH WORK OCCURS.
3. THE TEMPORARY COFFERDAM SYSTEMS MUST BE MAINTAINED TO ALLOW A DRY WORKING CONDITION (NO SEDIMENT PLUME) IN THE WATERCOURSE. SOIL DISTURBANCE WITHIN THE WATERCOURSE MUST TEMPORARILY CEASE IN THE EVENT OF ANY ABNORMALLY HIGH STORMWATER RUNOFF EVENT IF A DRY WORKING CONDITION CANNOT BE MAINTAINED WITH THE USE OF WATER PUMPS OR OTHER MEANS.
4. EXCAVATED SEDIMENT AND OTHER EXCESS MATERIALS WITHIN THE RIVER CHANNEL AND DOWNSTREAM TURBINE DISCHARGE EXCAVATION AREAS MUST BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY. CUT STONE AND ROCK RUBBLE FMAY BE USED ON SITE IF IT IS FOUND TO COMPLY WITH THE SPECIFICATIONS. ALL EXCESS MATERIALS GENERATED BY THE PROJECT MUST BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY.
5. CONTRACTOR SHALL PROTECT THE EXISTING MASONRY WALLS WITHIN AND ADJACENT TO THE PROJECT SITE WHICH ARE SCHEDULED TO REMAIN. ANY DAMAGE TO SUCH STRUCTURES SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER AND OWNER, AND AT THE CONTRACTOR'S SOLE EXPENSE.
6. THE USE OF THE OFF-SITE STORAGE/STAGING AREA ON LOT 74 OF PLAT 41 IN WEST WARWICK SHALL BE COORDINATED WITH THE PROPERTY OWNER, JACK'S TOWING, INC., PRIOR TO CONSTRUCTION.
7. THE CONTRACTOR SHALL PROTECT CONSTRUCTED WORK WITHIN COFFERDAMMED AREAS THAT COULD POTENTIALLY BECOME INUNDATED DURING FLOOD EVENTS.
8. TEMPORARY COFFERDAM(S) ARE TO BE CONSTRUCTED OF MATERIALS THAT CAN BE COMPLETELY REMOVED FROM THE RIVER UPON COMPLETION OF CONSTRUCTION. REMOVAL OF THE TEMPORARY COFFERDAM(S) SHALL BE CONDUCTED IN A CONTROLLED MANNER.
9. ACCESS, STAGING AND TEMPORARY SEDIMENT STOCKPILING AREAS NOT INDICATED ON THE PLANS SHALL BE DELINEATED BY THE CONTRACTOR FOR APPROVAL PRIOR TO PROJECT INITIATION. ALL DISTURBED AREAS OUTSIDE MODIFIED CHANNEL BANKS SHALL BE STABILIZED AND SUITABLY RESTORED AS INDICATED ON THE IN-STREAM & RIPARIAN HABITAT RESTORATION PLAN, OR AS OTHERWISE DIRECTED BY THE ENGINEER.
10. VEHICLE STORAGE AND FUELING SHALL BE PERFORMED AT LEAST 50' OUTSIDE THE RIVER CHANNEL AND ONLY IN DESIGNATED AREAS SUCH THAT THERE WILL BE NO CONTAMINATION OF SOIL, GROUNDWATER OR SURFACE WATER FROM SPILLS OR LEAKS.
11. PRIOR TO CONSTRUCTION, ACCESS AND CONSTRUCTION EASEMENTS WILL BE SECURED BY WOOD-PAWCATUCK WATERSHED ASSOCIATION (WPWA) WHERE ACCESS AND CONSTRUCTION WILL BE REQUIRED ON PRIVATE PROPERTIES SHOWN HEREIN.

VEGETATIVE RESTORATION NOTES

1. RESTORE DISTURBED AREAS TO SMOOTH GRADES AS INDICATED ON THE PLANS TO PROMOTE UNIMPEDED DRAINAGE AND OPTIMUM VEGETATIVE GROWTH.
2. PERMANENT VEGETATIVE COVER WILL BE APPLIED TO ALL DISTURBED AREAS THAT HAVE REACHED FINISHED GRADE AS SOON AS POSSIBLE, BUT NOT MORE THAN FOURTEEN (14) DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT AREA HAS PERMANENTLY CEASED. THE RECOMMENDED PERMANENT SEEDING DATES ARE APRIL 1 TO JUNE 15 AND AUGUST 15 TO OCTOBER 15. CONTRACTOR SHALL BE RESPONSIBLE FOR CARE, MAINTENANCE OF REPLACEMENT OF PLANTINGS TO ENSURE VIABILITY WITHIN THE WARRANTY/CORRECTION PERIOD, INCLUDING BUT NOT LIMITED TO WATERING AND PROTECTION FROM VEHICLE/EQUIPMENT TRAFFIC.
3. PERMANENT VEGETATIVE COVER WILL CONSIST OF A CONSERVATION SEED MIX IN THE LOCATIONS SPECIFIED ON THE "SITE RESTORATION PLAN" IN ADDITION TO TREE PLANTINGS ALSO SPECIFIED ON THAT PLAN. REFER TO THE "SITE RESTORATION PLAN" FOR SEED MIXTURE COMPOSITIONS; APPLICATION RATES; AND TREE SPACING REQUIREMENTS.
4. IN ANY AREAS WHERE IT IS DETERMINED THAT EROSION CONTROL MATTING MUST BE INSTALLED (e.g. WITHIN THE VEGETATIVE FILTER STRIP AREA), APPLY SEED BEFORE INSTALLATION OF EROSION CONTROL MATTING. ONE (1) INCH LAYER OF TOPSOIL MUST THEN BE SPREAD OVER SEED AND MATTING SUBSEQUENT TO INSTALLATION OF MATTING.

EROSION CONTROL NOTES (DURING CONSTRUCTION)

1.) DISTURBANCE OF SOIL SURFACES IS REGULATED BY STATE LAW AND LOCAL ORDINANCE. APPROVAL FROM RIDEM FRESHWATER WETLANDS AND RIPDES SECTIONS ARE REQUIRED. ALL WORK SHALL COMPLY WITH THE FOLLOWING CRITERIA AND ISSUED PERMIT CONDITIONS TO PREVENT OR MINIMIZE SOIL EROSION.

2.) THE INSTALLATION AND MAINTENANCE OF EROSION CONTROL DEVICES IS THE RESPONSIBILITY OF THE CONTRACTOR. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES, THE CONTRACTOR SHALL INSTALL ALL EROSION AND SEDIMENT CONTROL DEVICE AS SHOWN ON THE PLANS, OR AS DICTATED BY THE RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT AND THE TOWNS OF RICHMOND AND CHARLESTOWN. ALL EROSION CONTROL DEVICES SHALL BE MAINTAINED IN EFFECTIVE CONDITION THROUGHOUT CONSTRUCTION.

3.) THE CONTRACTOR SHALL USE THE LATEST EDITION OF THE "STATE OF RHODE ISLAND SOIL EROSION AND SEDIMENT CONTROL HANDBOOK" AS A GUIDE IN CONSTRUCTING THE EROSION AND SEDIMENT CONTROLS INDICATED ON THE PLANS. ALL EROSION AND SEDIMENT CONTROL MEASURES OR WORKS AND REHABILITATION MEASURES MUST CONFORM TO OR EXCEED THE SPECIFICATIONS OR STANDARDS SET OUT IN THIS HANDBOOK.

4.) THE CONTRACTOR SHALL INSPECT EROSION AND SEDIMENT CONTROL DEVICES AT THE END OF EACH WORKING DAY, AFTER EACH STORM EVENT, AND AT LEAST DAILY DURING PROLONGED RAINFALL. REPAIR OR REPLACEMENT SHOULD BE MADE PROMPTLY AS NEEDED.

5.) THE CONTRACTOR IS RESPONSIBLE FOR THE TIMELY INSTALLATION, INSPECTION, MAINTENANCE, AND/OR REPLACEMENT OF ALL TEMPORARY AND PERMANENT EROSION CONTROL DEVICES TO ENSURE PROPER OPERATION THROUGHOUT THE LIFE OF THE PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE OF PERMANENT MEASURES UNTIL CONSTRUCTION OF THE PROJECT IS COMPLETED OR UNTIL IT IS ACCEPTED BY THE CONTRACT OWNER. THE CONTRACT OWNER IS RESPONSIBLE THEREAFTER.

6.) IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CLEAN ROADS, CONTROL DUST, AND TAKE ALL NECESSARY MEASURES TO ENSURE THAT THE SITE AND ALL ADJACENT ROADS BE MAINTAINED IN A MUD- AND DUST-FREE CONDITION AT ALL TIMES THROUGHOUT THE LIFE OF THE CONTRACT. DUST CONTROL SHALL INCLUDE, BUT IS NOT LIMITED TO, WATER AND/OR CRUSHED STONE. DURING CONSTRUCTION, STOCKPILES SHALL BE COVERED AT THE END OF EACH DAY WITH A MINIMUM OF THREE-INCH POLY TO NOT ONLY CONTROL DUST, BUT TO REDUCE THE TRANSPORT OF SEDIMENT DURING PRECIPITATION EVENTS. ANY TRACKED OR FLOWING SEDIMENT THAT IS CONVEY FROM STOCKPILE AREAS SHALL BE SWEPT UP AND SECURED. CONSTRUCTION EQUIPMENT SHALL ALSO BE SWEPT PRIOR TO LEAVING THE CONSTRUCTION PROJECT SITE FOR DUST CONTROL PURPOSES.

7.) ALL PROPOSED CONSTRUCTION ENTRANCES SHALL BE CONSTRUCTED AS SHOWN ON THE PLANS AND DETAILS. ALL VEHICLE TRAFFIC ENTERING OR EXITING THE PROJECT SITE SHALL PASS OVER THE CONSTRUCTION ENTRANCES TO REDUCE THE TRACKING OR FLOWING OF SEDIMENT ONTO THE SURROUNDING ROADWAYS. ENTRANCES SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO THE SURROUNDING ROADWAYS. THIS WILL REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO THE SURROUNDING ROADWAYS MUST BE REMOVED IMMEDIATELY. ADDITIONAL ENTRANCES FOR CONSTRUCTION PHASING SHALL BE INSTALLED AS REQUIRED TO PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO ROADWAYS.

8.) THE CONTRACTOR SHALL INSTALL ALL PERIMETER SEDIMENT CONTROL BARRIERS (I.E. COIR ROLLS) AS SHOWN ON THE PLANS. A ROW OF STAKED COIR ROLLS SHALL ALSO BE INSTALLED AROUND ANY SOIL STOCKPILE AREAS.

9.) THE CONTRACTOR SHALL RESTORE DISTURBED AREAS AS INDICATED ON THE PLANS. OTHER AREAS DAMAGED DURING CONSTRUCTION SHALL BE RESEEDED OR OTHERWISE RESTORED TO THEIR ORIGINAL STATE AS CLOSELY AS POSSIBLE. TREES AND OTHER EXISTING VEGETATION NOT PROPOSED TO BE DEMOLISHED SHALL BE RETAINED AS INDICATED ON THE PLANS.

10.) TEMPORARY VEGETATIVE COVER SHALL BE APPLIED TO ANY DISTURBED AREAS (INCLUDING SOIL STOCKPILE AREAS) THAT HAVE NOT YET REACHED FINISHED GRADE AS SOON AS POSSIBLE, BUT NOT MORE THAN FOURTEEN (14) DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT AREA HAS TEMPORARILY CEASED, UNLESS THE ACTIVITY IS TO RESUME WITHIN TWENTY-ONE (21) DAYS. THE RECOMMENDED TEMPORARY SEEDING DATES ARE MARCH 15 TO NOVEMBER 15 WITH APPROVAL OF THE ENGINEER.

TEMPORARY VEGETATIVE COVER SHALL CONSIST OF 40% OF ANNUAL RYEGRASS AND 60% OF PERENNIAL RYEGRASS (RIDOT M18.10.5). ANNUAL OR PERENNIAL RYEGRASS SHALL BE PLANTED AT A RATE OF 75 LBS/ACRE (BY HAND) OR 85 LBS/ACRE (BY HYDROSEEDER).

LIMESTONE AND A SLOW RELEASE FERTILIZER SHALL BE APPLIED ACCORDING TO SOIL TEST RECOMMENDATIONS OFFERED BY THE UNIVERSITY OF RHODE ISLAND SOIL TESTING LABORATORY. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TIMING IS CRITICAL, SLOW RELEASE FERTILIZER MAY BE APPLIED AT THE RATE OF 650 POUNDS PER ACRE OF 10-10-10 OR EQUIVALENT. APPLY LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) AS FOLLOWS: 2 TONS PER ACRE (OR 90 POUNDS PER 1,000 SQUARE FEET).

11.) PERMANENT VEGETATIVE COVER SHALL BE APPLIED TO ALL DISTURBED AREAS THAT HAVE REACHED FINISHED GRADE AS SOON AS POSSIBLE, BUT NOT MORE THAN FOURTEEN (14) DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT AREA HAS PERMANENTLY CEASED. THE RECOMMENDED PERMANENT SEEDING DATES ARE APRIL 1 TO MAY 31 AND AUGUST 15 TO OCTOBER 15.

WITH EXCEPTION TO THE OFF-SITE TEMPORARY CONSTRUCTION STAGING/STORAGE AREA, PERMANENT VEGETATIVE COVER WILL CONSIST OF A CONSERVATION SEED MIX (FREE OF INVASIVE SPECIES) AS SPECIFIED ON THE "SITE RESTORATION PLAN" IN ADDITION TO TREE PLANTINGS ALSO SPECIFIED ON THAT PLAN. REFER TO THE "SITE RESTORATION PLAN". FOR SEED MIXTURE COMPOSITIONS, APPLICATION RATES AND TREE/SHRUB SPACING REQUIREMENTS.

GRASSED AREAS WITHIN THE OFF-SITE TEMPORARY CONSTRUCTION STAGING/STORAGE AREA THAT ARE DISTURBED BY CONSTRUCTION SHALL BE SEEDED WITH A TYPE-1 PARK SEED MIX (RIDOT M.18.10) CONSISTING OF 70% CREEPING RED FESCUE, 15% KENTUCKY BLUEGRASS, AND 15% PERENNIAL RYE GRASS. THIS MIX SHALL BE APPLIED AT A RATE OF 250 LBS. PER ACRE.

LIMESTONE AND A SLOW RELEASE FERTILIZER SHALL BE APPLIED ACCORDING TO SOIL TEST RECOMMENDATIONS OFFERED BY THE UNIVERSITY OF RHODE ISLAND SOIL TESTING LABORATORY. IF SOIL TESTING IS NOT FEASIBLE ON SMALL OR VARIABLE SITES, OR WHERE TIMING IS CRITICAL, SLOW RELEASE FERTILIZER MAY BE APPLIED AT THE RATE OF 650 POUNDS PER ACRE OF 10-10-10 OR EQUIVALENT. APPLY LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) AS FOLLOWS: 2 TONS PER ACRE (OR 90 POUNDS PER 1,000 SQUARE FEET).

12.) IF SEEDING CANNOT BE COMPLETED IMMEDIATELY OR WITHIN THE RECOMMENDED SEEDING DATES, USE THE TEMPORARY MULCHING MEASURE TO PROTECT THE SITE AND DELAY SEEDING UNTIL THE NEXT RECOMMENDED SEEDING PERIOD. TEMPORARY MULCHING SHOULD BE PERFORMED AS SOON AS POSSIBLE, BUT NOT MORE THAN FOURTEEN (14) DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT AREA HAS TEMPORARILY CEASED UNLESS THE ACTIVITY IS TO RESUME WITHIN TWENTY-ONE (21) DAYS.

ALL MULCHES MUST BE INSPECTED PERIODICALLY, IN PARTICULAR AFTER RAINSTORMS, TO CHECK FOR RILL EROSION. WHERE EROSION IS OBSERVED, ADDITIONAL MULCH MUST BE APPLIED. IF NETTING IS USED, THE NET SHALL BE INSPECTED AFTER RAINSTORMS FOR DISLOCATION OR FAILURE. IF WASHOUTS OR BREAKAGE OCCUR, THE NET MUST BE REINSTALLED AS NECESSARY AFTER REPAIRING DAMAGE TO SLOPE. INSPECTIONS SHALL TAKE PLACE UNTIL GRASSES ARE FIRMLY ESTABLISHED. GRASS IS CONSIDERED TO BE FIRMLY ESTABLISHED AT A MINIMUM HEIGHT OF THREE (3) INCHES.

13.) STRAW OR HAY MULCH, WOOD FIBER MULCH, AND HYDROMULCH ARE RECOMMENDED. STRAW OR HAY MULCH SHALL BE APPLIED AT A RATE OF 2 TONS PER ACRE, WOOD FIBER MULCH SHOULD BE APPLIED AT A RATE OF 1,500-2,000 POUNDS PER ACRE, OR HYDROMULCH SHALL BE APPLIED AT A RATE OF 1,500 POUNDS PER ACRE. WOOD FIBER MULCH SHALL NOT BE USED ALONE IN THE WINTER OR DURING HOT, DRY WEATHER. STRAW OR HAY MULCH MUST BE ANCHORED IMMEDIATELY AFTER SPREADING TO PREVENT WINDBLOWING. MULCH ANCHORING SHALL ALSO BE USED ON SLOPES GREATER THAN THREE (3) PERCENT AND CONCENTRATED FLOW AREAS SUCH AS DIVERSION AND WATERWAY CHANNELS.

14.) WASTE DISPOSAL: MATERIALS WHICH COULD BE A POTENTIAL SOURCE OF STORMWATER POLLUTION SUCH AS GASOLINE, DIESEL FUEL, HYDRAULIC OIL, ETC., SHALL BE STORED AT THE END OF EACH DAY IN A STORAGE TRAILER OR COVERED LOCATION AND TAKEN OFF-SITE AND PROPERLY DISPOSED OF. ALL TYPES OF WASTE GENERATED AT THIS SITE SHALL BE DISPOSED OF IN A MANNER CONSISTENT WITH STATE LAW AND/OR REGULATIONS.

16.) CONTROL OF ALLOWABLE NON-STORMWATER DISCHARGES: IF ALLOWABLE NON-STORM WATER DISCHARGES ARE OCCURRING AT THE SITE, SUCH DISCHARGES SHALL BE VISUALLY OBSERVED AND RECORDED AS OUTLINED BELOW AND IN ACCORDANCE WITH PART II OF THE RIPDES GENERAL PERMIT. THE LIST OF EXPECTED SOURCES OF ALLOWABLE NON-STORM WATER DISCHARGES FOR THIS PROJECT ARE AS FOLLOWS: (1) DISCHARGE FROM VEHICLE WASHDOWN WHERE NO DETERGENTS ARE USED, (2) EXTERNAL BUILDING WASHDOWN WHERE NO DETERGENTS ARE USED, (3) THE USE OF WATER TO CONTROL DUST, (4) FIRE HYDRANT FLUSHINGS, (5) LAWN WATERING, (6) POTABLE WATER SOURCES INCLUDING WATERLINE FLUSHINGS, (8) IRRIGATION DRAINAGE, (9) PAVEMENT WASHWATERS WHERE SPILLS OR LEAKS OF TOXIC OR HAZARDOUS MATERIALS HAVE NOT OCCURRED (UNLESS ALL SPILLED MATERIALS HAVE BEEN REMOVED) AND WHERE NO DETERGENTS ARE USED, AND (10) FOUNDATION OR FOOTING DRAINS WHERE FLOWS ARE NOT CONTAMINATED WITH PROCESS SUCH AS SOLVENTS OR CONTAMINATED BY CONTACT WITH SOILS WHERE SPILLS OR LEAKS OF TOXIC OR HAZARDOUS MATERIALS HAS OCCURRED.

17.) GOOD HOUSEKEEPING: THE PROJECT SITE SHALL PROVIDE FOR THE MINIMIZATION OF EXPOSURE OF CONSTRUCTION DEBRIS (INCLUDING, BUT NOT LIMITED TO, INSULATION, WIRING, PAINTS AND PAINT CANS, SOLVENTS, WALL BOARD, ETC.) TO PRECIPITATION BY MEANS OF DISPOSAL AND/OR PROPER SHELTER OR COVER. CONSTRUCTION WASTE MUST BE PROPERLY DISPOSED OF IN ORDER TO AVOID EXPOSURE TO PRECIPITATION AT THE END OF EACH WORKING DAY.

18.) INSPECTION OF PERIMETER SEDIMENT BARRIERS (INCLUDING THOSE ENCOMPASSING SOIL STOCKPILE AREAS) SHALL BE MADE AFTER EACH STORM EVENT AND REPAIR OR REPLACEMENT SHOULD BE MADE PROMPTLY AS NEEDED. CLEANOUT OF ACCUMULATED SEDIMENT BEHIND THE BALES IS NECESSARY IF ONE-HALF OF THE ORIGINAL HEIGHT OF THE COIR ROLLS BECOMES FILLED WITH SEDIMENT.

19.) DURING CONSTRUCTION, STOCKPILES SHALL BE COVERED AT THE END OF EACH DAY WITH A MINIMUM OF THREE-INCH POLY, AND ANY TRACKED OR FLOWING SEDIMENT (FROM STOCKPILE AREAS) SHALL BE SWEPT UP AND SECURED. CONSTRUCTION EQUIPMENT SHALL BE SWEPT PRIOR TO LEAVING THE CONSTRUCTION PROJECT SITE.

POLLUTION PREVENTION AND SOURCE CONTROL NOTES (POST-CONSTRUCTION)

1. TRASH AND RECYCLING RECEPTACLES MUST BE PROVIDED WITH REGULAR COLLECTION AT THE FACILITY POST-CONSTRUCTION.
2. THE USE OF SAND/SALT FOR DE-ICING MUST BE USED AS MINIMALLY AS POSSIBLE TO AVOID IMPACTS TO THE PERMEABLE DRIVEWAY SYSTEM.
3. IF SAND AND DE-ICING CHEMICALS ARE USED, SUCH CHEMICALS MUST BE STORED UNDER COVER SO AS TO PREVENT EXPOSURE TO STORMWATER.
4. SNOW DISPOSAL SHALL NOT OCCUR IN THE LOCATION OF THE VEGETATED FILTER STRIP AREA OR WITHIN 50 FEET OF THE RIVER.

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
FRESHWATER WETLANDS PROGRAM
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AS SPECIFIED IN THE LETTER OF APPROVAL
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NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL
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Environmental Management
APR - 8 2014
Office of Water Resources

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.	2/3/2014	REVISIONS PER RIDEM FRESHWATER WETLAND 1/24/14 REVIEW COMMENTS		

SEAL

PHILIP W. MORESCHI
No. 7428
REGISTERED PROFESSIONAL ENGINEER (CIVIL)

Date Signed:
February 3, 2014

SCALE:
HORZ.: AS NOTED
VERT.:
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HORZ.:
VERT.:
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GRAPHIC SCALE

FUSS & O'NEILL
317 IRON HORSE WAY, SUITE 204
PROVIDENCE, RI 02908
401.861.3070
www.fando.com

WATER STREET LAND, LLC

GENERAL NOTES & LEGEND

NATICK POND DAM HYDROELECTRIC PROJECT

WEST WARWICK RHODE ISLAND

PROJ. No.: 20121867.B10
DATE: DECEMBER 2013

CN-001

SHEET 2 OF 17

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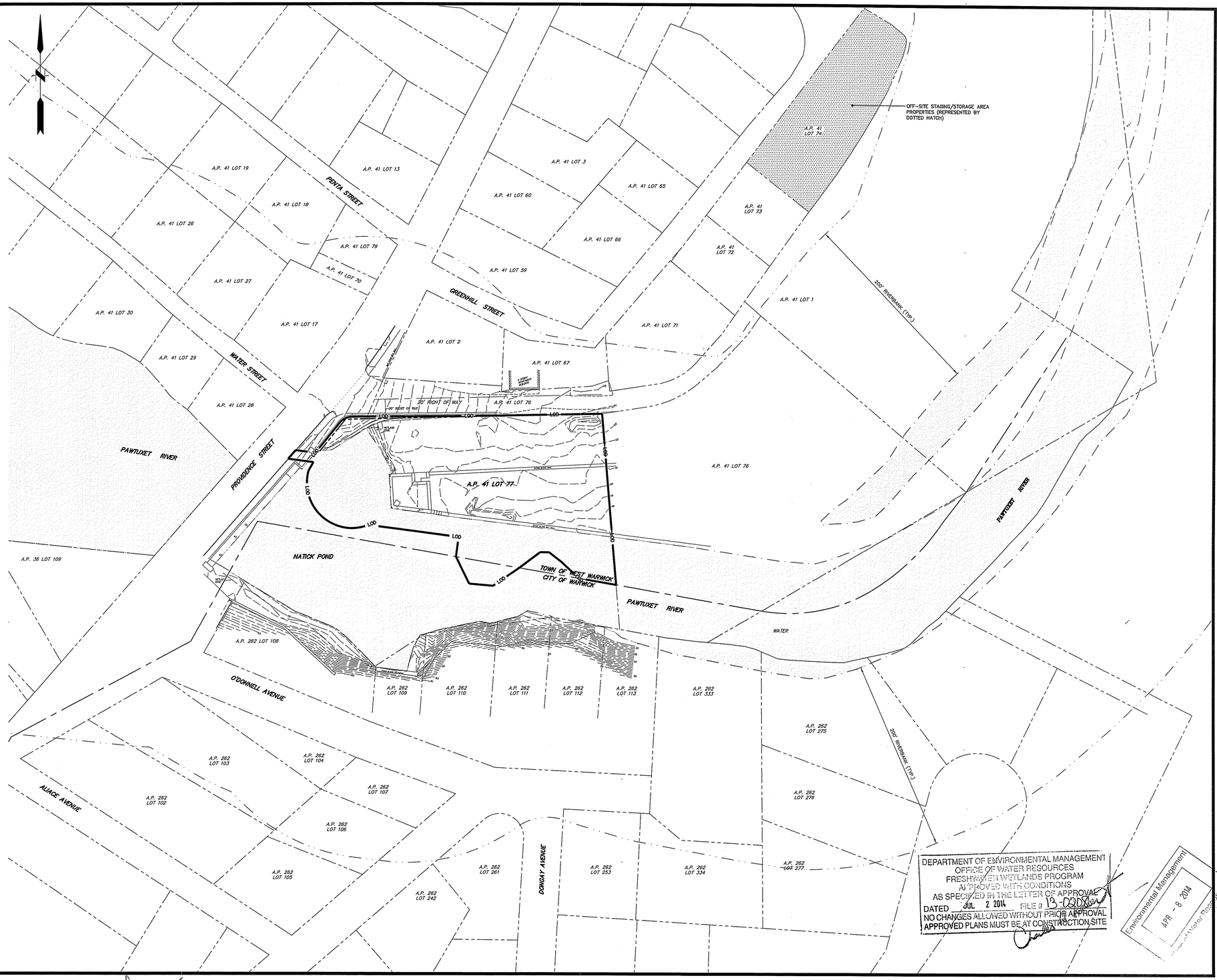
LEGEND

———	PROPERTY LINE
- - - - -	200' RADIUS
LOD	PROJECT LIMIT OF DISTURBANCE

NOTES:

1. PROPERTY BOUNDARIES ARE APPROXIMATE ONLY AND WERE OBTAINED AS FOLLOWS:
   - PROPERTY BOUNDARIES FOR WEST WARWICK WERE IMPORTED FROM THE TOWN OF WEST WARWICK'S GEOGRAPHIC INFORMATION SYSTEM (GIS) DATABASE; AND
   - PROPERTY BOUNDARIES FOR THE CITY OF WARWICK WERE DIGITIZED FROM A DIGITAL COPY OF ASSESSOR'S PLAT MAP 262.

   AS A RESULT, THIS PLAN IS SUBSTANTIALLY CORRECT IN ACCORDANCE WITH A CLASS IV STANDARD AS ADOPTED BY THE RHODE ISLAND BOARD OF REGISTRATION FOR PROFESSIONAL LAND SURVEYORS. THIS PLAN IS NOT TO BE CONSTRUED AS AN ACCURATE BOUNDARY SURVEY AND IS SUBJECT TO SUCH CHANGES AS AN ACCURATE BOUNDARY SURVEY MAY DISCLOSE. ALL PROPERTIES WHERE WORK WILL BE PROPOSED OR ACCESS REQUIRED MUST BE VERIFIED.
2. NOTE THAT THE SUBJECT PROPERTY, LOT No. 77 OF ASSESSOR'S PLAT No. 41 WITHIN THE TOWN OF WEST WARWICK, IS CURRENTLY OWNED BY WATER STREET LAND, LLC (THE APPLICANT). SINCE THIS IS A RECENT TRANSACTION, THE CITY OF WEST WARWICK IS STILL LISTED AS THE OWNER OF THE PROPERTY ON THE TOWN'S ON-LINE ASSESSOR'S DATABASE.
3. THE PROPERTY TO BE USED AS THE OFF-SITE STAGING AREA, LOT No. 74 OF ASSESSOR'S PLAT No. 41, IS REFLECTED ON THIS PLAN AND IS LOCATED OUTSIDE OF FRESHWATER WETLANDS.



DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
FRESHWATER WETLANDS PROGRAM
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DATED JUL 2 2014 FILE # 13-0208
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APR - 8 2014
Office of Water Resources

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SEAL

SEAL
PHILIP W. MORESCHI
No. 7428
REGISTERED PROFESSIONAL ENGINEER (CIVIL)

Date Signed:
February 3, 2014

SCALE:
HORZ.: 1" = 50'
VERT.:
DATUM:
HORZ.:
VERT.:
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GRAPHIC SCALE

FUSS & O'NEILL
317 IRON HORSE WAY, SUITE 204
PROVIDENCE, RI 02908
401.861.3070
www.fando.com

WATER STREET LAND, LLC

SITE LOCATION PLAN

NATICK POND DAM HYDROELECTRIC PROJECT

WEST WARWICK RHODE ISLAND

PROJ. No.: 20121867.B10
DATE: DECEMBER 2013

CS-101
SHEET 3 OF 17

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LEGEND

- EDGE OF WOODS
- CHAIN LINK FENCE
- WATER MAIN
- GAS MAIN
- ELECTRIC
- COMMUNICATIONS LINE
- EXISTING CONTOUR
- EDGE OF PAVEMENT
- OVERHEAD WIRES
- UTILITY POLE
- DRAINAGE MANHOLE
- CATCHBASIN
- SANITARY SEWER MANHOLE
- GATE VALVE
- SD(4.7') SEDIMENT DEPTH

TREE LEGEND

BC	BLACK CHERRY
SYC	SYCAMORE
RO	RED OAK
PO	PIN OAK
WO	WHITE OAK
ELM	AMERICAN ELM
SM	SILVER MAPLE
NM	NORWAY MAPLE
BE	BOX ELDER
WA	WHITE ASH
BL	BLACK LOCUST
BG	BLACK GUM
RM	RED MAPLE
MUL	MULBERRY

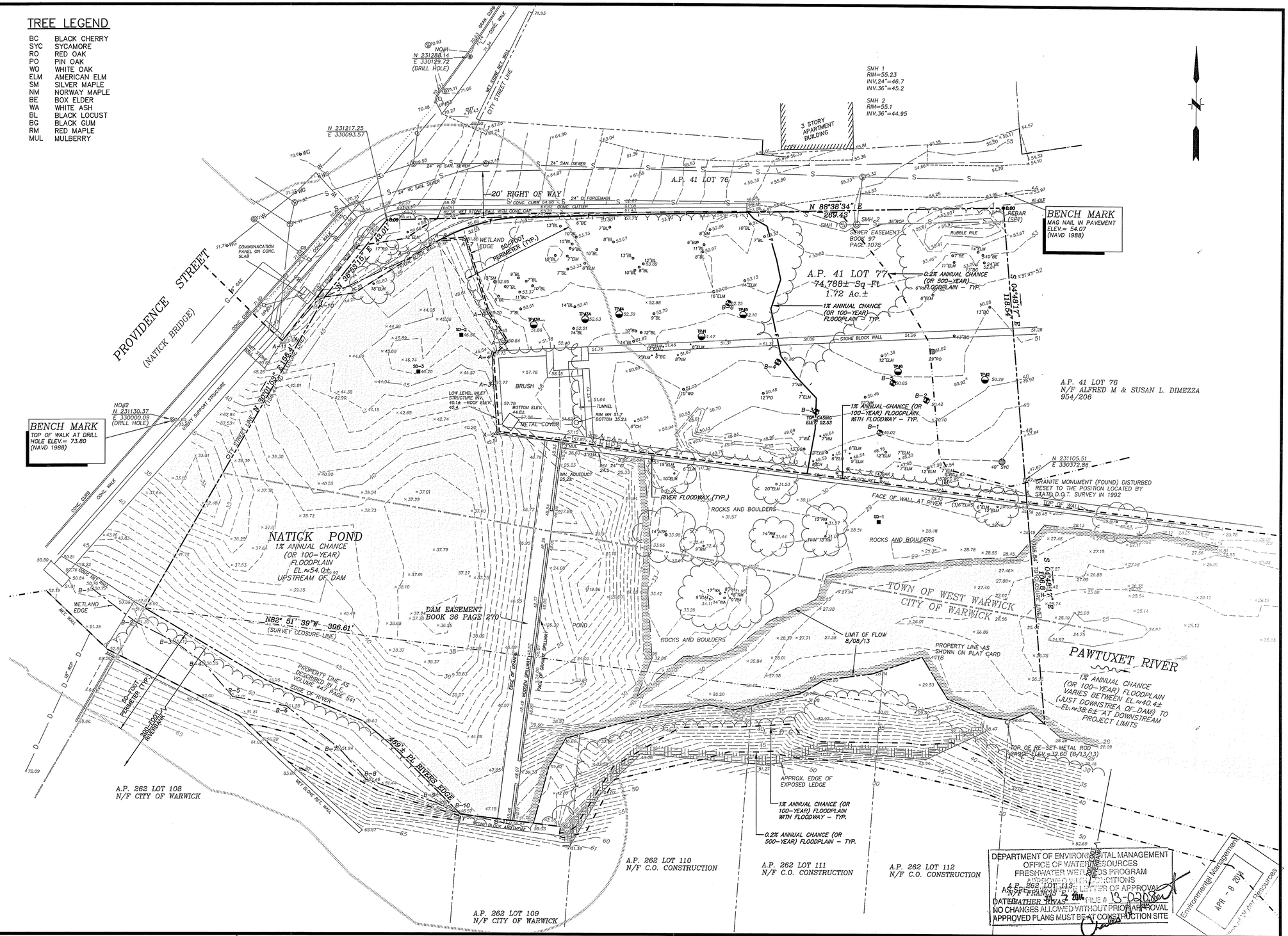
MAP NOTES:

1. EXISTING SITE CONDITIONS, INCLUDING TOPOGRAPHIC CONTOURS AND PROPERTY BOUNDARIES WITHIN THE IMMEDIATE PROJECT AREA, ARE BASED UPON AN ON-GROUND SURVEY PERFORMED BY DAVID D. GARDNER & ASSOCIATES, INC IN AUGUST 2013. THIS SURVEY AND PLAN CONFORMS TO A CLASS I STANDARD FOR BOUNDARY AND A CLASS III STANDARD FOR TOPOGRAPHY AS ADOPTED BY THE RHODE ISLAND BOARD OF REGISTRATION FOR PROFESSIONAL LAND SURVEYORS.
2. THE HORIZONTAL COORDINATES SHOWN HEREON WERE OBTAINED BY GPS WITH SUB METER ACCURACY FOR GIS PURPOSES. THE COORDINATE SYSTEM IS ON AN APPROXIMATE NAD83 RI STATE PLANE DATUM.
3. FLOODPLAIN AND FLOODWAY INFORMATION WAS OBTAINED FROM THE D-FIRM DATABASE FOR KENT COUNTY, RHODE ISLAND AS REFLECTED ON FIRM NUMBER 44003C0128G DATED DECEMBER 3, 2010. THE FLOODPLAIN AND FLOODWAY BOUNDARIES WERE THEN ADJUSTED (BY FUSS & O'NEILL) TO CONFORM TO TOPOGRAPHIC (ACTUAL GROUND) ELEVATIONS OBTAINED FROM THE DETAILED SURVEY.
8. THE PAWTUXET RIVER IS GREATER THAN 10 FEET IN WIDTH AND SHALL HAVE AN ASSOCIATED 200-FOOT RIVERBANK WETLAND THAT WILL EXTEND 200 FEET FROM BOTH SIDES OF THE RIVER'S EDGE. AS A RESULT, THE ENTIRE PROJECT AREA IS LOCATED WITHIN THE 200-FOOT RIVERBANK OF THE PAWTUXET RIVER.
9. WETLAND FLAGGING ALONG THE RIVER AND WITHIN THE PROJECT SITE WAS PERFORMED BY NATURAL RESOURCE SERVICES, INC. AND FIELD LOCATED BY DAVID D. GARDNER & ASSOCIATES, INC.
10. WETLAND HABITATS WITHIN THE PROJECT SITE INCLUDE RELATIVELY NARROW STRIPS OF FORESTED WETLAND AREAS BORDERING BOTH SIDES OF THE NATICK POND (UPSTREAM OF THE DAM), THE NATICK POND WHICH WAS CREATED BY THE IMPOUNDMENT OF THE PAWTUXET RIVER BY THE NATICK POND DAM, AND THE PAWTUXET RIVER. THE EDGES OF THE POND AND RIVER (AS SHOWN ON THIS PLAN) WERE LOCATED AT THE ORDINARY HIGH WATER MARK OF STANDING OR FLOWING WATER ALONG ASSOCIATED EMBANKMENTS AND/OR AT THE EDGE OF EXISTING RETAINING WALLS.
11. THE FOLLOWING JURISDICTIONAL BUFFERS (SETBACKS) WERE APPLIED TO THE ON-SITE WETLAND FEATURES:

FLAG SERIES	RIDEM CLASSIFICATION	JURISDICTIONAL BUFFER
A1-A11	FORESTED WETLAND	NO JURISDICTIONAL BUFFER
B1-B11	FORESTED WETLAND	NO JURISDICTIONAL BUFFER
N/A	NATICK POND	50-FOOT PERIMETER WETLAND
N/A	RIVER >10' WIDE	200-FOOT RIVERBANK WETLAND

SINCE NATICK POND IS PART OF THE PAWTUXET RIVER, A 200-FOOT RIVERBANK WETLAND WAS ALSO CONSERVATIVELY APPLIED TO THE NATICK POND.

12. THERE ARE NO NATURAL HERITAGE AREAS OR RARE SPECIES AREAS LOCATED WITHIN THE PROJECT LIMITS. THIS SITE DOES NOT LIE WITHIN ANY KNOWN AGRICULTURAL USE, CIVIC STRUCTURAL USE, OR FARMLAND CONSERVATION AREAS.
13. THE SITE IS LOCATED IN AN AVALON BEDROCK GEOLOGY – QUARTZITE AREA.



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FUSS & O'NEILL
317 IRON HORSE WAY, SUITE 204
PROVIDENCE, RI 02908
401.861.3070
www.fando.com

WATER STREET LAND, LLC

EXISTING CONDITIONS PLAN

NATICK POND DAM HYDROELECTRIC PROJECT

WEST WARWICK RHODE ISLAND

PROJ. No.: 20121867.B10
DATE: DECEMBER 2013

CS-102

SHEET 4 OF 17

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NOTES:

1. AN OFF-SITE STAGING/STORAGE AREA IS PROPOSED ON LOT No. 74 OF ASSESSOR'S PLAT No. 41 WHICH IS REFLECTED ON THE RADIUS PLAN.
2. IN ADDITION TO THE CONSTRUCTION ENTRANCE REFLECTED ON THIS PLAN, A CONSTRUCTION ENTRANCE (OF SIMILAR DIMENSIONS) SHALL ALSO BE INSTALLED ON THE OFF-SITE PROPERTY TO BE USED FOR CONSTRUCTION EQUIPMENT STAGING/STORAGE IN ORDER TO PREVENT THE TRACKING OF SEDIMENT ONTO WATER STREET IN THAT LOCATION.

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317 IRON HORSE WAY, SUITE 204
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WATER STREET LAND, LLC
SITE DEMOLITION AND EROSION CONTROL PLAN
NATICK POND DAM HYDROELECTRIC PROJECT
WEST WARWICK RHODE ISLAND

PROJ. No.: 20121867.B10
DATE: DECEMBER 2013

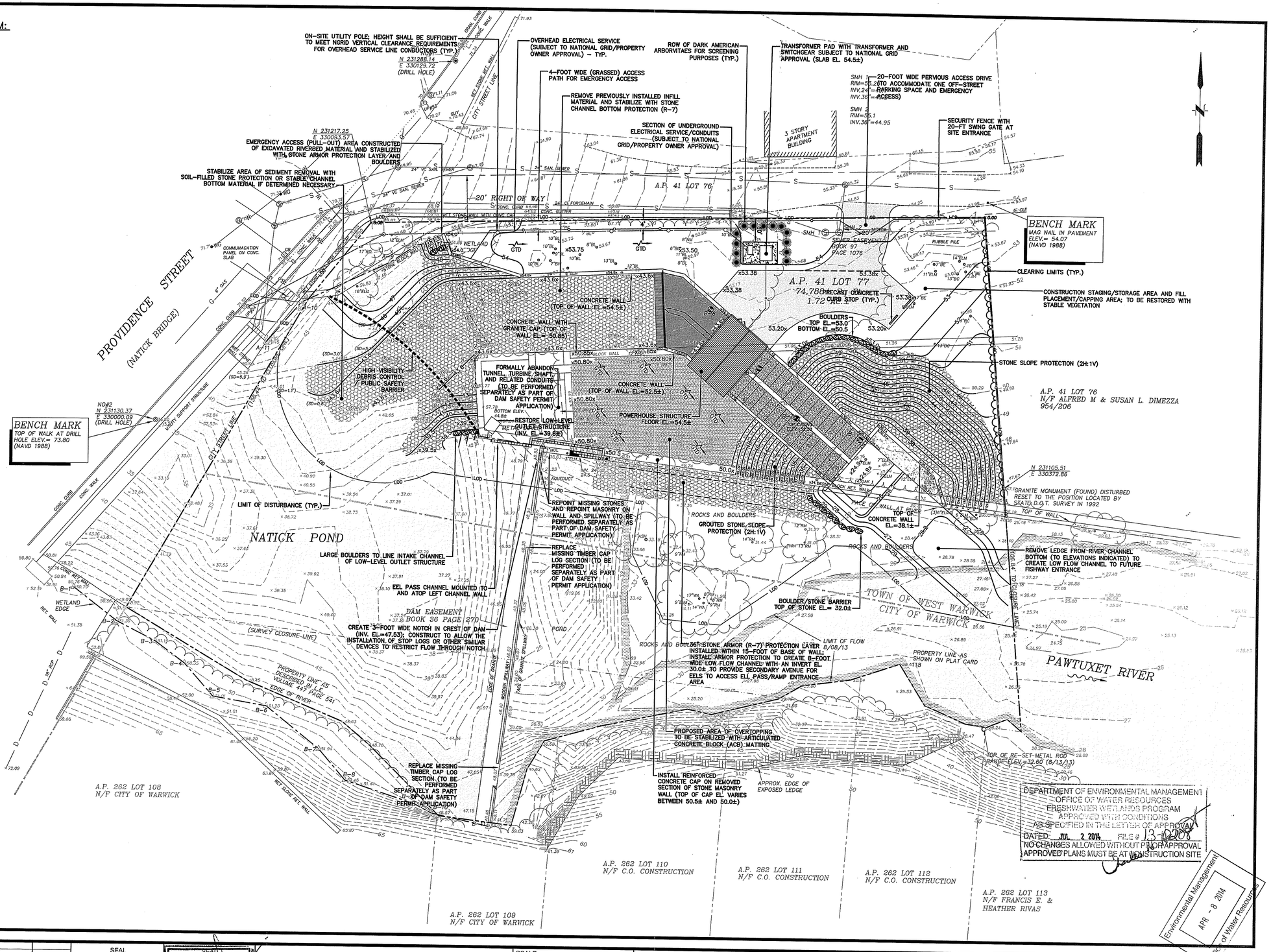
CS-103
SHEET 5 OF 17

DRAINAGE BASIN CHARACTERISTICS AT NATICK DAM:

Parameter	Value
Drainage area in square miles	181.5
Stream Density	1.97
10-85 slope in feet per mile based on preprocessed data	
Total stream length in miles	358
Percent of area covered by forest	59.2
Percent of area covered by urban land use	5.39
Percent of area covered by open water (lakes, ponds, reservoirs)	6.06
Percent of area covered by wetland land use	11.7
Average basin elevation in feet	419
Percent of area underlain by surficial geology (stratified drift deposits)	26.7
Percent of area covered by agriculture	4.19
Percent of area as storage (hi-res NHD waterbodies, wetlands)	10.5

NOTE:

1. THE LENGTH OF THE SPILLWAY AT THE NATICK DAM IS APPROXIMATELY 166–FEET.



GENERAL BOULDER SIZE NOTES:

1. BOULDERS PROPOSED WITHIN RIVER CHANNEL (I.E. TO LINE THE LOW–LEVEL INTAKE CHANNEL AND TO FORM THE BOULDER/STONE BARRIER), SHALL HAVE A MINIMUM SIZE OF 4'Lx3'Wx3'H.
2. BOULDER WALL PROPOSED OUTSIDE OF RIVER CHANNEL (ADJACENT TO PERMEABLE DRIVEWAY) SHALL HAVE A MINIMUM SIZE OF 3'Lx2.5'Wx2.5'H.

GENERAL STONE MASONRY WALL REPAIR NOTE:

1. EXISTING STONE MASONRY WALLS TO REMAIN (WITHIN THE LIMIT OF DISTURBANCE) SHALL BE REPOINTED/REPAIRED AS DETERMINED NECESSARY BY ENGINEER.

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
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APR - 8 2014
Office of Water Resources

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.	2/3/2014	REVISIONS PER RIDEM FRESHWATER WETLAND 1/24/14 REVIEW COMMENTS		

SEAL

SEAL
PHILIP W. MORESCHI
No. 7428
REGISTERED PROFESSIONAL ENGINEER (CIVIL)

Date Signed:
February 3, 2014

SCALE:
HORZ.: 1" = 20'
VERT.:
DATUM:
HORZ.:
VERT.:
20 10 0 20
GRAPHIC SCALE

FUSS & O'NEILL
317 IRON HORSE WAY, SUITE 204
PROVIDENCE, RI 02908
401.861.3070
www.fando.com

WATER STREET LAND, LLC

SITE LAYOUT AND GRADING PLAN

NATICK POND DAM HYDROELECTRIC PROJECT

WEST WARWICK · RHODE ISLAND

PROJ. No.: 20121867.B10
DATE: DECEMBER 2013

CS-104

SHEET 6 OF 17

File Path: J:\DWG\P2012\18678\10\Civil\Plan\20121867B10_GRA01.dwg Layout: CS-104 Plotted: Wed, February 12, 2014 - 11:46 AM User: samuda
MS VIEW: LAYER STATE: Plotter: DWG TO PDF.PC3 CTB File: FO.STB

RESTORATION NOTES:

1. ALL DISTURBED AREAS WITHIN THE LIMIT OF DISTURBANCE THAT ARE NOT TO BE COVERED BY IMPERVIOUS SURFACES, ARTICULATED CONCRETE BLOCK MATTING, RIPRAP, OR PERMEABLE PAVEMENT SHALL BE COVERED WITH TOPSOIL PRIOR AND SEEDED WITH THE FOLLOWING MIX:

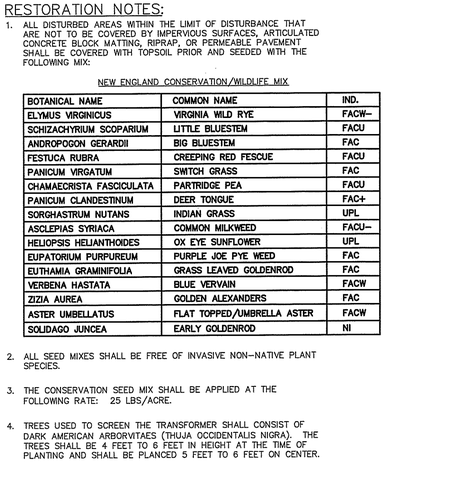
NEW ENGLAND CONSERVATION/WILDLIFE MIX

BOTANICAL NAME	COMMON NAME	IND.
ELYMUS VIRGINICUS	VIRGINIA WILD RYE	FACW–
SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM	FACU
ANDROPOGON GERARDII	BIG BLUESTEM	FAC
FESTUCA RUBRA	CREEPING RED FESCUE	FACU
PANICUM VIRGATUM	SWITCH GRASS	FAC
CHAMAECRISTA FASCICULATA	PARTRIDGE PEA	FACU
PANICUM CLANDESTINUM	DEER TONGUE	FAC+
SORGHASTRUM NUTANS	INDIAN GRASS	UPL
ASCLEPIAS SYRIACA	COMMON MILKWEED	FACU–
HELIOPSIS HELIANTHOIDES	OX EYE SUNFLOWER	UPL
EUPATORIUM PURPUREUM	PURPLE JOE PYE WEED	FAC
EUTHAMIA GRAMINIFOLIA	GRASS LEAVED GOLDENROD	FAC
VERBENA HASTATA	BLUE VERVAIN	FACW
ZIZIA AUREA	GOLDEN ALEXANDERS	FAC
ASTER UMBELLATUS	FLAT TOPPED/UMBRELLA ASTER	FACW
SOLIDAGO JUNCEA	EARLY GOLDENROD	NI

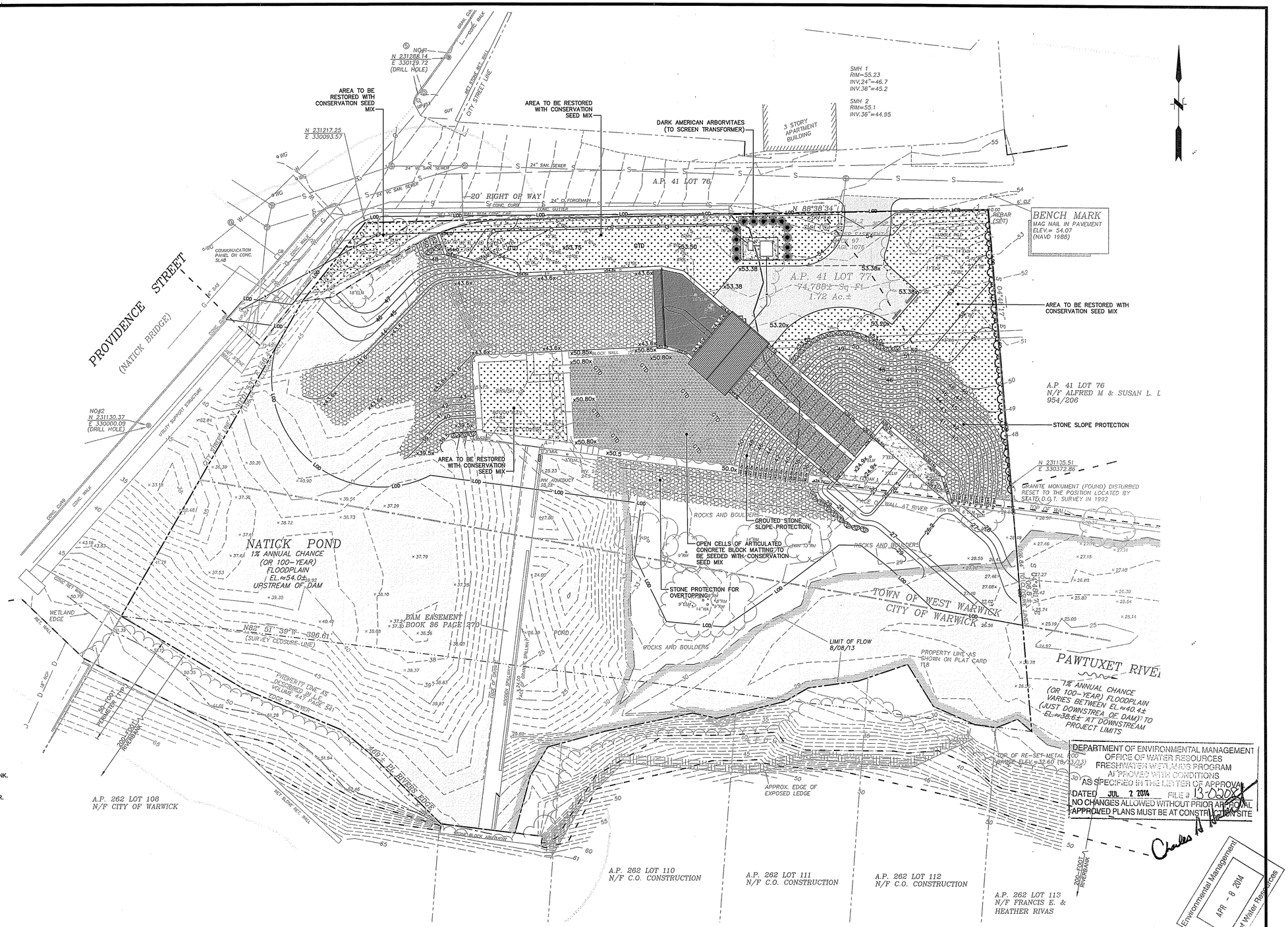
2. ALL SEED MIXES SHALL BE FREE OF INVASIVE NON–NATIVE PLANT SPECIES.

3. THE CONSERVATION SEED MIX SHALL BE APPLIED AT THE FOLLOWING RATE: 25 LBS/ACRE.

4. TREES USED TO SCREEN THE TRANSFORMER SHALL CONSIST OF DARK AMERICAN ARBORVITAES (THUJA OCCIDENTALIS NIGRA). THE TREES SHALL BE 4 FEET TO 6 FEET IN HEIGHT AT THE TIME OF PLANTING AND SHALL BE PLANCED 5 FEET TO 6 FEET ON CENTER.



EVERGREEN TREE PLANTING
NOT TO SCALE



DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
FRESHWATER WETLANDS PROGRAM
APPROVED WITH CONDITIONS
AS SPECIFIED IN THE LETTER OF APPROVAL
DATED JUL 2 2014 FILE # 13-0808
NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL
APPROVED PLANS MUST BE AT CONSTRUCTION SITE

Environmental Management
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WATER STREET LAND, LLC

SITE RESTORATION PLAN

NATICK POND DAM HYDROELECTRIC PROJECT

WEST WARWICK RHODE ISLAND

PROJ. No.: 20121867.B10
DATE: DECEMBER 2013

CS-105
SHEET 7 OF 17

File Path: J:\DWG\P2012\1867\B10\Civil\Plan\20121867B10_STP02_INSTREAM.dwg Layout: CS-105 Plotted: Wed, February 12, 2014 - 11:47 AM User: sarruda
MS VIEW: LAYER STATE: Plotter: DWG TO PDF.PC3 CTB File: FO.STB

GENERAL WATER CONTROL AND CONSTRUCTION SEQUENCE NOTES:

1. TEMPORARY COFFERDAMMING AND WORK ON THE RIVER SIDE OF WETLAND EDGES AND RIVER WALLS MUST BE COMPLETED DURING THE LOW FLOW PERIOD (I.E., THE PERIOD BETWEEN JULY 1 TO OCTOBER 31) AND BE MAINTAINED TO ALLOW A CONTROLLED WORKING CONDITION (NO SEDIMENT PLUME) IN THE WATERCOURSE. SOIL DISTURBANCE IN THE WATERCOURSE MUST TEMPORARILY CEASE IN THE EVENT OF ANY ABNORMALLY HIGH FLOOD EVENT IF A CONTROLLED WATER BYPASS CONDITION CANNOT BE MAINTAINED. AQUATIC RESOURCES MUST BE PROTECTED DURING INSTALLATION OF, AND DEWATERING WITHIN, THE UPSTREAM AND DOWNSTREAM COFFERDAMS.

2. THIS PLAN ILLUSTRATES ONE FEASIBLE APPROACH TO WATER CONTROL FOR THE PROJECT. ANY MODIFICATIONS/REVISIONS TO WATER CONTROL FOR THIS PROJECT (BY THE CONTRACTOR) SHALL BE SUBMITTED TO RIDEM AT LEAST TWO WEEKS PRIOR TO CONSTRUCTION FOR REVIEW.

3. THIS DESCRIPTION OF WORK IS NOT INTENDED TO ADDRESS ALL WORK REQUIRED UNDER THIS CONTRACT. THE CONTRACTOR SHALL COMPLETE ALL WORK AS INDICATED ELSEWHERE ON THE DRAWINGS AND SPECIFICATIONS, AND AS DIRECTED BY THE ENGINEER.

4. THE TEMPORARY GRADING AND SHORING IS CONCEPTUAL AND IS REFLECTED ONLY TO ILLUSTRATE THE TEMPORARY ACCESS WAY THAT MUST BE CONSTRUCTED TO GAIN ACCESS TO THE DOWNSTREAM RIVER WORK AREA.

WATER CONTROL AND CONSTRUCTION SEQUENCE:

PHASE 1A

1. CLEAR VEGETATION AS REQUIRED IN ORDER TO CONSTRUCT THE TEMPORARY CONSTRUCTION ENTRANCE. FOLLOWING THE INSTALLATION OF THE THE CONSTRUCTION ENTRANCE, INSTALL PERIMETER EROSION CONTROLS AND CLEAR THE REMAINDER OF VEGETATION/TREES WITHIN THE LIMIT OF DISTURBANCE AND LANDWARD OF THE RIVER WALL THAT ARE NOT SCHEDULED TO REMAIN.

2. CONSTRUCT (VIA EXCAVATION) A TEMPORARY ACCESS ROAD TO THE PROPOSED POWERHOUSE FACILITY, UPSTREAM TURBINE INTAKE AREA, AND DOWNSTREAM TURBINE DISCHARGE AREA INCLUDING ANY TEMPORARY SHORING SYSTEMS. THE ACCESS ROAD SHALL BE CONSTRUCTED IN THE APPROXIMATE LOCATION OF THE PROPOSED TURBINE CHANNEL AS REFLECTED ON THIS PLAN. THE SURFACE ELEVATION OF THIS TEMPORARY ACCESS ROADWAY SHALL CLOSELY APPROXIMATE THE PROPOSED SUBGRADE ELEVATION BELOW THE PROPOSED TURBINE CHANNEL. INSTALL A CRUSHED STONE CONSTRUCTION ENTRANCE AT THE BASE OF THE ACCESS ROAD ADJACENT TO THE SECTION OF WALL TO BE REMOVED IN THE APPROXIMATE LOCATION (AND TO THE APPROXIMATE DIMENSIONS) REFLECTED ON THIS PLAN.

3. REMOVE SECTION OF THE RIVER WALL ADJACENT TO THE DOWNSTREAM TURBINE DISCHARGE AREA IN ORDER TO ALLOW ACCESS TO THE RIVER. THE WALL MUST BE SELECTIVELY DECONSTRUCTED TO PRESERVE THE STABILITY OF THE ADJACENT SECTIONS OF WALL TO REMAIN AND MINIMIZE SEDIMENT DISCHARGED TO THE RIVER DURING THIS PROCESS. IN DOING SO, EXCAVATION ON THE LANDWARD SIDE OF WALL MUST BE COORDINATED WITH WALL REMOVAL TO AVOID WALL INSTABILITY OR COLLAPSE. ADDITIONALLY, A FIELD ASSESSMENT SHALL BE MADE BY THE ENGINEER AT THE TIME OF WALL REMOVAL TO CONFIRM THE WATER LEVELS ON THE RIVER SIDE OF THE WALL. IF WATER LEVELS EXTEND TO THE BASE OF THE EXISTING WALL, THE WALL SHALL ONLY BE REMOVED TO AN ELEVATION THAT IS APPROXIMATELY 2 FEET (MINIMUM) ABOVE THE CURRENT WATER LEVEL. THIS WILL NOT ONLY PREVENT THE BACKFLOW OF RIVER WATER ONTO THE SITE, BUT WILL PROTECT THE RIVER FROM EXCESSIVE SOIL DISTURBANCE/SEDIMENTATION. ONCE WATER LEVELS DECREASE AND RECEDE FROM THE BASE OF THE WALL, THE WALL CAN BE FURTHER REMOVED TO AN ELEVATION THAT WILL ALLOW THE CONTRACTOR TO GAIN ACCESS TO THE DOWNSTREAM AREA SUCH THAT THE DOWNSTREAM TEMPORARY COFFERDAM CAN BE INSTALLED WITH MINIMAL DISTURBANCE AND SEDIMENT DEPOSITION TO SURFACE WATERS.

4. INSTALL THE DOWNSTREAM TEMPORARY COFFERDAM SYSTEM INCLUDING THE INSTALLATION OF THE DOWNSTREAM DEWATERING AREA.

5. CLEAR ALL TREES/VEGETATION DOWNSTREAM OF THE DAM (INCLUDING ALL TREES/VEGETATION WITHIN 25 FEET OF THE DAM AND ADJACENT RIVER WALL WITHIN THE LIMIT OF DISTURBANCE.

6. INSTALL THE TURBIDITY CURTAIN AS REFLECTED ON THE DEMOLITION AND EROSION CONTROL PLAN AND REPAIR THE EXISTING RIVER WALL AS APPROVED BY THE RIDEM DAM SAFETY PROGRAM. ONCE REPAIRS TO THE EXISTING RIVER WALL HAVE BEEN COMPLETED, INSTALL THE SECTIONS OF THE EEL PASS CHANNEL TO BE MOUNTED TO THE SIDE OF THE EXISTING RIVER WALL.

7. PERFORM ROCK REMOVAL AND EARTH EXCAVATION WITHIN THE DOWNSTREAM TURBINE DISCHARGE AREA.

8. INSTALL DOWNSTREAM ROCK BARRIER, PERFORM FINISH GRADING WITHIN THE TURBINE DISCHARGE AREA TO ACHIEVE THE GRADES INDICATED ON THE SITE LAYOUT AND GRADING PLAN, AND INSTALL STONE STABILIZATION (AS REQUIRED) IN THE DOWNSTREAM TURBINE DISCHARGE AREA.

9. PERFORM FINAL ADJUSTMENTS ON THE TOP OF THE EXISTING WALL DOWNSTREAM OF THE TURBINE DISCHARGE AREA IN ORDER TO ACHIEVE UNIFORM STEPS OR SLOPE FROM EL. 46.6± TO EL. 37.5±.

10. CONSTRUCT THE CONCRETE PAD LOCATED AT THE ENTRANCE OF THE FUTURE FISH LADDER AND PERMANENT AND REMOVABLE SECTIONS OF THE ADJACENT CONCRETE WALL.

11. PERFORM FINAL ADJUSTMENTS ON THE TOP OF THE EXISTING WALL UPSTREAM OF THE TURBINE DISCHARGE AREA IN ORDER TO ACHIEVE UNIFORM STEPS OR SLOPE FROM EL. 50.0± TO EL. 34.7±.

12. PERFORM CLEAN-UP ACTIVITIES IN THE RIVER AREA DOWNSTREAM OF THE DAM, REMOVE TURBIDITY CURTAIN, AND REMOVE EXISTING COFFERDAM SYSTEM.

13. COMMENCE CONSTRUCTION OF THE TURBINE CHANNEL (INCLUDING WALLS AND POWERHOUSE) STARTING AT THE DOWNSTREAM END. PROCEED WITH CONSTRUCTION IN THE UPSTREAM DIRECTION TO THE APPROXIMATE POWERHOUSE FACILITY LOCATION.

14. CONSTRUCT ACCESS UPSTREAM OF THE POWERHOUSE FACILITY TO FACILITATE THE INSTALLATION OF THE UPSTREAM COFFERDAM SYSTEM LEAVING A BERM BETWEEN THE HEADPOND AND EXCAVATED TURBINE CHANNEL AREA (TO PREVENT FLOW INTO THE EXCAVATED CHANNEL FROM NATICK POND) UNTIL THE UPSTREAM COFFERDAM SYSTEM IS INSTALLED.

15. CONSTRUCT THE UPSTREAM COFFERDAM SYSTEM.

16. REMOVE SEDIMENT FROM WITHIN THE HEADPOND AREA, GRADE IN ACCORDANCE WITH THE SITE LAYOUT AND GRADING PLAN (INCLUDING GRADING WORK AT THE ENTRANCE OF THE LOW FLOW OUTLET, AND STABILIZE THE CHANNEL BOTTOM IF DETERMINED NECESSARY (BY ENGINEER) BY POUNDING STONE INTO THE CHANNEL BOTTOM.

17. EXCAVATE AREA WITHIN THE INTAKE CHANNEL TO THE TURBINE AREA TO SUBGRADE ELEVATION AND INSTALL INTAKE CHANNEL WALLS AND STONE CHANNEL BOTTOM UP TO THE APPROXIMATE POINT OF THE PROPOSED INTAKE SCREEN.

18. SHOULD A MAJOR STORM EVENT (I.E. A STORM EVENT GENERATING MORE THAN 3.3 INCHES OF RAINFALL OVER A 24-HOUR PERIOD) BE ENCOUNTERED DURING THIS PHASE OF CONSTRUCTION, THE CONTRACTOR SHALL BE PREPARED TO INSTALL A TEMPORARY EARTHEN/SANDBAG (BULK BAG) SECONDARY COFFERDAM SYSTEM WITHIN THE LOCATION OF THE PROPOSED INTAKE CHANNEL IN ORDER TO PROVIDE ADDITIONAL PROTECTION TO CONSTRUCTION ACCESSES AND WORK PREVIOUSLY INSTALLED DOWNGRADIENT OF THE INTAKE CHANNEL.

PHASE 1B

19. CONSTRUCT PHASE 1B COFFERDAM SYSTEM CONSISTING OF BULK BAGS JUST UPSTREAM OF THE PROPOSED LOCATION OF THE INTAKE SCREEN AND FILL WITH SMALL STONE RIPRAP. THIS SYSTEM CAN THEN BE USED AS A TEMPORARY ACCESS TO THE AREA BETWEEN THE NEWLY CONSTRUCTED INTAKE CHANNEL WALLS AND THE EXISTING RIVER WALL.

20. INSTALL TEMPORARY STONE ACCESS RAMP TO THE HEADPOND AND REMOVE THE REMOVE PHASE 1A UPSTREAM TEMPORARY PORTADAM COFFERDAMMING SYSTEM.

21. INSTALL THE POWERHOUSE FACILITY FOUNDATION.

22. ROUGH GRADE THE PHASE 1B PRIMARY IMPROVEMENT AREA AND REMOVE THE TOP SECTION OF THE EXISTING RIVER WALL TO ACCOMODATE THE INSTALLATION OF THE REINFORCED CONCRETE CAP.

23. INSTALL THE REINFORCED CONCRETE CAP AND INSTALL THE PRIMARY IMPROVEMENTS WITHIN THE PHASE 1B AREA INCLUDING, BUT NOT LIMITED TO, THE GROUTED RIPRAP SLOPE PROTECTION, THE ARTICULATED CONCRETE BLOCK MATTING, AND THE SECTION OF THE EEL PASS CHANNEL TO BE MOUNTED ATOP THE RIVERWALL AND ALONG THE SIDE OF THE EXISTING RIVERWALL UPSTREAM OF THE DAM.

24. COMPLETE INSTALLATION OF THE POWERHOUSE FACILITY AND REMOVE THE PHASE 1A AND 1B UPSTREAM DEWATERING AREA IN ADDITION TO THE PHASE 1B TEMPORARY ACCESS AND COFFERDAM SYSTEM.

PHASE 1C

PHASE 1C, WHICH HAS NOT BEEN DEPICTED, WILL CONSIST OF THE INSTALLATION OF IMPROVEMENTS BETWEEN THE NEWLY CONSTRUCTED TURBINE CHANNEL AND THE ADJACENT ROADWAY.

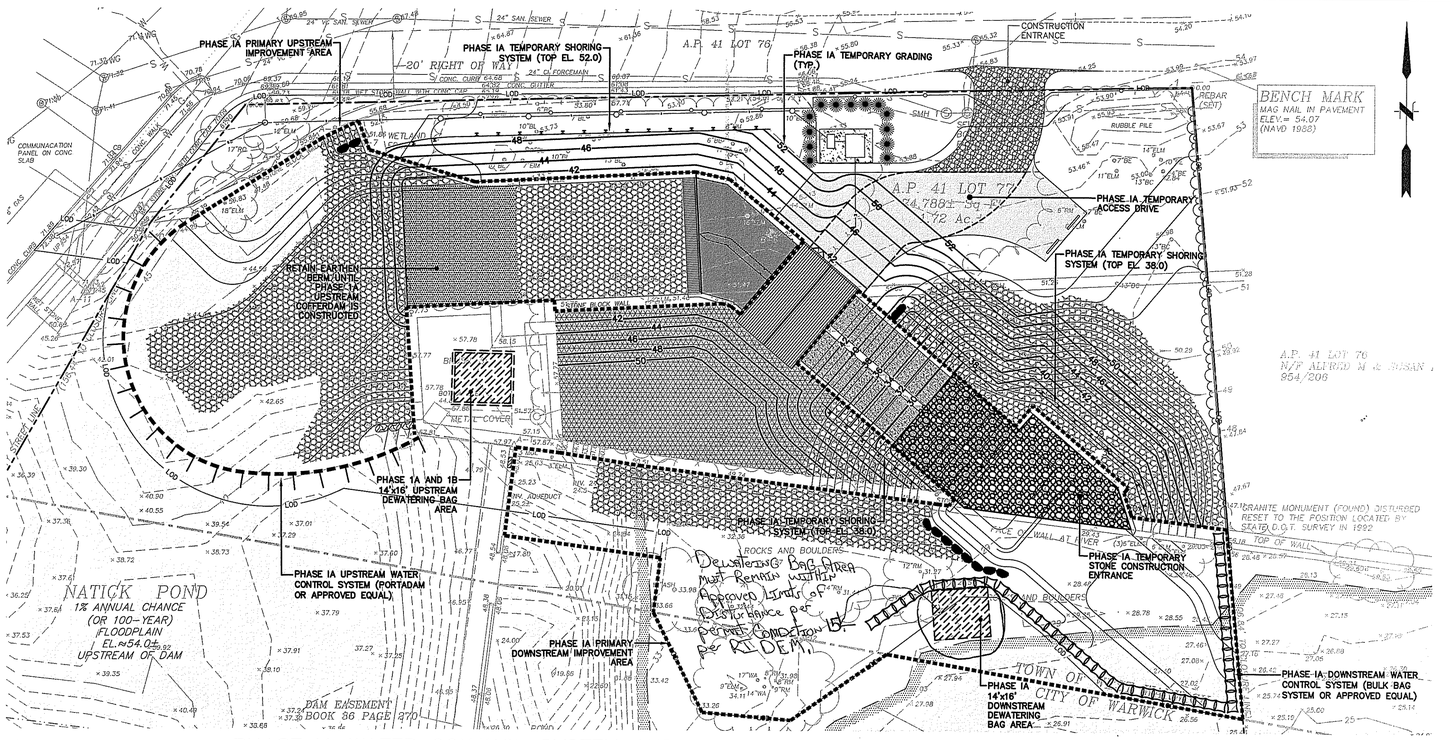
25. ROUGH GRADE THE PHASE 1C IMPROVEMENT AREA. ROUGH GRADING SHALL BRING THE ELEVATIONS WITHIN THE STONE SLOPE PROTECTION AREA AND GRAVELPAVE2 SYSTEM TO SUBGRADE.

26. INSTALL UNDERGROUND AND ABOVE-GRADE UTILITIES (I.E. THE PRIMARY AND SECONDARY FEEDS FROM THE TRANSFORMER TO THE POWERHOUSE FACILITY, THE ELECTRIC CONDUIT FROM THE POWERHOUSE FACILITY TO THE SUBMERSIBLE PUMP, AND THE DISCHARGE CONDUIT FROM THE SUBMERSIBLE PUMP TO THE EEL PASSAGE CHANNEL.

27. INSTALL THE STONE SLOPE PROTECTION, TRANSFORMER PAD, AND POWERHOUSE FACILITY APPURTENANCES (INCLUDING TURBINES).

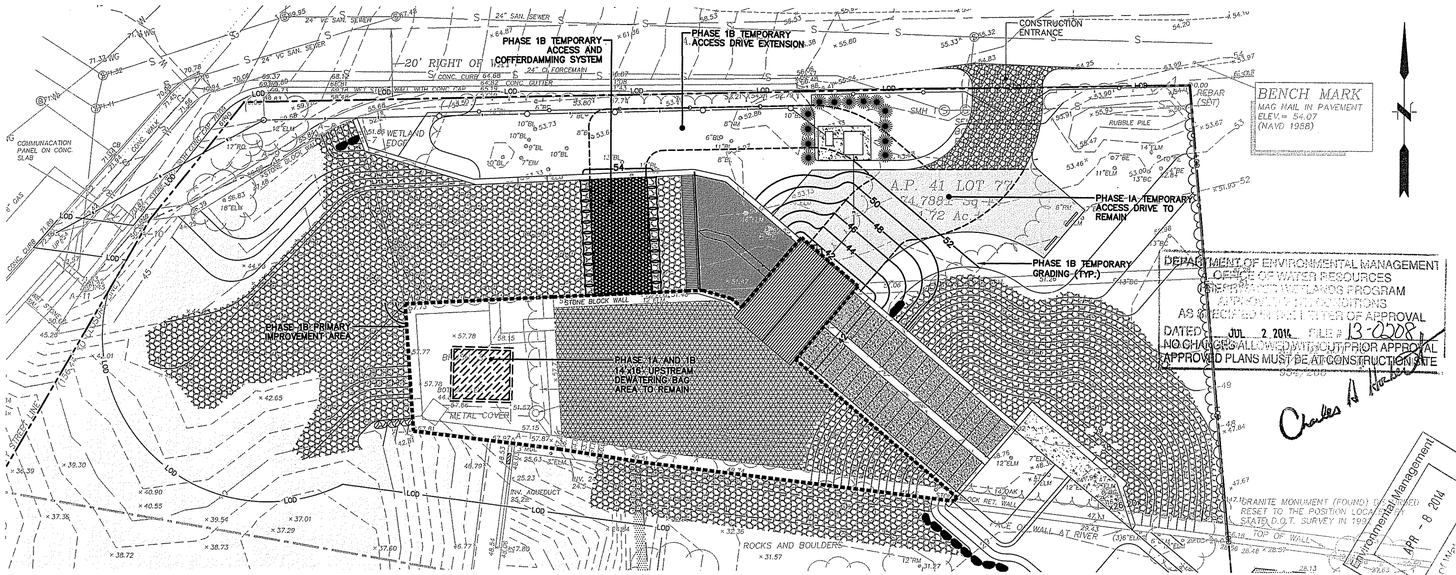
28. FINISH GRADE LANDSCAPED AREAS AND REMOVE CONSTRUCTION ENTRANCE. INSTALL GRAVELPAVE2 SYSTEM, VEGETATED FILTER STRIP (WITH EROSION CONTROL MATTING), AND RESTORE REMAINING DISTURBED AREAS WITH PLANTINGS (AS REFLECTED ON THE SITE RESTORATION PLAN) AND CONSERVATION MIX IN PHASE 1B AND 1C AREAS.

29. ONCE THE SITE HAS BEEN SATISFACTORILY STABILIZED, REMOVE EROSION CONTROL MEASURES.



PHASE 1A WATER CONTROL SYSTEM AND TEMPORARY ACCESS

NOT TO SCALE



PHASE 1B WATER CONTROL SYSTEM AND TEMPORARY ACCESS

NOT TO SCALE

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WATER STREET LAND, LLC

WATER CONTROL AND CONSTRUCTION SEQUENCING PLAN

NATICK POND DAM HYDROELECTRIC PROJECT

WEST WARWICK RHODE ISLAND

PROJ. No.: 20121867.B10
DATE: DECEMBER 2013

CS-106

SHEET 8 OF 17

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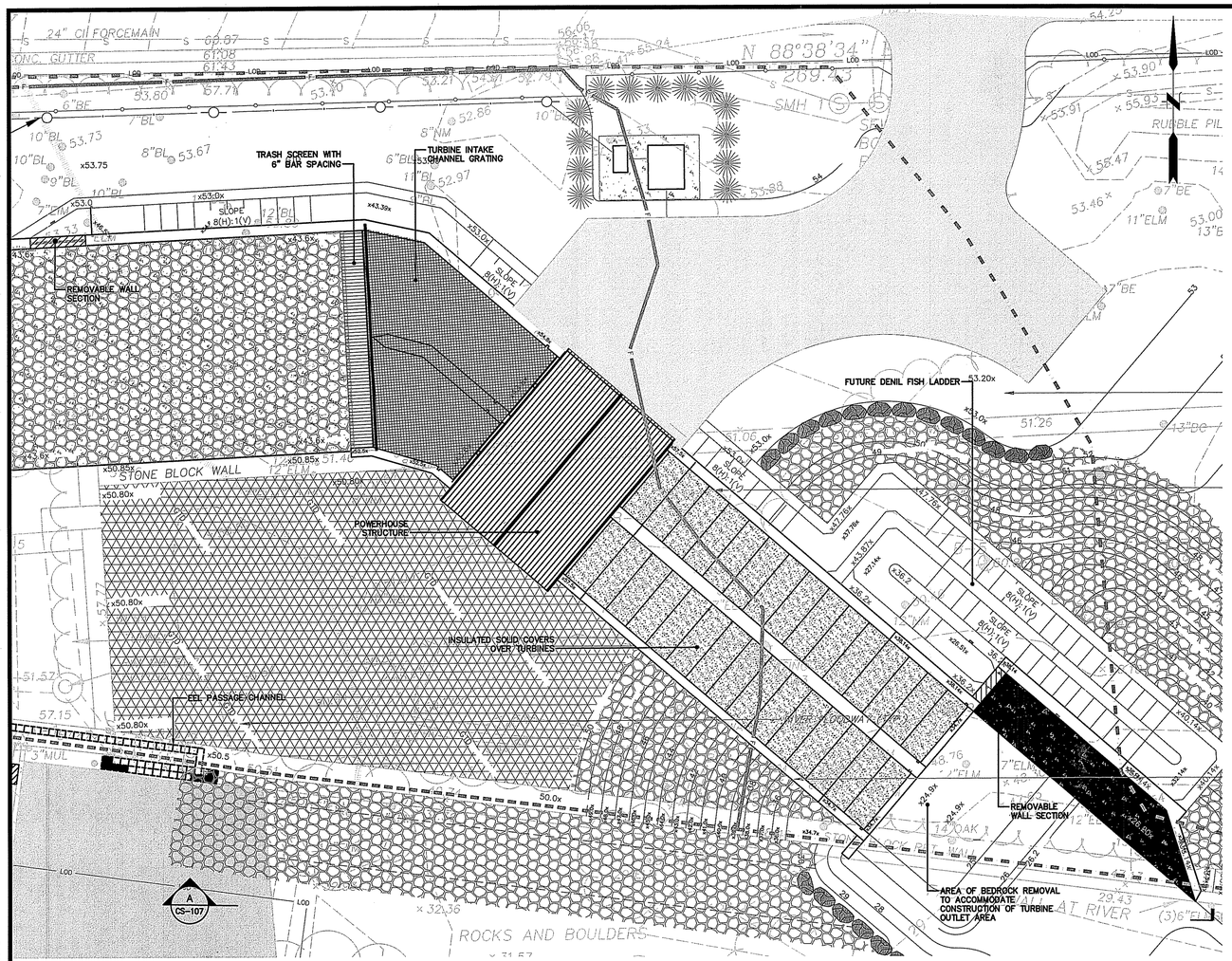
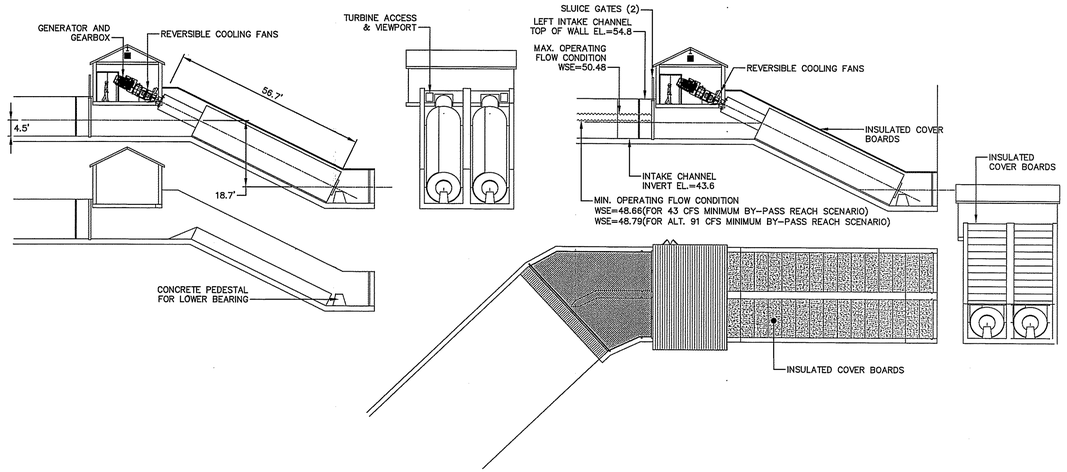


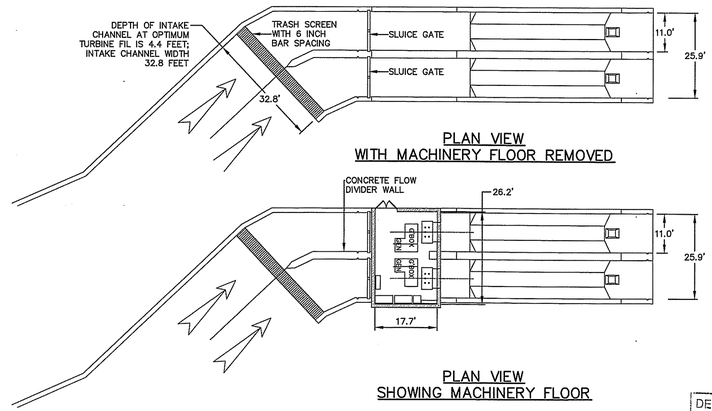
POWERHOUSE STRUCTURE AND LAYOUT

SCALE: 1"= 10'



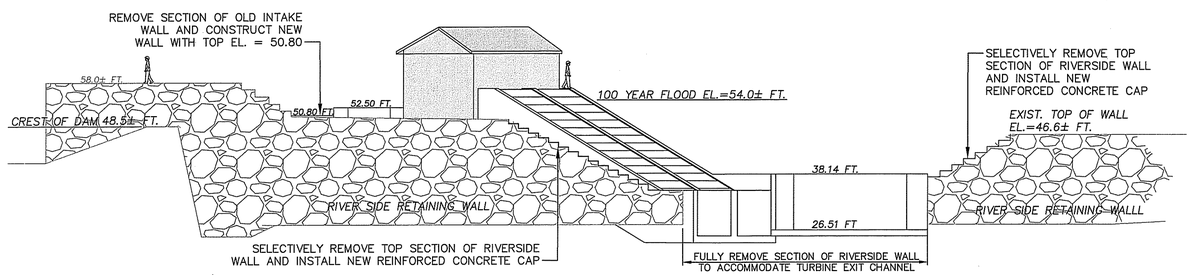
POWERHOUSE AND TURBINE CHANNEL PROFILE

SCALE: 1"= 20'



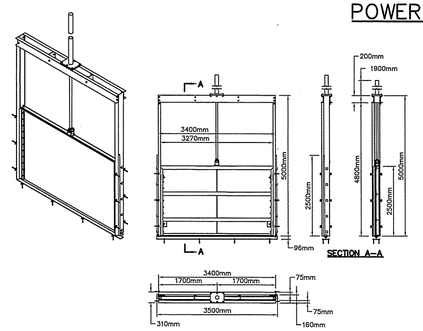
PLAN VIEW
WITH MACHINERY FLOOR REMOVED

PLAN VIEW
SHOWING MACHINERY FLOOR



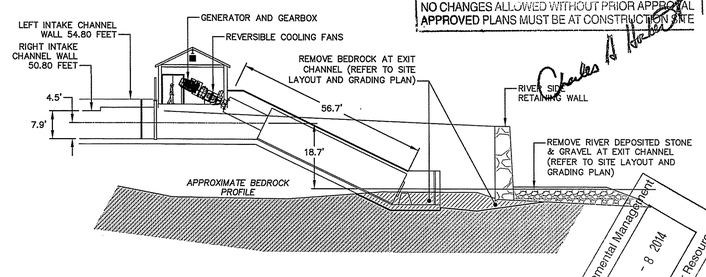
SECTION A

SCALE: 1"= 15'



SLUICE GATE TYPICAL DETAIL

SCALE: NOT TO SCALE



APPROXIMATE BEDROCK REMOVAL PROFILES

SCALE: 1"= 20'

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POWERHOUSE STRUCTURE AND TURBINE CHANNEL LAYOUT PLAN
NATICK POND DAM HYDROELECTRIC PROJECT
WEST WARWICK RHODE ISLAND

PROJ. No.: 20121867.B10
DATE: DECEMBER 2013
CS-107
SHEET 9 OF 17

File Path: J:\DWG\P2012\1867B10\CivilPlan\20121867B10_STP01_POWER.dwg Layout: CS-107 Plotted: Wed, February 12, 2014 - 11:47 AM User: sarruda
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LAYER STATE:
MS VIEW:

PRIMARY TARGET FISH SPECIES CHARACTERISTICS:

	alewife	blueback herring	American eel	American shad
Scientific Name	*Alosa pseudoharengus*	*Alosa aestivalis*	*Anguilla rostrata*	*Alosa sapidissima*
Classification	Anadromous	Anadromous	Catadromous	Anadromous
Upstream Migration	March 15- June 1 (Peak in April)	March 15 - June 15 (Peak in Late April to Early May)	March 15 -Sept. 30 (Peak in May to Early June)	May 1- July 1
Temp. Range	12° - 16°C	17°-26°C	---	12°C to 20°C
Downstream Migration	June - Nov.	June - Nov.	Late Summer - Fall	September-October
Min. Depth for Adults	≥ 9"	≥ 9"	≥6" (for eels less than 150 mm TL) ≥12" (for eels greater than150mm TL)	≥ 15"
Cruising Speed (ft/s)	2.8	2.8	2.4	2.8
Sustained Speed (ft/s)	4.8	2.8	---	7.6
Burst Speed (ft/s)	6.8	6.8	Elver 3.0, Adult 6.0-7.0	14.8

NOTES:

1. "CRUISING SPEED" IS SPEED THAT CAN BE MAINTAINED BY A PARTICULAR FISH SPECIES FOR GREATER THAN 200 MINUTES (ESSENTIALLY, INDEFINITELY).
2. "SUSTAINED SPEED" IS SPEED THAT CAN BE MAINTAINED BY A PARTICULAR FISH SPECIES FOR 20 SECONDS TO 200 MINUTES BASED ON FATIGUE TIME IN RESPIROMETER OR FLUME EXPERIMENTS.
3. BURST SPEED IS EXPECTED TO BE ONLY MAINTAINED BY A PARTICULAR FISH SPECIES FOR UP TO 20 SECONDS BASED ON FATIGUE TIME IN RESPIROMETER OR FLUME EXPERIMENTS. THIS SWIMMING MODE IS TYPICALLY USED WHEN ATTEMPTING TO PASS A RIVER FLOW DROP OR WEIR OPENING WHERE VELOCITIES ARE HIGHEST.

FISH PASSAGE DESIGN FLOWS:

Flow Event	Flow Rate (cfs)
Min. Operating Conditions	130 cfs
Normal Operating Conditions	330 cfs
Max. Operating Conditions	1,675 cfs

NOTES:

1. THESE FLOWS REPRESENT THE FOLLOWING:
   - MINIMUM OPERATING CONDITION FLOW – THE 99TH PERCENT EXCEEDANCE FLOW DURING THE FISH PASSAGE SEASON OVER THE PAST 15 YEARS.
   - NORMAL OPERATING CONDITION FLOW – THE AVERAGE OF THE MEAN AND MEDIAN APRIL FLOWS OVER THE PAST 15 YEARS.
   - MAXIMUM OPERATING CONDITION FLOW – THE FOURTH HIGHEST MAXIMUM ANNUAL FLOW (EXCLUDING OUTLIERS) THAT HAS OCCURRED DURING THE FISH PASSAGE SEASON OVER THE PAST 15 YEARS. THIS ESTIMATE EXCLUDED THE HISTORICALLY HIGH FLOWS THAT OCCURRED DURING THE MARCH/APRIL 2010 FLOOD BASED ON JUDGMENT AND KNOWLEDGE OF RIVER HYDRAULICS. THE MAXIMUM OPERATION CONDITION FLOW SELECTED FOR THIS PROJECT IS SLIGHTLY GREATER THAN FOUR TIMES THE AVERAGE ANNUAL FLOW. AS A RULE-OF-THUMB, THE MAXIMUM FLOW IS EXPECTED TO RANGE BETWEEN THREE TO FOUR TIMES THE AVERAGE ANNUAL FLOW.
2. ONLY FLOWS FROM THE PAST 15 YEARS (OBTAINED FROM USGS 011165000) WERE UTILIZED IN DETERMINING THE MINIMUM, NORMAL, AND MAXIMUM OPERATING FLOWS TO ACCOUNT FOR RECENT CHANGES IN HYDROLOGY THAT HAVE RESULTED FROM DEVELOPMENT AND/OR CLIMATE CHANGE. FLOWS OBTAINED FROM USGS 01116500 WERE ADJUSTED BY A FACTOR OF 0.9075 BASED ON THE RATIO OF THE DRAINAGE AT THE DAM (181.5 SQUARE MILES) TO THE DRAINAGE AREA AT THE USGS GAGE STATION (200 SQUARE MILES).

TURBINE OPERATING PARAMETERS (FOR 43 CFS MINIMUM BY-PASS FLOW SCENARIO):

TOTAL FLOW IN RIVER UPSTREAM OF DAM	PORTION OF FLOW TO BE DIVERTED THROUGH INTAKE CHANNEL/TURBINES	PORTION OF FLOW TO REMAIN IN RIVER (OR CREST DAM SPILLWAY)
<53 CFS	0 CFS	<53 CFS
53 CFS<x<325.4 CFS	10 CFS<x<282.4 CFS	43 CFS
>325.4CFS	282.4 CFS	>43 CFS

TURBINE OPERATING PARAMETERS (FOR ALTERNATE 91 CFS MINIMUM BY-PASS FLOW SCENARIO):

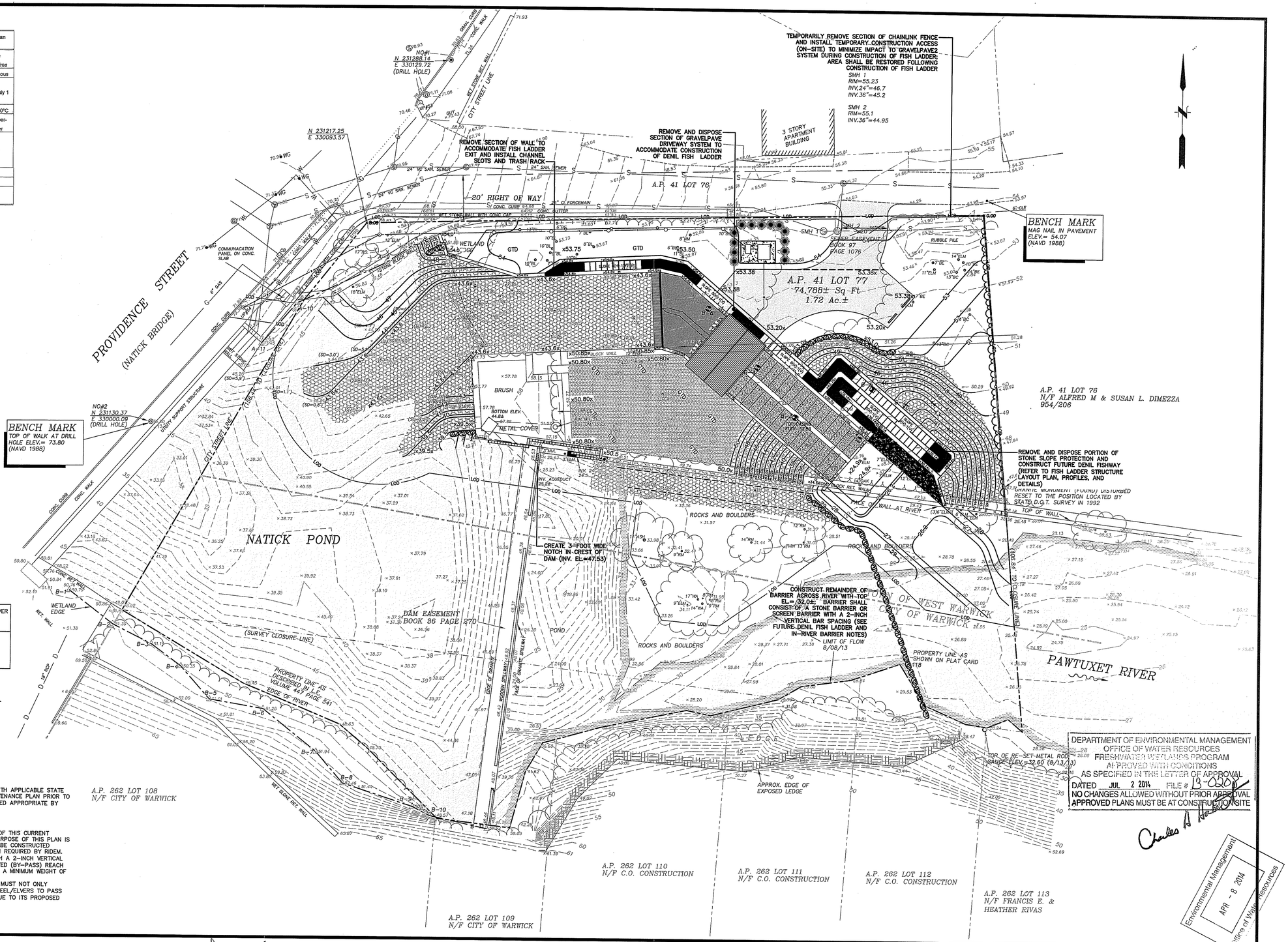
TOTAL FLOW IN RIVER UPSTREAM OF DAM	PORTION OF FLOW TO BE DIVERTED THROUGH INTAKE CHANNEL/TURBINES	PORTION OF FLOW TO REMAIN IN RIVER (OR CREST DAM SPILLWAY)
<101 CFS	0 CFS	<101 CFS
101 CFS<x<373.4 CFS	10 CFS<x<282.4 CFS	91 CFS
>373.4CFS	282.4 CFS	>91 CFS

FINAL MINIMUM BYPASS REACH FLOW NOTE:

FINAL MINIMUM BYPASS REACH FLOW PARAMETERS WILL BE DETERMINED IN CONSULTATION WITH APPLICABLE STATE AND FEDERAL REGULATORY AGENCIES AND WILL BE REPORTED IN THE OPERATION AND MAINTENANCE PLAN PRIOR TO PROJECT/TURBINE OPERATION (INCLUDING ANY ADDITIONAL OPERATIONAL RESTRICTIONS DEEMED APPROPRIATE BY REVIEW AGENCIES).

FUTURE DENIL FISH LADDER AND IN-RIVER BARRIER NOTES:

1. THE CONSTRUCTION OF THE DENIL FISH LADDER AND IN-RIVER BARRIER ARE NOT PART OF THIS CURRENT APPLICATION PROPOSAL AND ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY. THE PURPOSE OF THIS PLAN IS TO DEMONSTRATE THAT A VIABLE UPSTREAM ANADROMOUS FISH PASSAGE FACILITY CAN BE CONSTRUCTED ON-SITE ONCE FISH PASSAGE IS ACHIEVED AT THE DOWNSTREAM PONTIAC DAM OR WHEN REQUIRED BY RIDEM.
2. THE LOW IN-RIVER FISH BARRIER SHALL BE A STONE BARRIER OR SCREEN BARRIER (WITH A 2-INCH VERTICAL BAR SPACING) THAT WILL PREVENT ANADROMOUS SPECIES FROM PASSING UP THE DIVERTED (BY-PASS) REACH DURING HIGH FLOW CONDITIONS. IF CONSTRUCTED OF STONE, STONES USED SHALL HAVE A MINIMUM WEIGHT OF BETWEEN 2 TO 2.5 TONS WITH A MINIMUM DIMENSION OF 4'Lx3'Wx3'H.
3. THE ACTUAL DESIGN OF THE BARRIER MUST BE FINALIZED PRIOR TO CONSTRUCTION AND MUST NOT ONLY PREVENT ANADROMOUS FISH FROM PASSING UP THE DIVERTED REACH, BUT ALSO ALLOW EEL/ELVERS TO PASS DOWNSTREAM WHILE AVOIDING INCREASES IN 100 YEAR BASE FLOOD ELEVATIONS (BFE) DUE TO ITS PROPOSED LOCATION WITHIN A FLOODWAY.



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SEAL
PHILIP W. MORESCHI
No. 7428
REGISTERED PROFESSIONAL ENGINEER (CIVIL)
Date Signed: February 3, 2014

SCALE:
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317 IRON HORSE WAY, SUITE 204
PROVIDENCE, RI 02908
401.861.3070
www.fando.com

WATER STREET LAND, LLC
FUTURE BUILD-OUT SITE LAYOUT AND GRADING PLAN
NATICK POND DAM HYDROELECTRIC PROJECT
WEST WARWICK RHODE ISLAND

PROJ. No.: 20121867.B10
DATE: DECEMBER 2013
CS-108
SHEET 10 OF 17

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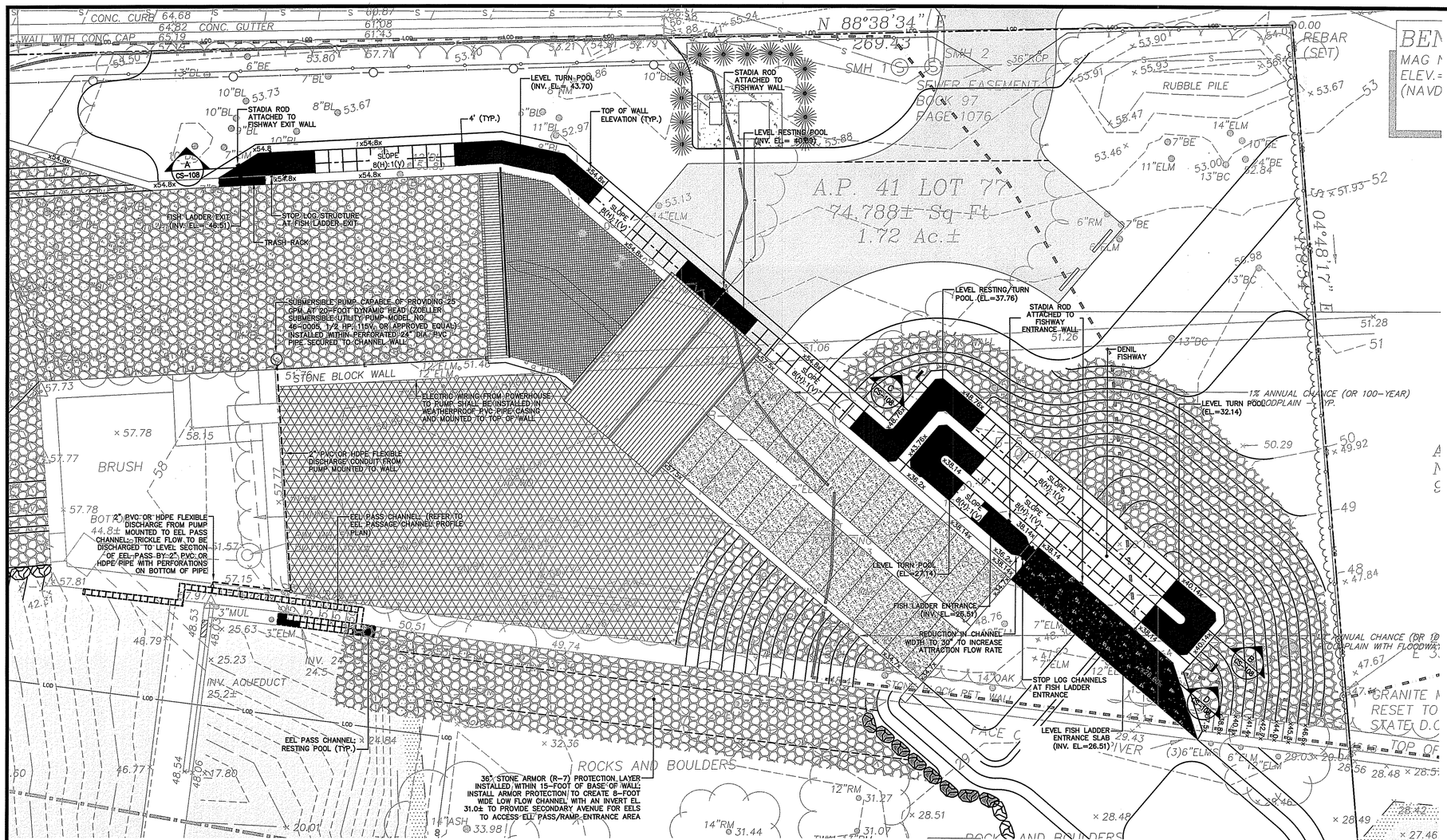

FISH LADDER STRUCTURE AND EEL PASSAGE

SCALE: 1"= 10'

GENERAL NOTES:

1. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS OF EXISTING STRUCTURES AND FEATURES IN THE FIELD.
2. THE TERM 'BEYOND' WHEN USED IN SECTION VIEWS OF STRUCTURAL ELEMENTS INDICATES THAT SAID ELEMENT IS NOT IN THE LINE OF THE SECTION CUT; HOWEVER, IT PROVIDES A GREATER UNDERSTANDING OF THE STRUCTURE.
3. IT IS THE CONTRACTORS RESPONSIBILITY TO VERIFY CLEARANCES TO ANY POTENTIAL OBSTRUCTION WHICH SHALL INCLUDE BUT NOT BE LIMITED TO EXISTING OVERHEAD UTILITIES, UNDERGROUND UTILITIES, ROADWAYS, STRUCTURES, WATERWAYS, BUFFER OFFSETS, AND ANY OTHER NATURAL OR MANMADE FEATURE THAT WOULD PREVENT THE CONSTRUCTION OR INSTALLATION OF ANY PART OF THE WORK OR ITEM REQUIRED TO COMPLETE THE WORK, PRIOR TO MOBILIZING EQUIPMENT TO THE SITE.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DESIGNING, INSTALLING, OPERATING AND MAINTAINING ALL EQUIPMENT NECESSARY TO DEWATER GROUNDWATER, AND BYPASS SURFACE WATER AROUND SITE EXCAVATIONS.
5. THE CONTRACTOR SHALL DETERMINE THE SURFACE PROFILE AND ELEVATIONS OF THE BEDROCK PRIOR TO EXCAVATION OF BEDROCK.

CONCRETE NOTES:

1. ALL CONCRETE WORK SHALL CONFORM TO ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS".
2. REINFORCING STEEL SHALL HAVE A MINIMUM CONCRETE COVER AS FOLLOWS:
   - CONCRETE DEPOSITED AGAINST GROUND = 3 IN.
   - CONCRETE EXPOSED TO WEATHER OR IN CONTACT WITH GROUND = 2 IN.
3. ALL REINFORCING STEEL SHALL BE CONTINUOUS AND LAPPED A MINIMUM OF 48 BAR DIAMETERS AT ALL SPLICES, CORNERS, AND INTERSECTIONS UNLESS NOTED OTHERWISE.
4. ALL REINFORCEMENT SHALL BE SECURELY TIED IN ITS PROPOSED LOCATION PRIOR TO AND DURING PLACEMENT OF CONCRETE USING APPROVED CHAIRS, SPACERS AND TIE WIRE AS REQUIRED. NO BARS SHALL BE CUT OR OMITTED IN THE FIELD WITHOUT THE APPROVAL OF THE ENGINEER.
5. CAST-IN-PLACE MARINE CONCRETE SHALL BE NORMAL WEIGHT CONCRETE AND SHALL DEVELOP A COMPRESSIVE STRENGTH OF 4,000 PSI IN 28 DAYS. CONCRETE SHALL HAVE A MAXIMUM AGGREGATE SIZE OF 3/4 INCH, A MINIMUM CEMENTITIOUS CONTENT OF 675 LBS/CU YD., AND A MAXIMUM SLUMP OF 4 INCHES.
7. ALL EXPOSED CONCRETE SURFACES SHALL RECEIVE FORM LINER TREATMENT TO SIMULATE APPEARANCE OF STONE MASONRY EXCEPT WERE NOTED FOR INTERIOR SURFACES OF FISH LADDER WALLS.
   - INTERIOR SURFACES OF EEL PASSAGE WALLS SHALL NOT RECEIVE FORM LINER TREATMENT.
   - SIGNAGE ELEMENTS SHALL NOT RECEIVE FORM LINER TREATMENT.
8. ALL CONCRETE SHALL BE AIR-ENTRAINED.
9. THE CONTRACTOR SHALL COORDINATE THE SIZES AND LOCATIONS OF ALL REQUIRED EMBEDDED ITEMS FOR ALL TRADES SUCH AS ANCHOR BOLTS, PIPING SLEEVES, HOLD-DOWN ANCHORS, ETC.
10. CONSTRUCTION JOINTS SHALL BE DETAILED AND LOCATED ON SHOP DRAWINGS AND APPROVED BY THE ENGINEER. UNLESS SHOWN OTHERWISE, CONSTRUCTION JOINTS ARE TO BE KEYED AND PROVIDE FOR CONTINUITY OF REINFORCING STEEL. CONSTRUCTION JOINTS ARE TO BE LOCATED WHERE CONSTRUCTION OPERATIONS ARE SUSPENDED FOR 30 MINUTES OR MORE.
11. CONSTRUCTION JOINTS IN WALLS SHALL BE LOCATED AT THE CONVENIENCE OF THE CONTRACTOR EXCEPT WHERE SPECIFICALLY SHOWN ON PLAN OR APPROVED BY THE ENGINEER.
12. NO HORIZONTAL CONSTRUCTION JOINTS ARE PERMITTED IN WALLS, OTHER THAN SHOWN IN DETAILS.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LIMITING POURS TO MINIMIZE SHRINKAGE CRACKING. IN GENERAL, WALLS SHALL NOT BE POURED IN CONTINUOUS LENGTHS EXCEEDING 40 FEET WITHOUT CONTRACTION (CONTROL) JOINTS. THE LOCATION AND CONFIGURATION OF JOINTS EXPOSED TO VIEW SHALL BE COORDINATED WITH THE ENGINEER.
14. DOWELS: PROVIDE, PLACE, AND SPACE TO MATCH REINFORCING.
15. ALL CONCRETE JOINTS, INCLUDING CONSTRUCTION, JOINTS SHALL HAVE WATER STOPS INSTALLED.
16. LADDER RUNGS TO BE INSTALLED FOR FUTURE MAINTENANCE AND ACCESS AT LOCATIONS SPECIFIED BY THE ENGINEER PRIOR TO CONSTRUCTION.

FISH LADDER GRATING:

GRATING LOAD PATHS SHALL BE DETERMINED BY THE CONTRACTOR.

1. GRATINGS SHALL BE ANCHORED USING THE GRATING MANUFACTURERS STANDARD ANCHORAGE DEVICES.
   - ANCHORAGE DEVICES SHALL BE EITHER HOT-DIPPED GALVANIZED OR STAINLESS STEEL.
   - ANCHORAGE DEVICES SHALL TAMPER RESISTANT.
   - ANCHORAGE DEVICES SECURING GRATING OVER THE FISH LADDER SHALL ALLOW FOR THE REMOVAL OF INDIVIDUAL SECTIONS OF GRATING
2. ALL GRATING OVER THE CONCRETE FISH LADDER CHANNEL SHALL BE REMOVABLE. THE CONTRACTOR SHALL CONFIGURE THE LENGTH OF GRATING SECTIONS IN ORDER TO LIMIT THE WEIGHT OF AN INDIVIDUAL SECTION OF GRATING TO 60 LBS, WITH A MAXIMUM LENGTH OF 6 FEET.
3. GRATING BEARING BARS SHALL BE OF A WIDTH, DEPTH, AND SPACING AS REQUIRED TO MEET THE STRUCTURAL PERFORMANCE REQUIREMENT UNLESS OTHERWISE INDICATED.
   - DUE TO VARIATIONS BETWEEN GRATING MANUFACTURERS, THE CONTRACTOR SHALL VERIFY THAT THE GRATING USED IS CAPABLE OF MEETING THE STRUCTURAL PERFORMANCE REQUIREMENTS.
4. ALL GRATING SHALL BE MOLDED OR PULTRUDED FIBERGLASS GRATING,
   - COLOR: GRAY
   - SURFACE: INTEGRAL GRIT
5. DESIGN LIVE LOADS OF THE GRATINGS BE 100 PSF UNIFORMLY DISTRIBUTED LOAD WITH A MAXIMUM DEFLECTION OF L/240 AT THE CENTER OF A SIMPLE SPAN OR A CONCENTRATED LOAD OF 500 POUNDS WITH A MAXIMUM DEFLECTION OF ¼" AT THE CENTER OF A SIMPLE SPAN.

STRUCTURAL STEEL NOTES:

1. ALL STRUCTURAL STEEL SHALL BE NEW, CLEAN, AND STRAIGHT AND SHALL BE DETAILED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE A.I.S.C. CODE OF STANDARD PRACTICE (ADOPTED MARCH 18, 2005), EXCEPT AS MODIFIED IN THESE NOTES AND THE PROJECT SPECIFICATIONS.
2. STEEL FABRICATION AND ERECTION SHALL COMPLY WITH THE BUILDING CODE, AND THE SPECIFICATIONS ACCOMPANYING THIS PLAN SET, AND THE "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS (ADOPTED JUNE 21, 2005)" OF A.I.S.C.
3. ALL WELDING SHALL CONFORM TO THE AMERICAN WELDING SOCIETY. D1.1-92 STRUCTURAL WELDING CODE-STEEL.
4. ALL FILLET WELDING SHALL BE A MINIMUM OF 3/16 INCH WELD UNLESS NOTED OTHERWISE ON DRAWINGS. SEE THE SPECIFICATION FOR ADDITIONAL REQUIREMENTS.
5. ALL FIELD CONNECTIONS SHALL BE BOLTED EXCEPT WHERE WELDING IS SPECIFIED ON THE PLANS. BOLTS SHALL BE 3/4 INCH DIAMETER MINIMUM. BOLT HOLES FOR STEEL ANCHORED TO CONCRETE, UTILIZING CAST-IN-PLACE ANCHORS, SHALL BE BOLT DIAMETER PLUS 5/16 INCH. CONNECTIONS NOT SPECIFICALLY DETAILED ON THE PLANS SHALL BE DESIGNED FOR THE LOADS INDICATED ON THE DRAWINGS OR THOSE STATED IN THE A.I.S.C UNIFORM LOAD TABLES, WHICHEVER IS GREATER.
6. PROVIDE HOLES, COPES, ETC. REQUIRED IN STRUCTURAL STEEL MEMBERS FOR WORK OF OTHER TRADES. THEY SHALL BE SHOWN ON STRUCTURAL SHOP DRAWINGS AND SHALL BE MADE IN THE SHOP. FIELD BURNING OF HOLES OR CUTS IN STRUCTURAL STEEL MEMBERS WILL NOT BE PERMITTED EXCEPT WITH THE SPECIFIC WRITTEN APPROVAL OF THE ENGINEER.
7. GALVANIZED STEEL SHALL CONFORM TO EITHER ASTM A992 OR ASTM A572, GRADE 50.
8. WEATHERING STEEL SHALL CONFORM TO ASTM A588, GRADE 50.
9. THE GRATING SUPPORT ANGELS AND BEAMS, AND THE STOP LOG CHANNELS SHALL BE GALVANIZED IN ACCORDANCE WITH THE SPECIFICATIONS. ALL OTHER STEEL SHALL BE WEATHERING STEEL.

COLD WEATHER CONSTRUCTION PROCEDURES:

1. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTINUOUSLY PROTECT SOILS, CONCRETE, MASONRY AND OTHER BUILDING MATERIALS FROM DAMAGE DUE TO COLD TEMPERATURES, UNTIL THE BUILDING(S) OR STRUCTURES HAVE BEEN TURNED OVER TO THE OWNER. THIS SHALL INCLUDE TEMPORARY ENCLOSURES, INSULATED BLANKETS, AND TEMPORARY HEATING, AS REQUIRED.
2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR AND/OR REPLACE ANY DAMAGED OR DEFECTIVE WORK, IN A MANNER APPROVED BY THE ENGINEER.
3. FOOTINGS SHALL NOT BE CONSTRUCTED ON FROZEN GROUND. ALL FROZEN SOIL SHALL BE REMOVED AND REPLACED WITH COMPACTED CRUSHED STONE.
4. FROZEN MATERIALS OR MATERIALS CONTAINING ICE SHALL NOT BE USED.
5. ALL PROTECTIVE AND CORRECTIVE WORK SHALL BE DONE AT THE EXPENSE OF THE CONTRACTOR.

JOINTS

1. JOINT SEALANT/CAULK SHALL HAVE THE FOLLOWING CHARACTERISTICS:
   - MOISTURE CURED/SINGLE COMPONENT/POLYURETHANE BASED/NON-SAG/ELASTOMERIC
   - COLOR: GRAY
   - RESISTANT TO WEATHERING
2. SEALANT SHALL COMPLY WITH THE FOLLOWING:
   - ASTM C-920, TYPE S, GRADE NS
3. PREPARE SURFACES AND APPLY SEALANT IN ACCORDANCE WITH THE MANUFACTURERS WRITTEN INSTRUCTIONS
4. CLOSED CELL ELASTOMER SHALL COMPLY WITH THE FOLLOWING:
   - ASTM D 545 / ASTM D1751
   - DENSITY: 2 PCF NOMINAL
   - THICKNESS: 2"
   - COMPRESSIVE STRENGTH: 5 PSI MIN. @ 25% / 12 PSI MIN. @ 50%
   - WATER ABSORPTION: 0.001 LB / FT²
   - TENSILE STRENGTH: 100 PSI
   - COLOR: BLACK

ANCHOR BOLTS / BOLTED CONNECTIONS:

1. ALL ANCHOR BOLTS AND ASSOCIATED BOLTED CONNECTIONS INDICATED ON THE STRUCTURAL PLANS SHALL BE OF THE SIZE INDICATED AND GALVANIZED IN ACCORDANCE WITH ASTM A153.
2. EPOXY ANCHORS WHERE INDICATED ON THE PLANS SHALL HAVE THE FOLLOWING EMBEDMENTS UNLESS NOTED OTHERWISE OR SUPERSEDED BY THE MANUFACTURERS MINIMUM EMBEDMENT REQUIREMENTS:

⅜" DIA. = 3" ½" DIA. = 4" ⅝" DIA. = 5" ¾" DIA. = 7"

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Office of Water Resources

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SEAL

PHILIP W. MORESCHI — No. 7428 — REGISTERED PROFESSIONAL ENGINEER (CIVIL)

Date Signed: February 3, 2014

SCALE:
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GRAPHIC SCALE

FUSS & O'NEILL
317 IRON HORSE WAY, SUITE 204
PROVIDENCE, RI 02908
401.861.3070
www.fando.com

WATER STREET LAND, LLC
FISH LADDER STRUCTURE AND EEL PASSAGE CHANNEL LAYOUT PLAN
NATICK POND DAM HYDROELECTRIC PROJECT
WEST WARWICK RHODE ISLAND

PROJ. No.: 20121867.B10
DATE: DECEMBER 2013
CS-109
SHEET 11 OF 17

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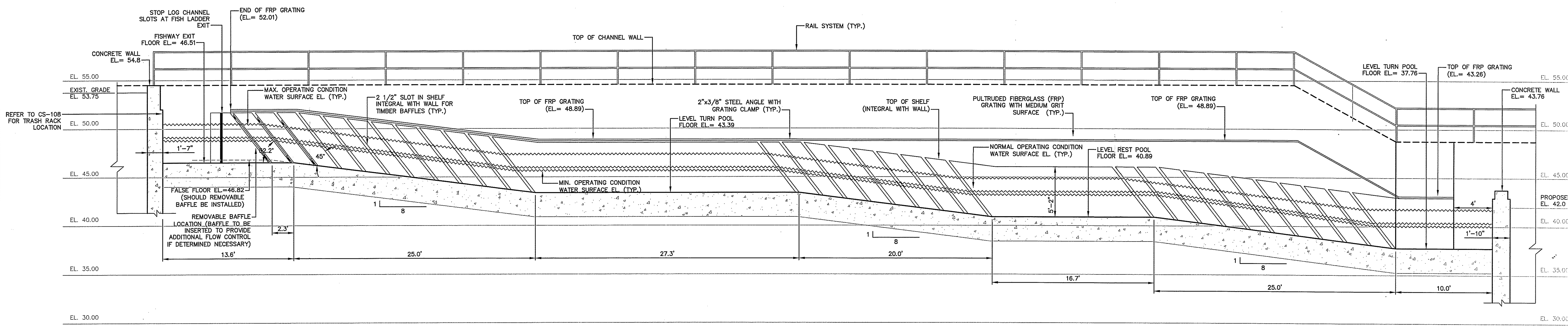
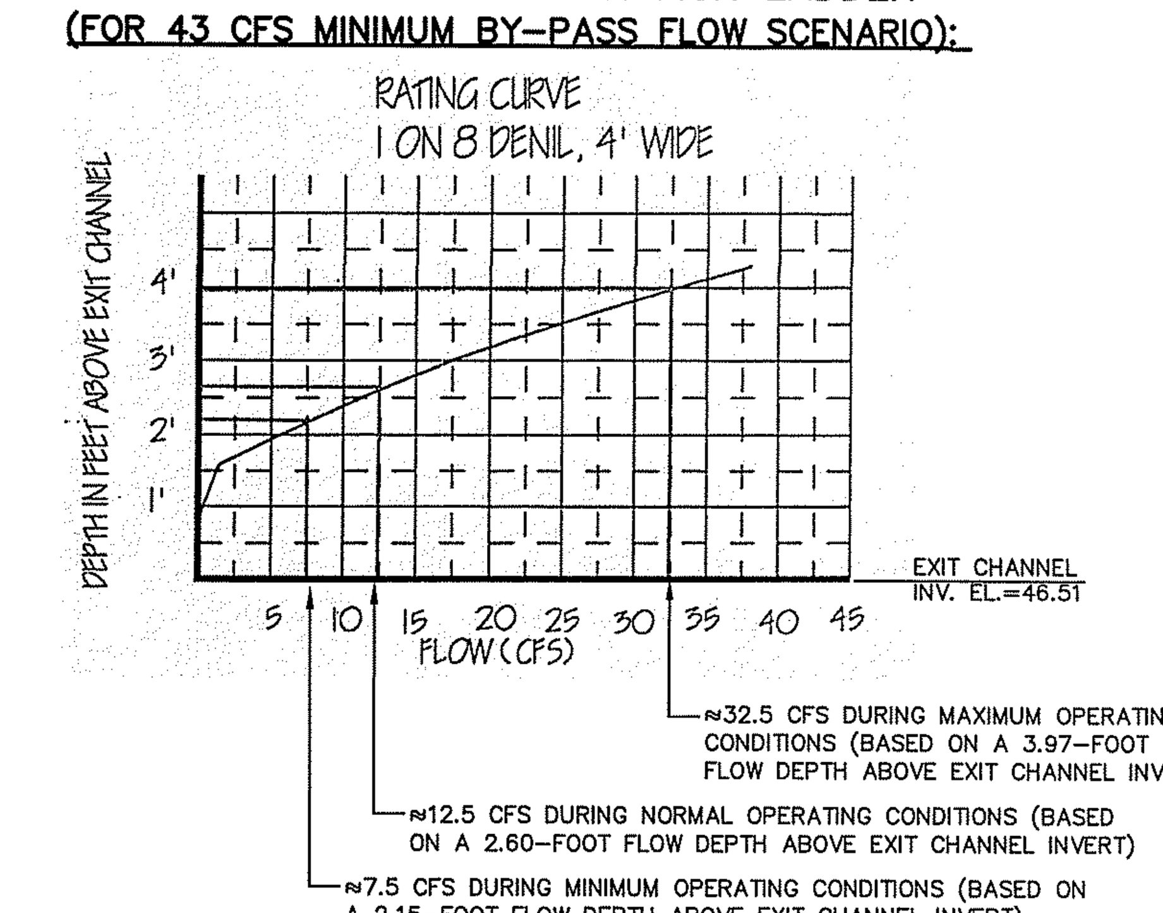
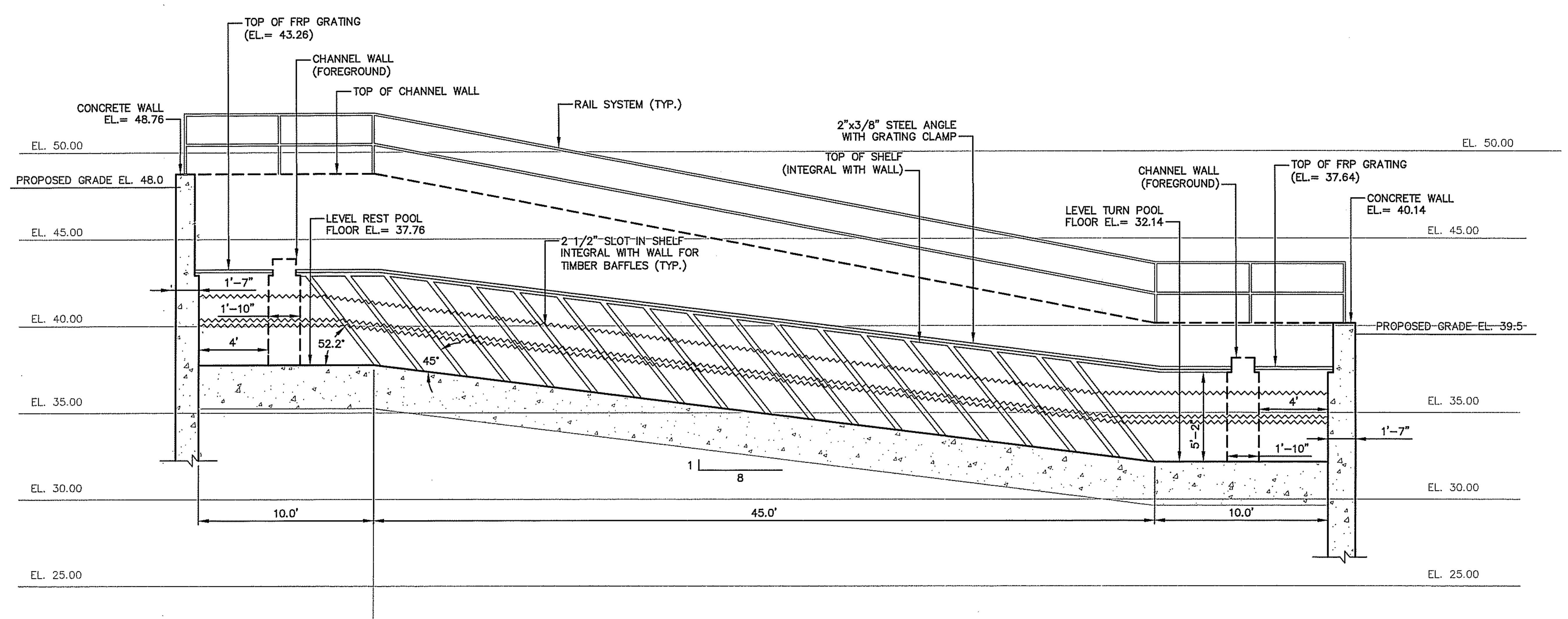


A DEVELOPED SECTION ALONG FISH LADDER
SCALE: 1"= 5'

FLOWS CONVEYED THROUGH FISH LADDER
(FOR 43 CFS MINIMUM BY-PASS FLOW SCENARIO):





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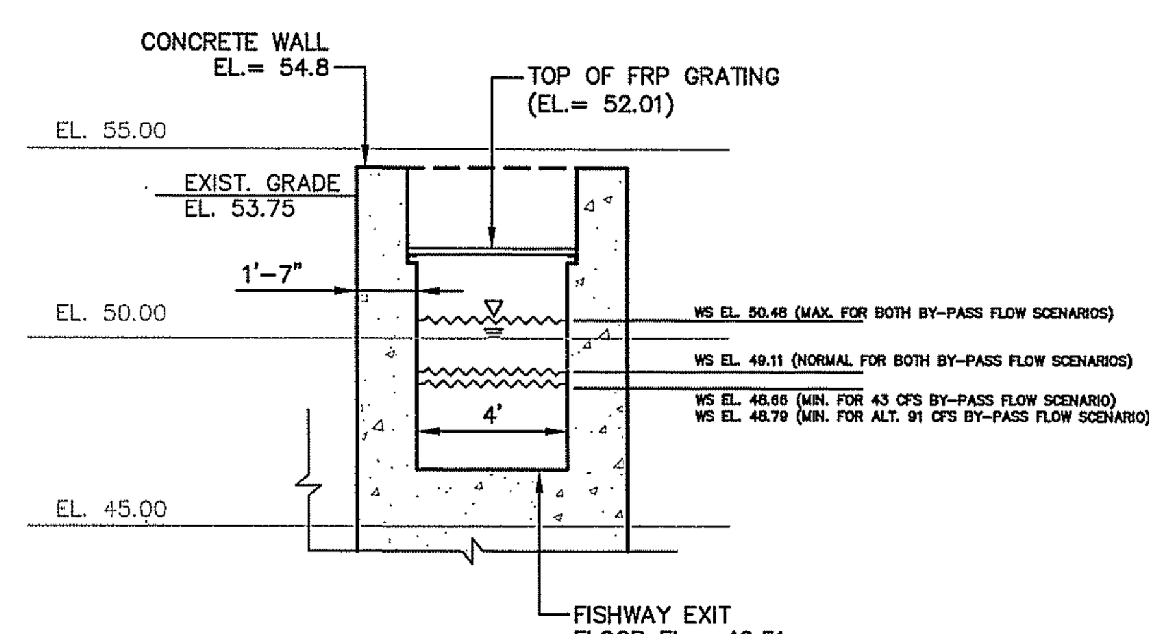
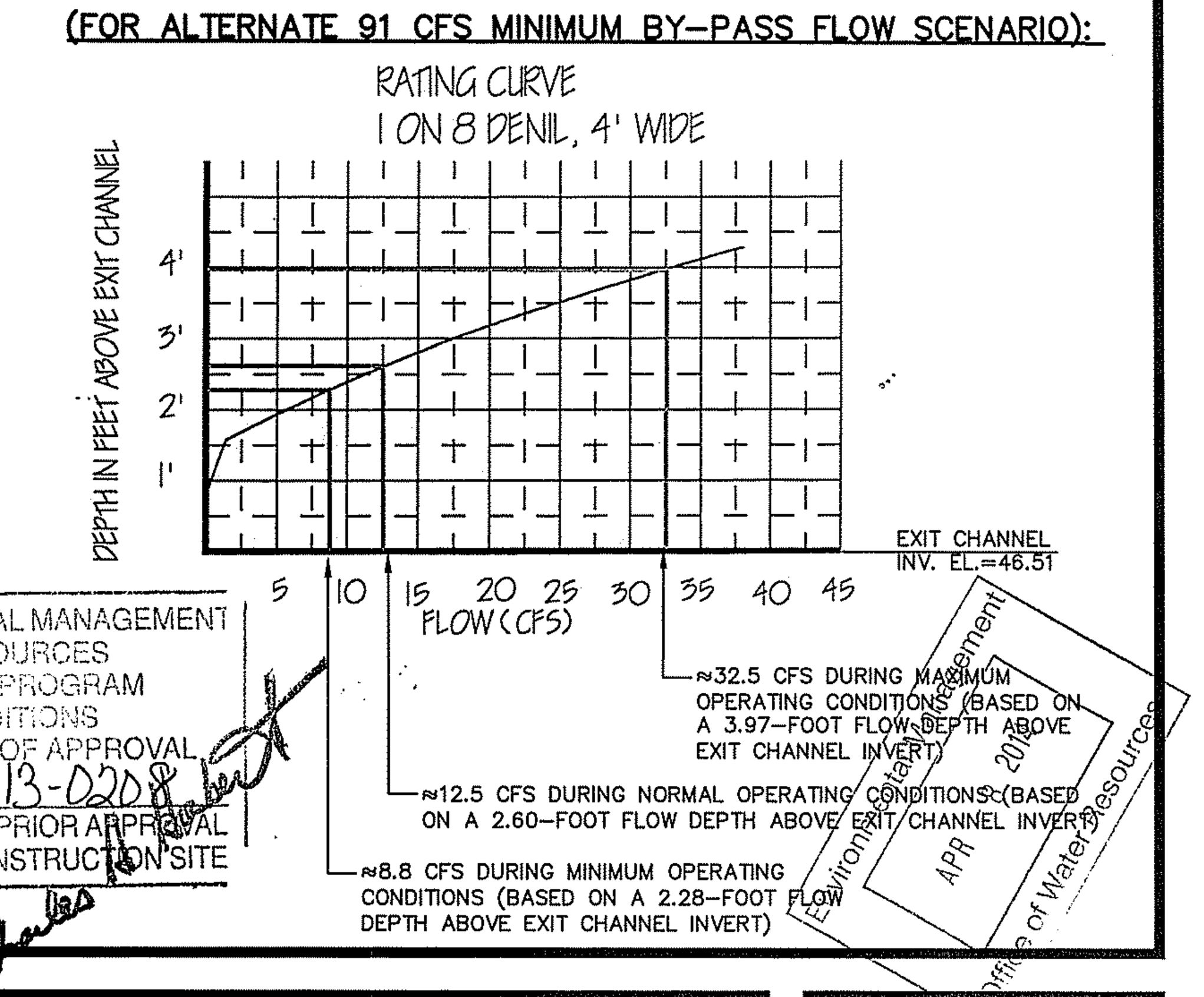
SCALE: 1"= 5'



FISH LADDER EXIT CHANNEL TYPICAL SECTION
SCALE: 1"=5'

FLOWS CONVEYED THROUGH FISH LADDER:
(FOR ALTERNATE 91 CFS MINIMUM BY-PASS FLOW SCENARIO):



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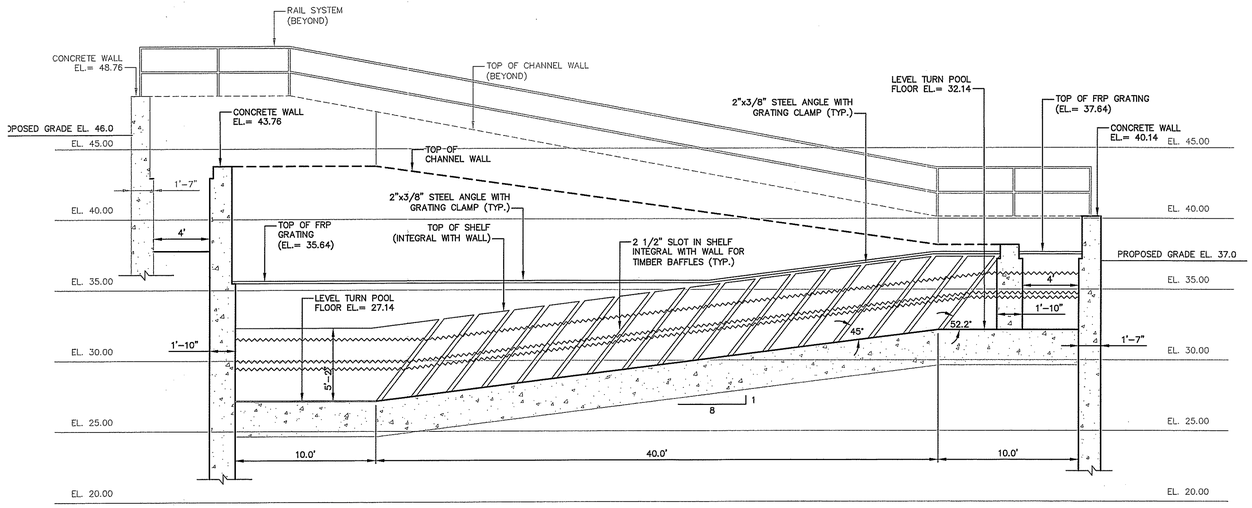

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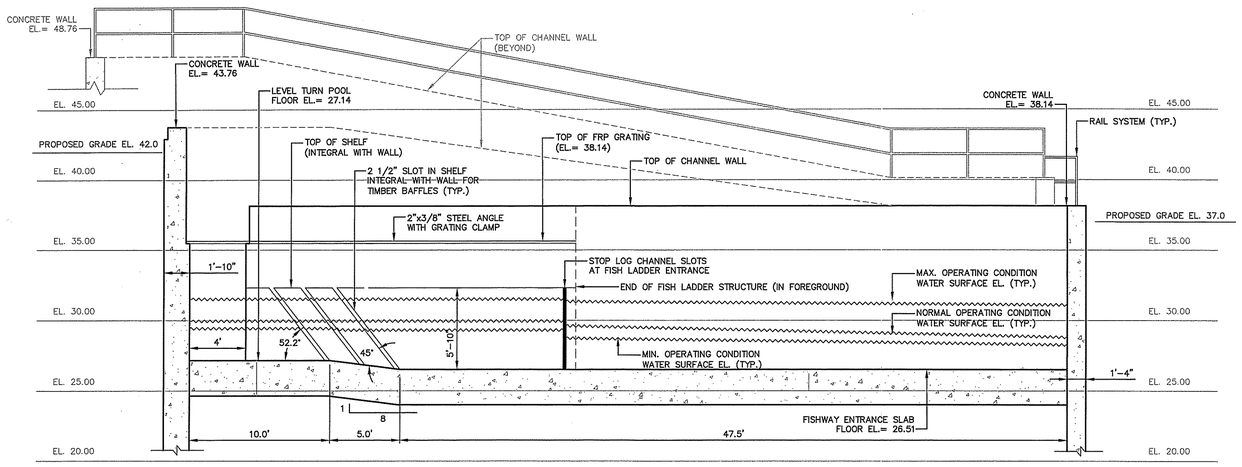
SCALE: 1"= 5'



D DEVELOPED SECTION ALONG FISH LADDER

SCALE: 1"= 5'

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FISH LADDER PROFILES

NATICK POND DAM HYDROELECTRIC PROJECT

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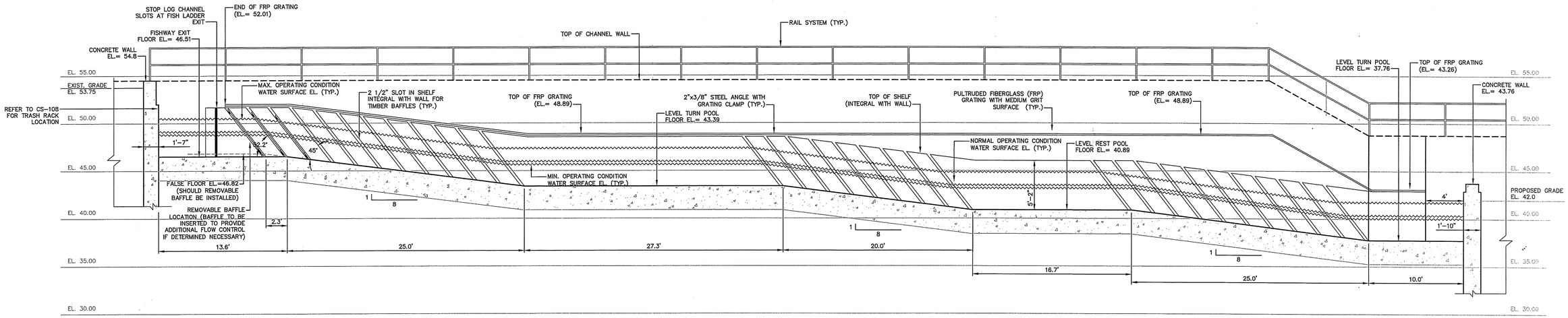
SHEET 13 OF 17



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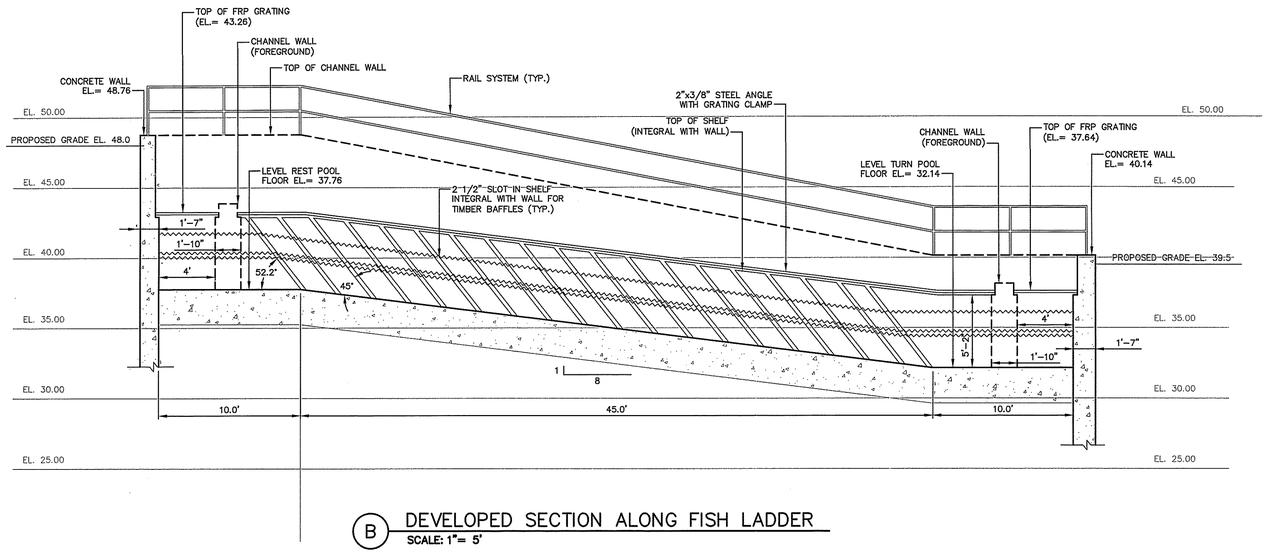

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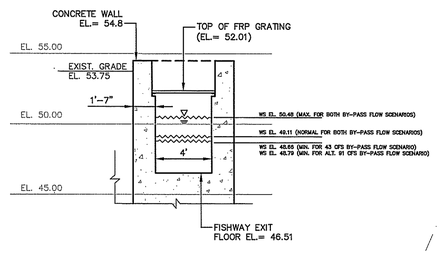

FISH LADDER EXIT CHANNEL
TYPICAL SECTION
SCALE: 1"=5'

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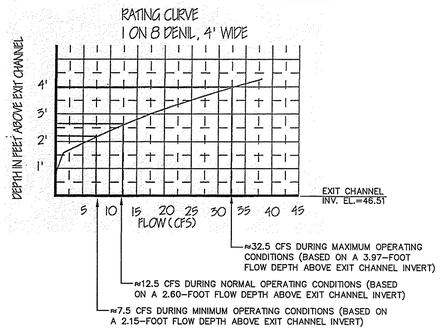

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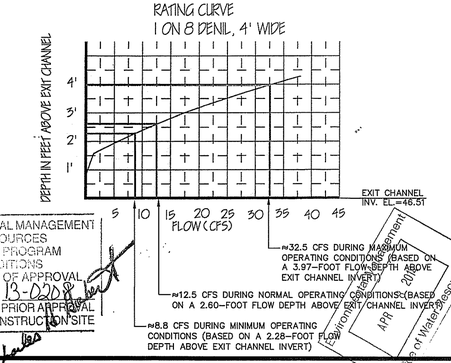

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GRAPHIC SCALE

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317 IRON HORSE WAY, SUITE 204
PROVIDENCE, RI 02908
401.861.3070
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WATER STREET LAND, LLC
FISH LADDER PROFILES
NATICK POND DAM HYDROELECTRIC PROJECT
WEST WARWICK RHODE ISLAND

PROJ. No.: 20121867.B10
DATE: DECEMBER 2013
CS-110
SHEET 12 OF 17

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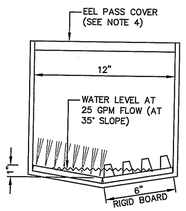
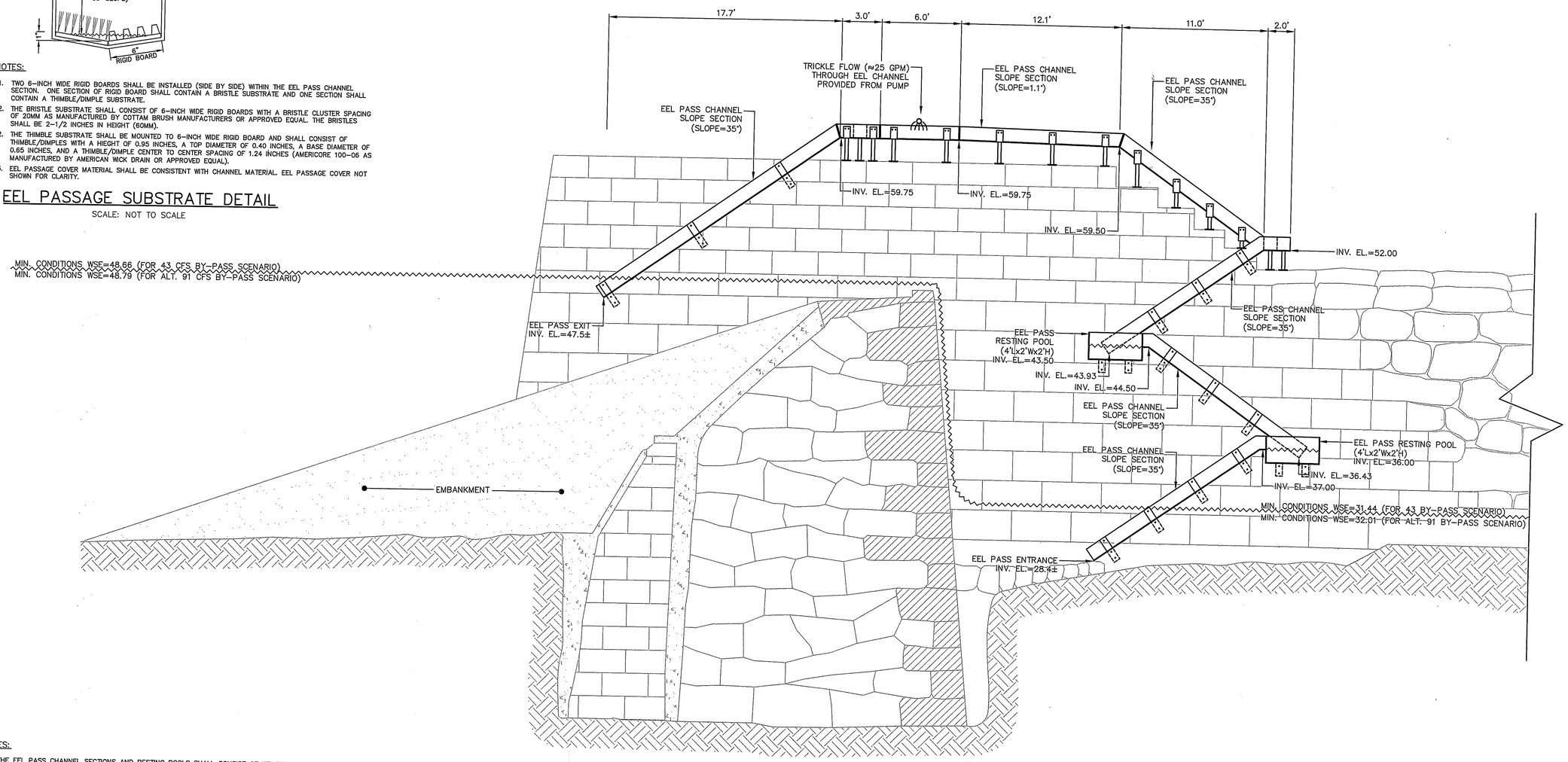


NOTES:

1. TWO 6-INCH WIDE RIGID BOARDS SHALL BE INSTALLED (SIDE BY SIDE) WITHIN THE EEL PASS CHANNEL SECTION. ONE SECTION OF RIGID BOARD SHALL CONTAIN A BRISTLE SUBSTRATE AND ONE SECTION SHALL CONTAIN A THIMBLE/DIMPLE SUBSTRATE.
2. THE BRISTLE SUBSTRATE SHALL CONSIST OF 6-INCH WIDE RIGID BOARDS WITH A BRISTLE CLUSTER SPACING OF 20MM AS MANUFACTURED BY COTTAM BRUSH MANUFACTURERS OR APPROVED EQUAL. THE BRISTLES SHALL BE 2-1/2 INCHES IN HEIGHT (60MM).
2. THE THIMBLE SUBSTRATE SHALL BE MOUNTED TO 6-INCH WIDE RIGID BOARD AND SHALL CONSIST OF THIMBLE/DIMPLES WITH A HIEGHT OF 0.95 INCHES, A TOP DIAMETER OF 0.40 INCHES, A BASE DIAMETER OF 0.65 INCHES, AND A THIMBLE/DIMPLE CENTER TO CENTER SPACING OF 1.24 INCHES (AMERICORE 100-06 AS MANUFACTURED BY AMERICAN WICK DRAIN OR APPROVED EQUAL).
3. EEL PASSAGE COVER MATERIAL SHALL BE CONSISTENT WITH CHANNEL MATERIAL. EEL PASSAGE COVER NOT SHOWN FOR CLARITY.

EEL PASSAGE SUBSTRATE DETAIL

SCALE: NOT TO SCALE



NOTES:

1. THE EEL PASS CHANNEL SECTIONS AND RESTING POOLS SHALL CONSIST OF WEATHERED STEEL, HDPE, OR GRADE 5052 ALUMINUM (SUBJECT TO SHPO APPROVAL) WITH COVERS.
2. THE PUMP USED TO SUPPLY THE EEL PASS WITH FLOW SHALL BE A SUBMERSIBLE UTILITY PUMP, 25 GPM PUMP AT A 20-FOOT DYNAMIC HEAD (ZOELLER MODEL No. 46-0005 OR APPROVED EQUAL).
3. THE EEL PASS CHANNEL SECTIONS THAT ARE MOUNTED TO THE SIDE OF THE EXISTING STONE MASONRY RIVER WALL SHALL BE CAPABLE OF BEING REMOVED DURING FLOOD EVENTS AND/OR BE DESIGNED WITH BREAKAWAY BOLTS.

EEL PASSAGE CHANNEL PROFILE

SCALE: 1"=5'

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
FRESHWATER WETLANDS PROGRAM
APPROVED WITH CONDITIONS
AS SPECIFIED IN THE LETTER OF APPROVAL
DATED JUL 2 2014 FILE # 13-0208
NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL
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Environmental Management
APR - 8 2014
Office of Water Resources

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.	2/3/2014	REVISIONS PER RIDEM FRESHWATER WETLAND 1/24/14 REVIEW COMMENTS		

SEAL

SEAL
PHILIP W. MORESCHI
No. 7428
REGISTERED PROFESSIONAL ENGINEER (CIVIL)

Date Signed:
February 3, 2014

SCALE:
HORZ.: 1" = 5'
VERT.:
DATUM:
HORZ.:
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5 2.5 0 5
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EEL PASSAGE CHANNEL PROFILE

NATICK POND DAM HYDROELECTRIC PROJECT

WEST WARWICK RHODE ISLAND

PROJ. No.: 20121867.B10
DATE: DECEMBER 2013

CS-112

SHEET 14 OF 17

File Path: J:\DWG\P2012\1867B10\Civil\Plan\20121867B10_PRF01_FISH.dwg Layout: CS-112 Plotted: Wed, February 12, 2014 - 11:49 AM User: sarruda
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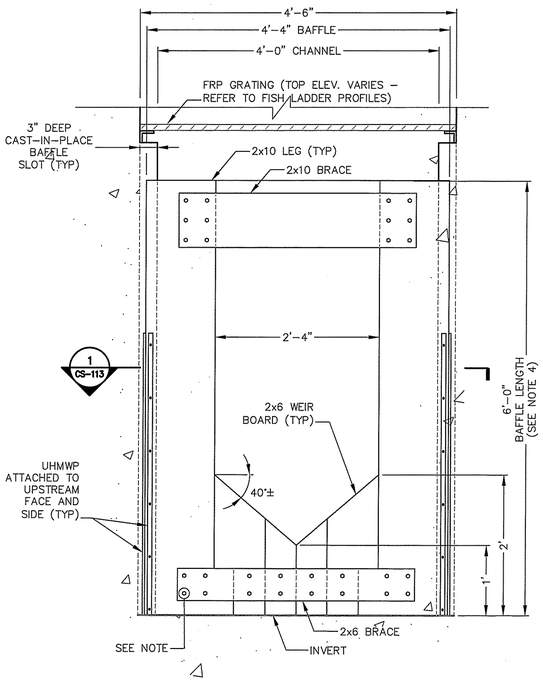
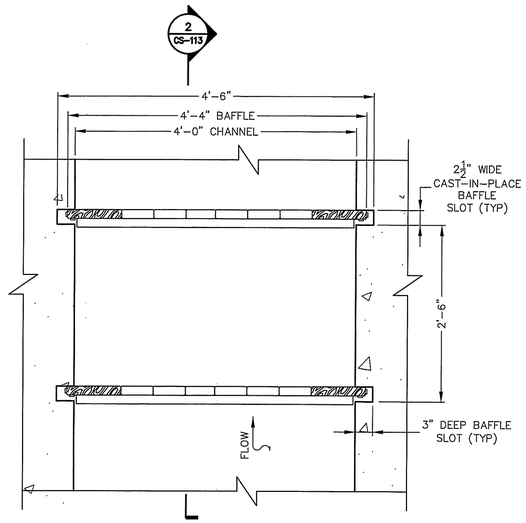


TIMBER BAFFLE TYPICAL SECTION

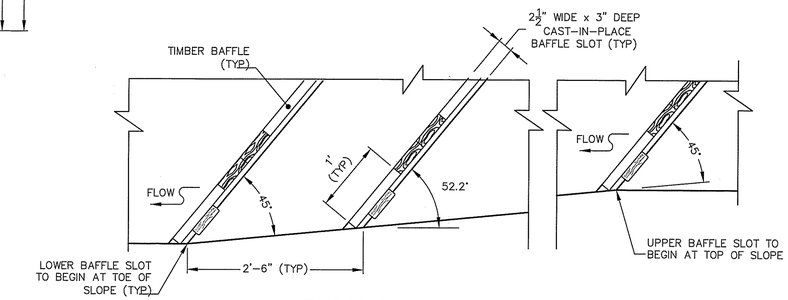
SCALE: NOT TO SCALE

NOTES:
1. BAFFLES ARE TO BE CONSTRUCTED FROM LUMBER RATED STRUCTURAL NO. 1 OR BETTER.
2. BAFFLES LOCATED DOWNSTREAM OF THE DOWNSTREAM FISH BYPASS OUTLET CHANNEL SHALL BE ASSEMBLED WITH GALVANIZED 9d NAILS.
3. BAFFLES LOCATED UPSTREAM OF THE DOWNSTREAM FISH BYPASS OUTLET CHANNEL SHALL BE ASSEMBLED WITH $\frac{3}{8}$ x 2.75" HOT DIPPED GALVANIZED CARRIAGE BOLTS AND FITTED WITH ULTRA-HIGH MOLECULAR WEIGHT POLYETHYLENE (UHMWP) STRIPS MEASURING $\frac{3}{4}$" x1"x48".
4. THE BAFFLE LENGTHS OF THE ENTRANCE CHANNEL BAFFLES SHALL BE INCREASED TO 7'-9."



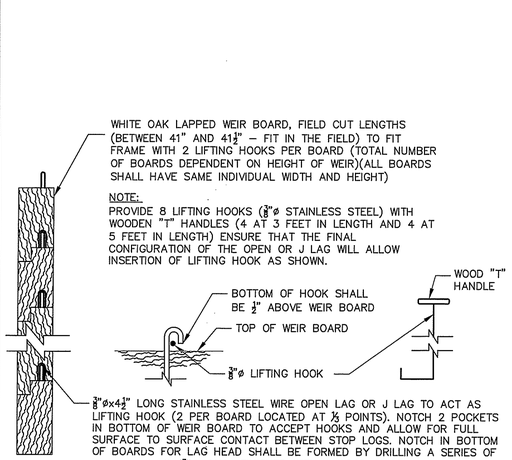
1 TIMBER BAFFLE SECTION A

SCALE: 1" = 1'-0"



2 TIMBER BAFFLE SECTION B

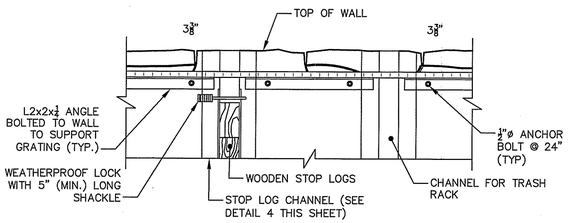
SCALE: 1" = 1'-0"



TYPICAL STOP LOG DETAIL

SCALE: 1"=1'-0"

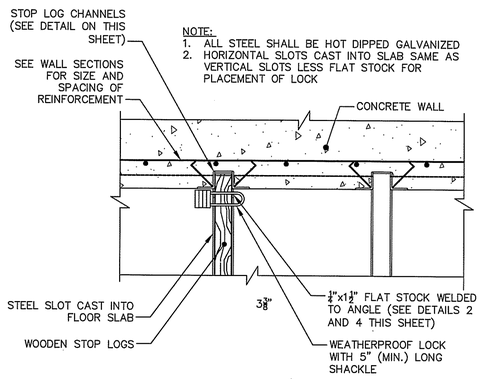
NOTE:
TRASH RACK CHANNELS ARE SIMILAR TO STOP LOG CHANNELS BUT LACK LOCK BARS



TYPICAL STOP LOG CHANNEL ELEVATION

SCALE: 1"=1'-0"

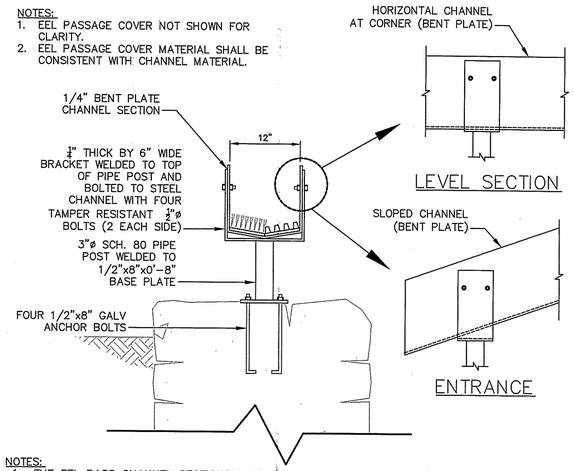
NOTE:
1. ALL STEEL SHALL BE HOT DIPPED GALVANIZED
2. HORIZONTAL SLOTS CAST INTO SLAB SAME AS VERTICAL SLOTS LESS FLAT STOCK FOR PLACEMENT OF LOCK



SECTION THRU STOP LOG CHANNEL

SCALE: 1"=1'-0"

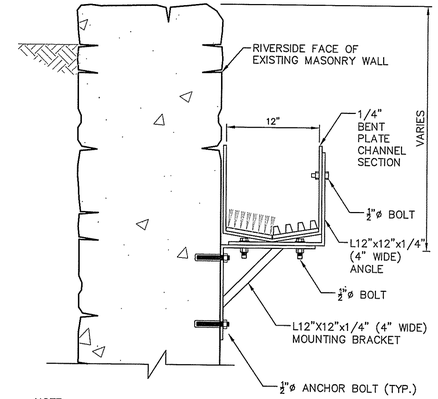
NOTES:
1. EEL PASSAGE COVER NOT SHOWN FOR CLARITY.
2. EEL PASSAGE COVER MATERIAL SHALL BE CONSISTENT WITH CHANNEL MATERIAL.



NOTES:
1. THE EEL PASS CHANNEL SECTIONS MOUNTED ATOP THE RIVERWALL SHALL CONSIST OF WEATHERED STEEL, HDPE, OR GRADE 5052 ALUMINUM (SUBJECT TO SHPO APPROVAL) WITH COVERS.
2. ALL STEEL FOR THE EEL PASSAGE CHANNEL, BRACKET, BASE PLATE, COVER PLATE, AND PIPE POST SHALL BE WEATHERING STEEL.
3. BOLTS SHALL BE WEATHERING STEEL.
4. ALL STEEL TO STEEL CONNECTIONS TO BE MADE 1/4" FILLET WELD (ALL AROUND).
5. TWO 6-INCH WIDE RIGID BOARDS SHALL BE INSTALLED (SIDE BY SIDE) WITHIN THE EEL PASS CHANNEL SECTION. ONE SECTION OF RIGID BOARD SHALL CONTAIN A BRISTLE SUBSTRATE AND ONE SECTION SHALL CONTAIN A THIMBLE/DIMPLE SUBSTRATE. REFER TO SHEET CS-112 FOR DETAILS AND NOTES PERTAINING TO THE EEL PASS SUBSTRATES.
6. EEL PASS CHANNEL SECTION MOUNTING BRACKETS SHALL CONSIST OF WELDED ALUMINUM OR WEATHERED STEEL ANGLES (SUBJECT TO SHPO APPROVAL). MISCELLANEOUS BOLTS, FITTINGS, AND HARDWARE SHALL BE WEATHERING STEEL.

TYPICAL EEL PASS CHANNEL ATTACHED TO TOP OF WALL

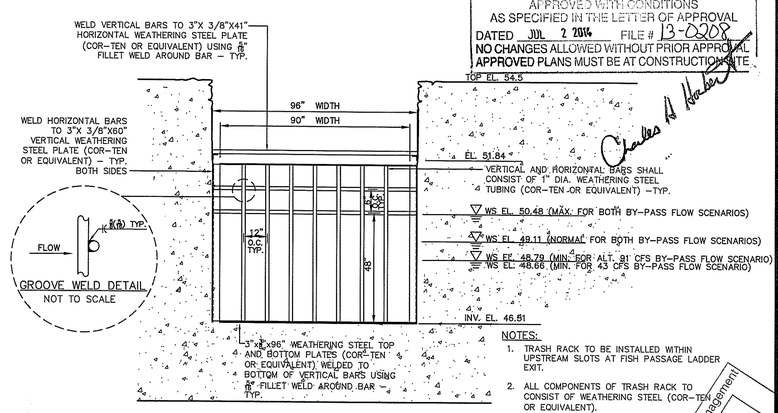
SCALE: NOT TO SCALE



NOTE:
1. EEL PASSAGE COVER NOT SHOWN FOR CLARITY.
2. THE EEL PASS CHANNEL SECTIONS AND RESTING POOLS MOUNTED TO THE SIDE OF THE RIVERWALL SHALL CONSIST OF WEATHERED STEEL, HDPE, OR GRADE 5052 ALUMINUM (SUBJECT TO SHPO APPROVAL) WITH COVERS.
3. BOLTS SHALL BE WEATHERING STEEL.
4. ALL STEEL TO STEEL CONNECTIONS TO BE MADE 1/4" FILLET WELD (ALL AROUND).
5. TWO 6-INCH WIDE ROWS OF BRISTLE SUBSTRATE SHALL BE INSTALLED (SIDE BY SIDE) WITHIN THE EEL PASS CHANNEL SECTIONS. THE BRISTLE SUBSTRATES SHALL CONSIST OF 6-INCH WIDE RIGID BOARDS WITH A BRISTLE CLUSTER SPACING OF 20MM AS MANUFACTURED BY COTTAM BRUSH MANUFACTURERS OR APPROVED EQUAL. THE BRISTLES SHALL BE 2-1/2 INCHES IN HEIGHT (60MM).
6. EEL PASS CHANNEL SECTION MOUNTING BRACKETS SHALL CONSIST OF WELDED ALUMINUM OR WEATHERED STEEL ANGLES (SUBJECT TO SHPO APPROVAL). MISCELLANEOUS BOLTS, FITTINGS, AND HARDWARE SHALL BE WEATHERING STEEL

TYPICAL EEL PASS CHANNEL ATTACHED TO SIDE OF WALL

SCALE: NOT TO SCALE



NOTES:
1. TRASH RACK TO BE INSTALLED WITHIN UPSTREAM SLOTS AT FISH PASSAGE LADDER EXIT.
2. ALL COMPONENTS OF TRASH RACK TO CONSIST OF WEATHERING STEEL (COR-TEN OR EQUIVALENT).

TRASH RACK (AT FISH LADDER EXIT)

SCALE: NOT TO SCALE

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SEAL

STATE OF RHODE ISLAND
PHILIP W. MORESCHI
No. 7428
REGISTERED PROFESSIONAL ENGINEER (CIVIL)

Date Signed:
February 3, 2014

SCALE:
HORZ.: AS NOTE
VERT.:
DATUM:
HORZ.:
VERT.:
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WATER STREET LAND, LLC
FISH LADDER AND EEL PASSAGE CHANNEL DETAILS
NATICK POND DAM HYDROELECTRIC PROJECT
WEST WARWICK RHODE ISLAND

PROJ. No.: 20121867.B10
DATE: DECEMBER 2013

CS-113
SHEET 15 OF 17

File Path: J:\DWG\P2012\20121867B10\Civil\Plan\20121867B10_PRF01_FISH.dwg Layout: CS-113 Plotted: Wed, February 12, 2014 - 11:49 AM User: samuda
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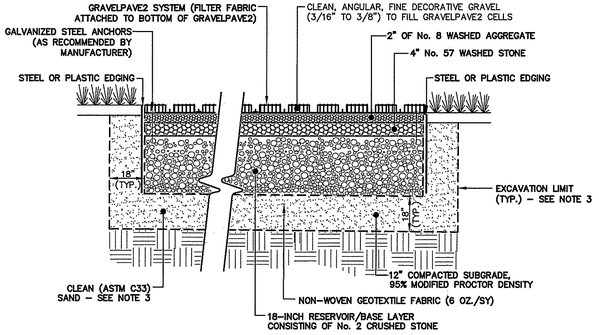
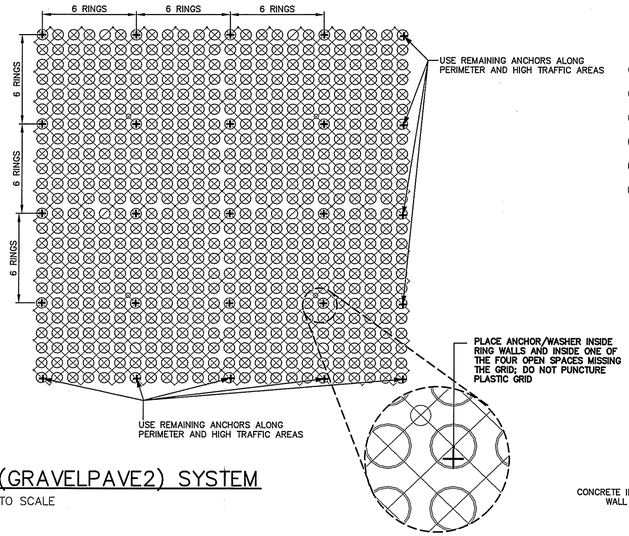
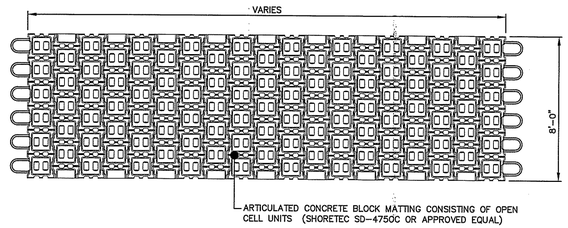


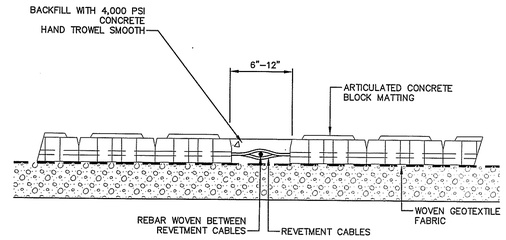
NOTES:
1. INSTALL GRAVELPAVE2 SYSTEM IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. THE COLOR OF DECORATIVE GRAVEL AND GRAVELPAVE2 SYSTEM SHALL BE SELECTED BY OWNER.
3. DUE TO THE PRESENCE OF SANDY FILL IN THE LOCATION OF THE PROPOSED PERVIOUS DRIVEWAY, OVEREXCAVATE (18-INCHES) TO EXCAVATION LIMITS SHOWN AND INSTALL AN 18-INCH LAYER OF CLEAN (ASTM C33) SAND.



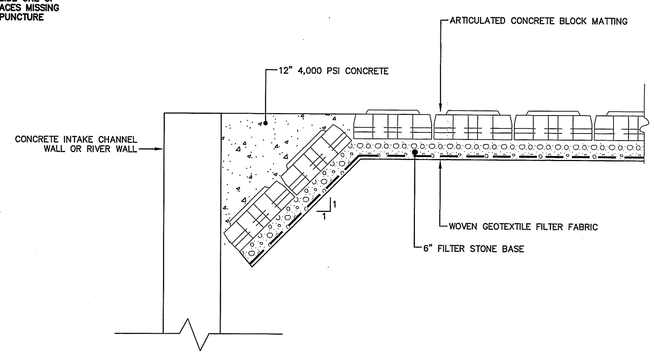
PERVIOUS DRIVEWAY (GRAVELPAVE2) SYSTEM
NOT TO SCALE



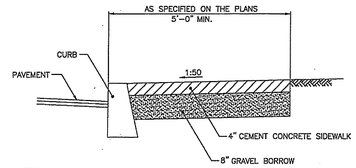
TYPICAL DETAIL OF ARTICULATING CONCRETE BLOCK MATTING
NOT TO SCALE



ARTICULATED CONCRETE BLOCK MATTING TYPICAL JOINT DETAIL PROFILE VIEW
NOT TO SCALE

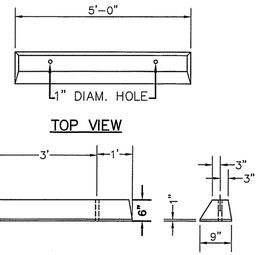


TYPICAL SECTION DETAIL FOR ARTICULATING CONCRETE BLOCK MATTING AND TERMINATION AT INTAKE CHANNEL OR RIVER WALL
NOT TO SCALE



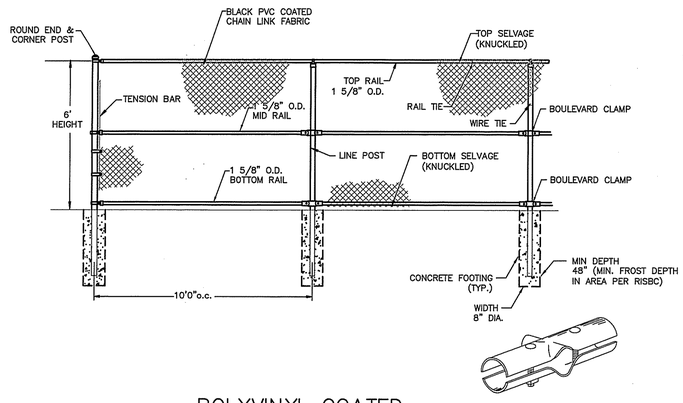
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 905 OF THE R.I. STANDARD SPECIFICATIONS.
2. FOR CURB SETTING DETAIL REFERENCE STD. 7.6.0.

CEMENT CONCRETE SIDEWALK REPAIR IN RIGHT-OF-WAY (R.I. STD. 43.1.0)
NOT TO SCALE



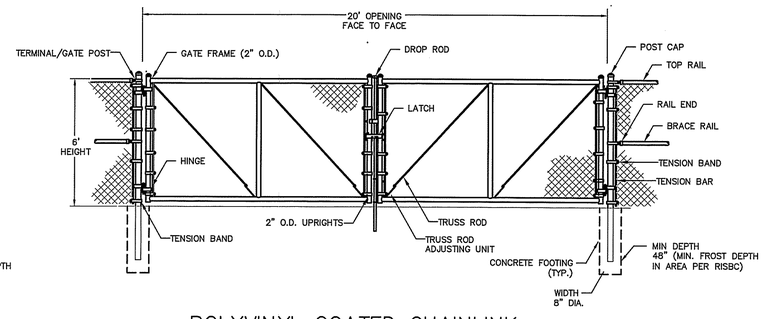
NOTES:
1. ALL SURFACES TO HAVE A SPONGE FLOAT FINISH.
2. EACH PRECAST CONCRETE CAR STOP SHALL BE FURNISHED WITH TWO 3/4"X 18" STEEL RODS.
3. ALL EXPOSED EDGES TO HAVE A 3/4" CHAMFER.

PRECAST CONCRETE CURB STOP
NOT TO SCALE

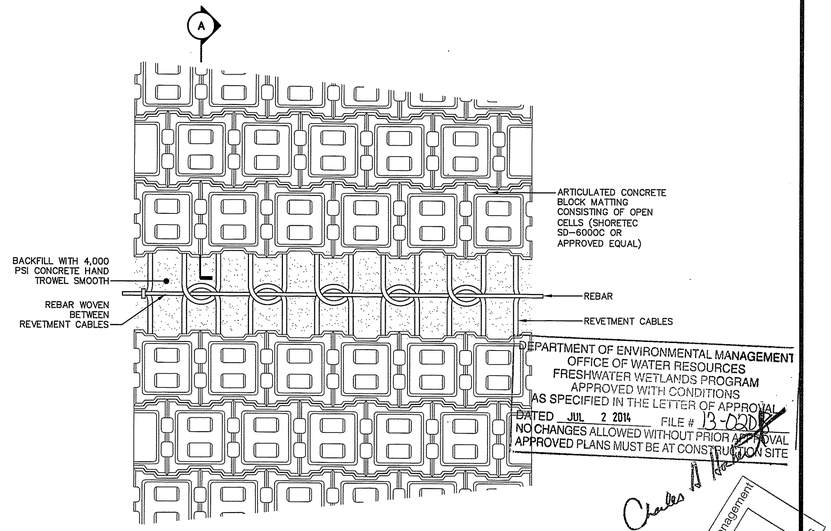


BOULEVARD CLAMP

POLYVINYL COATED CHAINLINK FENCE (6' HIGH)
NOT TO SCALE



POLYVINYL COATED CHAINLINK SWING GATE (20' OPENING)
NOT TO SCALE



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ARTICULATED CONCRETE BLOCK MATTING TYPICAL JOINT DETAIL PLAN VIEW
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PHILIP W. MORESCHI — No. 7428 — REGISTERED PROFESSIONAL ENGINEER (CIVIL)

Date Signed: February 3, 2014

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WEST WARWICK RHODE ISLAND

PROJ. No.: 20121867.B10
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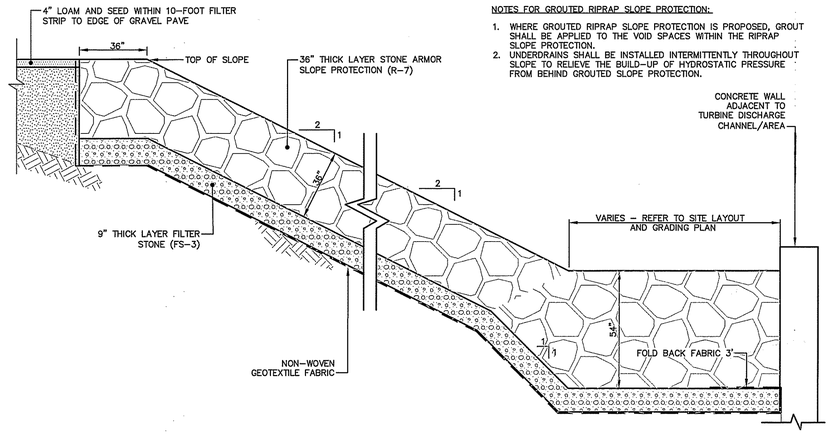
CD-501
SHEET 16 OF 17

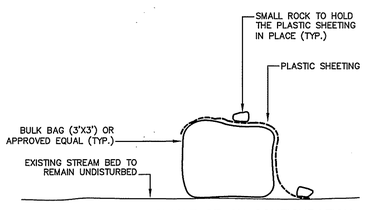


NOTES FOR GROUTED RIPRAP SLOPE PROTECTION:

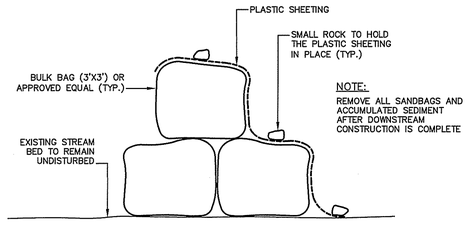
1. WHERE GROUTED RIPRAP SLOPE PROTECTION IS PROPOSED, GROUT SHALL BE APPLIED TO THE VOID SPACES WITHIN THE RIPRAP SLOPE PROTECTION.
2. UNDERDRAINS SHALL BE INSTALLED INTERMITTENTLY THROUGHOUT SLOPE TO RELIEVE THE BUILD-UP OF HYDROSTATIC PRESSURE FROM BEHIND GROUTED SLOPE PROTECTION.

STONE SLOPE PROTECTION

NOT TO SCALE



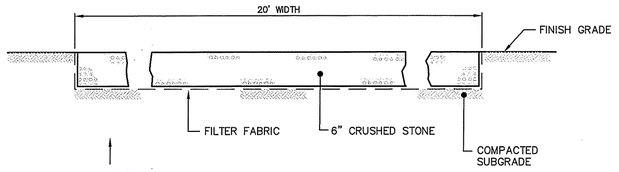
SINGLE STACK CONFIGURATION



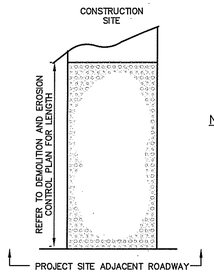
DOUBLE STACK CONFIGURATION

DOWNSTREAM WATER CONTROL SYSTEM

NOT TO SCALE



SECTION



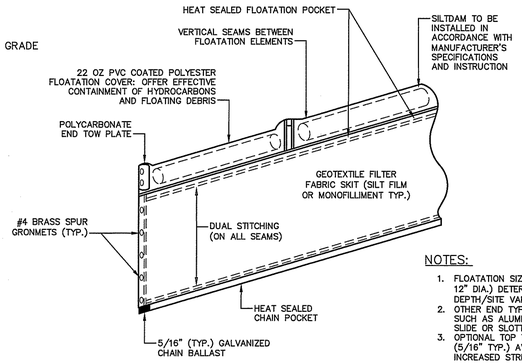
LOCATION PLAN

NOTES:

1. MAINTAIN CONSTRUCTION ENTRANCE PAVEMENT IN GOOD CONDITION THROUGHOUT CONSTRUCTION PERIOD.
2. ADJACENT ROADWAY SHALL BE SWEPT DAILY TO REMOVE ANY MATERIAL THAT MAY BE TRACKED ONTO PAVEMENT.
3. REMOVE AND DISPOSE OF ALL MATERIALS FOLLOWING CONSTRUCTION.

CONSTRUCTION ENTRANCE

NOT TO SCALE



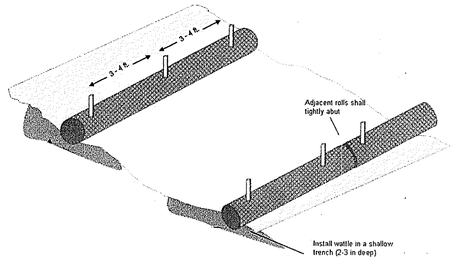
NOTES:

1. FLOATATION SIZE (6", 8" OR 12" DIA.) DETERMINED BY SKIRT DEPTH/SITE VARIABLES.
2. OTHER END TYPES AVAILABLE SUCH AS ALUMINUM UNIVERSAL SLIDE OR SLOTTED TUBE.
3. OPTIONAL TOP TENSION CABLE (5/16" TYP.) AVAILABLE FOR INCREASED STRENGTH.

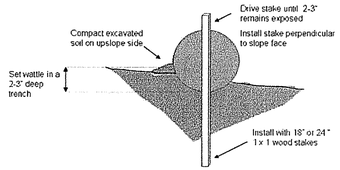
SILTDAM CONTAINMENT BARRIERS FORM A STURDY, ECONOMICAL, AND PURPOSE TURBIDITY BARRIER WHICH CAN ACCOMMODATE A WIDE VARIETY OF WIND, SEA AND CURRENT CONDITIONS, AN EXCELLENT BARRIER FOR DREDGE AND DRAGLINE OPERATIONS IN OPEN WATER WHERE INCREASED FLOTATION, DEPTH, AND TENSILE STRENGTHS ARE REQUIRED. FLOTATION IS PROVIDED THROUGH A SERIES OF CLOSED CELL EXPANDED POLYETHYLENE LOGS, WHICH ARE RESILIENT IN NATURE AND CAPABLE OF BEING SUBJECTED TO ROUGH SERVICE DURING THE DEPLOYMENT AND RECOVERY OF THE CONTAINMENT BARRIER. THE FLOTATION LOGS ARE COMPLETELY ENCLOSED IN A VINYL COATED FABRIC WHICH IS HEAT SEALED TO PROVIDE A WATERTIGHT FLOTATION COMPARTMENT AND GREATER STRENGTH. THE CONTAINMENT BARRIER MATERIAL CONSISTS OF A FILTER FABRIC COMPOSED OF WOVEN POLYPROPYLENE WHICH ALLOWS THE PASSAGE OF WATER, BUT RETAINS SOIL PARTICLES.

SILTDAM FLOATING TURBIDITY BARRIER

NOT TO SCALE



Typical Wattle Installation Guide



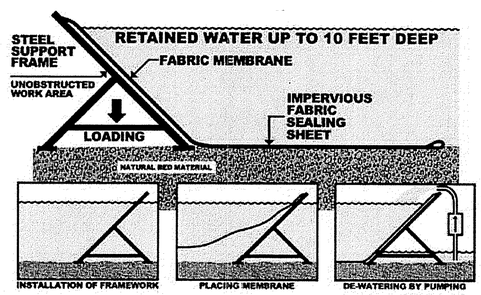
Entrenchment Detail

NOTES:

1. WATTLES SHALL BE INSTALLED BY THE CONTRACTOR AS INDICATED ON THE CONTRACT DRAWINGS. A ROW OF WATTLES SHALL ALSO BE INSTALLED AROUND ANY SOIL STOCKPILE AREAS UTILIZED BY THE CONTRACTOR DURING CONSTRUCTION IN UNPAVED AREAS.
2. WATTLES SHALL BE TRENCHED APPROXIMATE 2-3 INCHES AND STAKED SUCH THAT WATTLES DIRECTLY CONTACT SOIL AND PRECLUDE UNDERMINING OR BLOWOUTS. THE TRENCH SHALL BE APPROXIMATELY 9 INCHES WIDE. STAKES SHALL BE DRIVEN THROUGH THE CENTER OF THE WATTLE AT A SPACING OF 3-4 FEET ON CENTER AND NO GREATER THAN 6"FROM THE EACH END OF THE WATTLE. STAKES SHALL BE 1-INCH BY 1-INCH WOODEN STAKES WITH A LENGTH OF 18-24 INCHES. COMPACT SOIL EXCAVATED TO CREATE TRENCH ON UPHILL SIDE SIDE.
3. ENDS OF ADJACENT WATTLES SHALL BE TIGHTLY BUTTED OR OVERLAPPED SO THAT NO OPENING EXISTS FOR WATER TO PASS THROUGH. WATTLES SHALL BE FREE OF DAMAGE OR DEFECTS WHEN DELIVERED TO THE SHIPPER. NO VEHICLES SHALL BE DRIVEN OVER WATTLES.

COIR ROLL PERMETER EROSION CONTROL

NOT TO SCALE



UPSTREAM WATER CONTROL SYSTEM (PORTADAM OR APPROVED EQUAL)

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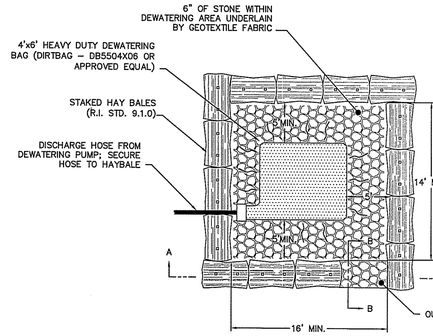
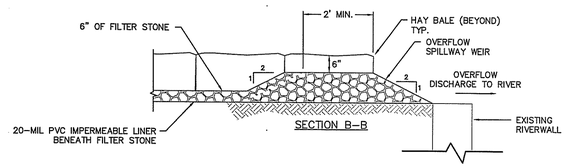
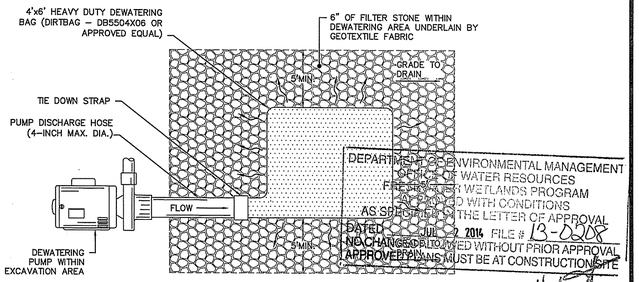




NOTES:
1. HAY BALES FOR EROSION CONTROL SHALL CONFORM TO SECTION 206 OF THE RIDOT STANDARD SPECIFICATIONS INCLUDING MATERIALS AND CONSTRUCTION METHODS.
2. BALES OF HAY SHALL BE FASTENED WITH WIRE AND HAVE A MINIMUM SIZE OF 1"x1.5"x3'.
3. FILTER STONE SHALL CONSIST OF 2 INCH MINUS STONE CONFORMING TO FS-2 FILTER STONE PER SUBSECTION M10.03.1 OF THE STANDARD SPECIFICATIONS.
4. FILTER FABRIC SHALL BE A NON-WOVEN GEOTEXTILE FILTER FABRIC AND SHALL CONFORM TO SECTION 206.02.2 OF THE STANDARD SPECIFICATIONS.

UPSTREAM DEWATERING AREA



DOWNSTREAM DEWATERING AREA

NOTES:
1. THE DEWATERING BAG, DIRTBAG® DB55 OR APPROVED EQUAL, SHALL BE HEAVY DUTY AND CONSIST OF A NONWOVEN BAG SEWN WITH A DOUBLE NEEDLE MATCHING USING A HIGH STRENGTH THREAD.
2. EACH DEWATERING BAG SHALL HAVE A FILL SPOUT LARGE ENOUGH TO ACCOMMODATE A 4-INCH DISCHARGE HOSE. THE BAG SHALL BE PROVIDED WITH STRAPS TO SECURE THE HOSE AND PREVENT PUMPED WATER FROM ESCAPING WITHOUT BEING FILTERED.
3. MAINTAIN DEWATERING BAG(S) AS NECESSARY TO EFFICIENTLY FILTER SEDIMENT OR PASS WATER AT A REASONABLE RATE. USE OF EXCESSIVE FLOW RATES OR OVERFILLING DIRTBAG® WITH SEDIMENT WILL CAUSE RUPTURES OF THE BAGS OR FAILURE OF THE HOSE ATTACHMENT STRAPS.
4. DISPOSE OF DEWATERING BAG AND CONTENTS AT OFF-SITE DISPOSAL FACILITY IN ACCORDANCE WITH THE APPROVED SOIL MANAGEMENT PLAN OR AS DIRECTED BY ENGINEER.
5. INSTALL DEWATERING BAG AND CRUSHED STONE BEDDING WITH A SLOPE SO INCOMING WATER FLOWS DOWNHILL THROUGH THE BAG WITHOUT CREATING MORE EROSION. STRAP THE NECK OF DEWATERING BAG TIGHTLY TO THE DISCHARGE HOSE.

DEWATERING AREAS

NOT TO SCALE

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Plotter: DWG TO PDF.PC3 CTB File: FO.STB
LAYER STATE:
MS VIEW:

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER
1.	2/3/2014	REVISIONS PER RIDEM FRESHWATER WETLAND 1/24/14 REVIEW COMMENTS		

SEAL

PHILIP W. MORESCHI
No. 7428
REGISTERED PROFESSIONAL ENGINEER (CIVIL)

Date Signed:
February 3, 2014

SCALE:
HORZ.: AS NOTED
VERT.:
DATUM:
HORZ.:
VERT.:
1 0 1
GRAPHIC SCALE

FUSS & O'NEILL
317 IRON HORSE WAY, SUITE 204
PROVIDENCE, RI 02908
401.861.3070
www.fando.com

WATER STREET LAND, LLC

CONSTRUCTION DETAILS

NATICK POND DAM HYDROELECTRIC PROJECT

WEST WARWICK RHODE ISLAND

PROJ. No.: 20121867.B10
DATE: DECEMBER 2013

CD-502

SHEET 17 OF 17