

# TOWN OF DENNIS, MA

# POUND POND FLOOD MITIGATION & DRAINAGE IMPROVEMENTS

MAY 2024

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LOCATION MAP  
SCALE: 1" = 2000'

PREPARED BY:  
**Tighe&Bond**

JOSEPH M. PERSECHINO, PE

PREPARED FOR:  
DEPARTMENT OF PUBLIC WORKS  
TOWN OF DENNIS  
120 THEOPHILUS ROAD  
SOUTH DENNIS, MA 02660



**90% DESIGN PLANS**  
NOT FOR CONSTRUCTION

**COMPLETE SET 22 SHEETS**

- EXISTING CONDITIONS NOTES:**
- THE EXISTING CONDITION FEATURES SHOWN WERE PREPARED FROM AN ACTUAL ON THE GROUND FIELD SURVEY CONDUCTED BY WSP IN OCTOBER OF 2021.
  - THE BEARING SYSTEM SHOWN HEREON IS REFERENCED TO THE NORTH AMERICAN DATUM OF 1983, MASSACHUSETTS STATE PLANE MAINLAND COORDINATE SYSTEM AND WAS ESTABLISHED UTILIZING RTK GPS SURVEY TECHNIQUES REFERENCING THE MACORS GPS NETWORK.
  - VERTICAL DATUM REFERENCES THE NAVD83 VERTICAL DATUM AND WAS ESTABLISHED ON SITE UTILIZING RTK GPS SURVEY TECHNIQUES REFERENCING THE MACORS GPS NETWORK.
  - THE PROPERTY LINES SHOWN HERE ON WERE TAKEN FROM THE MASSACHUSETTS GIS AND ARE NOT A RESULT OF AN ACTUAL ON THE GROUND SURVEY.
  - THE LOCATION OF THE UTILITIES AS SHOWN HEREON HAVE BEEN COMPILED FROM VISIBLE STRUCTURES AND INFORMATION OBTAINED FROM VARIOUS SOURCES. THE ACTUAL LOCATION OF ALL UTILITIES AND UNDERGROUND STRUCTURES SHALL BE CONSIDERED APPROXIMATE AND SHALL BE VERIFIED BY THE OWNER PRIOR TO ANY CONSTRUCTION. THE SURVEYOR MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICES OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED.

- GENERAL NOTES:**
- THE LOCATIONS OF UNDERGROUND UTILITIES ARE APPROXIMATE AND THE LOCATIONS ARE NOT GUARANTEED BY THE OWNER OR THE ENGINEER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ALL UTILITIES, ANTICIPATE CONFLICTS, REPAIR EXISTING UTILITIES AND RELOCATE EXISTING UTILITIES REQUIRED TO COMPLETE THE WORK.
  - COORDINATE ALL WORK WITHIN PUBLIC RIGHT OF WAYS WITH THE TOWN OF DENNIS.
  - THE CONTRACTOR SHALL EMPLOY A MASSACHUSETTS LICENSED LAND SURVEYOR TO DETERMINE ALL LINES AND GRADES.
  - THE CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES. CALL DIG SAFE AT LEAST 72 HOURS PRIOR TO THE COMMENCEMENT OF ANY DEMOLITION/CONSTRUCTION ACTIVITIES.
  - IT IS THE CONTRACTOR'S RESPONSIBILITY TO FAMILIARIZE THEMSELVES AND COMPLY WITH THE CONDITIONS OF ALL OF THE PERMIT APPROVALS.
  - THE CONTRACTOR SHALL OBTAIN AND PAY FOR AND COMPLY WITH ADDITIONAL PERMITS, NOTICES AND FEES NECESSARY TO COMPLETE THE WORK AND ARRANGE FOR AND PAY FOR NECESSARY INSPECTIONS AND APPROVALS FROM THE AUTHORITIES HAVING JURISDICTION.
  - THE CONTRACTOR SHALL PHASE DEMOLITION AND CONSTRUCTION AS REQUIRED TO PROVIDE CONTINUOUS SERVICE TO EXISTING BUSINESSES AND HOMES THROUGHOUT THE CONSTRUCTION PERIOD. EXISTING BUSINESS AND HOME SERVICES INCLUDE, BUT ARE NOT LIMITED TO ELECTRICAL, COMMUNICATION, FIRE PROTECTION, DOMESTIC WATER AND SEWER SERVICES. TEMPORARY SERVICES, IF REQUIRED, SHALL COMPLY WITH ALL FEDERAL, STATE, LOCAL AND UTILITY COMPANY STANDARDS. CONTRACTOR SHALL PROVIDE DETAILED CONSTRUCTION SCHEDULE TO OWNER PRIOR TO ANY DEMOLITION/CONSTRUCTION ACTIVITIES AND SHALL COORDINATE TEMPORARY SERVICES TO ADJUTERS WITH THE UTILITY COMPANY AND AFFECTED ADJUTER.
  - ALL MATERIALS AND CONSTRUCTION SHALL CONFORM WITH APPLICABLE FEDERAL, STATE, AND LOCAL CODES & SPECIFICATIONS.
  - ALL WORK SHALL CONFORM TO THE TOWN OF DENNIS, DEPARTMENT OF PUBLIC WORKS, STANDARD SPECIFICATIONS AND WITH THE STATE OF MASSACHUSETTS DEPARTMENT OF TRANSPORTATION.
  - CONTRACTOR TO SUBMIT AS-BUILT PLANS IN DIGITAL FORMAT (.DWG AND .PDF FILES) ON DISK TO THE OWNER AND ENGINEER UPON COMPLETION OF THE PROJECT. AS-BUILTS SHALL BE PREPARED AND CERTIFIED BY A MASSACHUSETTS LICENSED LAND SURVEYOR.
  - CONTRACTOR SHALL THOROUGHLY CLEAN ALL CATCH BASINS AND DRAIN LINES, WITHIN THE LIMIT OF WORK, OF SEDIMENT IMMEDIATELY UPON COMPLETION OF CONSTRUCTION.
  - THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING ALL HORIZONTAL AND VERTICAL CONTROL (E.G. CONTROL POINTS, TEMPORARY BENCHMARKS, ETC.)

- DEMOLITION NOTES:**
- EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO THE START OF ANY CLEARING OR DEMOLITION ACTIVITIES.
  - ALL MATERIALS SCHEDULED TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR UNLESS OTHERWISE SPECIFIED. THE CONTRACTOR SHALL DISPOSE OF ALL MATERIALS OFF-SITE IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REGULATIONS, ORDINANCES AND CODES.
  - COORDINATE REMOVAL, RELOCATION, DISPOSAL OR SALVAGE OF UTILITIES WITH THE OWNER AND APPROPRIATE UTILITY COMPANY.
  - ANY EXISTING WORK OR PROPERTY DAMAGED OR DISRUPTED BY CONSTRUCTION/ DEMOLITION ACTIVITIES SHALL BE REPLACED OR REPAIRED TO MATCH ORIGINAL EXISTING CONDITIONS BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
  - THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DEMOLITION AND OFF-SITE DISPOSAL OF MATERIALS REQUIRED TO COMPLETE THE WORK, EXCEPT FOR WORK NOTED TO BE COMPLETED BY OTHERS.
  - UTILITIES SHALL BE TERMINATED AT THE MAIN LINE PER UTILITY COMPANY AND TOWN OF DENNIS STANDARDS. THE CONTRACTOR SHALL REMOVE ALL ABANDONED UTILITIES LOCATED WITHIN THE LIMITS OF WORK UNLESS OTHERWISE NOTED.
  - CONTRACTOR SHALL VERIFY ORIGIN OF ALL DRAINS AND UTILITIES PRIOR TO REMOVAL/TERMINATION TO DETERMINE IF DRAINS OR UTILITY IS ACTIVE, AND SERVICES ANY ON OR OFF-SITE STRUCTURE TO REMAIN. THE CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY OF ANY SUCH UTILITY FOUND AND SHALL MAINTAIN THESE UTILITIES UNTIL PERMANENT SOLUTION IS IN PLACE.
  - REMOVE TREES AND BRUSH AS REQUIRED FOR COMPLETION OF WORK. CONTRACTOR SHALL GRUB AND REMOVE ALL STUMPS WITHIN LIMITS OF WORK AND DISPOSE OF OFF SITE IN ACCORDANCE WITH FEDERAL, STATE, AND LOCAL LAWS AND REGULATIONS.
  - CONTRACTOR SHALL PROTECT ALL PROPERTY MONUMENTATION THROUGHOUT DEMOLITION AND CONSTRUCTION OPERATIONS. SHOULD ANY MONUMENTATION BE DISTURBED BY THE CONTRACTOR, THE CONTRACTOR SHALL EMPLOY A MASSACHUSETTS LICENSED SURVEYOR TO REPLACE DISTURBED MONUMENTS.
  - PROVIDE INLET PROTECTION BARRIERS AT ALL CATCH BASINS/CURB INLETS WITHIN CONSTRUCTION LIMITS AS WELL AS CATCH BASINS/CURB INLETS THAT RECEIVE RUNOFF FROM CONSTRUCTION ACTIVITIES. INLET PROTECTION BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT. INLET PROTECTION BARRIERS SHALL BE "HIGH FLOW SILT SACK" BY ACF ENVIRONMENTAL OR EQUAL. INSPECT BARRIERS WEEKLY AND AFTER EACH RAIN EVENT OF 0.25 INCHES OR GREATER. CONTRACTOR SHALL COMPLETE A MAINTENANCE INSPECTION REPORT AFTER EACH INSPECTION. SEDIMENT DEPOSITS SHALL BE REMOVED AFTER EACH STORM EVENT OR MORE OFTEN IF THE FABRIC BECOMES CLOGGED OR SEDIMENT HAS ACCUMULATED TO 1/3 THE DESIGN DEPTH OF THE BARRIER.
  - THE CONTRACTOR SHALL PAY ALL COSTS NECESSARY FOR TEMPORARY PARTITIONING, BARRICADING, FENCING, SECURITY AND SAFETY DEVICES REQUIRED FOR THE MAINTENANCE OF A CLEAN AND SAFE CONSTRUCTION SITE.

- SITE NOTES:**
- PAVEMENT MARKINGS SHALL BE INSTALLED AS SHOWN, INCLUDING PARKING SPACES, STOP BARS, ADA SYMBOLS, PAINTED ISLANDS, FIRE LANES, CROSSES WALKS, ARROWS, LEGENDS AND CENTERLINES. ALL MARKINGS EXCEPT CENTERLINE AND MEDIAN ISLANDS TO BE CONSTRUCTED USING WHITE PAVEMENT MARKINGS. ALL THERMOPLASTIC PAVEMENT MARKINGS INCLUDING LEGENDS, ARROWS, CROSSES WALKS AND STOP BARS SHALL MEET THE REQUIREMENTS OF AASHTO M249. ALL PAINTED PAVEMENT MARKINGS INCLUDING CENTERLINES, LANE LINES AND PAINTED MEDIANS SHALL MEET THE REQUIREMENTS OF AASHTO M248 TYPE "F".
  - ALL PAVEMENT MARKINGS AND SIGNS TO CONFORM TO "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", "STANDARD ALPHABETS FOR HIGHWAY SIGNS AND PAVEMENT MARKINGS", AND THE AMERICANS WITH DISABILITIES ACT REQUIREMENTS, LATEST EDITIONS.
  - CENTERLINES SHALL BE FOUR (4) INCH WIDE YELLOW LINES.
  - CLEAN AND COAT VERTICAL FACE OF EXISTING PAVEMENT AT SAW CUT LINE WITH RS-1 EMULSION IMMEDIATELY PRIOR TO PLACING NEW BITUMINOUS CONCRETE.
  - CONTRACTOR TO PROVIDE BACKFILL AND COMPACTION AT CURB LINE AFTER CONCRETE FORMS FOR SIDEWALKS AND PADS HAVE BEEN STRIPPED. COORDINATE WITH BUILDING CONTRACTOR.
  - ALL DIMENSIONS ARE TO THE FACE OF CURB UNLESS OTHERWISE NOTED.

- GRADING AND DRAINAGE NOTES:**
- COMPACTION REQUIREMENTS:  
BELOW PAVED OR CONCRETE AREAS 95%  
TRENCH BEDDING MATERIAL AND SAND BLANKET BACKFILL 95%  
BELOW LOAM AND SEED AREAS 90%  
\* ALL PERCENTAGES OF COMPACTION SHALL BE OF THE MAXIMUM DRY DENSITY AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED AND CONTROLLED IN ACCORDANCE WITH ASTM D-1557, METHOD C FIELD DENSITY TESTS SHALL BE MADE IN ACCORDANCE WITH ASTM D-1556 OR ASTM-2922.
  - ALL STORM DRAINAGE PIPES SHALL BE HIGH DENSITY POLYETHYLENE (HANCOR HI-Q, ADS N-12 OR EQUAL) OR RCP CLASS IV, UNLESS OTHERWISE SPECIFIED.
  - ADJUST ALL MANHOLES, CATCH BASINS, CURB BOXES, ETC. WITHIN LIMITS OF WORK TO FINISH GRADE.
  - ALL DISTURBED AREAS NOT TO BE PAVED OR OTHERWISE TREATED SHALL RECEIVE 6" LOAM, SEED FERTILIZER AND MULCH.
  - ALL STORM DRAIN CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE MASSDOT STANDARD SPECIFICATIONS, LATEST EDITION.
  - ALL PROPOSED CATCH BASINS SHALL BE EQUIPPED WITH OIL/GAS SEPARATOR HOODS AND 4" SUMPS.

- EROSION CONTROL NOTES:**
- SEE SHEET C.501 FOR GENERAL EROSION CONTROL NOTES & DETAILS.

- UTILITY NOTE:**
- CONTRACTOR SHALL COORDINATE WITH ENGINEER AND THE TOWN OF DENNIS IF ANY EXISTING UTILITY RECONSTRUCTION IS REQUIRED.

**LEGEND**

- EXISTING RIGHT OF WAY LINE
- EXISTING PARCEL/PROPERTY LINE
- EXISTING ADJACENT PARCEL LINE
- EXISTING EDGE OF WETLAND
- EXISTING EDGE OF BANK
- EXISTING EDGE OF WATER
- EXISTING EDGE OF STORMWATER BASIN
- EXISTING 100' BUFFER ZONE (PER MAWPA)
- EXISTING 50' NO DISTURB ZONE
- EXISTING FEMA 100-YEAR FLOODPLAIN (REV 6/9/2014)
- EXISTING WOOD-POST FENCE
- EXISTING GUARDRAIL (WOOD)
- EXISTING GUARDRAIL (METAL)
- EXISTING EDGE OF DIRT/GRAVEL
- EXISTING TREE LINE
- EXISTING 5' CONTOUR LINE
- EXISTING 1' CONTOUR LINE
- EXISTING DRAIN LINE
- EXISTING WATER LINE
- EXISTING OVERHEAD ELECTRIC LINE
- EXISTING GAS LINE
- EXISTING WETLAND FLAG
- EXISTING SIGN
- UTILITY POLE
- ELECTRICAL HANDHOLE
- HYDRANT AND WATER GATE VALVE
- GAS GATE VALVE
- EXISTING CATCH BASIN AND DRAIN MANHOLE
- EXISTING TREE/BUSH
- TEMPORARY BENCH MARK
- PROPOSED STREAM/POND CENTERLINE
- PROPOSED TREE LINE
- PROPOSED 5' CONTOUR LINE
- PROPOSED 1' CONTOUR LINE
- PROPOSED 5' CONTOUR LINE (POND)
- PROPOSED 1' CONTOUR LINE (POND)
- PROPOSED POND EDGE
- PROPOSED SAWCUT LINE
- PROPOSED TIMBER BARRIER
- PROPOSED SILT SOCK
- PROPOSED SILT FENCE/SEDIMENT CURTAIN
- PROPOSED DRAIN LINE
- PROPOSED STREAM CHANNEL
- PROPOSED AREA OF CLEARING & GRUBBING
- PROPOSED AREA OF GRAVEL REMOVAL
- PROPOSED AREA OF PAVEMENT REMOVAL
- PROPOSED STABILIZED CONSTRUCTION EXIT
- PROPOSED PAVEMENT SECTION
- PROPOSED STONE DUST PATH
- PROPOSED PEDESTRIAN BRIDGE/LOOKOUT
- PROPOSED RIP-RAP
- PROPOSED COBBLESTONE
- PROPOSED STREAMBED/POND BOTTOM
- PROPOSED FABRIC ENCAPSULATED SOIL LIFTS
- PROPOSED EROSION CONTROL BLANKET
- PROPOSED DRAIN MANHOLE (4' AND 5')
- PROPOSED CATCH BASIN
- PROPOSED ROCK VANE
- PROPOSED LOG RIFFLE
- PROPOSED INLET PROTECTION
- PROPOSED ENGINEERED LOG JAM OR VERTICAL AGGRADATION ROOTWAD STRUCTURE (SEE PLANS FOR LOCATIONS AND TYPES)
- PROPOSED BRUSH AGGRADATION BUNDLE STRUCTURE
- PROPOSED BOULDER CLUSTER/BOULDER CASCADE/BOULDER EMBANKMENT
- PROPOSED SPOT GRADE
- EXISTING SPOT GRADE
- PROPOSED SLOPE
- PROPOSED TREE

**ABBREVIATIONS/ACRONYMS:**

APPROX.	APPROXIMATE
BABS	BRUSH AGGRADATION BUNDLE STRUCTURE
BC	BITUMINOUS CURB
BIT.	BITUMINOUS
BMK	BENCHMARK
BW	BOTTOM OF WALL
CB	CATCH BASIN
CPP	CORRUGATED PLASTIC PIPE
DMH	DRAIN MANHOLE
BIT.	DIAMETER
DYL	DOUBLE YELLOW LINE
ELEV.	ELEVATION
ELJ	ENGINEERED LOG JAM
EOG	EDGE OF GRAVEL
EOP	EDGE OF PAVEMENT
FEMA	FEDERAL EMERGENCY MANAGEMENT AGENCY
FESL	FABRIC ENCAPSULATED SOIL LIFT
HDPE	HIGH DENSITY POLYETHYLENE
INV.	INVERT
LF	LINEAR FEET
LR	LOG RIFFLE
MAWPA	MASSACHUSETTS WETLAND PROTECTION ACT
PDMH	PROPOSED DRAIN MANHOLE
PVC	POLYVINYL CHLORIDE
R	RADIUS
RCP	REINFORCED CONCRETE PIPE
R&R	REMOVE AND RESET
RWS	STONE RETAINING WALL
RWW	WOOD RETAINING WALL
S	SLOPE
SL	STOP LINE
SWL	SOLID WHITE LINE
TB	TOP OF BANK
TBR	TO BE REMOVED
THLWG	THALWEG (STREAMBED ELEVATION)
TR	TOP OF RIFFLE
TW	TOP OF WALL
TYP.	TYPICAL
VAR.S	VERTICAL AGGRADATION ROOTWAD STRUCTURE
VIF	VERIFY IN FIELD
WF	WETLAND FLAG
W/	WITH
W/IN	WITHIN
WSEL	WATER SURFACE ELEVATION

**PLANTING PLAN LEGEND**

	PROPOSED STREAM/POND BANK AREA (FESL'S)
	PROPOSED OPEN WATER/DEEP AQUATIC AREA
	PROPOSED EMERGENT DEEP WETLAND AREA
	PROPOSED EMERGENT SHALLOW WETLAND AREA
	PROPOSED WET MEADOW AREA
	PROPOSED SCRUB/SHRUB WETLAND AREA
	PROPOSED UPLAND BUFFER AREA



**90%  
DESIGN PLANS  
NOT FOR CONSTRUCTION**

**Pound Pond  
Flood  
Mitigation &  
Drainage  
Improvements**

Town of Dennis

Dennis, MA

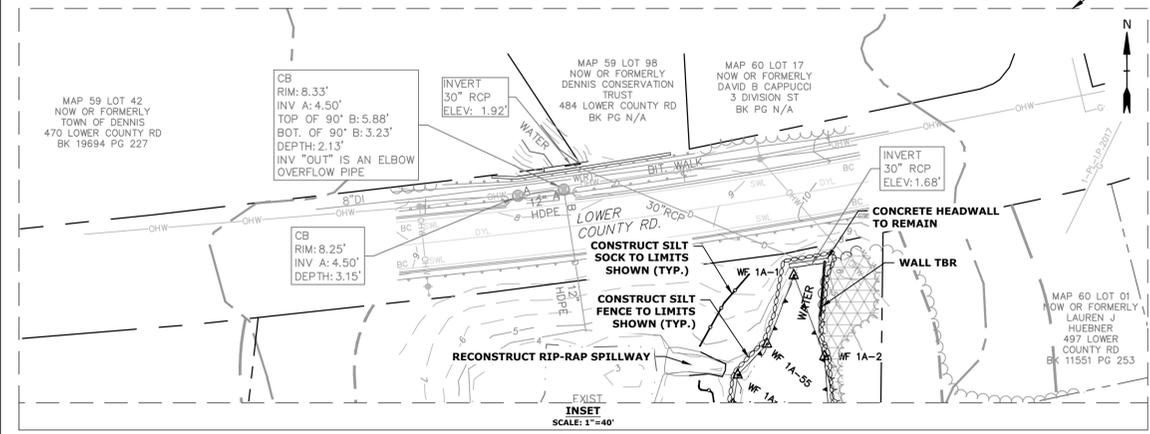
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DATE:	MAY 2024
FILE:	D0250-007-C-DSGN.DWG
DRAWN BY:	NSC
CHECKED:	GCB/TWB
APPROVED:	JMP

**GENERAL NOTES, LEGEND & VICINITY SHEET**

SCALE: AS SHOWN

**G.100**



MAP 41 LOT 42  
NOW OR FORMERLY  
TOWN OF DENNIS  
60 CHASE AVE.  
BK 19694 PG 233

**90%  
DESIGN PLANS  
NOT FOR CONSTRUCTION**

**Pound Pond  
Flood  
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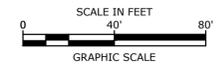
Town of Dennis

Dennis, MA

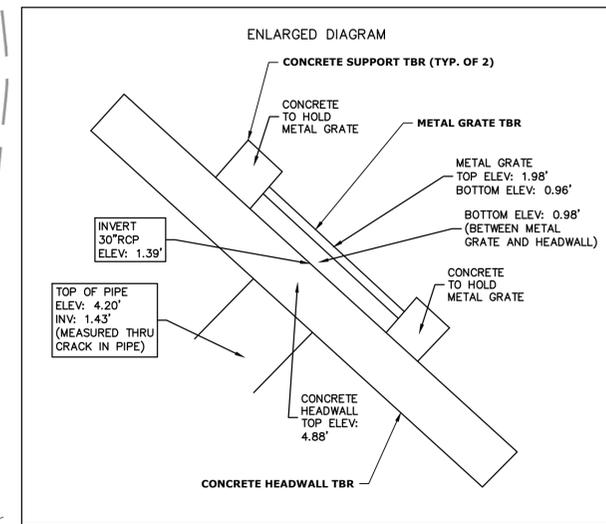
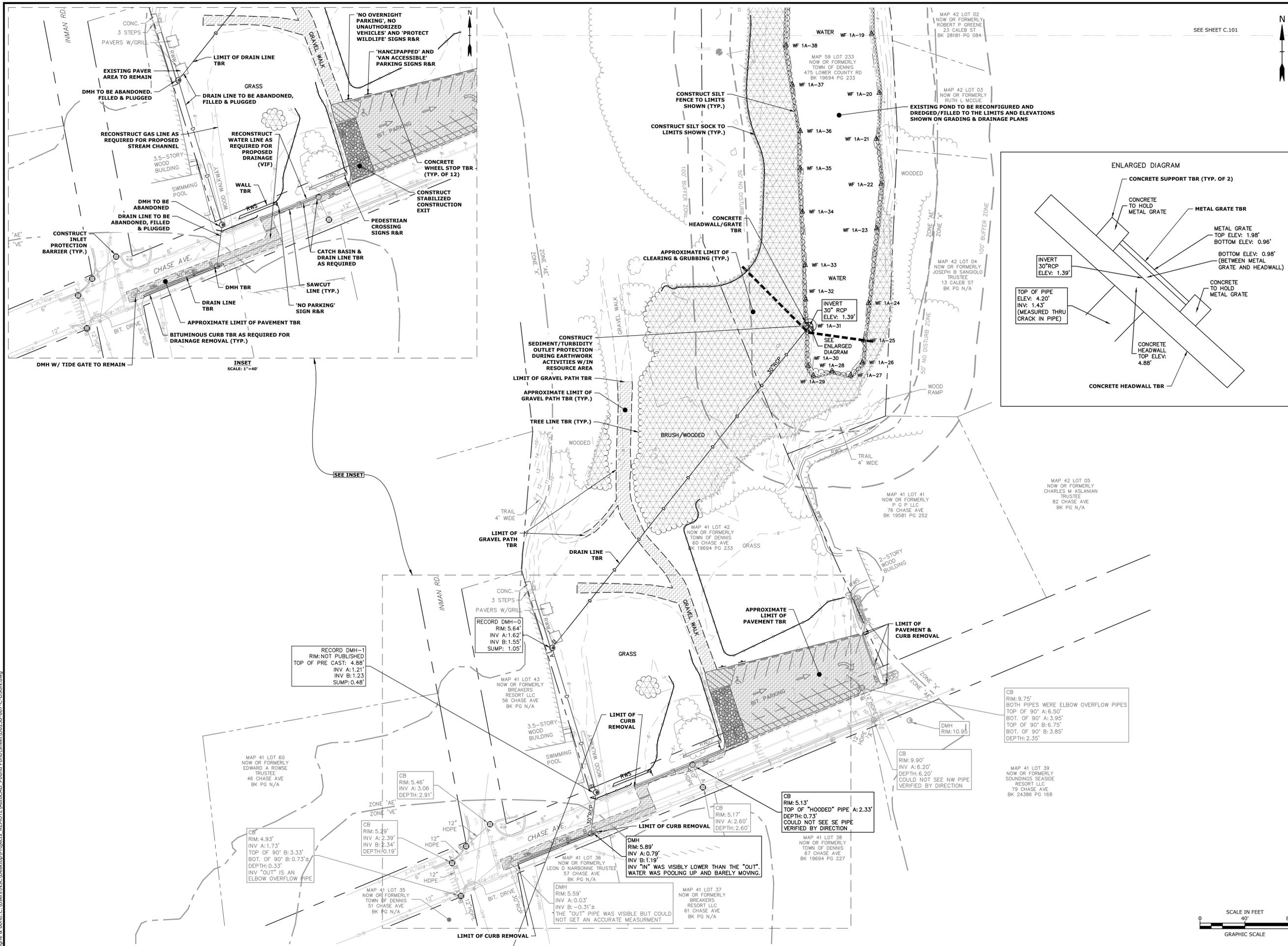

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APPROVED:	JMP	

**EXISTING CONDITIONS  
& DEMOLITION PLAN - 1**

SCALE: AS SHOWN



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**90%  
DESIGN PLANS  
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**Pound Pond  
Flood  
Mitigation &  
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Improvements**

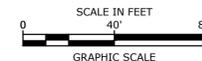
Town of Dennis

Dennis, MA

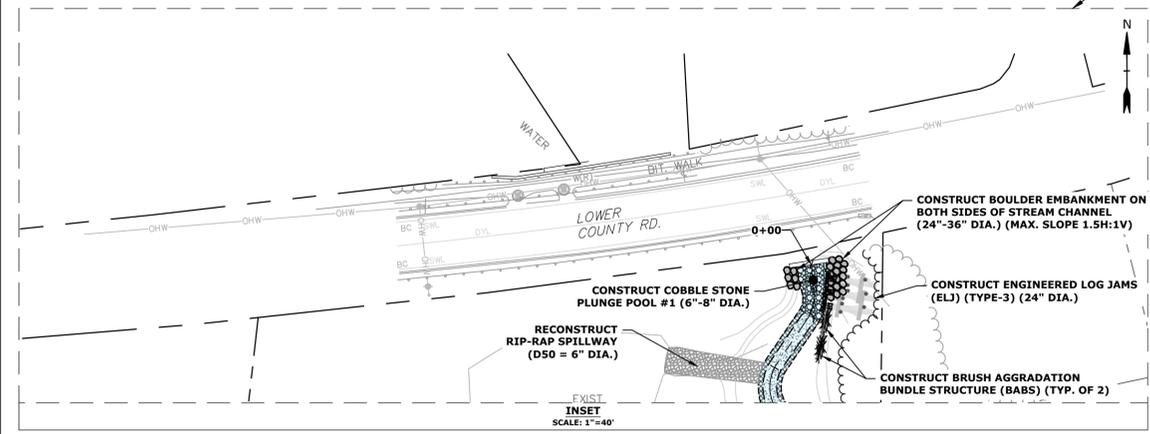
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DATE: MAY 2024		
FILE: D0250-007-C-DSGN.DWG		
DRAWN BY: NSC		
CHECKED BY: GCB/TWB		
APPROVED BY: JMP		

**EXISTING CONDITIONS  
& DEMOLITION PLAN - 2**

SCALE: AS SHOWN



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- ABBREVIATIONS/ACRONYMS**
- ADA AMERICAN DISABILITY ACT
  - BCC BITUMINOUS CONCRETE CURB
  - DIA. DIAMETER
  - DYL DOUBLE YELLOW LINE (4" WIDE)
  - R RADIUS
  - SL STOP LINE (12" WIDE)
  - SWL SINGLE WHITE LINE (4" WIDE)
  - TYP. TYPICAL

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**Pound Pond  
Flood  
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Town of Dennis

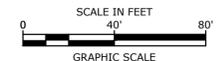
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**SITE PLAN - 1**

SCALE: AS SHOWN

**C.201**

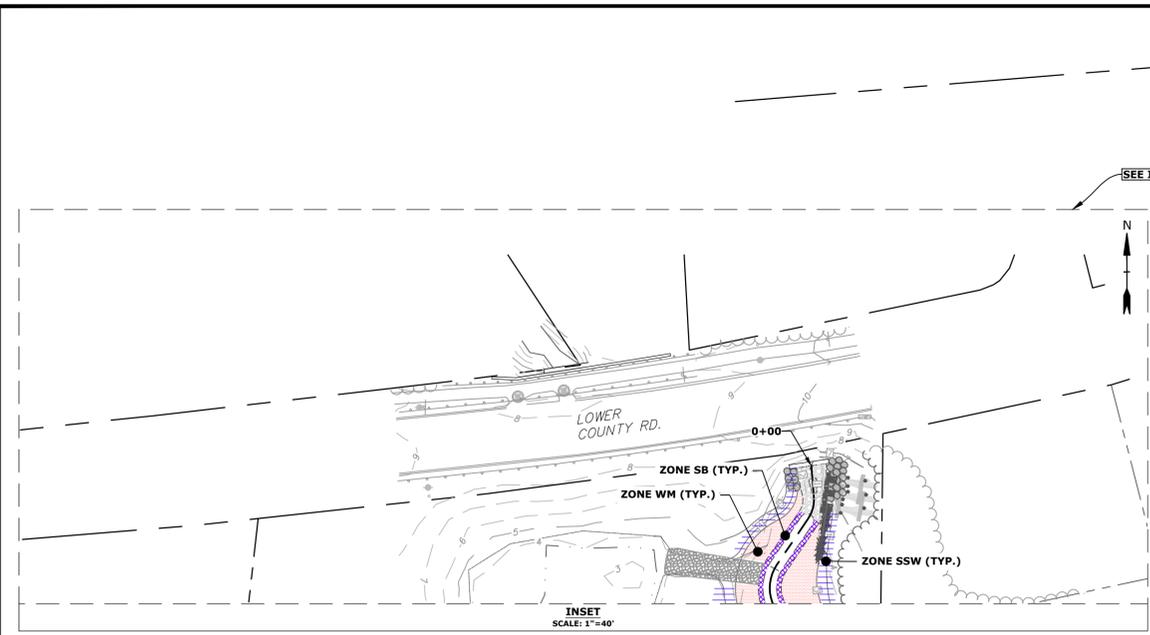


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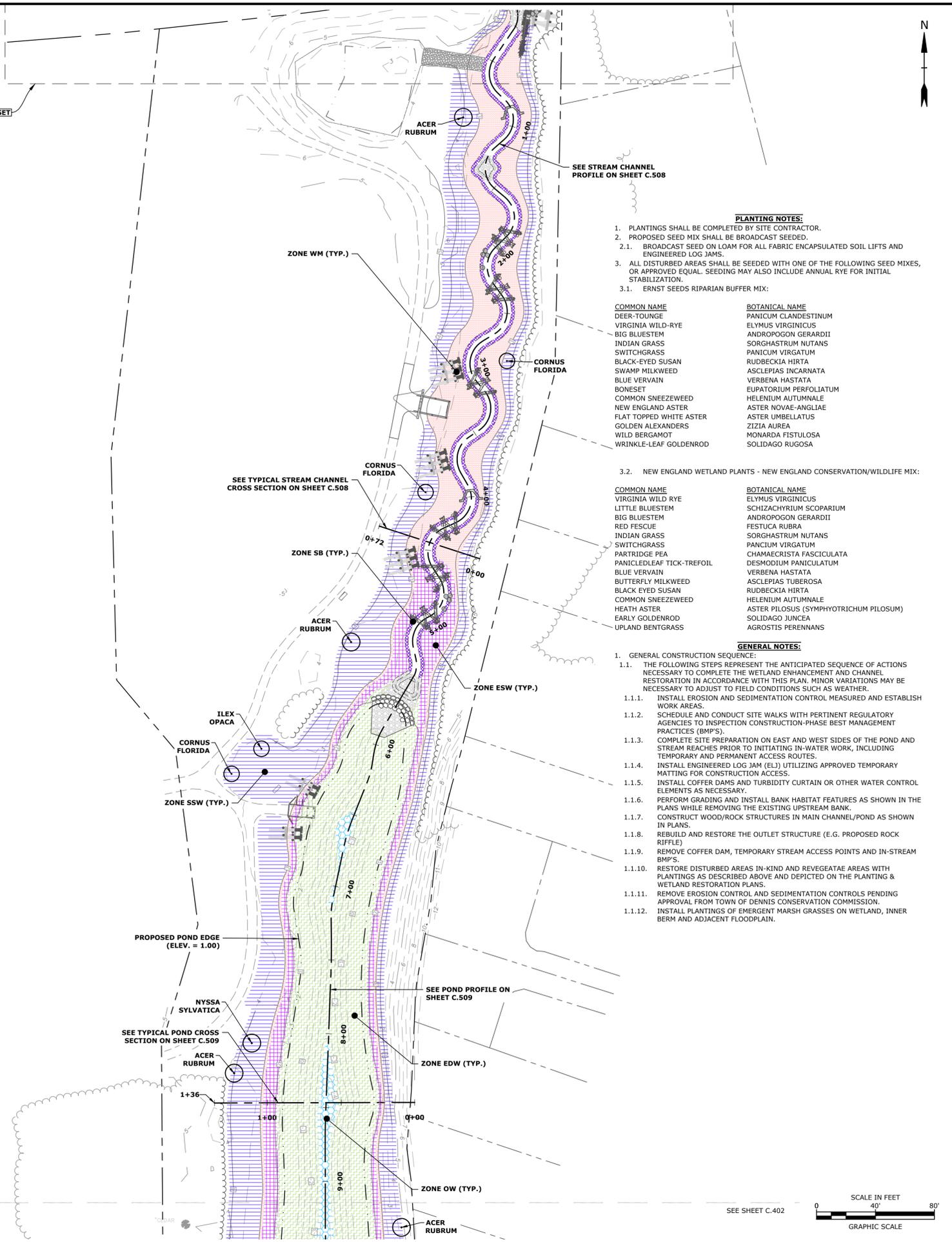




RESTORATION PLANTING SCHEDULE					
COMMON NAME	SCIENTIFIC NAME	PLANT SIZE	PLANTING DISTANCE (OC)	QUANTITY	PLANTING ELEVATION RANGE (FT.)
<b>ZONE SB: STREAM BANKS (LENGTH = 1,670± LF)</b>					
RED TWIG DOGWOOD	CORNUS SERICEA	2'	4'	TBD	WITHIN THE STREAM BANK FESL'S (VARIES)
WATER WILLOW	JUSTICIA AMERICANA	2'	4'	TBD	WITHIN THE STREAM BANK FESL'S (VARIES)
<b>ZONE PB: POND BANKS (LENGTH = 5,010± LF)</b>					
RED TWIG DOGWOOD	CORNUS SERICEA	BAREFOOT	4'	TBD	WITHIN THE STREAM BANK FESL'S (VARIES)
WATER WILLOW	JUSTICIA AMERICANA	BAREFOOT OR CUTTING	4'	TBD	WITHIN THE STREAM BANK FESL'S (VARIES)
<b>ZONE OW: OPEN WATER (AREA = 8,450± SF)</b>					
WHITE WATER LILY	NYMPHAEA ALBA	TUBER	12'	TBD	-7 TO -3
YELLOW WATER LILY	NUPHAR LUTEA	TUBER	12'	TBD	-7 TO -3
<b>ZONE EDW: EMERGENT DEEP WETLAND (AREA = 48,150± SF)</b>					
SOFT-STEM BULRUSH	SCHOENOPLECTUS TABERNAEMONTANI	PLUG	1'	TBD	-3.5 TO 1.8
HARD-STEM BULRUSH	SCHOENOPLECTUS ACUTUS	PLUG	3'	TBD	-3.5 TO 1.8
<b>ZONE ESW: EMERGENT SHALLOW WETLAND (AREA = 48,015± SF)</b>					
SOFT-STEM BULRUSH	SCHOENOPLECTUS TABERNAEMONTANI	PLUG	1'	TBD	1.8 TO 2.4
THREE-SQUARE BULRUSH	SCHOENOPLECTUS PUNGENS	PLUG	18"	TBD	1.8 TO 2.4
NORTHERN ARROWHEAD	SAGITTARIA CUNEATA	6"	1'	TBD	1.8 TO 2.4
ARROW ARUM	PELTANDRA VIRGINICA	6"	16"	TBD	1.8 TO 2.4
<b>ZONE WM: WET MEADOW (AREA = 14,550± SF)</b>					
PENNSYLVANIA SEDGE	CAREX PENNSYLVANICA	BAREFOOT	8"	TBD	2.4 TO 3.2
HAIRGRASS	DESCHAMPSIA FLEXUOSA	BAREFOOT	8"	TBD	2.4 TO 3.2
SWITCHGRASS	PANICUM VIRGATUM	BAREFOOT	8"	TBD	2.4 TO 3.2
SWEET FURN	COMPTONIA PEREGRINA	BAREFOOT	8"	TBD	2.4 TO 3.2
<b>ZONE TW: TRANSITIONAL WETLAND (AREA = 18,000± SF)</b>					
SWITCH PANICGRASS	PANICUM VIRGATUM	1 GAL.	8"	TBD	2.4 TO 4 (BETWEEN ZONES WM & SSW)
SEASIDE GOLDENROD	SOLIDAGO SEMPERVIRENS	1 GAL.	8"	TBD	2.4 TO 4 (BETWEEN ZONES WM & SSW)
BLUE-STEMMED GOLDENROD	SOLIDAGO CAESIA	1 GAL.	8"	TBD	2.4 TO 4 (BETWEEN ZONES WM & SSW)
MARITIME MARSH	ELDERVA FRUTESCENS	2 GAL.	8"	TBD	2.4 TO 4 (BETWEEN ZONES WM & SSW)
COASTAL SWEET PEPPERBUSH	CLETHRA ALNIFOLIA	2 GAL.	8"	TBD	2.4 TO 4 (BETWEEN ZONES WM & SSW)
SWAMP ROSE-MALLOW	HIBISCUS MOSHEUTOS	2 GAL.	8"	TBD	2.4 TO 4 (BETWEEN ZONES WM & SSW)
EASTERN FALSE WILLOW	BACCHARIS HALIMIFOLIA	2 GAL.	8"	TBD	2.4 TO 4 (BETWEEN ZONES WM & SSW)
AROMATIC ASTER	SYMPHYOTRICHUM OBLONGIFOLIUS	2 GAL.	8"	TBD	2.4 TO 4 (BETWEEN ZONES WM & SSW)
HIGH BUSH BLUEBERRY	VACCINIUM CORYMBOSUM	2 GAL.	8"	TBD	2.4 TO 4 (BETWEEN ZONES WM & SSW)
<b>ZONE SSW: SCRUB/SHRUB WETLAND (AREA = 32,650± SF)</b>					
FRAGRANT SUMAC	RHUS AROMATICA	2-3'	4'	TBD	3.2 TO 4.8
GROUNDSEL BUSH	BACCHARIS HALIMIFOLIA	6"	1'	TBD	3.2 TO 4.8
YELLOW WILD INDIGO	BAPTISTA TINCTORIA	6"	4'	TBD	3.2 TO 4.8
WINTERBERRY	ILEX VERTICILLATA	2 GAL.	4'	TBD	3.2 TO 4.8
ARROWWOOD	VIBURNUM DENTATUM	2 GAL.	5'	TBD	3.2 TO 4.8
<b>ZONE FW: FORESTED WETLAND (AREA = 12,000± SF)</b>					
RED MAPLE	ACER RUBRUM	2 GAL.	5'	5	3.5 TO 5.5 (BETWEEN ZONES SSW & UB)
DOGWOOD FLOWERING	CORNUS FLORIDA	1 GAL.	6	8	3.5 TO 5.5 (BETWEEN ZONES SSW & UB)
AMERICAN HOLLY	ILEX OPACA	2 GAL.	5'	3	3.5 TO 5.5 (BETWEEN ZONES SSW & UB)
BLACK GUM	NYSSA SYLVATICA	2 GAL.	5'	4	3.5 TO 5.5 (BETWEEN ZONES SSW & UB)
<b>ZONE UB: UPLAND BUFFER (AREA = 16,750± SF)</b>					
SWEET FURN	COMPTONIA PEREGRINA	2 GAL.	8"	TBD	4.5 TO 6
LITTLE BLUESTEM	SCHIZACHYRIUM SCOPARIUM	SEED	2'	TBD	4.5 TO 6
INKBERRY	ILEX GLABRA	2 GAL.	3'	TBD	4.5 TO 6
HIGH BUSH BLUEBERRY	VACCINIUM CORYMBOSUM	2 GAL.	6'	TBD	4.5 TO 6
FRAGRANT SUMAC	RHUS AROMATICA	2-3'	4'	TBD	4.5 TO 6
ELDERBERRY	SAMBUCUS CANADENSIS	2 GAL.	6-8"	TBD	4.5 TO 6
PRAIRIE DROPSEED	SPOROBOLUS HEEROLEPIS	SEED	1.5-2'	TBD	4.5 TO 6
TULIP TREE	LIRIODENDRON TULPIFERA	2 GAL.	6"	2	4.5 TO 6
SWAMP WHITE OAK	QUERCUS BICOLOR	2 GAL.	5'	8	4.5 TO 6

**NOTES:**  
 1. THE PLANTING ZONES TW AND FW ARE NOT SHOWN GRAPHICALLY ON THIS PLAN FOR CLARITY AS THEY ARE TRANSITIONAL ZONES AND INCORPORATE MORE THAN ONE PLANTING AREA.  
 2. THE PLANTING ZONE PB IS NOT GRAPHICALLY SHOWN ON THIS PLAN FOR CLARITY AS IT ENCOMPASSES MULTIPLE PLANTING ZONES. SEE GRADING, DRAINAGE & EROSION CONTROL PLANS FOR COMPLETE LIMITS OF FESL'S.

LEGEND		ABBREVIATIONS/ACRONYMS	
	PROPOSED STREAM/POND BANK AREA (FESL'S)	ELEV.	ELEVATION
	PROPOSED OPEN WATER/DEEP AQUATIC AREA	FESL	FABRIC ENCAPSULATED SOIL LIFT
	PROPOSED EMERGENT DEEP WETLAND AREA	FT.	FEET
	PROPOSED EMERGENT SHALLOW WETLAND AREA	LF	LINEAR FEET
	PROPOSED WET MEADOW AREA	OC	ON CENTER
	PROPOSED SCRUB/SHRUB WETLAND AREA	SF	SQUARE FEET
	PROPOSED UPLAND BUFFER AREA	TBD	TO BE DETERMINED
		TYP.	TYPICAL



- PLANTING NOTES:**
- PLANTINGS SHALL BE COMPLETED BY SITE CONTRACTOR.
  - PROPOSED SEED MIX SHALL BE BROADCAST SEEDED.
    - BROADCAST SEED ON LOAM FOR ALL FABRIC ENCAPSULATED SOIL LIFTS AND ENGINEERED LOG JAMS.
  - ALL DISTURBED AREAS SHALL BE SEEDED WITH ONE OF THE FOLLOWING SEED MIXES, OR APPROVED EQUAL. SEEDING MAY ALSO INCLUDE ANNUAL RYE FOR INITIAL STABILIZATION.
    - ERNST SEEDS RIPARIAN BUFFER MIX:

COMMON NAME	BOTANICAL NAME
DEER-TONGUE	PANICUM CLANDESTINUM
VIRGINIA WILD-RYE	ELYMUS VIRGINICUS
BIG BLUESTEM	ANDROPOGON GERARDII
INDIAN GRASS	SORGHASTRUM NUTANS
SWITCHGRASS	PANICUM VIRGATUM
BLACK-EYED SUSAN	RUDBECKIA HIRTA
SWAMP MILKWEED	ASCLEPIAS INCARNATA
BLUE VERVAIN	VERBENA HASTATA
BONESET	EUPATORIUM PERFOLIATUM
COMMON SNEEZEWEED	HELIENIUM AUTUMNALE
NEW ENGLAND ASTER	ASTER NOVAE-ANGLIAE
FLAT TOPPED WHITE ASTER	ASTER UMBELLATUS
GOLDEN ALEXANDERS	ZIZIA AUREA
WILD BERGAMOT	MONARDA FISTULOSA
WRINKLE-LEAF GOLDENROD	SOLIDAGO RUGOSA

3.2. NEW ENGLAND WETLAND PLANTS - NEW ENGLAND CONSERVATION/WILDLIFE MIX:

COMMON NAME	BOTANICAL NAME
VIRGINIA WILD RYE	ELYMUS VIRGINICUS
LITTLE BLUESTEM	SCHIZACHYRIUM SCOPARIUM
BIG BLUESTEM	ANDROPOGON GERARDII
RED FESCUE	FESTUCA RUBRA
INDIAN GRASS	SORGHASTRUM NUTANS
SWITCHGRASS	PANICUM VIRGATUM
PARTRIDGE PEA	CHAMAECRISTA FASCICULATA
PANICLED-LEAF TICK-TREFOIL	DESMODIUM PANICULATUM
BLUE VERVAIN	VERBENA HASTATA
BUTTERFLY MILKWEED	ASCLEPIAS TUBEROSA
BLACK EYED SUSAN	RUDBECKIA HIRTA
COMMON SNEEZEWEED	HELIENIUM AUTUMNALE
HEATH ASTER	ASTER PILOSUS (SYMPHYOTRICHUM PILOSUM)
EARLY GOLDENROD	SOLIDAGO JUNCEA
UPLAND BENTGRASS	AGROSTIS PERENNANS

- GENERAL NOTES:**
- GENERAL CONSTRUCTION SEQUENCE:
    - THE FOLLOWING STEPS REPRESENT THE ANTICIPATED SEQUENCE OF ACTIONS NECESSARY TO COMPLETE THE WETLAND ENHANCEMENT AND CHANNEL RESTORATION IN ACCORDANCE WITH THIS PLAN. MINOR VARIATIONS MAY BE NECESSARY TO ADJUST TO FIELD CONDITIONS SUCH AS WEATHER.
      - INSTALL EROSION AND SEDIMENTATION CONTROL MEASURED AND ESTABLISH WORK AREAS.
      - SCHEDULE AND CONDUCT SITE WALKS WITH PERTINENT REGULATORY AGENCIES TO INSPECTION CONSTRUCTION-PHASE BEST MANAGEMENT PRACTICES (BMP'S).
      - COMPLETE SITE PREPARATION ON EAST AND WEST SIDES OF THE POND AND STREAM REACHES PRIOR TO INITIATING IN-WATER WORK, INCLUDING TEMPORARY AND PERMANENT ACCESS ROUTES.
      - INSTALL ENGINEERED LOG JAM (ELJ) UTILIZING APPROVED TEMPORARY MATTING FOR CONSTRUCTION ACCESS.
      - INSTALL COFFER DAMS AND TURBIDITY CURTAIN OR OTHER WATER CONTROL ELEMENTS AS NECESSARY.
      - PERFORM GRADING AND INSTALL BANK HABITAT FEATURES AS SHOWN IN THE PLANS WHILE REMOVING THE EXISTING UPSTREAM BANK.
      - CONSTRUCT WOOD/ROCK STRUCTURES IN MAIN CHANNEL/POND AS SHOWN IN PLANS.
      - REBUILD AND RESTORE THE OUTLET STRUCTURE (E.G. PROPOSED ROCK RIFFLE)
      - REMOVE COFFER DAM, TEMPORARY STREAM ACCESS POINTS AND IN-STREAM BMP'S.
      - RESTORE DISTURBED AREAS IN-KIND AND REVEGETATE AREAS WITH PLANTINGS AS DESCRIBED ABOVE AND DEPICTED ON THE PLANTING & WETLAND RESTORATION PLANS.
      - REMOVE EROSION CONTROL AND SEDIMENTATION CONTROLS PENDING APPROVAL FROM TOWN OF DENNIS CONSERVATION COMMISSION.
      - INSTALL PLANTINGS OF EMERGENT MARSH GRASSES ON WETLAND, INNER BERM AND ADJACENT FLOODPLAIN.

90%  
DESIGN PLANS  
NOT FOR CONSTRUCTION

**Pond Pond  
Flood  
Mitigation &  
Drainage  
Improvements**

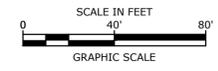
Town of Dennis

Dennis, MA

0	MAY 2024	90% DESIGN PLANS
MARK	DATE	DESCRIPTION
PROJECT NO:	D0250-007	
DATE:	MAY 2024	
FILE:	D0250-007-C-DSGN.DWG	
DRAWN BY:	NSC	
CHECKED:	GCB/TWB	
APPROVED:	JMP	

**PLANTING & WETLAND  
RESTORATION PLAN - 1**

SCALE: AS SHOWN



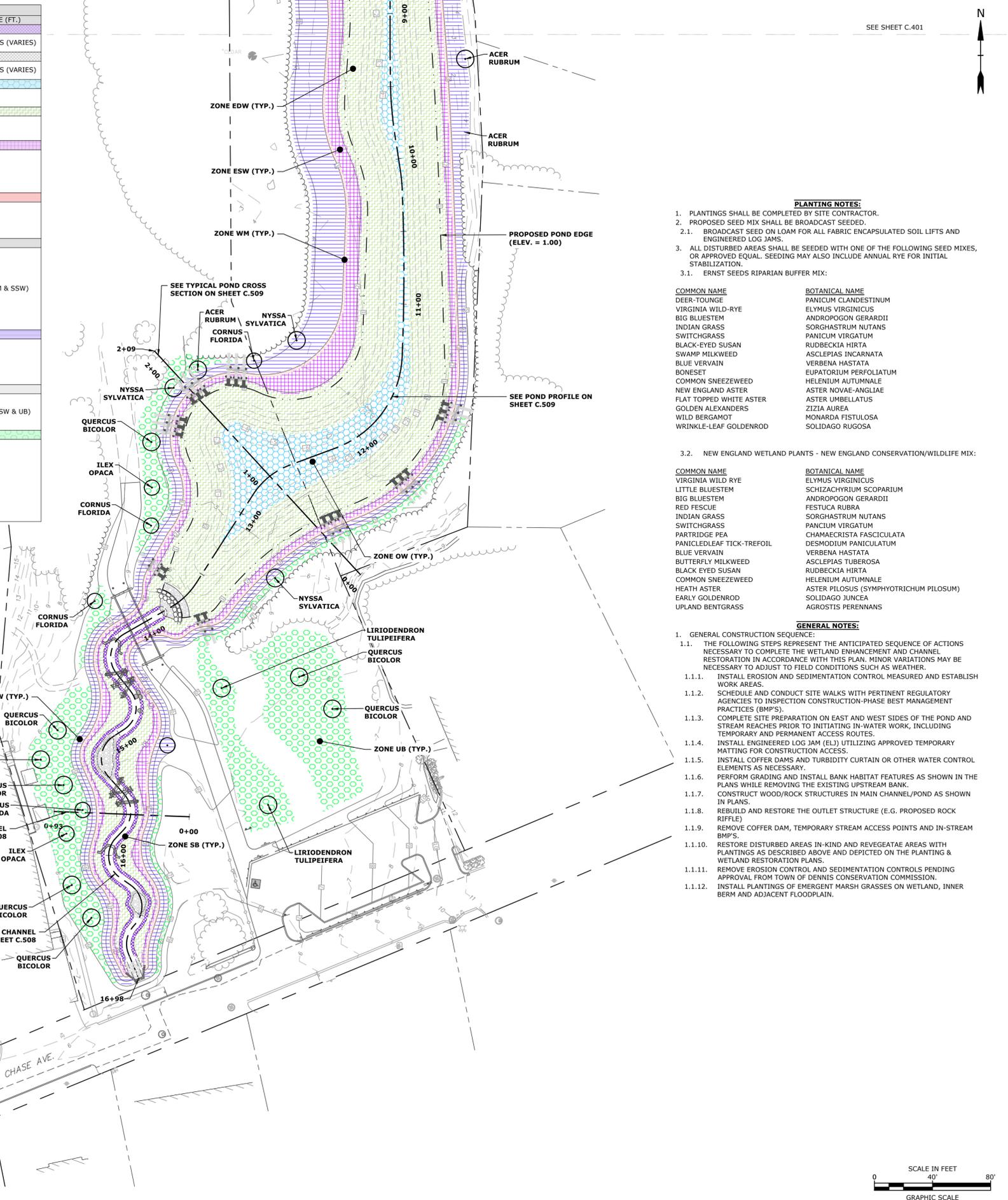
C.401



RESTORATION PLANTING SCHEDULE				
COMMON NAME	SCIENTIFIC NAME	PLANT SIZE	PLANTING DISTANCE (OC)	QUANTITY
<b>ZONE SB: STREAM BANKS (LENGTH = 1,670± LF)</b>				
RED TWIG DOGWOOD	CORNUS SERICEA	2'	4'	TBD
WATER WILLOW	JUSTITIA AMERICANA	2'	4'	TBD
<b>ZONE PB: POND BANKS (LENGTH = 5,010± LF)</b>				
RED TWIG DOGWOOD	CORNUS SERICEA	BAREFOOT	4'	TBD
WATER WILLOW	JUSTITIA AMERICANA	BAREFOOT OR CUTTING	4'	TBD
<b>ZONE OW: OPEN WATER (AREA = 8,450± SF)</b>				
WHITE WATER LILY	NYMPHAEA ALBA	TUBER	12'	TBD
YELLOW WATER LILY	NUPHAR LUTEA	TUBER	12'	TBD
<b>ZONE EDW: EMERGENT DEEP WETLAND (AREA = 48,150± SF)</b>				
SOFT-STEM BULRUSH	SCHOENOPLECTUS TABERNAEMONTANI	PLUG	1'	TBD
HARD-STEM BULRUSH	SCHOENOPLECTUS ACUTUS	PLUG	3'	TBD
<b>ZONE ESW: EMERGENT SHALLOW WETLAND (AREA = 48,015± SF)</b>				
SOFT-STEM BULRUSH	SCHOENOPLECTUS TABERNAEMONTANI	PLUG	1'	TBD
THREE-SQUARE BULRUSH	SCHOENOPLECTUS PUNGENS	PLUG	18"	TBD
NORTHERN ARROWHEAD	SAGITTARIA CUNEATA	6"	1'	TBD
ARROW ARUM	PELTANDRA VIRGINICA	6"	18"	TBD
<b>ZONE WM: WET MEADOW (AREA = 14,550± SF)</b>				
PENNSYLVANIA SEDGE	CAREX PENNSYLVANICA	BAREFOOT	8"	TBD
HAIRGRASS	DESCHAMPSIA FLEXUOSA	BAREFOOT	8"	TBD
SWITCHGRASS	PANICUM VIRGATUM	BAREFOOT	8"	TBD
SWEET FURN	COMPTONIA PEREGRINA	BAREFOOT	8"	TBD
<b>ZONE TW: TRANSITIONAL WETLAND (AREA = 18,000± SF)</b>				
SWITCH PANICGRASS	PANICUM VIRGATUM	1 GAL.	8"	TBD
SEASIDE GOLDENROD	SOLIDAGO SEMPERVIRENS	1 GAL.	8"	TBD
BLUE-STEMMED GOLDENROD	SOLIDAGO CAESIA	1 GAL.	8"	TBD
MARITIME MARSH	ELDERLVA FRUTESCENS	2 GAL.	8"	TBD
COASTAL SWEET PEPPERBUSH	CLETHRA ALNIFOLIA	2 GAL.	8"	TBD
SWAMP ROSE-MALLOW	HIBISCUS MOSHEUTOS	2 GAL.	8"	TBD
EASTERN FALSE WILLOW	BACCHARIS HALIMIFOLIA	2 GAL.	8"	TBD
AROMATIC ASTER	SYMPHYOTRICHUM OBLONGIFOLIUS	2 GAL.	8"	TBD
HIGH BUSH BLUEBERRY	VACCINIUM CORYMBOSUM	2 GAL.	8"	TBD
<b>ZONE SSW: SCRUB/SHRUB WETLAND (AREA = 32,650± SF)</b>				
FRAGRANT SUMAC	RHUS AROMATICA	2-3'	4'	TBD
GROUNDSEL BUSH	BACCHARIS HALIMIFOLIA	6"	1'	TBD
YELLOW WILD INDIGO	BAPTISTA TINCTORIA	6"	4'	TBD
WINTERBERRY	ILEX VERTICILLATA	2 GAL.	4'	TBD
ARROWWOOD	VIBURNUM DENTATUM	2 GAL.	5'	TBD
<b>ZONE FW: FORESTED WETLAND (AREA = 12,000± SF)</b>				
RED MAPLE	ACER RUBRUM	2 GAL.	5'	5
DOGWOOD FLOWERING	CORNUS FLORIDA	1 GAL.	6	8
AMERICAN HOLLY	ILEX OPACA	2 GAL.	5'	3
BLACK GUM	NYSSA SYLVATICA	2 GAL.	5'	4
<b>ZONE UB: UPLAND BUFFER (AREA = 16,750± SF)</b>				
SWEET FURN	COMPTONIA PEREGRINA	2 GAL.	8"	TBD
LITTLE BLUESTEM	SCHIZACHYRIUM SCOPARIUM	SEED	2"	TBD
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ELDERBERRY	SAMBUCUS CANADENSIS	2 GAL.	6-8'	TBD
PRAIRIE DROPSEED	SPOROBOLUS HEEROLEPIS	SEED	1.5-2"	TBD
TULIP TREE	LIRIODENDRON TULIPIFERA	2 GAL.	6"	2
SWAMP WHITE OAK	QUERCUS BICOLOR	2 GAL.	5'	8

- NOTES:**
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  - THE PLANTING ZONE PB IS NOT GRAPHICALLY SHOWN ON THIS PLAN FOR CLARITY AS IT ENCOMPASSES MULTIPLE PLANTING ZONES. SEE GRADING, DRAINAGE & EROSION CONTROL PLANS FOR COMPLETE LIMITS OF FESL'S.

LEGEND		ABBREVIATIONS/ACRONYMS	
	PROPOSED STREAM/POND BANK AREA (FESL'S)	ELEV.	ELEVATION
	PROPOSED OPEN WATER/DEEP AQUATIC AREA	FESL	FABRIC ENCAPSULATED SOIL LIFT
	PROPOSED EMERGENT DEEP WETLAND AREA	FT.	FEET
	PROPOSED EMERGENT SHALLOW WETLAND AREA	LF	LINEAR FEET
	PROPOSED WET MEADOW AREA	OC	ON CENTER
	PROPOSED SCRUB/SHRUB WETLAND AREA	SF	SQUARE FEET
	PROPOSED UPLAND BUFFER AREA	TBD	TO BE DETERMINED
		TYP.	TYPICAL



- PLANTING NOTES:**
- PLANTINGS SHALL BE COMPLETED BY SITE CONTRACTOR.
  - PROPOSED SEED MIX SHALL BE BROADCAST SEEDED.
  - BROADCAST SEED ON LOAM FOR ALL FABRIC ENCAPSULATED SOIL LIFTS AND ENGINEERED LOG JAMS.
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  - ERNST SEEDS RIPARIAN BUFFER MIX:

COMMON NAME	BOTANICAL NAME
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VIRGINIA WILD-RYE	ELYMIUS VIRGINICUS
BIG BLUESTEM	ANDROPOGON GERARDII
INDIAN GRASS	SORGHASTRUM NUTANS
SWITCHGRASS	PANICUM VIRGATUM
BLACK-EYED SUSAN	RUDBECKIA HIRTA
SWAMP MILKWEED	ASCLEPIAS INCARNATA
BLUE VERVAIN	VERBENA HASTATA
BONESET	EUPATORIUM PERFOLIATUM
COMMON SNEEZEWEED	HELIENIUM AUTUMNALE
NEW ENGLAND ASTER	ASTER NOVAE-ANGLIAE
FLAT TOPPED WHITE ASTER	ASTER UMBELLATUS
GOLDEN ALEXANDERS	ZIZIA AUREA
WILD BERGAMOT	MONARDA FISTULOSA
WRINKLE-LEAF GOLDENROD	SOLIDAGO RUGOSA

3.2. NEW ENGLAND WETLAND PLANTS - NEW ENGLAND CONSERVATION/WILDLIFE MIX:

COMMON NAME	BOTANICAL NAME
VIRGINIA WILD RYE	ELYMIUS VIRGINICUS
LITTLE BLUESTEM	SCHIZACHYRIUM SCOPARIUM
BIG BLUESTEM	ANDROPOGON GERARDII
RED FESCUE	FESTUCA RUBRA
INDIAN GRASS	SORGHASTRUM NUTANS
SWITCHGRASS	PANICUM VIRGATUM
PARTRIDGE PEA	CHAMAECRISTA FASCICULATA
PANICLED LEAF TICK-TREFOIL	DESMODIUM PANICULATUM
BLUE VERVAIN	VERBENA HASTATA
BUTTERFLY MILKWEED	ASCLEPIAS TUBEROSA
BLACK EYED SUSAN	RUDBECKIA HIRTA
COMMON SNEEZEWEED	HELIENIUM AUTUMNALE
HEATH ASTER	ASTER PILOSUS (SYMPHYOTRICHUM PILOSUM)
EARLY GOLDENROD	SOLIDAGO JUNCEA
UPLAND BENTGRASS	AGROSTIS PERENNANS

- GENERAL NOTES:**
- GENERAL CONSTRUCTION SEQUENCE:
    - THE FOLLOWING STEPS REPRESENT THE ANTICIPATED SEQUENCE OF ACTIONS NECESSARY TO COMPLETE THE WETLAND ENHANCEMENT AND CHANNEL RESTORATION IN ACCORDANCE WITH THIS PLAN. MINOR VARIATIONS MAY BE NECESSARY TO ADJUST TO FIELD CONDITIONS SUCH AS WEATHER.
    - INSTALL EROSION AND SEDIMENTATION CONTROL MEASURED AND ESTABLISH WORK AREAS.
    - SCHEDULE AND CONDUCT SITE WALKS WITH PERTINENT REGULATORY AGENCIES TO INSPECTION CONSTRUCTION-PHASE BEST MANAGEMENT PRACTICES (BMP'S).
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    - INSTALL COFFER DAMS AND TURBIDITY CURTAIN OR OTHER WATER CONTROL ELEMENTS AS NECESSARY.
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    - REMOVE COFFER DAM, TEMPORARY STREAM ACCESS POINTS AND IN-STREAM BMP'S.
    - RESTORE DISTURBED AREAS IN-KIND AND REVEGETATE AREAS WITH PLANTINGS AS DESCRIBED ABOVE AND DEPICTED ON THE PLANTING & WETLAND RESTORATION PLANS.
    - REMOVE EROSION CONTROL AND SEDIMENTATION CONTROLS PENDING APPROVAL FROM TOWN OF DENNIS CONSERVATION COMMISSION.
    - INSTALL PLANTINGS OF EMERGENT MARSH GRASSES ON WETLAND, INNER BERM AND ADJACENT FLOODPLAIN.

**90%  
DESIGN PLANS  
NOT FOR CONSTRUCTION**

**Pond Pond  
Flood  
Mitigation &  
Drainage  
Improvements**

Town of Dennis

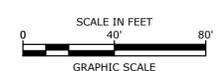
Dennis, MA

0	MAY 2024	90% DESIGN PLANS
MARK	DATE	DESCRIPTION

PROJECT NO:	D0250-007
DATE:	MAY 2024
FILE:	D0250-007-C-DSGN.DWG
DRAWN BY:	NSC
CHECKED:	GCB/TWB
APPROVED:	JMP

**PLANTING & WETLAND  
RESTORATION PLAN - 2**

SCALE: AS SHOWN



# WELCOME TO POUND POND

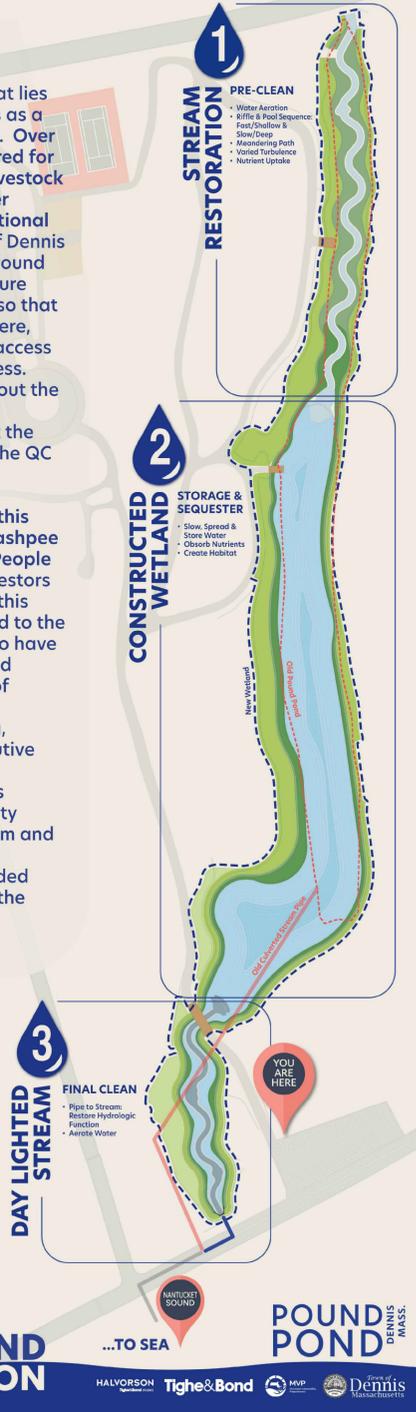
FROM SOURCE... DENNIS WATER-SHED

The water feature that lies ahead had its origins as a native cranberry bog. Over the years it was altered for cranberry farming, livestock watering, stormwater drainage and recreational floating. The Town of Dennis set goals to restore Pound Pond as a water feature within Seaview Park so that nature might thrive here, and the public have access to observe that process. More information about the restoration project is available throughout the Park or by scanning the QC code below.

The Town dedicates this restoration to the Mashpee Wampanoag Tribe, People of the First Light ancestors who first discovered this small water body, and to the citizens of Dennis who have worked to protect and restore it. The Town of Dennis, Community Preservation Funding, Massachusetts Executive Office of Energy and Environmental Affairs Municipal Vulnerability Preparedness Program and add more as needed collaboratively provided funding to complete the project.

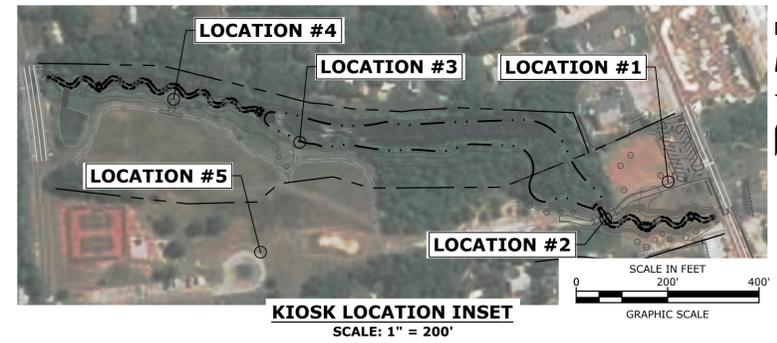


LEARN MORE HERE!

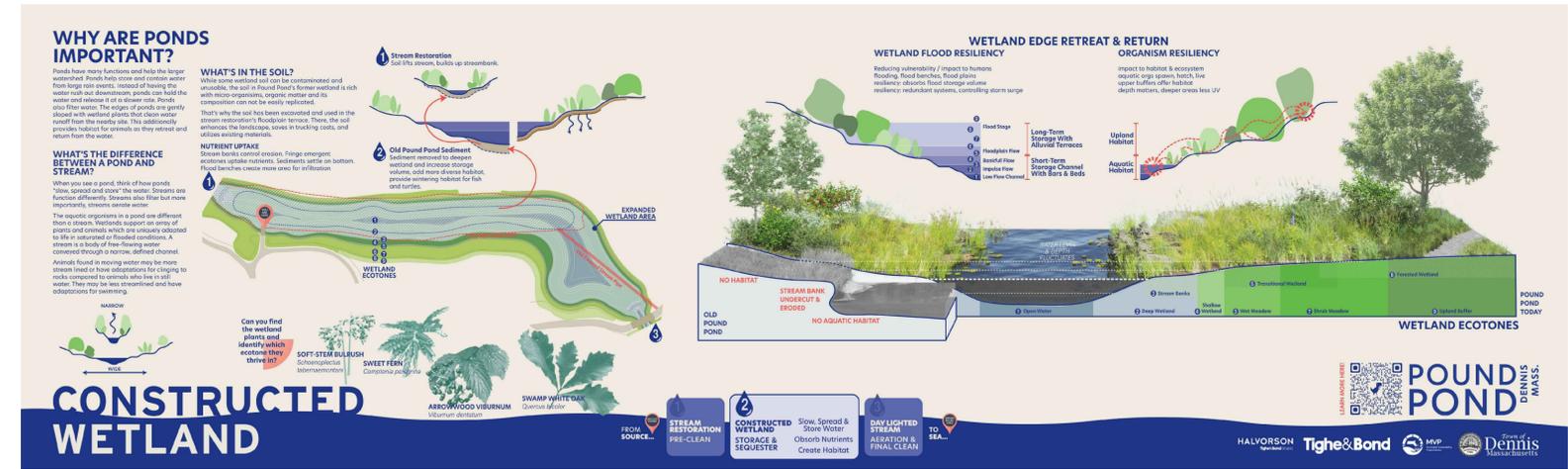


**POND POND RESTORATION**  
 HALVORSON Tighe&Bond MVP Dennis  
 ...TO SEA

LOCATION #1 & #5 (ENTRANCE SIGNS)



LOCATION #2 (PROPOSED BRIDGE SIGN)



LOCATION #3 (EXISTING OVERLOOK SIGN)



LOCATION #4 (PROPOSED OVERLOOK SIGN)

90%  
DESIGN PLANS  
NOT FOR CONSTRUCTION

## Pound Pond Flood Mitigation & Drainage Improvements

Town of Dennis

Dennis, MA

MARK	DATE	DESCRIPTION
0	MAY 2024	90% DESIGN PLANS
1	DATE	DESCRIPTION

PROJECT NO:	D0250-007
DATE:	MAY 2024
FILE:	D0250-007-C-DSGN.DWG
DRAWN BY:	NSC
CHECKED BY:	GCB/TWB
APPROVED:	JMP

**OVERALL KIOSK LOCATION PLAN**

SCALE: AS SHOWN

**C.511**

Last Saved: 5/29/2024 12:04pm By: NSC  
 Plotted On: May 29, 2024 12:04pm By: NSC  
 Tighe & Bond C:\Users\NSC\Desktop\Projects\_REMOT\AutoCAD\_Pond\_Pond\Sheet\DD250-007-C-DSGN.dwg

**GENERAL PROJECT INFORMATION**

PROJECT OWNER: TOWN OF DENNIS  
PROJECT NAME: POUND POND FLOOD MITIGATION & DRAINAGE IMPROVEMENTS  
PROJECT ADDRESS: DENNIS, MASSACHUSETTS 02170  
PROJECT LATITUDE: 42°-15'-44.0"N  
PROJECT LONGITUDE: 71°-0'-28.0"W

**PROJECT DESCRIPTION**

THE PROJECT CONSISTS OF THE CREATION OF WETLAND HABITAT, STREAM RESTORATION, BANK STABILIZATION CULVERT DAY LIGHTING AND LANDSCAPING IMPROVEMENTS TO REVITALIZE THE STORMWATER DRAINAGE FEATURE.

**DISTURBED AREA**

THE TOTAL AREA TO BE DISTURBED IS APPROXIMATELY 3.4 ACRES.

**SOIL CHARACTERISTICS**

BASED ON THE WEB SOIL SURVEY COMPLETED FOR THE SITE, SOILS CONSIST MOSTLY OF CARVER COARSE SAND OF HYDROLOGIC SOIL GROUP RATING OF A.

**NAME OF RECEIVING WATERS**

THE STORMWATER RUNOFF FROM THE SITE WILL ENTER A CLOSED DRAINAGE SYSTEM ON CHASE AVENUE BEFORE DISCHARGING INTO NANTUCKET SOUND.

**CONSTRUCTION SEQUENCE OF MAJOR ACTIVITIES:**

- 1. INSTALL ALL EROSION AND SEDIMENT CONTROL BARRIERS AS FIRST ORDER OF WORK.
- 2. CONSTRUCT THE PROPOSED STREAM CHANNEL.
- 3. CONSTRUCT ANY REQUIRED COFFERDAMS AND/OR DEWATERING PRACTICES REQUIRED FOR THE CONSTRUCTION OF THE PRECAST CONCRETE CULVERT, HEADWALLS, WINGWALLS AND FOUNDATION.
- 4. CONSTRUCT THE PRECAST CONCRETE CULVERT, HEADWALLS, WINGWALLS AND FOUNDATION AND REMOVE ANY COFFERDAMS AND/OR DEWATERING MEASURES.
- 5. CONSTRUCT FINAL GRADING.
- 6. WHEN THE AREA IS COMPLETELY STABILIZED, REMOVE THE EROSION AND SEDIMENT CONTROL BARRIERS.

**SPECIAL CONSTRUCTION NOTES:**

- 1. THE CONSTRUCTION SEQUENCE MUST LIMIT THE DURATION AND AREA OF DISTURBANCE.
- 2. PONDS AND SWALES SHALL BE INSTALLED EARLY ON IN THE CONSTRUCTION SEQUENCE (BEFORE ROUGH GRADING THE SITE).

**EROSION CONTROL NOTES:**

- 1. ALL EROSION CONTROL MEASURES AND PRACTICES SHALL CONFORM TO THE MOST CURRENT MASSACHUSETTS STORMWATER STANDARDS PREPARED BY THE MASSDOT.
- 2. PRIOR TO ANY WORK OR SOIL DISTURBANCE, CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR EROSION CONTROL MEASURES AS REQUIRED IN THE PROJECT MANUAL.
- 3. CONTRACTOR SHALL INSTALL TEMPORARY EROSION CONTROL BARRIERS, INCLUDING HAY BALES, SILT FENCES, MULCH BERMS, SILT SOCKS AND SILT SOCKS AS SHOWN IN THESE DRAWINGS AS THE FIRST ORDER OF WORK.
- 4. SILT SOCK INLET PROTECTION SHALL BE INSTALLED IN ALL EXISTING AND PROPOSED CATCH BASIN INLETS THAT MAY RECEIVE STORMWATER RUNOFF AND BE MAINTAINED FOR THE DURATION OF THE PROJECT.
- 5. PERIMETER CONTROLS INCLUDING SILT FENCES, MULCH BERM, SILT SOCK, AND/OR HAY BALE BARRIERS SHALL BE MAINTAINED FOR THE DURATION OF THE PROJECT UNTIL NON-PAVED AREAS HAVE BEEN STABILIZED.
- 6. THE CONTRACTOR AND PROPERLY DISPOSE OF ALL TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF CONSTRUCTION.
- 7. ALL DISTURBED AREAS NOT OTHERWISE BEING TREATED SHALL RECEIVE 6" LOAM, SEED AND FERTILIZER.
- 8. INSPECT ALL INLET PROTECTION AND PERIMETER CONTROLS WEEKLY AND AFTER EACH RAIN STORM OF 0.25 INCH OR GREATER. REPAIR/MODIFY AS NECESSARY TO MAXIMIZE EFFICIENCY OF FILTER. REPLACE ALL FILTERS WHEN SEDIMENT IS 1/3 THE FILTER HEIGHT.
- 9. CONSTRUCT EROSION CONTROL BLANKETS ON ALL SLOPES STEEPER THAN 3:1 AND AS SHOWN ON PLANS.

**TEMPORARY WATER CONTROL AND DEWATERING NOTES:**

- 1. THE CONTRACTOR SHALL PROVIDE, OPERATE AND MAINTAIN ADEQUATE PUMPING, DIVERSION AND DRAINAGE FACILITIES TO MAINTAIN THE EXCAVATED AREA SUFFICIENTLY DRY FROM GROUNDWATER AND/OR SURFACE RUNOFF SO AS NOT TO ADVERSELY AFFECT CONSTRUCTION PROCEDURES NOR CAUSE EXCESSIVE DISTURBANCE OF UNDERLYING OR SURROUNDING NATURAL GROUND.
- 2. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS REQUIRED FOR DEWATERING ACTIVITIES AND TAKE ACTIONS NECESSARY TO ENSURE THAT DEWATERING DISCHARGES COMPLY WITH PERMITS APPLICABLE TO THE PROJECT. THE CONTRACTOR SHALL DISPOSE OF WATER FROM THE TRENCHES AND EXCAVATIONS IN SUCH A MANNER AS TO AVOID PUBLIC NUISANCE, INJURY TO PUBLIC HEALTH OR THE ENVIRONMENT, DAMAGE TO PUBLIC OR PRIVATE PROPERTY, OR DAMAGE TO THE WORK COMPLETED OR IN PROGRESS.
- 3. THE CONTRACTOR SHALL BRACE OR OTHERWISE PROTECT PIPELINES AND STRUCTURES NOT STABLE AGAINST UPLIFT DURING CONSTRUCTION.
- 4. THE CONTRACTOR SHALL NOT EXCAVATE UNTIL THE DEWATERING SYSTEM IS OPERATIONAL AND THE EXCAVATION MAY PROCEED WITHOUT DISTURBANCE TO THE FINAL SUBGRADE OR SURROUNDING AREAS.
- 5. THE CONTRACTOR SHALL CONTINUE DEWATERING UNTIL THE STRUCTURES, PIPES AND APPURTENANCES TO BE INSTALLED HAVE BEEN COMPLETED SUCH THAT THEY WILL NOT FLOAT OR BE OTHERWISE DAMAGED BY AN INCREASE IN GROUNDWATER ELEVATION.
- 6. DEWATERING DISCHARGE:
  - A. INSTALL SAND AND GRAVEL, OR CRUSHED STONE, FILTERS IN CONJUNCTION WITH SUMPS, WELL POINTS, AND/OR DEEP WELLS TO PREVENT THE MIGRATION OF FINES FROM THE EXISTING SOIL DURING THE DEWATERING OPERATION.
  - B. WATER PUMPED FROM EXCAVATIONS MUST BE PASSED THROUGH A SILT FILTER BAG OR OTHER SUCH BEST MANAGEMENT PRACTICE (BMP) FEATURE PRIOR TO BEING DISCHARGED BACK TO A SURFACE WATER BODY.
  - C. DO NOT DISCHARGE WATER INTO ANY SANITARY SEWER SYSTEM.
  - D. ALL DEWATERING DISCHARGES SHALL BE OUTSIDE OF ANY WETLAND SYSTEMS.
  - E. FOLLOWING TREATMENT IN AN APPROPRIATE BMP, WATER PUMPED FROM EXCAVATIONS SHOULD GENERALLY BE DISCHARGED ON THE DOWNSTREAM SIDE OF THE WORK AREA.
  - F. THE DISCHARGE AREA FOR THE PUMP OR SIPHON OUTLET MUST BE PROPERLY PROTECTED TO PREVENT EROSION BY HIGH VELOCITY FLOW.
  - G. DISCHARGE FLOW VELOCITY FROM PUMPS OR SIPHONS UNDER UNPROTECTED, VEGETATED GROUND MUST NOT EXCEED A MAXIMUM OF 1 FOOT PER SECOND. DISCHARGE FLOW VELOCITY FROM PUMPS OR SIPHONS WITHIN THE UNPROTECTED NATURAL STREAM CHANNEL SHALL NOT EXCEED A MAXIMUM OF 3 FEET PER SECOND. IN THE EVENT EROSION RESULTS FROM VELOCITIES OF THE MAGNITUDES, THE CONTRACTOR SHALL TAKE STEPS TO MITIGATE THE EROSION OR SHALL REDUCE DISCHARGE FLOW VELOCITY.
- 7. THE CONTRACTOR SHALL INSTALL TEMPORARY COFFERDAMS AS REQUIRED. THE EXACT CONSTRUCTION DETAILS OF THE COFFERDAM SHALL BE DETERMINED BY THE CONTRACTOR PERFORMING THE WORK.
- 8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY WATER CONTROL, SURFACE WATER AND GROUNDWATER, NECESSARY TO EXECUTE AND COMPLETE THE WORK, SUBJECT TO THE RESTRICTIONS CONTAINED IN THE PROJECT PERMITS.
- 9. ALL TEMPORARY WATER CONTROL MEASURES SHALL BE IMPLEMENTED IN CONJUNCTION WITH APPROPRIATE SEDIMENT AND EROSION CONTROL MEASURES SO AS TO MITIGATE TO THE GREATEST EXTENT POSSIBLE RELEASE OF SEDIMENT INTO WATER BODIES AND POTENTIAL EROSION OF SOIL.
- 10. PUMPS OR GENERATORS WHICH UTILIZE LIQUID FUEL MUST BE PLACED WITHIN AN IMPERMEABLE SECONDARY CONTAINMENT AREA WITH SUFFICIENT CAPACITY TO CONTAIN THE FULL VOLUME OF THE FUEL TANK.
- 11. PUMP OR SIPHON INTAKES SHALL BE PLACED SUCH THAT SEDIMENT AND DEBRIS ENTRAINMENT IS MINIMIZED.
- 12. THE COFFERDAM SHALL NOT BE CONSTRUCTED OF UNCONTAINED FILL (SOIL, ROCK, OR ANY OTHER LOOSE MATERIAL). THESE TYPES OF COFFERDAMS ARE SPECIFICALLY DISALLOWED FOR ENVIRONMENTAL PROTECTION REASONS.

- 1. AN AREA SHALL BE CONSIDERED STABLE WHEN ONE OF THE FOLLOWING HAS OCCURRED:
  - A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
  - B. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
  - C. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED;
  - D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED;
  - E. IN AREAS TO BE PAVED, "STABLE" MEANS THAT BASE COURSE GRAVELS MEETING THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM 304.2 HAVE BEEN INSTALLED.
- 2. WINTER STABILIZATION PRACTICES:
  - A. ALL PROPOSED VEGETATED AREAS THAT DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED BY SEEDING AND INSTALLING EROSION CONTROL BLANKETS ON SLOPES GREATER THAN 3:1, AND SEEDING AND PLACING 3 TO 4 TONS OF MULCH PER ACRE, SECURED WITH ANCHORED NETTING, ELSEWHERE. THE INSTALLATION OF EROSION CONTROL BLANKETS OR MULCH AND NETTING SHALL NOT OCCUR OVER ACCUMULATED SNOW OR ON FROZEN GROUND AND SHALL BE COMPLETED IN ADVANCE OF THAW OR SPRING MELT EVENTS;
  - B. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS;
  - C. AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING SURFACES, WHERE WORK HAS STOPPED FOR THE WINTER SEASON, SHALL BE PROTECTED WITH A MINIMUM OF 3 INCHES OF CRUSHED GRAVEL, OR IF CONSTRUCTION IS TO CONTINUE THROUGH THE WINTER SEASON BE CLEARED OF ANY ACCUMULATED SNOW AFTER EACH STORM EVENT;
- 3. STABILIZATION SHALL BE INITIATED ON ALL LOAM STOCKPILES, AND DISTURBED AREAS, WHERE CONSTRUCTION ACTIVITY SHALL NOT OCCUR FOR MORE THAN TWENTY-ONE (21) CALENDAR DAYS BY THE FOURTEENTH (14TH) DAY AFTER CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED IN THAT AREA. STABILIZATION MEASURES TO BE USED INCLUDE:
  - A. TEMPORARY SEEDING;
  - B. MULCHING.
- 4. ALL AREAS SHALL BE STABILIZED WITHIN 45 DAYS OF INITIAL DISTURBANCE.
- 5. WHEN CONSTRUCTION ACTIVITY PERMANENTLY OR TEMPORARILY CEASES WITHIN 100 FEET OF NEARBY SURFACE WATERS OR DELINEATED WETLANDS, THE AREA SHALL BE STABILIZED WITHIN SEVEN (7) DAYS OR PRIOR TO A RAIN EVENT. ONCE CONSTRUCTION ACTIVITY PERMANENTLY OR TEMPORARILY CEASES IN THESE AREAS, SILT FENCES, MULCH BERMS, HAY BALE BARRIERS AND ANY EARTH/DIKES SHALL BE REMOVED ONCE PERMANENT MEASURES ARE ESTABLISHED.
- 6. DURING CONSTRUCTION, RUNOFF WILL BE DIVERTED AROUND THE SITE WITH EARTH DIKES, PIPING OR STABILIZED CHANNELS WHERE POSSIBLE. SHEET RUNOFF FROM THE SITE WILL BE FILTERED THROUGH SILT FENCES, MULCH BERMS, HAY BALE BARRIERS, OR SILT SOCKS. ALL STORM DRAIN BASIN INLETS SHALL BE PROVIDED WITH FLARED END SECTIONS AND TRASH RACKS. THE SITE SHALL BE STABILIZED FOR THE WINTER BY OCTOBER 15.

**STABILIZATION:**

- 1. AN AREA SHALL BE CONSIDERED STABLE WHEN ONE OF THE FOLLOWING HAS OCCURRED:
  - A. BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
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  - D. EROSION CONTROL BLANKETS HAVE BEEN PROPERLY INSTALLED;
  - E. IN AREAS TO BE PAVED, "STABLE" MEANS THAT BASE COURSE GRAVELS MEETING THE REQUIREMENTS OF NHDOT STANDARD FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM 304.2 HAVE BEEN INSTALLED.
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  - B. ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85 PERCENT VEGETATIVE GROWTH BY OCTOBER 15, OR WHICH ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS;
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- 6. DURING CONSTRUCTION, RUNOFF WILL BE DIVERTED AROUND THE SITE WITH EARTH DIKES, PIPING OR STABILIZED CHANNELS WHERE POSSIBLE. SHEET RUNOFF FROM THE SITE WILL BE FILTERED THROUGH SILT FENCES, MULCH BERMS, HAY BALE BARRIERS, OR SILT SOCKS. ALL STORM DRAIN BASIN INLETS SHALL BE PROVIDED WITH FLARED END SECTIONS AND TRASH RACKS. THE SITE SHALL BE STABILIZED FOR THE WINTER BY OCTOBER 15.

**DUST CONTROL:**

- 1. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL DUST THROUGHOUT THE CONSTRUCTION PERIOD.
- 2. DUST CONTROL METHODS SHALL INCLUDE, BUT BE NOT LIMITED TO, SPRINKLING WATER ON EXPOSED AREAS, COVERING LOADED DUMP TRUCKS LEAVING THE SITE, AND TEMPORARY MULCHING.

**STOCKPILES:**

- 1. LOCATE STOCKPILES A MINIMUM OF 50 FEET AWAY FROM CATCH BASINS, SWALES, AND CULVERTS.
- 2. ALL STOCKPILES SHOULD BE SURROUNDED WITH TEMPORARY EROSION CONTROL MEASURES PRIOR TO THE ONSET OF PRECIPITATION.
- 3. PERIMETER BARRIERS SHOULD BE MAINTAINED AT ALL TIMES, AND ADJUSTED AS NEEDED TO ACCOMMODATE THE DELIVERY AND REMOVAL OF MATERIALS FROM THE STOCKPILE. THE INTEGRITY OF THE BARRIER SHOULD BE INSPECTED AT THE END OF EACH WORKING DAY.

- 4. PROTECT ALL STOCKPILES FROM STORMWATER RUN-OFF USING TEMPORARY EROSION CONTROL MEASURES SUCH AS BERMS, SILT SOCK, OR OTHER APPROVED PRACTICE TO PREVENT MIGRATION OF MATERIAL BEYOND THE IMMEDIATE CONFINES OF THE STOCKPILES.

**OFF SITE VEHICLE TRACKING:**

- 1. THE CONTRACTOR SHALL CONSTRUCT STABILIZED CONSTRUCTION EXIT(S) PRIOR TO ANY EXCAVATION ACTIVITIES.
- 2. ANY SEDIMENT TRACKED ONTO PUBLIC RIGHT-OF-WAYS (BEYOND PROJECT LIMITS) SHALL BE SWEEP AWAY AT THE END OF EACH WORKDAY.

**VEGETATION:**

- 1. SEE LANDSCAPE PLANS.

**ALLOWABLE NON-STORMWATER DISCHARGES:**

- 1. FIRE-FIGHTING ACTIVITIES;
- 2. FIRE HYDRANT FLUSHING;
- 3. WATERS USED TO WASH VEHICLES WHERE DETERGENTS ARE NOT USED;
- 4. WATER USED TO CONTROL DUST;
- 5. POTABLE WATER INCLUDING UNCONTAMINATED WATER LINE FLUSHING;
- 6. ROUTINE EXTERNAL BUILDING WASH DOWN WHERE DETERGENTS ARE NOT USED;
- 7. PAVEMENT WASH WATERS WHERE DETERGENTS ARE NOT USED;
- 8. UNCONTAMINATED AIR CONDITIONING/COMPRESSOR CONDENSATION;
- 9. UNCONTAMINATED GROUND WATER OR SPRING WATER;
- 10. FOUNDATION OR FOOTING DRAINS WHICH ARE UNCONTAMINATED;
- 11. UNCONTAMINATED EXCAVATION DEWATERING;
- 12. LANDSCAPE IRRIGATION.

**WASTE DISPOSAL:**

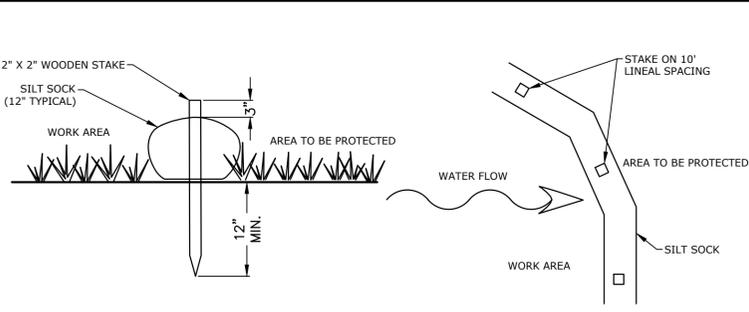
- 1. WASTE MATERIAL:
  - A. ALL WASTE MATERIALS SHALL BE COLLECTED AND STORED IN SECURELY LIDDED RECEPTACLES. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE SHALL BE DEPOSITED IN A DUMPSTER;
  - B. NO CONSTRUCTION WASTE MATERIALS SHALL BE BURIED ON SITE;
  - C. ALL PERSONNEL SHALL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL BY THE SUPERINTENDENT.
- 2. HAZARDOUS WASTE:
  - A. ALL HAZARDOUS WASTE MATERIALS SHALL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATION OR BY THE MANUFACTURER;
  - B. SITE PERSONNEL SHALL BE INSTRUCTED IN THESE PRACTICES BY THE SUPERINTENDENT.

**SPILL PREVENTION:**

- 1. CONTRACTOR SHALL BE FAMILIAR WITH SPILL PREVENTION MEASURES REQUIRED BY LOCAL, STATE AND FEDERAL AGENCIES. AT A MINIMUM, CONTRACTOR SHALL FOLLOW THE BEST MANAGEMENT SPILL PREVENTION PRACTICES OUTLINED BELOW.
- 2. THE FOLLOWING ARE THE MATERIAL MANAGEMENT PRACTICES THAT SHALL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES DURING CONSTRUCTION TO STORMWATER RUNOFF:
  - A. GOOD HOUSEKEEPING - THE FOLLOWING GOOD HOUSEKEEPING PRACTICE SHALL BE FOLLOWED ON SITE DURING CONSTRUCTION:
    - a. ONLY SUFFICIENT AMOUNTS OF PRODUCTS TO DO THE JOB SHALL BE STORED ON SITE;
    - b. ALL REGULATED MATERIALS STORED ON SITE SHALL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR PROPER (ORIGINAL IF POSSIBLE) CONTAINERS AND, IF POSSIBLE, UNDER A ROOF OR OTHER ENCLOSURE, ON AN IMPERVIOUS SURFACE;
    - c. MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL SHALL BE FOLLOWED;
    - d. THE SITE SUPERINTENDENT SHALL INSPECT DAILY TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS;
    - e. SUBSTANCES SHALL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER;
    - f. WHENEVER POSSIBLE ALL OF A PRODUCT SHALL BE USED UP BEFORE DISPOSING OF THE CONTAINER;
    - g. THE TRAINING OF ON-SITE EMPLOYEES AND THE ON-SITE POSTING OF RELEASE RESPONSE INFORMATION DESCRIBING WHAT TO DO IN THE EVENT OF A SPILL OF REGULATED SUBSTANCES.
  - B. HAZARDOUS PRODUCTS - THE FOLLOWING PRACTICES SHALL BE USED TO REDUCE THE RISKS ASSOCIATED WITH HAZARDOUS MATERIALS:
    - a. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE;
    - b. ORIGINAL LABELS AND MATERIAL SAFETY DATA SHALL BE RETAINED FOR IMPORTANT PRODUCT INFORMATION;
    - c. SURPLUS PRODUCT THAT MUST BE DISPOSED OF SHALL BE DISCARDED ACCORDING TO THE MANUFACTURER'S RECOMMENDED METHODS OF DISPOSAL.
  - C. PRODUCT SPECIFIC PRACTICES - THE FOLLOWING PRODUCT SPECIFIC PRACTICES SHALL BE FOLLOWED ON SITE:
    - a. PETROLEUM PRODUCTS:
      - i. ALL ON SITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE LEAKAGE;
      - ii. PETROLEUM PRODUCTS SHALL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED.
    - b. ASPHALT BASED SUBSTANCES USED ON SITE SHALL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
    - iii. SECURE FUEL STORAGE AREAS AGAINST UNAUTHORIZED ENTRY;
    - iv. INSPECT FUEL STORAGE AREAS WEEKLY;
    - v. WHEREVER POSSIBLE, KEEP REGULATED CONTAINERS THAT ARE STORED OUTSIDE MORE THAN 50 FEET FROM SURFACE WATER AND STORM DRAINS, 75 FEET FROM PRIVATE WELLS, AND 400 FEET FROM PUBLIC WELLS;
    - vi. COVER REGULATED CONTAINERS IN OUTSIDE STORAGE AREAS;
    - vii. SECONDARY CONTAINMENT IS REQUIRED FOR CONTAINERS CONTAINING REGULATED SUBSTANCES STORED OUTSIDE, EXCEPT FOR ON PREMISE USE HEATING FUEL TANKS, OR ABOVEGROUND OR UNDERGROUND STORAGE TANKS OTHERWISE REGULATED.
    - viii. THE FUEL HANDLING REQUIREMENTS SHALL INCLUDE:
      - (1) EXCEPT WHEN IN USE, KEEP CONTAINERS CONTAINING REGULATED SUBSTANCES CLOSED AND SEALED;
      - (2) PLACE DRIP PANS UNDER SPIGOTS, VALVES, AND PUMPS;
      - (3) HAVE SPILL CONTROL AND CONTAINMENT EQUIPMENT READILY AVAILABLE IN ALL WORK AREAS;
      - (4) USE FUNNELS AND DRIP PANS WHEN TRANSFERRING REGULATED SUBSTANCES;
      - (5) PERFORM TRANSFERS OF REGULATED SUBSTANCES OVER AN IMPERVIOUS SURFACE.
    - ix. FUELING AND MAINTENANCE OF EXCAVATION, EARTHMOVING AND OTHER CONSTRUCTION RELATED EQUIPMENT SHALL COMPLY WITH THE REGULATIONS OF THE MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION.
      - i. FERTILIZERS:
        - a. FERTILIZERS USED SHALL BE APPLIED ONLY IN THE MINIMUM AMOUNTS DIRECTED BY THE SPECIFICATIONS; ONCE APPLIED FERTILIZER SHALL BE WORKED INTO THE SOIL TO LIMIT EXPOSURE TO STORMWATER;
        - b. EXCESS PAINT SHALL NOT BE PAINT DUMPED TO THE STORM SEWER SYSTEM;
        - c. STORAGE SHALL BE IN A COVERED SHED OR ENCLOSED TRAILERS. THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER SHALL BE TRANSFERRED TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.
      - ii. PAINTS:
        - a. ALL CONTAINERS SHALL BE TIGHTLY SEALED AND STORED WHEN NOT REQUIRED FOR USE;
        - b. EXCESS PAINT SHALL NOT BE DISCHARGED TO THE STORM SEWER SYSTEM;
        - c. EXCESS PAINT SHALL BE DISPOSED OF PROPERLY ACCORDING TO MANUFACTURER'S INSTRUCTIONS OR STATE AND LOCAL REGULATIONS.
  - D. SPILL CONTROL PRACTICES - IN ADDITION TO GOOD HOUSEKEEPING AND MATERIAL MANAGEMENT PRACTICES DISCUSSED IN THE PREVIOUS SECTION, THE FOLLOWING PRACTICES SHALL BE FOLLOWED FOR SPILL PREVENTION AND CLEANUP:
    - a. MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP SHALL BE CLEARLY POSTED AND SITE PERSONNEL SHALL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES;
    - b. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP SHALL BE KEPT IN THE MATERIAL STORAGE AREA ON SITE. EQUIPMENT AND MATERIALS SHALL INCLUDE BUT NOT BE LIMITED TO BROOMS, DUSTPANS, MOPS, RAGS, GLOVES, GOGGLES, KITTY LITTER, SAND, SAWDUST AND PLASTIC OR METAL TRASH CONTAINERS SPECIFICALLY FOR THIS PURPOSE;
    - c. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY;
    - d. THE SPILL AREA SHALL BE KEPT WELL VENTILATED AND PERSONNEL SHALL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE;
    - e. SPILLS OF TOXIC OR HAZARDOUS MATERIAL SHALL BE REPORTED TO THE APPROPRIATE LOCAL, STATE OR FEDERAL AGENCIES AS REQUIRED;
    - f. THE SITE SUPERINTENDENT RESPONSIBLE FOR DAY-TO-DAY SITE OPERATIONS SHALL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR.
  - E. VEHICLE FUELING AND MAINTENANCE PRACTICE:
    - a. CONTRACTOR SHALL MAKE AN EFFORT TO PERFORM EQUIPMENT/VEHICLE FUELING AND MAINTENANCE AT AN OFF-SITE FACILITY;
    - b. CONTRACTOR SHALL PROVIDE AN ON-SITE FUELING AND MAINTENANCE AREA THAT IS CLEAN AND DRY;
    - c. IF POSSIBLE THE CONTRACTOR SHALL KEEP AREA COVERED;
    - d. CONTRACTOR SHALL KEEP A SPILL KIT AT THE FUELING AND MAINTENANCE AREA;
    - e. CONTRACTOR SHALL REGULARLY INSPECT VEHICLES FOR LEAKS AND DAMAGE;
    - f. CONTRACTOR SHALL USE DRIP PANS, DRIP CLOTHS, OR ABSORBENT PADS WHEN REPLACING SPENT FLUID.

**EROSION CONTROL OBSERVATIONS AND MAINTENANCE PRACTICES**

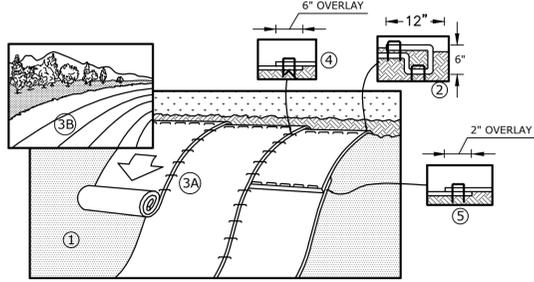
- 1. THIS PROJECT EXCEEDS ONE (1) ACRE OF DISTURBANCE AND THUS REQUIRES A SWPPP. THE SWPPP SHALL BE PREPARED BY THE CONTRACTOR. THE CONTRACTOR SHALL BE FAMILIAR WITH THE SWPPP AND KEEP AN UPDATED COPY OF THE SWPPP ON SITE AT ALL TIMES.
- 2. THE FOLLOWING REPRESENTS THE GENERAL OBSERVATION AND REPORTING PRACTICES THAT SHALL BE FOLLOWED AS PART OF THIS PROJECT:
  - A. OBSERVATIONS OF THE PROJECT FOR COMPLIANCE WITH THE SWPPP SHALL BE MADE BY THE CONTRACTOR AT LEAST ONCE A WEEK OR WITHIN 24 HOURS OF A STORM 0.25 INCHES OR GREATER;
  - B. AN OBSERVATION REPORT SHALL BE MADE AFTER EACH OBSERVATION AND DISTRIBUTED TO THE ENGINEER, THE OWNER, AND THE CONTRACTOR;
  - C. A REPRESENTATIVE OF THE SITE CONTRACTOR, SHALL BE RESPONSIBLE FOR MAINTENANCE AND REPAIR ACTIVITIES;
  - D. IF A REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 24 HOURS OF REPORT.



**NOTES:**

- 1. SILT SOCK SHALL BE SILT SOCK BY FILTREXX OR APPROVED EQUAL.
- 2. SILT SOCK SHALL BE FILLED WITH FILTERMEDIA BY FILTREXX OR APPROVED EQUAL.
- 3. WHERE TWO SILT SOCKS ARE JOINED, A MINIMUM OF 2 FEET OF OVERLAP SHALL BE MAINTAINED.
- 4. SILT SOCKS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- 5. CONTRACTOR TO INSTALL SILT SOCK IN J-HOOK OR SMILE CONFIGURATION TO LIMIT CONCENTRATION OF STORMWATER RUNOFF AT A SINGLE DISCHARGE POINT.

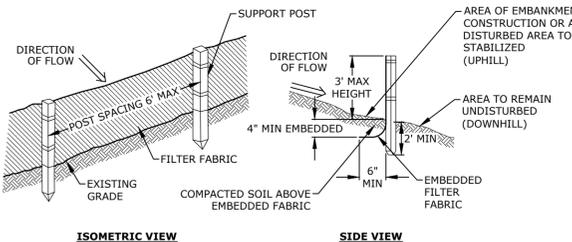
**SILT SOCK** 1  
NO SCALE



**NOTES:**

- 1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER AND SEED. BEGIN AT THE TOP OF THE SLOPE, 36" OVER THE GRADE BREAK, BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UPSLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/TACKS 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES SPACED 12" APART ACROSS THE WIDTH OF THE BLANKET.
- 2. ROLL THE BLANKETS DOWN THE SLOPE. ALL BLANKETS MUST BE SECURELY FASTENED TO THE SOIL SURFACE BY PLACING STAPLES IN APPROPRIATE LOCATIONS AS SHOWN ON THE STAPLE PATTERN GUIDE.
- 3. STAPLE LENGTHS SHALL BE A MINIMUM OF 8 INCHES.

**EROSION CONTROL BLANKET** 3  
NO SCALE



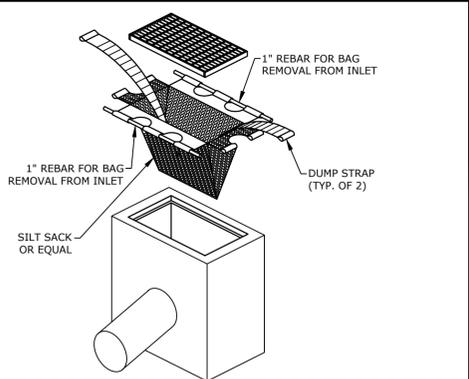
**ISOMETRIC VIEW**

**SIDE VIEW**

**NOTES:**

- 1. SILT FENCE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
- 2. ADJOINING SECTIONS OF THE FENCE SHALL BE OVERLAPPED BY 6 INCHES, FOLDED AND STAPLED TO A SUPPORT POST.
- 3. THE MAXIMUM CONTRIBUTING DRAINAGE AREA ABOVE THE FENCE SHOULD BE LESS THAN 1/4 ACRE PER 100 LINEAR FEET OF FENCE;
- 4. THE MAXIMUM LENGTH OF SLOPE ABOVE THE FENCE SHOULD BE 100 FEET;
- 5. THE MAXIMUM SLOPE ABOVE THE FENCE SHOULD BE 2:1;
- 6. FENCES SHOULD BE INSTALLED FOLLOWING THE CONTOUR OF THE LAND AS CLOSELY AS POSSIBLE, AND
  - a. THE ENDS OF THE FENCE SHOULD BE FLARED UPSLOPE;
  - b. THE FABRIC SHOULD BE EMBEDDED A MINIMUM OF 4 INCHES IN DEPTH AND 4 INCHES IN WIDTH IN A TRENCH EXCAVATED INTO THE GROUND, OR IF SITE CONDITIONS INCLUDE FROZEN GROUND, LEDGE, OR THE PRESENCE OF HEAVY ROOTS, THE BASE OF THE FABRIC SHOULD BE EMBEDDED WITH A MINIMUM THICKNESS OF 8 INCHES OF 3/4-INCH STONE;
  - c. THE SOIL SHOULD BE COMPACTED OVER THE EMBEDDED FABRIC;
  - d. SUPPORT POSTS SHOULD BE SIZED AND ANCHORED ACCORDING TO THE MANUFACTURER'S INSTRUCTIONS WITH MAXIMUM POST SPACING OF 6 FEET;
- 6. ADJOINING SECTIONS OF THE FENCE SHOULD BE OVERLAPPED BY A MINIMUM OF 6 INCHES (24 INCHES IS PREFERRED), FOLDED AND STAPLED TO A SUPPORT POST. IF METAL POSTS ARE USED, FABRIC SHOULD BE WIRE-TIED DIRECTLY TO THE POSTS WITH THREE DIAGONAL TIES.
- 7. SILT FENCING SHOULD NOT BE STAPLED OR NAILED TO TREES.
- 8. THE FILTER FABRIC SHOULD BE A PEROVIOUS SHEET OF PROPYLENE, NYLON, POLYESTER OR ETHYLENE YARN AND SHOULD BE CERTIFIED BY THE MANUFACTURER OR SUPPLIER.
- 9. THE FILTER FABRIC SHOULD CONTAIN ULTRAVIOLET RAY INHIBITORS AND STABILIZERS TO PROVIDE A MINIMUM OF 6 MONTHS OF EXPECTED USABLE CONSTRUCTION LIFE AT A TEMPERATURE RANGE OF 0 DEGREES FAHRENHEIT TO 120 DEGREES FAHRENHEIT.
- 10. POSTS FOR SILT FENCES SHOULD BE EITHER 4-INCH DIAMETER WOOD OR 1.33 POUNDS PER LINEAR FOOT STEEL WITH A MINIMUM LENGTH OF 5 FEET. STEEL POSTS SHOULD HAVE PROJECTIONS FOR FASTENING WIRE TO THEM. POSTS SHOULD BE PLACED ON THE DOWNSLOPE SIDE OF THE FABRIC. THE HEIGHT OF A SILT FENCE SHOULD NOT EXCEED 36 INCHES AS HIGHER FENCES MAY IMPOUND VOLUMES OF WATER SUFFICIENT TO CAUSE FAILURE OF THE STRUCTURE.
- 11. THE FILTER FABRIC SHOULD BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID THE USE OF JOINTS. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHOULD BE SPLICED TOGETHER ONLY AT SUPPORT POST, WITH A MINIMUM 6-INCH OVERLAP, AND SECURELY SEALED.
- 11. A MANUFACTURED SILT FENCE SYSTEM WITH INTEGRAL POSTS MAY BE USED.
- 12. POST SPACING SHOULD NOT EXCEED 6 FEET.
- 13. CONTRACTOR TO INSTALL SILT FENCE IN J-HOOK OR SMILE CONFIGURATION TO LIMIT CONCENTRATION OF STORMWATER RUNOFF AT A SINGLE DISCHARGE POINT.
- 14. A TRENCH SHOULD BE EXCAVATED APPROXIMATELY 4 INCHES WIDE AND 4 INCHES DEEP ALONG THE LINE OF POSTS AND UPGRADED FROM THE BARRIER.
- 15. THE STANDARD STRENGTH OF FILTER FABRIC SHOULD BE STAPLED OR WIRED TO THE POST, AND 8 INCHES OF THE FABRIC SHOULD BE EXTENDED INTO THE TRENCH. THE FABRIC SHOULD NOT EXTEND MORE THAN 36 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
- 16. THE INSTALLATION TRENCH SHOULD BE BACKFILLED AND THE SOIL COMPACTED OVER THE FILTER FABRIC.
- 17. SILT FENCE MAY BE INSTALLED BY "SLICING" USING MECHANICAL EQUIPMENT SPECIFICALLY DESIGNED FOR THIS PROCEDURE. THE SLICING METHOD USES AN IMPLEMENT TOWED BEHIND A TRACTOR TO "PLOW" OR SLICE THE SILT FENCE MATERIAL INTO THE SOIL. THE SLICING METHOD MINIMALLY DISRUPTS THE SOIL UPWARD AND SLIGHTLY DISPLACES THE SOIL, MAINTAINING THE SOIL'S PROFILE AND CREATING AN OPTIMAL CONDITION FOR SUBSEQUENT MECHANICAL COMPACTION.
- 18. SILT FENCES SHOULD BE INSTALLED WITH "SMILES" OR "J-HOOKS" TO REDUCE THE DRAINAGE AREA THAT ANY SEGMENT WILL IMPOUND (SEE DIAGRAMS NDES STORMWATER MANUAL VOLUME 3 PAGES 97-99).
- 19. SILT FENCES PLACED AT THE TOE OF A SLOPE SHOULD BE SET AT LEAST 6 FEET FROM THE TOE TO ALLOW SPACE FOR SHALLOW PONDING AND TO ALLOW FOR MAINTENANCE ACCESS WITHIN THE SLOPE.
- 20. SILT FENCES SHOULD BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREAS HAVE BEEN PERMANENTLY STABILIZED.

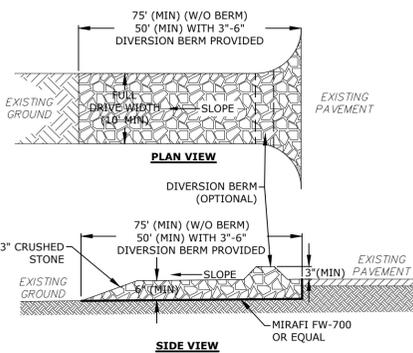
**SILT FENCE** 5  
NO SCALE



**NOTES:**

- 1. INLET PROTECTION BARRIER SHALL BE SILT SACK BY ACF ENVIRONMENTAL OR APPROVED EQUAL.
- 2. INLET PROTECTION BARRIER SHALL BE INSTALLED IN ALL EXISTING AND PROPOSED CATCH BASINS LOCATED WITHIN THE LIMIT OF WORK.
- 3. SILT SACK SHALL BE INSPECTED REGULARLY AND MAINTAIN IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS.

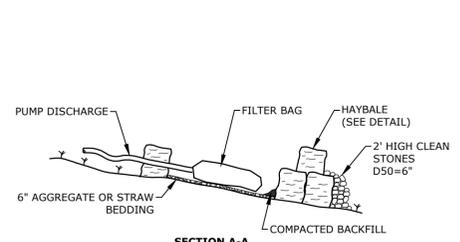
**INLET PROTECTION BARRIER** 2  
NO SCALE



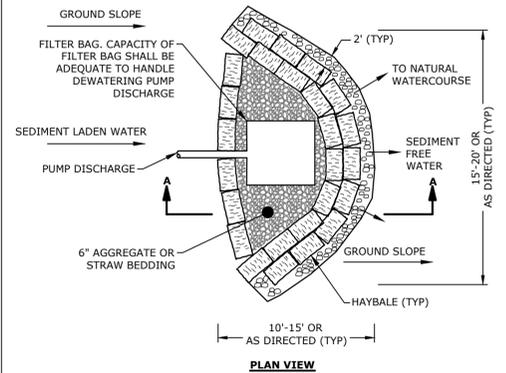
**NOTES:**

- 1. THE EXIT SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OF SEDIMENT FROM THE SITE, WHEN WASHING IS REQUIRED, IT SHALL BE DONE SO RUNOFF DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING STORM DRAINS, DITCHES, OR WATERWAYS.
- 2. NATURAL DRAINAGE THAT CROSSES THE LOCATION OF THE STONE PAD SHOULD BE INTERCEPTED AND PIPED BEHIND THE PAD, AS NECESSARY, WITH SUITABLE OUTLET PROTECTION.

**STABILIZED CONSTRUCTION EXIT** 4  
NO SCALE

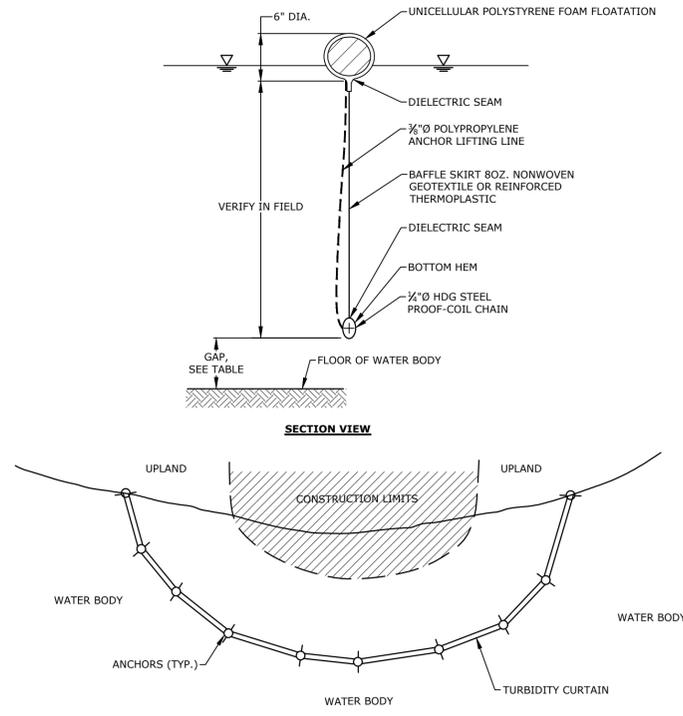


**SECTION A-A**



**NOTES:**

- 1. DISCHARGE LOCATION DEPENDS ON THE TYPE OF GROUNDWATER ENCOUNTERED.
- 2. DISCHARGE INTO LIKE WATER

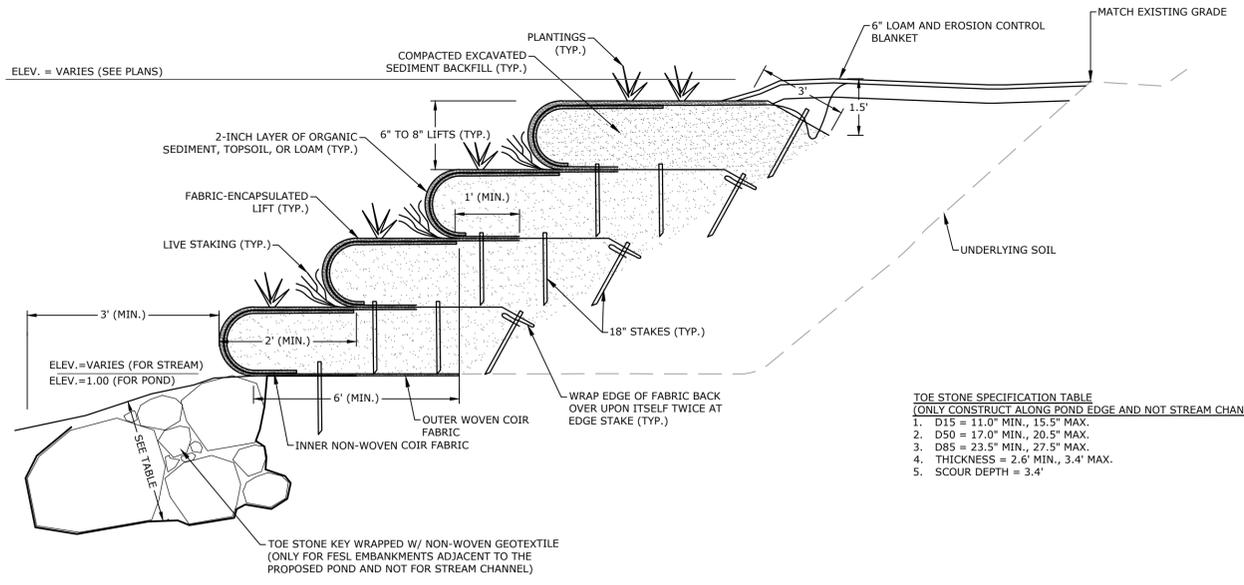


NOTES:

- TURBIDITY CURTAIN BY ENVIRONETICS, INC. OR APPROVED EQUAL.
- TURBIDITY CURTAIN MATERIAL SHALL BE ULTRAVIOLET LIGHT RESISTANT.

TYPE	DESCRIPTION	CONDITIONS	GAP (IN.)
I	FLATWATER	CALM AND PROTECTED	0
II	LIGHTWEIGHT	SEMI-PROTECTED AREA, CURRENTS UP TO 2 FT/S	12
III	MIDDLEWEIGHT	EXPOSED AREA, CURRENTS UP TO 5 FT/S	12
IV	HEAVYWEIGHT	EXPOSED TO WIND, CURRENT, AND TIDES	0

**TURBIDITY CURTAIN** 1  
NO SCALE

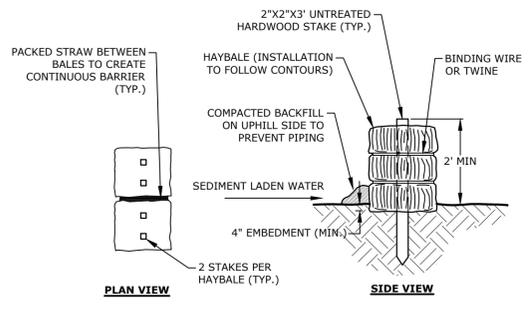


TOE STONE SPECIFICATION TABLE  
(ONLY CONSTRUCT ALONG POND EDGE AND NOT STREAM CHANNEL)

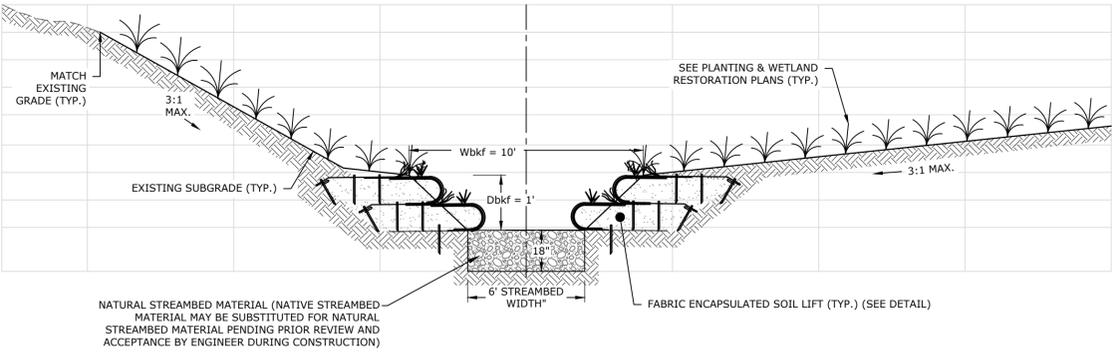
- D15 = 11.0" MIN., 15.5" MAX.
- D50 = 17.0" MIN., 20.5" MAX.
- D85 = 23.5" MIN., 27.5" MAX.
- THICKNESS = 2.6" MIN., 3.4" MAX.
- SCOUR DEPTH = 3.4"

- NOTES:
- SEE THE SITE AND GRADING, DRAINAGE & EROSION CONTROL PLANS FOR LOCATIONS AND LIMITS OF FESL.
  - INSTALL ENCAPSULATED SOIL LIFTS FROM DOWNSTREAM TO UPSTREAM, WITH UPSTREAM COIR FABRIC OVERLAPPING DOWNSTREAM FABRIC BY 18" MINIMUM.
  - USE SANDBAGS, TIMBER FORM, OR OTHER AS NECESSARY TO FORM FACE OF LIFT AND KEEP LOWER LIFTS SUFFICIENTLY DRY FOR INSTALLATION AND COMPACTION.
  - PROTECT FROM DAMAGE WHEN CONSTRUCTED BELOW TEMPORARY ACCESS ROAD OR NEAR OTHER WORK.
  - FABRIC ENCAPSULATED SOIL LIFTS WILL BE STACKED AND CONSTRUCTED IN LOCATIONS AND GRADES SHOWN IN THE PLANS AND SPECIFIED BELOW.
    - EXCAVATE BANK SLOPE AND PLACE FORMS (2"X8" BOARD) ALONG THE BANK AT THE FACE OF EACH FESL LOCATION TO ACHIEVE LINES AND GRADES. USE METAL T-POSTS OR WOODEN STAKES TO SECURE FORM IN PLACE FOR BOTTOM LIFT. USE WOODEN STAKES TO SECURE THE FORM WHEN CONSTRUCTING THE SECOND LIFT.
    - ROLL COIR FABRIC ALONG THE STREAMBANK AND PLACE FABRIC AGAINST THE SUBGRADE AND (VERTICAL) FORM FACE WITH FABRIC EMBEDMENT LENGTHS AS SHOWN.
    - REMOVE ALL WRINKLES IN COIR FABRIC AND ENSURE THE FABRIC RESTS TIGHTLY AGAINST THE SUBGRADE AND FORM FACE WITH PROPER EMBEDMENT LENGTHS (DEPTH). ALLOW EXCESS COIR FABRIC TO DRAPE OVER FORM TOWARD STREAM CHANNEL.
    - PLACE BACKFILL MATERIAL AND COMPACT TO 85% RELATIVE DENSITY. SOIL LIFT SHALL BE A MAXIMUM OF 8". FOLLOWING COMPACTION OF SOIL IN TWO (2) - 6-INCH LIFTS THE FABRIC IS WRAPPED OVER THE FRONT AND TOP OF THE SOIL MASS AND STAKED IN PLACE. THE NEXT FESL LIFT IS BUILT ON TOP OF THE LOWER LIFT AND SET BACK 2- FEET TO FORM A GEOTEXTILE RETAINING WALL.
    - WITHIN THE AREA IMMEDIATELY BEHIND THE FORM FACE AND WITHIN 1-FOOT OF THE FORM, EVENLY DISPERSE SEED ON THE BACKFILL MATERIAL.
    - PULL COIR FABRIC OVER THE BACKFILL MATERIAL TIGHT AND STAKE.
    - FESL WILL BE USED IN THE BANKS FROM THE TOE LINE TO THE DISTANCE UP THE BANK WHERE MAHW IS DENOTED ON THE PLANS. THE BANK WILL CONSIST OF TOE STONE AND FESL TO THE TOP OF BANK WHERE IT WILL TIE TO TYPE 1 BANK PROTECTION OF COIR FABRIC AND A RIPARIAN VEGETATION PLAN.
    - PLACE LIVE PLANTING AND CUTTINGS BETWEEN THE FESL PROTRUDING FROM THE FACE OF THE CONSTRUCTED BANK AS LIFTS ARE CONSTRUCTED.
    - FINISHED FESL SHALL HAVE NO LOOSE COIR FABRIC. AREAS WITH LOOSE FABRIC SHALL BE STAKED WITH WOODEN STAKES TO HOLD COIR FABRICS FIRMLY TO UNDERLYING SOIL. IF COIR FABRIC FOLDS ARE REQUIRED AROUND CHANNEL BENDS, THE FOLD SHALL BE IN THE DIRECTION OF FLOW.

**FABRIC ENCAPSULATED SOIL LIFT (FESL)** 2  
NO SCALE



**HAYBALE BARRIER** 3  
NO SCALE



ABBREVIATIONS:  
Dbkf = BANKFULL DEPTH  
Wbkf = BANKFULL WIDTH  
WSEL = WATER SURFACE ELEVATION

NATURAL STREAMBED MATERIAL:  
NATURAL STREAMBED MATERIAL SHALL BE A SANDY GRAVELLY MIX INTERSPERSED WITH 2-4" COBBLE, MEETING THE FOLLOWING GRADATION:

SIEVE SIZE	PERCENT PASSING BY WEIGHT
4"	100
#4	15-30
#200	0-12*

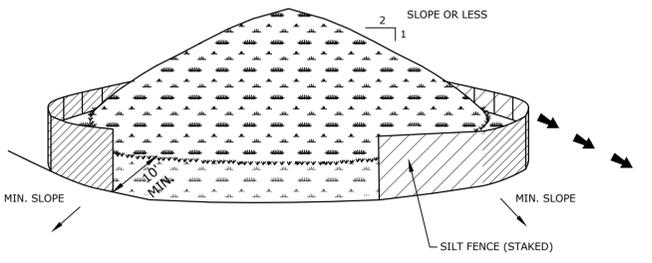
\*PERCENT PASSING THE #4 SIEVE

NOTES:  
1. SEE GRADING DRAINAGE & EROSION CONTROL PLAN SHEETS FOR EROSION CONTROL BLANKET TYPE AND LOCATION.  
2. SEE PLANTING PLAN SHEETS FOR TYPE AND LOCATION OF PLANTS.  
3. ALL AREAS TO BE PLANTED SHALL ALSO RECEIVE 6" OF LOAM AND SEED.

- TEMPORARY WATER CONTROL AND DEWATERING NOTES:**
- THE CONTRACTOR SHALL PROVIDE, OPERATE AND MAINTAIN ADEQUATE PUMPING, DIVERSION AND DRAINAGE FACILITIES TO MAINTAIN THE EXCAVATED AREA SUFFICIENTLY DRY FROM GROUNDWATER AND/OR SURFACE RUNOFF SO AS NOT TO ADVERSELY AFFECT CONSTRUCTION PROCEDURES NOR CAUSE EXCESSIVE DISTURBANCE OF UNDERLYING OR SURROUNDING NATURAL GROUND.
  - THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS REQUIRED FOR DEWATERING ACTIVITIES AND TAKE ACTIONS NECESSARY TO ENSURE THAT DEWATERING DISCHARGES COMPLY WITH PERMITS APPLICABLE TO THE PROJECT. THE CONTRACTOR SHALL DISPOSE OF WATER FROM THE TRENCHES AND EXCAVATIONS IN SUCH A MANNER AS TO AVOID PUBLIC NUISANCE, INJURY TO PUBLIC HEALTH OR THE ENVIRONMENT, DAMAGE TO PUBLIC OR PRIVATE PROPERTY, OR DAMAGE TO THE WORK COMPLETED OR IN PROGRESS.
  - THE CONTRACTOR SHALL BRACE OR OTHERWISE PROTECT PIPELINES AND STRUCTURES NOT STABLE AGAINST UPLIFT DURING CONSTRUCTION.
  - THE CONTRACTOR SHALL NOT EXCAVATE UNTIL THE DEWATERING SYSTEM IS OPERATIONAL AND THE EXCAVATION MAY PROCEED WITHOUT DISTURBANCE TO THE FINAL SUBGRADE OR SURROUNDING AREAS.
  - THE CONTRACTOR SHALL CONTINUE DEWATERING UNINTERRUPTED UNTIL THE STRUCTURES, PIPES AND APPURTENANCES TO BE INSTALLED HAVE BEEN COMPLETED SUCH THAT THEY WILL NOT FLOAT OR BE OTHERWISE DAMAGED BY AN INCREASE IN GROUNDWATER ELEVATION.
  - DEWATERING DISCHARGE:
    - INSTALL SAND AND GRAVEL, OR CRUSHED STONE, FILTERS IN CONJUNCTION WITH SUMPS, WELL POINTS, AND/OR DEEP WELLS TO PREVENT THE MIGRATION OF FINES FROM THE EXISTING SOIL DURING THE DEWATERING OPERATION.
    - WATER PUMPED FROM EXCAVATIONS MUST BE PASSED THROUGH A SILT FILTER BAG OR OTHER SUCH BEST MANAGEMENT PRACTICE (BMP) FEATURE PRIOR TO BEING DISCHARGED BACK TO A SURFACE WATER BODY.
    - DO NOT DISCHARGE WATER INTO ANY SANITARY SEWER SYSTEM.
    - ALL DEWATERING DISCHARGES SHALL BE OUTSIDE OF ANY WETLAND SYSTEMS.
    - FOLLOWING TREATMENT IN AN APPROPRIATE BMP, WATER PUMPED FROM EXCAVATIONS SHOULD GENERALLY BE DISCHARGED ON THE DOWNSTREAM SIDE OF THE WORK AREA.
    - THE DISCHARGE AREA FOR THE PUMP OR SIPHON OUTLET MUST BE PROPERLY PROTECTED TO PREVENT EROSION BY HIGH VELOCITY FLOW.
    - DISCHARGE FLOW VELOCITY FROM PUMPS OR SIPHONS OVER UNPROTECTED, VEGETATED GROUND MUST NOT EXCEED A MAXIMUM OF 1 FOOT PER SECOND. DISCHARGE FLOW VELOCITY FROM PUMPS OR SIPHONS WITHIN THE UNPROTECTED NATURAL STREAM CHANNEL SHALL NOT EXCEED A MAXIMUM OF 3 FEET PER SECOND. IN THE EVENT EROSION RESULTS FROM VELOCITIES OF THE MAGNITUDES, THE CONTRACTOR SHALL TAKE STEPS TO MITIGATE THE EROSION OR SHALL REDUCE DISCHARGE FLOW VELOCITY.
  - THE CONTRACTOR SHALL INSTALL TEMPORARY COFFERDAMS AS REQUIRED. THE EXACT CONSTRUCTION DETAILS OF THE COFFERDAM SHALL BE DETERMINED BY THE CONTRACTOR PERFORMING THE WORK.
  - THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY WATER CONTROL, SURFACE WATER AND GROUNDWATER, NECESSARY TO EXECUTE AND COMPLETE THE WORK, SUBJECT TO THE RESTRICTIONS CONTAINED IN THE PROJECT PERMITS.
  - ALL TEMPORARY WATER CONTROL MEASURES SHALL BE IMPLEMENTED IN CONJUNCTION WITH APPROPRIATE SEDIMENT AND EROSION CONTROL MEASURES SO AS TO MITIGATE TO THE GREATEST EXTENT POSSIBLE RELEASE OF SEDIMENT INTO WATER BODIES AND POTENTIAL EROSION OF SOIL.
  - PUMPS OR GENERATORS WHICH UTILIZE LIQUID FUEL MUST BE PLACED WITHIN AN IMPERMEABLE SECONDARY CONTAINMENT AREA WITH SUFFICIENT CAPACITY TO CONTAIN THE FULL VOLUME OF THE FUEL TANK.
  - PUMP OR SIPHON INTAKES SHALL BE PLACED SUCH THAT SEDIMENT AND DEBRIS ENTRAINMENT IS MINIMIZED.
  - THE COFFERDAM SHALL NOT BE CONSTRUCTED OF UNCONTAINED FILL (SOIL, ROCK, OR ANY OTHER LOOSE MATERIAL). THESE TYPES OF COFFERDAMS ARE SPECIFICALLY DISALLOWED FOR ENVIRONMENTAL PROTECTION REASONS.

- CONSTRUCTION SEQUENCE FOR STREAM/POND CONSTRUCTION:**
- IF PRACTICAL, ALL STREAM/POND WORK SHALL OCCUR DURING LOW FLOW PERIODS OF THE STREAM/POND.
  - INSTALL ALL EROSION AND SEDIMENT CONTROL BARRIERS AS FIRST ORDER OF WORK.
  - CONSTRUCT THE PROPOSED STREAM CHANNEL AND POND.
  - CONSTRUCT ANY REQUIRED COFFERDAMS AND/OR DEWATERING PRACTICES REQUIRED FOR THE CONSTRUCTION OF THE ROCK RIFLES, HEADWALLS, WINGWALLS AND FOUNDATION.
  - CONSTRUCT THE ROCK RIFLES, WINGWALLS AND FOUNDATION AND REMOVE ANY COFFERDAMS AND/OR DEWATERING MEASURES.
  - CONSTRUCT THE FINAL GRADING.
  - WHEN THE AREA IS COMPLETELY STABILIZED, REMOVE THE EROSION AND SEDIMENT CONTROL BARRIERS.

**TYPICAL STREAM SECTION** 5  
NO SCALE



- NOTES:
- AREA CHOSEN FOR STOCKPILING OPERATIONS SHALL BE DRY, STABLE, AND LOCATED OUTSIDE FLOODPLAIN.
  - MAXIMUM SLOPE OF STOCKPILE SHALL BE 2H:1V.
  - UPON COMPLETION OF SOIL STOCKPILING, EACH PILE SHALL BE SURROUNDED WITH EITHER SILT FENCING OR STRAW BALES.
  - STOCKPILE TO BE PLACED ON POLYETHYLENE SHEETING (MIN. 10 MIL THICKNESS); SECURELY COVER WITH POLYETHYLENE SHEETING (MIN. 10 MIL THICKNESS) WHEN NOT IN USE AND AT THE END OF EACH WORK DAY.

**TEMPORARY SOIL STOCKPILING** 4  
NO SCALE

90%  
DESIGN PLANS  
NOT FOR CONSTRUCTION

**Pound Pond  
Flood  
Mitigation &  
Drainage  
Improvements**

Town of Dennis

Dennis, MA

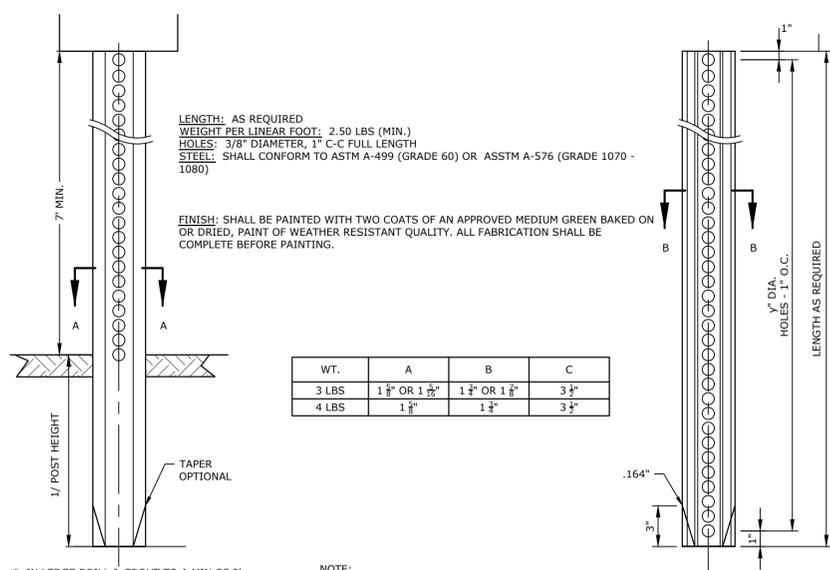
MARK	DATE	DESCRIPTION
0	MAY 2024	90% DESIGN PLANS

PROJECT NO:	D0250-007
DATE:	MAY 2024
FILE:	D0250-007-C-DTLS.DWG
DRAWN BY:	NSC
CHECKED:	GCB/TWB
APPROVED:	JMP

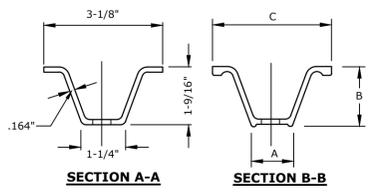
DETAILS SHEET - 2

SCALE: AS SHOWN

C.502

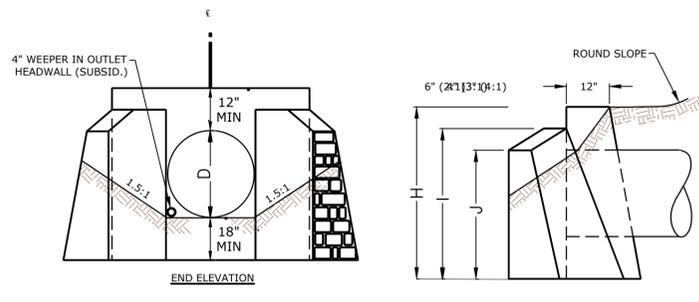
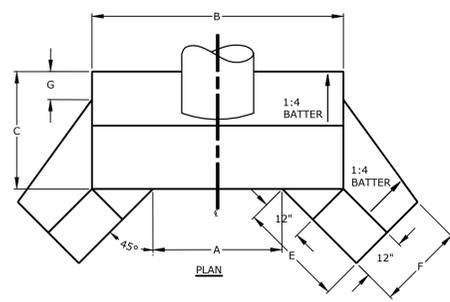


WT.	A	B	C
3 LBS	1 3/8\" OR 1 1/2\"	1 1/2\" OR 1 3/4\"	3 1/2\"
4 LBS	1 3/8\"	1 1/2\"	3 1/2\"



**TYPICAL METAL SIGN POSTS & LEGEND**  
NO SCALE

1	-
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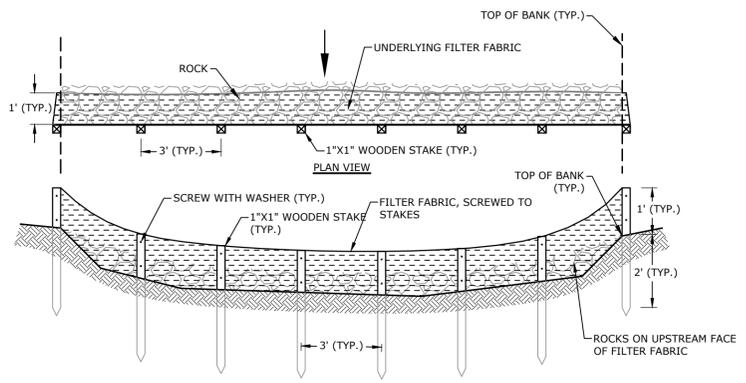


**MORTAR RUBBLE MASONRY WALL**  
NO SCALE

2	-
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DIAMETER D INCHES	QUANTITIES PER HEADER		DIMENSIONS									
	M.R.M. CU. YD.	EXC. FOR 1' DEPTH CU. YD.	A	B	C	E	F	G	H	I	J	
30	2.54	1.94	2'-9"	5'-7"	2'-3"	3'-7"	2'-0"	0'-6"	5'-0"	4'-6"	3'-10"	
	2.94	2.18	2'-9"	5'-7"	2'-3"	3'-7"	2'-0"	0'-6"	5'-0"	4'-8"	4'-1"	
30	3.18	2.27	2'-9"	5'-7"	2'-3"	3'-11"	2'-1"	0'-6"	5'-0"	4'-9"	4'-3"	

NOTE:  
1. DIMENSIONS SHOWN ARE TO PAYMENT LINES. MORTAR RUBBLE MASONRY TO BE STEPPED OUTSIDE PAYMENT LINES ON SLOPING FACES

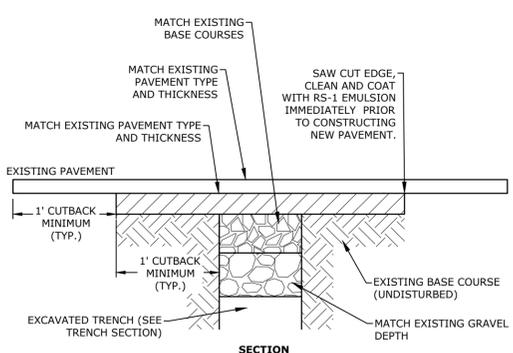
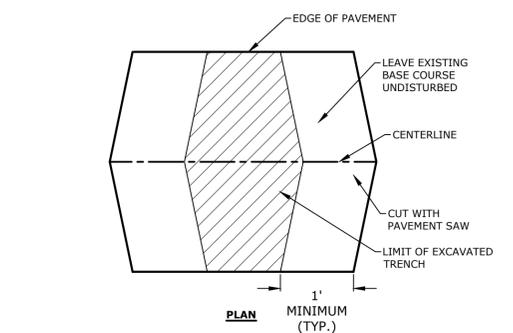


- MATERIALS:**  
THE SEDIMENT CURTAIN SHALL BE COMPOSED OF:  
• FILTER FABRIC (MIRAFI 140N OR APPROVED EQUAL)  
• BOTTOM ANCHORING WEIGHT (STONE)  
• ANCHORING POSTS (WOODEN STAKES)  
• AND SECURING MECHANISM (SCREWS, ZIP TIES)  
• ROCK (RIPRAP: D50=6")

- CONSTRUCTION DETAILS:**  
1. INSTALLATION  
1.1. THE SEDIMENT CURTAIN SHALL BE INSTALLED WHERE SHOWN ON THE PLANS.  
1.2. STAKES (1 in by 1 in) SHALL BE INSTALLED FROM ONE BANK TO THE OTHER, ON 3 ft CENTERS. STAKES SHALL BE DRIVEN AT LEAST 2 ft INTO THE GROUND, AND BE EXPOSED NO MORE THAN 12 in WHERE THEY ARE IN WATER.  
1.3. A SCREW WITH WASHER SHALL CONNECT THE GEOTEXTILE TO THE STAKES (STAKES ON THE DOWNSTREAM SIDE OF THE FABRIC). SCREWS POSITIONED 6 in ON CENTERS. AT THE TOP OF THE STAKES, CABLE TIES MAY BE USED IF NEEDED TO FASTEN A FLAP OF GEOTEXTILE OVER THE TOP OF THE STAKE.  
1.4. AT THE STREAMBED, A GEOTEXTILE FLAP SHALL EXTEND AT LEAST 1 ft UPSTREAM OF THE STAKES. STONE SHALL SIT ON THIS FLAP TO ANCHOR THE GEOTEXTILE TO THE BED.  
2. MAINTENANCE  
2.1. THE SEDIMENT CURTAIN SHALL BE INSPECTED DAILY, WITH ADDITIONAL MONITORING OF PERFORMANCE DURING STORMS OR SIGNIFICANT FLOW EVENTS.  
2.2. BED LOAD SEDIMENT ESCAPING THE DOWNSTREAM-MOST SEDIMENT CURTAIN SHALL CONSTITUTE INADEQUATE PERFORMANCE. THE CONTRACTOR SHALL IMMEDIATELY MODIFY, ADJUST, REPAIR OR REPLACE THE SEDIMENT CURTAIN TO CORRECT INADEQUACIES.  
2.3. THE SEDIMENT CURTAIN SHALL BE REMOVED EITHER WHEN MORE THAN 0.25 in OF RAIN IS FORECAST OR HAS FALLEN IN A 4 hr - OR SHORTER - PERIOD; OR WHEN IN-STREAM CONSTRUCTION ACTIVITIES WILL CEASE FOR MORE THAN 16 hrs (E.G. OVER WEEKENDS).  
2.4. THE SEDIMENT CURTAIN SHALL REMAIN IN PLACE UNTIL THE PROTECTED CONSTRUCTION ACTIVITIES HAVE CEASED AND THE TURBIDITY OF THE WATER ENCLOSED IS REDUCED TO ACCEPTABLE LEVELS. THE CURTAIN SHALL BE REMOVED WITHIN 72 HOURS OF THIS CONDITION BEING MET.

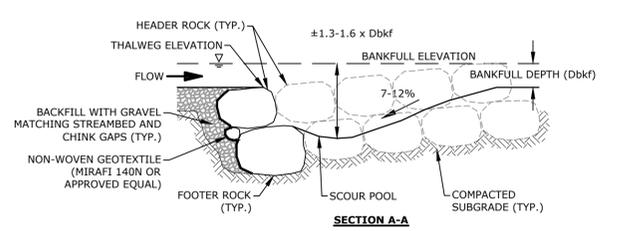
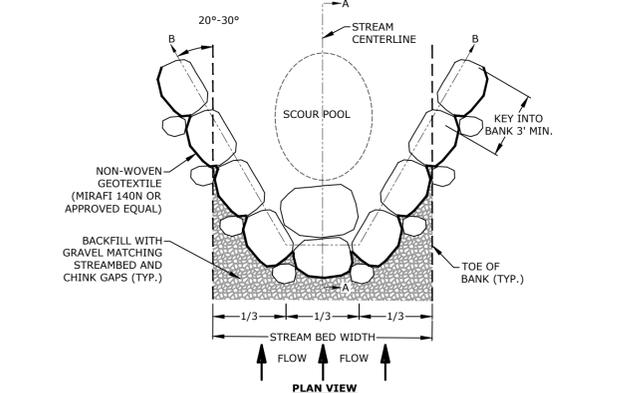
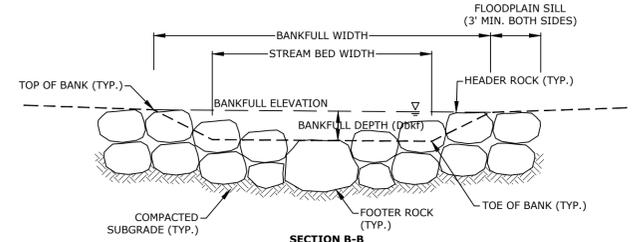
**IN STREAM SEDIMENT CURTAIN**  
NO SCALE

3	-
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**DIAMOND ROADWAY TRENCH PATCH**  
NO SCALE

4	-
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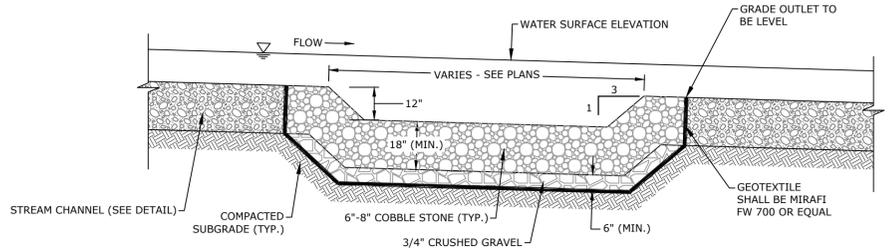


- SINGLE ROCK VANE CONSTRUCTION SEQUENCE:**  
1. EXCAVATE A TRENCH FOR THE VANE.  
2. SET THE FOOTER ROCKS.  
3. SET THE HEADER ROCKS.  
4. EXCAVATE A TRENCH FOR THE GEOTEXTILE FABRIC ON THE UPSTREAM SIDE OF THE VANE. THE TRENCH SHALL BE AT LEAST 3' DEEP.  
5. INSTALL NON-WOVEN GEOTEXTILE (MIRAFI 140N OR APPROVED EQUAL) UPSTREAM OF ROCK CROSS VANE FROM THE TOP OF THE TOP ROCK TO THE BOTTOM OF THE FOOTER ROCK AND EXTEND TO THE END OF BOTH ROCK VANES.  
6. BACKFILL THE UPSTREAM SIDE OF THE VANE WITH GRAVEL MATCHING STREAMBED MATERIAL.  
7. EXCAVATE A SILL TRENCH (MINIMUM LENGTH OF 3') AT THE BANK-END OF THE VANE.  
8. WEAVE ONE CONTINUOUS GEOTEXTILE ALONG VANE AND SILL.

- GENERAL NOTES:**  
1. FOOTER ROCKS SHALL BE ROUNDED STONE WITH BOULDERS NO SMALLER THAN 18" AND WITH AN AVERAGE SIZE OF AT LEAST 24".  
2. HEADER ROCKS SHALL BE ROUNDED STONE WITH BOULDERS NO SMALLER THAN 12" AND WITH AN AVERAGE SIZE OF AT LEAST 18".  
3. VANE ARM ROCKS SHALL BE KEYED INTO THE BANK WITH A SILL OF A MINIMUM LENGTH OF 3'.  
4. INSTALL NON-WOVEN GEOTEXTILE (MIRAFI 140N OR APPROVED EQUAL) UPSTREAM OF ROCK CROSS VANE FROM THE TOP OF THE TOP ROCK TO THE BOTTOM OF THE FOOTER ROCK AND EXTEND A MINIMUM OF 1' BEYOND TOP OF BANK ON BOTH SIDES OF STREAM.  
5. SET THE ELEVATION OF THE TOP OF THE ROCK VANE TO THE DESIGNED THALWEG (CENTERLINE) ELEVATION OF THE STREAMBED.  
6. SCOUR POOLS SHALL BE ±1.3-1.6 X THE BANKFULL DEPTH.

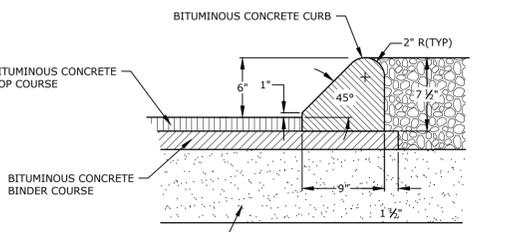
**ROCK CROSS VANE**  
NO SCALE

7	-
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**COBBLE STONE PLUNGE POOL**  
NO SCALE

5	-
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NOTE: SEE SITE PLANS FOR LIMITS

6	-
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**90% DESIGN PLANS**  
NOT FOR CONSTRUCTION

**Pound Pond Flood Mitigation & Drainage Improvements**

Town of Dennis

Dennis, MA

0	MAY 2024	90% DESIGN PLANS
MARK	DATE	DESCRIPTION

PROJECT NO:	D0250-007
DATE:	MAY 2024
FILE:	D0250-007-C-DTLS.DWG
DRAWN BY:	NSC
CHECKED:	GCB/TWB
APPROVED:	JMP

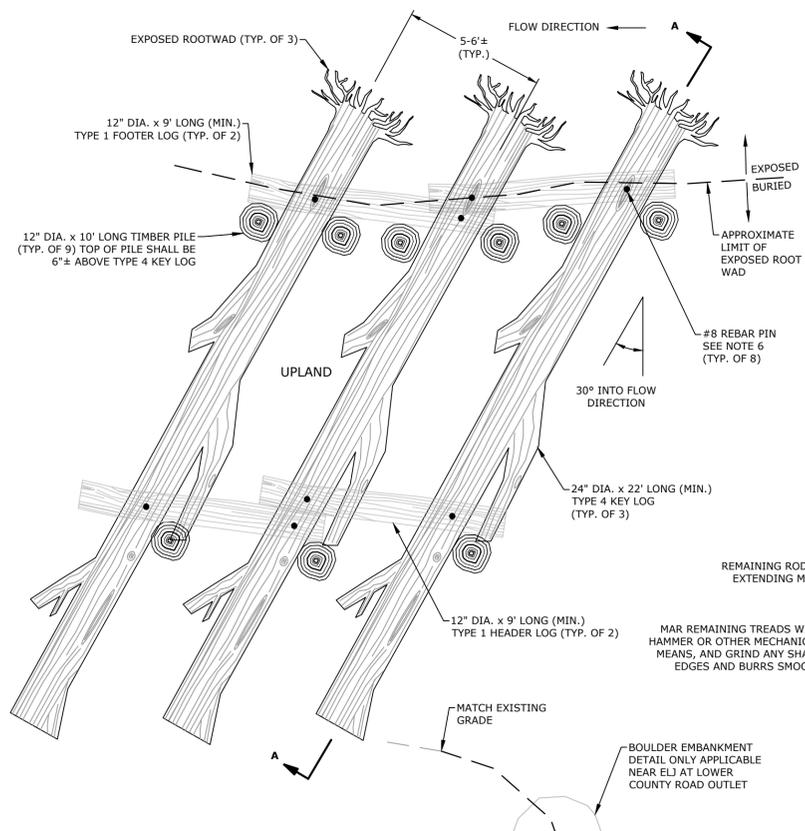
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SCALE: AS SHOWN

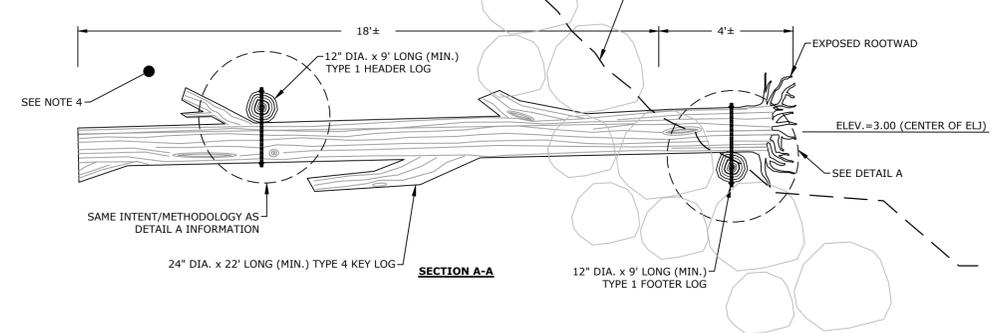
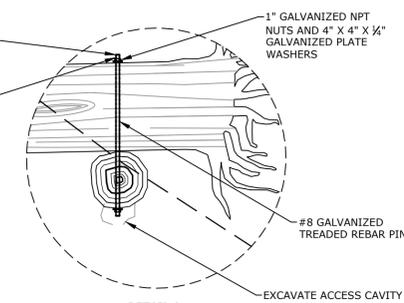
**C.503**



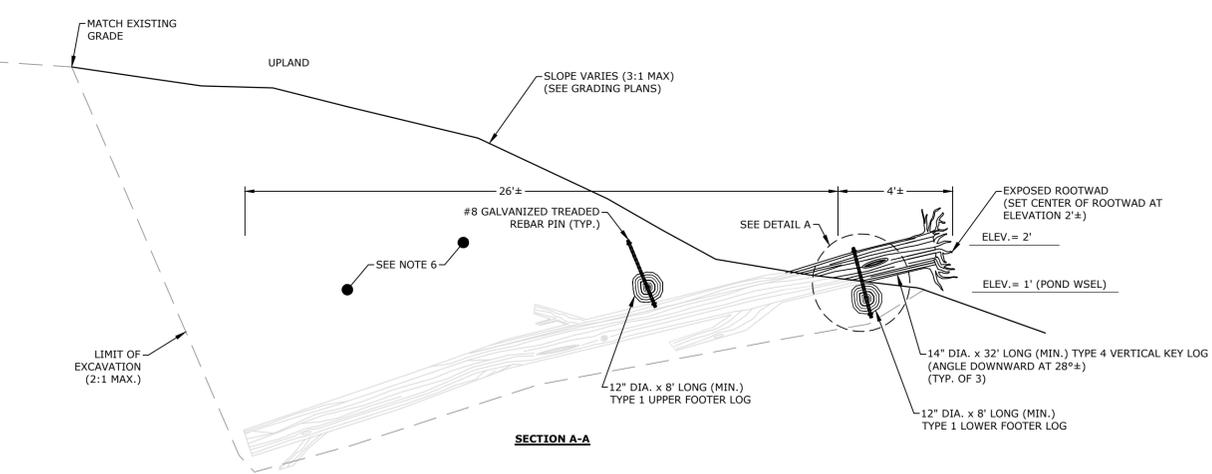
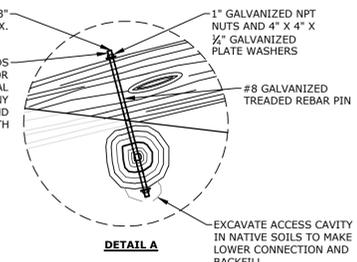
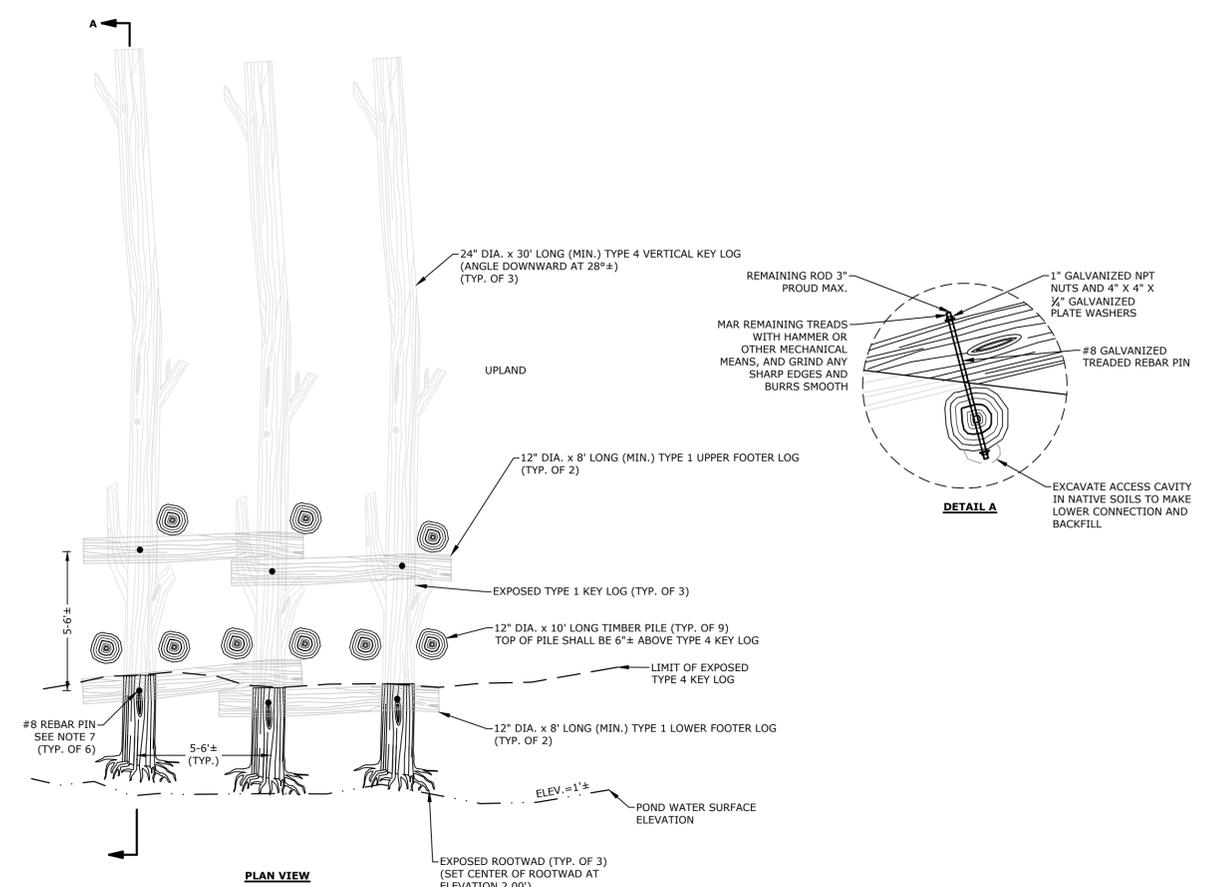




- NOTES:**
1. THE QUANTITIES SHOWN ARE REPRESENTATIVE OF THE ELJ TYPE 3. THE ELJ TYPE 2 STRUCTURE HAS VARYING QUANTITIES.
  2. BASE ELEVATION (BOTTOM OF FIRST PLACED LOG) OF EACH STRUCTURE SHALL BE CHECKED/VERIFIED BY THE OWNER OR ENGINEER BEFORE BEGINNING CONSTRUCTION.
  3. ALL CUT ENDS OF LOGS THAT WILL BE EXPOSED UPON COMPLETION OF STRUCTURE SHALL BE MARRED PRIOR TO INSTALLATION. THE CONTRACTOR SHALL USE AN EXCAVATOR, OR OTHER HEAVY EQUIPMENT TO TEAR APART WOOD FIBERS AT THE CUT END OF THE LOG TO CREATE THE APPEARANCE OF A LOG THAT HAS NATURALLY BROKEN APART.
  4. TYPE 4 LOG SHALL BE HANDLED A MINIMUM NUMBER OF TIMES TO REDUCE LOSS OF LIMBS, FOLIAGE. IF MORE THAN 15% OF TREE BRANCHES ARE REMOVED OR DAMAGED DURING HANDLING THE CONTRACTOR SHALL REPLACE TYPE 4 LOG AT NO COST TO THE OWNER.
  5. BACKFILL USING IMPORTED BORROW. PLACE BACKFILL IN 1 FOOT MAXIMUM LIFTS. COMPACT EACH LIFT USING MECHANICAL EQUIPMENT SUCH AS AN EXCAVATOR BUCKET OR EQUIPMENT TRACKING MAKING CERTAIN TO NOT DAMAGE OR CHANGE THE ELEVATION OF THE STRUCTURE MATERIAL DURING COMPACTION.
  6. 5/8" REBAR SHALL FULLY PENETRATE OUTSIDE CONTACTING LOGS. REBAR SHALL BE CUT AT ENDS TO BE FLUSH WITH LOGS AND POSTS. PILOT HOLES FOR REBAR SHALL BE DRILLED USING A BIT THAT IS 1/8" SMALLER THAN THE SPECIFIED BAR DIAMETER.
  7. LOG PLACEMENT CAN BE ADJUSTED IN THE FIELD AT THE DIRECTION OF THE OWNER OR ENGINEER.
  8. INSTALL PILES DURING EXCAVATION.
  9. LIVE STAKES SHALL BE INSTALLED TO ENSURE A MINIMUM OF 1-FT SUBMERGENCE IN GROUND WATER. SEE PLANTING SCHEDULE ON SHEET C-401 & C-402.

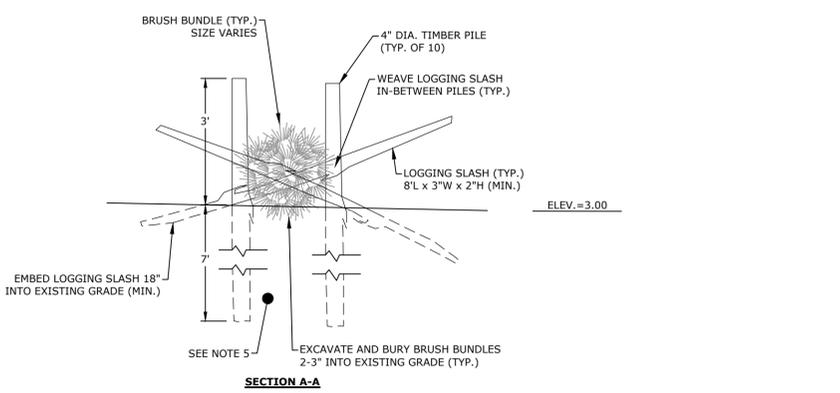


**ENGINEERED LOG JAMS (ELJ)**  
NO SCALE



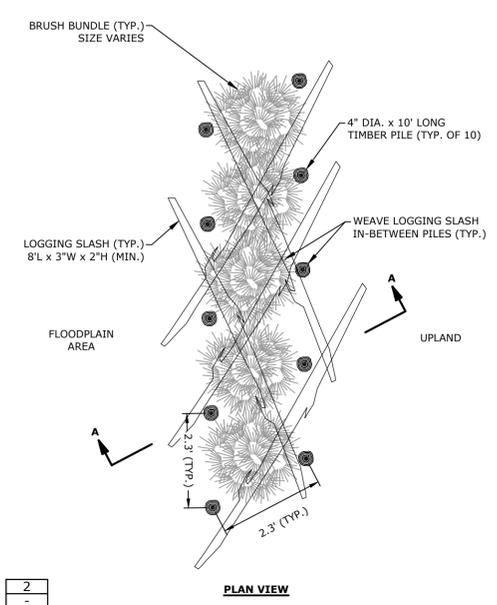
- NOTES:**
1. THE QUANTITIES SHOWN ARE REPRESENTATIVE OF THE VARs TYPE 3. THE VARs TYPE 2 STRUCTURE HAS VARYING QUANTITIES.
  2. SEE THE SITE AND GRADING PLANS FOR QUANTITY, LOCATION AND ORIENTATION/TYP OF EACH VARs.
  3. BASE ELEVATION (BOTTOM OF FIRST PLACED LOG) OF EACH STRUCTURE (SPECIFIED IN THE STRUCTURE SCHEDULE) SHALL BE CHECKED/VERIFIED BY THE OWNER OR ENGINEER BEFORE BEGINNING WORK FOR EACH STRUCTURE.
  4. ALL CUT ENDS OF LOGS THAT WILL BE EXPOSED UPON COMPLETION OF STRUCTURE SHALL BE MARRED PRIOR TO INSTALLATION. THE CONTRACTOR SHALL USE AN EXCAVATOR, OR OTHER HEAVY EQUIPMENT TO TEAR APART WOOD FIBERS AT THE CUT END OF THE LOG TO CREATE THE APPEARANCE OF A LOG THAT HAS NATURALLY BROKEN APART.
  5. TYPE 4 LOG SHALL BE HANDLED A MINIMUM NUMBER OF TIMES TO REDUCE LOSS OF LIMBS, FOLIAGE, ETC. IF MORE THAN 15% OF TREE BRANCHES ARE REMOVED OR DAMAGED DURING HANDLING THE CONTRACTOR SHALL REPLACE TYPE 4 LOG AT NO COST TO THE CONTRACTING AGENCY.
  6. BACKFILL USING NATIVE EXCAVATED MATERIAL UNLESS NATIVE MATERIAL IS UNSUITABLE FOR BACKFILL. PLACE BACKFILL IN 1-FOOT MAXIMUM LIFTS. COMPACT EACH LIFT USING MECHANICAL EQUIPMENT SUCH AS AN EXCAVATOR BUCKET OR EQUIPMENT TRACKING MAKING CERTAIN TO NOT DAMAGE OR CHANGE THE ELEVATION OF THE STRUCTURE MATERIAL DURING COMPACTION.
  7. 5/8" REBAR SHALL FULLY PENETRATE OUTSIDE CONTACTING LOGS. REBAR SHALL BE CUT AT ENDS TO BE FLUSH WITH LOGS AND POSTS. PILOT HOLES FOR REBAR SHALL BE DRILLED USING A BIT THAT IS 1/8" SMALLER THAN THE SPECIFIED BAR DIAMETER.
  8. LOG PLACEMENT CAN BE ADJUSTED IN THE FIELD AT THE DIRECTION OF THE OWNER OR ENGINEER.
  9. INSTALL PILES DURING EXCAVATION.
  10. LIVE STAKES SHALL BE INSTALLED TO ENSURE A MINIMUM OF 1-FT SUBMERGENCE IN GROUND WATER. SEE PLANTING SCHEDULE ON SHEET C-401 & C-402.

**VERTICAL AGGRADATION ROOTWAD STRUCTURES (VARs)**  
NO SCALE



- NOTES:**
1. THE QUANTITIES SHOWN ARE PER EACH INDIVIDUAL BABS.
  2. SEE THE SITE AND GRADING PLANS FOR QUANTITY, LOCATION AND ORIENTATION OF EACH BABS.
  3. THE CONTRACTOR SHALL COORDINATE WITH ENGINEER ON QUANTITY OF BRUSH BUNDLES AND LOGGING SLASH FOR EACH BABS PRIOR TO CONSTRUCTION.
  4. THE LOGGING SLASH SHALL BE WOVEN BETWEEN THE PILES AND OTHER SLASH TO SUFFICIENTLY SECURE THE BRUSH BUNDLES WITHIN THE STRUCTURE.
  5. BACKFILL USING IMPORTED BORROW. PLACE BACKFILL IN 1-FOOT MAXIMUM LIFTS. COMPACT EACH LIFT USING MECHANICAL EQUIPMENT SUCH AS AN EXCAVATOR BUCKET OR EQUIPMENT TRACKING MAKING CERTAIN TO NOT DAMAGE OR CHANGE THE ELEVATION OF THE STRUCTURE MATERIAL DURING COMPACTION.

**BRUSH AGGRADATION BUNDLE STRUCTURES (BABS)**  
NO SCALE



**PLAN VIEW**

**90%  
DESIGN PLANS  
NOT FOR CONSTRUCTION**

**Pound Pond  
Flood  
Mitigation &  
Drainage  
Improvements**

Town of Dennis

Dennis, MA

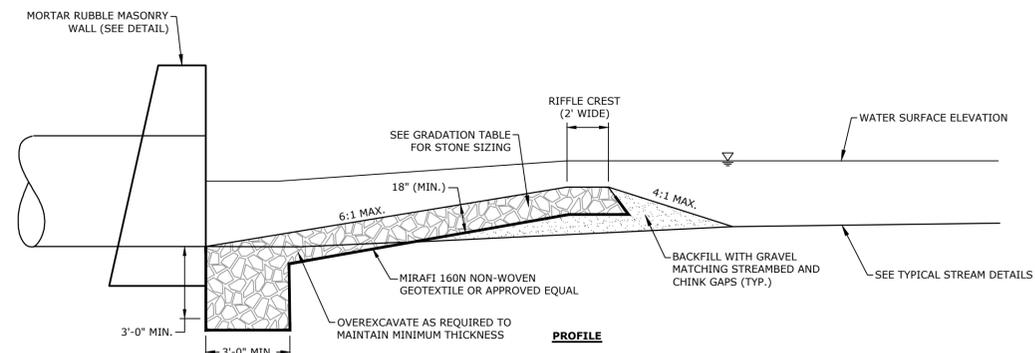
MARK	DATE	DESCRIPTION
0	MAY 2024	90% DESIGN PLANS

PROJECT NO:	D0250-007
DATE:	MAY 2024
FILE:	D0250-007-C-DTLS.DWG
DRAWN BY:	NSC
CHECKED:	GCB/TWB
APPROVED:	JMP

**DETAILS SHEET - 6**

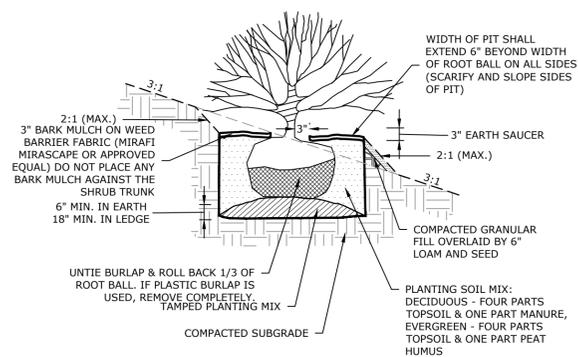
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**C.506**

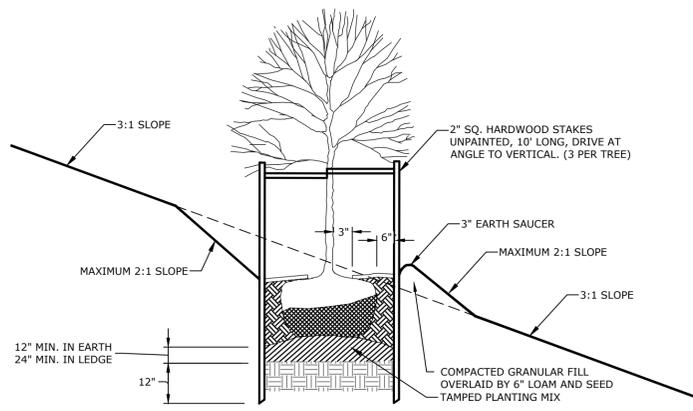


TYPE II RIFFLE MATRIX GRADATION	
PERCENT PASSING	SIZE CLASS RANGE (INCHES)
100%	18
84%	6 TO 10
50%	4 TO 6
16%	1 TO 2
10%	FINES <1 (W/SAND)

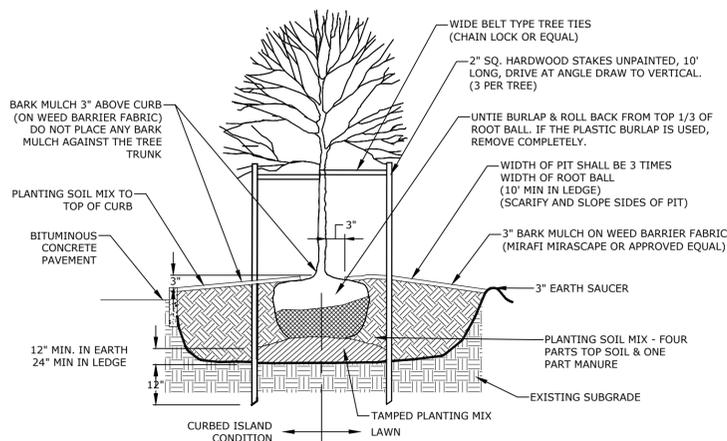
**ROCK RIFFLE** 1  
NO SCALE



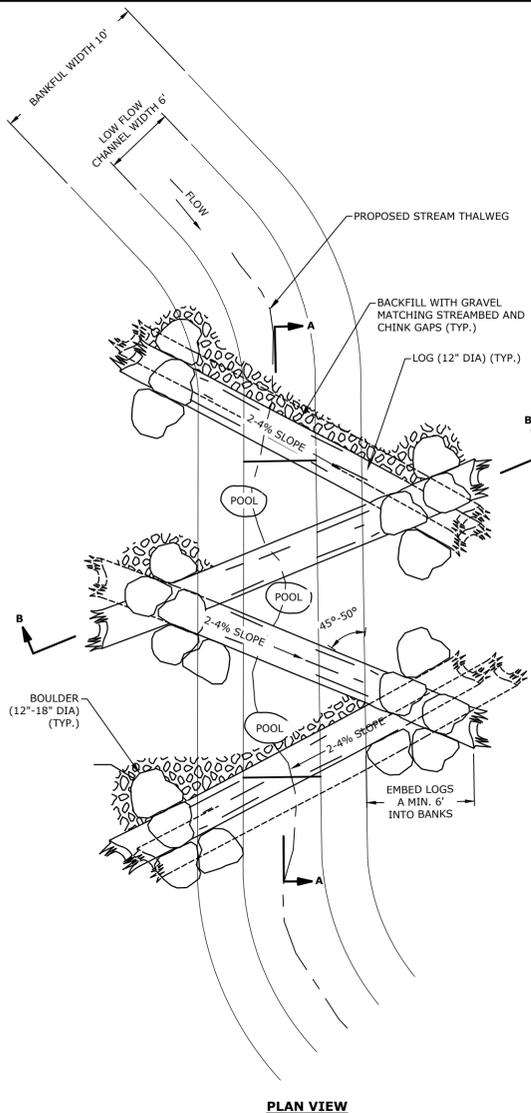
NOTE:  
1. PLANT AT SAME DEPTH AS PREVIOUSLY PLANTED, OR WITHIN 2" ABOVE.



NOTE:  
1. SEE DECIDUOUS PLANTING DETAIL FOR ADDITIONAL DETAILS.

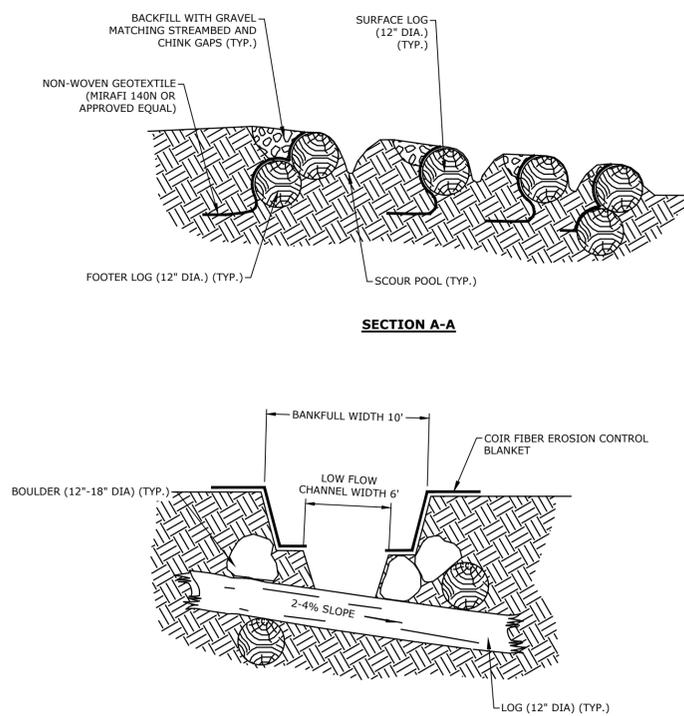


NOTE:  
1. PLANT AT SAME DEPTH AS PREVIOUSLY PLANTED OR WITHIN 2" ABOVE.



- NOTES:
- LOG AND BOULDER RIFFLES ARE GRADE CONTROL AND HABITAT ENHANCEMENT MEASURES THAT ARE USED TO MAINTAIN GRADE OF UPSTREAM POOLS, OXYGENATE WATER, AND PROVIDE HABITAT FOR EPIFAUNA AND FISH. THESE STRUCTURES ARE TYPICALLY USED IN LOWER GRADIENT STREAMS WITH SLOPES LESS THAN 3%. THIS DETAIL CAN BE USED FOR CONSTRUCTION RIFFLES USING BOULDERS, LOGS, OR A COMBINATION OF BOULDERS AND LOGS.
  - LOG AND BOULDER RIFFLES SHOULD BE PLACED AT THE STATIONS, OFFSETS, ELEVATIONS, AND GEOMORPHIC POSITIONS INDICATED ON THE STREAM MITIGATION DATA TABLE IN THE PROJECT PLANS; STREAM MITIGATION PLAN, OR AS DIRECTED BY THE ENGINEER. AT A MINIMUM, THE BANKFULL WIDTH, MINIMUM LOG AND/OR BOULDER DIMENSIONS, INVERT ELEVATIONS, AND SELECT MATERIAL CLASSIFICATION SHOULD BE SPECIFIED IN THE STREAM MITIGATION TABLE.
  - LOGS SHALL BE RELATIVELY STRAIGHT, RECENTLY HARVESTED AND DECAY RESISTANT SPECIES SUCH AS CEDAR, WHITE OAK, ETC.
  - BOULDERS PRESENT IN THE EXISTING STREAM MEETING THE SPECIFIED TYPE AND SIZE SHOULD BE USED IN THE RESTORED CHANNEL SEGMENT.
  - LOCATE LOG OR BOULDER RIFFLE STRUCTURES (RIFFLE LOGS AND BOULDER MINI-VANES) AT EQUALLY SPACED INTERVALS IN THE STRAIGHT SECTIONS OF THE CHANNEL BETWEEN MEANDER BENDS (I.E., BETWEEN UPSTREAM POINT OF TANGENCY AND DOWNSTREAM POINT OF CURVATURE), AS INDICATED ON THE STREAM MITIGATION PLANS.
  - THE MAXIMUM AMOUNT OF DROP IN INVERT FROM ONE RIFFLE LOG OR BOULDER MINI-VANE TO THE NEXT SHALL BE NO GREATER THAN 0.10 FOOT. THE COMBINED AMOUNT OF DROP OVER ALL THE MINI-VANES SHALL NOT EXCEED THE TOTAL AMOUNT OF FALL IN THE RIFFLE SLOPE. THE INVERT IN RIFFLE LOGS AND MINI-VANES SHALL ALTERNATE LEFT AND RIGHT OF CENTERLINE TO PRODUCE A MEANDERING FLOW PATTERN IN THE RIFFLE.
  - CONSTRUCT LOG RIFFLE STRUCTURES BY:
    - SHAPE THE CHANNEL AND FLOODPLAIN TO THE SPECIFIED GRADES AND DIMENSIONS.
    - LOG RIFFLE STRUCTURES ARE BUILT STARTING WITH THE DOWNSTREAM LOG AND PROCEEDING UPSTREAM. LOGS ARE SLOPED DOWN TWO PERCENT (2%) TO FOUR PERCENT (4%) AT THEIR UPSTREAM END.
    - RIFFLE LOGS SHALL OVERLAP IN THE STREAM BANK, WITH THE DOWNSTREAM END OF THE UPSTREAM LOG PLACED ON TOP OF THE UPSTREAM LOG, THEREBY HELPING TO ANCHOR THE DOWNSTREAM LOG. ADDITIONALLY, THE RIFFLE LOGS ARE ANCHORED WITHIN THE BANKS BY PINCHING BOTH SIDES OF THE LOG WITH BOULDERS.
    - EXCAVATE ENOUGH BED AND BANK MATERIAL TO PLACE THE RIFFLE LOGS, ANCHOR BOULDERS, NON-WOVEN GEOTEXTILE FABRIC (TYPE III), AND ALLUVIUM OR SELECT MATERIAL BACKFILL. SURFACE AND FOOTER LOGS SHOULD EXTEND A MINIMUM OF SIX FEET INTO EACH BANK.
    - THE UPSTREAM RIFFLE LOG IS BUILT WITH A LOG FOOTER. THE DOWNSTREAM RIFFLE LOGS ARE INSTALLED WITHOUT FOOTERS.
    - LOG RIFFLES SHALL ALL BE DESIGNED TO BE SUBMERGED OR COVERED AT LOW FLOWS TO REDUCE THE RATE OF WOOD DECOMPOSITION. INSTALL LOGS AT THE INVERTS SPECIFIED IN THE PLANS AND THEN CHECK THE ELEVATIONS OF THE INVERTS WITH SURVEY EQUIPMENT. PLACE THE FOOTER SURFACE LOGS AT THE UPSTREAM END OF THE RIFFLE TO MINIMIZE VOIDS AND TO PRODUCE A SMOOTH COMPACT SURFACE.
    - ONCE THE INVERTS HAVE BEEN ESTABLISHED, FILL THE VOIDS BETWEEN THE UPSTREAM FOOTER AND SURFACE LOG ON THE UPSTREAM SIDE WITH COARSE ALLUVIUM OR SPECIFIED SELECT MATERIAL.
    - PLACE NON-WOVEN GEOTEXTILE FABRIC ALONG THE ENTIRE UPSTREAM FACE OF EACH RIFFLE LOG. THE GEOTEXTILE SHALL EXTEND FROM THE BOTTOM OF THE FOOTER (WHERE PRESENT) TO THE FINISHED GRADE ELEVATION OF THE SURFACE LOG. ONLY GEOTEXTILE FABRIC (TYPE III) LISTED ON THE QUALIFIED PRODUCTS LIST SHALL BE USED. NAIL GEOTEXTILE TO THE SURFACE LOG APPROXIMATELY ONE QUARTER OF THE CIRCUMFERENCE DOWN FROM THE TOP OF THE SURFACE LOG USING TWO-INCH GALVANIZED ROOFING NAILS ON ONE-FOOT SPACING ALONG THE ENTIRE LENGTH OF THE LOG.
    - BACKFILL STRUCTURE AND NON-WOVEN GEOTEXTILE WITH EXCAVATED NATURAL STREAMBED MATERIAL. SOIL SHALL BE COMPACTED WELL AROUND BURIED PORTIONS OF THE STRUCTURE. TRIM ANY EXPOSED NON-WOVEN GEOTEXTILE FABRIC.
  - THE SURFACE OF LOG AND BOULDER RIFFLES SHALL BE FINISHED TO A NEAT AND COMPACT SURFACE IN ACCORDANCE WITH THE LINES, GRADES AND CROSS-SECTIONS OR ELEVATIONS SHOWN ON THE PLANS. THE DEGREE OF FINISH FOR INVERT ELEVATIONS SHALL BE WITHIN 0.10 FOOT OF THE GRADES AND ELEVATIONS INDICATED, OR AS DIRECTED BY THE ENGINEER. ALL GAPS OR VOIDS BETWEEN FOOTER AND SURFACE BOULDERS AND LOGS SHALL BE PLUGGED WITH SELECT MATERIAL TO FORM A TIGHT-FITTING SEAL.
  - RE-DRESSING OF CHANNEL AND BANKFUL BENCH/FLOODPLAIN WILL LIKELY BE REQUIRED FOLLOWING INSTALLATION OF IN-STREAM STRUCTURES AND SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.
  - A MIXTURE OF SELECT MATERIALS, AS SPECIFIED ON THE STREAM MITIGATION PLAN SHEETS, SHOULD BE USED FOR SUBSTRATE RESTORATION IN RIFFLE AND RUN HABITATS AND TO FILL GAPS BETWEEN LOGS. COARSE ALLUVIUM EXCAVATED FROM THE EXISTING STREAM BED, WHICH MEETS THE SPECIFIED SIZE CLASSIFICATION, IS THE PREFERRED MATERIAL TO USE FOR SUBSTRATE RESTORATION.
  - COIR FIBER EROSION CONTROL BLANKET SHALL BE INSTALLED ABOVE THE INNER-BERM STAGE AND NOT IN THE LOW-FLOW CHANNEL OF THE RIFFLE. SEE TYPICAL CROSS-SECTION DATA IN STREAM MITIGATION PLANS FOR INNER BEAM INFORMATION.
  - ALL MATERIALS ARE TO BE APPROVED BY ENGINEERS OR ENGINEER'S ON-SITE CONSTRUCTION OBSERVER.

**LOG RIFFLE** 5  
NO SCALE



90%  
DESIGN PLANS  
NOT FOR CONSTRUCTION

**Pound Pond  
Flood  
Mitigation &  
Drainage  
Improvements**

Town of Dennis

Dennis, MA

MARK	DATE	DESCRIPTION
0	MAY 2024	90% DESIGN PLANS

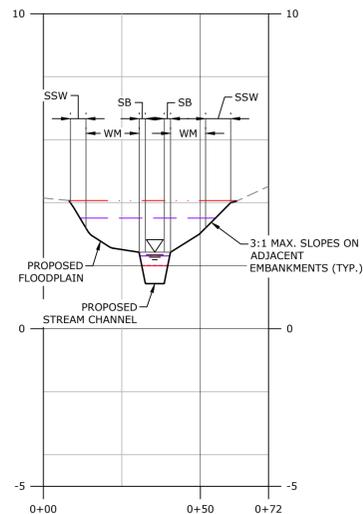
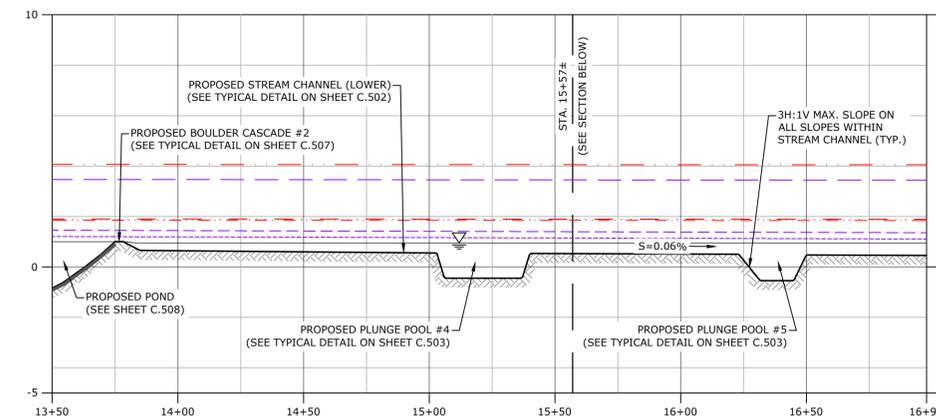
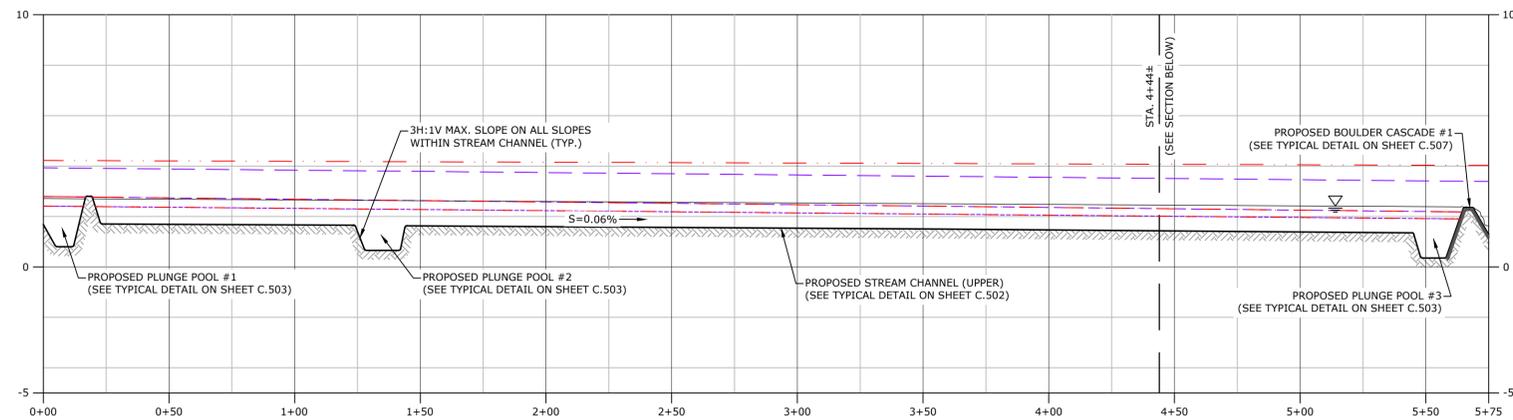
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DATE:	MAY 2024
FILE:	D0250-007-C-DTLS.DWG
DRAWN BY:	NSC
CHECKED:	GCB/TWB
APPROVED:	JMP

**DETAILS SHEET - 7**

SCALE: AS SHOWN

**C.507**

Last Saved: 6/30/2023 12:06pm By: NSC  
 Plotted On: May 29, 2024 - 12:06pm By: NSC  
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PROPOSED STREAM CHANNEL - STA. 4+44±			
STORM FREQUENCY	MLLW (FT.)	MHHW (FT.)	MHHW + SLR (FT.)
1-YEAR	2.01	2.00	4.23
2-YEAR	2.31	2.31	4.24
10-YEAR	2.81	2.78	4.42
50-YEAR	3.21	3.56	5.28
100-YEAR	3.51	4.07	5.15
10-YEAR W/ CC	2.95	3.07	4.61
100-YEAR W/ CC	4.18	4.53	5.86

**LEGEND**

TAILWATER CONDITION - MEAN LOWER LOW WATER

1-YEAR

2-YEAR

100-YEAR

TAILWATER CONDITION - MEAN HIGHER HIGH WATER

1-YEAR

2-YEAR

100-YEAR

**ABBREVIATIONS/ACRONYMS**

CC CLIMATE CHANGE

EDW EMERGENT DEEP WETLAND

ELEV. ELEVATION

ESW EMERGENT SHALLOW WETLAND

FW FORESTED WETLAND

MHHW MEAN HIGHER HIGH WATER

MLLW MEAN LOWER LOW WATER

OW OPEN WATER

SB FORESTED WETLAND

SLR SEA LEVEL RISE

SSW SCARB/SHRUB WETLAND

STA. STATION

TYP. TYPICAL

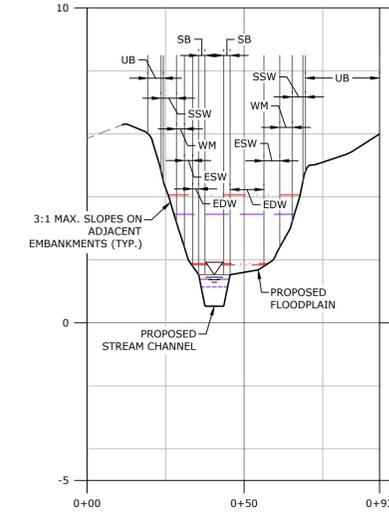
TW TRANSITIONAL WETLAND

UB UPLAND BUFFER

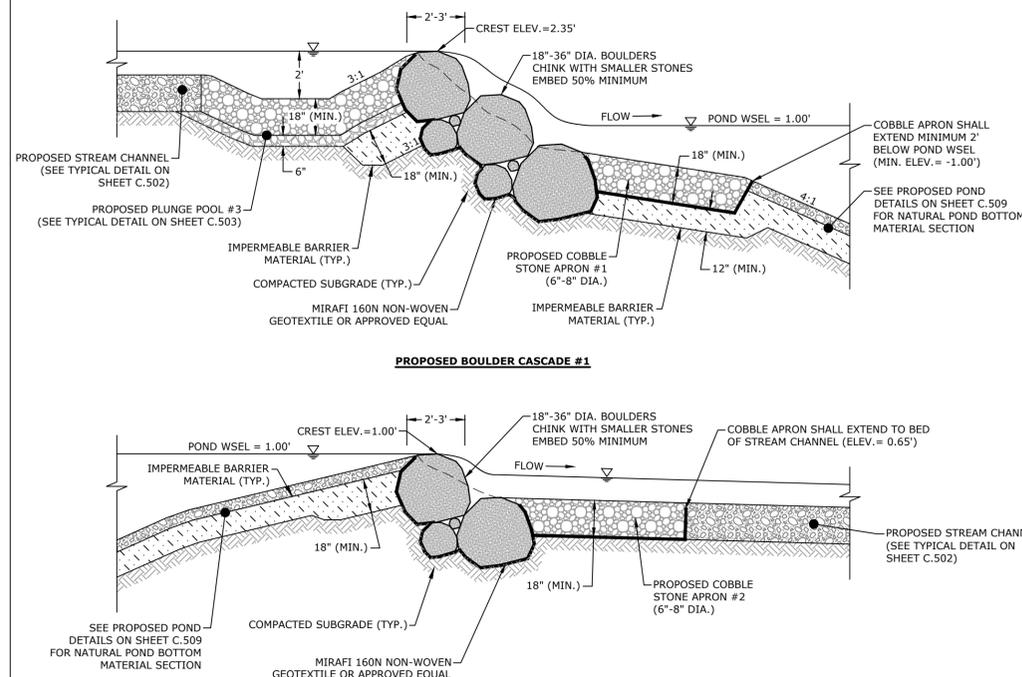
WM WET MEADOW

WSEL WATER SURFACE ELEVATION

PROPOSED STREAM CHANNEL - STA. 15+57±			
STORM FREQUENCY	MLLW (FT.)	MHHW (FT.)	MHHW + SLR (FT.)
1-YEAR	1.14	1.84	4.22
2-YEAR	1.39	1.89	4.24
10-YEAR	2.23	2.41	4.42
50-YEAR	3.11	3.54	5.27
100-YEAR	3.45	4.06	5.14
10-YEAR W/ CC	2.71	2.97	4.61
100-YEAR W/ CC	4.17	4.53	5.85

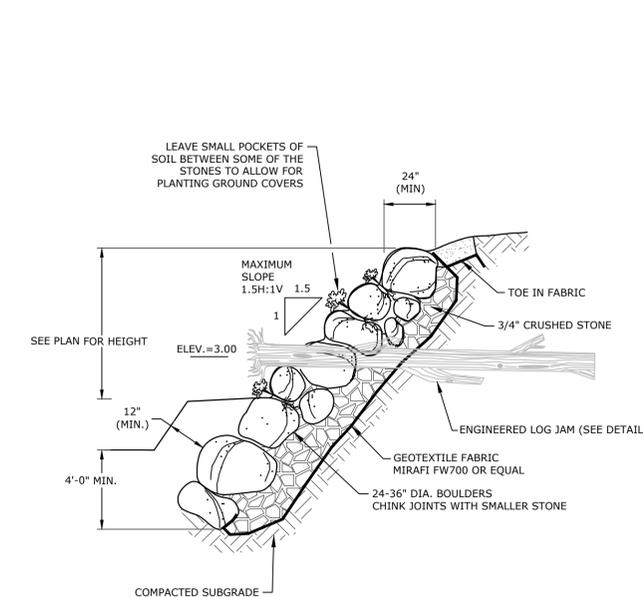


**PROPOSED STREAM CHANNEL PROFILE & SECTIONS**  
NO SCALE



- NOTES:**
- COBBLE STONE APRON:
    - SHALL BE INSTALLED PRIOR TO DREDGING - INSTALL BOULDER CASCADE PRIOR TO COBBLE STONE BED.
    - COBBLE STONE BED SHALL BE 6" TO 8" SIZED ROUNDED COBBLE.
    - SLOPE SHALL BE 3:1 MAXIMUM.
  - BOULDER CASCADE:
    - BOULDER CASCADES #1 & 2: SHALL BE ROUNDED STONE WITH BOULDERS NO SMALLER THAN 24" AND WITH AN AVERAGE SIZE OF AT LEAST 36".
    - CHINK ANTI-SCOUR MAT BOULDERS TO MID HEIGHT WITH SMALLER STONE TO FORM A DENSE MASS OF STONE.
    - SLOPE SHALL BE 3:1 MAXIMUM.
    - IF BOULDERS ARE NOT PERFECTLY ROUND, THE THICKER END SHALL BE PLACED DOWNSTREAM.
    - COBBLE STONE BED SHALL BE 6" TO 8" SIZED ROUNDED COBBLE.
  - IMPERMEABLE BARRIER:
    - MATERIAL SHALL MEET USCS CLASSIFICATIONS SC, SM, CL, OR ML AND HAVE A MAXIMUM PARTICLE SIZE OF 3" AND A PERMEABILITY LESS THAN 0.000001 CM/S WITH A P.I. GREATER THAN 6, AND MEET THE FOLLOWING GRADATION:
- | SIEVE SIZE | PERCENT FINER BY WEIGHT |
|------------|-------------------------|
| 3 INCH     | 100                     |
| 200        | 40 TO 100               |
- ALL FILL SHALL BE PLACED IN HORIZONTAL LIFTS AND BE COMPACTED TO 95% OF ASTM B-1557. LIFT THICKNESS SHALL BE NO GREATER THAN 12" PRE-COMPACTED OR LOOSE CONDITION.
  - IMPERMEABLE BARRIER FOUNDATION SHALL BE CLEARED OF TREES, BRUSH, TOPSOIL, ETC. PRIOR TO PLACEMENT OF FILL.

**BOULDER CASCADE**  
NO SCALE



- NOTES:**
- CONTRACTOR SHALL SUFFICIENTLY ANCHOR THE GEOTEXTILE AT THE TOP OF THE SLOPE PRIOR TO PLACING ANY BOULDERS TO PREVENT THE GEOTEXTILE FROM SLIPPING DOWN THE SLOPE.
  - THE SUBGRADE FOR THE FILTER MATERIAL, GEOTEXTILE FABRIC, OR BOULDERS SHALL BE CLEARED AND GRUBBED TO REMOVE ALL ROOTS, VEGETATION, AND OTHER DEBRIS AND PREPARED TO THE LINES AND GRADES SHOWN ON THE PLANS (LESS THE STONE THICKNESS).
  - GEOTEXTILE FABRICS SHALL BE PROTECTED FROM PUNCTURE OR TEARING DURING PLACEMENT OF THE BOULDERS. ALL OVERLAPS SHALL BE A MINIMUM OF 12 INCHES.

**BOULDER EMBANKMENT**  
NO SCALE

**90%  
DESIGN PLANS  
NOT FOR CONSTRUCTION**

**Pound Pond  
Flood  
Mitigation &  
Drainage  
Improvements**

Town of Dennis

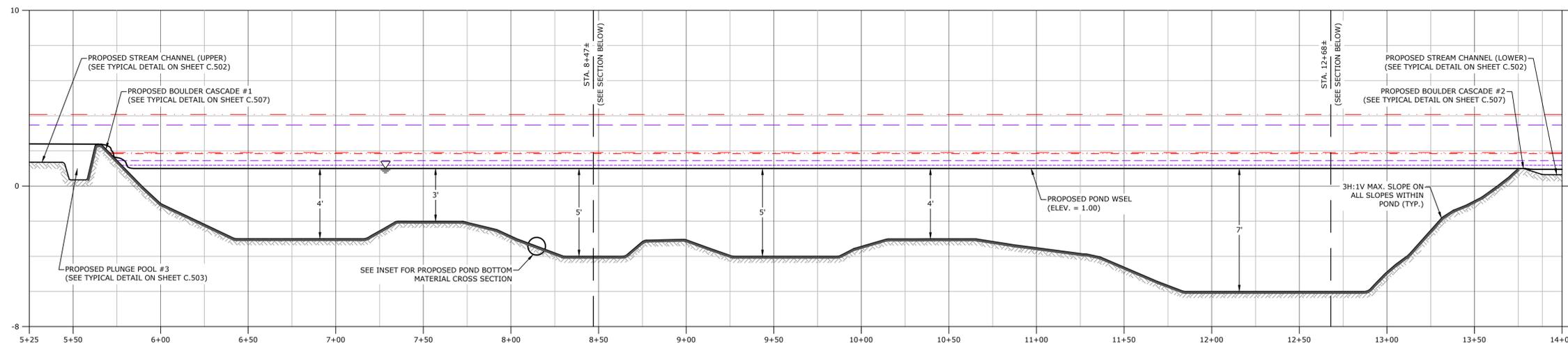
Dennis, MA

MARK	DATE	DESCRIPTION
0	MAY 2024	90% DESIGN PLANS
DATE:	MAY 2024	
FILE:	D0250-007-C-DTLS.DWG	
DRAWN BY:	NSC	
CHECKED:	GCB/TWB	
APPROVED:	JMP	

**DETAILS SHEET - 8**

SCALE: AS SHOWN

**C.508**



- NOTES:
- CONTRACTOR TO VERIFY GROUNDWATER TABLE ELEVATION PRIOR TO CONSTRUCTION.
  - IMPERMEABLE BARRIER MATERIAL SHALL MEET USCS CLASSIFICATIONS SC, SM, CL, OR ML AND HAVE A MAXIMUM PARTICLE SIZE OF 3" AND A PERMEABILITY LESS THAN 0.000001 CM/S WITH A P.I. GREATER THAN 6, AND MEET THE FOLLOWING GRADATION:

SIEVE SIZE	PERCENT FINER BY WEIGHT
3 INCH	100
NO. 200	40 TO 100

- ALL FILL SHALL BE PLACED IN HORIZONTAL LIFTS AND BE COMPACTED TO 95% OF ASTM B-157. LIFT THICKNESS SHALL BE NO GREATER THAN 12" PRE-COMPACTED OR LOOSE CONDITION.
- IMPERMEABLE BARRIER FOUNDATION SHALL BE CLEARED OF TREES, BRUSH, TOPSOIL, ETC. PRIOR TO PLACEMENT OF FILL.
- THE IMPERMEABLE BARRIER SHALL HAVE A MINIMUM 6 INCHES COVER OF NATURAL POND BOTTOM MATERIAL.
- NATURAL POND BOTTOM MATERIAL SHALL BE A SANDY GRAVELLY MIX INTERSPERSED WITH 4-6" COBBLE, MEETING THE FOLLOWING GRADATION:

SIEVE SIZE	PERCENT PASSING BY WEIGHT
6"	100
#4	15-30
#200	0-12*

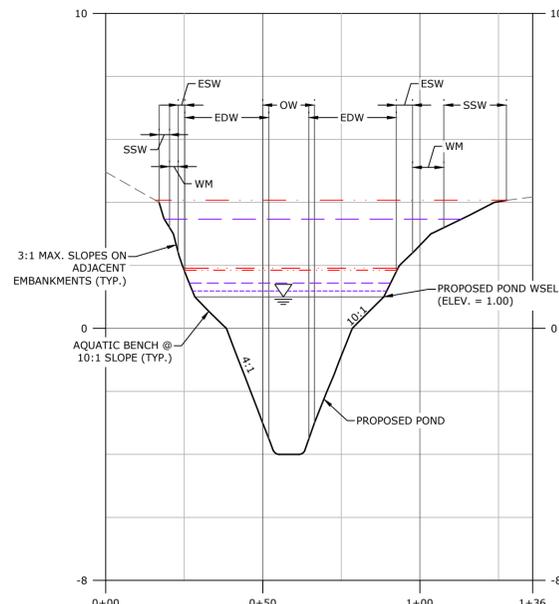
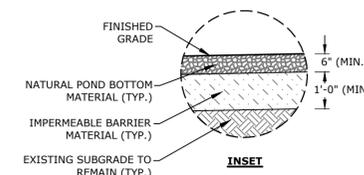
\*PERCENT PASSING THE #4 SIEVE

LEGEND

TAILWATER CONDITION - MEAN LOWER LOW WATER	
1-YEAR	---
2-YEAR	---
100-YEAR	---
TAILWATER CONDITION - MEAN HIGHER HIGH WATER	
1-YEAR	---
2-YEAR	---
100-YEAR	---

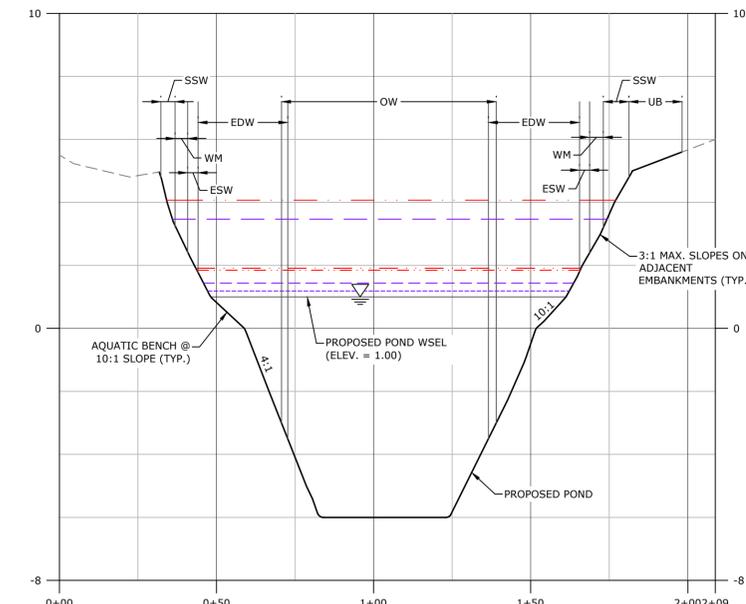
ABBREVIATIONS/ACRONYMS

CC	CLIMATE CHANGE
EDW	EMERGENT DEEP WETLAND
ELEV.	ELEVATION
ESW	EMERGENT SHALLOW WETLAND
FW	FORESTED WETLAND
MHHW	MEAN HIGHER HIGH WATER
MLLW	MEAN LOWER LOW WATER
OW	OPEN WATER
PB	FORESTED WETLAND
SB	FORESTED WETLAND
SLR	SEA LEVEL RISE
SSW	SCRUB/SHRUB WETLAND
STA.	STATION
TYP.	TYPICAL
TW	TRANSITIONAL WETLAND
UB	UPLAND BUFFER
WM	WET MEADOW
WSEL	WATER SURFACE ELEVATION



STA. 8+47±  
TYPICAL PROPOSED STREAM CHANNEL CROSS SECTION

PROPOSED POND - STA. 8+47±			
STORM FREQUENCY	MLLW (FT.)	MHHW (FT.)	MHHW + SLR (FT.)
1-YEAR	1.19	1.85	4.23
2-YEAR	1.44	1.91	4.24
10-YEAR	2.26	2.44	4.42
50-YEAR	3.55	3.55	5.27
100-YEAR	4.07	4.07	5.15
10-YEAR W/ CC	2.99	2.99	4.61
100-YEAR W/ CC	4.53	4.53	5.86



STA. 12+68±  
TYPICAL PROPOSED POND CROSS SECTION

PROPOSED POND - STA. 12+68±			
STORM FREQUENCY	MLLW (FT.)	MHHW (FT.)	MHHW + SLR (FT.)
1-YEAR	1.19	1.85	4.23
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10-YEAR W/ CC	2.99	2.99	4.61
100-YEAR W/ CC	4.53	4.53	5.86

PROPOSED POND PROFILE & SECTIONS  
NO SCALE

1  
-

90%  
DESIGN PLANS  
NOT FOR CONSTRUCTION

Pond Pond  
Flood  
Mitigation &  
Drainage  
Improvements

Town of Dennis

Dennis, MA

MARK	DATE	DESCRIPTION
0	MAY 2024	90% DESIGN PLANS

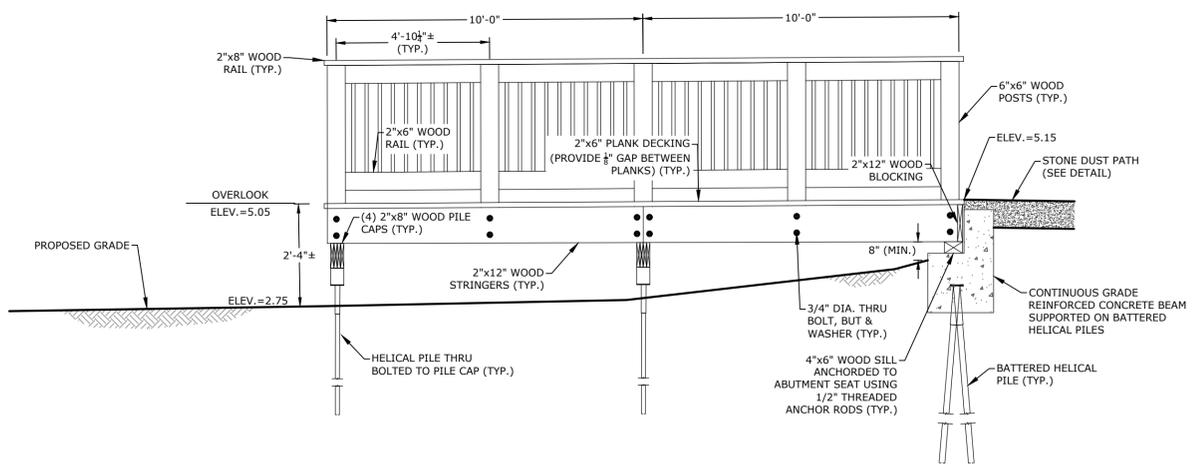
PROJECT NO:	D0250-007
DATE:	MAY 2024
FILE:	D0250-007-C-DTLS.DWG
DRAWN BY:	NSC
CHECKED:	GCB/TWB
APPROVED:	JMP

DETAILS SHEET - 9

SCALE: AS SHOWN

C.509

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TYPICAL ELEVATION (LOOKING SOUTH)

**PROPOSED TIMBER PEDESTRIAN OVERLOOK**  
NO SCALE

1
-

**DESIGN LOADS AND SPECIFICATIONS:**  
THE BRIDGE AND OVERLOOK COMPONENTS HAVE BEEN DESIGNED FOR THE FOLLOWING DESIGN LOADS AND SPECIFICATIONS.

**BRIDGE SUPERSTRUCTURE:**  
SPECIFICATION: LRFD GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES  
DESIGN METHOD: ALLOWABLE STRESS DESIGN (ASD)  
DESIGN LOADING: PEDESTRIAN LIVE LOAD = 90 PSF  
DEAD LOAD = COMPONENT DEAD LOAD  
VARIES: GROUND SNOW LOAD = 30 PSF  
WIND LOADS: EXPOSURE = C  
BASIC WIND SPEED = 132 MPH

**BOARDWALK FOUNDATION:**  
SPECIFICATION: LRFD GUIDE SPECIFICATIONS FOR THE DESIGN OF PEDESTRIAN BRIDGES  
DESIGN METHOD: LOAD AND RESISTANCE FACTOR DESIGN (LRFD)  
DESIGN LOADING: PEDESTRIAN LIVE LOAD, GROUND SNOW LOAD + COMPONENT DEAD LOAD  
LATERAL EARTH PRESSURES & LIVE LOAD SURCHARGE ALSO CONSIDERED  
REINFORCING STEEL: ASTM A 615 GRADE 60 BARS  
CONCRETE: CAST-IN-PLACE FOOTINGS, WINGWALLS, AND ABUTMENTS: 4000 PSI, 2", 610 CEMENT CONCRETE

**FOUNDATION NOTES:**  
1. CONCRETE SHALL NOT BE PLACED IN WATER OR ON FROZEN GROUND.  
2. TOP OF FOUNDATION ELEVATIONS PROVIDED ON THE DRAWINGS SHALL BE CONSIDERED MINIMUM DEPTHS.  
3. MINIMUM EMBEDMENT FOR FROST AND SCOUR PROTECTION FOR FOOTINGS FOUNDED ON SOIL IS 4 FEET BELOW ADJACENT GROUND SURFACE.  
4. ANY UNSUITABLE MATERIALS SUCH AS BOULDERS, ROOTS, ORGANIC SOILS, OR SILT/CLAY ENCOUNTERED WITHIN THE FOUNDATION BEARING ZONE, DEFINED BY A 1H:1V PLAN EXTENDING DOWNWARD AND OUTWARD FROM 1 FOOT BEYOND THE EDGE OF FOOTING, SHALL BE REMOVED AND REPLACED WITH CRUSHED STONE, AS DIRECTED BY THE ENGINEER.  
5. ALL FINISHED EXCAVATIONS SHALL BE INSPECTED BY THE SOILS INSPECTOR OR BY THE ENGINEER PRIOR TO ANY CONCRETE PLACEMENT.  
6. ALL EXCAVATIONS FOR FOOTINGS FOUNDED ON SOIL SHALL BE FINISHED BY HAND.  
7. CONTRACTOR SHALL PROVIDE CONTINUOUS DRAINAGE BY MECHANICAL METHODS TO CONTROL SURFACE AND UNDERGROUND WATER, AS REQUIRED DURING CONSTRUCTION.  
8. CONTRACTOR SHALL ENSURE THAT GROUND WATER LEVELS UNDER ADJACENT STRUCTURES AND PROPERTIES ARE NOT ALTERED.  
9. FOUNDATION MAY BE ALTERED, IF NECESSARY, TO SUIT CONDITIONS ENCOUNTERED DURING CONSTRUCTION, WITH THE APPROVAL OF THE ENGINEER.  
10. MINIMUM BACKFILL UNIT WEIGHT SHALL BE 120 POUNDS PER CUBIC FOOT (PCF).

**BOARDWALK HELICAL PILES:**  
1. ALL PILES SHALL BE HELICAL PILES.  
2. HELICAL PILES INCLUDING CONNECTION BRACKET TO PILE CAP DETAILS SHOWN ON THESE DRAWINGS ARE CONCEPTUAL ONLY. CONTRACTOR SHALL DESIGN PILES AND CONNECTIONS TO PILE CAP TO RESIST SPECIFIED DESIGN LOADS IN ACCORDANCE WITH SECTION 02457 OF THE DESIGN SPECIFICATIONS.  
3. HELICAL PILES ARE BATTERED A MINIMUM 1 BY 12. EXACT BATTER TO BE DETERMINED BY MANUFACTURER.

**BRIDGE FOUNDATIONS:**  
1. ALL BACKFILL UNDER OR ADJACENT TO ANY PORTION OF THE STRUCTURE SHALL BE PLACED IN ACCORDANCE WITH SECTION 03485 OF THE DESIGN SPECIFICATIONS.  
2. MAXIMUM BACKFILL ANGLE OF INTERNAL FRICTION SHALL BE 32 DEGREES.

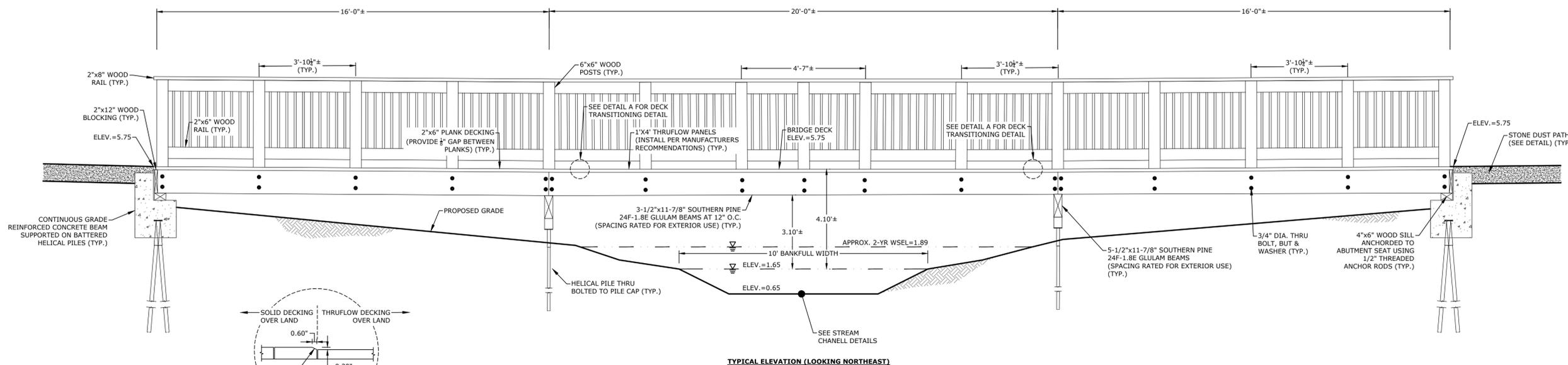
**STRUCTURAL WOOD NOTES:**  
1. ALL WOOD STRUCTURES HAVE BEEN DESIGNED IN ACCORDANCE WITH THE AMERICAN WOOD COUNCIL NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION AND COMMENTARY, 2015 ED.  
2. ALL DIMENSIONED LUMBER FOR THE PEDESTRIAN OVERLOOK PLATFORM SHALL BE SOUTHERN PINE AND DRIED TO A MAXIMUM 19% MOISTURE CONTENT. ALL DIMENSIONED LUMBER SHALL BE AT A MINIMUM NO. 2 GRADE.  
3. ALL HARDWARE USED FOR BRIDGE AND OVERLOOK SUPERSTRUCTURE SHALL BE GALVANIZED STEEL.  
4. BOLTS, SCREWS AND NAILS SHALL BE GALVANIZED CONFORMING TO ASTM A307. BOLT HOLES THROUGH THE WOOD SHALL BE DRILLED NO MORE THAN 1/16 INCH GREATER THAN THE BOLT DIAMETER.  
5. ALL DIMENSIONAL LUMBER SHALL CONFORM TO THE FOLLOWING MINIMUM ALLOWABLE STRESSES:

		RAIL POSTS	ALL OTHER COMPONENTS
MODULUS OF ELASTICITY	E	1,200,000	1,400,000
BENDING	Fb	850	1,100
COMPRESSION PARALLEL TO GRAIN	Fc	525	1,450
COMPRESSION PERPENDICULAR TO GRAIN	FcT	375	565
SHEAR PARALLEL TO GRAIN	Fv	165	175
TENSION PARALLEL TO GRAIN	Ft	550	675

6. PRESSURE TREAT ALL WOOD PRODUCTS, SEE DESIGN SPECIFICATIONS.  
7. FOR ALL DECK FRAMING MEMBERS SPANNING MORE THAN 8 FEET, PROVIDE BLOCKING NEAR SUPPORTS CONNECTING ADJACENT STRINGERS AS SHOWN ON THE DRAWINGS.  
8. JOIST, RAFTERS AND BEAMS SHALL NOT BE NOTCHED EXCEPT WHERE SHOWN ON THE DRAWINGS. OBTAIN STRUCTURAL ENGINEER'S APPROVAL FOR ANY HOLES THROUGH OR NOTCHES IN THE TOP OF HORIZONTAL MEMBERS.  
9. THE NAILING SCHEDULE FOR WOOD FRAMING ELEMENTS SHALL COMPLY WITH THE 2015 IBC TABLE 2304.10.1.1, EXCEPT AS OTHERWISE SHOWN, AND SHALL BE DONE WITH COMMON WIRE GALVANIZED NAILS UNLESS ANOTHER TYPE OF NAIL IS ALLOWED BY THE LOCAL BUILDING CODE.

**PROPOSED OVERLOOK AND BRIDGE NOTES**  
NO SCALE

3
-



TYPICAL ELEVATION (LOOKING NORTHEAST)

**PROPOSED TIMBER PEDESTRIAN BRIDGE**  
NO SCALE

4
-

90%  
DESIGN PLANS  
NOT FOR CONSTRUCTION

Pound Pond  
Flood  
Mitigation &  
Drainage  
Improvements

Town of Dennis

Dennis, MA

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CHECKED:	GCB/TWB	
APPROVED:	JMP	

DETAILS SHEET - 10

SCALE: AS SHOWN

C.510

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**BOULDER CASCADE**  
NO SCALE

1
-



**ROCK VANE**  
NO SCALE

2
-



**BOULDER EMBANKMENT (BE)**  
NO SCALE

3
-



**FABRIC ENCAPSULATED SOIL LIFTS (FESL)**  
NO SCALE

4
-



**ENGINEERED LOG JAMS (ELJ)**  
NO SCALE

5
-

**90%  
DESIGN PLANS  
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**Pound Pond  
Flood  
Mitigation &  
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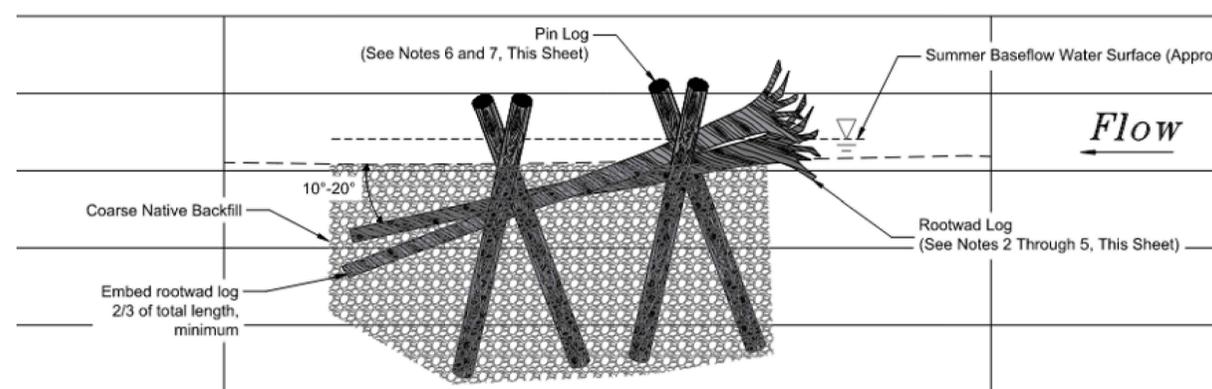
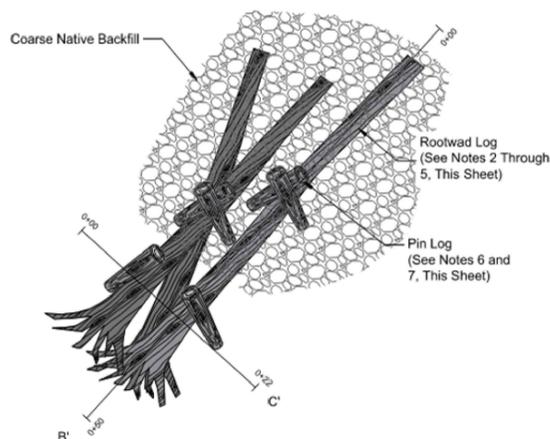
Town of Dennis

Dennis, MA



**BRUSH AGGRADATION BUNDLE STRUCTURES (BABS)**  
NO SCALE

6
-



**VERTICAL AGGRADATION ROOTWAD STRUCTURES (VARs)**  
NO SCALE

7
-

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**SAMPLE PHOTOGRAPHS**

SCALE: AS SHOWN

**C.601**