

PAVEMENT NOTES:

ROADWAY PAVEMENT: (FULL DEPTH RECONSTRUCTION)

BASE COURSE: 3" HOT MIX ASPHALT BASE COURSE MATERIAL, PLACED IN ONE LAYER SUBSURFACE COURSE: 3—1/2" HOT MIX ASPHALT PAVEMENT PLACED IN TWO LAYERS, MATERIAL OVER 2" BINDER COURSE MATERIAL. 1-1/2" TOP COURSE

SUBBASE: 12" GRAVEL BURROW

ROADWAY PAVEMENT: (COLD PLANING/RESURFACING)

MILLED PAVEMENT SURFACE SY. SURFACE COURSE: 1-1/2" MIN. HOT MIX ASPHALT PAVEMENT PLACED IN ONE LAYER, TOP MATERIAL. FOR TACK COAT, 0.07 GAL. PER

TEMPORARY PATCH:

EDGE OF EXIST. WETLANDS

EXISTING GRADE

3(MIN.)

LOAM AND SEED (MIN. 4")

PROPOSED GRADE (SEE PLAN)

PROPOSED SILTATION FENCE

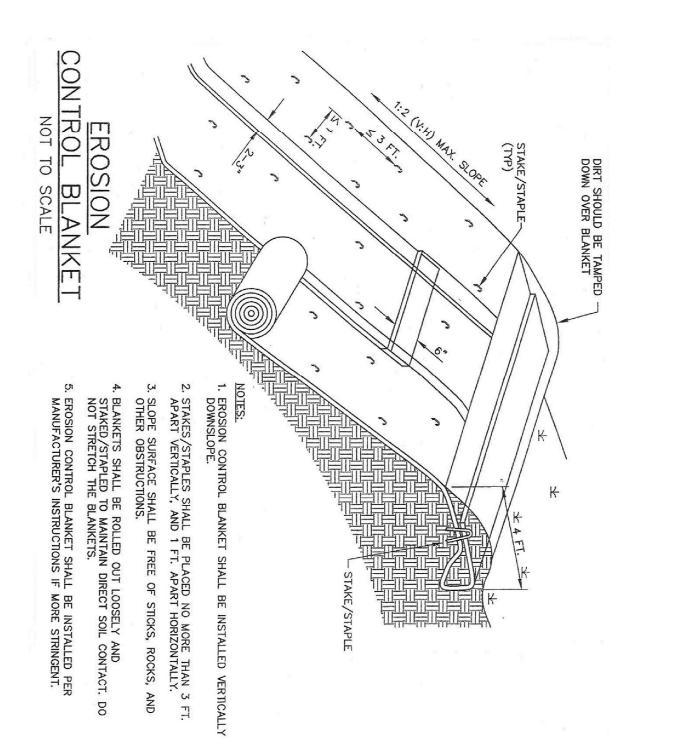
REPLICA TION

AREA

UPLAND

<u>SUBBASE:</u> GRAVEL BORROW

SURFACE COURSE:
3" HOT MIX ASPHALT BASE PLACED



WORK IN VEGETATED WETLAND AREAS

WETLAND SOIL SHALL BE EXCAVATED TO A DEPTH OF 12 INCHES, AND STOCKPILED AND COVERED WITH BURLAP OR STRAW MULCH. PERIODIC LIGHT APPLICATION OF WATER MAY BE REQUIRED TO MAINTAIN MOISTURE.

WETLAND SOIL SHALL BE RESPREAD 12 INCHES DEEP AND LIGHTLY COMPACTED BY HAND.

WETLAND SEED MIX SHALL BE APPLIED AT A RATE OF $1/2~{\rm LB./1000~SQUARE}$ FEET AND LIGHTLY RAKED TO ENSURE SOIL/SEED CONTACT.

WETLAND SEED MIX SHALL BE PURE LIVE SEED AND CONTAIN NATIVE NON—HYBRIDIZED SPECIES. SEED MIX SPECIES LIST SHALL BE SUBMITTED TO THE ENGINEER FOR APROVAL PRIOR TO APPLICATION.

WETLAND REPLICATION SECTION

NOT TO SCALE

EXCAVATE TO 1 FOOT BELOW
GRADE OF ADJACENT WETLAND
AND BACKFILL WITH WETLAND SOIL TO
MATCH GRADE OF ADJACENT WETLAND

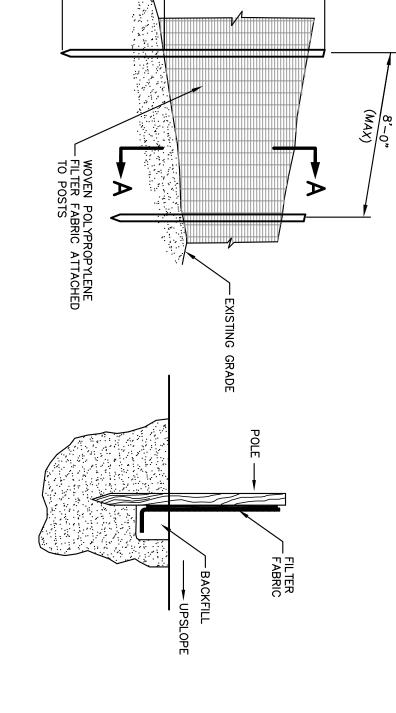
HYDROSEED WITH QUICK GERMINATING SOD FORMING CONSERVATION SEED MIX

VEGETATED AREAS/SLOPES:

4" LOAM AND SEED WITH EROSION CONTROL BLANKET (ON 3:1 SLOPE OR LESS USE NORTH AMERICAN GREEN S75BN SINGLE NET EROSION BLANKET; ON SLOPES GREATER THAN 3:1 US NORTH AMERICAN GREEN SC150BN DOUBLE NET EROSION CONTROL BLANKET, OR ENGINEER APPROVED EQUAL.)

CONSTRUCTION NOTES (SEE CONSTRUCTION SEQUENCE)

- ALL IN-STREAM WORK SHALL BE COORDINATED SO THAT THE CULVERT REMOVAL AND NEW CULVERT INSTALLATION BEGINS AND IS COMPLETED DURING A PERIOD OF "LOW FLOW" CONDITIONS AND IS PERFORMED IN ACCORDANCE WITH THE ORDER OF CONDITIONS. CONTRACTOR'S PROPOSED WORK SCHEDULE AND VERIFICATION OF WEATHER CONDITIONS SHALL BE SUBMITTED TO THE BOXFORD DEPARMENT OF PUBLIC WORKS FOR REVIEW AND APPROVAL PRIOR TO
- XISTING STREAMBED MATERIAL SHALL BE STOCKPILED SEPARATELY FOR REUSE, DITIONAL STREAMBED MATERIAL SHALL CONSIST OF CLEAN GRANULAR MATERIAL TH THE SAME GRADATION AS THE EXISTING STREAM CHANNEL. STREAMBED YIERIAL SHALL BE DURABLE WASHED ROUNDED AGGREGATE FREE OF FINES, YGANIC AND DELETERIOUS MATERIAL. CONCRETE, BRICK AND OTHER DISTRUCTION DEBRIS IS PROHIBITED. THE ENGINEER SHALL APPROVE MATERIAL YIOR TO PLACEMENT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF WATER AND STORM WATER AT ALL TIMES INCLUDING BUT NOT LIMITED TO MAINTAINING, REPLACING AND RE-FASTENING EROSION AND SEDIMENTATION CONTROL DEVICES AS NEEDED TO PREVENT SEDIMENT FROM LEAVING THE SITE AND ENTERING WETLAND RESOURCE AREAS.
- THE REFUELING OF VEHICLES AND/OR THE STOCKPILING OF NEW OR EXCAVATED FILL MATERIALS WITHIN 100 FEET OF THE STREAM NOT BE PERMITTED.
- THE CONTRACTOR SHALL COORDINATE ROAD CLOSURE CLOSELY WITH THE TOWN OF BOXFORD DEPARTMENT OF PUBLIC WORKS, TOWN MANAGER, POLICE, FIRE AND NEIGHBORING TOWN PUBLIC SAFETY DEPARTMENTS IN ACCORDANCE WITH ANY MUTUAL AID AGREEMENTS WITH THE MANUFACTURER'S REQUIREMENTS.
- WORK IN WETLAND RESOURCE AREAS SHALL BE CONDUCTED MANUALLY WITH EXCEPTION OF HAND HELD TOOLS, NO MECHANICAL EQUIPMENT SHALL BE OPERATED WITH THE RESOURCE AREAS AND STREAM.
- DISTURBED AREAS AND SLOPES SHALL BE STABILIZED WITH APPROVED SEED MIX PLANTINGS AND/OR EROSION CONTROL BLANKET, AS NECESSARY, AS SHOWN ON THE PLANS. SEED MIX AND EROSION CONTROL BLANKET SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.
- DEBRIS FROM CONSTRUCTION THAT FALLS INTO THE RESOURCE AREA WILL BE REMOVED PRIOR TO THE COMPLETION OF EACH WORKDAY.
- ALL DISTURBED LAND UNDER WATER AREAS SHALL BE STABILIZED AS INDICATED ON THE PLANS. DETAILS AND SECTIONS, OR AS DIRECTED BY THE ENGINEER OR THE TOWN PRIOR TO REMOVING WATER CONTROL MEASURES.
- CONSTRUCTION DISTURBANCE TO VEGETATED WETLAND BUFFER AREA MUST BE RESTORED TO EXISTING CONDITIONS. RESTORATION SHALL INCLUDE ALL EXISTING PLANTINGS. EROSION AND SEDIMENTATION CONTROLS SHALL BE REMOVED AFTER COMPLETION AND ACCEPTANCE OF ALL WORK WHEN AUTHORIZED BY THE BOXFORD CONSERVATION COMMISSION OR DESIGNEE.

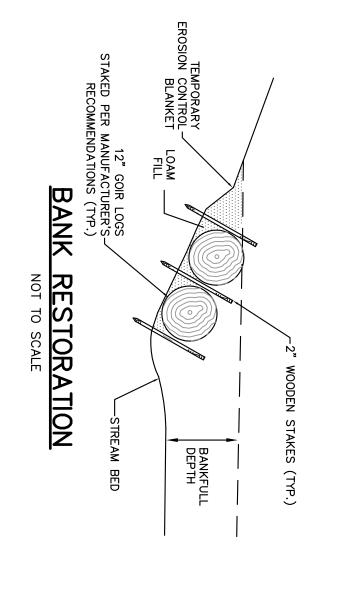


2'-0"

(MIN)

ELEVATION SECTION A-A

SILTATION FENCE DETAIL



CONSTRUCTION SEQUENCE

- WORK TO BE CONDUCTED DURING MID TO LATE SUMMER BEFORE THE START OF THE SCHOOL YEAR. PART OR ALL OF THE ROAD WILL BE BLOCKED OFF DURING THIS TIME. TRAFFIC WILL BE DETOURED EACH DAY (IF NEEDED) UNTIL CONSTRUCTION IS COMPLETE. CONSTRUCTION TO TAKE AT LEAST 7 TO 10 DAYS. START OF CONSTRUCTION WILL BE BASED ON A 10 DAY WEATHER FORECAST OF LITTLE OR NO RAIN. CERTAIN ITEMS MAY BE INITIATED PRIOR TO THE START OF CONSTRUCTION INCLUDING:
- A-REMOVE EXISTING GUARD RAIL WITHIN WORK AREA.
 B-INSTALL EROSION CONTROL (SILT SOCK OR STRAW WATTLES) ALONG THE OUTER EDGE OF THE WORK AREA.
 C-CUT ASPHALT ACROSS SECTION OF ROAD WHERE CULVERT IS TO BE REPLACED.
- AT THE START OF CONSTRUCTION, INSTALL SANDBAG DAM AND SUMP IN STREAM CHANNEL ON INLET SIDE OF CULVERT AS SHOWN ON PLAN. PLACE WATER PUMP OUTSIDE STREAM CHANNEL AND EXTEND WATER PUMP HOSE 50 FT OR MORE INTO BORDERING UPLANDS.
- REMOVE CUT ASPHALT AND EXCAVATE ROAD BASE MATERIAL TO EXPOSE AND REMOVE EXISTING CULVERT. ALL EXCAVATED MATERIAL, ESPECIALLY ASPHALT, TO BE REMOVED FROM SITE. CONTRACTOR TO BE RESPONSIBLE FOR THE PROPER DISPOSAL OF MATERIAL. EXCAVATED MATERIAL MAY BE TEMPORARILY STOCKPILED ALONG EDGE OF TRENCH AND/OR ROAD.
- WIDEN AND DEEPEN EXCAVATED TRENCH TO ACCOMMODATE NEW BOX CULVERT. PROVIDE SUPPORT TO EXISTING GAS LINE PER TECHNICIAN SPECIFICATIONS IN CONTRACT DOCUMENTS. INSTALL TEMPORARY STREAM DIVERSION PIPE THAT CONSIST OF APPROXIMATELY 70 FT OF 12" CORRUGATED PLASTIC PIPE. PIPE TO BE INSTALLED FROM SANDBAG BERM TO PLUNGE POOL AT OUTLET OF EXISTING CULVERT.
- INSTALL ADDITIONAL SUMPS IN EXCAVATED TRENCH (AS NEEDED) AND SET UP DE-WATERING BAG(S) NORTH OF CONSTRUCTION AREA. DE-WATERING BAGS TO BE PLACED ON EDGE OF ROAD. EXCAVATED TRENCH WILL REQUIRE A NEW ALIGNMENT OF OLD STREAMBED (SEE PLAN). BOX CULVERT WILL BE INSTALLED IN SEVEN 8' SECTIONS BEGINNING WITH THE INLET
- PREPARE AND COMPACT BASE MATERIAL PRIOR TO INSTALLATION OF NEW BOX CULVERT. BASE MATERIAL TO MEET ENGINEERING STANDARDS. INSTALL 2 OR 3 SECTIONS OF NEW CULVERT AT A TIME. PLACE STREAMBED MATERIAL INTO INSTALLED CULVERT SECTIONS. STREAMBED MATERIAL TO CONSIST OF A BASE OF WASHED AND COMPACTED COARSE SAND AND GRAVEL SPREAD AND GRADED TO FORM THE OUTLINE OF A BANK AND STREAMBED. INCE INSTALLED, THE BASE MATERIAL WILL BE LINED WITH 8" TO 12" STONES TO ORM THE STREAMBED AND BANK.
- AFTER THE STREAM BANK AND BED HAVE BEEN CREATED, PLACE CONCRETE TOP ON CULVERT AND BACKFILL WITH APPROPRIATE ROAD BASE MATERIAL.
- REPEAT STEPS 7 AND 9 WITH REMAINING CULVERT SECTIONS.
 REMOVE TEMPORARY STREAM DIVERSION PIPE.
- WHEN ENTIRE CULVERT HAS BEEN REPLACED, BACKFILLED AND COMPACTED, REPAVE ROADWAY PER PLAN. FILL PLUNGE POOL AT THE OUTLET OF CULVERT WITH SAME SIZE STONE AS IN CULVERT. SCRAP ACCUMULATED STREAMBED MATERIAL ON OUTLET SIDE OF ROAD TO MATCH THE GRADE OF THE CONSTRUCTED STREAMBED IN THE NEW CULVERT.
- ONCE WORK HAS BEEN COMPLETED AROUND THE NEW BOX CULVERT AND THE STREAMBED BELOW THE CULVERT HAS BEEN RE-GRADED, REMOVE SANDBAG DAM AND SUMP. EXCAVATE WETLAND REPLICATION AREA ON UPSTREAM SIDE OF CULVERT. WORK TO BE DONE MOSTLY BY HAND. RETAIN TOP 6" OF LOAM TO BE USED AS BASE FOR CREATED WETLAND. PLACE 8" STRAW WATTLE AT BASE OF EXCAVATION TO CREATE A TEMPORARY STREAM BANK. ONCE GRADED, PLANT CONSTRUCTED WETLAND WITH 3 WINTERBERRY AND 3 BLUEBERRY SHRUBS.
- BACKFILL SCOURED ROAD BANK AREAS WITH COMPACTED SAND AND GRAVEL TOPPED WITH 4" TO 6" OF LOAM (SEE PLAN) AND COVER WITH EROSION CONTROL BLANKET.
- INSTALL NEW GUARD RAIL
- SEED ALL DISTURBED SLOPES WITH AN SCS SOIL STABILIZATION MIX WHEN ROAD SLOPES ARE STABLE, REMOVE EROSION CONTROL.

DEWATERING NOTES

- 2. ALL WORK SHALL BE CLOSELY COORDINATED WITH THE BOXFORD CONSERVATION COMMISSION OR THEIR DESIGNEE. AND EROSION CONTROLS PRIOR TO BEGINNING WORK.
- ALL IN-STREAM WORK SHALL BE COORDINATED SO THAT CULVERT REMOVAL AND NEW CULVERT INSTALLATION BEGINS AND IS COMPLETED DURING A PERIOD OF "LOW FLOW" CONDITIONS AND IS PERFORMED IN ACCORDANCE WITH THE ORDERS OF CONDITIONS. CONTRACTOR'S WORK SCHEDULE AND VERIFICATION OF WEATHER CONDITIONS SHALL BE SUBMITTED TO THE BOXFORD DEPARTMENT OF PUBLIC WORKS FOR REVIEW AND APPROVAL PRIOR TO COMMENCING WORK.
- DEWATERING SHALL BE USED IF NECESSARY TO ENSURE SOIL COMPACTION AND CULVERT INSTALLATION IS PERFORMED "IN THE DRY"
- DEWATERING EFFLUENT SHALL BE DISCHARGED INTO A WATER FILTRATION BAG SUITABLE FOR THE REQUIRED FLOW AND LOCATED WITHIN A SETTLING BASIN SURROUNDED BY SILT FENCE, AT LOCATIONS APPROVED BY THE ENGINEER. DIRECT DEWATERING DISCHARGE TO CROOKED POND STREAM IS PROHIBITED
- 7. THE DEWATERING BASIN SHOULD BE PLACED ON A REASONABLY LEVEL, STABLE SOIL PUMPS AND HOSES SHALL BE IN GOOD WORKING CONDITION AND OF ADEQUATE CAPACITY FOR THE REQUIRED FLOW.
- ALL EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO COMMENCING DEWATERING OPERATIONS.

STREAMBED NOTES

1. EXISTING STREAMBED MATERIAL SHALL BE EXCAVATED AND STOCKPILED FOR REUSE.
2. STREAMBED AGGREGATE MATERIAL, SHAPE AND GRADATION SHALL BE AS SPECIFIED IN THE CONTRACT SPECIFICATIONS. IT IS THE INTENT TO GRADE THE STREAMBED WITHIN THE CULVERT TO APPROXIMATE UPSTREAM CHANNEL BOTTOM WIDTHS AND BANKS.

PREPARED FOR: TOWN OF BOXFORD DEF OF PUBLIC WORKS DEPARMENT

REVISED: REVISED: 12/30/16 CULVERT ELEVATION LOWERED 1/27/16 DEP COMMENTS ADDRESSED



CROOKED 234 Park Street • North Reading, MA 01864 • 978-664-8141 CULVERT POND REPLACEMENT STREAM **CROSSING**

BOXFORD, MASSACHUSETTS MIDDLETON ROAD

DECEMBER 2, 2015