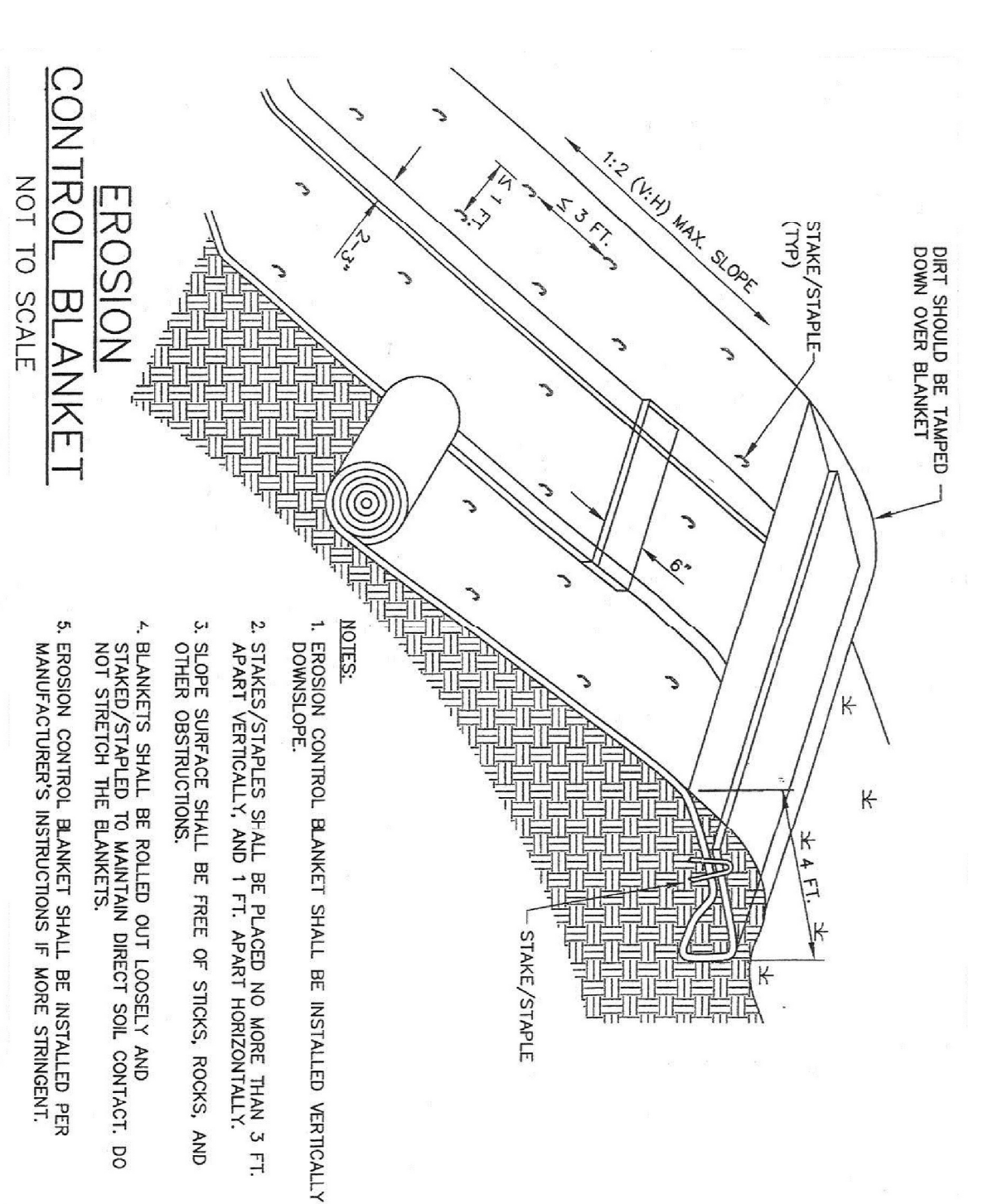


- WORK IN VEGETATED WETLAND AREAS**
1. WETLAND SOIL SHALL BE EXCAVATED TO A DEPTH OF 12 INCHES, AND STOCKPILED AND COVERED WITH BURLAP OR STRAW MULCH. PERIODIC LIGHT APPLICATION OF WATER MAY BE REQUIRED TO MAINTAIN MOISTURE.
 2. WETLAND SOIL SHALL BE RESPREAD 12 INCHES DEEP AND LIGHTLY COMPACTED BY HAND.
 3. WETLAND SEED MIX SHALL BE APPLIED AT A RATE OF 1/2 LB./1000 SQUARE FEET AND LIGHTLY RAKED TO ENSURE SOIL/SEED CONTACT.
 4. 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 APPROVAL PRIOR TO APPLICATION.

*RESOURCE IMPACTS		PRE-DEVELOPMENT		POST DEVELOPMENT	
BORDERING VEGETATED WETLANDS (BVM)		191 SF		77 SF REPLICATION	
LOST UPSTREAM		1.3 SF			
LOST DOWNSTREAM		61.27 SF			
NET LOSS		62.57 SF			
BANK		53 LF		35 LF	
UPSTREAM		16 LF		46.27 LF	
DOWNSTREAM		69 LF		54.12 LF	
TOTAL		124 LF		106.18 LF	
NET GAIN				206.28 LF	
LAND UNDER WATER (LUW)		178 SF		180.140 SF	
UPSTREAM		11.42 SF		1,298.1,147 SF	
DOWNSTREAM		1,320 SF		208.288 SF	
TOTAL		1,498 SF		1,686.1,905 SF	
NET GAIN				336.288 SF	

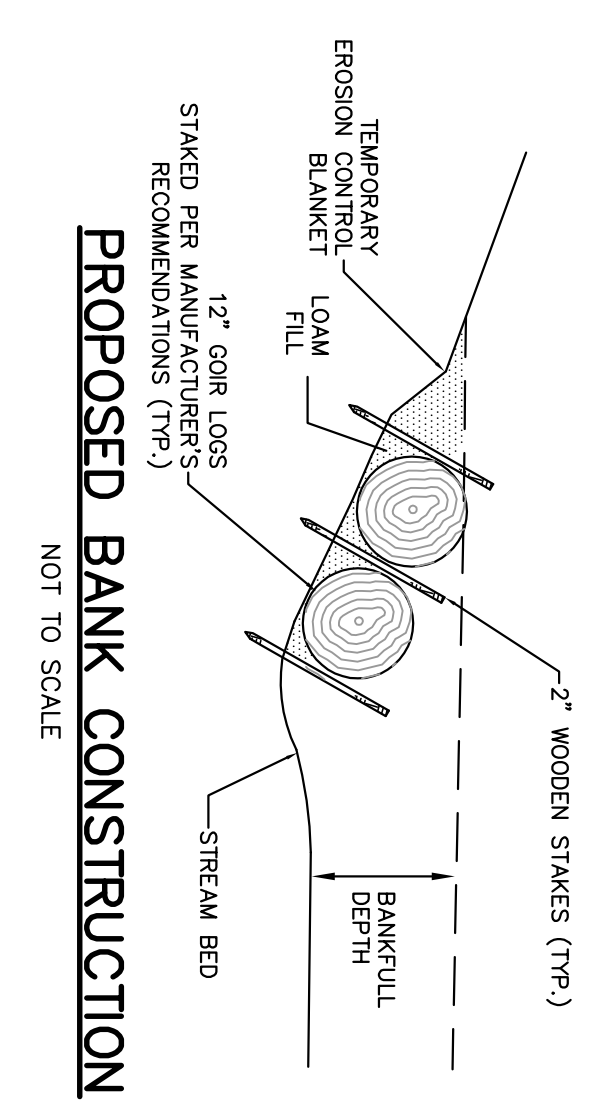
*RESOURCE IMPACT NUMBERS REVISED PER CHANGE IN DESIGN LOCATING CULVERT WITHIN COUNTY LAYOUT.



- VEGETATED AREAS/SLOPES:**
1. LOAM AND SEED WITH EROSION CONTROL BLANKET (ON 3:1 SLOPE OR LESS USE EROSION CONTROL BLANKET WITH STAKES/STAPLES AT 3' ON CENTER AND STAPLES/STAKES AT 1' ON CENTER. ON SLOPES GREATER THAN 3:1 USE NORTH AMERICAN GREEN SECTION DOUBLE NET EROSION CONTROL BLANKET, OR ENGINEER APPROVED EQUIV.)

CONSTRUCTION NOTES (SEE CONSTRUCTION SEQUENCE)

1. INSTALL SEDIMENTATION AND EROSION CONTROLS PRIOR TO BEGINNING WORK.
2. ALL WORK SHALL BE CLOSELY COORDINATED WITH THE BOXFORD CONSERVATION COMMISSION OR THEIR DESIGNEE.
3. 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. THE CONTRACTOR SHALL SUBMIT A WORK SCHEDULE AND VERIFICATION OF WEATHER CONDITIONS TO THE BOXFORD CONSERVATION COMMISSION FOR REVIEW AND APPROVAL PRIOR TO COMMENCING WORK.
4. EXISTING STREAMBED MATERIAL SHALL BE STOCKPILED SEPARATELY FOR REUSE. STREAMBED MATERIAL SHALL BE DOUBLE WASHED ROUNDED AGGREGATE FREE OF FINES, AND STOCKPILED IN A COVERED AREA. STREAMBED MATERIAL SHALL BE REPLACED WITH THE SAME GRADE AND QUANTITY AS REMOVED. CONSTRUCTION DEBRS IS PROHIBITED. THE ENGINEER SHALL APPROVE MATERIAL PRIOR TO PLACEMENT.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF WATER AND STORM WATER AT ALL TIMES INCLUDING BUT NOT LIMITED TO MAINTAINING ACCESS TO ADJACENT PROPERTIES AND MAINTAINING ACCESS TO ADJACENT WETLANDS AS NEEDED TO PREVENT SEWERAGE FROM LEAVING THE SITE AND ENTERING WETLAND RESOURCE AREAS.
6. THE REFUELING OF VEHICLES AND/OR THE STOCKPILING OF NEW OR EXCAVATED FILL MATERIALS WITHIN 100 FEET OF THE STREAM NOT BE PERMITTED.
7. THE CONTRACTOR SHALL COORDINATE ROAD CLOSURE CLOSELY WITH THE TOWN OF BOXFORD DEPARTMENT OF PUBLIC WORKS, TOWN MANAGER, POLICE, FIRE AND ALL OTHER AGENCIES. TRAFFIC SAFETY DEPARTMENTS IN ACCORDANCE WITH ANY MUTUAL AGREEMENTS.
8. WORK IN WETLAND RESOURCE AREAS SHALL BE CONDUCTED MANUALLY WITH EXCAVATORS AND BACKHOES. MECHANICAL EQUIPMENT SHALL BE OPERATED WITH THE RESOURCE AREAS AND STREAM.
9. DISTURBED AREAS AND SLOPES SHALL BE STABILIZED WITH APPROVED SEED MIX, PLANTINGS AND/OR EROSION CONTROL BLANKET, AS NECESSARY, AS SHOWN ON THE PLANS. DETAILS AND SECTIONS, OR AS DIRECTED BY THE ENGINEER OR THE TOWN PRIOR TO REMOVING WATER CONTROL MEASURES.
10. EROSION AND SEDIMENTATION CONTROLS SHALL BE REMOVED AFTER COMPLETION AND ACCEPTANCE OF ALL WORK WHEN AUTHORIZED BY THE BOXFORD CONSERVATION COMMISSION OR DESIGNEE.
11. CONSTRUCTION DISTURBANCE TO VEGETATED WETLAND BUFFER AREA MUST BE PLANNED TO EXISTING CONDITIONS. RESTORATION SHALL INCLUDE ALL EXISTING PLANTINGS.
12. 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.
13. EROSION AND SEDIMENTATION CONTROLS SHALL BE REMOVED AFTER COMPLETION AND ACCEPTANCE OF ALL WORK WHEN AUTHORIZED BY THE BOXFORD CONSERVATION COMMISSION OR DESIGNEE.
14. CONSTRUCTION DISTURBANCE TO VEGETATED WETLAND BUFFER AREA MUST BE PLANNED TO EXISTING CONDITIONS. RESTORATION SHALL INCLUDE ALL EXISTING PLANTINGS.
15. DISTURBED AREAS AND SLOPES SHALL BE STABILIZED WITH APPROVED SEED MIX, PLANTINGS AND/OR EROSION CONTROL BLANKET, AS NECESSARY, AS SHOWN ON THE PLANS. DETAILS AND SECTIONS, OR AS DIRECTED BY THE ENGINEER OR THE TOWN PRIOR TO REMOVING WATER CONTROL MEASURES.
16. EROSION AND SEDIMENTATION CONTROLS SHALL BE REMOVED AFTER COMPLETION AND ACCEPTANCE OF ALL WORK WHEN AUTHORIZED BY THE BOXFORD CONSERVATION COMMISSION OR DESIGNEE.
17. CONSTRUCTION DISTURBANCE TO VEGETATED WETLAND BUFFER AREA MUST BE PLANNED TO EXISTING CONDITIONS. RESTORATION SHALL INCLUDE ALL EXISTING PLANTINGS.
18. 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.
19. EROSION AND SEDIMENTATION CONTROLS SHALL BE REMOVED AFTER COMPLETION AND ACCEPTANCE OF ALL WORK WHEN AUTHORIZED BY THE BOXFORD CONSERVATION COMMISSION OR DESIGNEE.
20. CONSTRUCTION DISTURBANCE TO VEGETATED WETLAND BUFFER AREA MUST BE PLANNED TO EXISTING CONDITIONS. RESTORATION SHALL INCLUDE ALL EXISTING PLANTINGS.



- EROSION CONTROL BLANKET**
1. EROSION CONTROL BLANKET SHALL BE INSTALLED VERTICALLY DOWNSLOPE.
 2. STAKES/STAPLES SHALL BE PLACED NO MORE THAN 3 FT. APART VERTICALLY AND 1 FT. APART HORIZONTALLY.
 3. SLOPE SURFACE SHALL BE FREE OF STICKS, ROCKS, AND OTHER OBSTRUCTIONS.
 4. BLANKETS SHALL BE ROLLED OUT LOOSELY AND STAKES/STAPLES TO MAINTAIN DIRECT SOIL CONTACT. DO NOT STRETCH THE BLANKETS.
 5. EROSION CONTROL BLANKET SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS IF MORE STRINGENT.

CONSTRUCTION SEQUENCE

1. WORK TO BE CONSTRUCTED DURING THE LATE SUMMER BEFORE THE START OF THE RAINY SEASON. THE ROAD WILL BE BLOCKED DURING THIS TIME. TRAFFIC WILL BE DETOURNED UNTIL CONSTRUCTION IS COMPLETED. CONSTRUCTION TO TAKE AT LEAST 5 WORK DAYS. START OF CONSTRUCTION TO BE DETERMINED BY THE BOXFORD CONSERVATION COMMISSION. CROWN 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 MATS) ALONG THE C-CUT ASPHALT ACROSS SECTION OF ROAD WHERE CULVERT IS TO BE REPLACED.
2. 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 DOWNSTREAM OF SANDBAG DAM AND EXTEND WATER PUMP HOSE 50 FT OR MORE INTO STREAM. SANDBAG DAM AND WATER PUMP SHALL BE REMOVED AFTER CONSTRUCTION IS COMPLETED.
3. REMOVE CUT ASPHALT AND EXISTING ROAD BASE MATERIAL TO EXPOSE AND REMOVE EXISTING CULVERT. CONTRACTOR TO BE RESPONSIBLE FOR THE PROPER DISPOSAL OF MATERIAL. EXCAVATED MATERIAL MAY BE TEMPORARILY STOCKPILED ALONG EDGE OF HIGHWAY AND/OR ROAD.
4. WORK AND DEEPEN EXCAVATED TRENCH TO ACCOMMODATE NEW BOX CULVERT. CONTRACTOR SHALL SUBMIT A WORK SCHEDULE AND VERIFICATION OF WEATHER CONDITIONS TO THE BOXFORD CONSERVATION COMMISSION FOR REVIEW AND APPROVAL PRIOR TO COMMENCING WORK. CONTRACT DOCUMENTS, INSTALL TEMPORARY STREAM DIVERSION PIPE THAT CONSIST OF APPROXIMATELY 70 FT OF 12" CORRUGATED PLASTIC PIPE. PIPE TO BE COVERED WITH SANDBAGS BENEATH FLOWING POOL AT OUTLET OF EXISTING CULVERT.
5. INSTALL ADDITIONAL SUMP IN EXCAVATED TRENCH (AS NEEDED) AND SET UP DE-WATERING BAGS NORTH OF CONSTRUCTION AREA. DE-WATERING BAGS TO BE PLACED IN EXCAVATED TRENCH. TRENCH WILL RESUME A NEW ALIGNMENT OF OLD STREAMBED (SEE PLAN).
6. ROW MATERIAL WILL BE INSTALLED IN SECTIONS BEGINNING WITH THE INLET ENTRANCE SECTION UPSTREAM AND ENDING WITH THE OUTLET SECTION.
7. PREPARE AND CONTACT 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.
8. PLACE STREAMBED MATERIAL INTO INSTALLED CULVERT SECTIONS. STREAMBED MATERIAL TO CONSIST OF A BASE OF WASHED AND COMPACTED CLAY COARSE SAND STREAMBED SOILS INSTALLED OVER BASE MATERIAL. WILL BE LAYER WITH 8 TO 12" STONES TO FORM THE STREAMBED AND BANK.
9. AFTER THE STREAM BANK AND BED HAVE BEEN CREATED, PLACE CONCRETE TOP ON CULVERT AND BACKFILL WITH APPROPRIATE ROAD BASE MATERIAL.
10. REPEAT STEPS 7 AND 9 WITH REMAINING CULVERT SECTIONS.
11. REMOVE TEMPORARY STREAM DIVERSION PIPE.
12. WHEN ENTIRE CULVERT HAS BEEN REPLACED, BACKFILLED AND COMPACTED, REMOVE ROADWAY PER PLAN.
13. FILL PLUNGE POOL AT THE OUTLET OF CULVERT WITH SAME MATERIAL AS IN CULVERT. SCOUR ACCUMULATED STREAMBED MATERIAL ON OUTLET SIDE OF ROAD TO MATCH THE GRADE OF THE CONSTRUCTED STREAMBED IN THE NEW CULVERT.
14. EXCAVATE WETLAND REPLICATION AREA ON UPSTREAM SIDE OF CULVERT. WORK TO BE COMPLETED PRIOR TO THE START OF THE RAINY SEASON. EXCAVATION TO BE USED TO CREATE WETLAND. PLACE A STRAW MATS AT BASE OF EXCAVATION TO CREATE A WETLAND BANK. ONCE GRADED, PLANT CONSTRUCTED WETLAND WITH 3 WINTERBERRY AND 3 BLUEBERRY SHRUBS.
15. ONCE WORK HAS BEEN COMPLETED AROUND THE NEW BOX CULVERT AND THE STREAMBED, BACKFILL AND GRADUALLY REMOVE SANDBAG DAM AND SUMP BELOW THE CULVERT HAS BEEN RE-GRADDED, REMOVE SANDBAG DAM AND SUMP. BACKFILL SCOURED ROAD BANK AREAS WITH COMPACTED SAND AND GRAVEL, TOPPED WITH 4 TO 6" LOAM (SEE PLAN) AND COVER WITH EROSION CONTROL BLANKET. INSTALL NEW GUARD RAIL.
16. WHEN ALL DISTURBED SLOPES WITH AN SCS SOIL STABILIZATION MIX.
17. SEED ALL DISTURBED SLOPES WITH AN SCS SOIL STABILIZATION MIX.
18. WHEN ROAD SLOPES ARE STABLE, REMOVE EROSION CONTROL.

DEWATERING NOTES

1. INSTALL SEDIMENTATION AND EROSION CONTROLS PRIOR TO BEGINNING WORK.
2. ALL WORK SHALL BE CLOSELY COORDINATED WITH THE BOXFORD CONSERVATION COMMISSION OR THEIR DESIGNEE.
3. 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. THE CONTRACTOR SHALL SUBMIT A WORK SCHEDULE AND VERIFICATION OF WEATHER CONDITIONS TO THE BOXFORD DEPARTMENT OF PUBLIC WORKS FOR REVIEW AND APPROVAL PRIOR TO COMMENCING WORK.
4. DEWATERING SHALL BE USED IF NECESSARY TO ENSURE SOIL COMPACTION AND CULVERT INSTALLATION IS PERFORMED IN THE DRY.
5. DIRECT DEWATERING DISCHARGE TO CROOKED POND STREAM IS PROHIBITED.
6. DEWATERING EFFLUENT SHALL BE DISCHARGED INTO A WATER FILTRATION BASIN SUITABLE FOR THE REQUIRED FLOW AND LOCATED WITHIN A SETTLING BASIN SURROUNDED BY SILT FENCE, AT LOCATIONS APPROVED BY THE ENGINEER.
7. THE DEWATERING BASIN SHOULD BE PLACED ON A REASONABLY LEVEL, STABLE SOIL.
8. PUMPS AND HOSES SHALL BE IN GOOD WORKING CONDITION AND OF ADEQUATE CAPACITY FOR THE REQUIRED FLOW.
9. 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 GRAINATION SHALL BE AS SPECIFIED IN THE CONTRACT SPECIFICATIONS. IT IS THE INTENT TO GRADE THE STREAMBED BANKS TO THE CULVERT TO APPROPRIATE STREAMBED BOTTOM WIDTHS AND CAPACITY FOR THE REQUIRED FLOW.

EROSION CONTROL

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