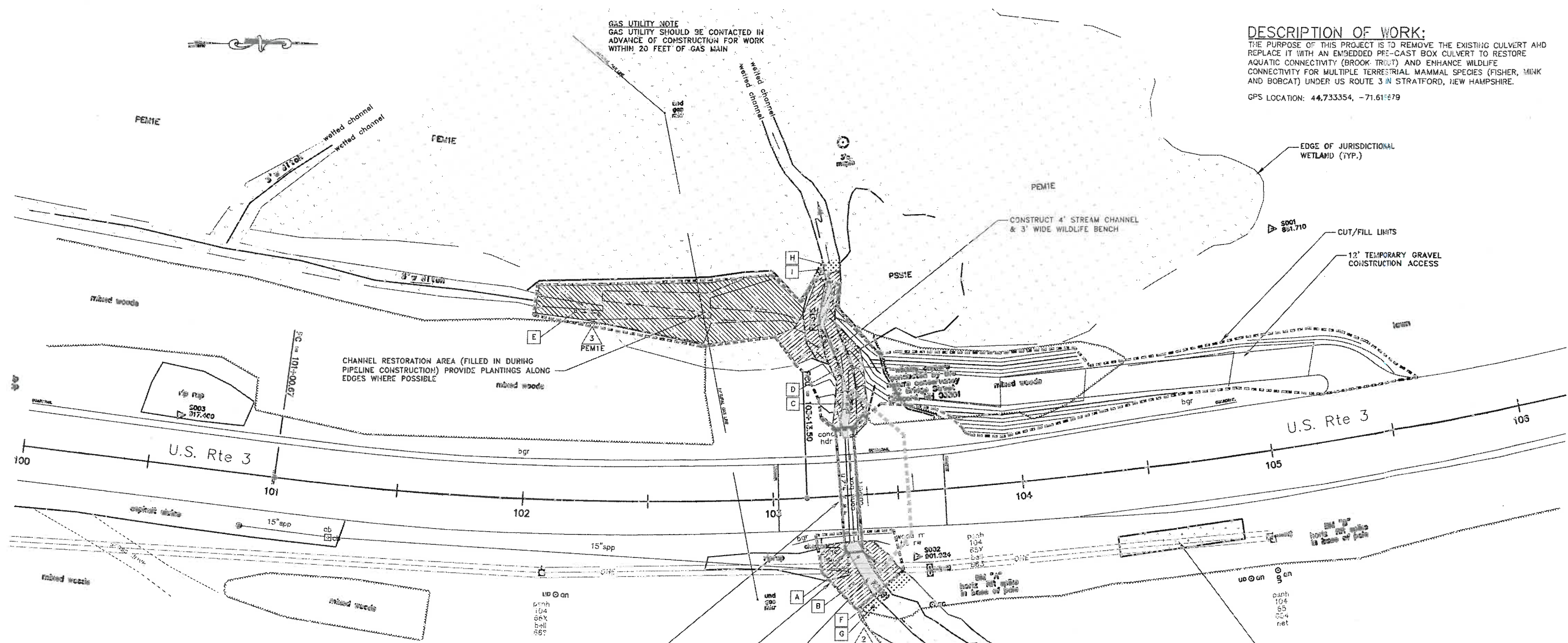


DESCRIPTION OF WORK:
 THE PURPOSE OF THIS PROJECT IS TO REMOVE THE EXISTING CULVERT AND REPLACE IT WITH AN EMBEDDED PRE-CAST BOX CULVERT TO RESTORE AQUATIC CONNECTIVITY (BROOK TROUT) AND ENHANCE WILDLIFE CONNECTIVITY FOR MULTIPLE TERRESTRIAL MAMMAL SPECIES (FISHER, MINK AND BOBCAT) UNDER US ROUTE 3 IN STRATFORD, NEW HAMPSHIRE.
 GPS LOCATION: 44.733354, -71.616679

GAS UTILITY NOTE
 GAS UTILITY SHOULD BE CONTACTED IN ADVANCE OF CONSTRUCTION FOR WORK WITHIN 20 FEET OF GAS MAIN



LEGEND

- TYPE OF WETLAND IMPACT**
- NH WETLANDS BUREAU (PERMANENT NON-WETLAND) [diagonal hatching]
 - NH WETLANDS BUREAU & ARMY CORPS OF ENGINEERS (PERMANENT WETLAND) [solid grey]
 - TEMPORARY IMPACTS [dotted pattern]
- WETLAND DESIGNATION NUMBER** [triangle with number]
- WETLAND IMPACT LOCATION** [square with number]
- WETLAND MITIGATION AREA** [square with #]
- MITIGATION** [diagonal hatching]

7' WIDE X 5' DEEP PRE-CAST BOX CULVERT EMBEDDED 2' FOR 4' WIDE NATURAL STREAM SIMULATION AND 3' WIDE WILDLIFE PASSAGE SHELF

INSTALL SANDBAG COFFER DAM AND 24" HDPE FOR CLEAN WATER BYPASS PIPE. MAINTAIN 3' SEPARATION BETWEEN BYPASS PIPE AND NEW STRUCTURE FOOTINGS

PROPOSED 50' L X 8' WIDE DEWATERING AREA WITHIN EXISTING DITCHLINE USING APPROPRIATE HHDES APPROVED BMP'S

Wetland	Proposed	Construction	Area (sq ft)						Wetland Loss (sq ft)		
			Wetland	Non-Wetland	Temporary	Permanent	Loss	Gain	Net		
1	PEMIE	A	130	10	-	-	140	130	0	130	
2	PEMIE	B	415	10	-	-	425	415	0	415	
3	PEMIE	C	225	10	-	-	235	225	0	225	
4	PEMIE	D	1000	10	-	-	1010	1000	0	1000	
5	PEMIE	E	10	10	-	-	20	10	10	0	
6	PEMIE	F	10	10	-	-	20	10	10	0	
7	PEMIE	G	10	10	-	-	20	10	10	0	
8	PEMIE	H	10	10	-	-	20	10	10	0	
9	PEMIE	I	10	10	-	-	20	10	10	0	
10	PEMIE	J	10	10	-	-	20	10	10	0	
Total			2000	70	0	0	2070	2000	70	2070	

PLAN REFERENCE:
 1. SURVEY COMPLETED BY NHDOT ON JUNE 26, 2018 FOR NHDOT PROJECT NO. 41788.
 2. WETLANDS MAPPED BY MATT URBAN & SARAH LARGE JUNE 2018.
 3. RIGHT OF WAY LIMITS FROM AS-BUILT PLANS FA-221(1) 1938 AND P-2421 1955.

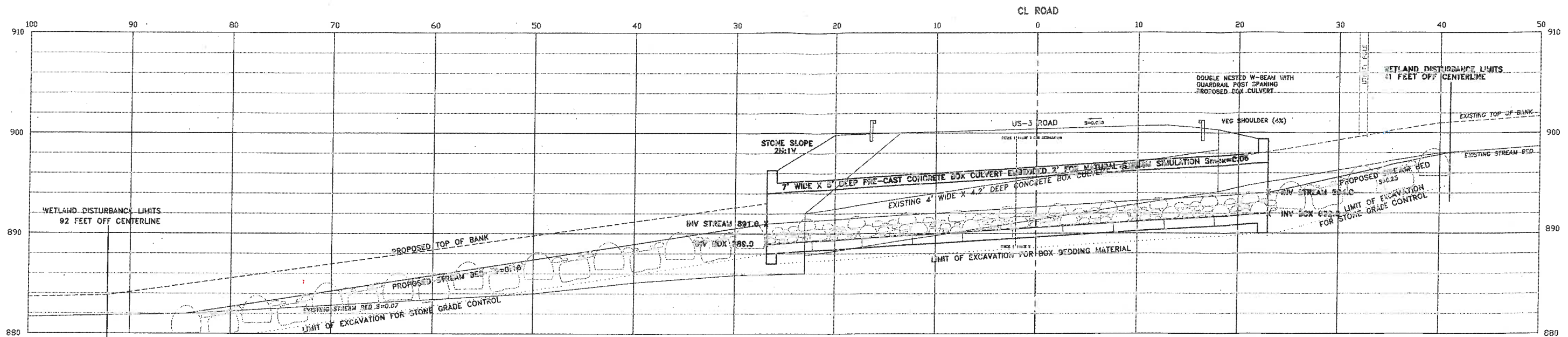


PROJECT CONTACT:
 JAMES MCMAHON III, P.E.
 ASSISTANT DISTRICT ENGINEER
 DISTRICT 1 MAINTENANCE
 (603) 788-4641

STATE OF NEW HAMPSHIRE
 DEPARTMENT OF TRANSPORTATION
 BUREAU OF HIGHWAY MAINTENANCE
 DISTRICT ONE
 641 MAIN STREET, LANCASTER, NEW HAMPSHIRE 03584
 TEL: (603) 780-4641 FAX: (603) 786-4260

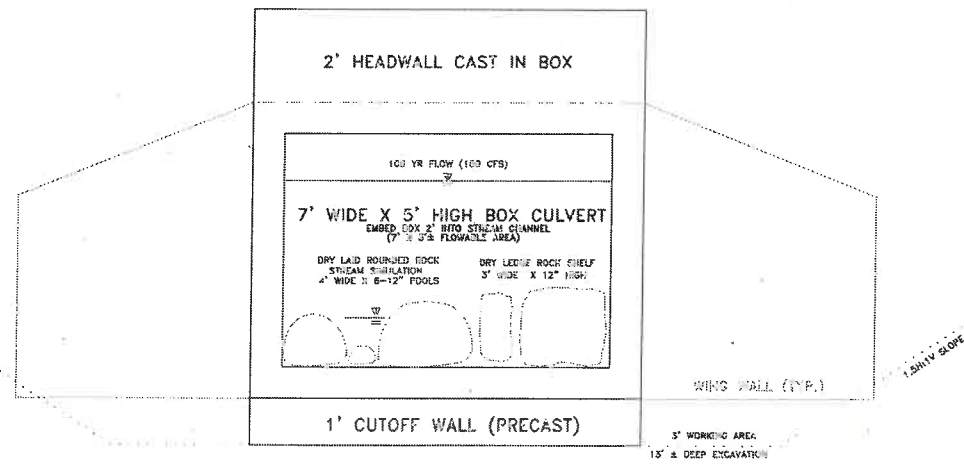
41788 STRATFORD
NFWF US-3 CULVERT REPLACEMENT
 STRATFORD, NEW HAMPSHIRE
 OVERALL SITE PLAN

SURVEYED BY:	NHDOT
WETLANDS BY:	NHDOT
DRAWN BY:	JFM
CHECKED BY:	PLE
SCALE:	AS NOTED
DATE:	10/27/18
OVERALL SITE PLAN	
SHEET	1 OF 3

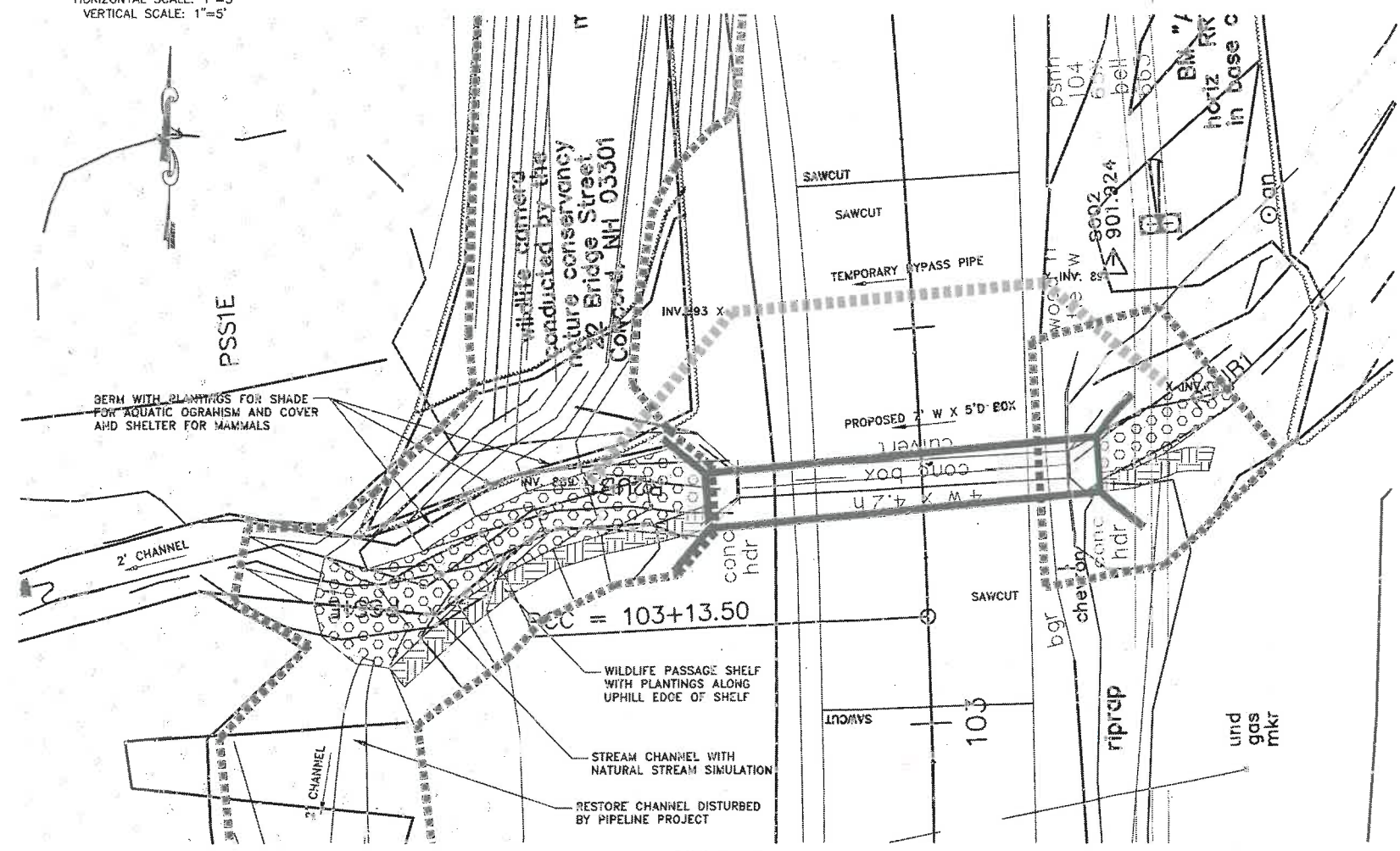


CULVERT & STREAM RESTORATION PROFILE

HORIZONTAL SCALE: 1"=5'
VERTICAL SCALE: 1"=5'



BOX CULVERT
SCALE: 1"=2'



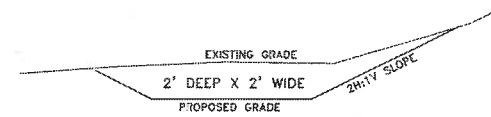
BOX CULVERT
SCALE: 1"=10'

CULVERT INSTALLATION NOTES:

1. NO VEHICLES INCLUDING CONSTRUCTION EQUIPMENT SHALL BE DRIVEN OVER THE PIPE UNTIL THE MINIMUM DEPTH OF COVER HAS BEEN PLACED.
2. THE CONTRACTOR SHALL NOT PLACE BEDDING MATERIAL UNTIL THE ENGINEER HAS INSPECTED THE FOUNDATION/UNDISTURBED EARTH. REMOVE ROCK OR OTHER UNYIELDING FOUNDATIONS MATERIAL AS NECESSARY TO PLACE BEDDING TO MINIMUM THICKNESS. OVER-EXCAVATE UNSUITABLE FOUNDATION MATERIAL SUCH AS SOFT, SPRINGY, ORGANIC, OR OTHERWISE EXCESSIVELY YIELDING MATERIAL TO A DEPTH OF AT LEAST 12" BELOW BOTTOM OF BEDDING AND REPLACE WITH SUITABLE MATERIAL PRIOR TO PLACEMENT OF BEDDING.
3. PLACE & COMPACT CULVERT BEDDING MATERIAL. BEDDING MATERIAL SHALL MEET NHDOT STRUCTURAL FILL ITEM NO. 508. PEA GRAVEL (3/8") MAY BE USED FOR THE TOP 2" OF CONSOLIDATED STONE TO ASSIST FINISH GRADING OF BEDDING MATERIAL.
4. SET BOX CULVERT SECTIONS AND WING WALLS AT THE DOWNSTREAM END OF THE CULVERT AND WORK TOWARDS THE UPSTREAM END OF THE CULVERT.
5. PIPE BACKFILL MATERIAL SHALL MEET THE REQUIREMENT FOR PIPE BEDDING MATERIAL WITHIN 2 FEET OF THE CULVERT, INCLUDING ON TOP OF THE PIPE. THE REMAINDER OF THE TRENCH SHALL BE FILLED AND COMPACTED WITH THE EXISTING STOCKPILED ROAD BASE MATERIALS REMOVED FROM THE EXCAVATION, EXCLUDING ANY UNSUITABLE MATERIALS.
6. PLACE PIPE BACKFILL EQUALLY ON BOTH SIDES OF CULVERT AND UP TO THE ELEVATION OF THE CULVERT SPAN. PLACE BACKFILL MATERIAL IN 6"-8" LIFTS COMPACTED WITH A VIBRATORY PLATE COMPACTOR TO 95% STANDARD PROCTOR DENSITY. HAND TAMP OR USE VIBRATORY "JUMPING JACK" IN AREAS WHERE THE COMPACTOR EQUIPMENT CANNOT REACH.
7. UNSUITABLE MATERIAL INCLUDES, BUT NOT LIMITED TO, ORGANIC MATERIAL, FROZEN LUMPS, SOILS SUCH AS PEAT OR BOG, OVERSATURATED SILTS, GLAYS OR SANDS WHOSE WATER CONTENT PREVENTS SPECIFIED COMPACTION, AND STONE OR ROCK FRAGMENTS GREATER THAN 3 INCHES.

DRAINAGE CALCULATIONS:

CULVERT DRAINAGE AREA: 231 ACRES
TIER 2 CROSSING PER NHDES STREAM CROSSING RULES
DESIGN FOR 100-YEAR FLOOD EVENT FLOOD:
METHOD 2-YR 50-YR 100-YR
#1 USGS STREAMSTATS 17 67 82 CFS
#2 TR-55 (SFS) 10 140 180 CFS ←--USE
#3 RATIONAL METHOD* N/A 140 N/A CFS
*NOTE: DRAINAGE AREA EXCEEDS METHOD LIMITATION
NO HISTORY OF FLOODING OVER ROAD (US-3) AT THIS LOCATION.
OVERTOPPING FLOW FOR EXISTING 4'W X4.2'H BOX CULVERT: 163 CFS
OVERTOPPING FLOW FOR PROPOSED 7'W X5'H BOX CULVERT: 305 CFS



DITCH/CHANNEL RESTORATION
NOT TO SCALE

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41788 STRATFORD
NFWF US-3 CULVERT REPLACEMENT
STRATFORD, NEW HAMPSHIRE
CULVERT & STREAM RESTORATION PROFILE

SURVEYED BY:	NHDOT
WETLANDS BY:	NHDOT
DRAWN BY:	JFM
CHECKED BY:	PLB
SCALE:	AS NOTED
DATE:	10/27/18
CULVERT & STREAM RESTORATION PROFILE	
SHEET 2 OF 3	

CONSTRUCTION SEQUENCE:

- CONTACT DIGSAFE AND UTILITY COMPANIES FOR MARKING ANY UTILITIES WITHIN THE WORK AREA. STOCKPILE MATERIALS AT THE NEAREST PATROL SHED.
- INSTALL DEMARCATION FOR TREE CLEARING AND CONSTRUCTION LIMITS.
- PROVIDE PUBLIC NOTICE AND SIGNAGE. SAWCUT PAVEMENT AT EXCAVATION LIMITS.
- INSTALL DEWATERING AREA, DOWNSTREAM PERMITTER CONTROL, AND ADDITIONAL EROSION CONTROLS MEETING NHDES AND NHDOT REQUIREMENTS, AS DIRECTED BY THE ENGINEER.
- EXCAVATE/SHAPE STREAM CHANNELS AT CULVERT OUTLET. PROVIDE TEMPORARY 24" PIPE CROSSING OR TIMBER MAT SPANNING EXISTING CHANNEL TO CROSS DOWNSTREAM OF EXISTING BOX CULVERT. USE CAUTION WHEN EXCAVATING NEAR THE PROPANE LINE. UTILITY COMPANY SHALL BE ON SITE TO LOCATE AND EXPOSE PIPE.
- INSTALL STREAM CHANNEL STONES AND STABILIZE OUTLET CHANNEL AS INDICATED ON THE PLAN. SEE CLEAN WATER BYPASS & DIVERSION NOTES.
- INSTALL TEMPORARY BYPASS/DIVERSION MEASURES, STARTING AT OUTLET AND WORKING UPSTREAM.
- REMOVE GUARDRAIL & INSTALL CONCRETE BARRIERS ALONG TOP OF FILL SLOPE MEETING NHDOT REQUIREMENTS.
- INSTALL 24" PIPE AT INLET OF EXISTING BOX CULVERT TO 25' OFF CENTERLINE (MIN) AND INSTALL TEMPORARY ROAD BASE MATERIALS FOR ONE-WAY TRAFFIC BYPASS ON THE NORTHBOUND SIDE OF US-3. PROVIDE ONE-WAY ALTERNATING TRAFFIC WITH CONCRETE BARRIERS, PORTABLE TRAFFIC SIGNALS, PORTABLE LIGHTING AND APPROPRIATE SIGNAGE IN ADVANCE OF THE PROJECT AREA.
- REMOVE THE LOWER HALF OF THE EXISTING CULVERT, WHILE PROVIDING ENOUGH ROOM FOR DETOUR ON UPPER HALF. EXCAVATE A MINIMUM OF 3' BEYOND NEW CULVERT DIMENSION WITH 1.5H:1V SLOPE.
- PREPARE CULVERT BEDDING MATERIAL TO LIMITS OF EXCAVATION. EXCAVATE FOR CUTOFF WALLS AND INSTALL PRE-CAST CUTOFF WALL.
- SET WING WALLS AND BOX CULVERT SECTION(S). PLACE CULVERT INFILL MATERIAL (NATURAL STREAM SIMULATION) INSIDE EACH SET SECTION BEFORE PROCEEDING TO THE NEXT UPSTREAM SECTION. CARE SHOULD BE TAKEN NOT TO DAMAGE THE CULVERT OR WEIRS DURING PLACEMENT.
- BACKFILL SIDES AND TOP OF CULVERT WITH GRANULAR BACKFILL. PROVIDE 12" CRUSHED MILLINGS ON TOP OF STRUCTURAL FILL FOR TEMPORARY TRAFFIC DETOUR SURFACE TREATMENT.
- DETOUR TRAFFIC ONTO NEW CULVERT SECTION, REMOVE UPPER HALF OF EXISTING CULVERT, AND INSTALL UPPER CULVERT SECTIONS WITH CULVERT INFILL (NATURAL STREAM SIMULATION) MATERIAL.
- RESTORE USTREAM AND DOWNSTREAM CHANNELS.
- REMOVE TEMPORARY DIVERSION/BYPASS PIPE.
- INSTALL ROAD BASE MATERIALS AND SELECT MATERIALS TO FINISH PAVEMENT TO MEET PAVEMENT REQUIREMENTS.

CONSTRUCTION NOTES:

- THEY MUST BE KEPT CLEAR OF THE WORK AREA. ANY SIGNIFICANT CHANGES TO THE PROPOSED GRADING IF EXISTING FIELD CONDITIONS HAVE SIGNIFICANTLY CHANGED OR UNEXPECTED CONDITIONS ARISE (I.E. BEDROCK, LEDGE, OTHER OBSTRUCTIONS, ETC).
- ALL WORK MUST BE DONE OUTSIDE OF FLOWING WATER TO MINIMIZE THE POTENTIAL FOR THE RELEASE OR DISCHARGE OF TURBID OR SEDIMENT LADEN WATER. TO THE EXTENT PRACTICAL, CONSTRUCTION ACTIVITIES SHALL BE DONE IN THE DRY OR ISOLATED FROM THE FLOWING WATER.
- THE TEMPORARY BYPASS/DIVERSION DETAIL PROVIDES A GENERAL DESCRIPTION FOR A SUITABLE METHOD OF CONTROLLING WATER DURING CONSTRUCTION.
- SITE CONDITIONS MAY DIFFER FROM THOSE SHOWN ON THE DRAWINGS DUE TO SEASONAL WATER LEVELS, SEDIMENT DEPOSITION, AND EROSION SINCE THE TIME OF THE SURVEY.
- LOCATE STAGING AREAS AND WORKING PLATFORMS AWAY FROM SENSITIVE AREAS INCLUDING WETLANDS AND STREAM BUFFERS.
- ANY TREES CUT OUTSIDE THE DISTURBED AREA AND WITHIN 50 FEET OF THE STREAM, SHALL BE CUT AS FLUSH AS POSSIBLE TO THE EXISTING GRADE. ANY STUMPS WITHIN 20 FEET OF THE EDGE OF PAVEMENT SHALL BE REMOVED.
- CONTRACTOR SHALL LAY OUT THE CONSTRUCTION BASELINE AND STAKE OUT THE CLEARING LIMITS AND DISTURBANCE LIMITS OF PROPOSED WORK PRIOR TO CONSTRUCTION.
- NO CHANNEL DISTURBANCE, INCLUDING MOVEMENT OF EQUIPMENT, WILL BE ALLOWED OUTSIDE THE CONSTRUCTION LIMITS IDENTIFIED ON THE PLAN. WORKING OUTSIDE THESE LIMITS MAY REQUIRE ADDITIONAL PERMITTING REQUIREMENTS AND/OR LANDOWNER PERMISSION.

CLEAN WATER BYPASS & DIVERSION NOTES:

- INSTALL THE TEMPORARY BYPASS PIPE AT LEAST 20 FEET FROM THE OUTER EDGE OF THE PROPOSED CULVERT OR WING WALL, OR 1.5H:1V FROM THE BOTTOM OF THE CULVERT EXCAVATION.
- TEMPORARILY STABILIZE ANY DISTURBED AREAS AND INSTALL SILT FENCE OR OTHER APPROVED PERIMETER CONTROL ALONG THE DOWNSTREAM EDGES. PROVIDE TWO LAYERS OF PERIMETER CONTROL ALONG STREAM BANKS AND/OR JURISDICTIONAL WETLAND BOUNDARY.
- INSTALL A SANDBAG COFFER DAM UPSTREAM OF THE EXISTING CULVERT.
- PIPE OR PUMP WATER FROM THE COFFER DAM TO THE TEMPORARY BYPASS PIPE LOCATED DOWNGRADIENT.
- INSPECT DIVERSION PIPE AND COFFER DAM DAILY AND AFTER RAIN EVENTS GREATER THAN 1".
- AFTER THE NEW CULVERT IS INSTALLED AND THE STREAM AND BANKS RESTORED, REMOVE THE COFFER DAM AND TEMPORARY BYPASS PIPE.
- REMOVE SILT FENCE OR OTHER APPROVED PERIMETER CONTROL WHEN THE DISTURBED AREAS ARE STABILIZED TO THE SATISFACTION OF THE ENGINEER.

EROSION & SEDIMENT CONTROL NOTES:

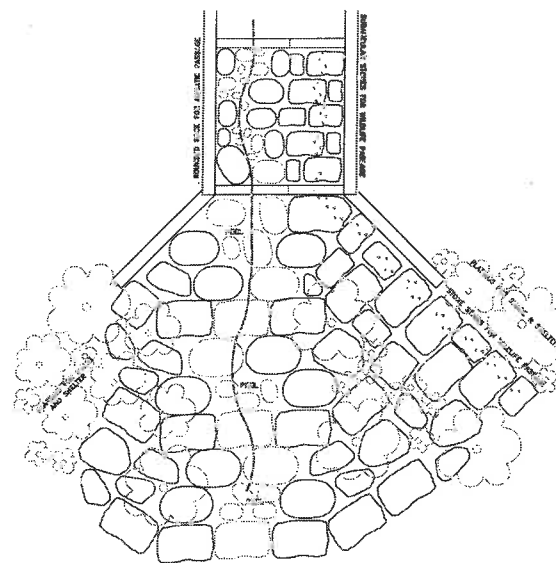
- EROSION AND SEDIMENT CONTROL MEASURES MEETING NHDES AND NHDOT REQUIREMENTS ARE REQUIRED THROUGH THE CONSTRUCTION PERIOD AND UNTIL THE PROJECT IS COMPLETE AND THE DISTURBED AREAS ARE STABILIZED TO THE SATISFACTION OF THE ENGINEER.
- THE CONTRACTOR SHOULD REVIEW THE WEATHER FORECAST CLOSELY PRIOR TO SCHEDULING WORK ACTIVITIES TO PREVENT WORKING IN THE RAIN.
- DISTURBED AREAS WITH THE POTENTIAL TO DISCHARGE SEDIMENT LADEN WATER INTO STREAM, JURISDICTIONAL WETLANDS OR OFF THE SITE MUST BE PROTECTED WITH TEMPORARY EROSION CONTROL MEASURES, SUCH AS SILT FENCE OR OTHER APPROVED PERIMETER CONTROL AT THE END OF EACH WORK DAY.
- ALL MATERIAL STOCKPILE AREAS SHALL BE SURROUNDED BY SILT FENCE AT THE END OF EACH DAY AND PRIOR TO A FORCASTED PRECIPITATION EVENT.
- THE EXISTING VEGETATION IS TO REMAIN UNDISTURBED TO THE EXTENT POSSIBLE. NO TREES ARE TO BE REMOVED FROM AREAS OUTSIDE THE CONSTRUCTION LIMITS. STUMPS SHALL BE CUT FLUSH WITHIN 50 FEET OF THE STREAM OR WETLAND, UNLESS WITHIN CULVERT REPLACEMENT OR STREAM CHANNEL RESTORATION LIMITS IN WHICH CASE STUMPS AND ROOT MASS SHALL BE REMOVED COMPLETELY.
- ALL SLOPES AND DISTURBED AREAS SHALL BE SCARIFIED TO A DEPTH OF 1-2 INCHES PARALLEL TO CONTOURS. DO NOT SMOOTH FINISHED SURFACE PRIOR TO SEEDING AND MULCHING.
- INSTALLATION OF SILT FENCE, OR OTHER ENGINEER APPROVED PERIMETER CONTROL, SHALL BE COMPLETED PRIOR TO THE START OF ANY EARTH WORK IN ANY GIVEN AREA. SILT FENCE SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
- SILT FENCES SHALL BE KEPT CLEAN DURING CONSTRUCTION AND REMOVE WHEN ALL SLOPES HAVE MORE THAN 85% COVERAGE BY HEALTHY VEGETATION. EROSION CONTROL MEASURES MUST BE INSPECTED ON A WEEKLY BASIS AND AFTER EVERY RAINFALL.

RESTORATION OF SURFACES:

- AFTER WORK IS COMPLETE, THE CONSTRUCTION/SITE ACCESS, CONSTRUCTION VEHICLE PARKING, STOCKPILE AND STAGING AREAS SHALL BE STABILIZED AND RESTORED TO PRE-CONSTRUCTION CONDITION. RESTORATION MAY INCLUDE INSTALLING TOPSOIL, GRASS SEED, FERTILIZER AND MULCH TO AFFECTED AREA.
- ALL DISTURBED AREAS TO BE REVEGETATED MUST BE SEEDED AND PROTECTED FROM EROSION AS SOON AS PRACTICAL AFTER ACHIEVING FINISH GRADE.
- INVASIVE OR NOXIOUS SPECIES SHOULD NOT BE USED AND SHOULD BE DISPOSED OF AS REQUIRED BY NHDES REQUIREMENTS.
- PROTECT ALL DISTURBED AREAS SEEDED (OR HYDROSEEDED, USING ENGINEER APPROVED METHOD AND MIX) WITH EROSION CONTROL FABRIC OR BLANKETS ON SLOPES GREATER THAN 3H:1V. LOOSE MULCH IS ACCEPTABLE ON DISTURBED SLOPES FLATTER THAN 3H:1V.

DEWATERING NOTES:

- AREAS REQUIRING DEWATERING WITHIN THE CULVERT TRENCH EXCAVATION SHALL BE DISCHARGED TO THE DEWATERING PAD LOCATION SHOWN ON THE SITE PLAN. ANY SATURATED SOLIDS SHOULD BE TRANSPORTED TO THE NEAREST PATROL SHED GRAVEL STOCKPILE AREA FOR DEWATERING.
- THE DEWATERING AREA SHOULD BE NO CLOSER THAN 50 FEET FROM A JURISDICTIONAL WETLAND OR SURFACE WATER WITHOUT ENGINEER AND NHDES APPROVAL. ALL DOWNSTREAM SURFACE WATERS AND WETLANDS SHALL BE PROTECTED.
- A STONE SUMP INTAKE SHALL BE CONSTRUCTED IN AREAS WHERE THE WATER TABLE MUST BE LOWERED TO INSTALL PIPE BEDDING OR STREAMBED GRADE CONTROL STRUCTURES.
- NO SEDIMENT LADEN WATERS SHOULD BE DISCHARGED TO THE TEMPORARY WATER BYPASS PIPE OR TO THE STABILIZED DOWNSTREAM CHANNEL.
- EXISTING STREAMBANK MATERIALS EXCAVATED FOR REUSE WITHIN THE CONSTRUCTED CHANNEL OR TO BE USED FOR CULVERT INFILL SHALL BE STOCKPILED AT THE PATROL SHED UNTIL DRY.



SIMULATED STREAM BED & DRY SHELF DETAIL

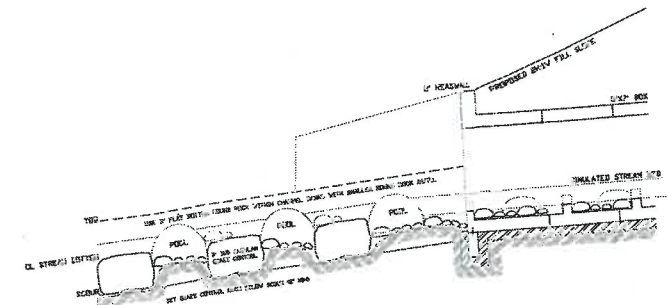
STREAMBED MATERIAL NOTES:

- THE STREAMBED MATERIAL IS TO BE PLACED IMMEDIATELY UPSTREAM AND DOWNSTREAM OF CULVERT, AS SHOWN ON THE DESIGN PLANS. ALL EFFORTS SHALL BE MADE TO REPLICATE THE EXISTING STREAM WITHIN THE CULVERT AND ADJACENT TO THE WORK AREA.
- THE STREAMBED MATERIAL SHALL CONSIST OF NATIVE COBBLES, BOULDERS AND STONES MIXED WITH EXISTING STREAM BED MATERIAL. ANGULAR, SUBANGULAR, OR SUB-ROUNDED ROCK (FLAT-BOTTOMED ROCK) IS PREFERRED OVER ROUND ROCK, MEETING THE FOLLOWING SPECIFICATIONS:
 - BOULDERS AND STONES 1.5' TO 3' DIAMETER ROCKS SHALL BE PLACED AS SHOWN ON PLANS AND DETAILS.
 - COBBLES, BOULDERS AND STONES 3" TO 18" DIAMETER.

STONE SIZE	PASSING BY WEIGHT
18"	80%
6"	30%
4"	5%
 - COBBLES AND GRAVEL 2" AND UNDER.

STONE SIZE	PASSING BY WEIGHT
2"	95%
3/4"	20-25%
#4	10-15%
#8	0-5%
 - CRUSHED OR PROCESSED STONE SHALL NOT BE USED WITHIN THE STREAM CHANNEL UNDER BANK FULL CONDITIONS (2-YR RECURRENT FLOWS).

- THE EXISTING STREAM BED MATERIAL SHALL BE REMOVED, DRAINED AND STOCKPILED FOR REUSE.
- STONE MATERIALS UNDER 18" SHALL BE PRE-BLENDED OUTSIDE THE PROJECT AREA AND MIXED AT A RATIO OF 3" TO 18" AT 55% AND LESS THAN 2" AT 45% RESPECTIVELY. THE PRE-BLENDING SHALL BE DONE IN A WAY THAT WILL PREVENT THE STREAMBED MIX FROM BEING CONTAMINATED BY WORK SITE OR SELECT ROAD BASE & CULVERT BEDDING MATERIALS.
- STONE MATERIALS OVER 18" SHALL BE PLACED DURING THE PLACEMENT OF THE BLENDED MATERIALS UNDER 18". THE LARGER STONES SHALL BE PLACED FIRST IN A RANDOM FASHION WITHIN THE LIMITS SHOWN ON THE PLAN AND WITHIN THE CROSS SECTION SHOWN ON THE PLANS.
- ALL STREAMBED MATERIAL SHALL BE PLACED AND LOCKED TIGHTLY TOGETHER TO PREVENT MOVEMENT DURING HIGH FLOWS.
- STONES WITHIN THE DOWNSTREAM END OF THE CULVERT SHALL BE PLACED RANDOMLY BUT WITH A MINIMUM DISTANCE OF 5 FEET AND MAXIMUM DISTANCE OF 15 FEET APART. THE LARGER STONES SHALL BE SET WITHIN THE STREAM CHANNEL AT LEAST 1' EXPOSED ABOVE THE FINISHED STREAM PROFILE.
- THE LARGER STONES SET WITHIN 10' OF THE CULVERT SHALL BE SET AS FLUSH AS POSSIBLE WITH THE STREAM PROFILE AND IN NO HIGHER THAN 6" ABOVE THE FINISHED STREAM PROFILE.
- NHDOT RIPRAP CLASS V (18" NOMINAL, 24" MAX) SHALL BE USED FOR SLOPE STABILIZATION AT THE CORNER OF THE CULVERTS AND OTHER AREAS OUTSIDE THE STREAM CHANNEL. SEE PLANS FOR STONE SIZING.
- SMALL NATIVE TREES (20%), SHRUBS (40%), AND WILDFLOWERS (20%) SHALL BE PLANTED ALONG THE EDGES OF THE CONSTRUCTED STREAM BED AND BETWEEN STONES WHERE POSSIBLE TO PROVIDE SHADING FOR STREAMBED AND COVER FOR WILDLIFE PASSAGE.



SIMULATED STREAM BED WITHIN BOX CULVERT DETAIL

CULVERT INFILL MATERIAL NOTES:

- THE INTENT OF THE CULVERT INFILL/EMBEDMENT MATERIAL IS TO CREATE A NATURAL STREAM CHANNEL WITHIN THE CULVERT THAT SIMULATES THE NEARBY CHANNEL TO ENCOURAGE FISH PASSAGE AND RESIST SCOUR DURING LARGER SEASONAL RAIN EVENTS.
- CONTRACTOR SHALL TAKE PRECAUTIONS DURING PLACEMENT OF EMBEDMENT MATERIAL TO AVOID DAMAGE OR DEFORMATION TO THE CULVERT.
- CONTRACTOR SHALL BALANCE THE ELEVATION OF THE PRECAST WEIR OF THE PIPE WITH THE ELEVATION OF EMBEDMENT MATERIAL PLACED INSIDE AS NEEDED TO PREVENT DAMAGE.
- A 3-INCH CUSHION OF EXISTING STREAMBED MATERIAL IS RECOMMENDED TO PROTECT THE PIPE FROM DAMAGE DUE TO PLACEMENT OF COBBLES AND SMALL BOULDERS.
- EMBEDMENT MATERIAL SHALL CONSIST OF WELL-GRADED, 12" MINUS, FLAT BOTTOM, NATURAL RIVER MATERIAL.

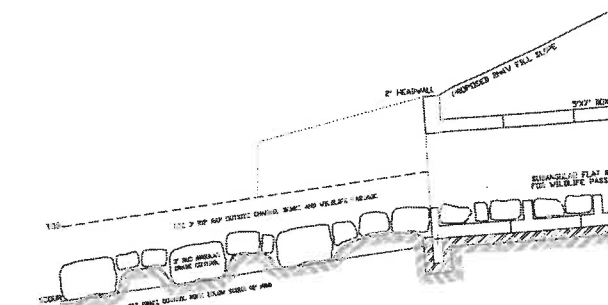
COBBLES, BOULDERS AND SMALL STONES 3" TO 12" DIAMETER.

STONE SIZE	PASSING BY WEIGHT
12"	80%
6"	30%
4"	5%

COBBLES AND GRAVEL 2" AND UNDER.

STONE SIZE	PASSING BY WEIGHT
2"	95%
3/4"	20-25%
#4	10-15%
#8	0-5%

- COBBLES, BOULDERS & SMALL STONES MEASURING LESS THAN 12" SHALL BE DISTRIBUTED THROUGHOUT THE CULVERT LENGTH, FLAT SIDE DOWN, WITH THE REMAINING EMBEDMENT MATERIAL PLACED AROUND THEM. THE LOWEST POINT OF THE CONSTRUCTED STREAM BED SHALL BE OFFSET BETWEEN THE WEIRS 12-18" EITHER SIDE OF THE BOX AND BETWEEN THE SMALL POOLS (6" POOL) TO CREATE A SINUOUS (CURVE-LIKE) ALIGNMENT BETWEEN THE V-NOTCH WEIRS CAST INTO THE BOTTOM OF THE CULVERT.
- THE EMBEDMENT MATERIAL SHALL BE PLACED SUCH THAT THERE ARE NO ABRUPT VERTICAL DROPS IN EXCESS OF 3 INCHES, AND SO THAT THE FLOW OF WATER IS GENERAL CONCENTRATED IN THE CENTER OF THE CONSTRUCTED CHANNEL RATHER THAN DISPERSED ACROSS THE ENTIRE WIDTH OF THE CHANNEL.



TERRESTRIAL PASSAGE DETAIL

WILDLIFE PASSAGE NOTES:

- THE MATERIALS USED FOR THE DRY LEDGE PASSAGE IS TO BE PLACED WITHIN THE CULVERT AND IMMEDIATELY UPSTREAM AND DOWNSTREAM OF CULVERT, AS SHOWN ON THE DESIGN PLANS. ALL EFFORTS SHALL BE MADE TO PROVIDE A SAFE & TRAVERSABLE CROSSING WITHIN THE CULVERT AND ADJACENT TO THE WORK AREA FOR TERRESTRIAL MAMMALS SUCH AS FISHER, MINK AND BOBCAT.
- THE DRY LEDGE/STONE MATERIAL SHALL CONSIST OF RELATIVELY FLAT ROCK MEASURING 12" H X 18" W X 24" L IN SIZE. STONE SHALL HAVE A TOLERANCE OF 3" IN HEIGHT, BUT CAN VARY IN 12" IN WIDTH AND LENGTH ONLY IN SIZE WITHIN THE CHANNEL. NATIVE SUBANGULAR ROCK IS PREFERRED OVER ROUND ROCK TO IMPROVE GRIPPING FOR MAMMALS.
- ALL ROCK SHELF MATERIAL SHALL BE PLACED AND LOCKED TIGHTLY TOGETHER TO PREVENT MOVEMENT DURING HIGH FLOWS. THERE SHOULD BE NO MORE THAN A 12" DROP BETWEEN STONES.
- THE LARGER STONES SET WITHIN THE CULVERT SHALL BE SET AS FLUSH AS POSSIBLE WITH THE STREAM PROFILE AND IN NO HIGHER THAN 6" ABOVE THE FINISHED STREAM PROFILE.
- NHDOT RIPRAP SHALL BE USED FOR SLOPE STABILIZATION AT THE CORNER OF THE CULVERTS AND OTHER AREAS OUTSIDE THE STREAM CHANNEL. SEE PLANS FOR STONE SIZING.

PROJECT CONTACT:
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DISTRICT ONE

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41788 STRATFORD
NFWF US-3 CULVERT REPLACEMENT

STRATFORD, NEW HAMPSHIRE
MISCELLANEOUS NOTES & DETAILS

SURVEYED BY:	NHDOT
WETLANDS BY:	NHDOT
DRAWN BY:	JFM
CHECKED BY:	PLD
SCALE:	AS NOTED
DATE:	10/27/18
MISCELLANEOUS NOTES & DETAILS	SHEET 3 OF 3