



Vermont Department of Environmental Conservation

Agency of Natural Resources

Watershed Management Division
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Montpelier VT 05620-3522
www.watershedmanagement.vt.gov

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AUTHORIZATION TO CONDUCT STREAM ALTERATION ACTIVITIES

Pursuant to Section C.2.2 of the VT Stream Alteration General Permit (Reporting activities not requiring an application)

Project Number: SA-06- 36 -2015

Applicant Name: Town of Warren

Mailing Address: PO Box 337, Warren, VT 05674 Phone: (802) 496-2709

Project Location (44.1100, -72.8860); W. Hill Rd. Email: publicworks@warrenvt.org

The Secretary of the Vermont Agency of Natural Resources (VT ANR) has determined that:

1. This project authorizes replacement of existing 16'x9.3' (WXH) CMP with a 18'x7.8' (WXH) open bottom multi plate pipe arch
2. The proposed activity is eligible for coverage under the VT ANR Stream Alteration General Permit.
3. The proposed activity will meet the terms and conditions of the General Permit provided:
 - a) The project will be completed and approved as shown on the plan dated 06/12/2015, prepared by Milone & MacBroom, and approved by the Vermont Agency of Natural Resources.
 - b) The project will not adversely affect the public safety by increasing flood hazards.
 - c) The project will not significantly damage fish life or wildlife.
 - d) The project will not significantly damage the rights of riparian owners.
 - e) The project will not obstruct the movement of aquatic life indigenous to the waterbody beyond the actual duration of construction.
 - f) The project is conducted in a manner which minimizes or avoids any discharge of sediment or other pollutants to surface waters in violation of the VT Water Quality Standards.
 - g) The ANR River Management Engineer is notified by phone or email when construction begins and when the project is complete.
 - h) In-stream working dates for all GP activities are from July 1st through October 1st; any in-stream work outside these dates will require an Individual Stream Alteration Permit authorization by the River Management Engineer.
 - i) This authorization has been posted for three days public comment. This authorization constitutes final approval.

If there are any changes in the project plan or deviation in construction from the plan, the Permittee must notify the River Management Engineer immediately.

If the project is constructed as you have described, as shown on the above referenced approved plans and according to the above conditions, there is no reason to expect any violation of Vermont Water Quality Standards.

Signed this 17th day of July, 2015
David K. Mears, Commissioner
Department of Environmental Conservation

This permit expires October 1, 2015.

by:
Jaron Borg, River Management Engineer

WEST HILL ROAD CULVERT REPLACEMENT BRADLEY BROOK AOP RESTORATION

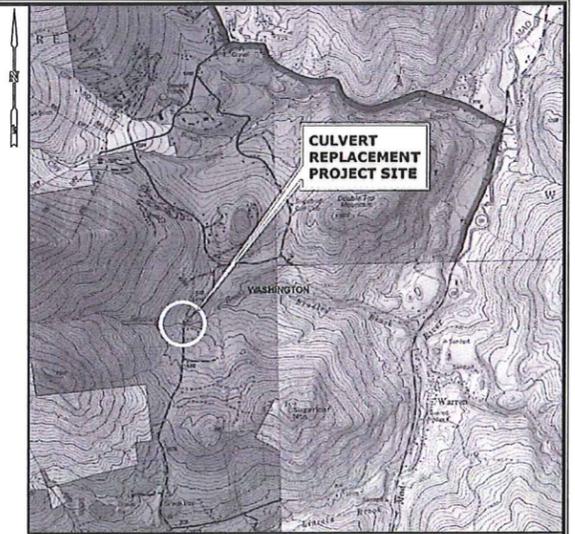
WARREN, VERMONT

APPROVAL
WATERSHED MANAGEMENT DIVISION

DATE 07/17/2015

BY [Signature]
THIS APPROVAL IS SUBJECT TO THE TERMS
AND CONDITIONS OF STREAM ALTERATION
PERMIT # SA'06-36-2015 ISSUED HEREWITH

FINAL DESIGN
JUNE 16, 2015



LOCATION MAP:



PROJECT SITE VICINITY MAP:



PREPARED FOR:

FRIENDS OF THE MAD RIVER
PO BOX 255
WAITSFIELD, VERMONT 05674

IN PARTNERSHIP WITH:

U.S. FISH & WILDLIFE SERVICE
VERMONT AGENCY OF NATURAL RESOURCES
TOWN OF WARREN

LIST OF DRAWINGS

NO.	NAME	TITLE
01	-	TITLE SHEET
02	SP-1	SITE PLAN - EXISTING CONDITIONS
03	SP-2	SITE PLAN - PROPOSED CONDITIONS
04	SE-1	WATER HANDLING PLAN & NOTES
05	STR-1	STRUCTURAL DETAILS
06	STR-2	STRUCTURAL DETAILS
07	STR-3	STRUCTURAL & WATER HANDLING DETAILS
08	B-1	BORING LOGS

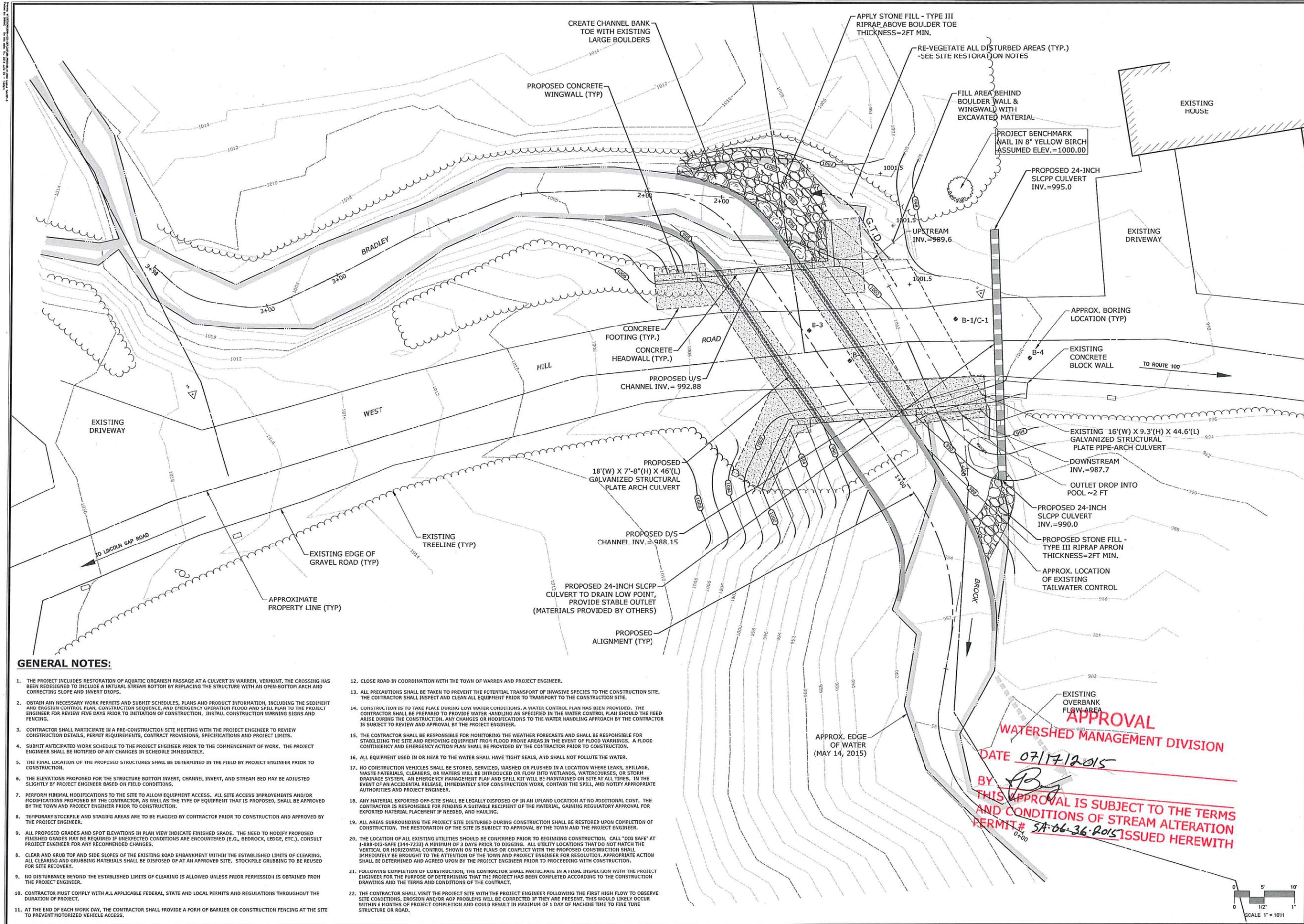
PREPARED BY:



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GENERAL NOTES:

1. THE PROJECT INCLUDES RESTORATION OF AQUATIC ORGANISM PASSAGE AT A CULVERT IN WARREN, VERMONT. THE CROSSING HAS BEEN REDESIGNED TO INCLUDE A NATURAL STREAM BOTTOM BY REPLACING THE STRUCTURE WITH AN OPEN-BOTTOM ARCH AND CORRECTING SLOPE AND INVERT DROPS.
2. OBTAIN ANY NECESSARY WORK PERMITS AND SUBMIT SCHEDULES, PLANS AND PRODUCT INFORMATION, INCLUDING THE SEDIMENT AND EROSION CONTROL PLAN, CONSTRUCTION SEQUENCE, AND EMERGENCY OPERATION FLOOD AND SPILL PLAN TO THE PROJECT ENGINEER FOR REVIEW FIVE DAYS PRIOR TO INITIATION OF CONSTRUCTION. INSTALL CONSTRUCTION WARNING SIGNS AND FENCING.
3. CONTRACTOR SHALL PARTICIPATE IN A PRE-CONSTRUCTION SITE MEETING WITH THE PROJECT ENGINEER TO REVIEW CONSTRUCTION DETAILS, PERMIT REQUIREMENTS, CONTRACT PROVISIONS, SPECIFICATIONS AND PROJECT LIMITS.
4. SUBMIT ANTICIPATED WORK SCHEDULE TO THE PROJECT ENGINEER PRIOR TO THE COMMENCEMENT OF WORK. THE PROJECT ENGINEER SHALL BE NOTIFIED OF ANY CHANGES IN SCHEDULE IMMEDIATELY.
5. THE FINAL LOCATION OF THE PROPOSED STRUCTURES SHALL BE DETERMINED IN THE FIELD BY PROJECT ENGINEER PRIOR TO CONSTRUCTION.
6. THE ELEVATIONS PROPOSED FOR THE STRUCTURE BOTTOM INVERT, CHANNEL INVERT, AND STREAM BED MAY BE ADJUSTED SLIGHTLY BY PROJECT ENGINEER BASED ON FIELD CONDITIONS.
7. PERFORM MINIMAL MODIFICATIONS TO THE SITE TO ALLOW EQUIPMENT ACCESS. ALL SITE ACCESS IMPROVEMENTS AND/OR MODIFICATIONS PROPOSED BY THE CONTRACTOR, AS WELL AS THE TYPE OF EQUIPMENT THAT IS PROPOSED, SHALL BE APPROVED BY THE TOWN AND PROJECT ENGINEER PRIOR TO CONSTRUCTION.
8. TEMPORARY STOCKPILE AND STAGING AREAS ARE TO BE FLAGGED BY CONTRACTOR PRIOR TO CONSTRUCTION AND APPROVED BY THE PROJECT ENGINEER.
9. ALL PROPOSED GRADES AND SPOT ELEVATIONS IN PLAN VIEW INDICATE FINISHED GRADE. THE NEED TO MODIFY PROPOSED FINISHED GRADES MAY BE REQUIRED IF UNEXPECTED CONDITIONS ARE ENCOUNTERED (E.G., BEDROCK, LEDGE, ETC.). CONSULT PROJECT ENGINEER FOR ANY RECOMMENDED CHANGES.
10. CLEAR AND GRUB TOP AND SIDE SLOPES OF THE EXISTING ROAD EMBANKMENT WITHIN THE ESTABLISHED LIMITS OF CLEARING. ALL CLEARING AND GRUBBING MATERIALS SHALL BE DISPOSED OF AT AN APPROVED SITE. STOCKPILE GRUBBING TO BE REUSED FOR SITE RECOVERY.
11. NO DISTURBANCE BEYOND THE ESTABLISHED LIMITS OF CLEARING IS ALLOWED UNLESS PRIOR PERMISSION IS OBTAINED FROM THE PROJECT ENGINEER.
12. CONTRACTOR MUST COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL PERMITS AND REGULATIONS THROUGHOUT THE DURATION OF PROJECT.
13. AT THE END OF EACH WORK DAY, THE CONTRACTOR SHALL PROVIDE A FORM OF BARRIER OR CONSTRUCTION FENCING AT THE SITE TO PREVENT MOTORIZED VEHICLE ACCESS.
14. CLOSE ROAD IN COORDINATION WITH THE TOWN OF WARREN AND PROJECT ENGINEER.
15. ALL PRECAUTIONS SHALL BE TAKEN TO PREVENT THE POTENTIAL TRANSPORT OF INVASIVE SPECIES TO THE CONSTRUCTION SITE. THE CONTRACTOR SHALL INSPECT AND CLEAN ALL EQUIPMENT PRIOR TO TRANSPORT TO THE CONSTRUCTION SITE.
16. CONSTRUCTION IS TO TAKE PLACE DURING LOW WATER CONDITIONS. A WATER CONTROL PLAN HAS BEEN PROVIDED. THE CONTRACTOR SHALL BE PREPARED TO PROVIDE WATER HANDLING AS SPECIFIED IN THE WATER CONTROL PLAN SHOULD THE NEED ARISE DURING THE CONSTRUCTION. ANY CHANGES OR MODIFICATIONS TO THE WATER HANDLING APPROACH BY THE CONTRACTOR IS SUBJECT TO REVIEW AND APPROVAL BY THE PROJECT ENGINEER.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MONITORING THE WEATHER FORECASTS AND SHALL BE RESPONSIBLE FOR STABILIZING THE SITE AND REMOVING EQUIPMENT FROM FLOOD PRONE AREAS IN THE EVENT OF FLOOD WARNINGS. A FLOOD CONTINGENCY AND EMERGENCY ACTION PLAN SHALL BE PROVIDED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
18. ALL EQUIPMENT USED IN OR NEAR TO THE WATER SHALL HAVE TIGHT SEALS, AND SHALL NOT POLLUTE THE WATER.
19. NO CONSTRUCTION VEHICLES SHALL BE STORED, SERVICED, WASHED OR FLUSHED IN A LOCATION WHERE LEAKS, SPILLAGE, WASTE MATERIALS, CLEANERS, OR WATERS WILL BE INTRODUCED OR FLOW INTO WETLANDS, WATERCOURSES, OR STORM DRAINAGE SYSTEM. AN EMERGENCY MANAGEMENT PLAN AND SPILL KIT WILL BE MAINTAINED ON SITE AT ALL TIMES. IN THE EVENT OF AN ACCIDENTAL RELEASE, IMMEDIATELY STOP CONSTRUCTION WORK, CONTAIN THE SPILL, AND NOTIFY APPROPRIATE AUTHORITIES AND PROJECT ENGINEER.
20. ANY MATERIAL EXPORTED OFF-SITE SHALL BE LEGALLY DISPOSED OF IN AN UPLAND LOCATION AT NO ADDITIONAL COST. THE CONTRACTOR IS RESPONSIBLE FOR FINDING A SUITABLE RECIPIENT OF THE MATERIAL, GAINING REGULATORY APPROVAL FOR EXPORTED MATERIAL PLACEMENT IF NEEDED, AND HAULING.
21. ALL AREAS SURROUNDING THE PROJECT SITE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED UPON COMPLETION OF CONSTRUCTION. THE RESTORATION OF THE SITE IS SUBJECT TO APPROVAL BY THE TOWN AND THE PROJECT ENGINEER.
22. THE LOCATION OF ALL EXISTING UTILITIES SHOULD BE CONFIRMED PRIOR TO BEGINNING CONSTRUCTION. CALL "DIG SAFE" AT 1-888-DIG-SAFE (344-7233) A MINIMUM OF 3 DAYS PRIOR TO DIGGING. ALL UTILITY LOCATIONS THAT DO NOT MATCH THE VERTICAL OR HORIZONTAL CONTROL SHOWN ON THE PLANS OR CONFLICT WITH THE PROPOSED CONSTRUCTION SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE TOWN AND PROJECT ENGINEER FOR RESOLUTION. APPROPRIATE ACTION SHALL BE DETERMINED AND AGREED UPON BY THE PROJECT ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
23. FOLLOWING COMPLETION OF CONSTRUCTION, THE CONTRACTOR SHALL PARTICIPATE IN A FINAL INSPECTION WITH THE PROJECT ENGINEER FOR THE PURPOSE OF DETERMINING THAT THE PROJECT HAS BEEN COMPLETED ACCORDING TO THE CONSTRUCTION DRAWINGS AND THE TERMS AND CONDITIONS OF THE CONTRACT.
24. THE CONTRACTOR SHALL VISIT THE PROJECT SITE WITH THE PROJECT ENGINEER FOLLOWING THE FIRST HIGH FLOW TO OBSERVE SITE CONDITIONS. EROSION AND/OR AOP PROBLEMS WILL BE CORRECTED IF THEY ARE PRESENT. THIS WOULD LIKELY OCCUR WITHIN 6 MONTHS OF PROJECT COMPLETION AND COULD RESULT IN MAXIMUM OF 1 DAY OF MACHINE TIME TO FINE TUNE STRUCTURE OR ROAD.



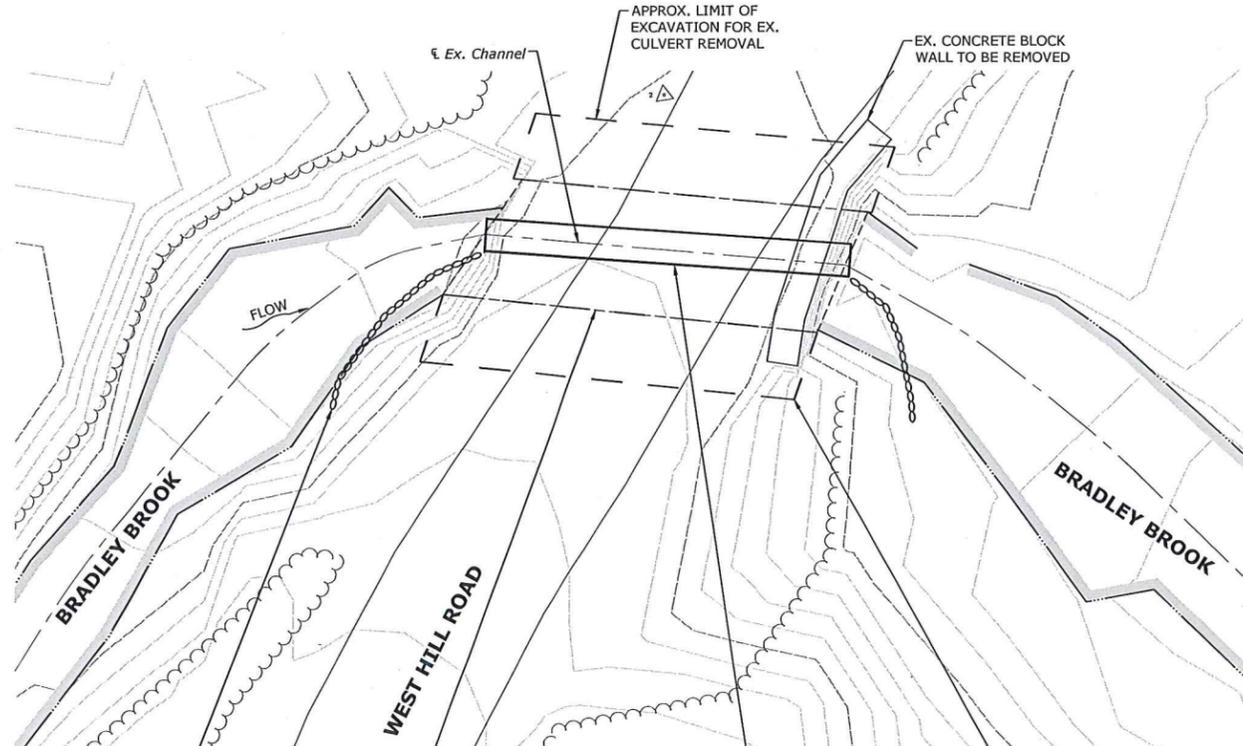
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DESCRIPTION	DATE	BY

SITE PLAN - PROPOSED CONDITIONS
 BRADLEY BROOK AOP RESTORATION
 WEST HILL ROAD
 WARREN, VERMONT

BMC/RKS	BMC	RKS
DESIGNED	DRAWN	CHECKED
SCALE	1"=10'	
DATE	JUNE 12, 2015	
PROJECT NO.	5094-02	
DRAWING NO.	03 OF 08	
SP-2		
SHEET NO.		

1.0000 - 10' = 10'-0" SCALE
 1.0000 - 10' = 10'-0" SCALE
 1.0000 - 10' = 10'-0" SCALE



STAGE I
SCALE: 1"=10'-0"

WATERSHED MANAGEMENT DIVISION

APPROVAL

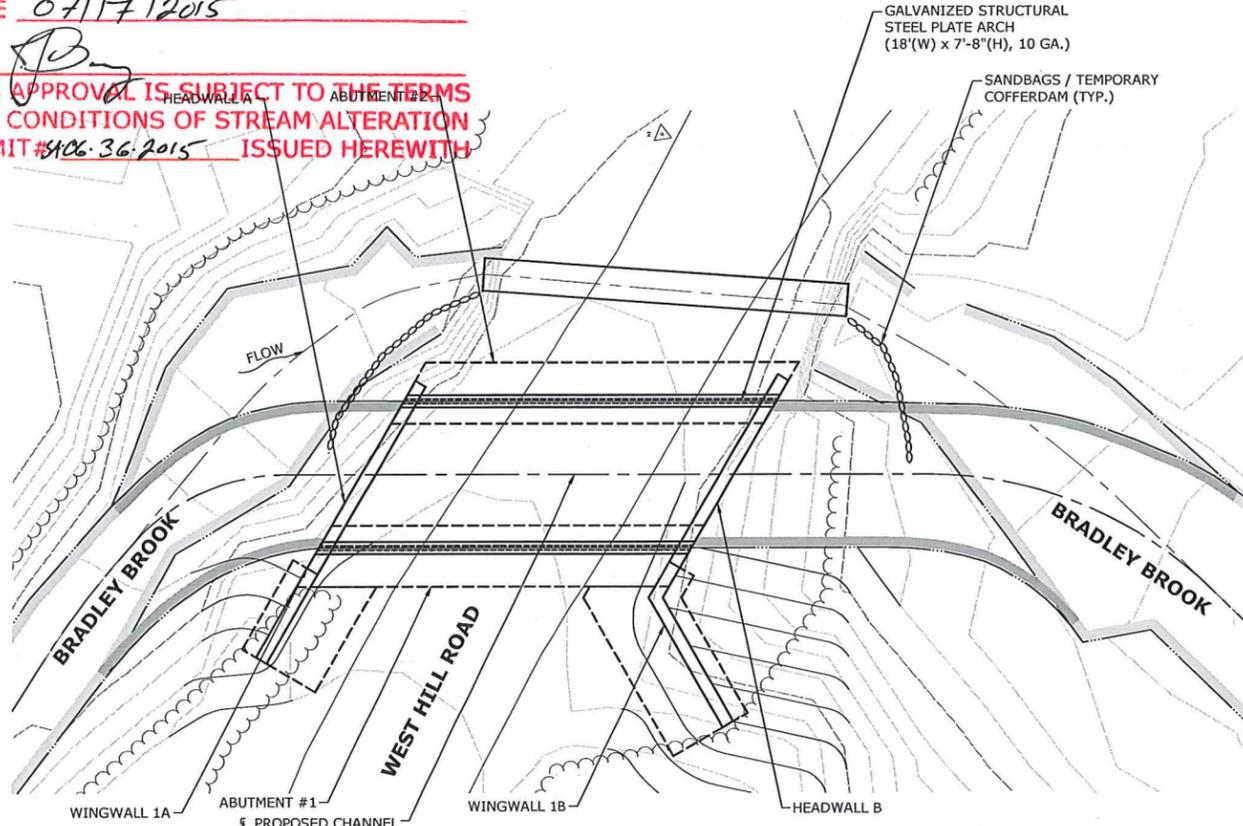
EX. CULVERT TO BE REMOVED AS NECESSARY TO INSTALL ABUTMENT #2

SANDBAGS / TEMPORARY COFFERDAM (TYP.)

DATE 07/17/2015

BY [Signature]

THIS APPROVAL IS SUBJECT TO THE TERMS AND CONDITIONS OF STREAM ALTERATION PERMIT # 406-36-2015 ISSUED HEREWITH



STAGE II
SCALE: 1"=10'-0"

WATER CONTROL NOTES:

1. THE PROPOSED WATER CONTROL PLAN IS PROVIDED AS A RECOMMENDED APPROACH. THE CONTRACTOR IS RESPONSIBLE FOR SUBMITTING A PROPOSED CONSTRUCTION SEQUENCE TO THE PROJECT ENGINEER FOR APPROVAL PRIOR TO THE START OF CONSTRUCTION
2. WORK DURING LOW WATER.
3. OK TO WORK IN WET, YET MINIMIZE RIVER CHANNEL DISTURBANCE. WORK ON PLATFORM OF RIVER COBBLE ADEQUATE.
4. INSTALL WATER DIVERSION AS SHOWN IN PLAN STAGE I, II & III OR PUMP AROUND PRACTICE.
5. CONTINUE WATER DIVERSION OR PUMP AROUND PRACTICE UNTIL WORK IS COMPLETE.
6. THERE SHALL BE NO CLAIMS FOR EXTRA COMPENSATION FOR PROJECT DELAYS DUE TO WATER CONTROL ASSOCIATED WITH HIGH WATER LEVELS FROM NATURAL EVENTS SUCH AS FLOODS.

CONSTRUCTION SEQUENCE NOTES:

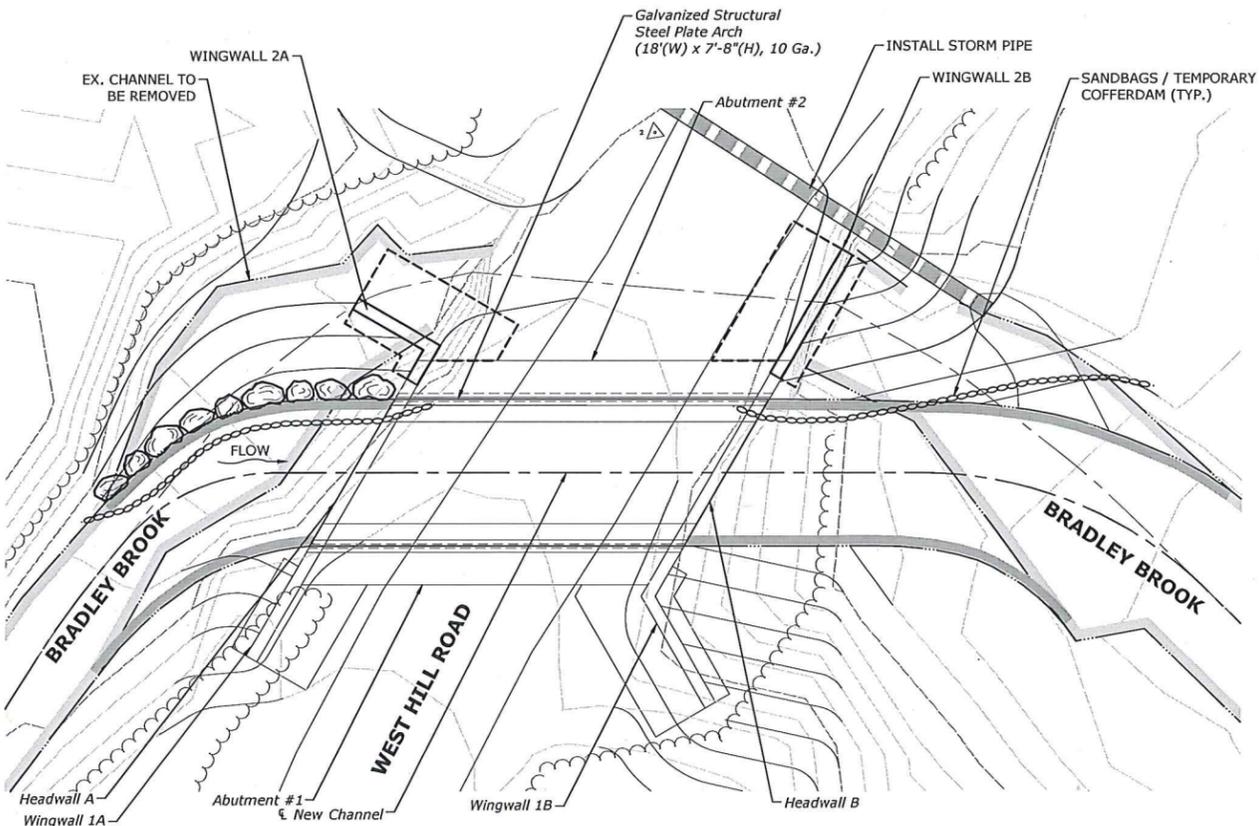
- STAGE I**
1. INSTALL SEDIMENT & EROSION CONTROLS AS REQUIRED.
 2. REMOVE EXISTING CONCRETE BLOCK WALL.
 3. REMOVE EXISTING CULVERT AS NECESSARY TO INSTALL ABUTMENT #2.
 4. INSTALL TEMPORARY WATER HANDLING PIPE.
 5. INSTALL SANDBAGS / TEMPORARY COFFERDAM TO DIVERT WATER PER PLANS.
- STAGE II**
1. EXCAVATE FOR ABUTMENTS, WINGWALLS & CHANNEL PER PLANS AND STOCKPILE MATERIAL FOR REUSE.
 2. INSTALL CONCRETE ABUTMENTS 1 & 2 PER PLANS.
 3. INSTALL NEW GALVANIZED STRUCTURAL STEEL PLATE ARCH CULVERT.
 4. INSTALL CAST-IN-PLACE CONCRETE HEADWALLS A & B, AND CAST-IN-PLACE WINGWALLS 1A & 1B.
 5. GRADE CHANNEL & BANKS PER PLANS UP TO ABUTMENT 1 AND WINGWALLS 1A & 1B USING STOCKPILE MATERIAL.
- STAGE III**
1. REMOVE & REINSTALL SANDBAGS / TEMPORARY COFFERDAM TO DIVERT WATER INTO NEW CHANNEL PER PLANS OR PUMP WATER AROUND.
 2. REMOVE TEMPORARY WATER HANDLING PIPE CULVERT.
 3. EXCAVATE FOR WINGWALLS 2A & 2B PER PLANS AND STOCKPILE MATERIAL FOR REUSE.
 4. INSTALL CAST-IN-PLACE CONCRETE WINGWALLS 2A & 2B.
 5. CONSTRUCT REMAINING PORTIONS OF PROPOSED CONDITIONS PER PLANS.
 6. GRADE REMAINING CHANNEL BANKS PER PLANS. RESTORE ROADWAY OVER NEW CULVERT.
 7. REMOVE SANDBAGS / TEMPORARY COFFERDAM.
 8. REMOVE SEDIMENT & EROSION CONTROLS.
 9. RESTORE SITE (SEE SITE RESTORATION NOTES).
- NOTE**
1. CONTRACTOR MAY SUBMIT ALTERNATE CONSTRUCTION SEQUENCE TO THE ENGINEER FOR APPROVAL.
 2. WORK TO BE COMPLETED DURING LOW FLOW.

SEDIMENT & EROSION CONTROL NOTES:

1. THE SEDIMENT AND EROSION CONTROL PRACTICES IMPLEMENTED AS PART OF THE PROJECT SHALL BE IMPLEMENTED AND MAINTAINED ACCORDING TO "THE LOW RISK SITE HANDBOOK FOR EROSION PROTECTION AND SEDIMENT CONTROL" GUIDANCE DOCUMENT FROM THE VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION, WHERE APPLICABLE IN CONSULTATION WITH PROJECT ENGINEER.
2. THE PROJECT IS LOCATED SO RUNOFF WILL BE MOSTLY CONTAINED WITHIN THE PROPOSED STRUCTURE EXCAVATION AND DIRTY WATER PRODUCED DURING CONSTRUCTION WILL BE TREATED AS SHOWN ON PLANS. EROSION CONTROLS NEEDED INCLUDE: DEWATERING BASINS AND POSSIBLY LIMITED SILT FENCING IF SEDIMENT MIGRATION IS OBSERVED DURING CONSTRUCTION, AS DETERMINED BY THE PROJECT ENGINEER IN THE FIELD.
3. THE LIMITS OF DISTURBANCE SHALL BE CLEARLY MARKED IN THE FIELD FOR REVIEW BY THE PROJECT ENGINEER.
4. LIMIT SOIL DISTURBANCE. NO DISTURBED SOIL SURFACES SHALL BE ALLOWED TO REMAIN EXPOSED FOR MORE THAN 7 CONSECUTIVE DAYS.
5. THE CONTRACTOR SHALL MAINTAIN ALL STREETS, SIDEWALKS, AND WALKWAYS IN THE AREA FREE OF SOIL, MUD AND CONSTRUCTION DEBRIS.
6. EXCAVATION AND MOVING OF MATERIAL SHOULD MINIMIZE SPILLING MATERIAL IN THE RIVER, BUCKETS ARE NOT TO OVERFLOW AND SPILL MATERIAL.
7. THE CONTRACTOR IS RESPONSIBLE FOR THE MAINTENANCE OF ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES. THE CONSTRUCTION INSPECTOR WILL VERIFY THE MAINTENANCE ON A PREDETERMINED SCHEDULE AND AFTER RAINFALL EVENTS OF 0.5 INCH OR GREATER.
8. WITHIN 48 HOURS OF FINAL GRADING, EXPOSED SOIL NOT PROTECTED BY STONE RIPRAP MUST BE SEEDED AND MULCH (SEE SITE RESTORATION NOTES).
9. THE SITE SHOULD BE KEPT CLEAN OF LOOSE DEBRIS, LITTER, AND BUILDING MATERIALS.
10. A COPY OF ALL PLANS AND REVISIONS, APPLICABLE PERMITS, AND THE SEDIMENT AND EROSION CONTROL PLAN SHALL BE MAINTAINED ON-SITE BY THE CONTRACTOR AT ALL TIMES DURING CONSTRUCTION.

SITE RESTORATION NOTES:

1. THIS WORK SHALL CONSIST OF RESTORING THE PROJECT SITE, ACCESS ROUTE, AND ALL OTHER AREAS DISTURBED DURING CONSTRUCTION TO PRE-CONSTRUCTION CONDITIONS TO THE EXTENT POSSIBLE. IN ADDITION, THE FOLLOWING SPECIFICATIONS APPLY.
2. RE-CREATE NATIVE STREAMBED WITH MIX OF PARTICLE SIZES THROUGH STRUCTURE AND ON ALL DISTURBED ADJACENT STREAMBED. ROUGHEN CHANNEL WITH RANDOM BOULDER CLUSTERS, WHERE NECESSARY, REFER TO CHANNEL AWAY FROM ROAD FOR EXAMPLE (VTRANS SPECIFICATION 203.27 FOR CHANNEL EXCAVATION).
3. ALL DISTURBED AREAS SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITIONS UPON COMPLETION OF WORK, INCLUDING BUT NOT LIMITED TO ANY STOCKPILE AND STAGING AREAS, CONSTRUCTION EQUIPMENT PARKING AREAS, AND ANY OTHER AREAS DISTURBED OR DAMAGED DURING CONSTRUCTION. RESTORATION MAY INCLUDE LIGHT GRADING, TOPSOIL AND SEED, MULCH, AND/OR PATCHING OF ROAD SURFACE. ANY PATCHING OF THE GRAVEL ROADWAY SHALL USE MATCHING MATERIAL, AS SPECIFIED BY THE TOWN.
4. REAPPLY STOCKPILED GRUBBING MATERIAL TO A DEPTH OF 6" MINIMUM AT ALL DISTURBED AREAS, ACCORDING TO VTRANS SPECIFICATION 651.07.
5. APPLY EROSION CONTROL BLANKET TO SLOPES STEEPER THAN 2:1 SLOPE. USE BIONET SHORT TERM BIODEGRADABLE EROSION CONTROL BLANKETS ITEM NUMBER S150BN, AS MANUFACTURED BY NORTH AMERICAN GREEN, 5401 ST. WENDEL-CYNTHIANA ROAD, ROSELVILLE, IN 47623, OR APPROVED EQUAL. INSTALL EROSION CONTROL BLANKET ACCORDING TO MANUFACTURER'S INSTRUCTIONS AND SPECIFICATIONS.
6. ALL DISTURBED AREAS TO BE RE-VEGETATED SHALL BE SEEDED AND PROTECTED FROM EROSION AS SOON AS PRACTICAL ONCE FINISH GRADE IS ACHIEVED. REVEGETATION PROCEDURES SHOULD FOLLOW VTRANS SPECIFICATION 651 FOR TURF ESTABLISHMENT.
7. SEED MIX FOR RESTORING ALL DISTURBED AREAS WITHIN THE PROJECT SITE SHALL BE NEW ENGLAND CONSERVATION / WILDLIFE MIX (PROVIDED BY NEW ENGLAND WETLAND PLANTS, INC, 820 WEST STREET, AMHERST, MA 01002, OR APPROVED EQUAL) APPLIED AT A RATE OF 25 POUNDS PER ACRE OR APPROVED EQUAL. CONTRACTOR SHALL PROVIDE A LIST OF SPECIES INCLUDED IN THE MIX PRIOR TO APPLICATION FOR REVIEW AND APPROVAL BY THE PROJECT ENGINEER. SEED QUALITY WILL CONFORM TO VTRANS SPECIFICATION 755.04.
8. ALL SEEDED AREAS WILL BE COVERED WITH HAY MULCH ACCORDING TO VTRANS SPECIFICATION 755.10, APPLIED AT A RATE OF 2 TONS/ACRE, AND MECHANICALLY ANCHORED.
9. ALL RESTORATION WORK IS SUBJECT TO FINAL APPROVAL BY THE TOWN AND PROJECT ENGINEER.



STAGE III
SCALE: 1"=10'-0"



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DESCRIPTION	DATE

WATER HANDLING PLAN & NOTES

BRADLEY BROOK AOP RESTORATION

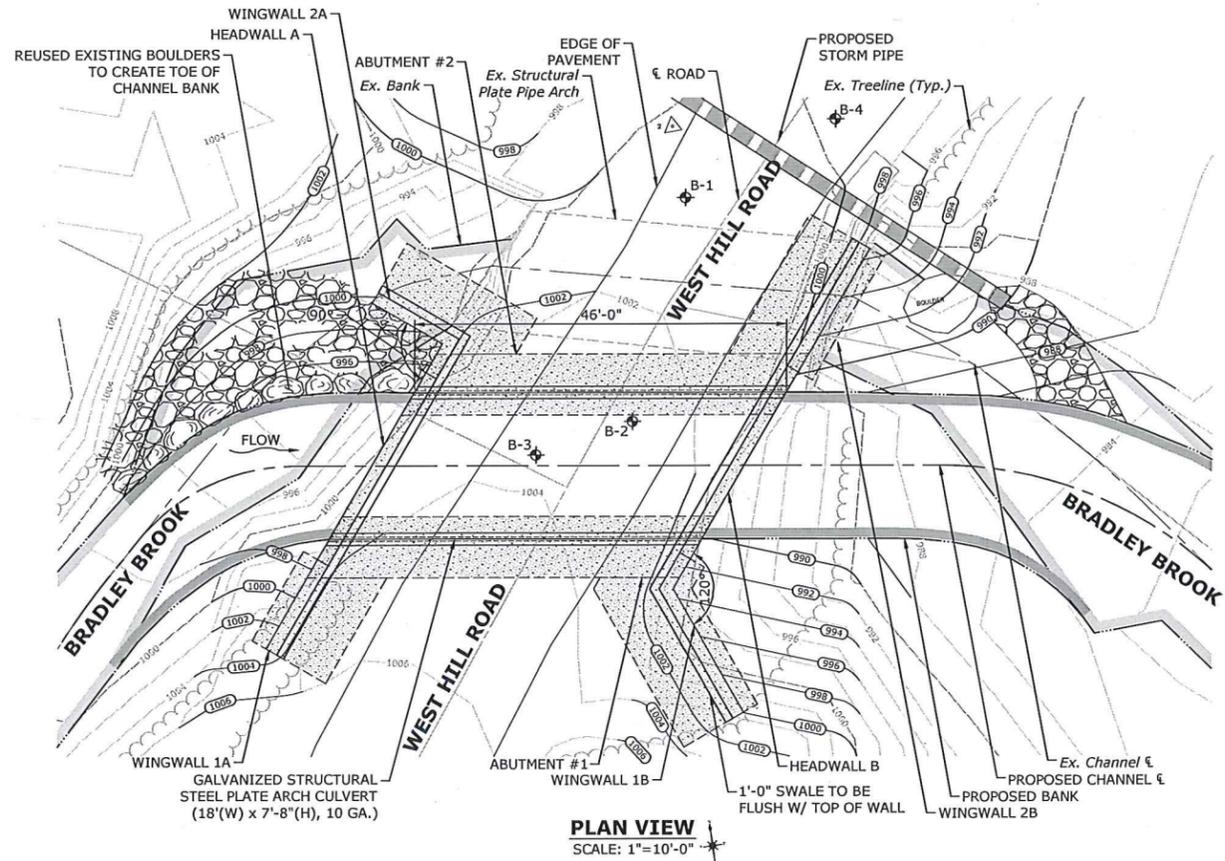
WEST HILL ROAD

WARREN, VERMONT

KP <small>DESIGNED</small>	NP <small>DRAWN</small>	KP <small>CHECKED</small>
AS NOTED		
SCALE		
DATE		
PROJECT NO.		
DRAWING NO.		

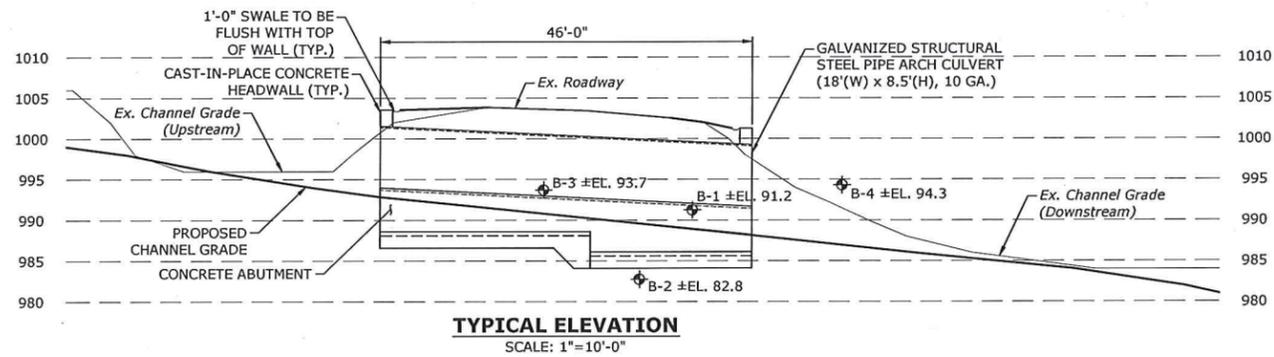
SE-1

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PLAN VIEW
SCALE: 1"=10'-0"

APPROVAL
WATERSHED MANAGEMENT DIVISION
DATE 07/17/2015
BY [Signature]
THIS APPROVAL IS SUBJECT TO THE TERMS
AND CONDITIONS OF STREAM ALTERATION
PERMIT # SA-06-36-2015 ISSUED HEREWITH



TYPICAL ELEVATION
SCALE: 1"=10'-0"

NOTE
CHANNEL BED SHOWN @ CENTER OF CULVERT,
FOOTING IS SHOWN BEYOND.

GENERAL STRUCTURAL NOTES:

ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO STATE OF VERMONT AGENCY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION, DATED 2011, AND ITS LATEST REVISIONS, AND THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, DATED 2007, AND ITS LATEST REVISIONS.

TYPICAL DETAILS AND NOTES ON THESE DRAWINGS SHALL APPLY UNLESS SPECIFICALLY SHOWN OR NOTED OTHERWISE. CONSTRUCTION DETAILS NOT FULLY SHOWN OR NOTED SHALL BE SIMILAR TO DETAILS SHOWN FOR OTHER SIMILAR CONDITIONS.

IF ANY CONDITIONS ARISE DURING CONSTRUCTION THAT PRECLUDE COMPLIANCE WITH THE DETAILS SHOWN ON THESE DRAWINGS, THE WORK IN THE AFFECTED AREAS SHALL CEASE AND THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY.

THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR EXCAVATION PROCEDURES, SHORING, AND PROTECTION. FOUNDATION EXCAVATIONS SHALL BE REVIEWED AND ACCEPTED BY THE ENGINEER OR HIS REPRESENTATIVE PRIOR TO THE PLACEMENT OF ANY REINFORCING STEEL OR CONCRETE.

CONCRETE NOTES:

ALL PORTIONS OF THE SPILLWAY SHALL BE "CONCRETE, HIGH PERFORMANCE - CLASS B".

THE MINIMUM COVER FOR REINFORCING STEEL IN THE SUBSTRUCTURE SHALL BE THREE INCHES ALONG WALL FACES AGAINST EARTH, AND TWO INCHES ELSEWHERE UNLESS NOTED OTHERWISE.

REINFORCING STEEL PLACEMENT TOLERANCES SHALL BE AS FOLLOWS:

SPACING +/- 1"
CLEARANCE +/- 1/4"

REINFORCING SHALL CONFORM TO ASTM A615 GRADE 60. REINFORCING STEEL SHALL BE CONTINUOUS AND SHALL BE FABRICATED AND PLACED IN ACCORDANCE WITH ACI 318, LATEST EDITION.

NOTE:

* CONCRETE HEADWALLS SHALL BE DESIGNED & BUILT PER CULVERT MANUFACTURER'S RECOMMENDATIONS.

* NO GUARDRAIL WAS PROPOSED AT THE TOWNS REQUEST.

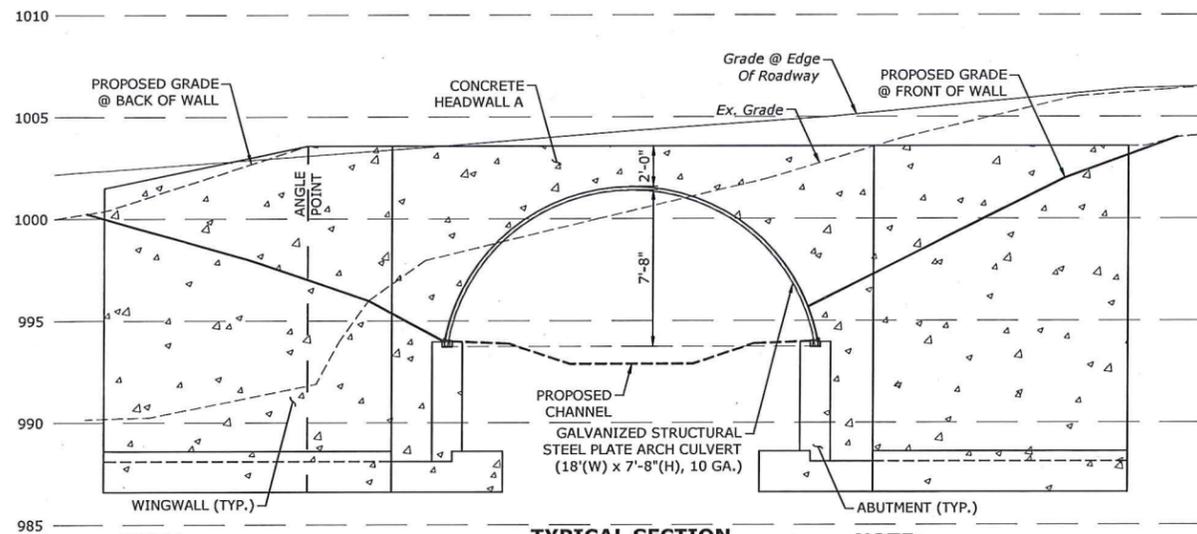
BACKFILL SPECS:

1. **GRANULAR BACKFILL FOR STRUCTURES:** GRANULAR BACKFILL FOR STRUCTURES SHALL BE OBTAINED FROM APPROVED SOURCES, IT SHALL CONSIST OF SATISFACTORILY GRADED, FREE DRAINING GRANULAR MATERIAL REASONABLY FREE FROM LOAM, SILT, CLAY, AND ORGANIC MATERIAL.

COMPACT ALL BACKFILL AROUND PIPE IN 6" LIFTS TO MINIMUM 95% AASHTO T99 STANDARD PROCTOR DENSITY. ASSURE VOIDS AND SOFT SPOTS DO NOT OCCUR UNDER THE HAUNCHES. BACKFILL HEIGHTS MUST NOT HAVE MORE THAN A TWO LIFT DIFFERENTIAL FROM ONE SIDE OF THE PIPE TO THE OTHER TO PREVENT DISTORTION DURING COMPACTION.

GRANULAR BACKFILL FOR STRUCTURES SHALL MEET THE GRADATION REQUIREMENTS OF THE FOLLOWING TABLE AS DETERMINED IN ACCORDANCE WITH AASHTO T27 AND AASHTO T11:

TABLE 704.08A	
GRANULAR BACKFILL FOR STRUCTURES	
SIEVE DESIGNATION	PERCENTAGE BY MASS (WEIGHT) PASSING SQUARE MESH SIEVES
75 mm (3 inch)	100
4.75 mm (No. 4)	45 TO 75
150 µm. (No. 100)	0 TO 12
75 µm. (No. 200)	0 TO 6



TYPICAL SECTION (UPSTREAM)
SCALE: 1/4"=1'-0"

NOTE:
GRADE AT BACK OF WALL TO BE FLUSH W/ SWALE (SEE ELEVATION VIEW).

NOTE:
FINAL SHAPE OF PROPOSED CHANNEL TO BE DETERMINED IN THE FIELD BY PROJECT ENGINEER. VARIATIONS IN CHANNEL BOTTOM EXPECTED TO MIMIC EXISTING NATURAL CHANNEL CONDITIONS.

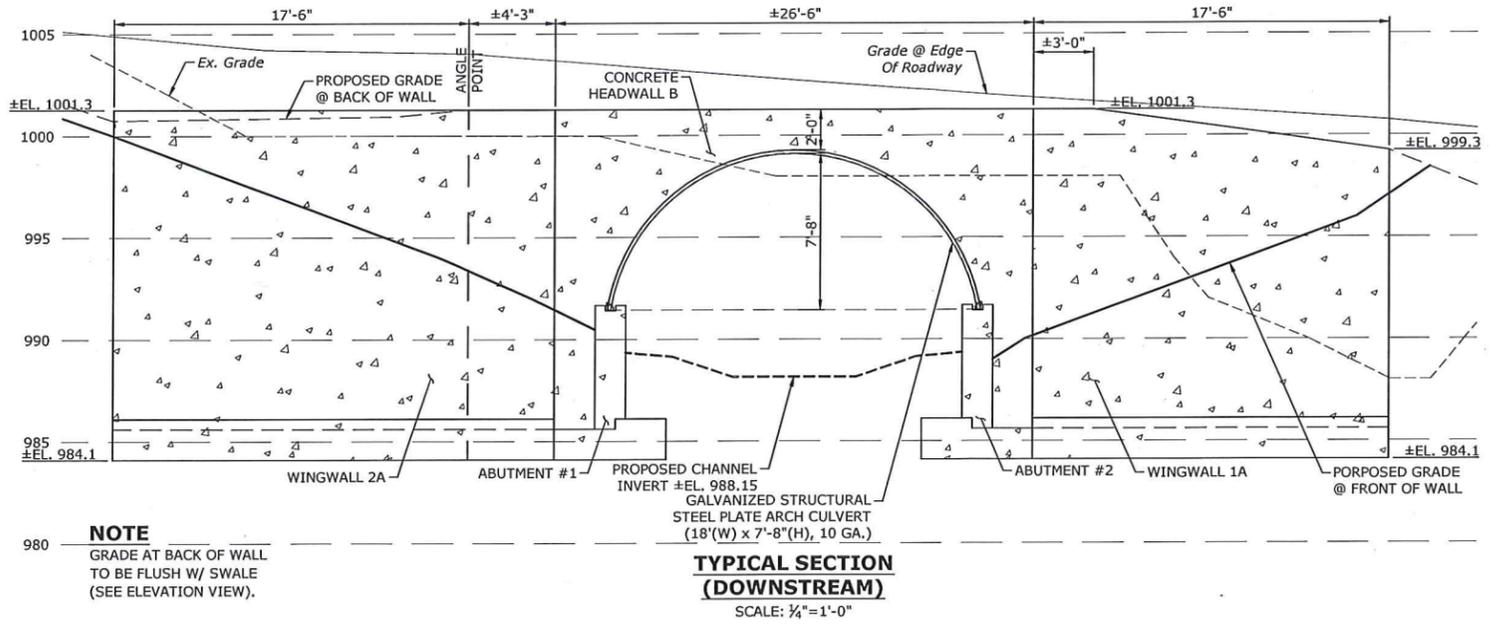
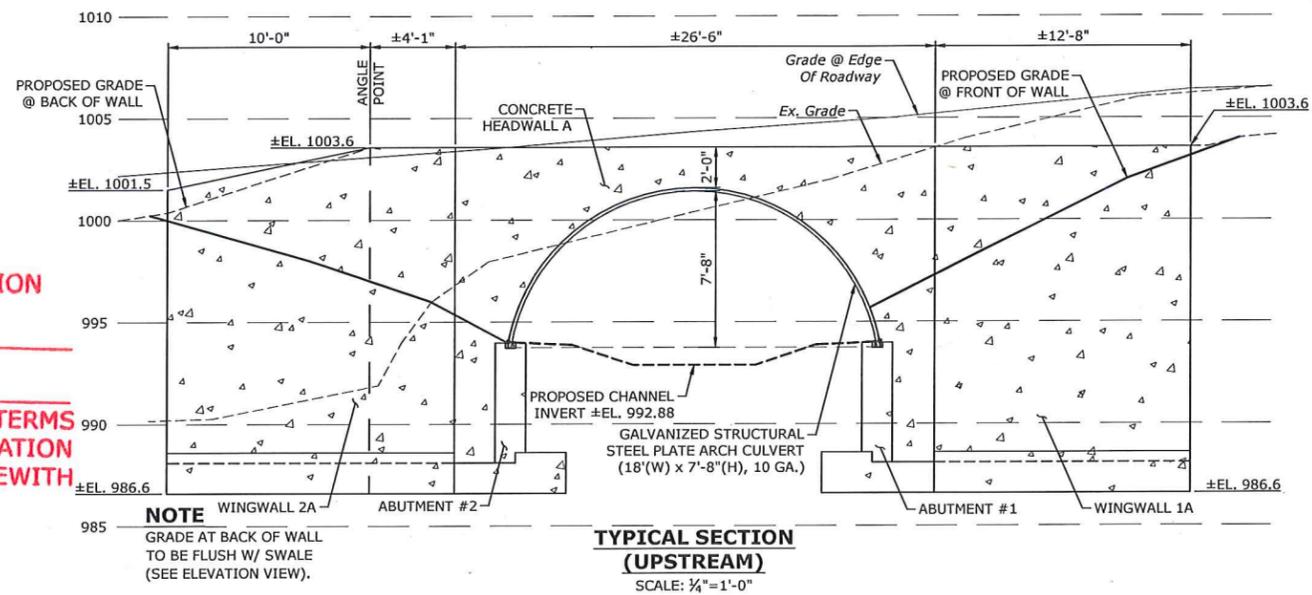
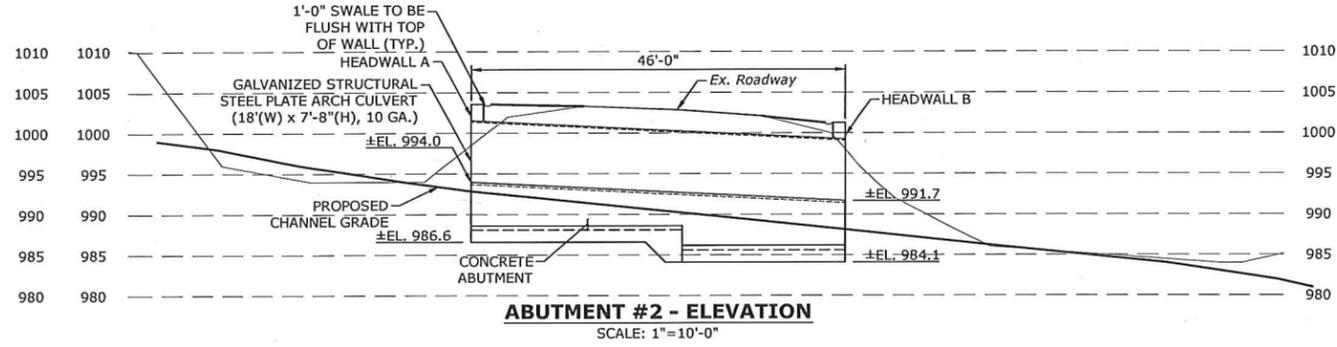
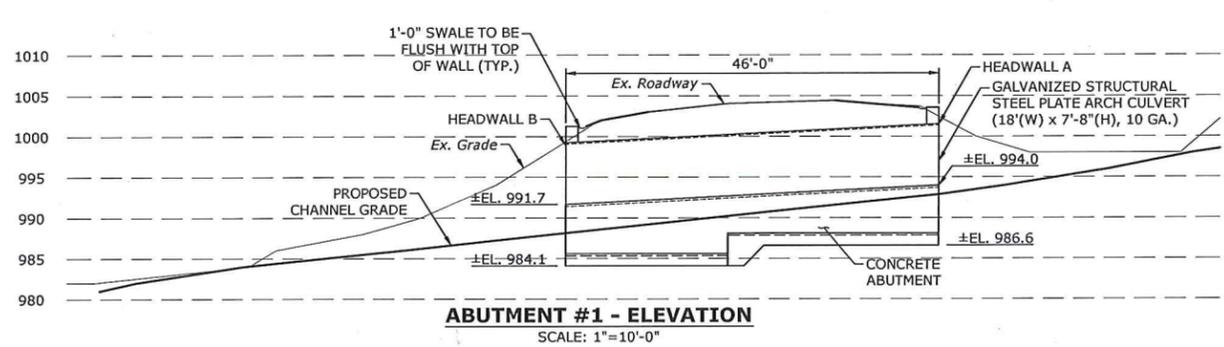
MILONE & MACBROOM
1 South Main Street, 2nd Floor
Waterbury, Vermont 05676
(802) 882-8335
Fax: (802) 882-8346
www.miloneandmacbroom.com

DESCRIPTION	DATE	BY

STRUCTURAL DETAILS
BRADLEY BROOK AOP RESTORATION
WEST HILL ROAD
WARREN, VERMONT

KP DESIGNED	NP DRAWN	KP CHECKED
AS NOTED		
DATE: JUNE 12, 2015		
PROJECT NO.: 5094-02		
DRAWING NO.: 05 OF 08		

STR-1



APPROVAL
WATERSHED MANAGEMENT DIVISION
DATE 07/17/2015
BY [Signature]
THIS APPROVAL IS SUBJECT TO THE TERMS AND CONDITIONS OF STREAM ALTERATION PERMIT # SA-06-36-2015 ISSUED HERewith

NOTE:
FINAL SHAPE OF PROPOSED CHANNEL TO BE DETERMINED IN THE FIELD BY PROJECT ENGINEER. VARIATIONS IN CHANNEL BOTTOM EXPECTED TO MIMIC EXISTING NATURAL CHANNEL CONDITIONS.

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FINAL SHAPE OF PROPOSED CHANNEL TO BE DETERMINED IN THE FIELD BY PROJECT ENGINEER. VARIATIONS IN CHANNEL BOTTOM EXPECTED TO MIMIC EXISTING NATURAL CHANNEL CONDITIONS.

MILONE & MACBROOM
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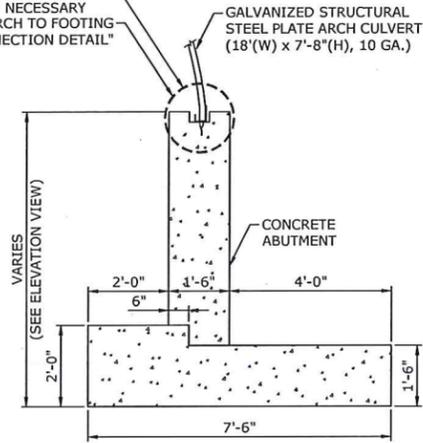
DESCRIPTION	DATE	BY

STRUCTURAL DETAILS
BRADLEY BROOK AOP RESTORATION
WEST HILL ROAD
WARREIM, VERMONT

KP	NP	KP
DESIGNED	DRAWN	CHECKED
AS NOTED		
SCALE		
DATE: JUNE 12, 2015		
PROJECT NO.: 5094-02		
DRAWING NO.: 06 OF 08		

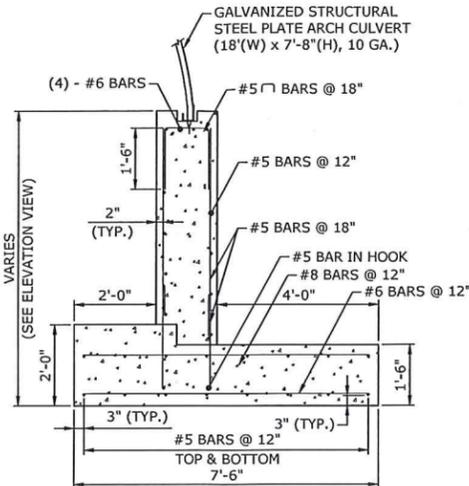
STR-2

FINAL LAYOUT & METHOD OF CONNECTION SHALL BE PER MANUFACTURERS RECOMMENDATIONS, CONTRACTOR TO MODIFY KEYWAY AS NECESSARY SEE "ARCH TO FOOTING CONNECTION DETAIL"

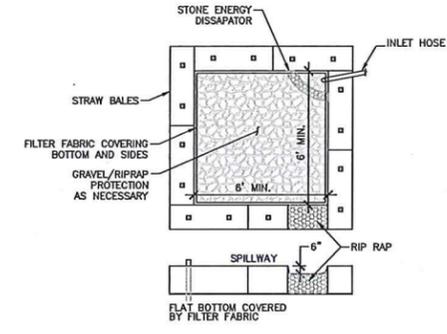


TYPICAL ABUTMENT SECTION
SCALE: 1/2"=1'-0"

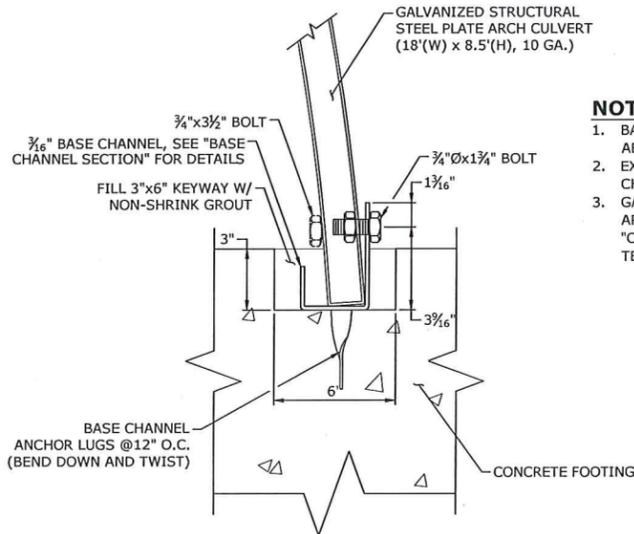
NOTE
SEE "REINFORCING SECTION"



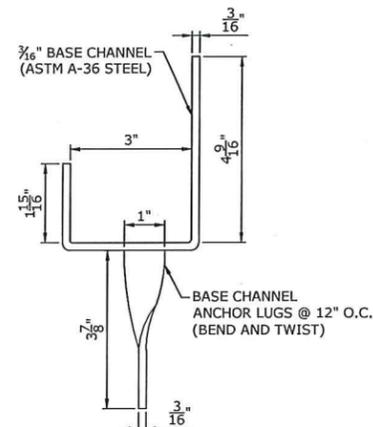
TYPICAL ABUTMENT REINFORCING
SCALE: 1/2"=1'-0"



TEMPORARY DEWATERING BASIN
NOT TO SCALE

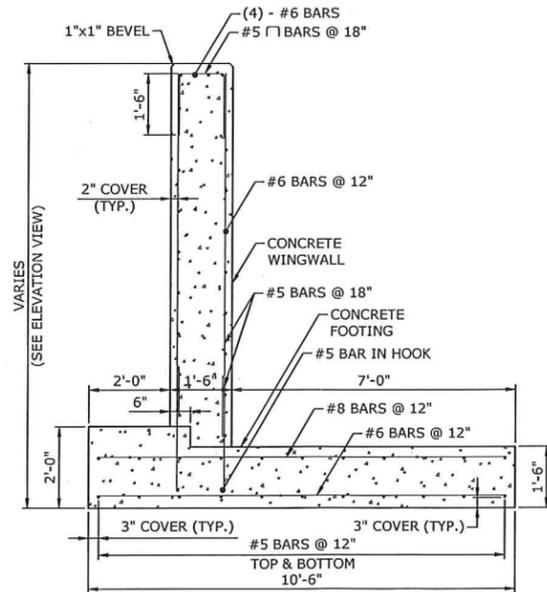


ARCH TO FOOTING CONNECTION DETAIL
SCALE: 3"=1'-0"



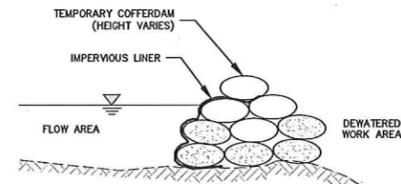
BASE CHANNEL SECTION
SCALE: 6"=1'-0"

- NOTES**
1. BASE CHANNEL SHALL BE FORMED INTO ABUTMENT PRIOR TO CONCRETE POUR.
 2. EXACT LOCATION AND NUMBER OF CHANNELS PER MANUFACTURER
 3. GALVANIZED STRUCTURAL PLATE PIPE ARCH TO BE MANUFACTURED BY "CONTECH ENGINEERED SOLUTIONS, LLC", TEL. 802-233-9912, OR APPROVED EQUAL.



TYPICAL WINGWALL SECTION
SCALE: 1/2"=1'-0"

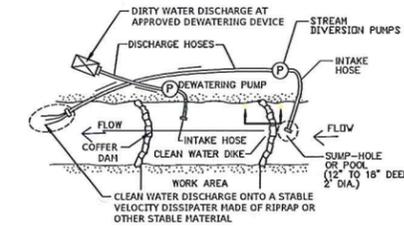
APPROVAL
WATERSHED MANAGEMENT DIVISION
DATE 07/17/2015
BY [Signature]
THIS APPROVAL IS SUBJECT TO THE TERMS AND CONDITIONS OF STREAM ALTERATION PERMIT # 51-06-36-2015 ISSUED HEREWITH



TEMPORARY COFFERDAM DETAIL
NOT TO SCALE

NOTES:

1. COFFER DAM AND PUMP SYSTEM TO BE SIZED FOR NORMAL FLOW CONDITIONS.
2. COFFER DAM CAN BE CONSTRUCTED OF SANDBAGS AS SHOWN HERE, CONCRETE JERSEY BARRIERS, OR PILED RIVER SEDIMENT. RIVER SEDIMENT IS EXPECTED TO BE ABLE TO BE USED ON THIS PROJECT SITE.
3. COFFERDAM MUST BE AT LEAST 1 FOOT TALLER THAN NORMAL WATER.



PUMP AROUND PRACTICE
NOT TO SCALE

DESCRIPTION	DATE	BY

STRUCTURAL & WATER HANDLING DETAILS
BRADLEY BROOK AOP RESTORATION
WEST HILL ROAD
WARREN, VERMONT

KP	NP	KP
DESIGNED	DRAWN	CHECKED
AS NOTED		
SCALE		
DATE JUNE 12, 2015		
PROJECT NO. 5094-02		
DRAWING NO. 07 OF 08		

STR-3

MILONE & MACBROOM
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