

Vermont Department of Environmental Conservation  
Watershed Management Division  
Rutland Regional Office  
88 Merchants Row, Suite 430 Asa Bloomer Building  
Rutland, VT 05701-5903

Agency of Natural Resources

<http://dec.vermont.gov/watershed/rivers>

[cell] 802-490-6163

[fax] 802-786-5915

## 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-09-020-2016**

Watercourse: **Unnamed Brook**

Applicant Name: **Town of Chester**

Email: [dpisha@vermontel.net](mailto:dpisha@vermontel.net)

Mailing Address: **PO Box 370, Chester, VT 05143**

Phone: **(802) 875-2173**

Project Location: **Potash Brook Rd, Chester, VT**

Lat/Lon: **N 43.271639 / W 72.669333**

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

1. This project authorizes under **Section C.2.2.5 - the replacement of an existing CMP with an open bottom AI Box.**
2. The proposed activity is eligible for coverage under the VT ANR Stream Alteration General Permit (SAGP).
3. The proposed activity will meet the terms and conditions of the General Permit provided:
  - a) The project will be completed **as described in the plans dated 08/01/2016, by Dufresne Group Consulting Engineers, and as discussed with the River Management Engineer.**
  - 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 is completed.
  - h) **Normal in-stream Time of Year (TOY) working dates for all SAGP activities are from July 1<sup>st</sup> through October 1<sup>st</sup>,** any in-stream work outside these dates will require an authorization by the River Management Engineer (RME).
  - i) This authorization has been posted for three working days public comment. This authorization constitutes final approval.

**Additional Conditions: Onsite preconstruction meeting is required prior to commencement of any instream work activities.**

If there are any changes in the project plan or deviation in construction from the approved plans, Permittee must notify the ANR River Management Engineer immediately via phone (802) 490-6962 or email [scott.jensen@vermont.gov](mailto:scott.jensen@vermont.gov)

*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 8<sup>th</sup> day of September, 2016

This permit expires on October 1, 2017.

Alyssa B. Schuren, Commissioner  
Department of Environmental Conservation

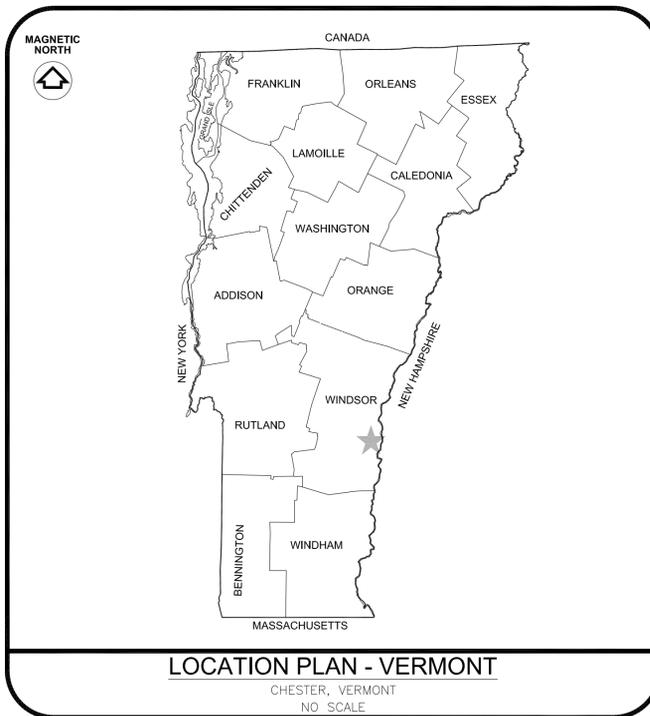
by: \_\_\_\_\_

Scott Jensen, P.E. River Management Engineer

# POTASH BROOK ROAD CULVERT REPLACEMENT #1

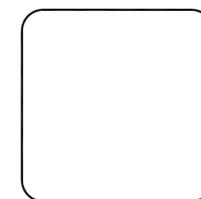
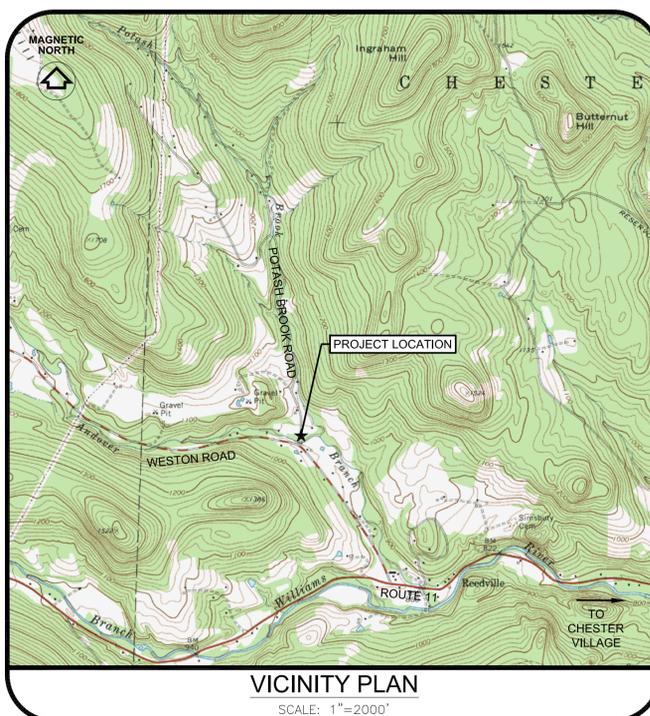
CHESTER, VERMONT

JUNE 15, 2016



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<b>SELECT BOARD</b>
JOHN DEBENEDETTI, CHAIRMAN
THOMAS BOCK, VICE CHAIRMAN
HEATHER CHASE
ARUNAS "ARNE" JONYAS
WILLIAM LINDSAY
<b>TOWN MANAGER</b>
DAVID PISHA
<b>HIGHWAY SUPERINTENDANT</b>
GRAHAM KENNEDY



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DUFRESNE GROUP  
CONSULTING ENGINEERS  
54 Main Street, Suite 200  
Springfield, Vermont 05156  
E-mail: info@dufresnegroup.com  
Web: dufresnegroup.com

Springfield, VT • Tel: (802) 674-2904 Fax: (802) 674-2913  
Barre, VT • Tel: (802) 479-3698  
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**GENERAL NOTES:**

1. SURVEY COMPLETED BY DUFRESNE GROUP IN MAY 2015. COORDINATE SYSTEM IS VERMONT STATE PLANE. VERTICAL DATUM IS NAVD88.
2. EXPLORATORY EXCAVATION IS REQUIRED TO LOCATE UNDERGROUND UTILITIES. CONTRACTOR SHALL USE EXTREME CAUTION TO PREVENT DAMAGE TO EXISTING UTILITIES. CONTRACTOR SHALL COORDINATE WITH DIG SAFE (1-888-DIG SAFE) A MINIMUM OF 72 HOURS PRIOR TO EXCAVATION.
4. ALL EXISTING UNDERGROUND UTILITIES WERE LOCATED USING THE BEST AVAILABLE INFORMATION. CONTRACTOR IS RESPONSIBLE FOR PROTECTION OF ALL UTILITIES WHETHER OR NOT THEY ARE SHOWN ON THE PLANS. ALL REPAIRS TO DAMAGED UTILITIES SHALL BE MADE BY THE CONTRACTOR USING MATERIALS APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
5. CONTRACTOR SHALL VERIFY LOCATION OF ALL OVERHEAD AND UNDERGROUND ELECTRIC, CABLE AND TELEPHONE LINES AND TAKE NECESSARY PRECAUTIONS IN STRICT ACCORDANCE WITH OSHA STANDARDS DURING CONSTRUCTION. CONTRACTOR SHALL CONTACT THE LOCAL POWER UTILITY AND TELEPHONE UTILITY REGARDING ANY NECESSARY SUPPORT OF ANY UTILITY POLES DURING CONSTRUCTION. LOCAL ELECTRIC UTILITY IS GREEN MOUNTAIN POWER. LOCAL PHONE UTILITY IS VERMONT TELEPHONE COMPANY.
7. GENERALLY HEAVY OR DARK LINE WORK OR NOTES REFER TO PROPOSED IMPROVEMENTS. LIGHT LINE WORK OR SCREENED GENERALLY DENOTES EXISTING FEATURES.
9. TECHNICAL SPECIFICATIONS PROVIDE NECESSARY INFORMATION AND ARE PART OF THE CONTRACT DOCUMENTS FOR THIS PROJECT.
8. ALL DISTURBED AREAS SHALL BE RESTORED TO CLASS A RESTORATION UNLESS OTHERWISE SHOWN. CONTRACTOR IS RESPONSIBLE FOR REMOVAL, CARE & REPLANTING OF ALL PLANTINGS AND SHRUBS DISTURBED DURING CONSTRUCTION.
9. THE CONTRACTOR SHALL BE REQUIRED TO STAKE OUT THE CULVERT AND MAINTAIN THE THREE DIMENSIONAL CONTROL OF THE SITE USING A COORDINATE SYSTEM AND ELEVATION THAT EXACTLY COINCIDES WITH THE DESIGN DRAWINGS.
10. THE CONTRACTOR SHALL CONSTRUCT A TEMPORARY STREAM CROSSING UPSTREAM OF THE EXISTING CULVERT AS SHOWN ON THE PLANS. POTASH BROOK ROAD TO THE NORTH OF THE PROJECT ARE DEAD END ROADS AND CLOSURE OF THE ROAD IS NOT ALLOWED. CONTRACTOR SHALL ERECT SAFETY BARRIERS AND INSTALL ADEQUATE EXCAVATION SUPPORT AS SPECIFIED AND LIMIT CONSTRUCTION ACTIVITIES TO THE CURRENT ACTIVE AREA TO ACCOMMODATE TRAFFIC IMMEDIATELY ADJACENT TO THE WORK AREA. CONTRACTOR SHALL SUBMIT DETOUR AND CONSTRUCTION SIGNAGE PLAN FOR APPROVAL PRIOR TO COMMENCING WORK.
11. CONTRACTOR TO USE EXTREME CAUTION WHEN EXCAVATING NEAR BUILDINGS AND OTHER STRUCTURES. ANY DAMAGE TO BUILDINGS AND STRUCTURES SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER AT NO ADDITIONAL COST TO THE OWNER.
12. THE CONTRACTOR'S EROSION PREVENTION AND SEDIMENT CONTROL MEASURES SHALL COMPLY WITH VERMONT STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION AND SEDIMENT CONTROL. THE CONTRACTOR SHALL REVIEW PROPOSED MEASURES WITH THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
13. REFER TO CIVIL AND STRUCTURAL DETAILS FOR CONSTRUCTION DETAILS.
14. CONTRACTOR'S STAGING AREA SHALL BE LOCATED WITHIN THE CONSTRUCTION EASEMENT AREAS DESIGNATED ON THESE PLANS.
15. REFER TO SPECIFICATIONS FOR BORING LOGS.
16. ADEQUATE PROTECTION OF THE CULVERT DURING CONSTRUCTION SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTOR SHALL FOLLOW AND COMPLY WITH ALL RECOMMENDATIONS AND REQUIREMENTS OF THE CULVERT MANUFACTURER INCLUDING, MAINTENANCE AND INSTALLING ADDITIONAL FILL OVER THE CULVERT TO PROTECT THE CULVERT FROM CONSTRUCTION LOADS.
17. ALL CONSTRUCTION ACTIVITIES SHALL BE CONFINED TO THE PUBLIC RIGHT-OF-WAY OR EASEMENT AREAS.

**ABBREVIATION LIST**

APPROX	APPROXIMATELY
BVCS	BEGINNING VERTICAL CURVE STATION
BVCE	BEGINNING VERTICAL CURVE ELEVATION
CL	CENTER LINE
CMP	CORRUGATED METAL PIPE
DIA	DIAMETER
ED	EDGE
ELEV	ELEVATION
EVCS	END VERTICAL CURVE STATION
EVCE	END VERTICAL CURVE ELEVATION
GND	GROUND
H	HORIZONTAL
INV	INVERT
OHW	OVERHEAD WIRE
PL	PROPERTY LINE
PT	POINT
PVI	POINT OF VERTICAL INTERSECTON
ROW	RIGHT-OF-WAY
STA	STATION
TBM	TEMPORARY BENCH MARK
TYP	TYPICAL
UG	UNDERGROUND
UP	UTILITY POLE
W	WATER LINE
V	VERTICAL
K	RATE OF VERTICAL CURVATURE

LEGEND	
<b>EXISTING:</b>	
	MAJOR CONTOUR
	MINOR CONTOUR
	RIGHT-OF-WAY
	EDGE OF GRAVEL ROAD/DRIVE
	BORING LOCATION
	CENTERLINE OF ROAD
	OVERHEAD WIRES
	STREAM FLOW DIRECTION
	EDGE OF STREAM
<b>PROPOSED:</b>	
	NEW REINFORCED CONCRETE WALL WITH FOOTING
	TYPE II RIP RAP
	GROUT
	CONCRETE STEM WALL/FOOTING
	CRUSHED STONE
	GRAVEL
	MAJOR CONTOUR
	MINOR CONTOUR
	SILT FENCE
	PROJECT DELINEATION FENCE
	DIVERSION SWALE
	GUARDRAIL



**DUFRESNE GROUP  
CONSULTING ENGINEERS**

56 Main Street, Suite 200  
Springfield, VT 05156  
E-mail: info@dufresnegroup.com  
Web: www.dufresnegroup.com

Springfield, VT • Tel: (802) 674-2904 Fax: (802) 674-2913  
Barre, VT • Tel: (802) 479-3698 Fax: (802) 479-2261  
St. Johnsbury, VT • Tel: (802) 748-8605 Fax: (802) 748-4512  
Manchester, VT • Tel: (802) 768-8291 Fax: (802) 768-6315

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REVISIONS	DATE	COMMENTS	BY	
			DATE	COMMENTS

POTASH BROOK ROAD  
CULVERT REPLACEMENT #1

**GENERAL NOTES, LEGEND  
AND EXISTING CONDITIONS**

CHESTER, VERMONT

Project #	---
Project Mgr.	TPK
Design by	TPK
Drawn by	TPK
Reviewed by	NRJ
Approved by	TPK
Date	JULY 20, 2015
Scale	AS SHOWN

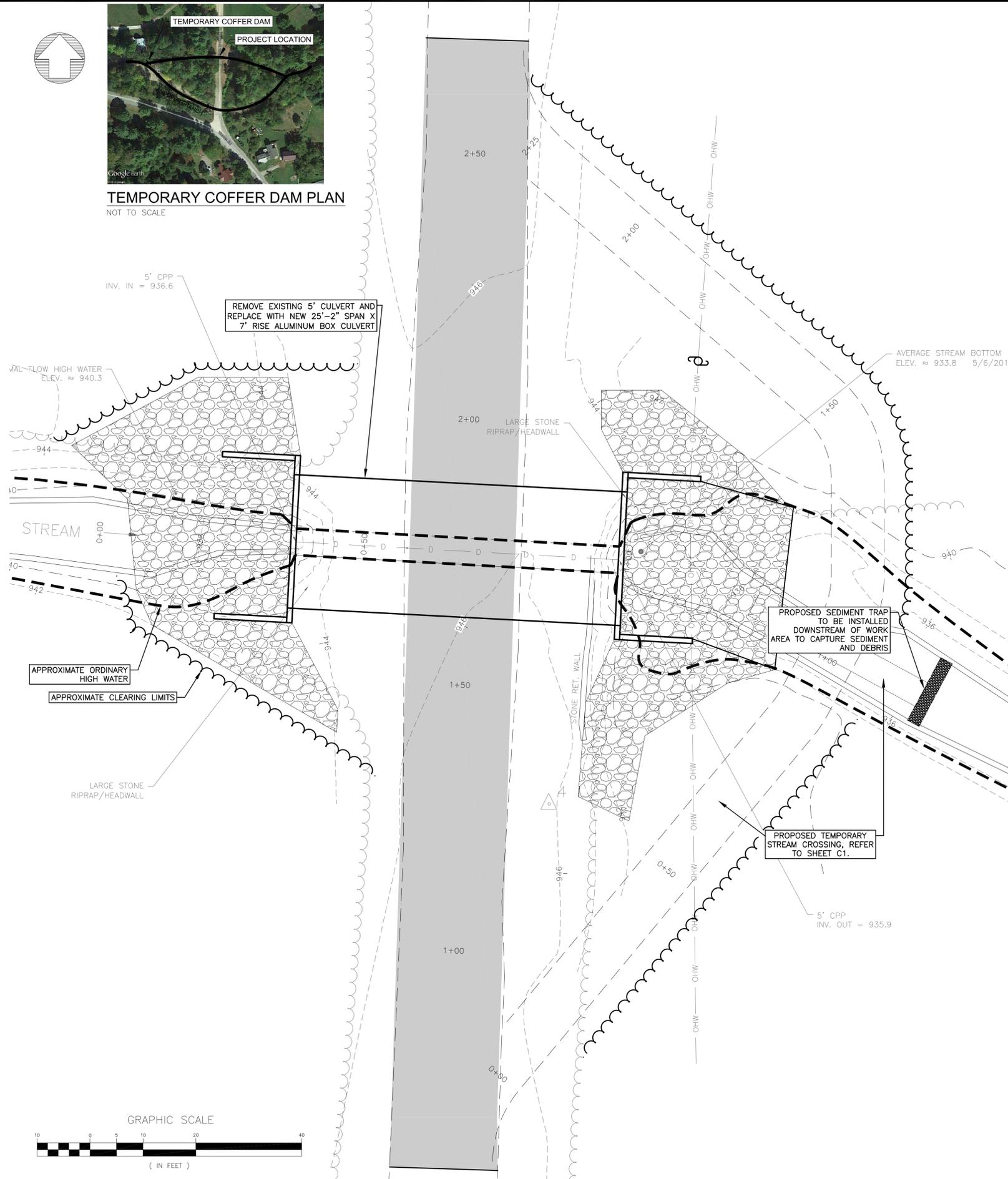
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**G1**

SHEET 1 OF 8

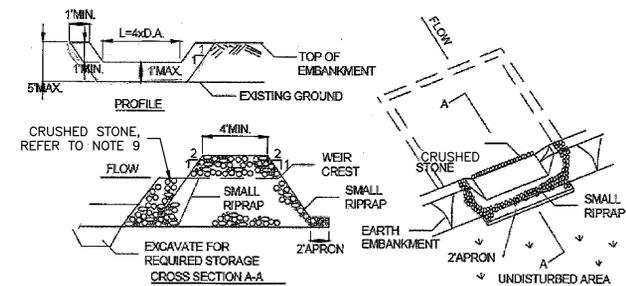


TEMPORARY COFFER DAM PLAN  
NOT TO SCALE



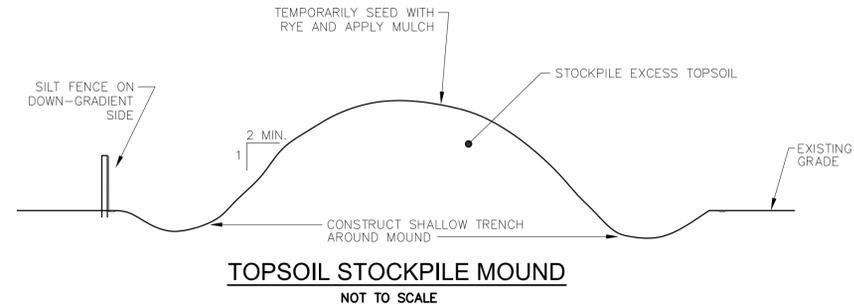
**GENERAL NOTES:**

1. ANY WATER FROM DEWATERING OR STREAM BYPASS SHALL BE TREATED WITH A SEDIMENT TRAP PRIOR TO ENTERING THE STREAM CHANNEL.
2. THE PROPOSED METHOD OF DEWATERING THE CONSTRUCTION EXCAVATION IS BY DIVERTING FLOW IN CHANNEL UPSTREAM TO POTASH BROOK. ALL WATER PUMPED OUT OF THE EXCAVATION SHALL BE DISCHARGED UPSTREAM OF THE SEDIMENT TRAP OR THROUGH A SEDIMENT BAG. CONTRACTOR SHALL SUBMIT PLAN FOR STREAM DIVERSION TO ENGINEER FOR APPROVAL PRIOR TO CONDUCTING IN-STREAM WORK.
3. CONTRACTOR SHALL CONSTRUCT STABILIZED CONSTRUCTION ENTRANCES AS NECESSARY TO PREVENT TRACKING OF MATERIALS ONTO POTASH BROOK ROAD. ADDITIONAL EROSION CONTROL AND SEDIMENT PREVENTION MEASURES, SUCH AS SILT FENCE AND STABILIZATION MAY BE REQUIRED DURING CONSTRUCTION AND WILL BE PROVIDED BY THE CONTRACTOR.
4. REFER TO CIVIL SHEETS FOR ADDITIONAL CULVERT AND UTILITY DETAILS.
5. INSTALL SILT FENCE AROUND SOIL STOCK PILES AND ALONG CONTOURS AT BASE OF DISTURBED AREAS. ACTUAL LOCATIONS TO BE FIELD DETERMINED.

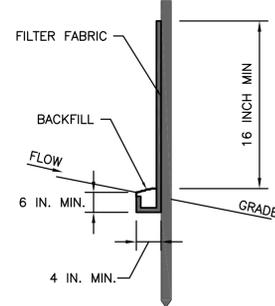


**STONE OUTLET SEDIMENT TRAP  
CONSTRUCTION SPECIFICATIONS:**

1. AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED, AND STRIPPED OF ANY VEGETATION AND ROOT MATERIAL. THE POOL AREA SHALL BE CLEARED.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS AND OTHER WOODY VEGETATION AS WELL AS OVER-SIZED STONES, ROCKS, ORGANIC MATERIAL, OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
3. ALL CUT AND FILL SLOPES SHALL BE 2:1 OR FLATTER.
4. THE STONE USED IN THE OUTLET SHALL BE SMALL RIP RAP (TYPE I STONE FILL) WITH A 1 FOOT THICKNESS OF 2" AGGREGATE (WASHED CRUSHED STONE) PLACED ON THE UP-GRADE SIDE ON THE SMALL RIP RAP OR EMBEDDED FILTER CLOTH IN THE RIP RAP.
5. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. IT SHALL BE PLACED ON SITE AND STABILIZED.
6. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND AS REQUIRED BY THE ENGINEER.
7. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND SEDIMENT ARE CONTROLLED.
8. THE STRUCTURE SHALL BE REMOVED AND THE AREA STABILIZED WHEN THE DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
9. A ONE FOOT LAYER OF CRUSHED STONE MAY BE PLACED ON THE UPSTREAM SIDE OF THE RIP RAP IN PLACE OF THE EMBEDDED FILTER CLOTH.

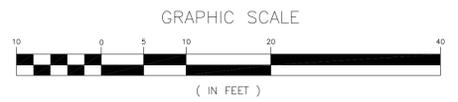


TOPSOIL STOCKPILE MOUND  
NOT TO SCALE



SILT FENCE INSTALLATION DETAIL  
NOT TO SCALE

SLOPE STEEPNESS (H:V)	MAXIMUM SLOPE LENGTH BETWEEN SILT FENCE ROWS (FEET)
2:1	25
3:1	50
4:1	75
5:1 OR FLATTER	100



GRAPHIC SCALE  
( IN FEET )

**EROSION CONTROL AND SEDIMENT PREVENTION PLAN**

SCALE: 1"=10'

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DUFRESNE GROUP  
CONSULTING ENGINEERS

56 Main Street, Suite 200  
Springfield, VT 05156  
E-mail: info@dufresnegroup.com  
Web: www.dufresnegroup.com  
Springfield, VT • Tel: (802) 674-2904 Fax: (802) 674-2913  
Barnes, VT • Tel: (802) 479-3698 Fax: (802) 479-2261  
St. Johnsbury, VT • Tel: (802) 748-8605 Fax: (802) 748-4512  
Manchester, VT • Tel: (802) 768-8291 Fax: (802) 768-8315  
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REVISIONS	DATE	COMMENTS	BY

POTASH BROOK ROAD  
CULVERT REPLACEMENT #1

**EROSION CONTROL AND SEDIMENT  
PREVENTION PLAN**

CHESTER, VERMONT

Project #	---
Project Mgr.	TPK
Design by	TPK
Drawn by	TPK
Reviewed by	NRJ
Approved by	TPK
Date	JULY 20, 2015
Scale	AS SHOWN

**G2**



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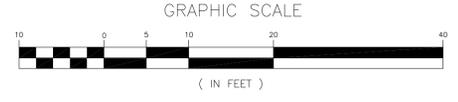
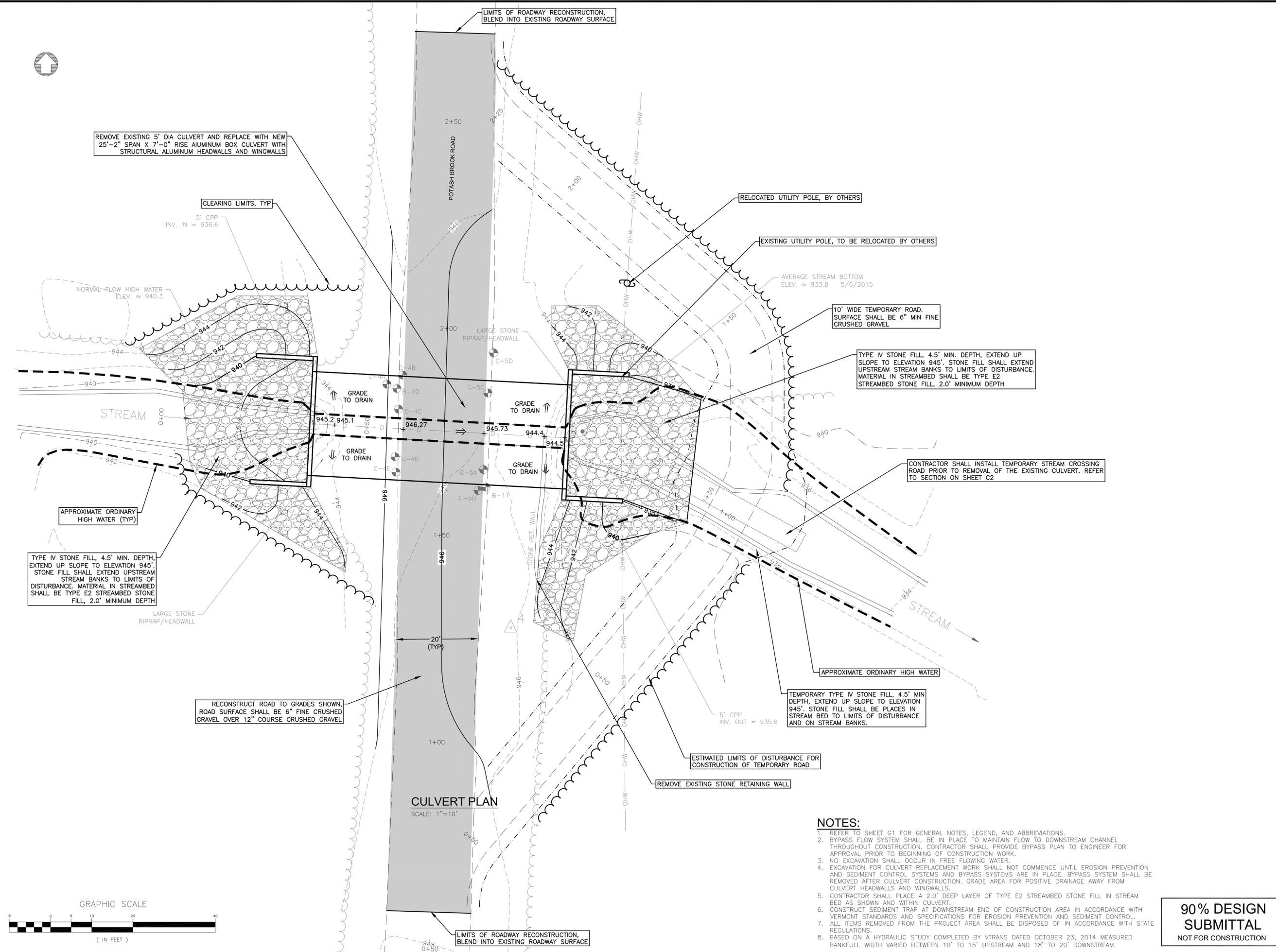
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Web: www.dufresnegroup.com  
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Burrton, VT • Tel: (802) 479-3698 Fax: (802) 479-2261  
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REVISIONS	DATE	COMMENTS	BY

POTASH BROOK ROAD  
CULVERT REPLACEMENT #1  
  
DRAFT CULVERT PLAN  
  
CHESTER, VERMONT

Project #	---
Project Mgr.	TPK
Design by	NRJ
Drawn by	TPK
Reviewed by	TPK
Approved by	TPK
Date	JULY 20, 2015
Scale	AS SHOWN

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C1  
SHEET 5 OF 8



- NOTES:**
- REFER TO SHEET G1 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
  - BYPASS FLOW SYSTEM SHALL BE IN PLACE TO MAINTAIN FLOW TO DOWNSTREAM CHANNEL THROUGHOUT CONSTRUCTION. CONTRACTOR SHALL PROVIDE BYPASS PLAN TO ENGINEER FOR APPROVAL PRIOR TO BEGINNING OF CONSTRUCTION WORK.
  - NO EXCAVATION SHALL OCCUR IN FREE FLOWING WATER.
  - EXCAVATION FOR CULVERT REPLACEMENT WORK SHALL NOT COMMENCE UNTIL EROSION PREVENTION AND SEDIMENT CONTROL SYSTEMS AND BYPASS SYSTEMS ARE IN PLACE. BYPASS SYSTEM SHALL BE REMOVED AFTER CULVERT CONSTRUCTION. GRADE AREA FOR POSITIVE DRAINAGE AWAY FROM CULVERT HEADWALLS AND WINGWALLS.
  - CONTRACTOR SHALL PLACE A 2.0' DEEP LAYER OF TYPE E2 STREAMBED STONE FILL IN STREAM BED AS SHOWN AND WITHIN CULVERT.
  - CONSTRUCT SEDIMENT TRAP AT DOWNSTREAM END OF CONSTRUCTION AREA IN ACCORDANCE WITH VERMONT STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION AND SEDIMENT CONTROL.
  - ALL ITEMS REMOVED FROM THE PROJECT AREA SHALL BE DISPOSED OF IN ACCORDANCE WITH STATE REGULATIONS.
  - BASED ON A HYDRAULIC STUDY COMPLETED BY VTRANS DATED OCTOBER 23, 2014 MEASURED BANKFULL WIDTH VARIED BETWEEN 10' TO 15' UPSTREAM AND 18' TO 20' DOWNSTREAM.

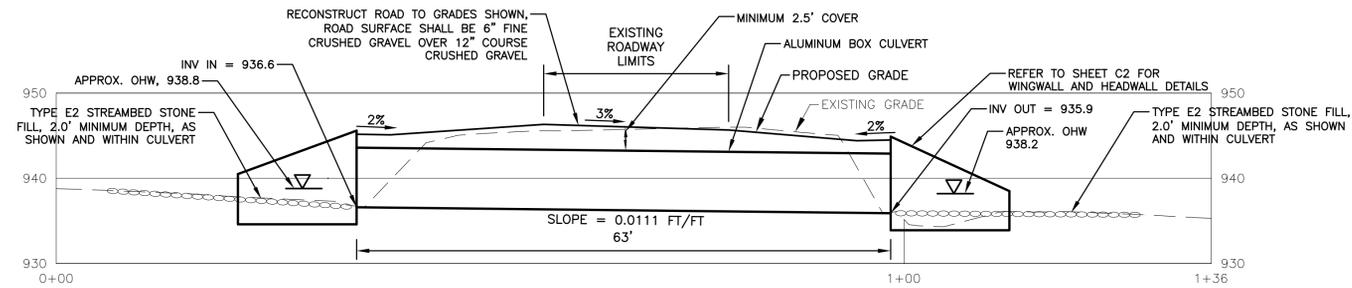
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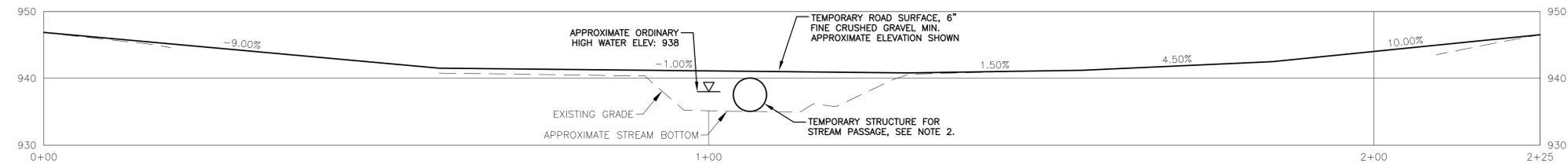
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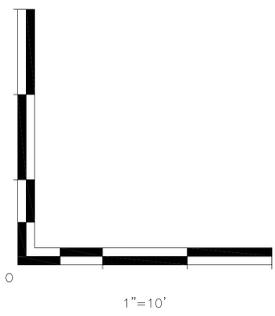
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**BOX CULVERT PROFILE**  
SCALE: 1"=10' H/V



**TEMPORARY STREAM CROSSING PROFILE**  
SCALE: 1"=10' H/V



**NOTES:**

- REFER TO SHEET G1 FOR GENERAL NOTES, LEGEND, AND ABBREVIATIONS.
- PROVIDE TEMPORARY STRUCTURE, WITH 5' MINIMUM SPAN LENGTH, SLOPE TO MATCH STREAM BOTTOM, LENGTH AS REQUIRED. A 5' DIAMETER CULVERT SHOWN AS EXAMPLE. ADJUST COVER OVER STRUCTURE TO MEET MANUFACTURER MINIMUM.

**90% DESIGN  
SUBMITTAL**  
NOT FOR CONSTRUCTION

REVISIONS	DATE	COMMENTS	BY	
			DATE	COMMENTS

POTASH BROOK ROAD  
CULVERT REPLACEMENT #1  
**CULVERT PROFILES**  
CHESTER, VERMONT

Project #	---
Project Mgr.	TPK
Design by	TPK
Drawn by	TPK
Reviewed by	NRJ
Approved by	TPK
Date	JULY 20, 2015
Scale	AS SHOWN

**C2**

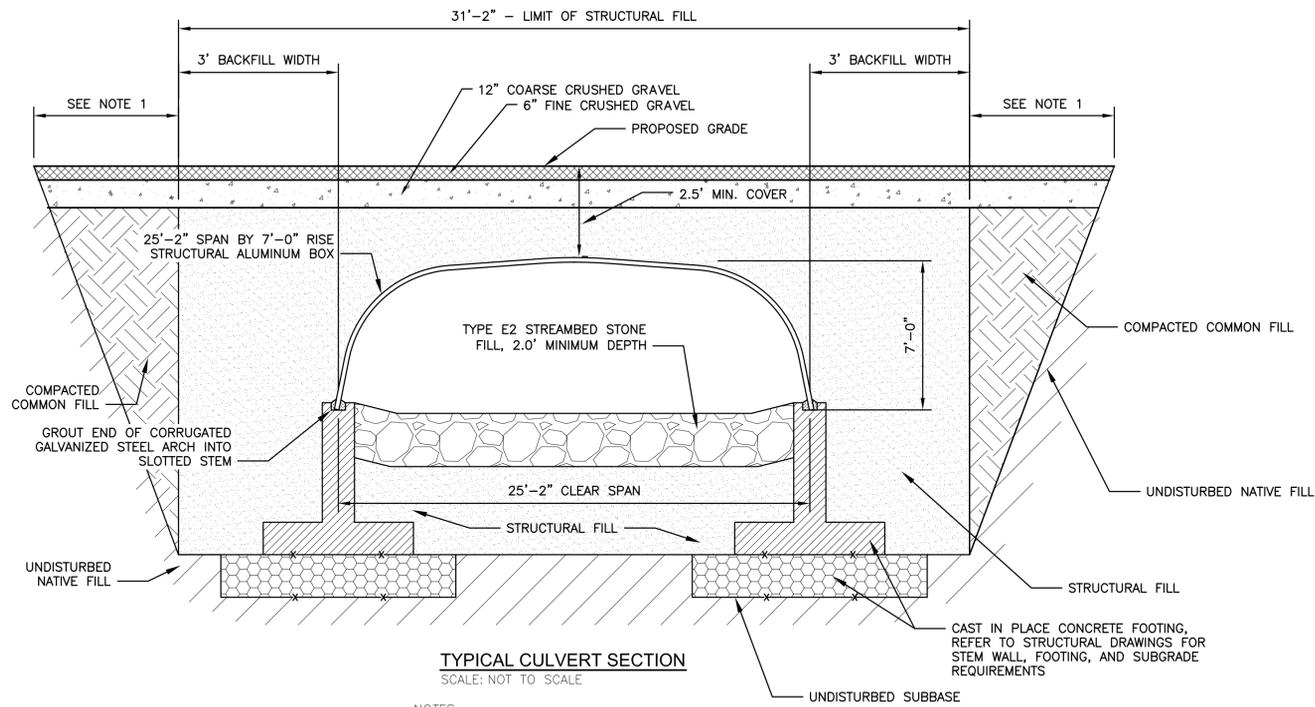


DUFRESNE GROUP  
CONSULTING ENGINEERS

56 Main Street, Suite 200  
Springfield, VT 05156  
E-mail: info@dufresnegroup.com  
Web: www.dufresnegroup.com

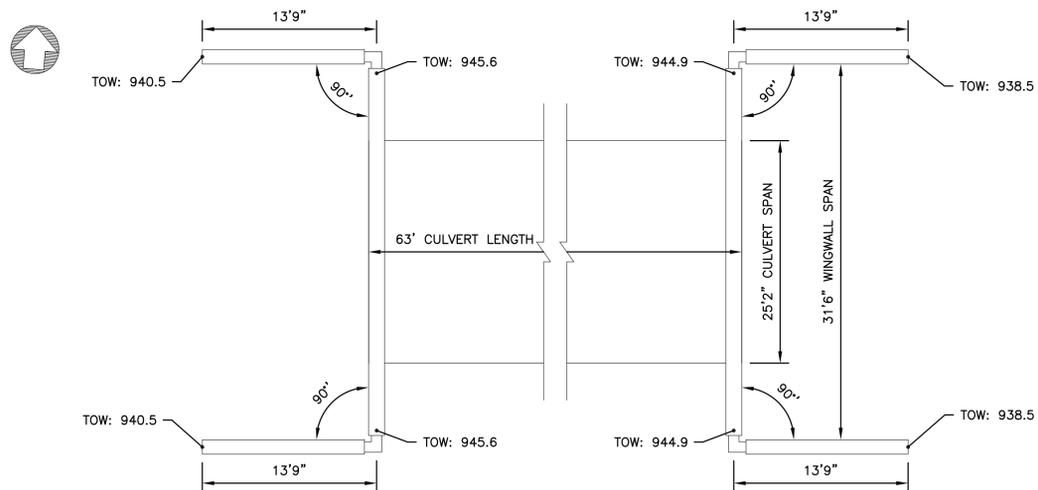
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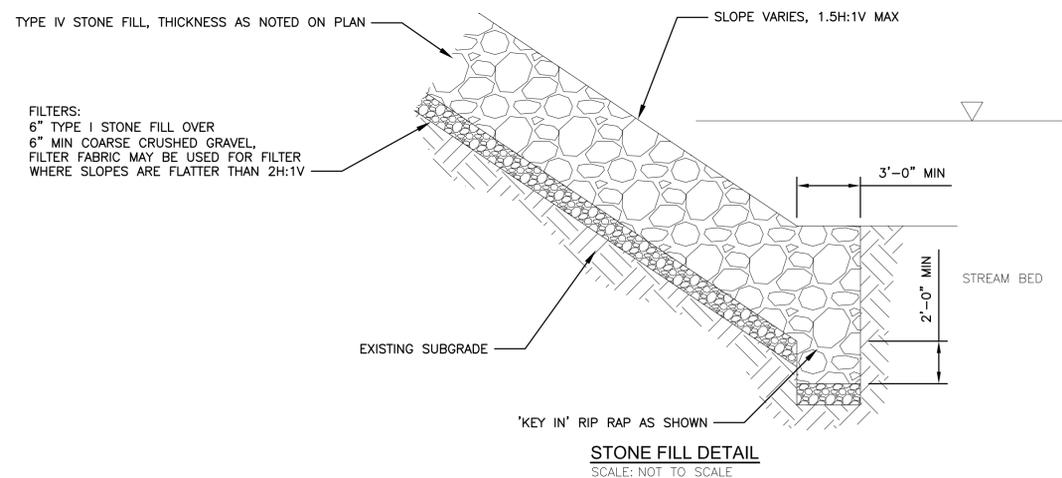
TYPICAL CULVERT SECTION  
SCALE: NOT TO SCALE

NOTES:  
1. WHERE BACKFILL WIDTH OF COMMON FILL IS NOT AGAINST UNDISTURBED NATIVE FILL, MINIMUM WIDTH OF COMPACTED COMMON FILL SHALL BE 6.5'

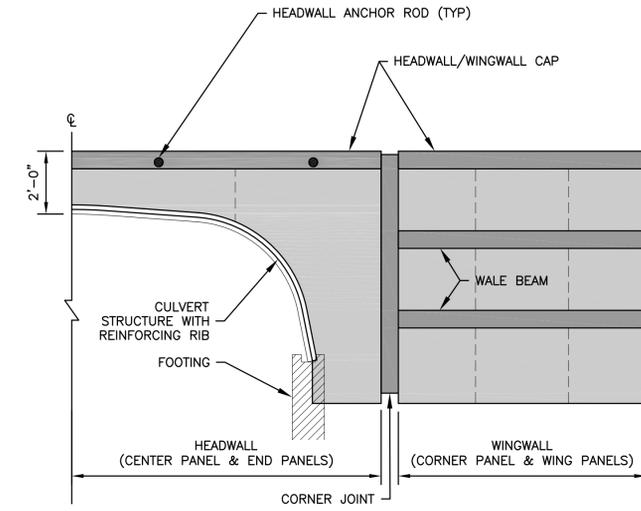


CULVERT DIMENSIONS DETAIL  
SCALE: NOT TO SCALE

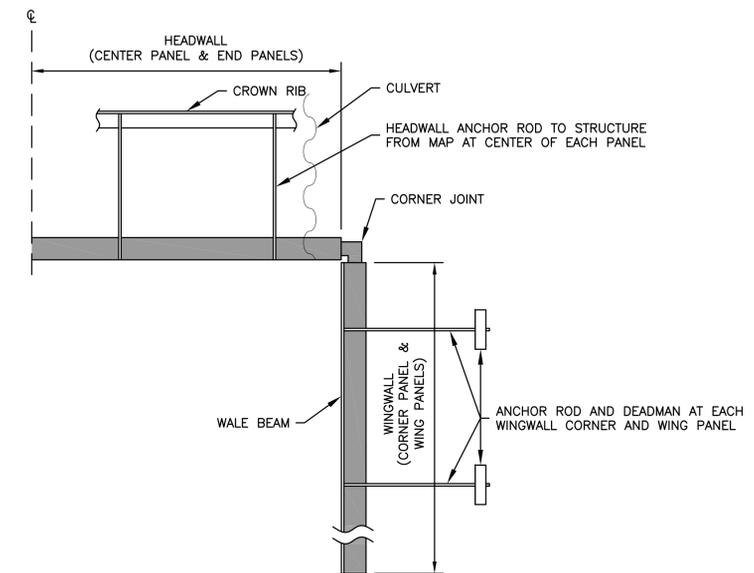
NOTES:  
1. DIMENSIONS MAY VARY BASED ON EXACT MANUFACTURER'S REQUIREMENTS AND DESIGN



STONE FILL DETAIL  
SCALE: NOT TO SCALE



TYPICAL CULVERT HEADWALL AND WINGWALL ELEVATION  
SCALE: NOT TO SCALE



TYPICAL CULVERT HEADWALL AND WINGWALL PLAN  
SCALE: NOT TO SCALE

HEADWALL AND WINGWALL NOTES:

1. DIMENSIONS OF HEADWALL AND WINGWALL PANELS, ROD LENGTH, DEADMAN AND TIEBACK REQUIREMENTS, AND ALL REINFORCING ITEMS SHALL BE SPECIFICALLY DESIGNED BY THE MANUFACTURER OF THE CULVERT STRUCTURE.
2. HEADWALL AND WINGWALL COMPONENTS SHALL BE SPECIFICALLY MANUFACTURED TO ACCOMPANY THE CULVERT STRUCTURE.
3. CONTRACTOR SHALL FOLLOW ALL MANUFACTURER'S REQUIREMENTS AND RECOMMENDATIONS FOR INSTALLATION OF THE HEADWALLS AND WINGWALLS AND APPROPRIATE ATTACHMENT TO THE CULVERT STRUCTURE.
4. ALL PANEL SHALL BE FABRICATED FROM ALUMINUM STRUCTURAL PLATE PER ASTM B746.
5. ALL WINGWALL AND HEADWALL PANELS SHALL BE TRENCHED INTO THE GROUND.
6. TOP OF HEADWALL AND WINGWALLS ELEVATIONS SHALL BE AS SHOWN ON CULVERT DIMENSION DETAIL ON THIS SHEET.
7. HEADWALLS SHALL BE FIELD MODIFIED AROUND CONCRETE CULVERT FOOT PER MANUFACTURER'S APPROVED METHODS.

REVISIONS  
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DATE	COMMENTS	BY

POTASH BROOK ROAD  
CULVERT REPLACEMENT #1

TYPICAL DETAILS

CHESTER, VERMONT

Project #	---
Project Mgr.	TPK
Design by	TPK
Drawn by	TPK
Reviewed by	NRJ
Approved by	TPK
Date	JULY 20, 2015
Scale	AS SHOWN

90% DESIGN  
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C3

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## 1. GENERAL NOTES

- IN THE CASE OF A CONFLICT BETWEEN THE DRAWINGS OR NOTES ON THE DRAWINGS, THE ENGINEER SHALL BE NOTIFIED TO RESOLVE THE DISCREPANCY.
- IF DEVIATIONS OR CHANGES FROM THE DESIGN AND SHOP DRAWINGS ARE REQUIRED DUE TO INTERFERENCES, FABRICATION ERRORS, OR OTHER CAUSES, THE ENGINEER SHALL BE NOTIFIED. SUBMIT ANY PROPOSED CHANGES TO THE ENGINEER FOR REVIEW PRIOR TO MAKING CHANGES.

## 2. FOUNDATION RELATED EARTHWORK

### EXCAVATION

- EXCAVATE SUBSOIL TO ACCOMMODATE FOUNDATIONS. HAND TRIM EXCAVATIONS. REMOVE LOOSE MATERIAL.
- OWNER TO ENGAGE A GEOTECHNICAL ENGINEER TO SCHEDULE A REVIEW OF NATIVE SOIL OR LEDGE CONDITIONS. FOOTINGS HAVE BEEN DESIGNED FOR A MINIMUM NOMINAL BEARING RESISTANCE OF 5000 PSF, BASED ON PRESUMPTIVE BEARING VALUES (ASHTO TABLE C10.6.2.6.1-1).
- COMPACT DISTURBED LOAD BEARING SOIL IN DIRECT CONTACT WITH FOUNDATIONS TO ORIGINAL BEARING CAPACITY. PLACE A MINIMUM OF 18 INCHES OF CRUSHED STONE BENEATH SPREAD FOOTINGS IF STANDING WATER OR CLAY SOILS ARE ENCOUNTERED IN EXCAVATIONS.
- IF OVER-EXCAVATION OCCURS, REPLACE MATERIAL WITH SUITABLE WELL-DRAINED MATERIAL, IN 6 INCH LIFTS, APPROVED BY THE ENGINEER AND COMPACTED TO 95% OF MODIFIED PROCTOR.
- PROTECT THE SITE AND ALL CONSTRUCTION, EXISTING AND PROPOSED, FROM THE EFFECTS OF FREEZING OR FROST ACTION.

### SUBMITTALS FOR REVIEW:

- SUBMIT SIEVE ANALYSIS AND STANDARD MOISTURE-DENSITY CURVE FOR EACH BACKFILL MATERIAL. RESUBMIT WHENEVER A NEW PIT OR SUBSTANTIALLY DIFFERENT MATERIAL IS USED.

### BACKFILL AND COMPACTION

- PLACE AND COMPACT BACKFILL IN EQUAL CONTINUOUS LAYERS NOT EXCEEDING 8" OF COMPACTED DEPTH FOR HAND HELD COMPACTION EQUIPMENT AND A MAXIMUM OF 12" INCHES COMPACTED DEPTH FOR VIBRATORY ROLLERS.
- MAINTAIN OPTIMUM MOISTURE CONTENT OF BACKFILL MATERIALS TO ATTAIN COMPACTION DENSITY.
- COMPACTION TESTING SHALL BE PERFORMED IN ACCORDANCE WITH ASTM D2922, TEST METHODS FOR SOIL BY NUCLEAR METHODS. MAXIMUM DENSITY SHALL BE DETERMINED BY THE MODIFIED PROCTOR METHOD, ASTM D1557.

### BACKFILL REQUIREMENTS:

- BACKFILL ALONG RETAINING WALLS:
  - MATERIAL: GRANULAR BACKFILL, SUITABLE NATIVE SOIL
  - COMPACTION: 95% MODIFIED PROCTOR
- BELOW FOOTINGS:
  - MATERIAL: CRUSHED STONE, GRANULAR BACKFILL
  - COMPACTION: 95% MODIFIED PROCTOR
  - TESTING: EVERY 1000 SF/LIFT

### MATERIALS:

- GRANULAR BACKFILL: SEE SPECIFICATIONS
- CRUSHED STONE: SEE SPECIFICATIONS
- SUITABLE NATIVE SOIL: ON SITE SAND OR GRAVEL REASONABLY FREE OF LOAM, SILT, CLAY, OR ORGANIC MATTER.

## 3. CAST-IN-PLACE CONCRETE

- CODES AND STANDARDS: COMPLY WITH THE PROVISIONS OF THE LATEST EDITIONS OF:
  - ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE"
  - ACI 301 "SPECIFICATIONS FOR STRUCTURAL CONCRETE"
  - ACI 305 "HOT WEATHER CONCRETING"
  - ACI 306 "STANDARD SPECIFICATION FOR COLD WEATHER CONCRETING"
  - ACI 308 "STANDARD PRACTICE FOR CURING CONCRETE"
  - ASHTO 2010 LRFD "BRIDGE DESIGN SPECIFICATIONS, FIFTH EDITION"
- PRIOR TO PLACEMENT OF CONCRETE, SUBMIT TO ENGINEER MIX DESIGN INCLUDING TECHNICAL DATA SHEETS ON ANY ADMIXTURES TO BE USED.
- CONCRETE TESTING: THE CONTRACTOR SHALL PREPARE A SET OF 4 CYLINDERS/TEST SET TO BE TESTED AT AN INDEPENDENT LABORATORY. THE CYLINDERS SHALL BE TAKEN FROM ONE CONCRETE TRUCK AND LABELED WITH DATE, TRUCK NUMBER, AND LOCATION OF CONCRETE PLACEMENT. EACH SAMPLE SHALL ALSO BE TESTED FOR SLUMP, AIR CONTENT, AND TEMPERATURE. THE CYLINDERS SHALL BE TESTED AS FOLLOWS: 1 AT 7 DAYS; 2 AT 28 DAYS; AND A THIRD HELD FOR A 56 DAY BREAK IF REQUIRED. TEST CYLINDERS SHALL BE TAKEN AT LEAST ONCE PER PLACEMENT OR EVERY 50 CUBIC YARDS.
- FIELD TESTING SHALL BE PERFORMED BY A GRADE 1 ACI FIELD TESTING TECHNICIAN.
- FIELD TESTING TO BE PAID FOR BY OWNER.
- SUBMIT MIX DESIGN AND EITHER TRIAL MIX DESIGNS OR HISTORIC FIELD DATA FOR APPROVAL IN ACCORDANCE WITH ACI 318, CHAPTER 5.
- COMPRESSIVE STRENGTH AT 28 DAYS: 5,000 PSI
- TRANSIT MIX SHALL CONFORM TO ASTM C94.
- MAXIMUM AGGREGATE SIZE SHALL BE 3/4".
- SLUMP: 3" TO 5".
- AIR ENTRAINMENT OF 4 TO 6% BY VOLUME.
- NO CHLORIDE OR OTHER UNAUTHORIZED ADMIXTURES SHALL BE USED.
- PLACE NO CONCRETE WHEN AMBIENT TEMPERATURE IS BELOW 40 DEGREES FAHRENHEIT OR MORE THAN 90 DEGREES FAHRENHEIT.
- COMPLY WITH ACI CODES AND PLACE CONCRETE IN A CONTINUOUS OPERATION WITHIN PLANNED JOINTS OR SECTIONS. DO NOT PERMIT COLD JOINTS TO OCCUR.
- CURING: BEGIN INITIAL CURING AS SOON AS FREE WATER HAS DISAPPEARED FROM EXPOSED SURFACES. WHERE POSSIBLE, KEEP CONTINUOUSLY WET FOR 72 HOURS. CONTINUE CURING BY USE OF MOISTURE RETAINING COVER OR MEMBRANE-FORMING CURING COMPOUND.

## 3. CAST-IN-PLACE CONCRETE (CONTINUED)

- GROUT: PRE-MIXED, NON-SHRINK GROUT, MEETING THE REQUIREMENTS OF VAOT 707.03.
- NO CONCRETE SHALL BE DROPPED MORE THAN 4 FEET INSIDE A FORM.
- CHAMFER ALL EXPOSED EDGES  $\frac{3}{4}$ ".
- COAT ALL EXPOSED SURFACES WITH SILANE 40 WATER REPELLANT.
- DO NOT BEGIN BACKFILLING OF CONCRETE WALLS PRIOR TO A MINIMUM OF EITHER SEVEN DAYS HAVE PASSED OR CONCRETE TESTING REVEALS THAT THE PLACED CONCRETE HAS ATTAINED 75% OF THE REQUIRED DESIGN STRENGTH.

### CONCRETE FORMWORK

- CONCRETE FORMS SHALL BE CLEAN AND FREE FROM DEBRIS. IF FORMS ARE COATED WITH A RELEASE AGENT, THE RELEASE AGENT SHALL BE COLORLESS MINERAL OIL WHICH SHALL NOT STAIN CONCRETE OR ABSORB MOISTURE OR IMPAIR NATURAL BONDING OF CONCRETE.
- SOAK INSIDE SURFACE OF UNTREATED FORMWORK WITH WATER PRIOR TO USE.
- DO NOT DAMAGE CONCRETE DURING FORM STRIPPING.
- PROVIDE BRACING TO ENSURE STABILITY OF FORMWORK.
- DO NOT REMOVE FORMS OR BRACING UNTIL CONCRETE HAS GAINED SUFFICIENT STRENGTH TO CARRY ITS OWN WEIGHT AND IMPOSED LOADS.

### CONCRETE REINFORCING

- SHOP DRAWINGS SHALL BE PROVIDED PRIOR TO START OF CONCRETE PLACING. INDICATE BAR SIZES, SPACING, LOCATION, LAPS, AND QUANTITIES.
- REINFORCING STEEL SHALL BE ASTM A615, GRADE 60.
- CHAIRS AND SPACERS SHALL BE PLACED TO ADEQUATELY SUPPORT REINFORCING DURING PLACEMENT. FOREIGN MATERIALS SUCH AS WOOD OR OTHER UNSUITABLE SUPPORTS SHALL NOT BE USED TO SUPPORT REINFORCING. SET WIRE TIES SO ENDS ARE DIRECTED INTO CONCRETE WHERE CONCRETE WILL BE EXPOSED.
- CONCRETE CLEAR COVER FOR REINFORCEMENT (UNLESS SHOWN OTHERWISE):
  - TOP OF BRIDGE DECK, BOTTOM OF FOOTINGS: 3".
  - ALL OTHER LOCATIONS: 2".

## 4. ALUMINUM BOX CULVERT

- SEE SPECIFICATION SECTION 02641.

## 5. DRAWING LEGEND

NOTE: NOT ALL SYMBOLS AND NOTATIONS USED

	NORTH ARROW		CONCRETE
	ELEVATION		GROUT or FINE CRUSHED GRAVEL
	TOP OF FOOTING ELEV.		LEDGE/ROCK
	SECTION NUMBER DRAWING WHERE SHOWN		CRUSHED STONE
	DECK SPAN DIRECTION OR GRATING DIRECTION		COMPACTED GRANULAR/NATIVE FILL
	SLOPE DIRECTION, and MAGNITUDE		UNDISTURBED SUBGRADE
	F.S. FOOTING STEP		



DUFRESNE GROUP  
CONSULTING ENGINEERS

54 Main Street, P.O. Box B  
Windsor, Vermont 05089  
E-mail: dufresne@vermontel.net  
Web: www.dufresnegroup.com  
Windsor, VT • Tel: (802) 674-2904 Fax: (802) 674-2913  
Barre, VT • Tel: (802) 479-3698 Fax: (802) 479-2261  
St. Johnsbury, VT • Tel: (802) 748-8605 Fax: (802) 748-4512  
Manchester, VT • Tel: (802) 768-8291 Fax: (802) 768-6315

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208 Flynn Avenue Suite 2A, Burlington, VT 05401  
Tel: 802.863.6225  
Fax: 802.863.6306  
EngineeringVentures.com

REVISIONS	DATE	BY	COMMENTS

POTASH BROOK ROAD  
CULVERT REPLACEMENT #1

GENERAL NOTES

CHESTER, VERMONT

Project #	15550
Project Mgr.	OHG
Design by	DQ
Drawn by	DQ
Reviewed by	BN
Approved by	BN
Date	8/25/2016
Scale	AS NOTED

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8/25/2016

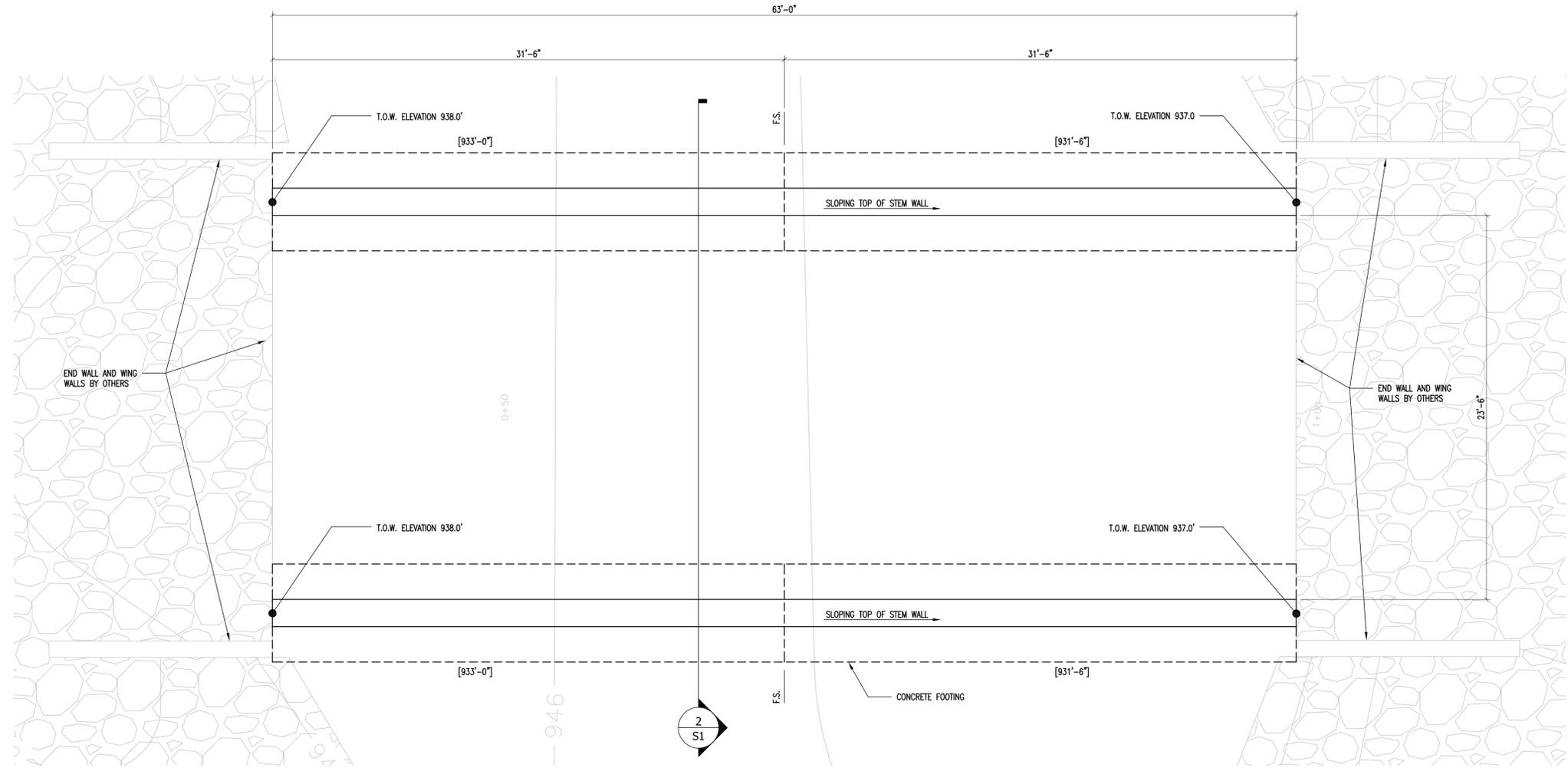
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**DUFRESNE GROUP**  
CONSULTING ENGINEERS  
54 Main Street, P.O. Box B  
Windsor, Vermont 05089  
E-mail: dufresne@vermontel.net  
Web: www.dufresnegrp.com  
Windsor, VT • Tel: (802) 674-2904 Fax: (802) 674-2913  
Barre, VT • Tel: (802) 479-3698 Fax: (802) 479-2261  
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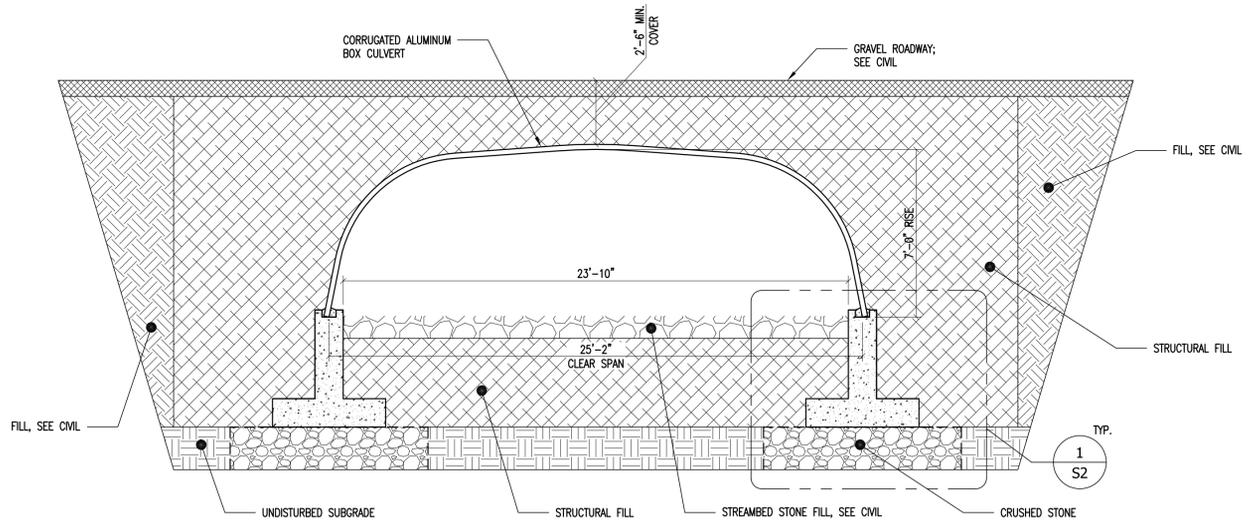


**ENGINEERING VENTURES INC**  
208 Flynn Avenue Suite 2A, Burlington, VT 05401  
tel. 802.863.6225  
fax 802.863.6306  
EngineeringVentures.com



**CORRUGATED ALUMINUM BOX CULVERT PLAN**

1/4" = 1'-0"



**CORRUGATED ALUMINUM BOX CULVERT SECTION**

1/4" = 1'-0"



REVISIONS	DATE	COMMENTS	BY
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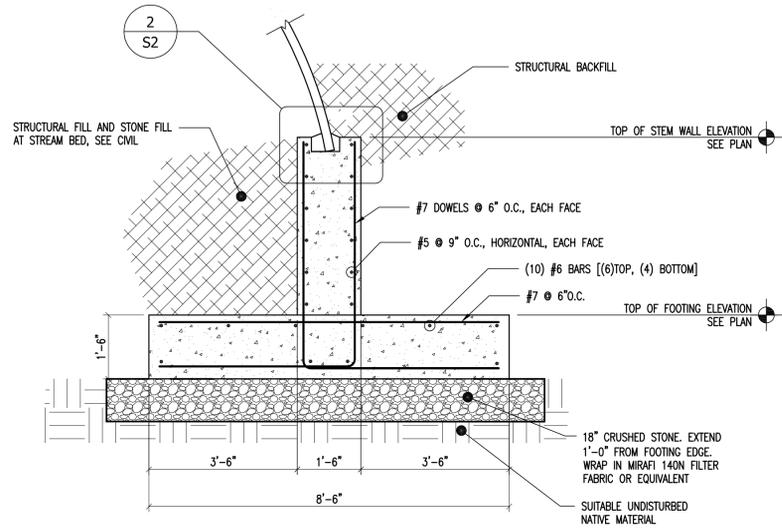
POTASH BROOK ROAD  
CULVERT REPLACEMENT #1  
CULVERT PLAN AND SECTION  
CHESTER, VERMONT

Project #	15550
Project Mgr.	OHG
Design by	DQ
Drawn by	DQ
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Approved by	BN
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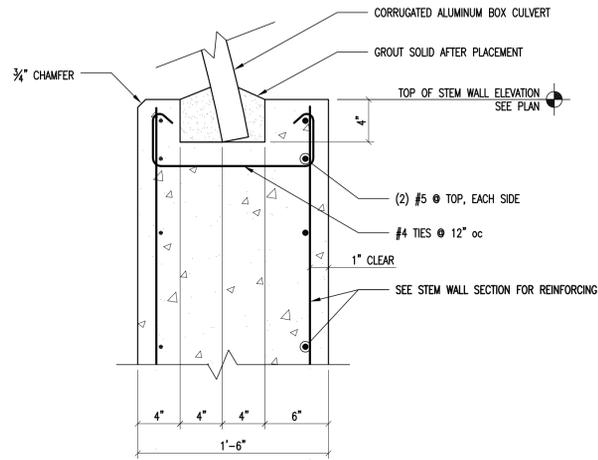
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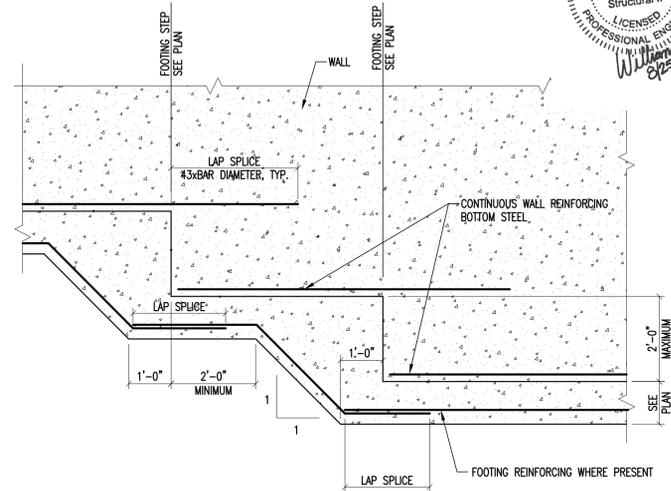
TYPICAL CAST-IN-PLACE CONCRETE  
STEM WALL SECTION

1/2"=1'-0"



TOP OF STEM WALL DETAIL

1-1/2"=1'-0"



TYPICAL FOOTING STEP

1/2"=1'-0"



DUFRESNE GROUP  
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54 Main Street, P.O. Box B  
Windsor, Vermont 05089  
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208 Flynn Avenue Suite 2A, Burlington, VT 05401  
tel. 802.863.6225  
fax 802.863.6306  
engineering@ventures.com

REVISIONS	DATE	COMMENTS	BY

POTASH BROOK ROAD  
CULVERT REPLACEMENT #1

SECTIONS

CHESTER, VERMONT

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Project Mgr.	OHG
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