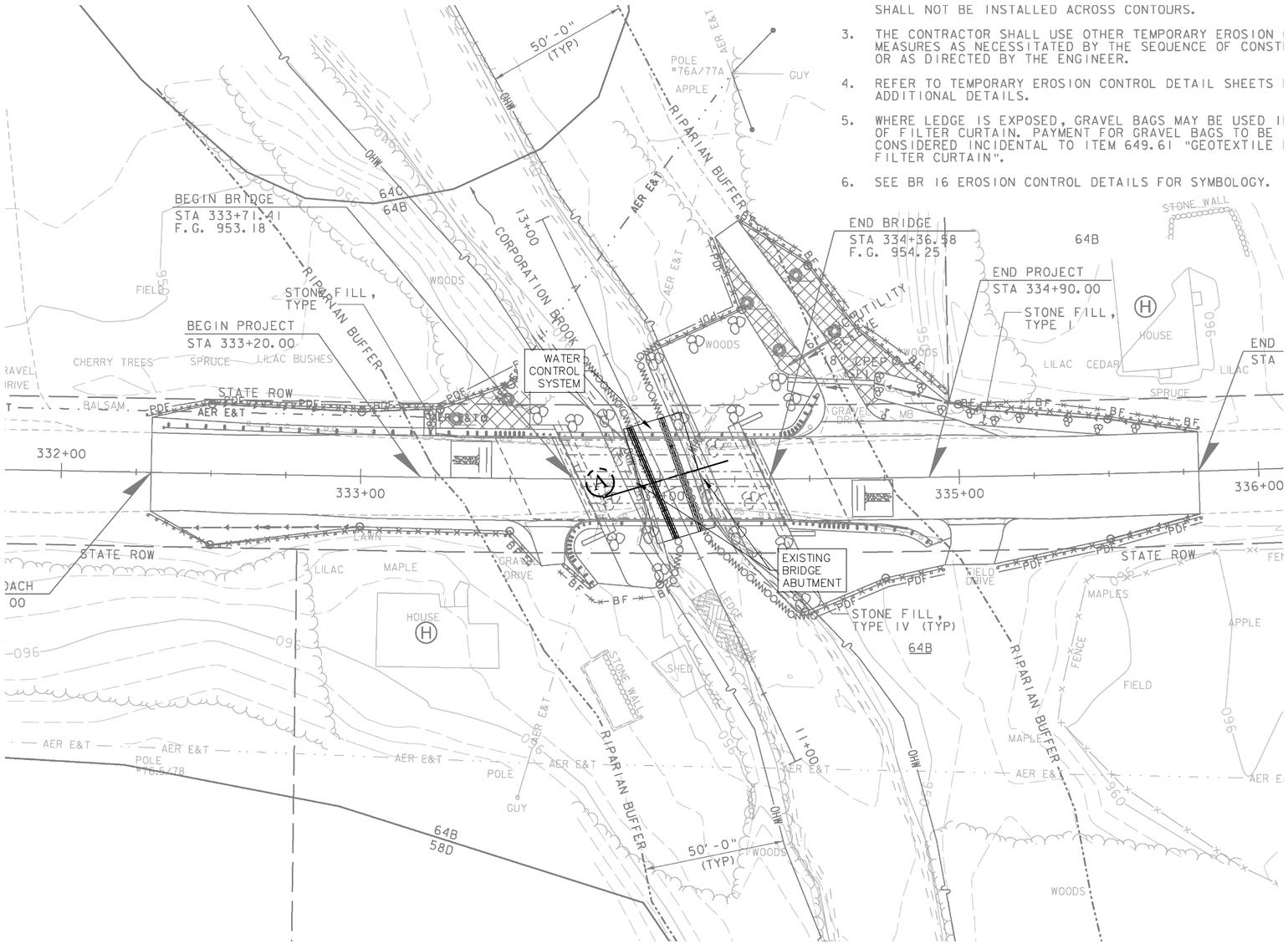
SHALL NOT BE INSTALLED ACROSS CONTOURS.

3. THE CONTRACTOR SHALL USE OTHER TEMPORARY EROSION
MEASURES AS NECESSITATED BY THE SEQUENCE OF CONST
OR AS DIRECTED BY THE ENGINEER.

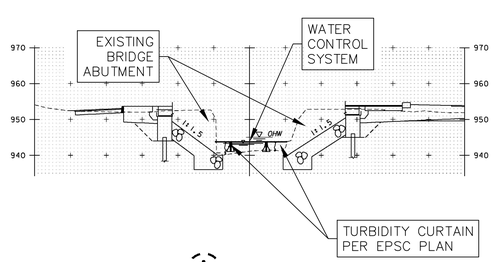
4. REFER TO TEMPORARY EROSION CONTROL DETAIL SHEETS
ADDITIONAL DETAILS.

5. WHERE LEDGE IS EXPOSED, GRAVEL BAGS MAY BE USED I
OF FILTER CURTAIN. PAYMENT FOR GRAVEL BAGS TO BE
CONSIDERED INCIDENTAL TO ITEM 649.61 "GEOTEXTILE
FILTER CURTAIN".

6. SEE BR 16 EROSION CONTROL DETAILS FOR SYMBOLOGY.



PLAN VIEW
1" = 20'



(A) VIEW
1" = 20'

Water Control Requirements:

1. The water control system is to be coordinated with the EPSC work.
2. This work shall consist of the construction, maintenance and removal of water control system in accordance with the specifications at locations designated in the Plans or in the Contract.
3. The Contractor shall obtain any and all necessary permits or clearances for alternate methods.
4. The locations and elevations for excavation shall be as indicated on the Plans.
5. During the performance of all work under this contract, the Contractor shall adopt such precautions in the conduct of his operation as may be necessary to avoid contaminating ground or surface water.
6. All earthwork, grading, moving of equipment, water control and other operation likely to create silting, shall be so planned and conducted as to minimize pollution in any wetland resource area.
7. Water used for any purpose whatsoever by the Contractor, which has become contaminated with soil, bitumen, salt, concrete or other pollutants shall not be discharged into any wetland resource area.
8. Under no circumstances shall the Contractor discharge pollutants into a wetland resource area.
9. The Contractor shall not store fuel or permit any refueling of construction equipment while such equipment is within 100 feet of any resource area.
10. The contractor shall make all efforts to control the run-off of water and sediment from the project site during path construction.
11. The Contractor shall use such equipment and shall perform his operations in such a manner that boiling or other disturbances of the soil in the construction area will be prevented.
12. After having served its purpose, the water control system shall become the property of the Contractor and shall be removed by the Contractor from the site subject to the Engineer's approval.

Water Control Procedure:

1. Stream diversions shall be conducted in such a manner as to minimize siltation and prevent contamination of the waterway
2. Ensure that water control operations neither cause the accumulation of siltation nor any adverse effect to the water or the environment
3. The effectiveness of the water control method used will vary based on the field conditions at the time at which the work is being performed
4. Weather monitoring will be required.
5. If flows are beyond the capacity of all available measures, the water control system is to be removed, the excavation flooded and all obstacles preventing free flow of the stream removed.
6. The Water Control System is non-permanent and is to not harm the ecology of the waterway, land under water, and surrounding land

General Notes

General:

1. Existing conditions are taken from Contract Drawings.
2. All dimensions relative to existing elements are to be field checked prior to fabrication and installation of proposed elements.
3. Control datums are those from the Contract Documents.
4. Design is based on conditions shown in the Contract Documents. Should conditions encountered in the field vary from those indicated conditions, the design may be invalid and revisions should be investigated.

Water Control System

1. Install turbidity barriers
2. Install debris Shield
3. Begin removal of existing bridge superstructure
4. Clear Shield of debris daily
5. Monitor debris accumulation on the Shield
6. Clear Shield of debris when accumulation reaches 6"
7. Monitor weather
8. Clear Shield of all debris when a storm is forecast that will cause submersion of the Shield
9. If flows are beyond the capacity of all available measures, the water control system is to be removed, the excavation flooded and all obstacles preventing free flow of the stream removed
10. If Water System is removed, repeat steps 1 through 7 when flows have such subsided.
11. Resume removal of existing bridge superstructure
12. Remove Water Control System

STATE OF VERMONT
TERRY WATTS
LICENSED PROFESSIONAL ENGINEER

-140612-

No.	Revision/Issue	Date

Firm Name and Address
TAW Associates
Waterville Valley, NH
603-236-4247 www.TAWAssociates.net

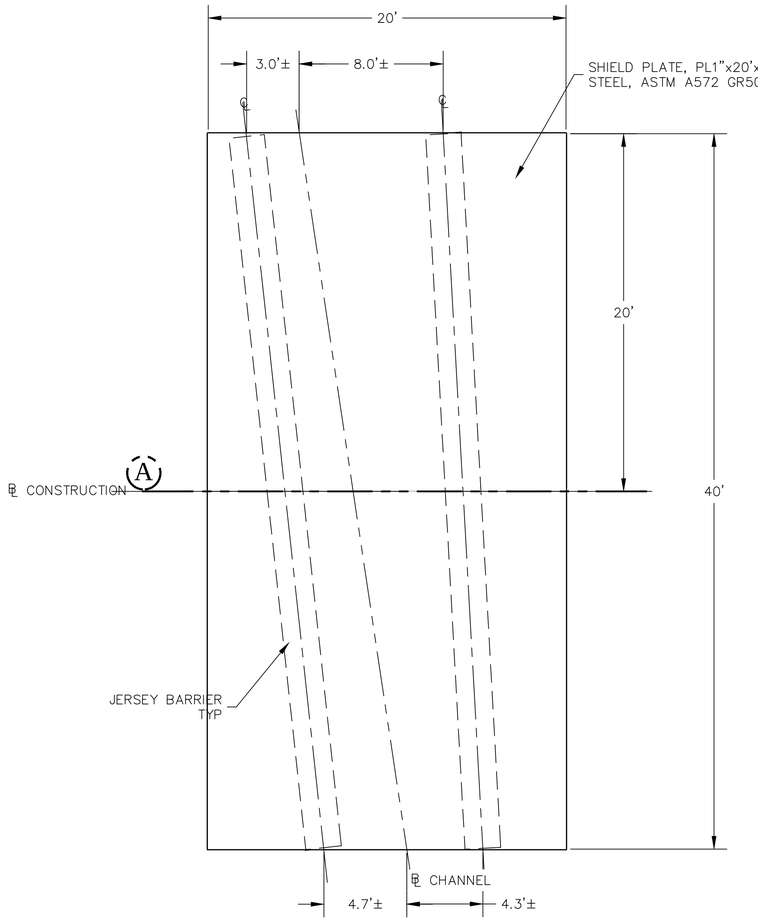
Proposed Improvement Bridge Project Bridge No. 13, 15, 16 & 19 - Rochester, VT Vtrans ER BRF 0162(19), (16), (17) & (18)

Project Name and Address
Water Control
Bridge 16

GENERAL PLAN

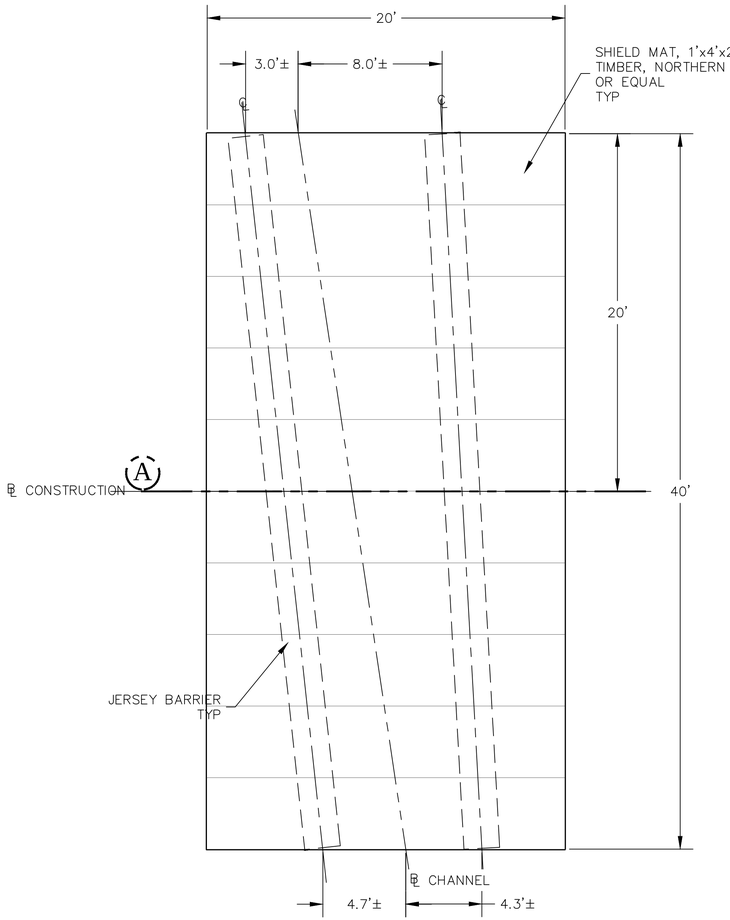
Project	Sheet
140403C	WC01
Date: June 12, 2014	
Scale: noted	

SCHULTZ CONSTRUCTION, INC.



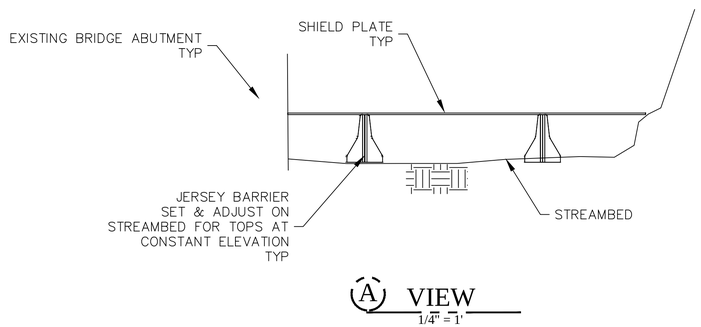
PLAN VIEW

$\frac{1}{4}$" = 1'



PLAN VIEW

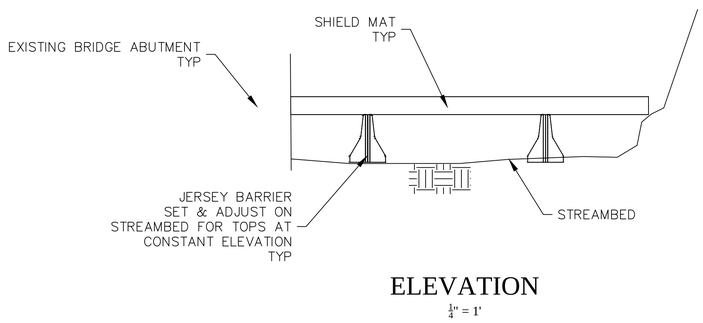
$\frac{1}{4}$" = 1'



A VIEW

1/4" = 1'

SHIELD PLATE OPTION



ELEVATION

$\frac{1}{4}$" = 1'

SHIELD MAT OPTION

General Notes

STATE OF VERMONT
TERRY WAITE
LICENSED PROFESSIONAL ENGINEER

-140612-

No.	Revision/Issue	Date

Firm Name and Address

TAW Associates
Waterville Valley, NH
603-236-4247 www.TAWAssociates.net

Proposed Improvement Bridge Project Bridge No. 13, 15, 16 & 19 - Rochester, VT Vtrans ER BRF 0162(19), (16), (17) & (18)

Project Name and Address

Water Control Bridge 16

DETAILS

Project	Sheet
140403C	WC02
Date: June 12, 2014	
Scale: noted	

SCHULTZ CONSTRUCTION, INC.

DOCUMENT: 140403C

Engineering Computations

Water Control Plan
Bridge 16

-

For The Project:
Proposed Improvement Bridge Project Bridge No. 13, 15, 16 & 19 – Rochester, VT
Vtrans ER BRF 0162(19), (16), (17) & (18)

-

for

SCHULTZ CONSTRUCTION, INC.

by

TAW ASSOCIATES

June 12, 2014

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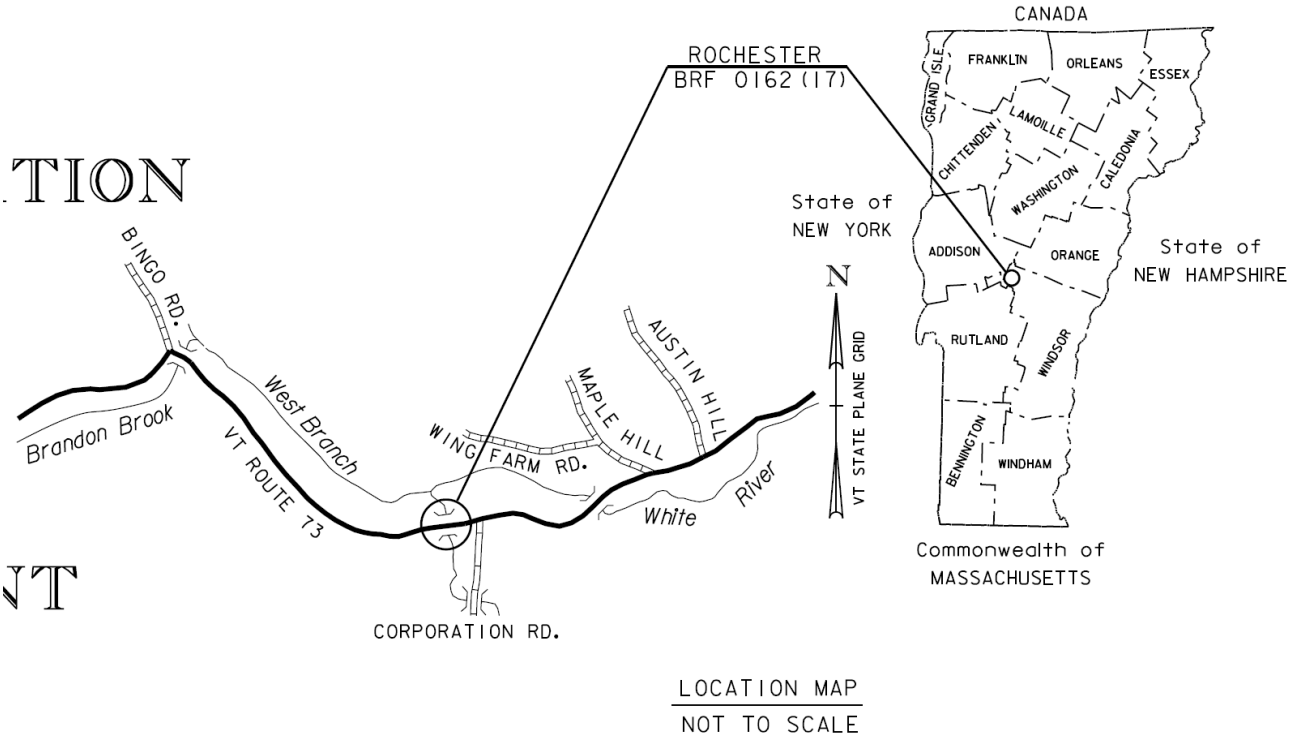
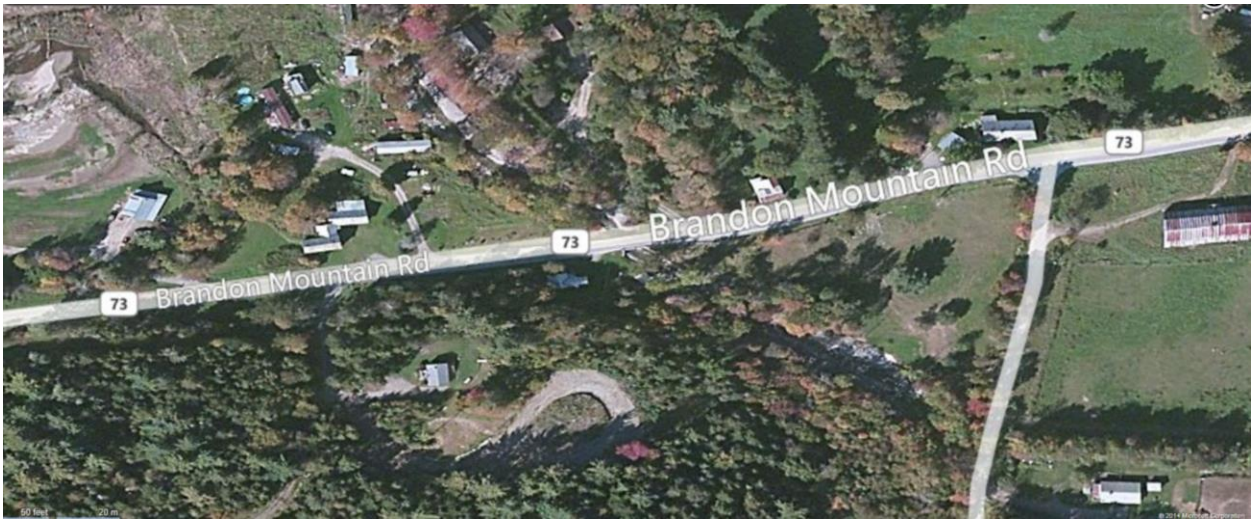
Design Flow: **14**
Maximum Restricted Flow: **15**

LOCUS:

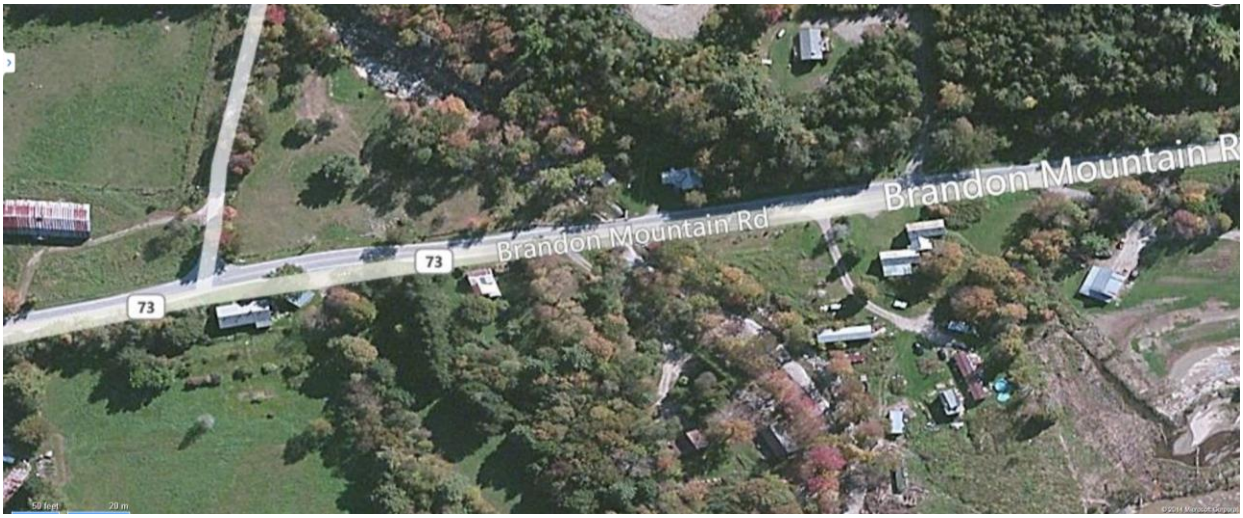


PHOTOS:


Brandon Mountain Rd
73
Brandon Mountain Rd
73
Brandon Mountain Rd
73


73
Brandon Mountain Rd
73
Brandon Mountain Rd
73


Corporation Rd
73


Brandon Mountain Rd
73
73


73

HYDROLOGIC DATA

HYDROLOGIC DATA

Date: October 2012

DRAINAGE AREA :	6.0 sq. mi.
CHARACTER OF TERRAIN :	Mountainous, forested, steep
STREAM CHARACTERISTICS :	Incised, semi-alluvial
NATURE OF STREAMBED :	Cobbles and gravel

PEAK FLOW DATA

Q 2.33 =	400 cfs	Q 50 =	1400 cfs
Q 10 =	860 cfs	Q 100 =	1650 cfs
Q 25 =	1150 cfs	Q 500 =	2300 cfs

DATE OF FLOOD OF RECORD :	Unknown	
ESTIMATED DISCHARGE:	Unknown	
WATER SURFACE ELEV.:	Unknown	
NATURAL STREAM VELOCITY :	@ 50 = 11.4 fps	
ICE CONDITIONS :	Moderate	
DEBRIS:	Moderate	
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY?		No
IS ORDINARY RISE RAPID?	No	
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS?		No
IF YES, DESCRIBE:		

WATERSHED STORAGE:	<1%	HEADWATERS:	
		UNIFORM:	X
		IMMEDIATELY ABOVE SITE:	

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE:	Concrete T-beam		
YEAR BUILT:	1929		
CLEAR SPAN(NORMAL TO STREAM):	18'		
VERTICAL CLEARANCE ABOVE STREAMBED:		8'	
WATERWAY OF FULL OPENING:	150 sq. ft.		
DISPOSITION OF STRUCTURE:	Replace		
TYPE OF MATERIAL UNDER SUBSTRUCTURE:		See borings	

WATER SURFACE ELEVATIONS AT:

Q2.33 =	945.8'	VELOCITY =	9.0 fps
Q10 =	947.7'	"	11.5 fps
Q25 =	948.6'	"	12.8 fps
Q50 =	950.5'	"	13.6 fps
Q100 =	951.5'	"	14.3 fps

REQUIRED CHANNEL PROTECTION: Stone Fill, Type IV

PERMIT INFORMATION

AVERAGE DAILY FLOW:	12 cfs	DEPTH OR ELEVATION:
ORDINARY LOW WATER:	6 cfs	~0.5'
ORDINARY HIGH WATER:	175 cfs	~1.5'

GENERAL PROCEDURE:

The purpose of the Water Control System is to shield the stream from demolition debris relative to the removal of the existing bridge superstructure. It is not intended to provide for construction "in-the-dry". The GC has proposed this general procedure regarding this Project:

The Water Control System is to consist of two rows of jersey barriers running parallel to the existing abutments to be set onto the stream bed passing beneath the existing bridge. Steel road plates or timber crane mats are to be set horizontally on top of and spanning between the jersey barriers and extending beyond the turbidity barriers on both sides as a Shield protecting the stream from demolition debris.

Weather monitoring will be required. If a storm is forecast which will raise the water surface above the Shield, the Shield will be cleared of all debris and allowed to be submerged as the higher stream flows pass through in the stream channel.

Should a storm occur of flow rate greater than the capacity of the restricted flow, the Water Control System will be removed to allow unrestricted stream flow.

WATER CONTROL SYSTEM:

Water Control Requirements:

1. The water control system is to be coordinated with the EPSC work.
2. This work shall consist of the construction, maintenance and removal of water control system in accordance with the specifications at locations designated in the Plans or in the Contract.
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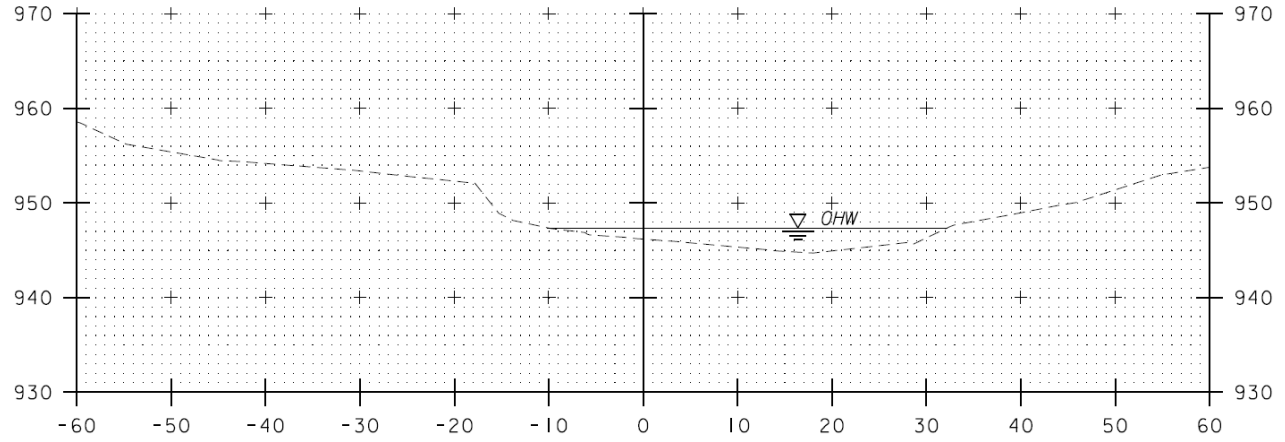
12. Remove Water Control System

SUPPORTING ANALYSIS:

Channel Flows:



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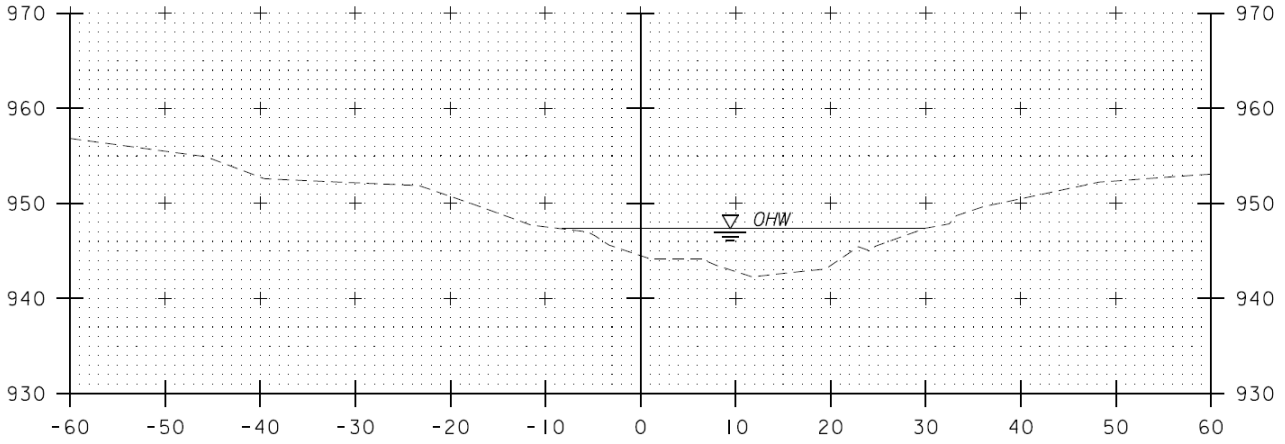

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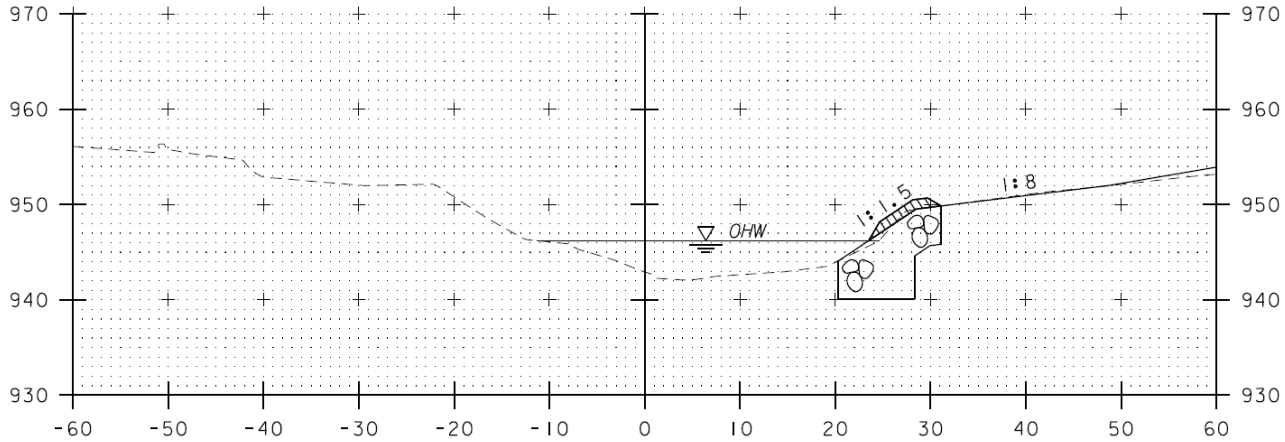
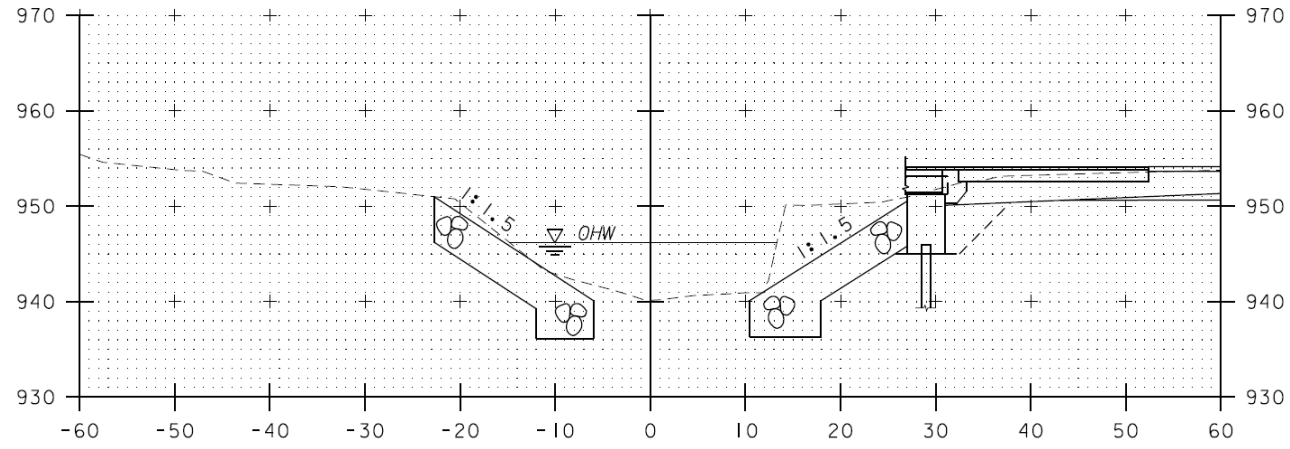


STA 11+44, RT
BEGIN UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, TYPE IV

11+50



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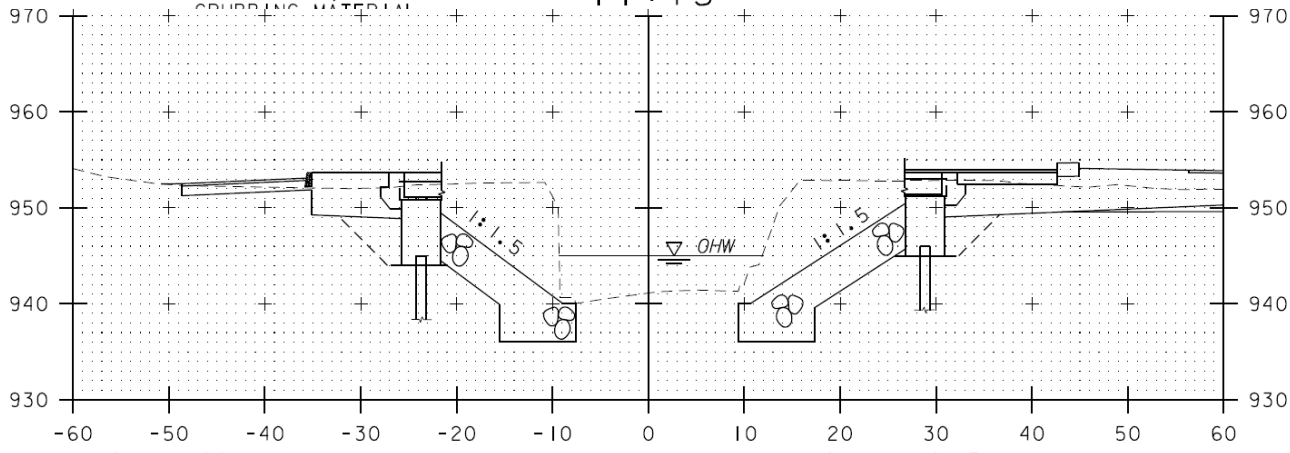
BEGIN UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, TYPE IV
GRUBBING MATERIAL

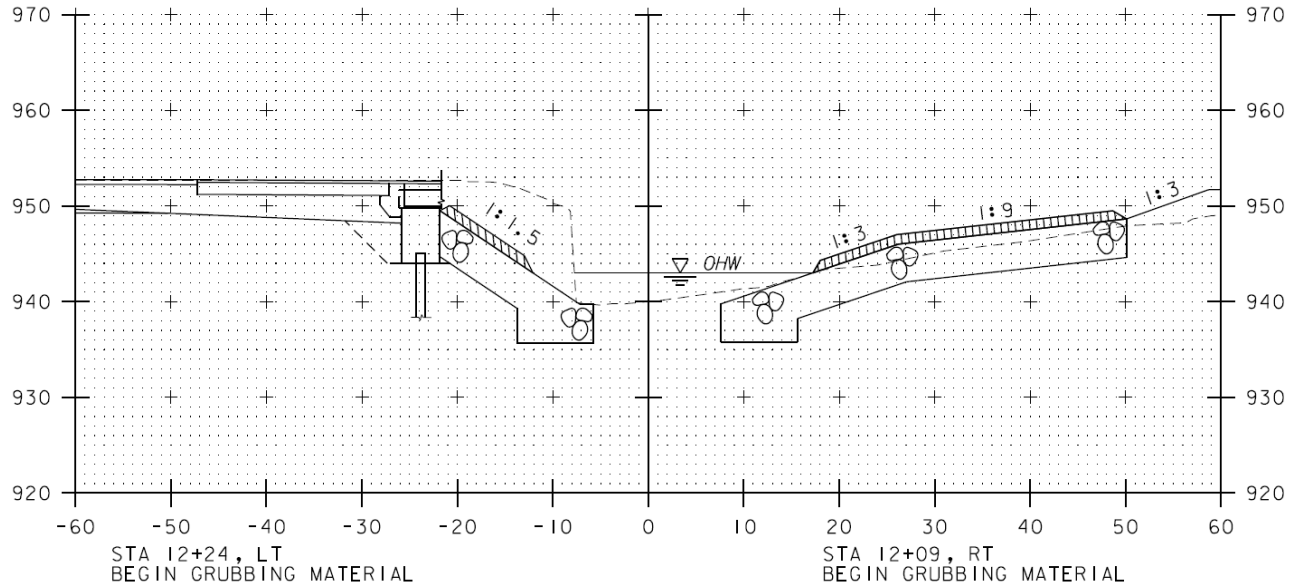
11+75



STA 11+90, LT
END GRUBBING MATERIAL

STA 11+82, RT
END GRUBBING MATERIAL

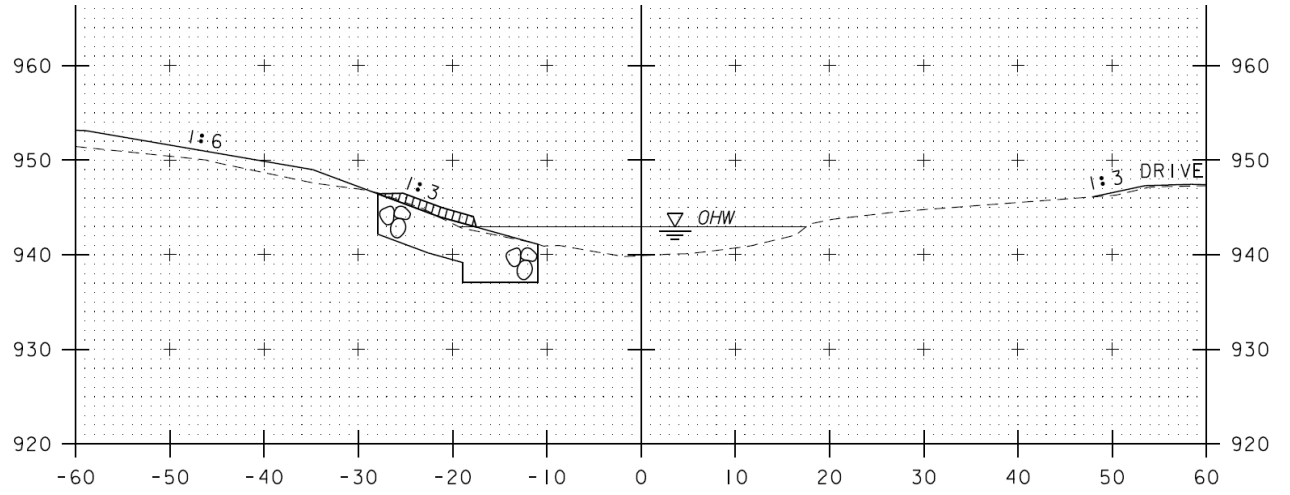
12+00



STA 12+24, LT
BEGIN GRUBBING MATERIAL

STA 12+09, RT
BEGIN GRUBBING MATERIAL

12+25



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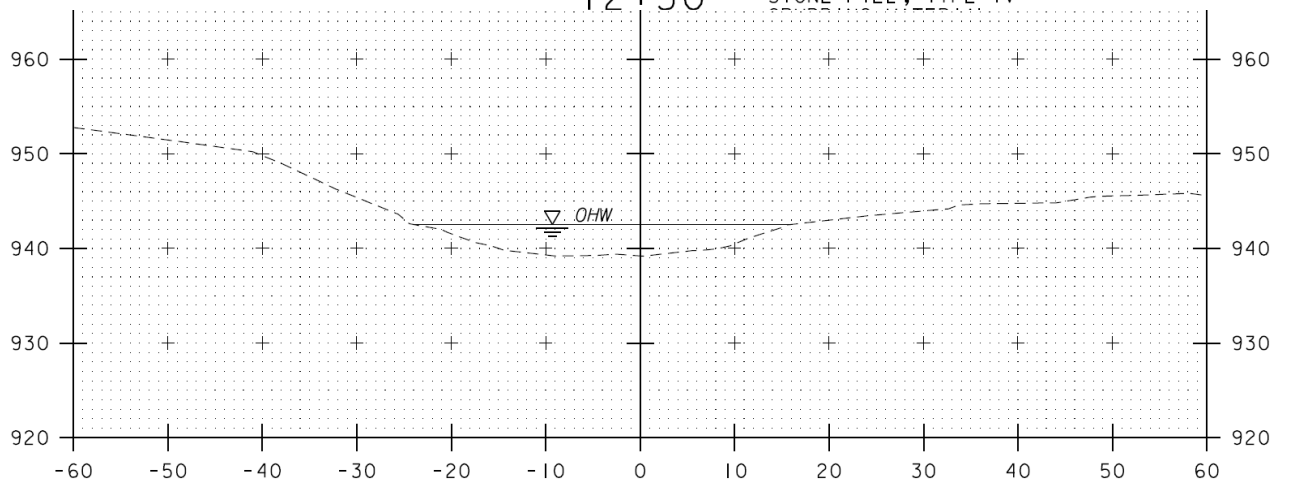
END UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE FOR STONE FILL
STONE FILL, TYPE IV

12+50



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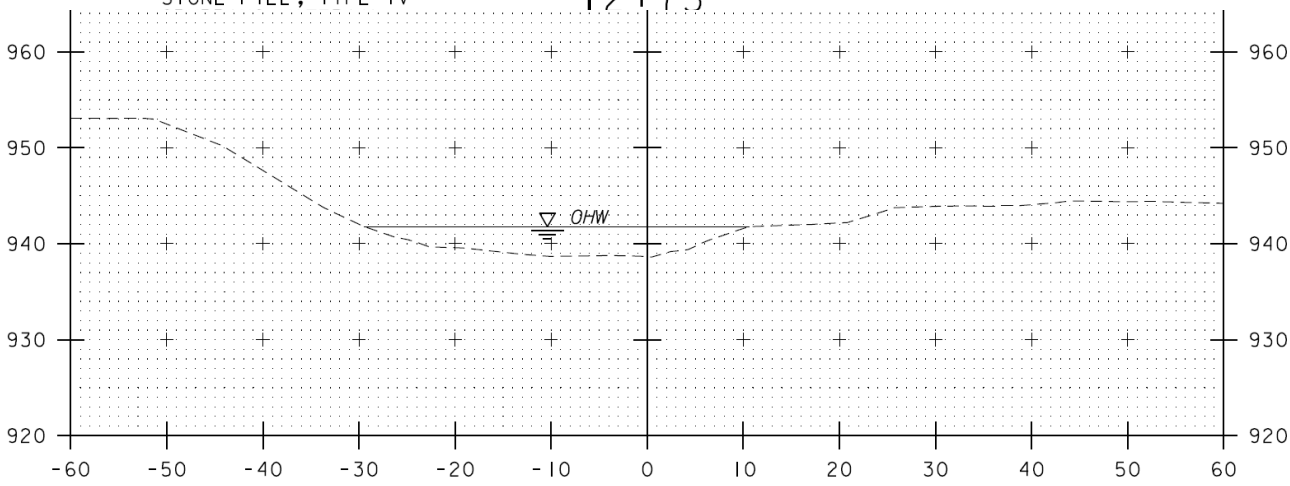
END UNCLASSIFIED CHANNEL EXCAVATION
GEOTEXTILE FOR STONE FILL
STONE FILL, TYPE IV

12+75



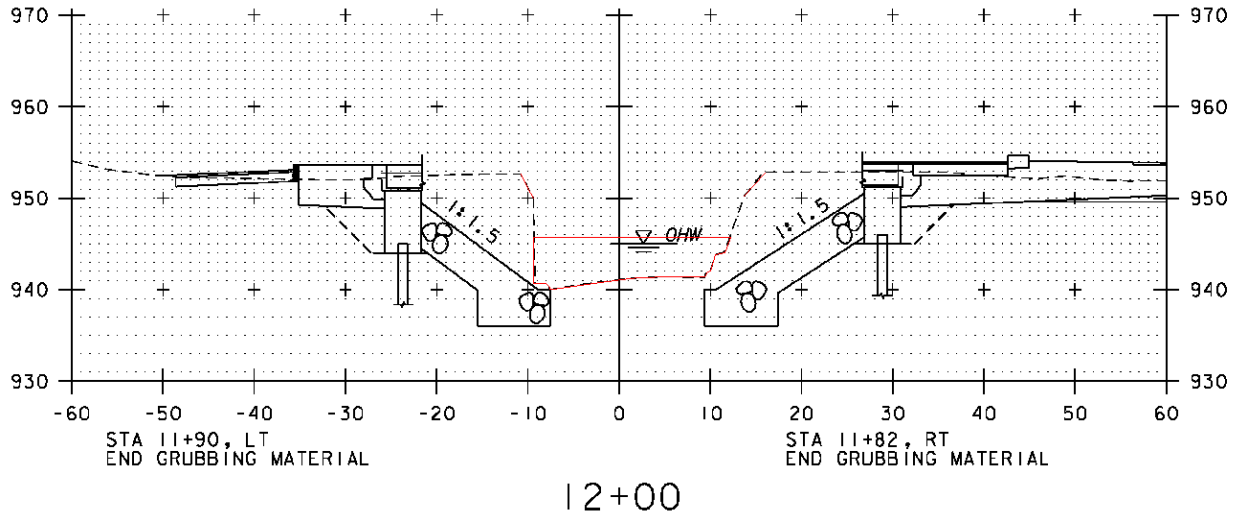
13+00

Channel Characteristics:

Determine characteristics of the existing channel through the existing bridge. From the Contract Documents for,

$EL_{Q2.33}$ = 945.8 ft
$V_{Q2.33}$ = 9.0 fps
$Q_{2.33}$ = 400 cfs

Based on,



P = 30.0'
A = 96.3sf

Natural Channels (minor streams, top width at flood state < 100 feet)	
Fairly regular section	0.030 to 0.070
Irregular section with pools	0.040 to 0.100

Source: Design and Construction of Sanitary and Storm Sewers, American Society of Civil Engineers and the Water Pollution Control Federation, 1969.

n = 0.077

Then,

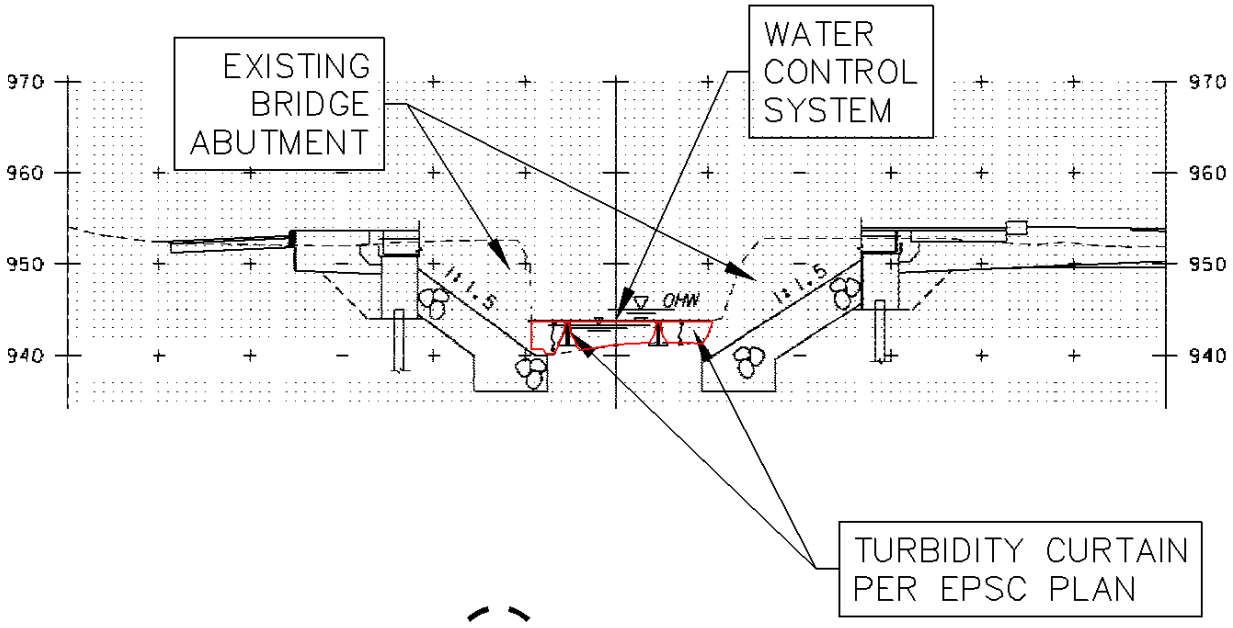
S	ft/ft	0.01000
n		0.077
P	ft	30.000
A	ft^2	96.300
R=A/P	ft	3.210
$Q = A (1.486/n) R^{2/3} S^{1/2}$	cfs	404

The Q value corresponds closely with the Contract Plan hydraulic data for $Q_{2.33}$.

Design Flow:

Using these assumptions which conform to the specified $Q_{2.33}$, determine the characteristics for Q_{shield}.

EL_{shield} = 943.7 ft



Therefore,

S	ft/ft	0.01000
n		0.077
P	ft	32.624
A	ft^2	45.000
R=A/P	ft	1.379
$Q = A (1.486/n) R^{2/3} S^{1/2}$	cfs	108

Q_{shield} = 108 cfs

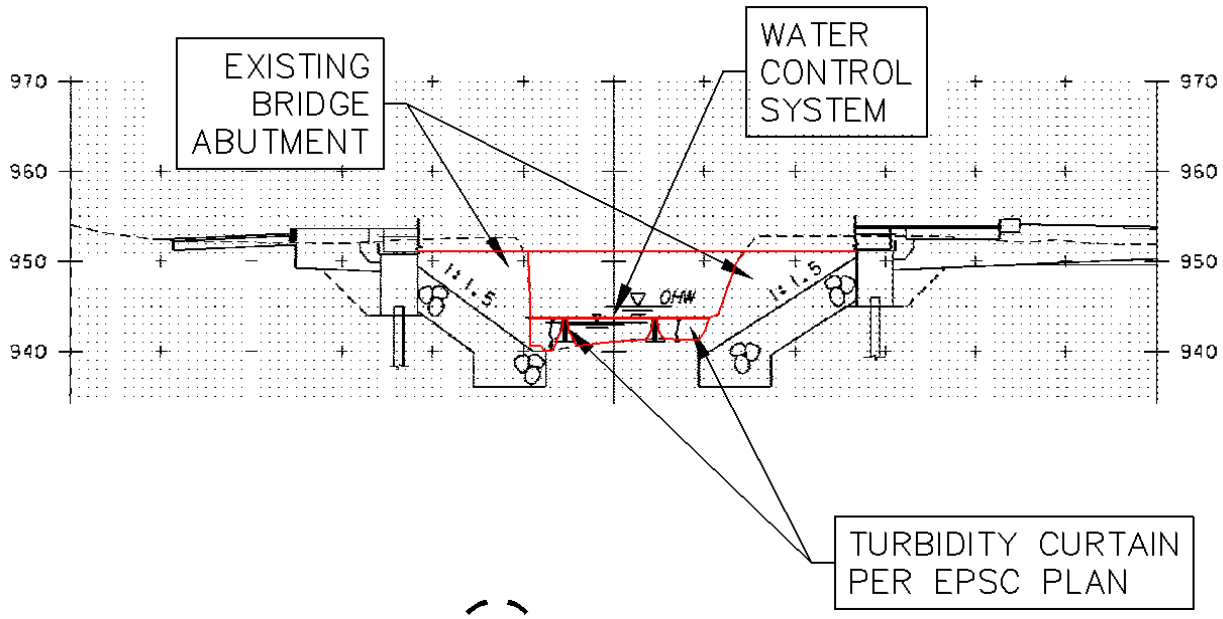
The GC desires to design the Water Control System for $Q_{shield,}$ therefore

Q_{design} = Q_{shield} = 108 cfs

Maximum Restricted Flow:

Road Plate Option:

Determine the maximum flow that can pass with the Water Control System in place using the road plate option.



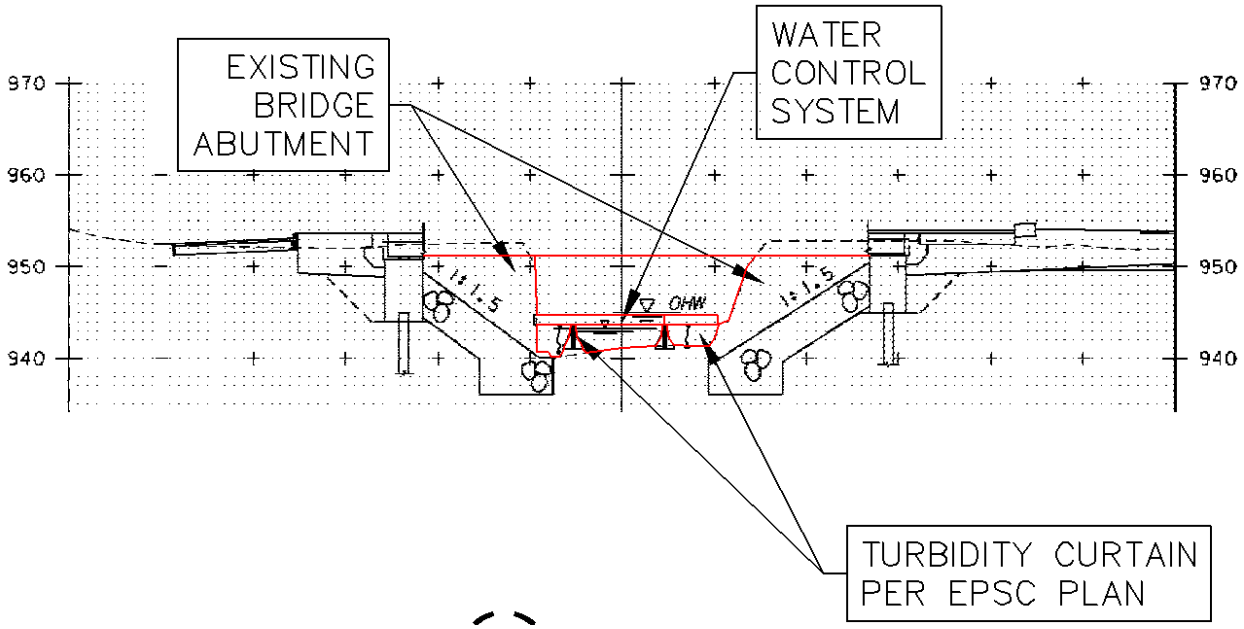
$EL_{max\ restricted}$ = 951± ft

S	ft/ft	0.01000
n		0.077
P	ft	88.500
A	ft^2	207.200
R=A/P	ft	2.341
$Q = A\ (1.486/n)\ R^{2/3}\ S^{1/2}$	cfs	705

$Q_{max\ restricted}$ = 705 cfs (Road Plate Option)

Crane Mat Option:

Determine the maximum flow that can pass with the Water Control System in place using the crane mat option.



$EL_{max\ restricted}$ = 951± ft

S	ft/ft	0.01000
n		0.077
P	ft	90.380
A	ft^2	189.320
R=A/P	ft	2.095
$Q = A\ (1.486/n)\ R^{2/3}\ S^{1/2}$	cfs	598

$Q_{max\ restricted}$ = 598 cfs (Crane Mat Option)