



# Non-Conformance Report

Form #: 3.01

**URGENT ACTION ITEM**

Check box if urgent

Report No.	Date	Project
1	11/20/2018	Antrim Wind Project

### Non-Conformance Description:

The details on sheet C-08 of the IFC set show culvert SD-4 as a 3-sided box culvert with an undisturbed stream channel. During the installation of the first 20 ft of the culvert, the stream bed was excavated, graded, and replaced with stone. (See attached Photo)

Prepared By: Derek Watts

Date: 11/20/2018

### Proposed Correction

See **Appendix 1** enclosed: Sargent Corp. Document "Culvert SD-4: Box culvert stability and streambed Non-conformance analysis and report."

See **Appendix 2** enclosed: Sargent Corp. Revised remediation plan per DES on site visit 12/18/18

Prepared By: Sargent Corp.

Date: 11/30/2018

### Approved Correction

See **Appendix 3** enclosed: approval email from DES 12/21/18

See **Appendix 4** enclosed: Remediation progress pictures

Prepared By: DES

Date: 12/21/2018

If Corrective Action Rejected...By (Owner):

Date:

### Correction Complete / NCR Closed

Project Quality Manager:

Derek Watts

Date: 1/17/2019

If NCR Closure Rejected...By (Owner):

Date:

Owner must respond within 24hrs if Owner rejects "corrective action" or "NCR Closure" notices.

Antrim NH Wind: Culvert SD-4: Box culvert stability and streambed  
Non-conformance analysis and report

**Introduction**

On November 19, 2018 installation of a 10' wide x 2' high open-bottomed box culvert resulted in non-conforming work, specifically disturbance of existing stream-bed contrary to requirements and exposing of the footer bedding to potential scouring or under-mining. This document will detail the history of how the non-conformance arose including identification of root causes, measures taken to prevent recurrence of similar issues, and the proposed plan to resolve the non-conformance.

**History**

The box culvert, SD-4 at Station 18+75, was designed as open-bottomed and the plans show not disturbing the central portion of the stream channel. Sargent Corporation developed a Preparatory Inspection Report to plan for the installation (copy attached – Attachment A). The report was developed by the superintendent, surveyor and a foreman on November 16<sup>th</sup>. The plan addressed dewatering, layout, excavation, bedding, setting of footers and decking, backfilling, traffic, wingwalls, and termination of dewatering and cleanup. The report specifically states "as best as possible do not disturb stream bed in culvert area."

On November 19<sup>th</sup>, the day of initial installation, the crew reviewed the Preparatory Inspection Report. Work commenced with off-setting grades stakes and establishing dewatering. The crew was instructed about excavating two distinct trenches, one for each footer i.e. one on each side of stream.

Excavation started at the outlet end. The foreman left the work area to bring a laborer to get a dump truck. The laborer then returned to the work area with the truck. The foreman was delayed in returning to the work area as he assisted a new foreman get oriented with his new task.

The foreman returned to the work area after approximately 45 minutes to find the excavator had been unable to confine excavation to the originally intended limits due to the presence of large rocks, stumps and roots. The streambed had already been disturbed so the work continued with placing of ¾" crushed stone for the footers and in the streambed area, placing of rock in the streambed area, and installation of the planks. By the end of the work day, 5 planks totaling 20' had been installed.

The intention was to resume work on the box culvert on November 20<sup>th</sup> with removal of the existing temporary bridge and extending the box culvert to its final length. However, during the Plan of the Day Meeting, the non-conformance of the work was brought to Sargent's attention and installation work was not resumed. The only work done in the area since was restoration of the stream flow through the remaining streambed and through the installed portion of the culvert. The water in this area has been running clear.

**Root Causes**

Sargent Corporation has identified root causes of the non-conformance. First, there was a lack of supervision while the foreman was away from the work area. Second, production over-shadowed design and environmental considerations preventing the stopping of work and exploration of alternatives.

Antrim NH Wind: Culvert SD-4: Box culvert stability and streambed  
Non-conformance analysis and report

**Preventative Measures**

To address the root cause of lack of supervision, Sargent foreman will not leave an activity unsupervised when it is at a critical point. Crew members have been instructed to cease work if the nature of the work substantially changes when the foreman is not in the area.

To address the second root cause, Sargent has met with the personnel directly involved and also had an entire crew Environmental Stand-Down the morning of November 27<sup>th</sup>. The environmentally sensitive nature of the project and the importance of our environmental obligations were stressed. Additionally, everyone was instructed to ask for clarification if they any doubts or concerns, to re-focus on the Preparatory Inspection Reports and to value their contents, and to re-affirm environmental considerations as a top priority.

**Conformance Plan**

To address the non-conformance issues, Sargent proposes to increase the footer depth with a second course of footer blocks, isolate the footer bedding from stream flow, and re-establish to mimic the natural streambed. See attached "Conformance Plan" for details of this plan.

Sargent Corporation will not re-commence work in the area until the conformance plan has been approved by the project team and by NHDES.

Antrim NH Wind

Conformance Plan: SD-4 Box Culvert

Plan updated 11/30/2018

Sargent Corporation has developed a plan to address stability and streambed issues at box culvert SD-4.

The revised installation will prevent the flow of water under the footings and will provide a streambed mimicking that of a natural stream.

#### Phase 1 – Preparatory

- Confirm approval of conformance plan by NHDES and Project Team.
- Develop new Preparatory Inspection Report for crew guidance. Assure report reflects conformance plan as approved. Provide copy of Preparatory Inspection Report to Reed & Reed for comment.
- Gather necessary materials and tools.
- Collect native rocks from onsite. Preference to above ground rocks such as from old rock walls. Clean the native rocks to be used in streambed as needed by brooming or hosing in an area with appropriate E&S and water controls, separate from the culvert work area.
- Monitor weather so as to perform work in lower flow conditions.
- Provide Reed & Reed notice of intended work date to allow for inspection.

#### Phase 2 – Installation Prep

In accordance with the Preparatory Inspection Report:

- Establish survey controls with off-sets
- Establish E&S controls
- Establish dewatering

Monitoring and maintenance of E&S and dewatering to continue through remaining phases.

#### Phase 3 – Installation

##### Phase 3A – Re-Install

The installed components and temporary streambed materials will be removed. Additional depth of excavation will be done for the additional course of footers. The footers will be bedded on  $\frac{3}{4}$ " crushed stone. Native earth materials will be used to backfill above the  $\frac{3}{4}$ " crushed stone on both the interior and exterior of the footers. This fill will be compacted.

The streambed will be shaped with a slight depression near the middle for low flow. Geotextile fabric (140N) will be placed over the compacted earth fills.

## Antrim NH Wind

Conformance Plan: SD-4 Box Culvert

Plan updated 11/30/2018

For the streambed, onsite materials will be used as much as possible. The streambed will be created by placing native rocks (approximately 1' – 2' in size) salvaged from on-site and chinking them in place with a 1.5" to 3.5" deep layer of stone such as Dirt Doctors NH Riverbed 1 ½" to 2" stone. The material placement will be done to match existing streambed elevations. The placement of the larger rocks will be done to mimic the nature of the stream just upstream and downstream from the work area, excluding placement of any boulders so large as to pose a problem in the constrained area in the culvert.

Tie-in to the existing streambed will be done so as to match existing elevations and widths.

After streambed is satisfactorily established, the bridge decking will be placed.

### Phase 3A – New Installation

The excavation for footings in the area where work has not yet taken place has the risk of disturbing the currently undisturbed streambed. Sargent will work to minimize any stream disturbance. Materials adjacent to the stream excavated for the footings will be salvaged, stockpiled separately than other materials, and later replaced above the compacted earth fill. Sargent will hoe-ram in place rather than removing large boulders. If root systems or stumps are encountered whose removal intact would disturb the streambed, these roots or stumps will be cut in place before removal.

Placement of blocks, backfill, fabric and decking placement will proceed as with Phase 3A above.

### Phase 4 – Post-Installation

After installation of the culvert components, compacted earth fill will be placed at the end of the culverts to prevent migration of water into the footings from that area. The fill placed at the ends of the culverts will be covered with 140N geotextile fabric and rock armored. Larger boulders will be placed as wingwalls at the culvert corners. Road gravels will be placed adjacent to and over the culvert shortly after installation. Any other adjacent areas will be stabilized with riprap.

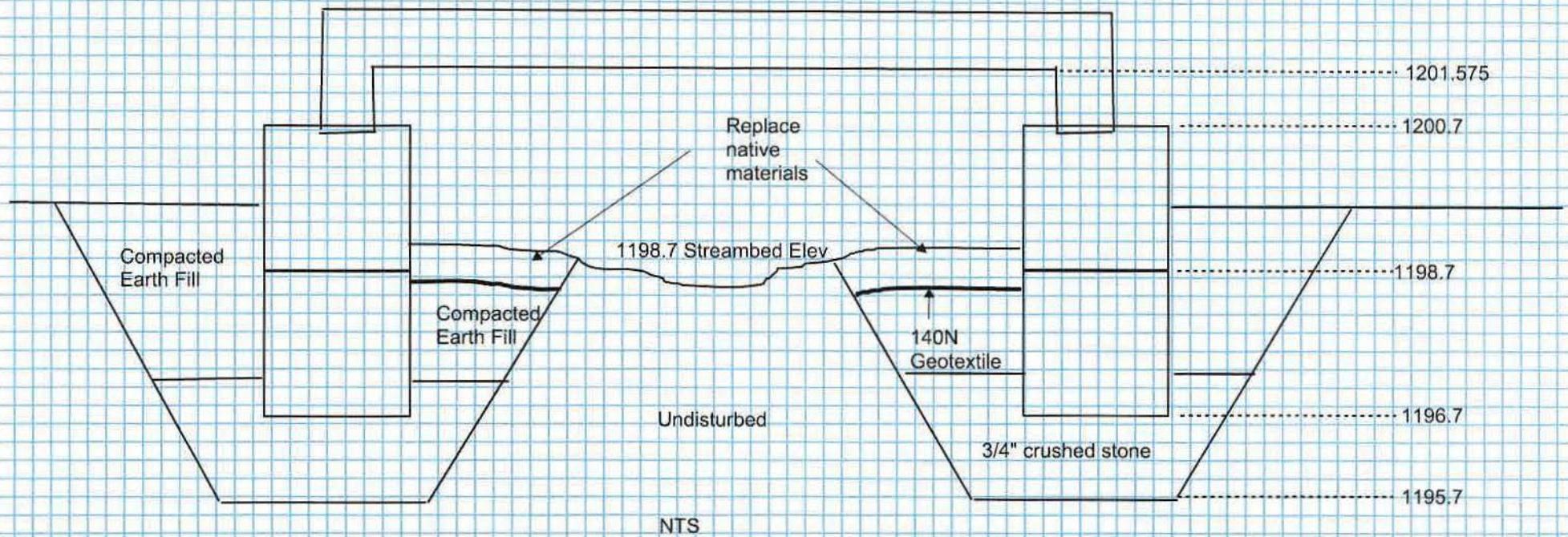
Dewatering will cease and temporary E&S controls will be removed as appropriate.

Summit Geoengineering has reviewed the attached sketch and this plan and commented "This is a sound concept. This approach will provide a stable base for the abutment blocks and will also provide sufficient scour protection."

This proposal is subject to review and acceptance by NHDES before work will commence.

Antrim NH Wind  
Conformance Plan: SD-4 Box Culvert

Undisturbed channel

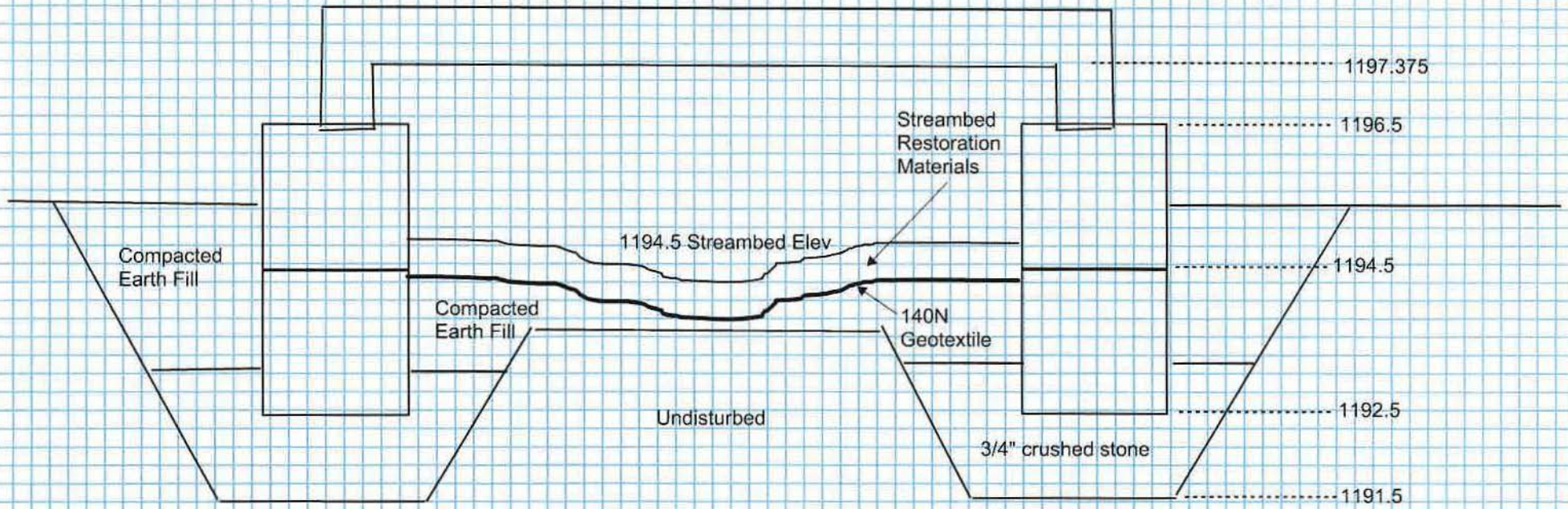


Upstream streambed elevation: 1198.7'.  
Minimum required between streambed and bottom of culvert decking: 2'.

11/30/18 8:55

Antrim NH Wind  
Conformance Plan: SD-4 Box Culvert

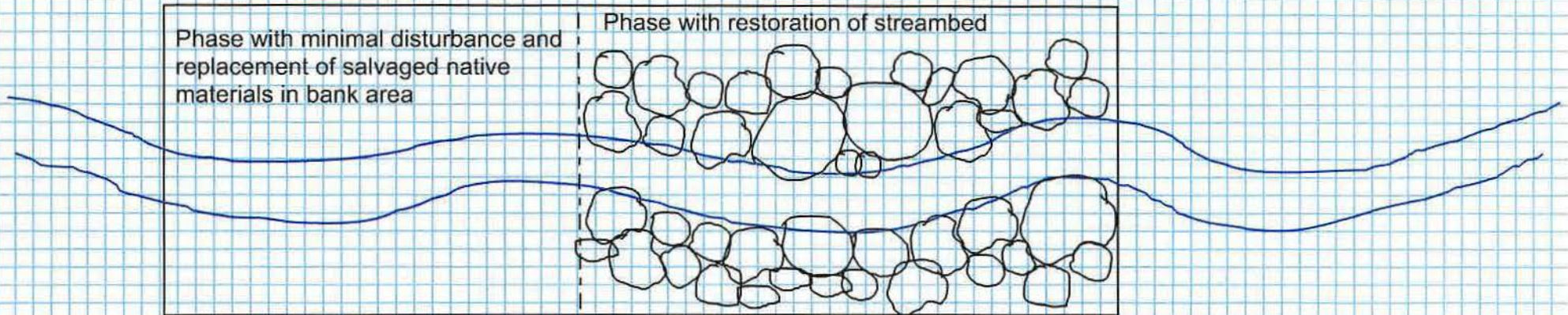
Disturbed streambed restoration



Downstream streambed elevation: 1194.5  
Minimum required between streambed and bottom of culvert decking: 2'.  
NTS

11/30/18 8:51am

Antrim NH Wind  
Conformance Plan: SD-4 Box Culvert



Site rocks placed randomly.  
Rocks to be chinked in place  
with smaller stone (not shown).

NTS

11/30/2018 9:00 am



# THE DIRT DOCTORS

709 KEITH AVENUE PEMBROKE, NH 03275

PHONE (603) 229-3200

FAX (603) 225-2717

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## NH Riverbed 1 ½ - 2”

Smooth natural river stone found in the waterways of the white mountains. Stone consists of a variety of natural colors as seen in the rives of Kancamagus highway.

\$49.00 per yard



## Riverstone 3 - 6”

Naturally Round, earthstone color, large stone. Great for edging and ponds.

\$42.70 per yard



## Round Stone ¾” or 1 ½”

Rich Caramel Color & Naturally Round. Great for driveways, walkways, and pool area. Foot Friendly

\$42.70 per yard



## Delivery Cost (to Antrim, NH)

Tri-axle (18-20 Yards) \$130.00

6-Wheeler (8-10 Yards) \$100.00

Undisturbed stream conditions near box culvert



SM 11/20/18

**SARGENT**  
CORPORATION

Excellence for Generations.

AN EMPLOYEE OWNED COMPANY

**Preparatory Inspection**

DATE: 11/15/18

JOB: Antwin

SUPER: Wright

FORE: Dewborn

JOB# \_\_\_\_\_

ITEM# 100

DIG SAFE# 2018408784

INSPECTOR/OWNER REPRESENTATIVE: Larry Dereck

ITEM DESCRIPTION: Box Culverts JOB QUANTITY: 35'

BUDGETED PRODUCTION: 8 ft/hr OVERALL DURATION: 1 day

SCOPE OF WORK:

excavate subgrade, dewater  
By pass pump, riprap interior,  
install concrete, backfill  
  
See Attached  
sheets

EXCLUSIONS FROM SCOPE:

Building access road

**As-Built Survey**

Performed By Contractor Or Owner?

(Note spec section and paragraph)

(Note spec section and paragraph)

SPECIFICATION REVIEW: N/A

DETAIL REVIEW: Page C-08

EQUIPMENT AND MANPOWER REQUIRED	MATERIALS AND SUB'S	SMALL/ HAND TOOLS REQUIRED
Foreman	3/4" stone	Lazer
Labor	Fabric	Shovels
excavator	Rip Rap	2 way chain
	Gravel	Lifting bar
	ledge back fill	Pumps
	Dig Rocks for weirs	

<b>SITE CONDITIONS/ CONFLICTS:</b>	
By pass pump clean water	
Identify Existing Utilities. Check Boxes Below With Yes No Not/Applicable	
Electrical (O.H, U.G) <input type="checkbox"/> Gas <input type="checkbox"/> Water <input type="checkbox"/> Sewer <input type="checkbox"/> Communications <input type="checkbox"/> Other <input type="checkbox"/>	
<b>SAFETY CONCERNS &amp; ACTION NEEDED:</b> Backing, traffic Lifting, pinch points, trip hazards eye contact,	
<b>PERMITS AND PERMIT REQUIREMENTS:</b> n/a	<b>WEATHER AND ENVIRONMENTAL CONCERNS:</b> No turbid water
<b>ALTERNATIVES IF DELAYED:</b> Ditching, wrap	<b>TESTING REQUIRED AND SUBMITTAL REVIEW:</b> Testing n/a Submittal has been approved
<b>OTHER OPERATIONS IMPACTED:</b> have to maintain traffic	
<b>COMMENTS ON PROGRESS:</b>	

PRINT NAME	POSITION	SIGNATURE	DATE SIGNED
Jeshua Dearborn	Foreman		11/16/18
Shawn Powell	Fore		11-19-18
Michael Tupper	Foreman		11-19-18
Nick Kinney	Operator		11-19-18
Matthew St Peter	laborer		11-19-18

# • SUPPLY®

CONSTRUCTION & INDUSTRIAL

AH HARRIS  
KENSEAL

WHITE CAP  
HARMAC

Set up fabric & Hay bales upstream of Culvert SD-3A to pump clean water into,

Set up fabric & Hay bales by ~~land~~ treatment SW-1 to pump dirty water into

off set layout of Culvert

Set up Lazor @ proper Alignment & pitch (!)

1194.5 @ bottom of  $\frac{3}{4}$ " stone @ outlet

1195.5 @ bottom of Concrete footer block @ outlet

Dig sump hole up stream of temp bridge set up sufficient pumps to pump clean water into clean water filter

After water is controlled in work area dig a sump hole down stream of outlet of Culvert (as close as practical) put in sufficient pumps to pump dirty water into dirty water filter.

\* As best as possible do not disturb stream bed in culvert area.

Excavate unsuitable materials from under area where footers go there is 38' ~~off~~ of footer & 36' of culvert so start footer 6" beyond edge of culvert on down stream end. that will leave play in the upstream end when you are complete.

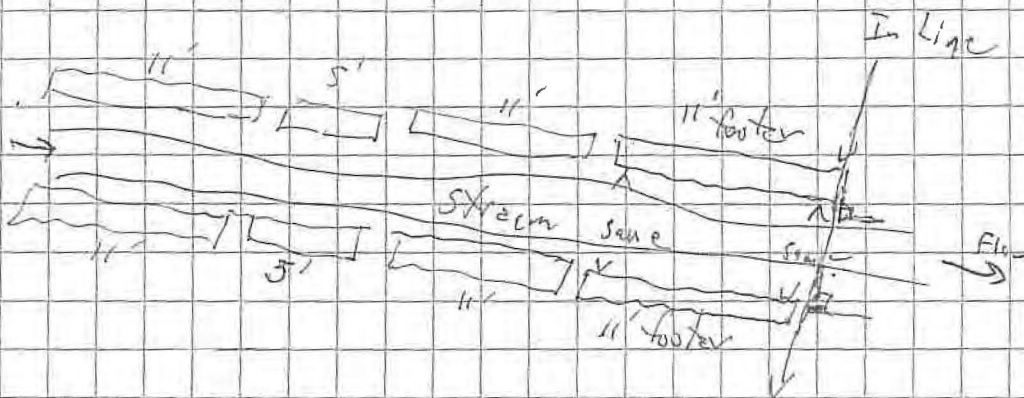
\* It calls for 1' of  $\frac{3}{4}$ " stone, what's critical is a solid base for the footer. Remove all unsuitable materials, leave anything solid below bottom of concrete grade no matter the amount of  $\frac{3}{4}$ " stone.

Unsuitable material is anything organic.

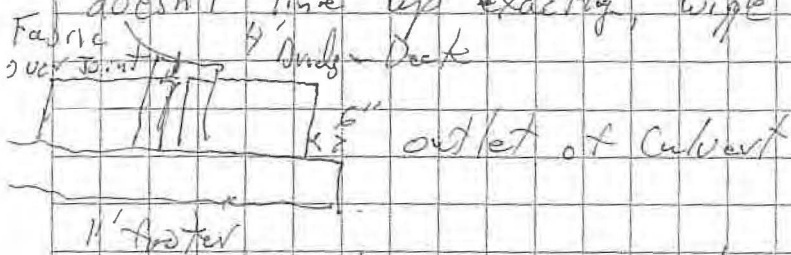
there should be a good bed of solid boulder to build on, the stone subgrade will not be uniform

Grade the  $\frac{3}{4}$ " stone to bottom of Concrete Grade bucket tump

Keep an eye on your pumps so that they keep up.  
Use the 2 way chain to set the footer blocks  
Start with one 11" block on each side, check the slots for the same width as bridge deck and make them square with each other start @ Down stream end



After the first two footers are set backfill the inside with a course well ~~de~~ graded riprap chink w/ gravel.  
Set the first bridge deck using the spreader bar, if it doesn't line up exactly, wipe the footers with excavator bucket.



Set the second Bridge deck wiggling footers as necessary.  
Cut 2' wide strips of fabric to cover joints in bridge deck  
~~at and set~~  
Grade and set the next 2 11' footers with riprap on inside  
Set next 3 bridge decks wiggling footers as necessary  
then set the 5' footers this will get you to the existing bridge

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CONSTRUCTION & INDUSTRIAL

AH HARRIS  
KENSEAL

WHITE CAP  
HARMAC

Set the sixth bridge deck this will get you 24' of bridge ready to backfill

Remove lifting eyes and

Place fabric over joints

Backfill with gravel within 3'-4' of the concrete bringing up both sides equally

Use blasted ledge for rest of backfill

Connect a temp. road over 24' of bridge

Remove temp bridge

finish the box culvert in the same manner as the first half

Place boulder wing walls on ~~at~~ ~~the~~ ~~outlet~~ corner of bridge, then pull dirty water pump & clean up stream bed.

Place boulder wingwalls on inlet end & ~~then~~ pull pump and clean up stream bed

take steel plates to Rt 9 call Kenny release all steel plates haul back to stillwater as available transport  
take spreader bar & lifting eyes to Dirigo in Madison

Page 3

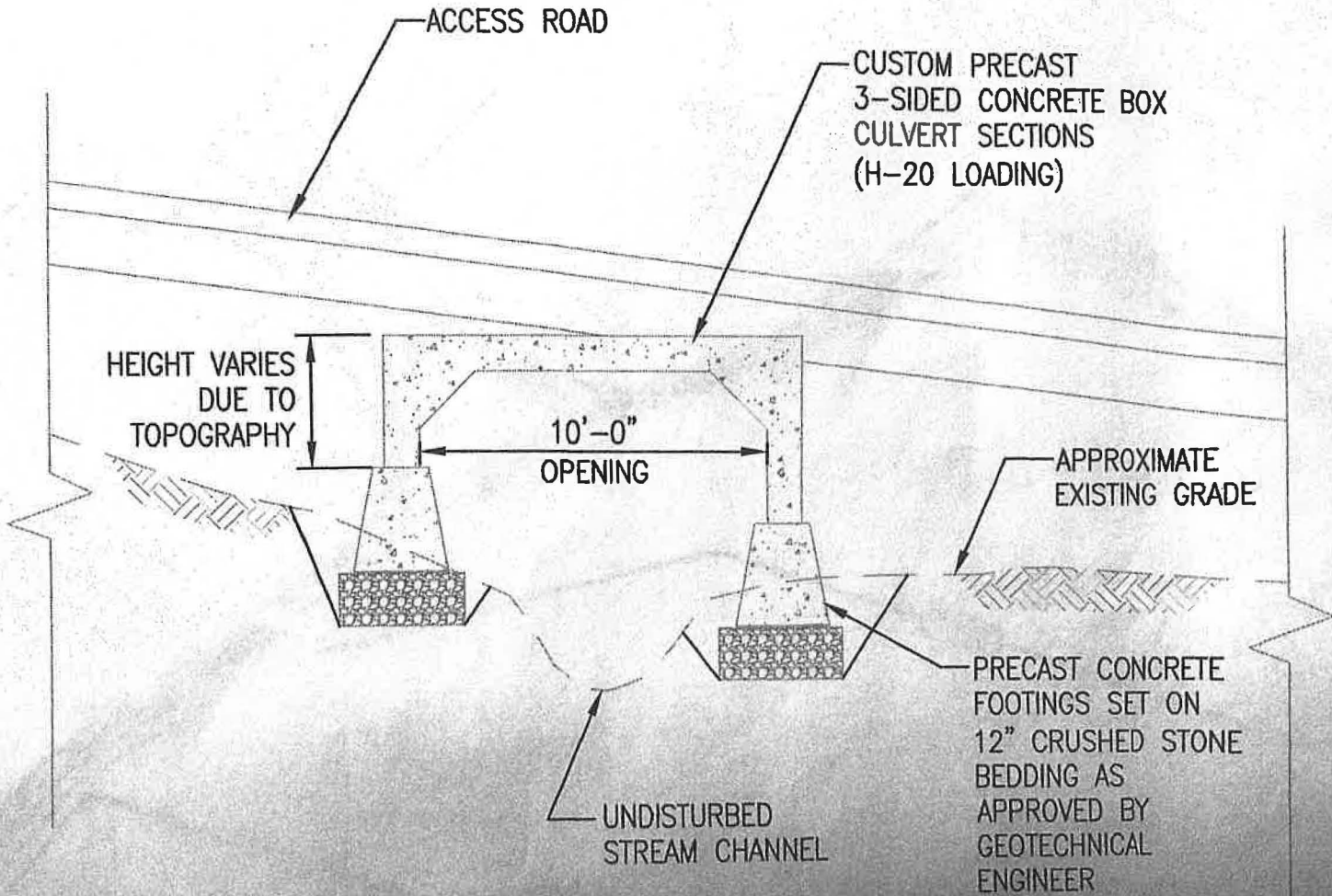
Manchester, NH • Portsmouth, NH • West Lebanon, NH

Portland, ME • Augusta, ME • Bangor, ME

800-431-3000

B-23	25%	75	ROADWAY (STA. 202+25 TO 221+00)
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SD-27
SD-28
SD-29



\*SD-  
\*\* CC  
TO M

BOX CULVERT  
NOT TO SCALE

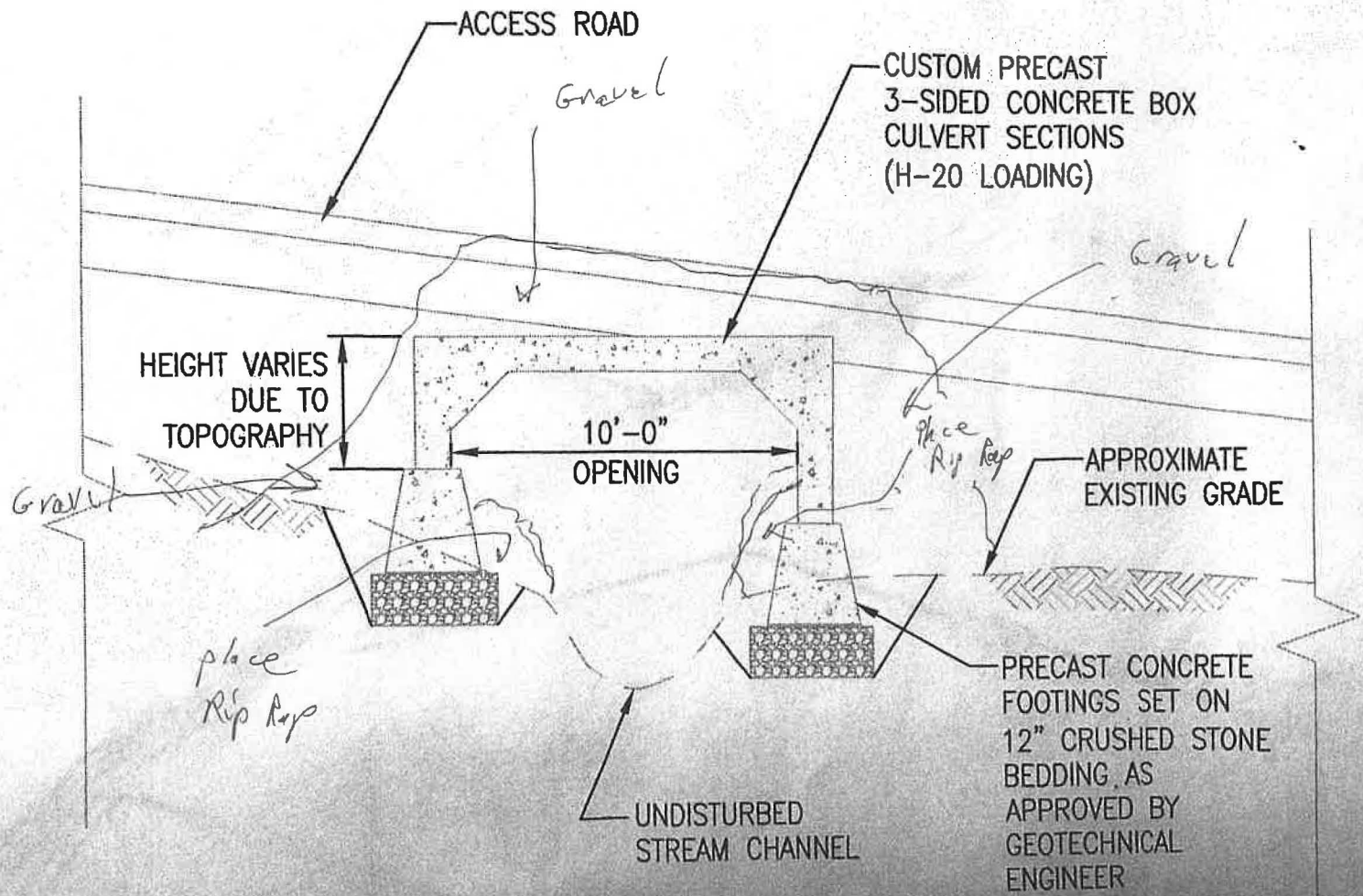
NOTE:  
STREAM WORK MUST BE PERFORMED DURING LOW FLOW TIMES  
AND IN ACCORDANCE WITH PERMIT.

ELEV A



B-23	25%	75	ROADWAY (STA. 202+25 TO 221+00)
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SD-27
SD-28
SD-29



\*SD-  
\*\* C  
TO M

**BOX CULVERT**  
NOT TO SCALE

**NOTE:**  
STREAM WORK MUST BE PERFORMED DURING LOW FLOW TIMES  
AND IN ACCORDANCE WITH PERMIT.

ELEV A

B-23

25%

75

ROADWAY (STA. 202+25 TO 221+00)

SD — 27

SD — 28

SD — 29

\*SD-4  
\*\*  
TO CON  
MA

ACCESS ROAD

CUSTOM PRECAST  
3-SIDED CONCRETE BOX  
CULVERT SECTIONS  
(H-20 LOADING)

HEIGHT VARIES  
DUE TO  
TOPOGRAPHY

10'-0"  
OPENING

APPROXIMATE  
EXISTING GRADE

PRECAST CONCRETE  
FOOTINGS SET ON  
12" CRUSHED STONE  
BEDDING AS  
APPROVED BY  
GEOTECHNICAL  
ENGINEER

UNDISTURBED  
STREAM CHANNEL

BOX CULVERT

NOT TO SCALE

NOTE:

STREAM WORK MUST BE PERFORMED DURING LOW FLOW TIMES  
AND IN ACCORDANCE WITH PERMIT.

ELEV A

Antrim NH Wind

Conformance Plan: SD-4 Box Culvert

Updated 11/30/2018

Updated 12/20/2018 after comments from SEC & DES site visit.

Sargent Corporation has developed a plan to address stability and streambed issues at box culvert SD-4.

The revised installation will prevent the flow of water under the footings and will provide a streambed mimicking that of a natural stream.

#### Phase 1 – Preparatory

- Confirm approval of conformance plan by NHDES and Project Team. Work to be done within 30 days of approval.
- Develop new Preparatory Inspection Report for crew guidance. Assure report reflects conformance plan as approved. Provide copy of Preparatory Inspection Report to Reed & Reed for comment.
- Gather necessary materials and tools.
- Produce streambed material mix: Collect native rocks from onsite. Blasted and angular materials will not be used. Supplement found native materials with imported materials. Material will include fine sands, gravels, cobbles and boulders. Mix the sand, gravels, cobbles and boulders together ahead of time.
- Monitor weather so as to perform work in lower flow conditions.
- Provide Reed & Reed notice of intended work date to allow for inspection.
- Photos will be taken before, during and after work.

#### Phase 2 – Installation Prep

In accordance with the Preparatory Inspection Report:

- Establish survey controls with off-sets
- Establish E&S controls, including for water used for the in-place hosing down of placed streambed material mix.
- Establish dewatering

Monitoring and maintenance of E&S and dewatering to continue through remaining phases.

#### Phase 3 – Installation

##### Phase 3A – Re-Install

The installed components and temporary streambed materials will be removed. Additional depth of excavation will be done for the additional course of footers. The footers will be bedded on ¾" crushed stone. A geotextile separation layer will be placed on the ¾" crushed stone. Native earth materials will be used to

Antrim NH Wind

Conformance Plan: SD-4 Box Culvert

Updated 11/30/2018

Updated 12/20/2018 after comments from SEC & DES site visit.

backfill above the fabric on both the interior and exterior of the footers. This fill will be compacted.

The streambed will be shaped with a slight depression near the middle for low flow. No geotextiles will be used above the compacted earth fills.

The streambed will be created by placing the streambed material mix on the shaped compacted bed while maintaining the low flow channel. The mix will be placed the full width of the interior. The placement of the larger boulders may be adjusted after initial placement. The mix will then be hosed down to wash the finer materials downward. The material placement will be done to match existing streambed elevations. The placement of the mix will be done to mimic the nature of the stream just upstream and downstream from the work area, excluding placement of any boulders so large as to pose a problem in the constrained area in the culvert.

Tie-in to the existing streambed will be done so as to match existing elevations and widths. After streambed is satisfactorily established, the bridge decking will be placed.

#### Phase 3B – New Installation

The excavation for footings in the area where work has not yet taken place has the risk of disturbing the currently undisturbed streambed. Sargent will work to minimize any stream disturbance. Materials adjacent to the stream excavated for the footings will be salvaged, stockpiled separately than other materials, and later replaced above the compacted earth fill. Sargent will hoe-ram in place rather than removing large boulders. If root systems or stumps are encountered whose removal intact would disturb the streambed, these roots or stumps will be cut in place before removal.

The footers will be bedded on  $\frac{3}{4}$ " crushed stone. A geotextile separation layer will be placed on the  $\frac{3}{4}$ " crushed stone. Native earth materials will be used to backfill above the fabric on both the interior and exterior of the footers. This fill will be compacted. No geotextile fabric will be used above the compacted earth fill. In the interior, above the compacted fill, salvaged excavation material will be placed. The bridge decking will then be placed.

#### Phase 4 – Post-Installation

Antrim NH Wind

Conformance Plan: SD-4 Box Culvert

Updated 11/30/2018

Updated 12/20/2018 after comments from SEC & DES site visit.

After installation of the culvert components, compacted earth fill will be placed at the end of the culverts to prevent migration of water into the footings from that area. The fill placed at the ends of the culverts will be rock armored. Larger boulders will be placed as wingwalls at the culvert corners. Road gravels will be placed adjacent to and over the culvert shortly after installation. Any other adjacent areas will be stabilized with riprap.

Dewatering will cease and temporary E&S controls will be removed as appropriate.

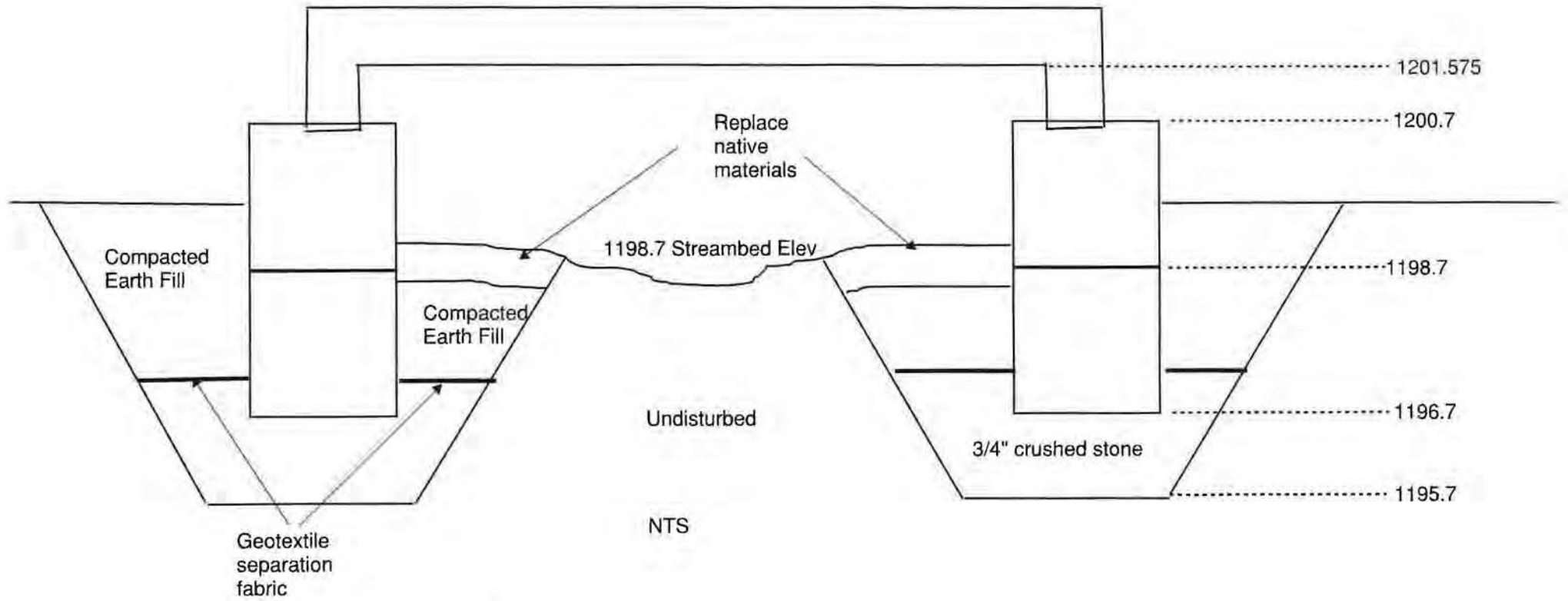
A post-installation report including photographs will be prepared and submitted.

Summit Geoengineering has reviewed the attached sketch and this plan – see attached letter from Summit Geoengineering.

This proposal is subject to review and acceptance by NHDES before work will commence.

Antrim NH Wind  
Conformance Plan: SD-4 Box Culvert

Undisturbed channel

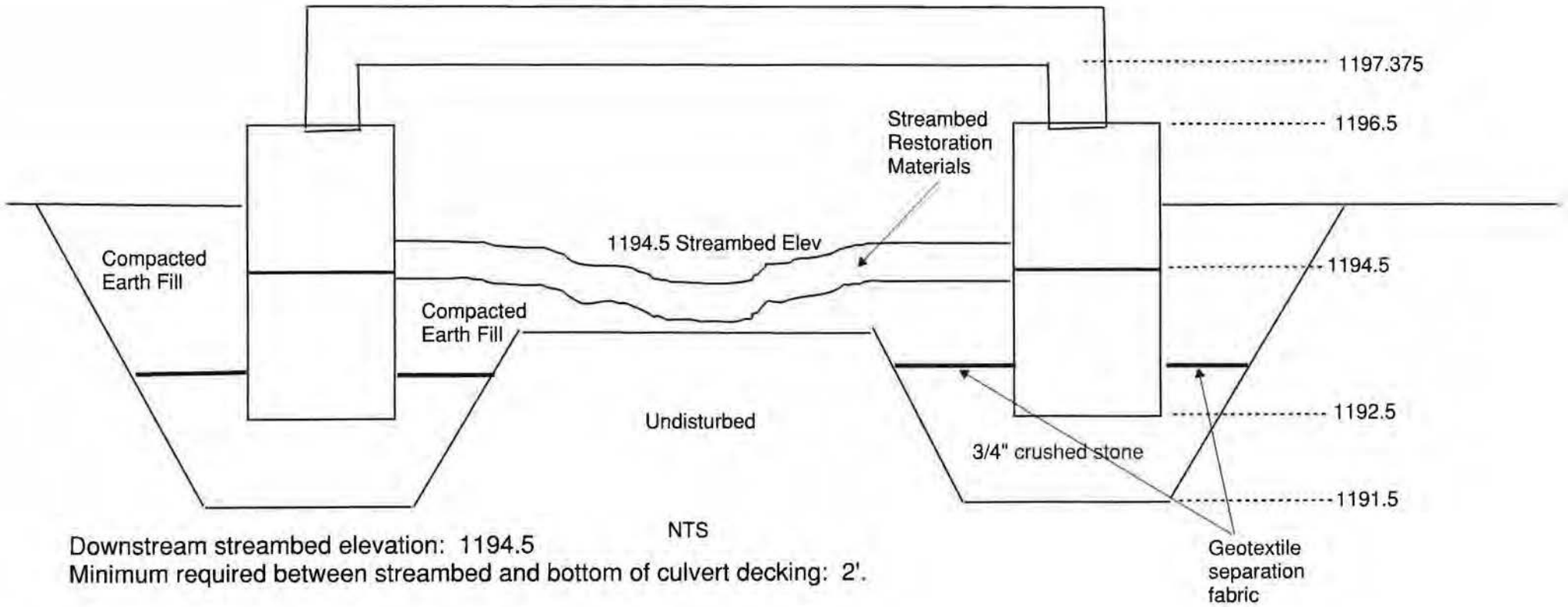


Upstream streambed elevation: 1198.7'.  
Minimum required between streambed and bottom of culvert decking: 2'.

12/20/2018 11:32 am

Antrim NH Wind  
Conformance Plan: SD-4 Box Culvert

Disturbed streambed restoration



12/20/18 11:34 am



November 30, 2018  
December 20, 2018  
SGS #18326

Kevin Burns  
Sargent Corporation  
P.O. Box 345  
Stillwater, Maine 04489

Reference: Updated Conformance Plan, SD-4 Box Culvert, Antium, NH Wind

Dear Kevin;

Summit has reviewed the updated conformance plan prepared by Sargent Corporation for stabilizing the bridge abutments, providing scour protection for the footings, and restoring the streambed. A copy of the updated plan (dated December 20, 2018) is attached to this letter.

Based on our review of this information, photographs of the construction, and phone conversations with you, it is our opinion that this approach will provide a stable base for the abutment blocks and will also provide sufficient scour protection. Evaluation of the streambed restoration is beyond our expertise.

Our opinion is based on a review of information above provided by others. A site inspection was not performed by SGS. While we feel the information, we received is sufficient to provide the opinion above there may be pertinent information of conditions not brought to our attention. SGS is not liable for unforeseen or undisclosed conditions.

If there are any questions, please contact me.

Respectfully Submitted  
**Summit Geoengineering Services, Inc.**

A handwritten signature in blue ink that reads "William M. Peterlein".

William M. Peterlein, P.E.  
President & Principal Engineer





## Derek Watts

---

**From:** Dustin Littlefield  
**Sent:** Friday, December 21, 2018 3:34 PM  
**To:** 'Kevin Burns'  
**Cc:** Sean Milligan (smilligan@sargent-corp.com); Mark Wright (mwright@sargent-corp.com); 'tlepage@sargent-corp.com'; Tim Folster; Jason Millett; Art Cavanagh; Lance York; Derek Watts  
**Subject:** FW: Antrim Box Culvert

Kevin,  
NH DES has approved the revised plan. Please schedule the restoration and installation of the balance of the box culvert following the new year. We also need to ensure construction is performed in low flow conditions, and with appropriate documentation as discussed at the meeting. .

Thank you,  
Dustin

**From:** Bouchard, Jessica [mailto:Jessica.Bouchard@des.nh.gov]  
**Sent:** Friday, December 21, 2018 3:25 PM  
**To:** Dustin Littlefield; Rennie, Craig  
**Cc:** Mauck, Ridge; Jack Kenworthy (jack.kenworthy@waldengreenenergy.com); Jeff Nelson; Deutsch, Larry; Dave Gill; dvalleau@trcsolutions.com; Art Cavanagh; Lance York; Derek Watts  
**Subject:** RE: Antrim Box Culvert

Dustin,

The revised Conformance Plan has been reviewed and it incorporates the stream bed restoration method that was discussed Tuesday during the NHDES site visit. Placement of geotextile fabric only along the base of the footers, below the compacted earth fill and at the depth indicated on the plans, is a reasonable modification of the original plan. It is unlikely that the fabric would become exposed at this depth.

The updated Conformance Plan, as received on December 21, 2018, is acceptable.

Thank you,

Jessica R. Bouchard  
Wetland Specialist  
Land Resources Management  
NH Department of Environmental Services  
29 Hazen Drive, PO Box 95  
Concord, NH 03302-0095  
Ph: (603) 271-4064 Fax: (603) 271-6588  
Email: [jessica.bouchard@des.nh.gov](mailto:jessica.bouchard@des.nh.gov)

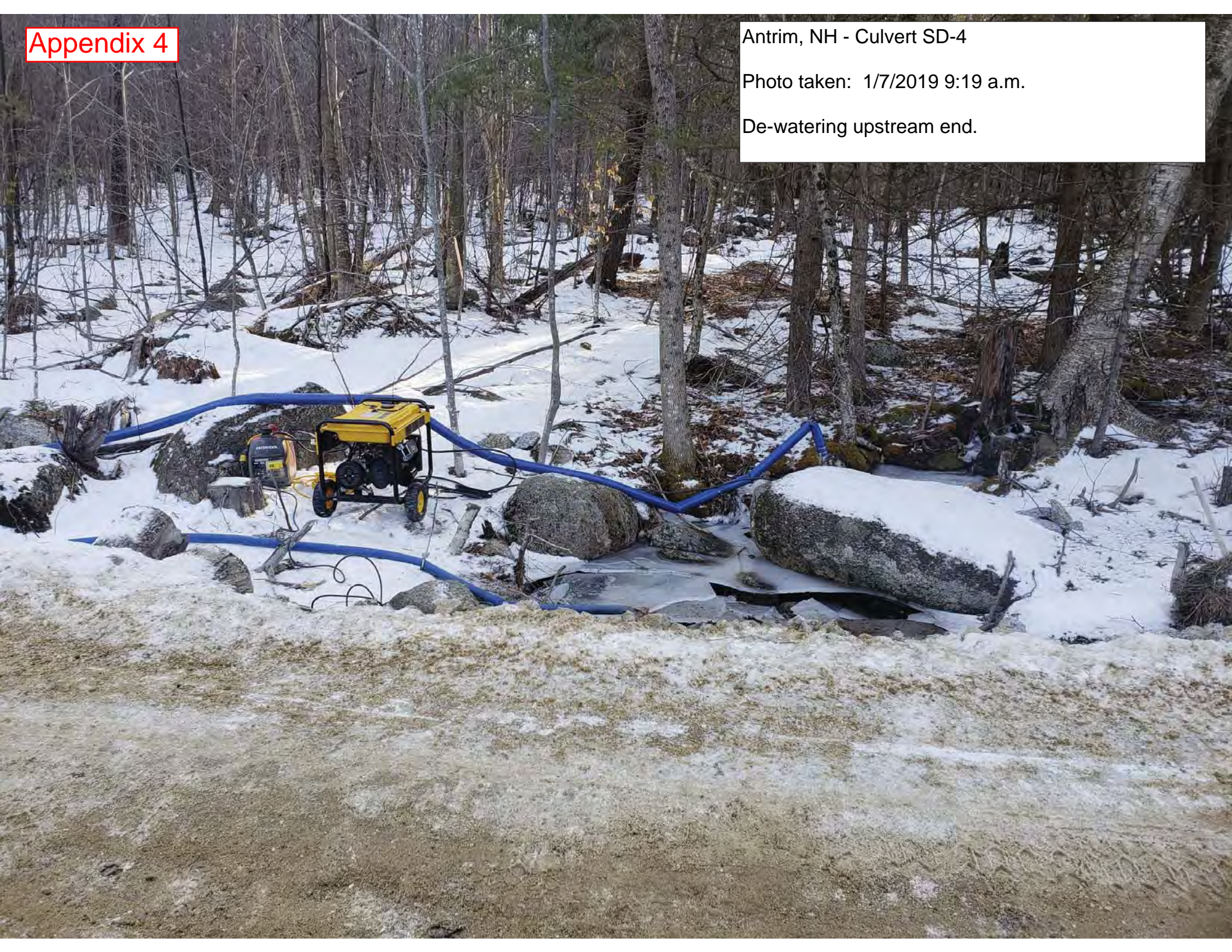
**From:** Dustin Littlefield [mailto:dlittlefield@reed-reed.com]  
**Sent:** Thursday, December 20, 2018 5:03 PM  
**To:** Rennie, Craig  
**Cc:** Bouchard, Jessica; Mauck, Ridge; Jack Kenworthy (jack.kenworthy@waldengreenenergy.com); Jeff Nelson; Deutsch, Larry; Dave Gill; dvalleau@trcsolutions.com; Art Cavanagh; Lance York; Derek Watts  
**Subject:** RE: Antrim Box Culvert

Appendix 4

Antrim, NH - Culvert SD-4

Photo taken: 1/7/2019 9:19 a.m.

De-watering upstream end.



Antrim, NH - Culvert SD-4

Photo taken: 1/7/2019 9:20 a.m.

Removing bridge decking.





Antrim, NH - Culvert SD-4

Photo taken: 1/7/2019 9:41 a.m.

Remaining decking, footers, and large rocks - all removed shortly after this photo.

Antrim, NH - Culvert SD-4

Photo taken: 1/7/2019 11:03 a.m.

Sump to collect dirty water below culvert, pumped to Treatment Swale #1.



Antrim, NH - Culvert SD-4

Photo taken: 1/7/2019 1:07 pm

Fabric installed on 3/4" crushed stone, first block placed.



Antrim, NH - Culvert SD-4

Photo taken: 1/7/2019 1:32 pm

Leveling and backfilling.





Antrim, NH - Culvert SD-4

Photo taken: 1/7/2019 2:24 pm

Compacting earth backfill.





Antrim, NH - Culvert SD-4

Photo taken: 1/7/2019 2:48 pm

Adjusting large boulders.



Antrim, NH - Culvert SD-4

Photo taken: 1/7/2019 3:57 pm

Placing second course of footer blocks.



Antrim, NH - Culvert SD-4  
Photo taken: 1/7/2019 4:37 pm  
Compacting streambed materials.



Antrim, NH - Culvert SD-4  
Photo taken: 1/7/2019 4:44 pm  
Washing in streambed materials.



Antrim, NH - Culvert SD-4  
Photo taken: 1/7/2019 4:44 pm  
Washing in streambed materials.



Antrim, NH - Culvert SD-4  
Photo taken: 1/7/2019 4:45 pm  
Streambedded after washing in material. Low-flow area visible.



Antrim, NH - Culvert SD-4

Photo taken: 1/8/2019 7:56 am

Culvert decking with fabric at joints. Backfill of decking has begun.



Antrim, NH - Culvert SD-4

Photo taken: 1/8/2019 2:15 pm

Transition from re-work area to new work area.  
Streambed undisturbed in new work area.






Antrim, NH - Culvert SD-4

Photo taken: 1/8/2019 3:02 pm

Backfilling footers.



Antrim, NH - Culvert SD-4

Photo taken: 1/8/2019 3:15 pm

Backfilling footers.

Antrim, NH - Culvert SD-4

Photo taken: 1/8/2019 4:13 pm

Footers backfilled and stream channel starting to flow.





Antrim, NH - Culvert SD-4  
Photo taken: 1/8/2019 4:20 pm  
Backfilled and stream flowing.



Antrim, NH - Culvert SD-4

Photo taken: 1/9/2019 3:04 pm

Headwall area from upstream.



Antrim, NH - Culvert SD-4

Photo taken: 1/10/2019 12:30 pm

Headwall area from downstream.