Design Drawings

for the

October 2017 Storm Damage: Rocky Branch

located in

Bartlett, New Hampshire

prepared for

Town of Bartlett

HEB Project # 2019-064

Issued: September 3, 2019

Revised: July 10, 2020

Applicant: Town of Bartlett
56 Town Hall Road
Intervale, NH 03845

Owners: Bennett Revoc. Family Trust
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Hillsbrough, NH 03244

HHP Nominee Trust
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Stratham, NH 03885

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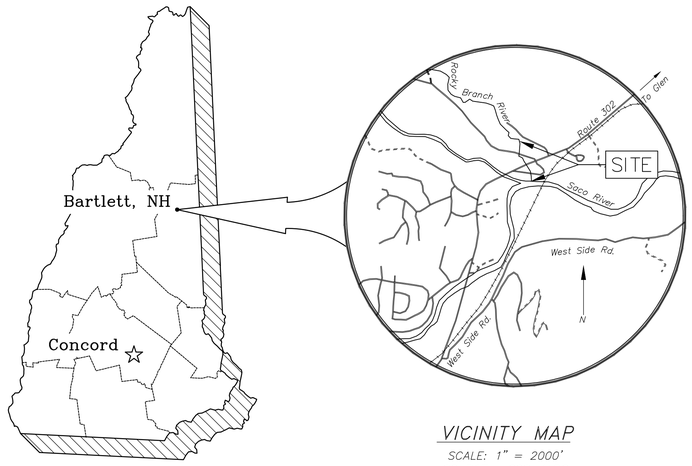

VICINITY MAP
SCALE: 1" = 2000'
SOURCE: USGS MAPS
(NORTH CONWAY WEST, NH QUAD.)

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Engineer/Surveyor

STATE OF NEW HAMPSHIRE · JOSHUA M. McALLISTER No. 12206 · LICENSED PROFESSIONAL ENGINEER

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STATE OF NEW HAMPSHIRE · No. 979 KEVIN L. TILTON · LICENSED LAND SURVEYOR · SIGNATURE

C1.01
SHEET 2 OF 6

2019-064
Erosion & Sediment Control Plan
October 2017 Storm Damage

General Erosion-Control Requirements:

The primary intent of the erosion control requirements and the construction sequence is to stage the project in a manner that will minimize the potential for erosion and the potential negative effects associated therewith. The Engineer shall be contacted and the plan shall be amended if the intent is not being achieved.

1. Erosion control definitions:

   "Strip topsoil": Excavate topsoil, screen, and stockpile.

   "Seed(ing)": Adjust ph, apply fertilizer, sow the seed mixture, apply mulch (or erosion control matting), apply tackifier.

   "Significant rainfall event": more than ½-inch of rain.

2. Install all erosion control measures prior to earthwork operation and maintain all erosion control measures and seeded embankments during construction. Erosion control shall be removed only upon the establishment of all vegetated areas.
3. All drainage structure inlets shall be protected using inlet protection or catch basin inserts.
4. Erosion control measures shall be implemented complying with the Best Management Practices (BMPs) of the 'New Hampshire Stormwater Management Manual, Volume 2, Post-Construction Best Management Practices Section & Design,' by the NHDES, USDA SCS, and Rockingham County Conservation District, latest edition.
5. Do not disturb areas outside the limits of proposed work. Areas disturbed by the Contractor's operations shall be restored to their original condition at the Contractor's expense. All areas disturbed during construction not covered with buildings, structures or pavement shall receive four (4) inches of loam and seed.
6. The downhill side of all stockpiles shall be encircled with silt fence.
7. All ditches, swales, and other areas of concentrated flow shall be stabilized prior to directing flow to them. Inlet protection to be installed prior to directing flow to storm drains.
8. Before weekends, and if a significant rainfall event is anticipated during the construction of the cut/fill embankments, a temporary berm shall be constructed along the top of the fill embankments, and temporary slope drains (pipes) with temporary stone outlet aprons shall be installed at the base of the slopes.
9. The maximum time that any disturbed areas shall be left unstabilized shall be 14 days.
10. The smallest practical area shall be disturbed to complete the required construction, but no more than 5 acres at any one time.
11. Lot disturbance, other than that shown on the approved plans, shall not commence until after the roadway and the associated drainage is complete and stable.
12. An area shall be considered stable if one of the following has occurred:
    A. Base course gravels have been installed in areas to be paved;
    B. A minimum of 85 percent vegetated growth has been established;
    C. A minimum of 3 inches of non-erosive material such as stone or riprap has been installed; or
    D. Erosion control blankets have been properly installed.
13. All erosion control measures shall be inspected weekly, and after every 0.25 inches or greater rainfall within a 24-hour period.
14. All roadways/parking areas and cut and fill slopes shall be stabilized within 72 hours of achieving finished grade.
15. Precaution shall be taken throughout the duration of construction activity to prevent, abate, and control the emission of fugitive dust, including but not limited to, wetting, covering, shielding, or vacuuming.
16. The project must meet the requirements and intent of RSA 430:53 and Agr 3800 relative to invasive species.
17. Temporary water diversions (swales, basins, etc.) must be used as necessary until areas are stabilized.
18. Detention basins and swales shall be installed before rough grading at the site.

Construction Sequence:

NHDES requires that certain steps be taken in order to minimize the erosion of soil within the limits of work. These measures are integral to the successful restoration of the project site. Listed below is a potential construction sequence that would achieve this goal. The specific means and methods are to be determined by the Contractor, but must meet the requirements of the approved Wetlands Permit and supporting Contract Documents. Contractor's proposed construction sequence shall be approved by Engineer prior to construction.

1. Install erosion and sediment control measures prior to any earth moving activity that will influence or affect stormwater runoff.
2. Clear and grub area necessary for construction access.
3. Install temporary siltation measures and cofferdams in the channel.
4. Remove river cobble in designated areas.
5. Place new riprap in noted locations and repair existing riprap.
6. Remove water diversion equipment and construction equipment when grout has cured and has been approved by Engineer.
7. Stabilize site and disturbed areas. Leave erosion and sediment control materials in place until the project area has stabilized.

Critical Erosion Areas:

Temporary seeding and/or mulching shall be used to protect exposed critical areas during construction. The following areas are particularly susceptible to erosion and shall receive extra attention when being inspected and maintained:

1. The larger cut and fill areas along the road and driveways.
2. Areas not worked or not to be worked for 3 weeks.
3. Areas of concentrated flow such as the ditches, swales, and toe of uphill facing slopes.
4. Stormwater ponds and level spreaders.

Legend

- Existing major contour (410)
- Existing minor contour (408)
- Proposed major contour (410)
- Proposed minor contour (408)
- Edge of water
- Riprap
- Delineated Wetland
- Existing/Proposed Vegetation Line
- Silt Fence
- Proposed Cofferdam
- Proposed erosion control matting

Wetland Impacts (Upstream)

- Permanent Wetland Impact Area (Bank Stabilization) = 8,026 SF
- Permanent Wetland Impact Area (Cobble Removal) = 44,371 SF
- Temporary Wetland Impact Area = 0 SF
- Total Wetland Impact Area = 52,397 SF
- Stream Channel Impact Length = 724 LF
- Stream Bank Impact Length = 1,154 LF
- Total Stream Impact Length = 1,878 LF

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Sandra L. Merrill Trustee
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HHP Nominee Trust
Ronald J. Potch, Trustee
PO Box 9
Glen, NH 03838
Station=1+54.90
Offset=108.90

CONSTRUCT STABILIZED CONSTRUCTION ENTRANCE. NHDOT ITEM 699.1

INSTALL EROSION CONTROL MATTING AS NEEDED TO STABILIZE IMPACTED TOP OF BANK AREAS. ANTICIPATED 10' WIDE. NHDOT ITEM 645.2

INSTALL TEMPORARY COFFERDAM

PERMANENT WETLAND IMPACT AREA (BANK STABILIZATION) = 8,026 SF

PERMANENT WETLAND IMPACT AREA (COBBLE REMOVAL) = 44,371 SF

TBM #10: Drill hole w/ MagNail set in high point of a 6'x4'X3.5' boulder Elev.= 579.47'

TBM #11: Nail w/ washer set 1.0' up in SE side of 23" white pine Elev.= 571.94'

BM RM 17: Chiseled square fnd. in old bridge abutment Elev.= 578.58' (NAVD88)

Rocky Branch

delineated wetland

U.S.. Route 302 right-of-way

CRAWFORD NOTCH ROAD

U.S. RO

GRID

MAGNETIC

16 1/2°

Plan Reference:

1. Aug. 18, 1989 NHDOT right-of-way plan for state project no. P-3960, Sheet 43.

Survey Notes:

2. Site features and topography are per a field survey performed July 2019; under the direct supervision of Kevin L. Tilton, LLS #979; using a Leica TS16 robotic total station and Leica Viva Series GPS/GNSS receivers; and conforming with the technical standards for topographic surveys per the NH Code of Administrative Rules of the Board of Licensure for Land Surveyors.
3. Orientation is grid. Coordinate grid is NHSPC - NAD83, established with GPS observations tied to the NGS CORS network.
4. Contour interval = 1 ft. Vertical datum is NAVD88 tied to FEMA benchmark RM17 on the west abutment of the former Route 302 bridge over the Rocky Branch.
5. This plan does not represent a complete boundary survey by HEB. Boundary information shown is per Bartlett tax maps and Plan Ref. 1.
6. Jurisdictional wetlands shown were delineated by Gregory W. Howard, CWS of North Country Soil Services on July 19, 2019, and located by HEB.

U.S. Fish and Wildlife Classification:

R2US1A	Riverine, Lower Perennial, Unconsolidated Shore, Cobble-Gravel, Temporarily Flooded
R2UB1H	Riverine, Lower Perennial, Unconsolidated Bottom, Cobble-Gravel, Permanently Flooded
PSS1E	Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Seasonally Flooded/Saturated
R3US1A	Riverine, Upper Perennial, Unconsolidated Shore, Cobble-Gravel, Temporarily Flooded
R3UB1H	Riverine, Upper Perennial, Unconsolidated Bottom, Cobble-Gravel, Permanently Flooded
PFO1E	Palustrine, Forested, Broad-Leaved Deciduous, Seasonally Flooded/Saturated

30 0 30 60 120 ft
6 0 15 30 m
1 inch = 30 feet
(1 : 360)

No.	Revision	DATE	BY
1	Revised per NRCS, NHDES & LAC comments	07/10/20	TBG/DDD

STATE OF NEW HAMPSHIRE - JOSHUA M. McALLISTER No. 12206 - LICENSED PROFESSIONAL ENGINEER

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DESIGNED BY	TBG/JDS
DRAWN BY	TBG/JDS/DDD
CHECKED BY	JMM
FIELD BOOK	359-360
SCALE	1"=30'
DATE	09/03/2019

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2019-064
C1.01
SHEET 2 OF 6

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C1.11
SHEET 3 OF 6

2019-064
Site Plan
October 2017 Storm Damage

T.L. 2JERICO/038L04
Merrill RB Trust

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T.L. 2JERICO/028L00
HHP Nominee Trust

T.L. 2RT302-3/138MAS
Rocky River Resort HOA

Rocky Branch

delineated wetland

rock deposits

PROPOSED TEMPORARY CONSTRUCTION ACCESS EASEMENT.

T.L. 2JERICO/038L02 APPROX. 1,050 S.F.
T.L. 2JERICO/038L01 APPROX. 4,050 S.F.
T.L. 2JERICO/028L00 APPROX. 2,900 S.F.

REPAIR EXISTING RIPRAP BANK STABILIZATION AS NOTED ALONG 360 LF WITH RIPRAP CLASS VII (NHDOT ITEM 583.7).

REMOVE RIVER COBBLE DEPOSITS IN DRY GRAVEL/COBBLE BAR AREA (SEE CROSS SECTIONS SHEET 3.11 FOR DEPTH).

CONSTRUCT BANK STABILIZATION "A" WITH KEYED IN TOE ALONG 130 LF WITH RIPRAP CLASS VII (NHDOT ITEM 583.7).

CLEAR AND GRUB AS NECESSARY TO ACCESS AND CONSTRUCT BANK STABILIZATION (NHDOT ITEM 201.1).

Station=1+54.90
Offset=108.90

TBM #10: Drill hole w/ MagNail set in high point of a 6'x4'X3.5' boulder
Elev.= 579.47'

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Elev.= 571.94'

Route 302 right-of-way

U.S. ROUTE 302

TCH ROAD

Control-Point Table

Point #	Description	Northing	Easting	Elevation
7	5002	584943.27	1106548.21	572.28
8	5001	584723.26	1106803.81	566.56
9	MAGNAIL	584837.06	1106488.21	569.95

GRID
MAGNETIC
16 1/2°

General Notes:

1. The location of existing utilities are approximate and have not been independently verified. Contact "Dig-Safe" prior to any excavation at 1-888-344-7233 and any other utility owners for accurate utility marking. Contractor to pay for all damages which may occur by failure to locate and preserve any utilities.
2. Contractor is responsible for all work shown on the drawings, unless otherwise noted.
3. Coordinate construction activities, materials storage and equipment staging area with Engineer.
4. All disturbed areas within project limits not covered by hard surfaces or landscaping shall be finished with 4" of loam (NHDOT Item 641) and turf establishment (NHDOT Item 646.31).
5. The work shall be done during low water periods or "in the dry." There shall be no excavation in free flowing water.
6. Erosion and sediment controls shall be installed prior to any excavation.
7. All dredged material shall be placed outside NHDES Wetlands Bureau Jurisdiction.
8. All disturbed areas shall be stabilized within 3 days of final grading.
9. Erosion and sediment controls shall remain in place until disturbed areas are fully stabilized.
10. All work shall conform to the latest edition of the NHDOT Standard Specifications for Road & Bridge Construction at the time of plan issuance.
11. Perform all work in compliance with federal, state, and local permit approvals. Copies of all permit approvals shall be maintained at the project site.
12. Site security and job safety are the sole responsibility of the contractor. All construction activities shall comply with OSHA standards and local requirements.
13. Provide submittals (gradations, proctors, product data, etc.) as directed by the Owner and Engineer for all materials to be incorporated into the work.
14. Provide field testing of installed materials (compaction, density, leakage, etc) as directed by the Owner and Engineer at no cost to the Owner.
15. The Engineer shall have full access to the site when the work is in preparation and progress. They may observe the work on a periodic or full-time basis.
16. Provide detailed construction schedule to the Owner and Engineer prior to construction.

Note:

- Rocky River Resort easement as needed.

30 0 30 60 120 ft
6 0 15 30 m
1 inch = 30 feet
(1 : 360)

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CHECKED BY	JMM
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2019-064
C1.11
SHEET 3 OF 6

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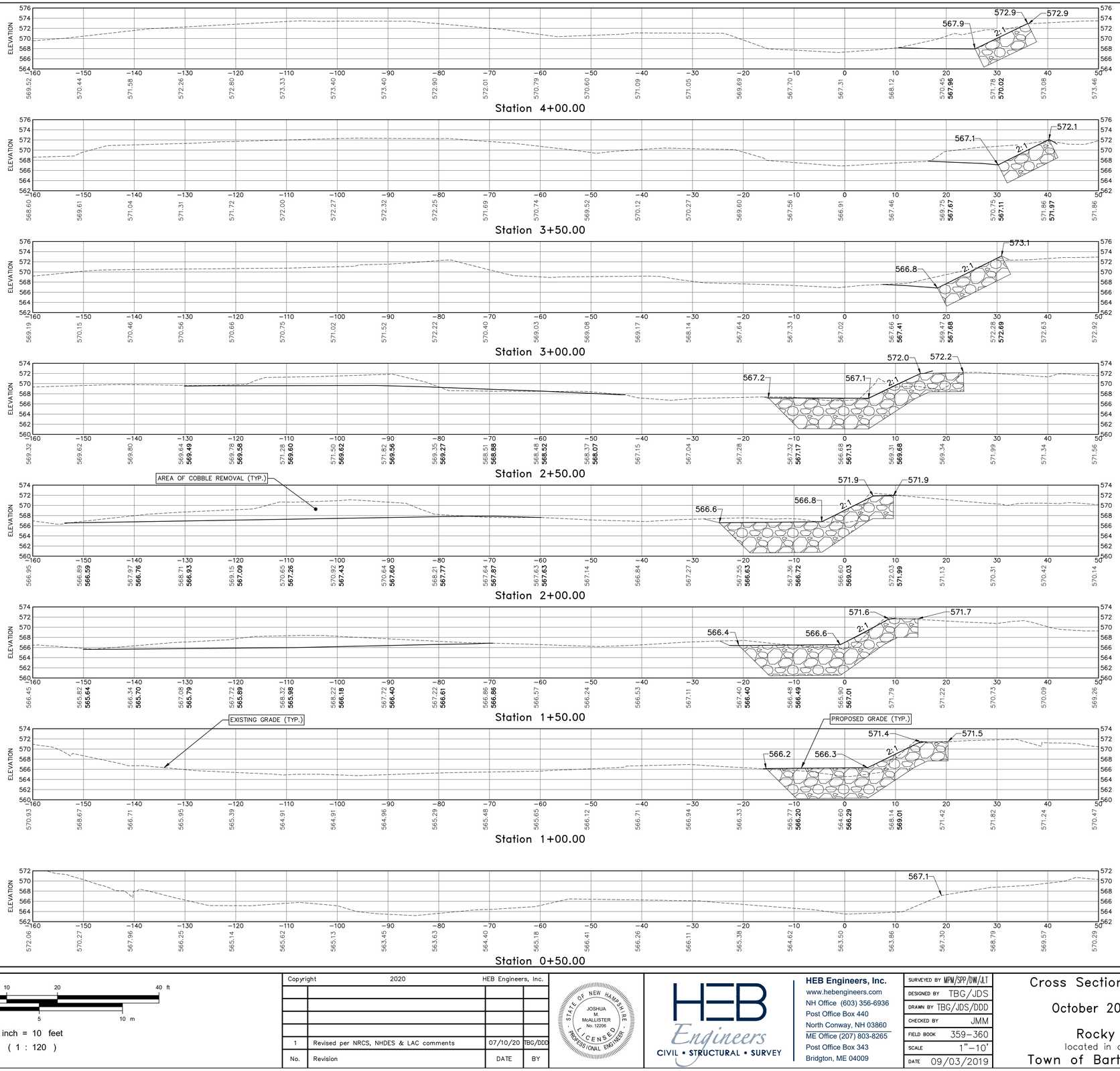
2019-064
Cross Sections: STA 0+50-4+00
October 2017 Storm Damage



1 inch = 10 feet
(1 : 120)

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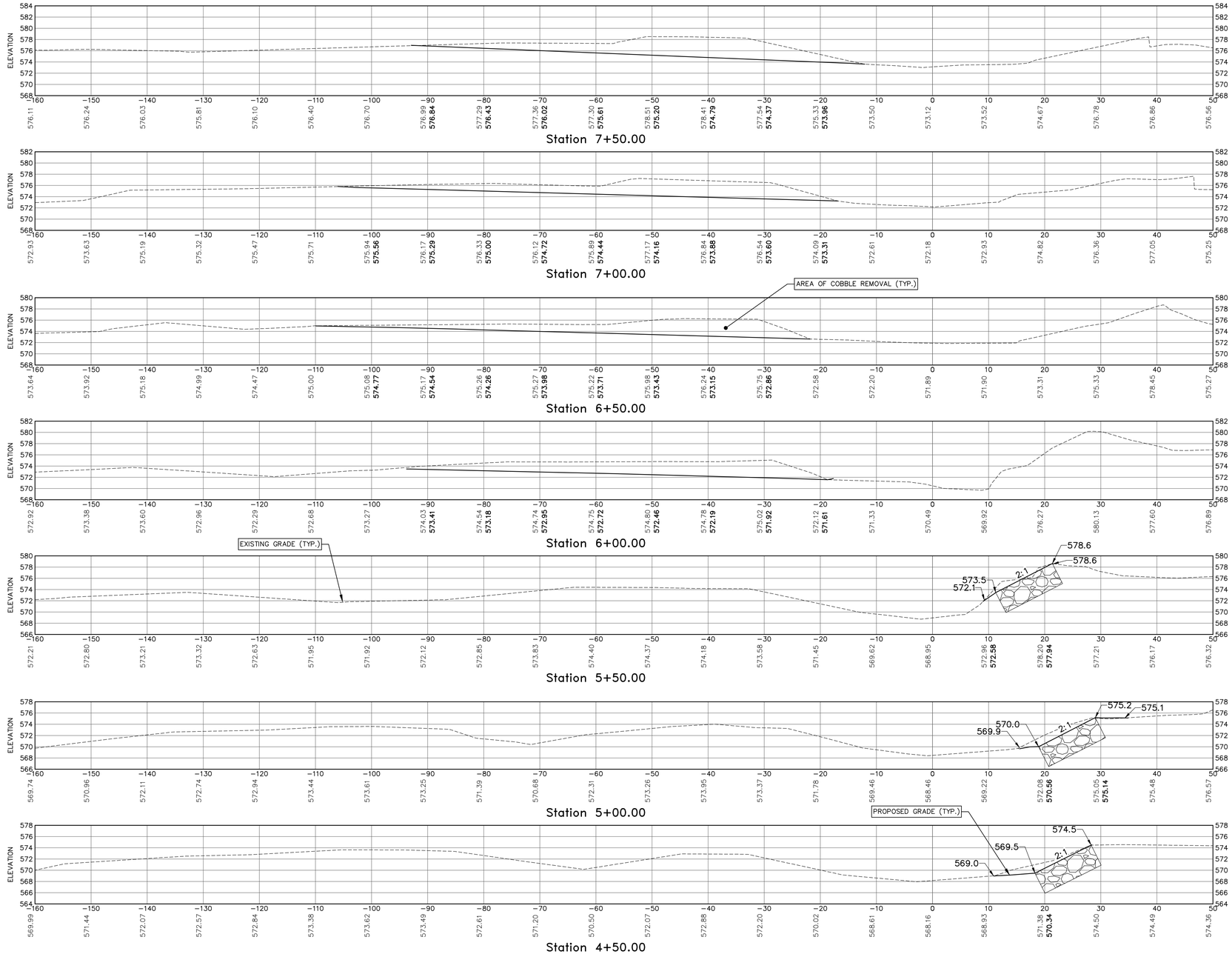
C3.11
SHEET 4 OF 6



10 0 10 20 40 ft
2 0 5 10 m

1 inch = 10 feet
(1 : 120)

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1	Revised per NRCS, NHDES & LAC comments	07/10/20	TBG/DDD
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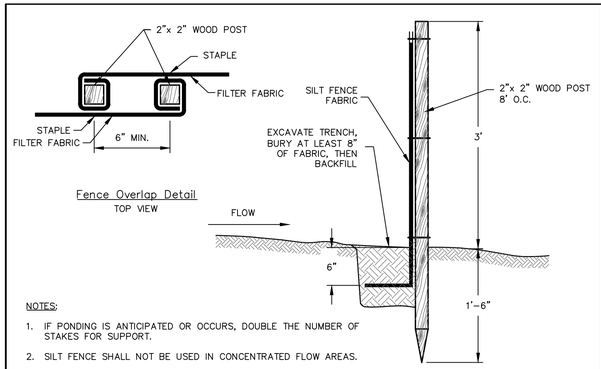
C3.12
SHEET 5 OF 6



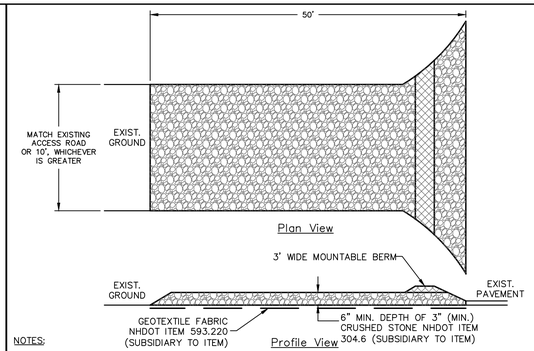
NOTES:

1. IF PONDING IS ANTICIPATED OR OCCURS, DOUBLE THE NUMBER OF STAKES FOR SUPPORT.
2. SILT FENCE SHALL NOT BE USED IN CONCENTRATED FLOW AREAS.
3. SEDIMENT DEPOSITS SHALL BE INSPECTED AFTER EVERY STORM EVENT AND REMOVED WHEN DEPOSITS REACH APPROXIMATELY 1/3 THE HEIGHT OF THE SILT FENCE, OR WHEN "BULGES" DEVELOP IN THE SILT FENCE.

NHDOT Item 645.531

Silt Fence Installation

Scale: 1" = 1'

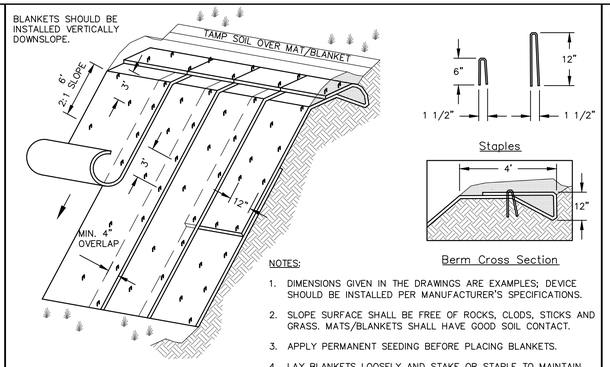


NOTES:

1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHT-OF-WAYS. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEAN OUT OF ANY MEASURES USED TO TRAP SEDIMENT. THE PAD SHALL SLOPE AWAY FROM THE EXISTING ROADWAY.
2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ONTO PUBLIC RIGHT-OF-WAY.
3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
4. ALL MATERIALS, LABOR, CONSTRUCTION, MAINTENANCE AND REMOVAL OF THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE INCLUDED IN NHDOT ITEM 699. **NHDOT Item 699.1**

Stabilized Construction Entrance

Scale: 1" = 10'



TYPICAL SLOPE SOIL STABILIZATION

NOTES:

1. DIMENSIONS GIVEN IN THE DRAWINGS ARE EXAMPLES; DEVICE SHOULD BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS.
2. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
3. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
4. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.
5. SLOPES OF 3:1 OR FLATTER SHALL MEET NHDOT ITEM 645.42. SLOPES OF 1.5:1 OR FLATTER SHALL MEET NHDOT ITEM 645.44.

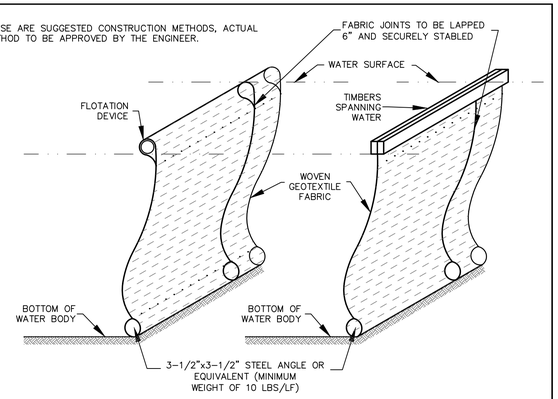
NHDOT Item 645.42/645.44

Erosion Blankets Slope Installation

N.T.S.

NOTE:

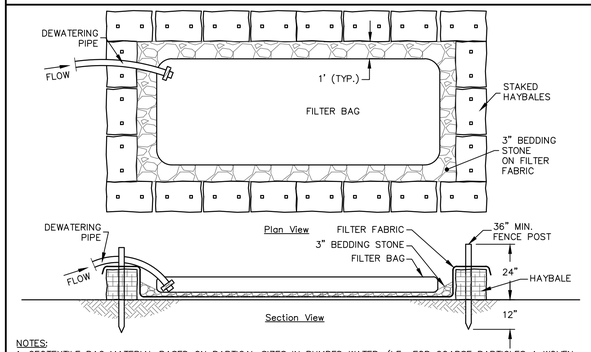
1. THESE ARE SUGGESTED CONSTRUCTION METHODS, ACTUAL METHOD TO BE APPROVED BY THE ENGINEER.



Item 15713

Sedimentation Barrier

N.T.S. (Isometric)

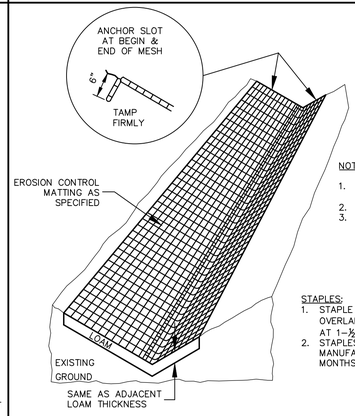


NOTES:

1. GEOTEXTILE BAG MATERIAL BASED ON PARTICAL SIZES IN PUMPED WATER, (I.E., FOR COARSE PARTICLES A WOVEN MATERIAL; FOR SILTS/CLAYS A NON-WOVEN MATERIAL).
2. DO NOT OVER PRESSURIZE BAG OR USE BEYOND CAPACITY.
3. LOCATE DISCHARGE SITE ON FLAT UPLAND AREAS AS FAR AWAY AS POSSIBLE FROM STREAMS, WETLANDS, OTHER RESOURCES AND POINTS OF CONCENTRATED FLOW.
4. DOWNGRADIENT FROM RECEIVING AREA MUST BE WELL VEGETATED OR OTHERWISE STABLE FROM EROSION, (I.E., FOREST FLOOR OR COARSE GRAVEL/STONE).
5. DISCHARGE LOCATION SHALL MEET ALL REGULATORY SETBACKS FROM WETLANDS AND OTHER WATER COURSES.
6. ALL MATERIALS, LABOR, CONSTRUCTION, MAINTENANCE AND REMOVAL OF THE SEDIMENTATION BASIN, AND RESTORATION OF THE AREA SHALL BE INCLUDED IN NHDOT ITEM 699. DISPOSE OF FILTER BAGS WHEN FULL AND REPLACE.

Sedimentation Basin Details

N.T.S.



NOTES:

1. INSTALL E.C.M. IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
2. ALWAYS APPLY SEED PRIOR TO INSTALLING E.C.M.
3. CUT SMALL HOLE IN FABRIC PRIOR TO PLANTING TREE SEEDLING, IF NECESSARY.

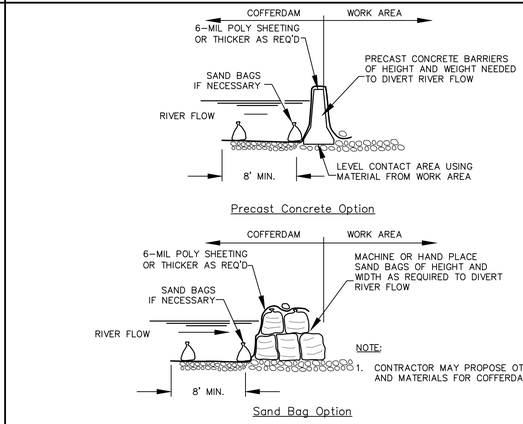
STAPLES:

1. STAPLE SPACING TO BE 3' O.C. EXCEPT ALONG THE OVERLAPS (4" TYP.) AND EDGES, WHICH BOTH SHALL BE AT 1-½" C/C SPACING.
2. STAPLES SHALL BE AS RECOMMENDED BY THE MATTING MANUFACTURER AND SHALL BE DESIGNED TO LAST 18 MONTHS.

Item 62901

Erosion-Control Matting

N.T.S. (Isometric)



Precast Concrete Option

NOTE:

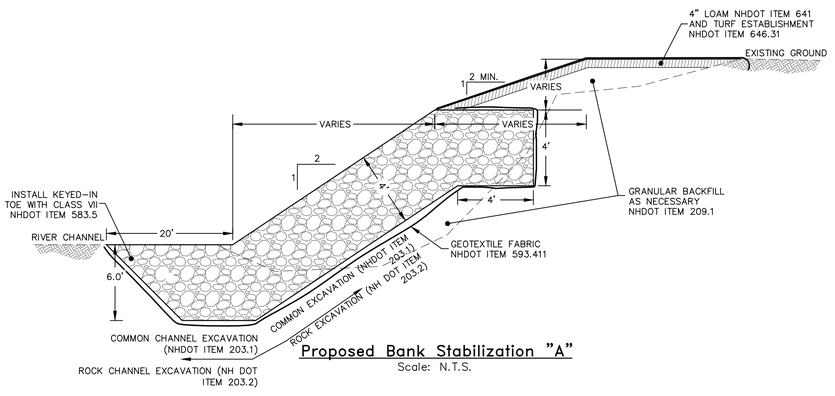
1. CONTRACTOR MAY PROPOSE OTHER METHODS AND MATERIALS FOR COFFERDAMS.

Sand Bag Option

Item 20805

Temporary Cofferdams

N.T.S.



Proposed Bank Stabilization "A"

Scale: N.T.S.

No.	Revision	DATE	BY
1	Revised per NRCS, NHDES & LAC comments	07/10/20	TBG/DDD

STATE OF NEW HAMPSHIRE — JOSHUA M. McALLISTER No. 12206 — LICENSED PROFESSIONAL ENGINEER

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SURVEYED BY	MPM/SPP/DWM/JLT
DESIGNED BY	TBG/JDS
DRAWN BY	TBG/JDS/DDD
CHECKED BY	JMM
FIELD BOOK	359-360
SCALE	AS NOTED
DATE	09/03/2019

Construction Details - General
for the
October 2017 Storm Damage
on the
Rocky Branch River
located in and prepared for the
Town of Bartlett, New Hampshire

2019-064

C5.11

SHEET 6 OF 6