



**GREENLEAF
FORESTRY**

PO Box 39,
Westford, VT 05494

Tel (802)-849-6629 Fax (802)-849-6689
Email: glforestry@aol.com

MASTER PLAN FOR EROSION PREVENTION, SEDIMENT CONTROL (EPSC) AND STORMWATER MANAGEMENT



**4X4 CENTER
BOLTON, VERMONT
JUNE, 2012**

**Developed by:
Scott E. Moreau, Greenleaf Consulting, Inc. Consultant
Addison Kasmarek, Greenleaf Consulting, Inc. Consultant**



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PO Box 39,
Westford, VT 05494

Tel (802)-849-6639 Fax (802)-849-6689
Email: glforestry@aol.com

This plan has been prepared for The 4x4 Center in response to the town of Bolton, Vermont's requirement for a comprehensive Master Plan for Erosion Prevention, Sediment Control and Stormwater Management ("EPSC Master Plan"). It addresses all areas identified and associated uses and conforms to the current "Vermont Standards and Specifications for Erosion Prevention and Sediment Control" as prepared by the State of Vermont Department of Environmental Conservation Water Quality Division. The planned activities herein have been developed in accordance with our professional recommendations.

Scott E. Moreau
Greenleaf Consulting, Inc.

Addison J. Kasmarek
Greenleaf Consulting, Inc.

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- ANR Wetlands Program-Alan Quackenbush, State Wetlands Coordinator
- ANR Rivers Program-Christopher Brunelle, River Management Engineer

I. Introduction and 4x4 Activities Overview

This Master Plan Application is filed by Automotive Services International, Inc., d/b/a 4x4 Center (Applicant) for Master Plan approval of future uses and expansions to the 4x4 Center Off-Road Driver Training School located on roads and trails at the Bolton Valley Ski Resort off the Bolton Valley Access Road in Bolton, Vermont.

This Master Plan Application is submitted pursuant to Section 6 of the Stipulation of Dismissal and Order in Docket No. 6-1-10 Vtec dated June 15, 2011 (the "Stipulation").

The 4x4 Center operates a driving school at Bolton Valley Ski Area (BV). The driving school was founded in 1993 and started work on permitting to move to BV in 2004. Permits were obtained by 2006 and the first classes were conducted at BV during the summer of 2006.

The 4x4 Center's primary customers are Michelin Tire, The US Department of Defense (DOD) and corporations with fleets of vehicles. Catering to Michelin and the DOD has required changes and modifications to the driving school program, including changes and additions to the terrain, on a regular basis. In order for the driving school to remain competitive, these changes need to be effected quickly.

The 4x4 Center driving school caters to customers in two primary areas:

- Customers who want to be trained in a specific driving application related primarily to trucks & SUV's.
- Customers who want to promote or train on a product related to trucks & SUV's.

To provide driving school services, the 4x4 Center driving school needs a variety of terrain including man made driving obstacles, skid pads and demonstration areas and natural severe terrain.

II. Objectives of the Master Plan

The purpose of this Master Plan, which was developed during the fall of 2011 and spring of 2012, is to provide a three-year plan for development with expansion procedures in place to allow for a more streamlined permitting process. A more rapid permitting process will allow the driving school to remain competitive moving forward. Pursuant to Section 6 of the Stipulation, once this Master Plan is approved, the proposed uses, trails, structures, facilities and features set forth herein will be exempt from compliance with § 3.16(B) of the Town of Bolton Land Use and Development Regulations.

There are only a few such driving schools in the country, and therefore, there are no specific examples for permitting such a use in Vermont. The needs of the school are unusual and changing, but by focusing on providing the satisfactory environmental protection, new and changing uses can be accommodated. There are many permitted uses in operation that have the potential for far greater impact, such as logging. Procedures & permits applicable to those uses can be applicable here, if modified accordingly

By creating standard protocol for development & permitting it is hoped the following will be achieved:

- A streamlined permitting process to allow The 4x4 Center to react quickly to industry request & changes in order to remain competitive & win new business.
- A less rigid permit that does not specify dates of operation, thereby reducing the need for additional permit requests.

- To eliminate the definition of winter & summer as boundaries.
- To allow minor modification of erosion control devices & terrain to adjust to needed erosion control.

III. Development of the Master Plan

The Master Plan has been developed through a process of:

- Over six years of experience with successful erosion control & environmental resource protection.
- The experience of making the driving school compatible with other users of the area, such as neighbors and the ski resort.
- Adopting recognized practices such as *Acceptable Management practices For Maintaining Water Quality On Logging Jobs In Vermont*, Vermont Department of Forests, Parks, and Recreation, 1987.
- Consulting with an Erosion Prevention and Sediment Control (EPSC) professional.
- Consulting with a licensed professional engineer.
- Conducting an environmental study of identified areas of development.
- Inviting input from various departments within the Vermont Agency of Natural Resources.

IV. Areas of Expected Expansion

The majority of development will be on the parcel of land known as the South Parcel. (See Map 1) The 4x4 Center is currently exploring the possibility of purchasing the South Parcel from the ski resort; accordingly, future development will be focused on this Parcel.

The basis for choosing this area is:

- It abuts Timberline Lodge, parking lots & ski lift; thus, the area already has substantial development.
- It has been extensively logged in the past.
- A substantial portion of the South Parcel is used for gladed skiing; thus, it is already used for recreational purposes.
- A substantial portion of the South Parcel already has approved driving school trails on it.
- The South Parcel has no immediate residential neighbors.
- During previous development permitting, ANR has suggested focusing development in this area.
- An environmental study has shown the South Parcel to have few wetlands, most of which can be avoided. See Map 3 and the Wetlands Report from Arrowwood Environmental.
- By adding connectors into existing trails, "loops" of trails are formed, making the most of existing trails and limiting development of new trails.

Increasing driving terrain offers the following advantages:

- Greater choice of terrain to use what is most appropriate for the weather conditions.
- Less overall travel per trail.
- A wider variety of terrain to offer customers.

V. Environmental Protection & Erosion Control

The methods for dealing with erosion control are split into two categories:

1. Impervious Areas: areas that are impervious, such as buildings and skid pads, are covered by the attached professionally-engineered storm water solution & plan.
2. Pervious Areas: areas that are pervious, such as trails & grassy areas, will be covered by the trail maintenance practices below. These practices were originally modeled on acceptable management practices for maintaining water quality on logging jobs in Vermont. Departures from the practices were suggested by an EPSC professional where the nature of this activity differed from logging & were incorporated into the original Act 250 permit for the 4x4 Center, No. 4C0436-26.

Protocol For Erosion Control on Pervious Areas:

- Ditches shall be used to divert water away from trail surfaces.
- Ditches will not discharge directly into surface waters.
- Water entering a trail shall be moved away from the trail before gaining sufficient flow & velocity to erode ditches.
- Ditches will be properly stabilized with seeding or rock lining to minimize erosion.
- Waterbars or Broad Base Dips (“BBDs”) will be used to relieve ditches or move water away from the roadway before gaining sufficient flow & velocity to erode ditches. See attached Schematic of Waterbar / Broad Base Dip.
- Waterbars& BBDs will be spaced appropriately for the road grade, surface type & terrain type.
- Conveyor Belt Water Bars should be used in steep terrain where conventional water bars are not practical or surfaces do not permit. See attached Schematic of Conveyor Belt Water Bars.
- All erosion control devices will be built with material to permanently stabilize the trail.
- Silt ponds will be used at the exit of water bars or ditches if there is insufficient vegetation. See attached Schematic of Check Dam with Silt Pond.
- Silt fencing will be used in areas of fresh disturbance prior to permanent erosion controls taking place. See attached Schematic of Silt Fence Installation.
- Culverts will only be used when terrain does not allow for a ditch or water bar to move water from one side of the trail to the other. Culverts will be sized according to drainage area & be installed at a 30 degree down grade angle and a 4 degree down hill angle. They will discharge onto stone or gravel. See attached Schematic of Culvert.
- Trails will be laid out to provide proper 25’ filter strips/buffers along streams.

Protocol For Stream Crossings in Pervious Areas:

- Stream crossings will not involve major stream disturbance.
- Trails are planned to keep stream crossings to an absolute minimum.
- Fords have been suggested as the best way of crossing streams by ANR. See Permit 4C0436-26A and attached Schematic of Ford.
- Stable streambeds& approaches will be permanently created with rock or stone.
- Areas of exposed soil within 25’ of the stream crossing will be seeded & mulched.
- Water bars will be at least 25’ from the stream.

Protocol For Maintenance of Pervious Areas:

- Trails will be inspected before & after use.
- Recommendations with necessary urgency for repair or upgrade will be noted in the daily log along with completion date.
- Water bars, silt ponds, detention ponds & ditches will be cleaned regularly. They will be cleaned at the beginning and end of the summer season & as needed throughout the summer season based on rainfall.

- Material for the repair & building of permanent water bars & check dams will be placed strategically around the trail network so that it can be quickly accessed to affect any necessary repair.
- Trail & water bar surfaces will be monitored & repaired / stabilized as necessary to avoid erosion.
- An ESPC professional will evaluate & document minor modifications to erosion control devices & terrain to adjust to needed erosion control.
- An ESPC professional will perform an end of season trail evaluation.

Protocol For New Trail Building

- Evaluate land for environmental impacts & suitability.
- Submit trail map for permitting.
- Install trail & erosion control devices with input from EPSC professional.
- Submit as built details of trail with trail log at the end of the season.

VI. Uses, Trails, Structures, Facilities and Features

The Master Plan must accommodate specific and unspecific future development of features and trails. These areas of development have been categorized as involving impervious or pervious surfaces, as the requirements for erosion control & storm water management are different.

Specific Development

1. Trails – Pervious

- Use of 5.05 miles of additional trails are planned on the upper portion of the South Parcel (Upper Timberline Glades). See Map 1. Trails are chosen by mapping existing logging trails and using those that connect or come closest to connecting to form loops. Arrowwood Environmental conducted a wetland study and evaluated possible trail locations for wetlands and surface waters. The wetland study mapped to at least 80' to either side of these trails. Based on the results of this study, the proposed new trails will avoid wetlands with a minimum 80' buffer. See Map 3 and the Wetlands Report from Arrowwood Environmental.

When choosing and developing new trails, consideration is also given to having an easier direction and a harder direction. This means that weather conditions can be taken into account when picking the day's route and material and machines can gain access for trail repair and maintenance. All erosion control protocols listed in Section V of this Master Plan will apply to all new trails.

- An extra 1.1 miles of trails are planned for the Warm Up Area. See Maps 1 & 2. All erosion control protocols listed in Section V of this Master Plan will apply to these trails.
- To create additional trails within the Warm Up Area and take advantage of existing trails while minimizing impacts on skiers, a section of proposed trail crosses a small ravine. See Map 2. This trail is a clearly defined existing skidder trail. Due to the skidder ruts and water flow, a very small class three wetland must be crossed. Grover Engineering has designed this crossing. See Stream Crossing Plan. Per discussions with the Stormwater Section of ANR, the proposed new trails are considered pervious and will not require stormwater treatment infrastructure.

2. Features – Pervious

- The Warm Up Area, depicted on Map 2, was studied completely for wetlands. See Maps 2 & 3 and attached Wetlands Report from Arrowwood Environmental. An existing trail located north of the Traction Circle (described below) will be the site of a proposed

straightaway and turn-around that will be used as a Winter Exercise Lane. See Map 2 (Winter Exercise Lane is marked in light blue). The existing approximately 12-foot wide trail will be widened to 40-feet, and a turn-around will be added to the north end of the lane, as depicted on the Site Plan. All disturbed areas resulting from construction at this location will be seeded and mulched and no extra gravel or paved surfaces will be created. Per discussions with the Stormwater Section of ANR, the Winter Exercise Lane is considered pervious and will not require stormwater treatment infrastructure. All erosion control protocols listed in Section V of this Master Plan will apply to the Winter Exercise Lane and all proposed trails in the warm up area.

- The “Flip Flop” feature that is to be displaced by the Traction Circle will be recreated. See Map 2. This feature has two tracks approximately 50 feet long that are at different elevations. At the middle point of the track, the two tracks switch their elevations so the lower track becomes the higher track & vice versa. This feature will be built from dirt and reinforced with crushed stone. All erosion control protocols listed in Section V of this Master Plan will apply to the Flip Flop feature.

3. Features – Impervious

- A Traction Circle will be developed in the warm up area. See Map 2 & Site Plan. This area was chosen because the Traction Circle needs to be on ground that is as flat as possible. It also needs to be adjacent to the existing flat area for winter driving exercises. The Traction Circle will consist of a round track that has a width of 30’. The outside diameter of the track will be 200’ and the inside diameter will be 140’. It will be constructed from crushed compacted gravel. The center of the circle will be grass with a catch basin to accommodate stormwater. An engineered solution to erosion control & storm water is provided as this area is classified as impervious. Please see attached EPSC Site Plan.
- A hospitality trailer pad will be created adjacent to the winter skid pad. This will have a trailer parked on it for warming & shelter. The hospitality pad will be 30’ by 30’ and will be accessed by a short section of trail. See Site Plan & Map 2. An engineered solution to erosion control & storm water is provided as this area is classified as impervious. See EPSC Site Plan.

4. Infrastructure

- A small storage / repair facility is planned within the Warm Up Area. See Map 2. This building will be used for storage of equipment, light mechanical repair & clerical activities. The permitted but not constructed wash pad will be relocated beside it. The building will be 86’ x 26’ with an impervious storage area around it of 130’ by 60’.

Water will be supplied either with its own well or from Catamount/Bolton Water & Sewer LLC. Septic will be provided either with its own septic system or from Catamount/Bolton Water & Sewer LLC.

An engineered solution to erosion control & storm water is provided as this area is classified as impervious. See EPSC Site Plan.

Unspecific Development

A significant portion of the South Parcel was studied for environmental impacts. See Map 3. This area has been identified as the best area to allow for currently unidentified trail and obstacle development. Additional trails and features will be developed in this area; however, they have not been specifically identified at this time. As it is established that following the protocol for trail

building within this area reduces or eliminates environmental concerns, streamlined permitting of trails and features in this area should be possible.

VII. Dates of Operation and Seasonal Boundaries

Currently, the driving school is permitted to operate annually from May 1st to October 31st and December 15th to March 15th. These dates were established when the first permits were drawn up & the majority of the driving was done on ski trails. Boundaries were also imposed for summer & winter use. These restrictions create a lot of scheduling problems as a specific end of season date can fall anywhere in a week often rendering a full week unusable. At other times, a last minute class cannot be accommodated even if the weather is good. Since the original permit was issued, many factors have changed that make these restrictions unnecessary:

- The school has evolved & opportunities for business have presented themselves that do not always require upper mountain trail use.
- Some classes are held on only the impervious surfaces at Timberline Lodge.
- The weather varies dramatically from year to year, having more impact than a specific date.
- The obligations within the permit to avoid erosion address activities better than specific dates.
- The relationship between the ski area & The 4x4 Center takes care of any decisions regarding ski / driving scheduling.

It is suggested, therefore, that The 4x4 Center be entitled to operate anywhere on the permitted trail system year round.

VIII. Application for Master Plan Approval

Applicants respectfully request that the Development Review Board (DRB) grant Master Plan approval. The Master Plan outlines the uses and needs The 4x4 Center envisions over the next five years. A degree of flexibility is built in to allow for changing needs. The environmental study and comments from ANR, together with protocols for trail building, erosion control and maintenance, should allow for streamlined Administrative Approvals. Updating the permit to allow for the flexibility in dates of operation, winter / summer boundaries and erosion control modifications will prevent unnecessary permit requests.

APPENDICES



3045 Theodore Roosevelt Highway
 Waterbury, VT 05676
 Phone: (802) 434-3064 • Fax: (802) 434-6404
 E-Mail: Deborah@townofboltonvt.com

APPLICATION TO THE DEVELOPMENT REVIEW BOARD

For Pud's Preliminary Subdivision Review Final Subdivision
 Review -See Attached Tables 6.1 & 6.2
VARIABLE FEES (SEE SCHEDULE)

Note: All information requested on this application must be completed in full and submitted to the Zoning Administrator, with required fees and attachments, at least 30 days in advance of a regularly scheduled Development Review Board meeting. Information checklists for each type of application are available at the Bolton Town Office. A request to waive one or more application requirements may be submitted in writing with the application. Failure to provide required information may result in the application being deemed incomplete by the Zoning Administrator, which may delay the development review process.

Type of Application (check all that apply):

- Master Plan Review** _____ Planned Unit/Planned Residential Development
 Site Plan Review _____ Preliminary Subdivision Review (Major Subdivisions)
 Conditional Use Review _____ Final Subdivision Review (All Subdivisions)

Applicant Information

	Owner(s) of Record (as shown on deed)	Applicant(s) (if not owner)	Other Contact
Name(s) (all)	Mountain Operations and Development, LLC & Catamount/Bolton Land, LLC	Automotive Services International	Annie Dwight
	c/o Larry Williams, President	c/o Michael Hopwood	c/o Monaghan Safar Dwight
Mailing Address	4302 Bolton Valley Access Road	63 Ethan Allen Drive	156 Battery Street
	Bolton Valley, VT 05477	S. Burlington, VT 05403	Burlington, VT 05401
Phone / Fax #s			Phone: 802-660-4735 Fax: 802-419-3662

Property Information

Location: Bolton Valley Resort **Warranty Deed:** 61-32, 59-490
(911 Address + Town Road / Street / Highway) (Book and Page Number - In Bolton Town Office)

Tax Parcel ID #: 7-3004250 **Zoning District(s):** Resort Residential, Resort Village, Forest
(Tax Maps in Bolton Town Office) (Zoning Maps in Bolton Town Office)

Total Lot Area: +/- 316 acres (w/some trails on +/- 700 acre parcel owned by resort) **Road Frontage:** 2,240 +/- feet (larger resort parcel has +/- 4,000 feet)
(Deed / Calculated / Surveyed) (Measured along all roads)

Project Summary Information

(also attach one page project summary)

	Existing	Proposed
Lots (#):	See Attached.	See Attached.
Use Type(s) (see zoning district lists):	Outdoor Recreation	Outdoor Recreation
Structure(s) (#):	0	1
Road(s) (total length in feet):	N/A	N/A
Parking Spaces (#):	N/A	N/A
Building/Structure Height(s) (feet):	N/A	N/A
Building Coverage (sq. ft.):¹	0	2,236
Lot Coverage (sq. ft.):²	0	45,655

I solemnly swear of affirm, under pains of penalty and perjury that all statements herein, and other evidence I submit in connection with this application shall be true and correct to the best of my knowledge and belief, and that I have read and followed all instructions.

Signature of Applicant(s): _____

Hopwood

Date: 7/13/12

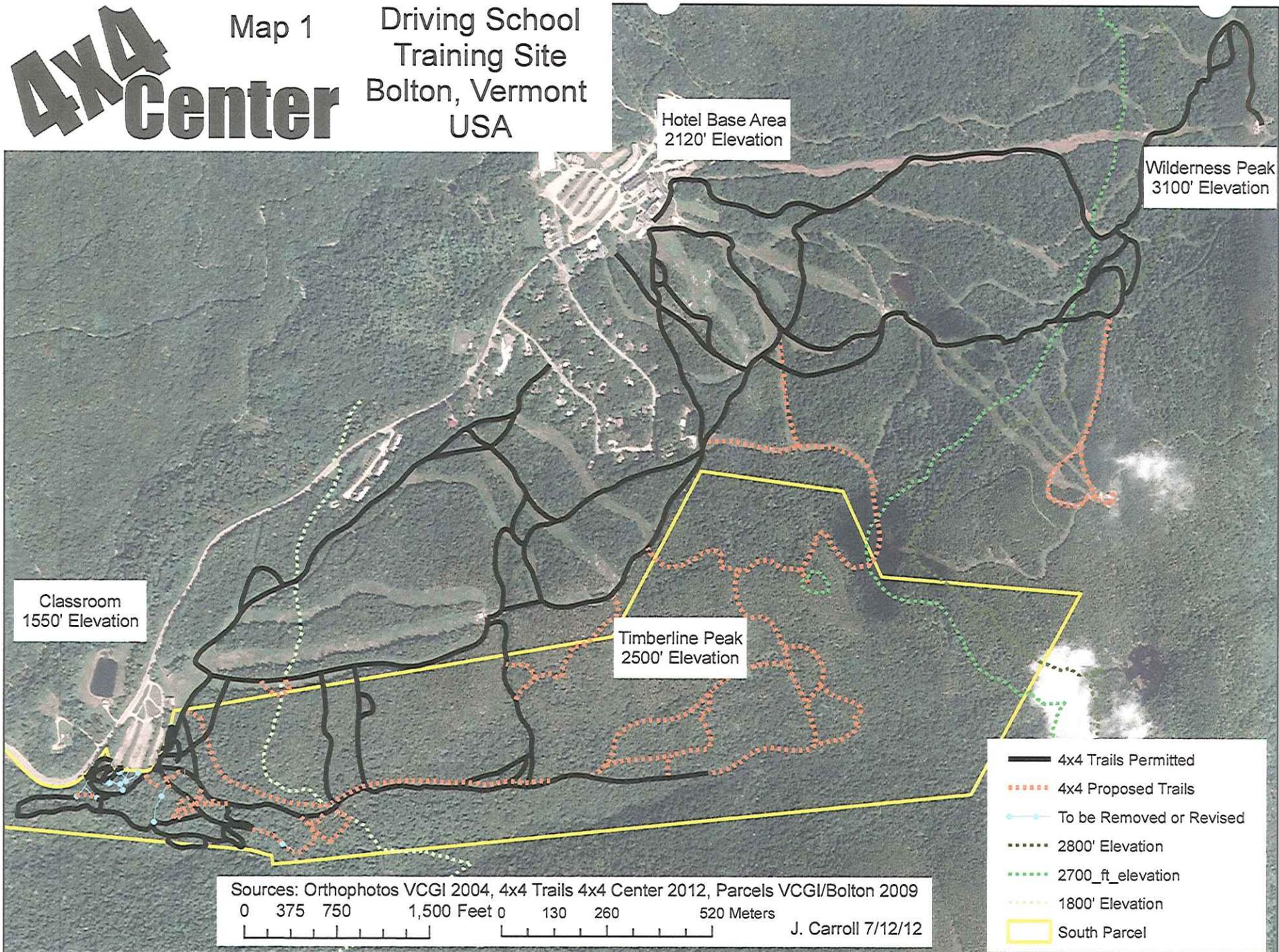
Administrative Use Only	Date Received: _____	Fee Paid: _____	
	<input type="checkbox"/> Incomplete – Notified Applicant <input type="checkbox"/> Referred to Development Review	Date: _____ (Letter Attached)	Date: _____
	Zoning Administrator: _____		Date: _____

¹ Total (combined) building footprint area.
² Total (combined) area of building footprints, parking areas, and all other impervious surfaces.

4x4 Center

Map 1

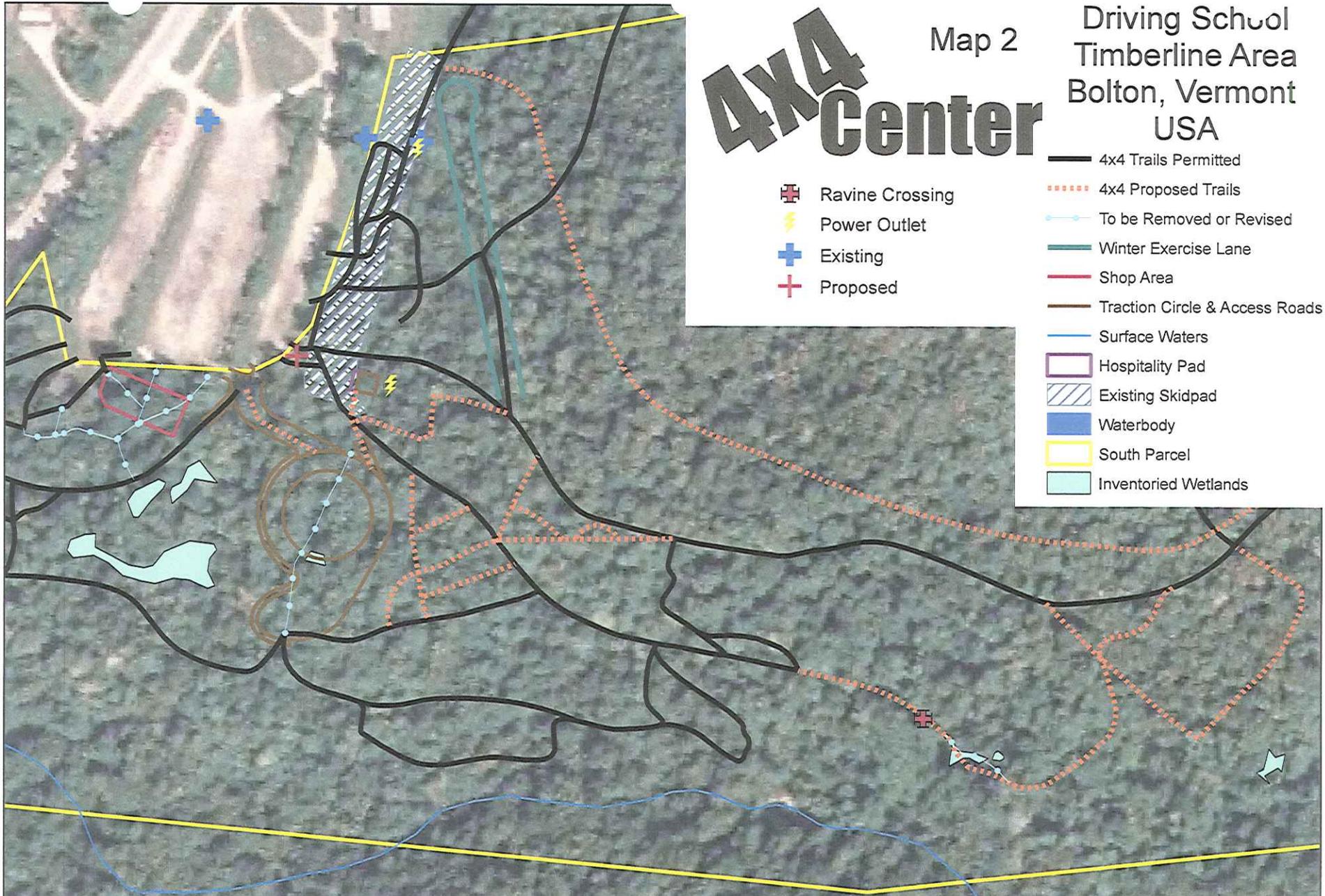
Driving School
Training Site
Bolton, Vermont
USA



4x4 Center

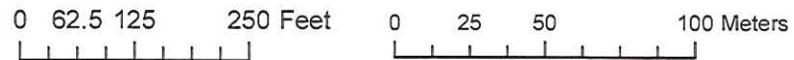
Map 2

Driving School
 Timberline Area
 Bolton, Vermont
 USA



- 4x4 Trails Permitted
- 4x4 Proposed Trails
- To be Removed or Revised
- Winter Exercise Lane
- Shop Area
- Traction Circle & Access Roads
- Surface Waters
- Hospitality Pad
- Existing Skidpad
- Waterbody
- South Parcel
- Inventoried Wetlands
- Ravine Crossing
- Power Outlet
- Existing
- Proposed

Sources: Orthophotos VCGI 2004, 4x4 Trails 4x4 Center 2012,
 Parcels VCGI/Bolton 2009, Traction Circle Grover Eng 2012,
 Wetlands Arrowwood Environmental Preliminary Inventory 2012

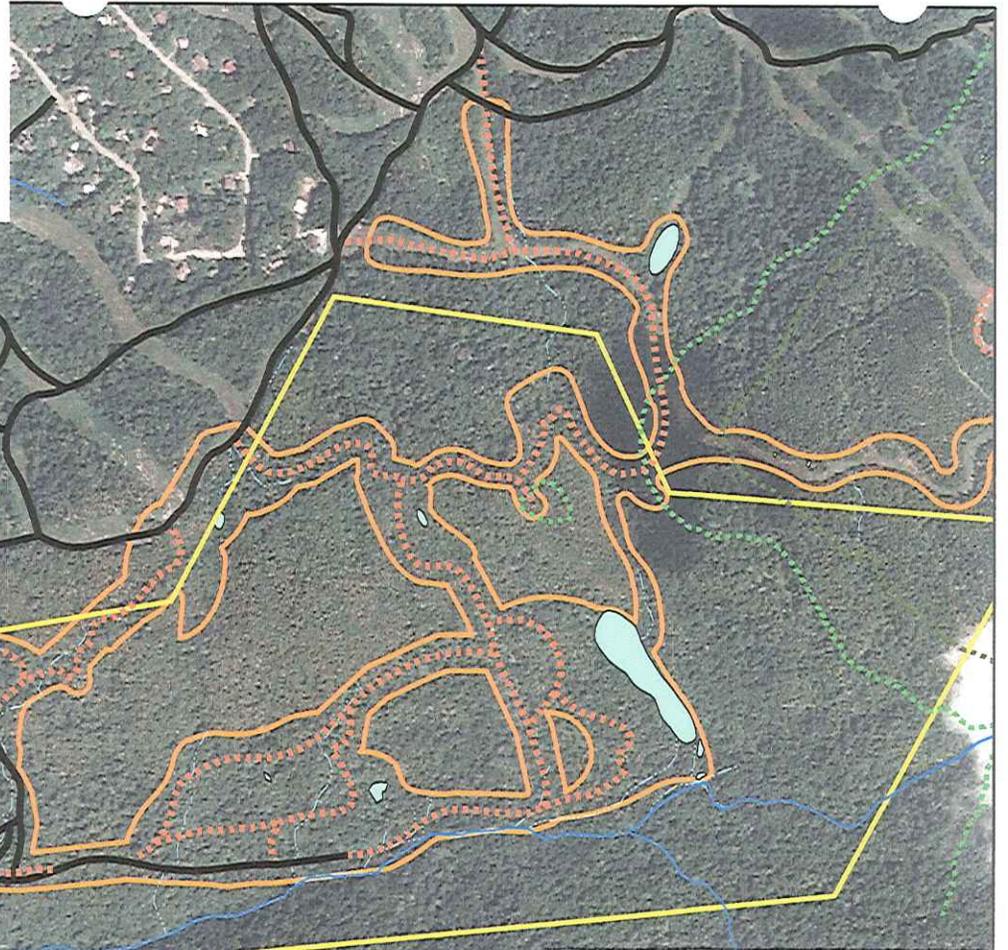


J. Carroll 7/12/12

4x4 Center

Map 3

Driving School
South Parcel
Bolton, Vermont
USA



0 295 590 1,180 Feet 0 100 200 400 Meters

Sources: Orthophotos VCGI 2004, 4x4 Trails 4x4 Center 2012,
Parcels VCGI/Bolton 2009, Streams, Wetlands & Env Study Area
Arrowwood Environmental Preliminary Inventory 2012

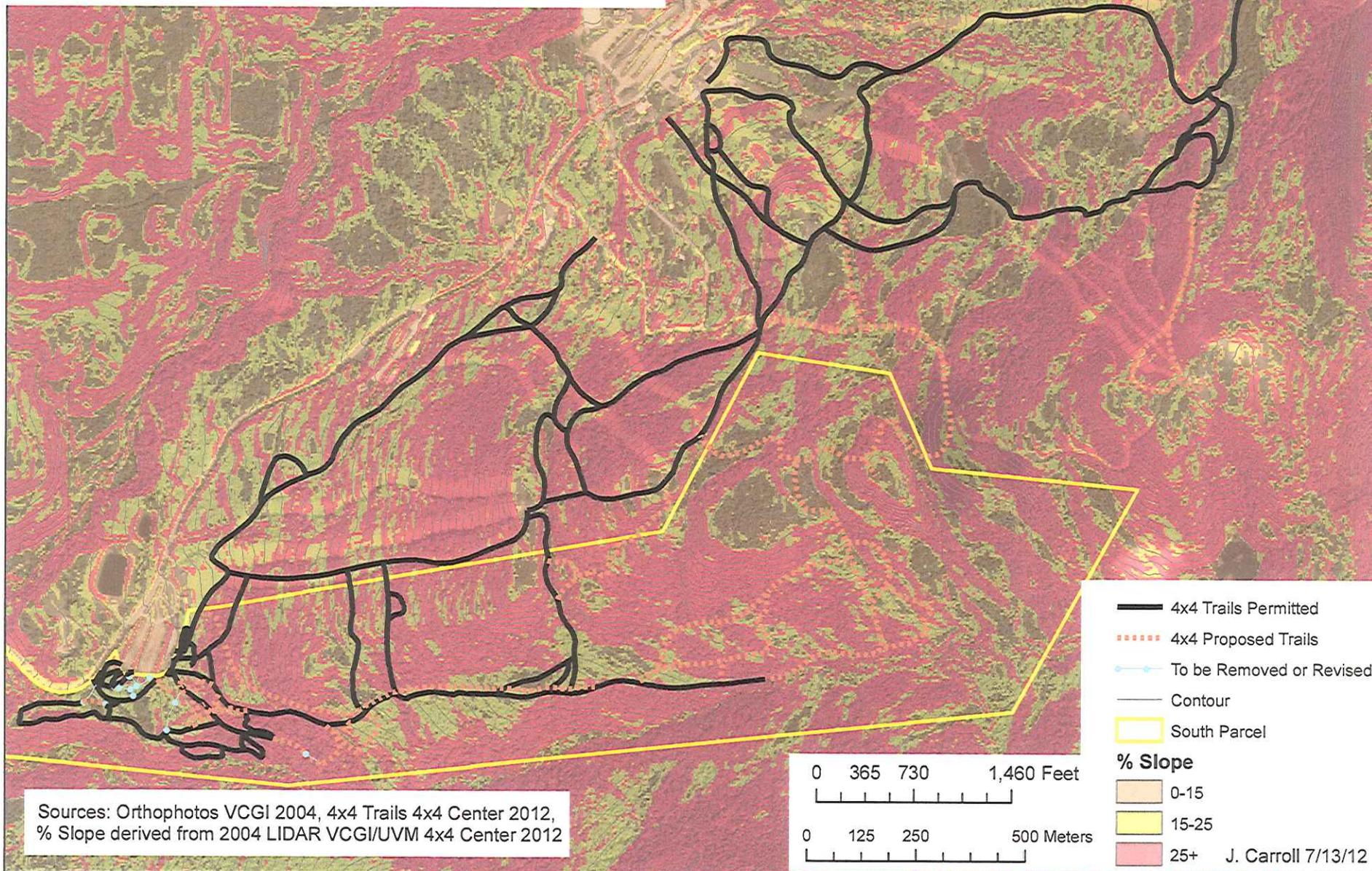
J. Carroll 7/12/12

- 4x4 Trails Permitted
- - - 4x4 Proposed Trails
- To be Removed or Revised
- - - 2800' Elevation
- - - 2700' elevation
- - - 1800' Elevation
- Surface Waters
- - - Streams Approximate
- Env Study Area
- South Parcel
- Inventoried Wetlands
- Waterbody

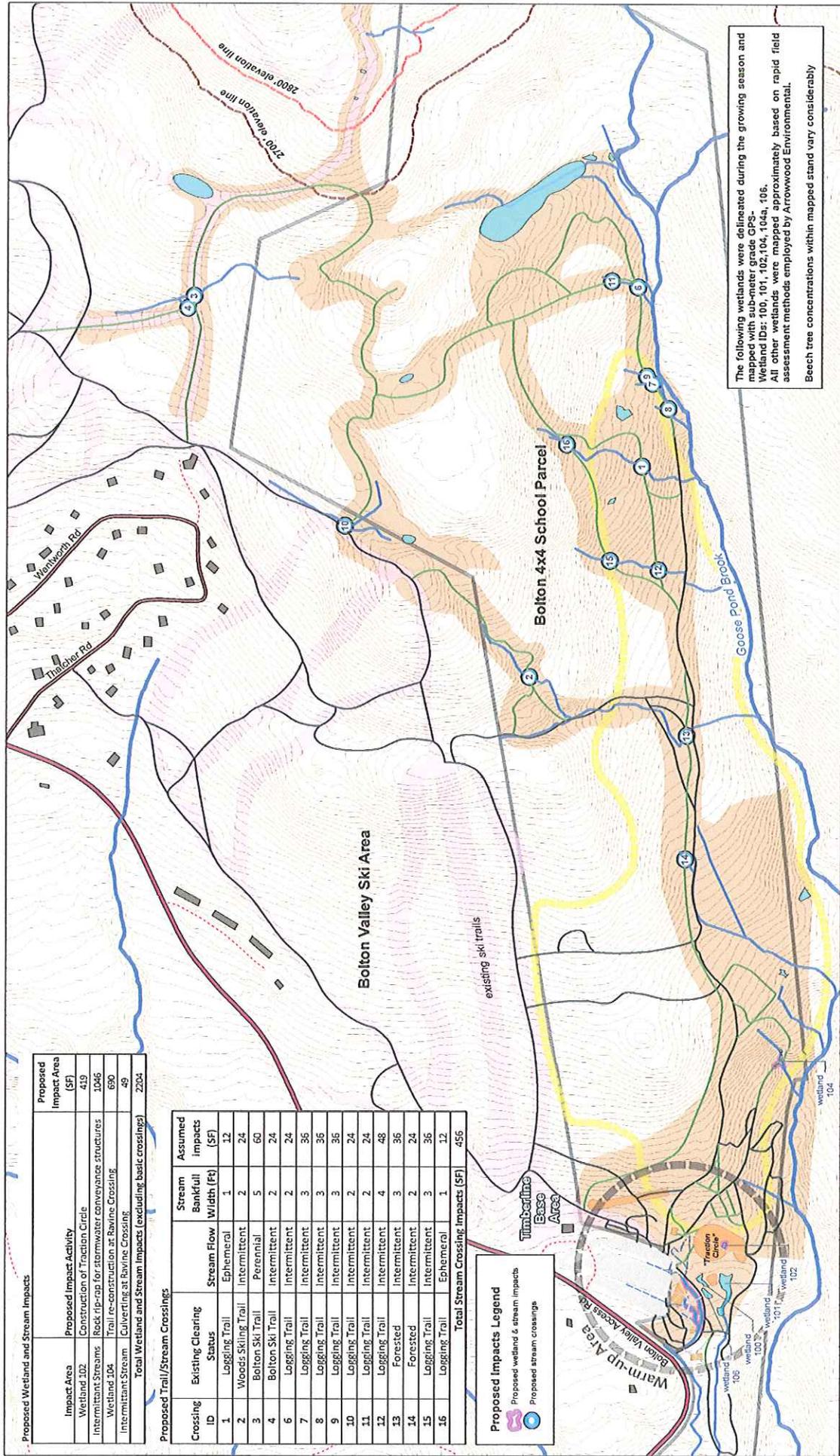
4x4 Center

Map 5

Driving School
Percent Slope
Bolton, Vermont
USA



Sources: Orthophotos VCGI 2004, 4x4 Trails 4x4 Center 2012,
% Slope derived from 2004 LIDAR VCGI/UVM 4x4 Center 2012



The following wetlands were delineated during the growing season and mapped with sub-meter grade GPS:
 Wetland IDs: 100, 101, 102, 104, 104a, 106.
 All other wetlands were mapped approximately based on rapid field assessment methods employed by Arrowwood Environmental.
 Beech tree concentrations within mapped stand vary considerably

The 4x4 Center, Bolton, Vt.
Natural Resources: Map 6
 Thursday, July 12, 2012
 Prepared by: Ashly Mahoney, Arrowwood Environmental
 Coordinates system: NAD 1983 StatePlane Vermont FIPS 4800

Notes: Wetland boundaries provided by Arrowwood Environmental based upon field review in 2011 and 2012. Wetland boundaries were identified in the field based on available and identifiable characteristics upon field review. Wetland boundaries were mapped using mapping grade GPS units with no guarantee of accuracy. Stream delineation based on mapping grade GPS points at occasional crossing points which were then compared to 2' interval site topography derived from CDEPC LIDAR data. Streamcourse interpolated based on "best professional judgment" from available data, select areas (Assessed Area) along and adjacent to existing and proposed trails were surveyed for natural resources. Use Only responsible for understanding the limitations of this data. This is NOT a survey. Errors and omissions may exist. Other data from Bolton 4x4 Center, Grover Engineering, Bolton Valley Resort and VCC.

Impact Area	Proposed Impact Activity	Proposed Impact Area (SF)
Wetland 102	Construction of Traction Circle	419
Intermittent Streams	Rock rip-rap for stormwater conveyance structures	1046
Wetland 104	Trail re-construction at Ravine Crossing	690
Intermittent Stream	Culverting at Ravine Crossing	49
Total Wetland and Stream Impacts (excluding basic crossings)		2204

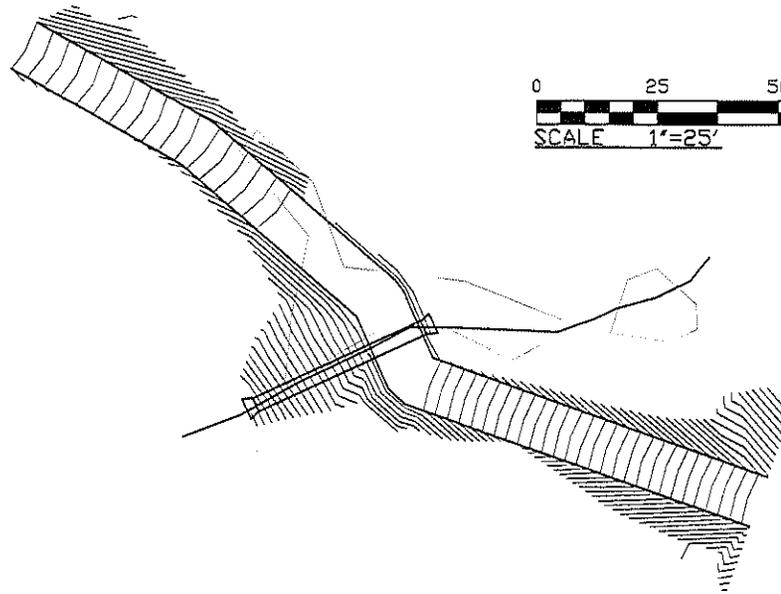
Proposed Trail/Stream Crossings	Existing Clearing Status	Stream Bankfull Width (Ft)	Stream Flow	Assumed Impacts (SF)
1	Logging Trail	1	Ephemeral	12
2	Woods Skiing Trail	2	Intermittent	24
3	Bolton Ski Trail	5	Perennial	60
4	Bolton Ski Trail	2	Intermittent	24
6	Logging Trail	2	Intermittent	24
7	Logging Trail	3	Intermittent	36
8	Logging Trail	3	Intermittent	36
9	Logging Trail	3	Intermittent	36
10	Logging Trail	2	Intermittent	24
11	Logging Trail	2	Intermittent	24
12	Logging Trail	4	Intermittent	48
13	Forested	3	Intermittent	36
14	Forested	2	Intermittent	24
15	Logging Trail	3	Intermittent	36
16	Logging Trail	1	Ephemeral	12
Total Stream Crossing Impacts (SF)				456

Proposed Impacts Legend
 Proposed wetland & stream impacts
 Proposed stream crossings

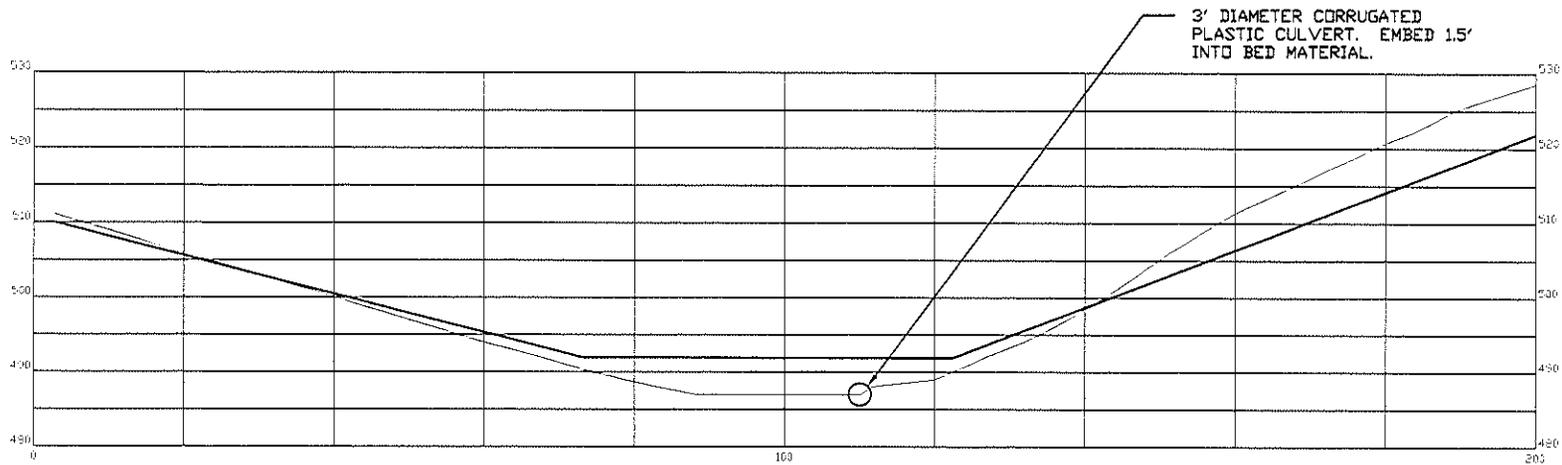
4x4 Trails: Use Status
 In Use
 Proposed
 To be Removed
 Existing gravel/asphalt
 Proposed gravel/asphalt

Bolton 4x4 Boundary
 Assessed Area
 Ephemeral & Intermittent Streams
 Ditches
 Wetlands (see notes)
 Beech Stand (approx.)

1' EX. CONTOURS
 1' PR. CONTOURS
 EX. 4X4 ROAD
 EX. DRAINAGE
 WETLAND BOUNDARY



TOPOGRAPHY BASED ON MAY
 2012 SURVEY BY GROVER
 ENGINEERING PC. ELEVATION
 DATUM IS ARBITRARY.



THE 4X4 CENTER DRIVING SCHOOL
 Bolton
 Vermont

GROVER ENGINEERING PC
 2044 Main Road, Huntington, Vermont 05462
 phone / fax 802-254-2009 info@groverengineering.com

SCALE: 1"=25'
 DATE: JULY 9, 2012
 DWG NO: 3 of 3
 FILE: \streamcrossing\streamcrossing.dwg
 PROJ: 12009

STREAM CROSSING



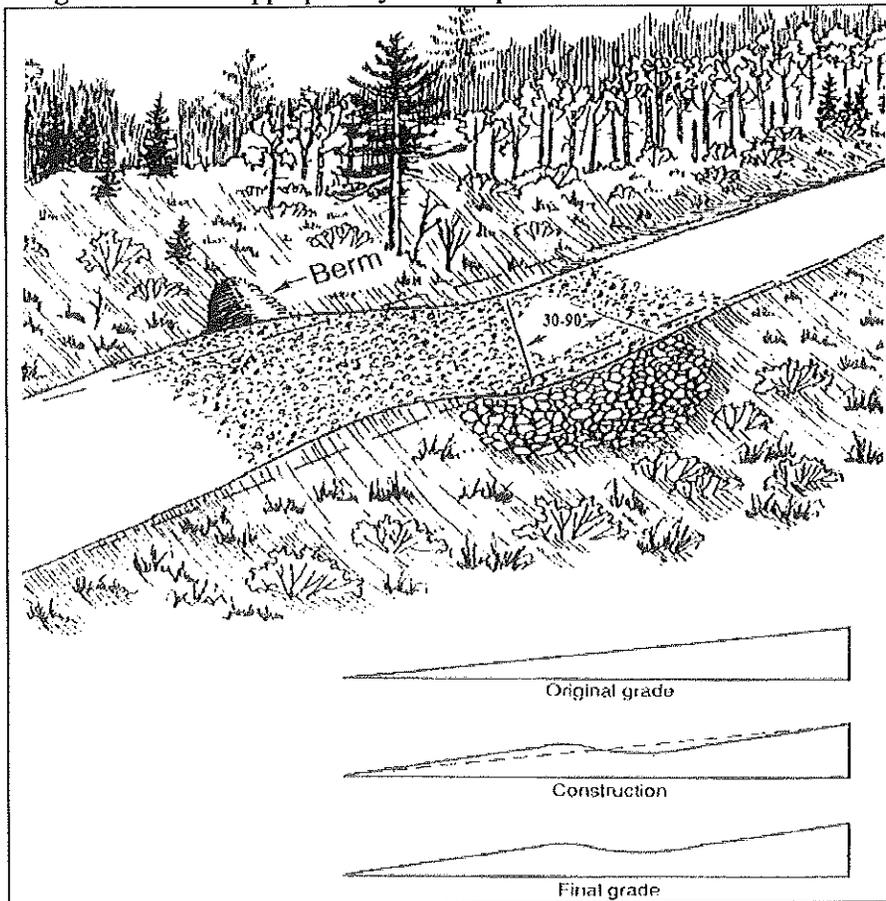
GREENLEAF
FORESTRY

PO Box 39,
Westford, VT 05494

Tel (802)-849-6629 Fax (802)-849-6689
Email: glforestry@aol.com

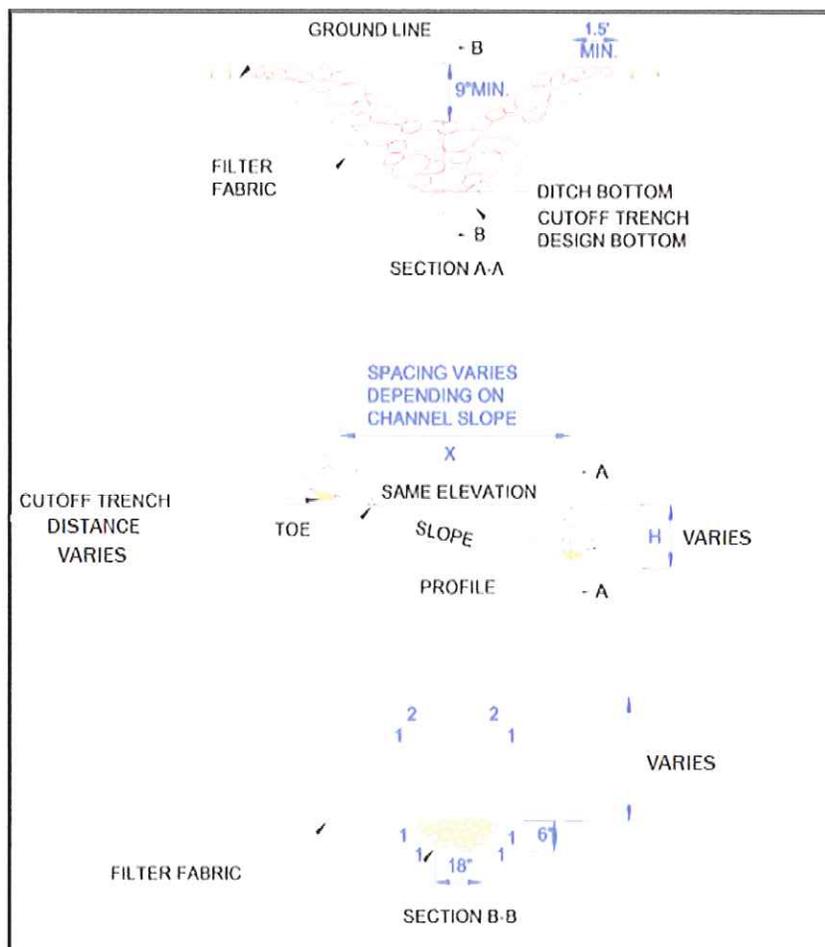
Waterbar / Broad Base Dip

- Waterbars and/or broad base dips are to be constructed pursuant to the stipulations in *Acceptable Management practices For Maintaining Water Quality On Logging Jobs In Vermont*, Vermont Department of Forests, Parks, and Recreation, 1987, on the down slope of trails to prevent water gaining sufficient flow & velocity to erode the trail.
- Waterbars are made up of a dip & a hump.
- The dip & the hump should be rounded to allow vehicle travel.
- The hump should be constructed from a gravel/cobble mix & then compacted.
- The dip should be out sloped to provide a sufficient change in grade to turn the water.
- Waterbars should be installed somewhere between 90 & 30 degrees to the trail depending on out slope.
- The water should flow into a vegetated area or drainage ditch with a check dam.
- Spacing the waterbars appropriately for trail pitch & surface.



Check Dam With Silt Pond

- Check dams should be placed in drainage ditches to slow water & catch sediment where there is insufficient protective strip of vegetation.
- Check dams should be constructed from rock.
- Create a dam within the drainage ditch with a sediment sump prior to the dam. This creates a small silt pond.
- Ensure the center of the dam is lower than the edges.
- The rock used must be large enough to stay in place given the expected water flow through the drainage ditch.
- Check & clean as necessary after storm event.





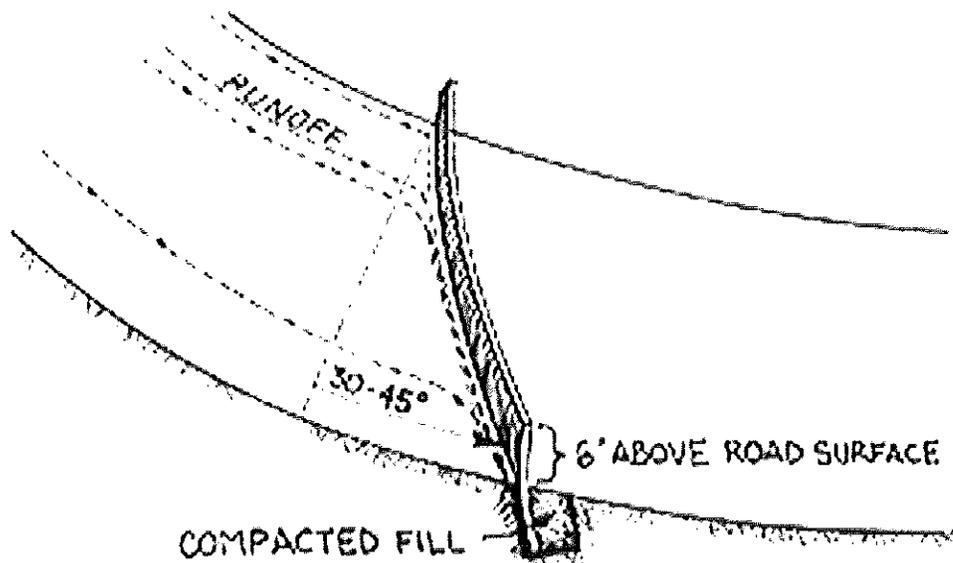
GREENLEAF
FORESTRY

PO Box 39,
Westford, VT 05494

Tel (802)-849-6629 Fax (802)-849-6689
Email: glforestry@aol.com

Conveyor Belt Water Bars

- To be used on steeper terrain where vehicle travel easily damages conventional water bars.
- Dig a trench at a 30 – 40 degree angle to the trail. The face of the cut should be on the uphill side.
- Place the conveyor belting of at least 12” wide in the ground with 6” proud of the trail surface.
- Refill the trench & compact the trail.
- If necessary reinforce the water bar by nailing a pressure treated board to the base of the conveyor belting.
- Remove berms or other obstructions from the lower end of the water bar to allow water to move off the road.
- The water should flow into a vegetated area or a drainage ditch with a check dam.
- Space the water bars appropriately for trail pitch & surface.



Conveyer belt water bar



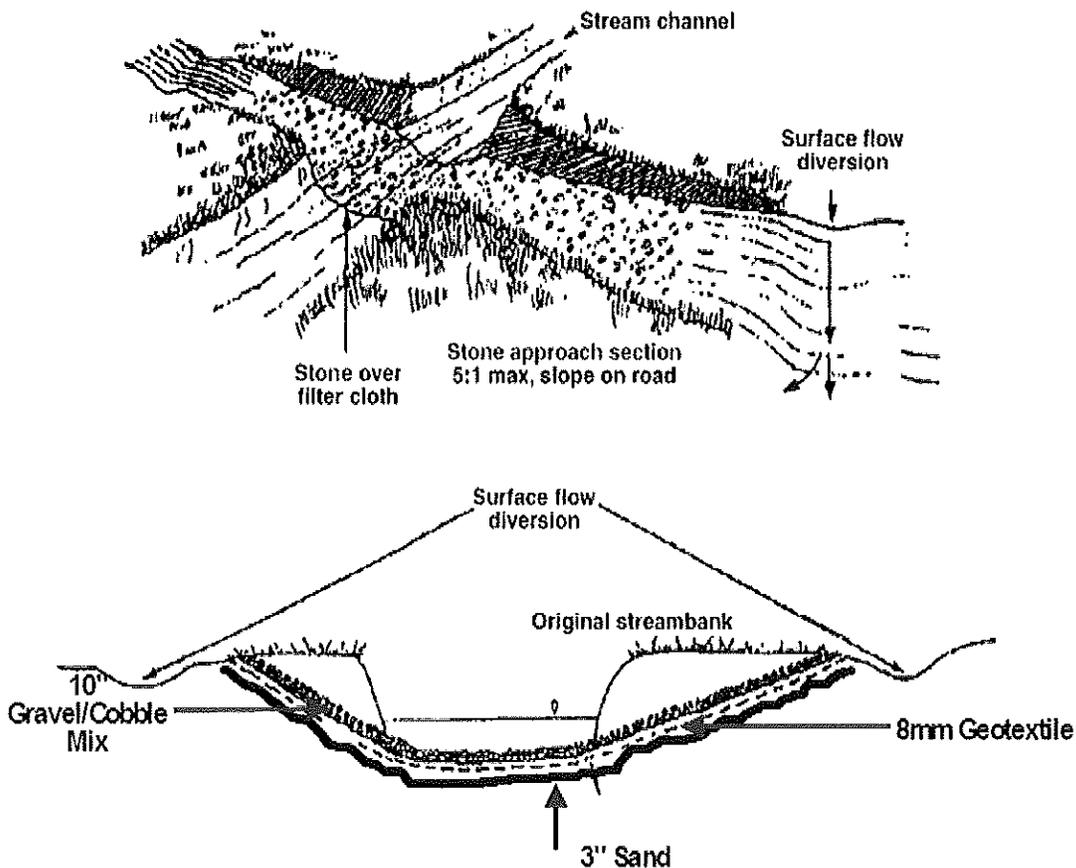
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Email: glforestry@aol.com

Ford

- Crossing points should have sloping banks with an approach section slope of no more than 5:1 & be stabilized with a gravel/ cobble mixture.
- On the approach, ideally no closer than 25' should be a surface flow diversion (water bar).
- A trench should be excavated one foot deep across the waterway placing 3" of sand, 8mm geotextile & 10" gravel/cobble.
- The work area should be isolated from stream flow by diversion or sandbag dam with pump around.





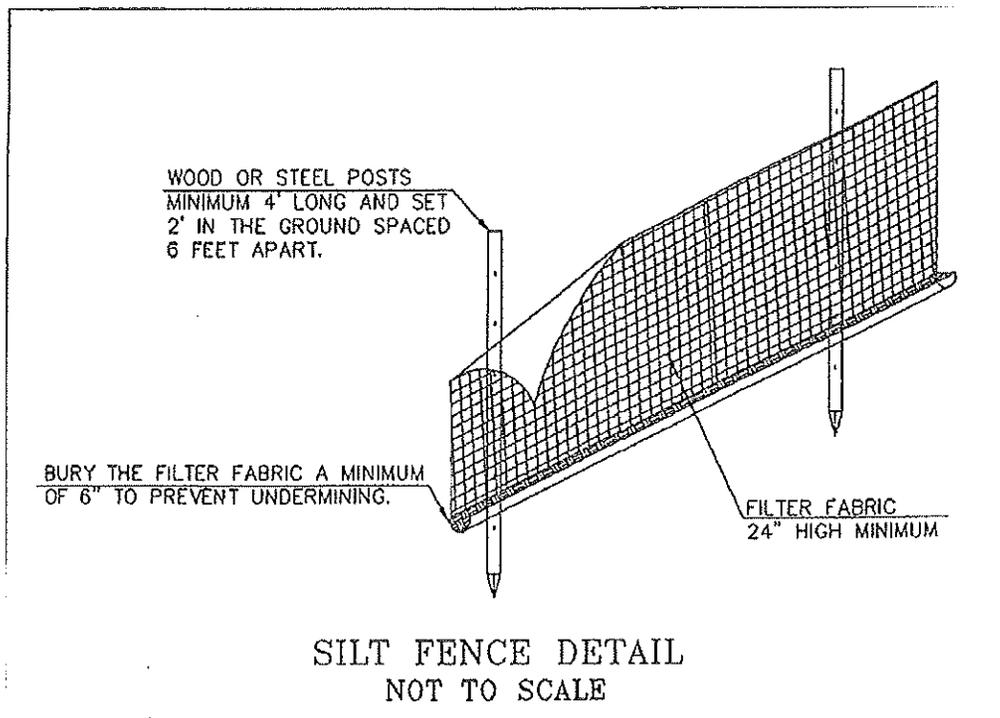
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Email: glforestry@aol.com

Silt Fence Installation

- Silt fences are to be constructed on a level contour. Sufficient area should exist behind the fence for ponding to occur without flooding or overtopping the fence.
- Place silt fence on downhill edge of bare soil.
- A trench should be excavated approximately 6 in. wide and 6 in. deep along the line of the planned silt fence.
- Bottom of the silt fence should be keyed-in a minimum of 12 inches.
- Posts should be spaced a maximum of 6 ft apart and driven securely into the ground a minimum of 18 in. or 12 in. below the bottom of the trench.
- The trench should be backfilled with compacted native material.
- Construct silt fences with a setback of at least 3 ft from the toe of a slope. Where a silt fence is determined to be not practicable due to specific site conditions, the silt fence may be constructed at the toe of the slope, but should be constructed as far from the toe of the slope as practicable. Silt fences close to the toe of the slope will be less effective and difficult to maintain.
- Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/3 the height of the barrier; in no case should the reach exceed 500 ft.





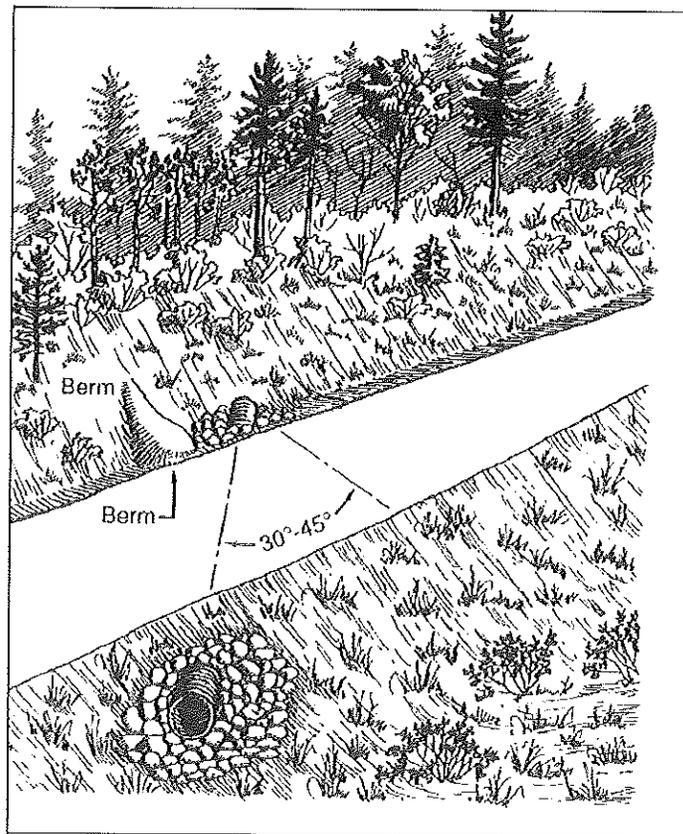
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Culvert

- Culverts should be used when terrain does not allow for a waterbar to move water from one side of the trail to the other.
- Culverts should extend 1' either side of trail.
- Culverts should be installed at a 30 degree down grade angle with a 4 degree pitch to reduce the possibility of clogging with leaf litter & other debris.
- Erosion control materials should be used to minimize undercutting at the culvert inlet & outlet.
- Select the size of the culvert according to the size of the road & the general amount of surface area that is being drained. 12" is the minimum recommended culvert size.





ARROWWOOD ENVIRONMENTAL

950 BERT WHITE ROAD
HUNTINGTON, VT 05462
(802) 434-7276 FAX: (802) 329-2253

Memorandum

To: Mike Hopwood, Bolton 4x4 Center

Fr: Dori Barton, Jeff Parsons

Dt: July 9, 2012

RE: Natural Resource Review for the 4x4 Center Master Plan

Introduction: The 4x4 Center engaged Arrowwood Environmental (AE) to conduct a natural resources review for its proposed master plan. As part of this review, AE conducted remote review and on-site field evaluations of wetlands and streams. Field assessments were conducted over the time period of October 2011 through May 2012. Site visits were also conducted with the Vermont Wetlands Office. The attached Natural Resources Map displays the proposed warm up area, trail, and infrastructure development, assessment areas, and identified natural resources.

Wetlands: AE identified wetland resources in the Assessed Area (see attached Natural Resources Map). Wetland areas were identified with wetland delineation flagging and surveyed via GPS. Trail layout was generally designed to provide greater than 50' buffers about each flagged wetland. The only exception to this within the proposed trail network is at wetland #104. This wetland is located approximately 1000' east-southeast of the proposed Traction Circle. Wetland #104 is located within an existing trail, and is intersected by a small stream. Mr. Alan Quackenbush conducted a site visit on April 4, 2012 to review this wetland and determined it to be Class 3 per the Vermont Wetland Rules. Mr. Quackenbush recommended care be taken to protect water quality in this location.



Figure 1. Wetland # 104. Photo taken on June 15, 2012

The applicant has engineered a stream/wetland crossing to minimize wetland impacts and provide for a stable trail surface. The current trail encompasses a slightly larger area of wetland, is steeply sloped and susceptible to erosion. Moving the trail slightly to the south and providing a well-designed stream crossing will result in decrease in erosion potential, decrease in area of wetland impact and improved stream habitat conditions. The design as proposed will result in 690 sq.ft of impact to this Class III wetland and 49 sq.ft of stream impact for the proposed culvert described below. The following narrative is provided by the project engineer, Dean Grover from Grover Engineering PC (GEPC).

Intermittent Stream/Wetland Crossing for 4x4 Trail

As an adjunct to the trail improvements planned at the 4x4 Center, GEPC has conducted a topographic survey of a site requiring a culvert for a trail crossing a small intermittent stream and adjacent wetland. This crossing is located about 1000- feet east-southeast of the Traction Circle. A separate site plan for this site, Intermittent Stream and Wetlands Crossing Plan (Sheet 3 of 3) depicts the steep existing terrain at this location, and the proposed installation of a 3-foot diameter x 40-foot long culvert. About 40 yards of extra fill materials will be brought to this site and used to install the elevated roadway above the existing terrain. This approach avoids extensive cutting into the steep hill slope that would otherwise result in excessively steep cut banks on the uphill side of the road that would be difficult to stabilize. The 3-foot culvert is significantly oversized from what is necessary for the small intermittent stream and adjacent wetlands, but was selected to permit about half of the culvert to be dug into the ground and to fill with stream alluvium over time. This will create a relatively natural streambed through the culvert that should permit passage of aquatic organisms.

Our modeling indicates that the small watershed above this crossing could be passed with a 12-inch culvert. By significantly oversizing the culvert, and minimizing cutting into the steep embankment above the trail I feel we have reduced overall impacts at the site. About half of the culvert would be embedded into the streambed, to essentially form a small bottomless arch culvert (this is noted on the plans).

The slope of the culvert would be about 40% which is consistent with the surprisingly consistent profile of the brook of 38%.

Upon further conversation with Mr. Grover, he recommends that natural-shaped boulders be placed below the culvert outlet to insure a slower velocity and accumulation of sediment in the culvert. He also suggested inspecting the culvert and outfall following a few storm events.

The remaining trail network, as proposed will result in no additional wetland impacts. AE worked closely with the 4x4 Center to redesign new trail sections to avoid identified wetland resources in the project area and to provide significant buffer zones to these resources.



Figure 2. Wetland # 102. Photo taken on June 15, 2012

Within the warm up area, wetlands have generally been provided a post-construction buffer width of 25' with the exception of wetland #102 within the proposed Traction Circle. Mr. Alan Quackenbush conducted a site visit on April 4, 2012 to review the wetlands in the vicinity of the Traction Circle and wetland #102. Mr. Quackenbush determined each of the wetlands to be Class 3 and

outside the jurisdiction of the Vermont Wetland Rules. As a result of Mr. Quackenbush's input, the Traction Circle was redesigned to avoid and minimize wetland impacts to the extent possible. The Circle was shifted to the east, resulting in impacts to a small seepage wetland area adjacent to and already impacted by an existing trail. It was agreed, given the size and current degree of impact, that wetland 102 had limited if any significant functions and values. The resulting design will impact approximately 419 sq.ft of this Class III wetland.

The applicant made significant design changes to provide the 25' wetland buffer to wetland #'s 100, 106 and 101. The applicant reduced the size of the Circle and engaged in multiple design iterations to accomplish this task. The stormwater detention pond adjacent to the Traction Circle has been configured such that after construction the southern fill area will be restored to a forested condition providing a 25' buffer to wetland 101.

Streams

AE identified streams within the project area, as shown on the attached natural resources map. AE identified stream channels through a remote review of digital data sources and some field verification. The applicant provided AE with information regarding existing stream crossings and proposed new crossings.

The streams within the project area are generally described as small, intermittent channels. The following table provides a summary of stream crossings related to trail development within the project area. Crossing ID #'s correspond with labeling on the attached natural resources map.

Crossing ID	Existing Clearing Status	Stream Flow	Stream Bankfull Width (Ft)	Assumed impacts (SF)
1	Logging Trail	Ephemeral	1	12
2	Woods Skiing Trail	Intermittent	2	24
3	Bolton Ski Trail	Perennial	5	60
4	Bolton Ski Trail	Intermittent	2	24
6	Logging Trail	Intermittent	2	24
7	Logging Trail	Intermittent	3	36
8	Logging Trail	Intermittent	3	36
9	Logging Trail	Intermittent	3	36
10	Logging Trail	Intermittent	2	24
11	Logging Trail	Intermittent	2	24
12	Logging Trail	Intermittent	4	48
13	Forested	Intermittent	3	36
14	Forested	Intermittent	2	24
15	Logging Trail	Intermittent	3	36
16	Logging Trail	Ephemeral	1	12
Total Stream Crossing Impacts (SF)				456

The 4x4 Center has developed protocols to address stream crossings associated with the trail network. The following protocols are provided by the 4x4 Center:

Protocols for Stream Crossings (4x4 Center Master Plan application)

1. Stream crossings will not involve major stream disturbance.
2. Trails are planned to keep stream crossings to a minimum.
3. Fords have been suggested as the best way of crossing streams by ANR (permit 4C0436-26A)
4. A stable stream bed and approaches will be permanently created from rock or stone.
5. Areas of exposed soil within 25' of the stream crossing will be seeded and mulched.
6. Water bars will be at least 25' from the stream.

AE contacted Chris Brunelle via email to arrange a site visit to review new crossing locations. Mr. Brunelle, already having visited the site during previous permit review, declined the visit. He reviewed the stream crossing Ford template, provided in the master plan application, and found it to be acceptable from the River Management perspective (email correspondence 6/11/2012).

An additional 1046 sq.ft of impact to intermittent streams will occur as a result of rock rip-rap for stormwater conveyance structures within the warm up area and traction circle.

----- Original Message -----

Subject:RE: Bolton 4x4 Center

Date:Tue, 10 Jul 2012 15:53:59 -0400

From:Quackenbush, Alan <Alan.Quackenbush@state.vt.us>

To:'Dori Barton' <dori@arrowwoodvt.com>

Hi Dori,

Thanks for summary of the April 4, 2012 site visit. I concur that the wetlands are all Class III and no state wetland permit is required for the proposed "traction circle". Thanks for the re-design to avoid and minimize impacts. - Alan

From: Dori Barton [<mailto:dori@arrowwoodvt.com>]

Sent: Monday, July 09, 2012 10:23 AM

To: Quackenbush, Alan

Subject: Bolton 4x4 Center

Hi Alan. I am working on the Master Plan application with Mike Hopwood from the Bolton 4x4 Center. We are hoping to have a letter/email from you regarding your site visit with us back on April 4, 2012. You may recall that we visited the wetlands in the vicinity of the proposed traction circle near the existing parking area. At this visit you had determined that all these wetlands were Class 3 per the new wetland rules. You had also encouraged redesign of the circle to avoid all but the very small wetland adjacent to and already impacted by the existing trail. The project was redesigned to accommodate these requests, with the only direct wetland impact being to this small wetland. In addition, we were able to redesign to generally provide a 25' buffer to the remaining wetlands in this area. I believe that we addressed your major concerns by redesigning the layout of the circle.

I realize you are very busy. I believe that even a simple concurrence with what is written in this email would be helpful to our Act 250 process. Thank you and best regards. Dori

--

Dori Barton
ecologist, project manager
Arrowwood Environmental
dori@arrowwoodvt.com
950 Bert White Road
Huntington, VT 05462
[802-434-7276](tel:802-434-7276)
[802-329-2259](tel:802-329-2259) (fax)

From: Dori Barton [<mailto:dori@arrowwoodvt.com>]
Sent: Wednesday, May 16, 2012 3:32 PM
To: Brunelle, Chris
Subject: Bolton 4x4 Center

Hi Chris. I'm working with Mike Hopwood from the Bolton 4x4 Center on creating a master plan for his Act 250 permit. Some of the new trails that he would like to permit will involve crossing small intermittent streams. I'm checking to see if you would like to visit the site as part of the Act 250 review. I believe you may have visited the area previously Mike. He is providing Act 250 with some templates for how he plans on dealing with the crossings, you may have seen or even recommended these to him in the past. Let me know if you would like to schedule a site visit. Thanks. Dori

--

Dori Barton
ecologist, project manager
Arrowwood Environmental
dori@arrowwoodvt.com
950 Bert White Road
Huntington, Vt 05462
[802-434-7276](tel:802-434-7276)
[802-329-2259](tel:802-329-2259) (fax)

On 5/22/2012 3:29 PM, Brunelle, Chris wrote:

I remember being there some years ago. I don't think I need to visit the site at this time, I would like to review the templates he's providing ACT250. Can you let me know when he sends them in or email them to me?

Thanks,

Chris

On Jun 8, 2012, at 9:20, "Dori Barton" <dori@arrowwoodvt.com> wrote:

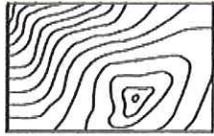
Hi Chris. I'm checking to see if you have had a chance to look at the ford crossing template I emailed. Mike has a deadline to file his Act 250 permit application for his master plan next week and is hoping to have a sign off letter/email from you if possible. Please let me know if there is anything I can provide you to help in your review. Thanks. Dori

Dori Barton
ecologist, project manager
Arrowwood Environmental
dori@arrowwoodvt.com
950 Bert White Road
Huntington, Vt 05462
[802-434-7276](tel:802-434-7276)
[802-329-2259](tel:802-329-2259) (fax)

On 6/11/2012 8:53 AM, Brunelle, Chris wrote:

I reviewed the templates and find them acceptable from the River Management perspective.

Chris Brunelle, SAE
777-5328



**GROVER
ENGINEERING PC**

Water and Wastewater - Site Design
Stormwater Management - Environmental Consulting

2044 Main Road, Huntington, Vermont 05462
phone: 802-434-2989 | email: dean@groverengineeringpc.com

July 9, 2012

Mr. Michael Rainville, Chair
Development Review Board
Town of Bolton

RE: 4x4 Center Master Plan – Narrative
Bolton

Dear Mr. Rainville and Members of the DRB:

The 4x4 Center Master Plan seeks permits for expansion of their existing driving school adjacent to the Bolton Valley Timberline Lodge (BVTL). This driving school has been in operation since 2006. The principal goal of this plan is to provide a facility with sufficient flexibility in layout, grades and obstacles to accommodate the varied and quickly changing requirements for training terrain requested by their clients. Grover Engineering PC (GEPC) was retained to provide technical and engineering assistance in preparing design drawings for this Master Plan, to assure that stormwater treatment is provided for impervious structures, that there is sufficient water/wastewater capacity for the project, and that the project will be completed in a manner that minimizes erosion and sediment migration during construction.

Site Conditions

The proposed site for the expanded 4x4 Center school is located to the south of three large existing parking lots serving the BVTL, and is shown on the accompanying plan: Master Site Plan – (Sheet 1 of 3). Slopes on the site are relatively steep with aspects to the southwest and west. The site is covered by a mature, mixed-species, predominantly hardwood forest. Three wetlands have been identified at the site (see Sheet 1) and were examined in late-April 2012 by Alan Quackenbush with the Vermont ANR Wetlands Section. Based on Alan Quackenbush's evaluation these wetlands have been characterized as Class Three Wetlands, and consequently do not have defined wetland buffers. However, to protect these important wooded wetlands, 25-foot buffers have been provided and most development activities have been eliminated from these voluntary buffers. One exception to this exclusion is the detention pond proposed for the Traction Circle. Although embankments for this pond do reach into these buffers, these embankments will be planted back with trees to regenerate these buffer areas.

Stormwater runoff from the existing BVTL parking lots passes through the proposed training center. These existing flows, some of which will be re-routed as part of this expansion, are discussed further below.

Driving school trails that were constructed and are maintained by the 4x4 Center are located within the proposed expanded training center. Some trails will be abandoned or re-routed as part of the proposed facility expansion.

New Infrastructure & Grading

In April 2012 GEPC conducted an existing conditions and topographic (1-foot contour interval) total station survey of the area proposed for improvements and development by the 4x4 Center. Following the survey, GEPC worked with 4x4 Center personnel to optimally locate the following proposed facilities: Hospitality

Trailer Pad; Shop; Vehicle Wash Pad; Traction Circle, and Winter Exercise Lane in a manner that generally avoid wetlands, fits the existing topography, provides sufficient setbacks from property lines, surface water, and a public well serving Catamount/Bolton Water And Sewer, LLC (CBWS) and adjoins to the existing Bolton Valley parking lots in a manner suitable for training activities. Final grades of all structures have 1.5H:1V or milder slopes that can be constructed to stabilize final slopes using excavated rock and by application of erosion matting, seed and mulch. Cuts and fills have been approximately balanced to minimize having to import or export significant quantities of materials.

Trees removed during construction will be sold as timber, firewood, or wood chips. Stumps will be buried onsite or disposed of in a legal manner offsite.

Stormwater Management

Once final locations and grades were established for the proposed structures, stormwater management systems were designed to provide collection, treatment and detention of stormwater flows from the impervious surfaces using best management practices (BMPs) approved by the State of Vermont. To help insure that the stormwater management plans for the 4x4 Center are consistent with the current regulations, we conducted a site walk-through of the planned facility with Kevin Burke, Environmental Analyst with the Vermont DEC Stormwater Section on the afternoon of April 19, 2012. His comments were used to guide the design of the storm system shown on the site plan and described in this narrative.

In addition to the onsite topographic survey data, GEPC used LIDAR contours provided by the Vermont Center for Geographic Information to define watershed areas upslope of the area proposed for development. A HydroCAD model was used to generate hydrographs that in turn were used to size pipes, conveyance channels, detention ponds and grass channels. Under the Vermont Operational Stormwater permit (General Permit 3-9015) treatment of the Water Quality Volume (WQv) generated from a 0.9-inch rain event, and the Channel Protection Volume (CPv) generated from a storm with a 1-year recurrence interval, are required for new impervious surfaces at the 4x4 Center, since more than one-acre of total impervious area is proposed by this expansion.

An important component of the stormwater system is the management of existing stormwater flows generated from the existing parking lots. These flows are mostly directed around the proposed 4x4 Center structures and detention pond, and the existing flows and 4x4 Center ponds are only commingled after the 4x4 Center ponds have been detained and treated. Rock lined swales with check dams are used to redirect the existing flows in a non-erosive manner.

Following are further details of the stormwater systems for each proposed structure:

Traction Circle: All stormwater from the Traction Circle pavement travels as sheet flow across the grass-lined inner core of the pad, is collected in a catch basin at the center of the pad, and is piped to a dedicated detention pond below the pad designed to detain the Channel Protection Volume. Discharge from this pond flows at a controlled rate into a 5-foot wide by 60-foot long grass channel that flows at a depth of less than 4-inches and a low velocity to provide at least 10-minutes of detention time in this channel. This grass channel treats the Water Quality Volume. The grass channel has been installed downstream of the sprinkler system, described below, to enhance the treatment and infiltration capabilities of the grass channel.

Shop: This building and the surrounding impervious areas are treated in a Pocket Pond located below the Shop, which was designed with adequate volume and detention for both the WQv and CPv. (As detailed below, wash water generated at the Vehicle Wash Pad is segregated from the stormwater, and is separately treated and released away from the Pocket Pond.)

Hospitality Trailer Pad: The small gravel pad at this location will be used to park a trailer that will serve as a meeting site and warming hut. Stormwater from this pad is piped to the catch basin at the center of the Traction Circle, and is treated in the pond/channel system below this pad.

Vehicular access to both proposed ponds has been provided, to permit removal of accumulated sediment from the pond forebays.

Sprinkler System for Traction Circle

The Traction Circle may be wetted down during some driving exercises. This practice is only performed during the May 1st to October 31st season. Irrigation water for this practice is withdrawn from the Traction Circle detention pond and is pumped up onto the Traction Circle via a 3-inch pipe, where it is distributed using an above-ground manifold pipe with sprayers. The sprinkler system water either evaporates or flows back to the pond. A submersible pump located near the outlet of the pocket pond connects to and energizes the 3-inch pipe, providing pressurized water for the sprinkler system. The maximum anticipated volume of sprinkler system water of about 3500-gallons., has been added to the Traction Circle Pond as additional storage beyond that required for stormwater treatment. A pipe with quick-connect leading from the Traction Circle down to this pond permits addition of water to the system during dry weather, as required. The source of this make-up water is the ski area snowmaking pond across the road from the 4x4 Center. Water for the existing sprinkler system used by the school has been extracted from this pond for the past 3 to 4 years under an agreement with the Bolton Valley Ski Area.

Shop Domestic Water Supply and Wastewater Disposal Systems

The Shop at the Bolton 4x4 Center serves as a small, local field support shop for minor vehicle repairs. The building will also house a small office. More involved repairs are performed at the main 4x4 Center facility located on Ethan Allen Drive in South Burlington. The Shop domestic water and wastewater system have been preliminarily designed with a capacity of up to six employees. Domestic water and vehicle wash water will be supplied from either a new onsite drilled well or from the public community water system serving the CBWS complex. Septic wastes from the bathroom in the Shop will be disposed either by construction of a septic tank, dosing tank, mound leachfield system, or by connection to the CBWS wastewater system using a pump station and force main. A mound leachfield site has been located downhill of the wellhead protection area for the BVTL well, and is shown on the site plan.

No floor drain will be installed in the Shop. Meltwater from snow accumulated on vehicles that are then serviced in the shop will collect in a suppressed sump in the Shop floor. This accumulated meltwater will be discharged by squeegeeing out the Shop doors only after insuring that the water is free of visible sheens, free product or other signs of contamination.

Vehicle Wash Pad Process Water

A vehicle wash pad was previously permitted under the State of Vermont Land Use Development Permit 4C-0436-26E., and was also permitted by the Town of Bolton. This narrative and the accompanying plans provide more details of this wash pad.

The 4x4 Center washes six driving school vehicles twice a week at the Bolton facility when training is active. Consequently, since fewer than 30 vehicles per week are washed, the land-based disposal BMP for vehicle washing may be used. This BMP is described in the *DEC-Wastewater Management Division-Practice Regarding Washwater Discharges from Vehicle Washing, rev. 5/6/2009*. In conformance with Item 4 of this practice, washing will occur on a concrete surface with a central sump and drain that will collect wash water. This wash pad will be covered with a roof to minimize co-mingling of the washwater with stormwater. Collected washwater is piped to a level spreader located uphill of a 30-foot wide, 20-foot long graded, grass-

covered slope that will treat this water and allow it to infiltrate or evaporate. This slope is sized to accommodate anticipated washwater flows. This treatment area is isolated from waters of the state or stormwater drains and ditches. No acids, bases, metal brighteners or degreasing agents will be used in the washwater.

Erosion Prevention and Sediment Control during Construction

To determine the level of risk of erosion of this site during construction, GEPC filled out *Appendix A –Risk Evaluation of the CEC-General Permit 3-9020 (2006) for Stormwater Runoff from Construction Sites as Amended February 2008*. This Risk Evaluation is attached, and indicates that the site scores as a Moderate Risk site due principally to the presence of slopes greater than 15% that are being disturbed, and the relatively close receiving waters below the site (small brooks both within and outside wetlands). Based on this scoring, the construction site is eligible for coverage under the 3-9020 General Permit provided that a Notice of Intent and fee are submitted, and a project-specific Erosion Prevention and Sediment Control (EPSC) plan is submitted and is followed during the construction activities. GEPC has prepared a preliminary Erosion Prevention and Sediment Control Plan (Sheet 2 of 3) that conforms with *The Vermont Standards and Specifications for Erosion Prevention and Sediment Control* to satisfy this requirement. Among other EPSC structures is the application of erosion matting on all disturbed slopes in excess of 2H:1V (50% slopes), and silt fencing downhill of all disturbed areas.

Construction of the various elements of the driving school center will be performed in phases, and erosion prevention structures that provide protection for each phase of construction will be installed before that work begins. This phased approach to construction minimizes the area of disturbance of the site at any particular point in time, as is recommended in the state EPSC guidance document.

Winter Exercise Lane

An existing trail located north of the Traction Circle is the site of a proposed straight-away and turn-around to be used as a Winter Exercise Lane. The existing approximately 12-foot wide trail will be widened to 40-feet, and a turn-around will be added to the north end of the lane, as depicted on the site plan. All disturbed areas at this location will be seeded and mulched, and no gravel or paved surfaces will be created beyond the extent of the existing trail. These new grass-covered driving surfaces will only be used during winter, snow-covered conditions. Per discussions with ANR Stormwater Section personnel, these grass-covered areas are considered to be pervious and will not require stormwater treatment devices.

Intermittent Stream/Wetland Crossing for 4x4 Trail

As an adjunct to the trail improvements planned at the 4x4 Center, GEPC has conducted a topographic survey of a site requiring a culvert for a trail crossing a small intermittent stream and adjacent wetland. This crossing is located about 1000- feet east-southeast of the Traction Circle. A separate site plan for this site, Intermittent Stream and Wetlands Crossing Plan (Sheet 3 of 3) depicts the steep existing terrain at this location, and the proposed installation of a 3-foot diameter x 40-foot long culvert. About 40 yards of extra fill materials will be brought to this site and used to install the elevated roadway above the existing terrain. This approach avoids extensive cutting into the steep hillslope that would otherwise result in excessively steep cut banks on the uphill side of the road that would be difficult to stabilize. The 3-foot culvert is significantly oversized from what is necessary for the small intermittent stream and adjacent wetlands, but was selected to permit about half of the culvert to be dug into the ground and to fill with stream alluvium over time. This will create a relatively natural streambed through the culvert that should permit passage of aquatic organisms.

Our design of a Master Plan for the expanded 4x4 Center provides a facility that will meet the State of Vermont requirement for an Operational Stormwater System, and has sufficient water and wastewater capacity to support the planned Shop. Vehicle washing occurs in a manner that conforms to best-management practices approved by the Vermont DEC. Site work will be accomplished under an EPSC that will minimize erosion during the duration of the phased construction of this project, and is consistent with requirements for a Vermont Construction General Permit for a Moderate Risk site.

Sincerely,

A handwritten signature in black ink, appearing to read "Dean Grover". The signature is fluid and cursive, with the first name "Dean" and the last name "Grover" clearly distinguishable.

Dean A. Grover, P.E.
Grover Engineering PC

Attachment & Enclosures

Cc: Michael Hopwood, The 4x4 Center

APPENDIX A - RISK EVALUATION

Accurately answering the questions in this appendix will allow you to determine whether a proposed construction project is considered a Low Risk or Moderate Risk project, which defines the application and permit requirements that are applicable to your project.

The risk evaluation procedure consists of two parts. Part I is a Basic Risk Evaluation, which determines if a project is automatically categorized as Low Risk based upon the answers to a few basic questions.

If a project is not automatically categorized as Low Risk based upon the Basic Risk Evaluation, you must complete Part II, Detailed Risk Evaluation, to determine the risk category for your project. This part includes questions on more detailed aspects of the project.

Once the appropriate risk category has been determined, refer to Part III for the application requirements.

You should be aware that each completed Appendix A is incorporated by reference and included in the terms of this general permit, and each permittee shall undertake its construction activities in accordance with the completed Appendix A, as a condition of this permit. Failure to comply with the completed Appendix A shall be deemed a violation of this permit and subject to enforcement action.

APPENDIX A

Part I – Basic Risk Evaluation

A project may automatically be categorized as Low Risk based on a few basic project characteristics. Answer each question below to determine if a project is automatically categorized as Low Risk. For definitions of terms used in the following questions (e.g. disturbance, vegetated buffer) refer to Appendix C.

Basic Risk Evaluation				
	Criteria	Answer	Score Direction	Enter Score
1.	Will the proposed independent project alone disturb more than 2 acres of land?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	If YES, enter 1, if NO enter 0	1
2.	Is the project within a watershed impaired due to stormwater or sediment as specified on Part A of the Vermont 303(d) list?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	If YES, enter 1, if NO enter 0	0
3.	Will the project have any stormwater discharges from the construction site to receiving water(s) that do not first pass through a 50 ft vegetated buffer area?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	If YES, enter 1, if NO enter 0	1
4.	Will the project have disturbed earth in any one location for more than 14 consecutive calendar days without temporary or final stabilization?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	If YES, enter 1, if NO enter 0	0
5.	Will the project have more than five acres of disturbed earth at any one time?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	If YES, enter 1, if NO enter 0	0
Total Score for Basic Risk Evaluation (add score from questions 1-5)				2

If the Total Score for Basic Risk Evaluation is 0, the proposed project is eligible for coverage under this permit as a Low Risk project. Proceed to Part IV of Appendix A for a summary of the application requirements for Low Risk Projects. If not, proceed to Part II.

Criterion 1: Only include the disturbance planned for an independent project. For example, if a lot owner is only building on a single house lot in a residential subdivision, only consider the disturbance associated with that lot, not the entire common plan. Refer to Appendix C for definitions of independent project and disturbance.

Criterion 2: Refer to the following web page for a list of waters in these categories:
http://www.vtwaterquality.org/stormwater/htm/sw_cgpeeligibility.htm

Criterion 3: Refer to the Appendix C for the definition of vegetated buffer area.

Criterion 4: Refer to Appendix C for definitions of temporary and final stabilization.

Criterion 5: Refer to Appendix C for the definition of disturbed earth.

Part II – Detailed Risk Evaluation

For projects not automatically categorized as Low Risk in Part I, this Detailed Risk Evaluation must be completed to determine if a project is Low Risk, Moderate Risk, or requires an Individual Permit. This evaluation determines the risk category by weighing the balance of factors which contribute to and mitigate against the risk of a discharge of sediment from the construction project. Complete all questions in Part II for the independent project. For definitions of terms used in the evaluation, refer to Appendix C.

Detailed Risk Evaluation – Identify Risk Factors				
Criteria		Answer	Score Direction	Enter Score
A.	Will the proposed project have earth disturbance within 100 ft (horizontal) upslope of any lake or pond or 50 feet (horizontal) upslope of any rivers or stream (perennial or seasonal)?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	If YES, enter 1, if NO enter 0	1
B.	Will the project have stormwater discharges by direct conveyance (tributary, channel, ditch, storm sewer, etc.) to a water of the state listed on the 303 (d) Part A list as being impaired by stormwater or sediment; a Class A Water; or an Outstanding Resource Water?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	If YES, enter 1, if NO enter 0	0
C.	Will the project have more than five acres of disturbed earth at any one time?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	If YES, enter 1, if NO enter 0	0
D.	Will the project have disturbed earth in any one location for more than 14 consecutive calendar days without temporary or final stabilization?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	If YES, enter 1, if NO enter 0	0
E.	Will the project include more than one acre of disturbance on soil that is greater than 15% slope?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	If YES, enter 1, if NO enter 0	1
F.	Will the project include more than one acre of disturbance of soils with a high ($K > 0.36$) erodibility rating?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	If YES, enter 1, if NO enter 0	0
G.	Total Score for Risk Factors (add A through F)			2

Criterion A: Measure lake distance from mean water level, and stream or river distance from top of bank. Do not include disturbance for the installation of stormwater treatment facilities or road stream crossings if there are no reasonable alternative locations.

Criterion B: Refer to http://www.vtwaterquality.org/stormwater/html/sw_cgpligibility.htm for the listing.

Criterion C: The maximum allowable for Low Risk Projects is 7 acres. **Moderate risk projects over 5 acres may be required to file an Individual Discharge Permit application if determined necessary by the Secretary.**

Criterion D: The maximum allowable for Low Risk Projects is 21 days. **Moderate risk projects over 21 days may be required to file an Individual Discharge Permit application if determined necessary by the Secretary.**

Criterion E: Include disturbance for the duration of the project, not at any one point in time. Slope determinations should be based on a site survey of the future disturbance area.

Criterion F: Include disturbance for the entire individual project, not at any one point in time. The Erosion Factor K, is a measure of the inherent erodibility of a soil type. Refer to NRCS soil maps for your county. If soils data is not available (e.g. if the site is built on assorted fill material), contact ANR for directions on evaluating soil erodibility.

Part II Continued – Detailed Risk Mitigation Factor Evaluation

Detailed Risk Evaluation – Identify Risk Mitigation Factors				
	Criteria	Answer	Score Direction	Enter Score
H.	Will stormwater leaving the construction site pass through at least 50 feet of established vegetated buffer before entering a receiving water?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	If YES, enter 1, if NO enter 0	0
I.	Will the project be limited to two acres or less of disturbed earth at any one time?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	If YES, enter 1, if NO enter 0	1
J.	Will the project have a maximum of 7 consecutive days of disturbed earth exposure in any location before temporary or final stabilization is implemented?	YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>	If YES, enter 1, if NO enter 0	1
K.	Will the project disturb less than two acres of soil with an erodibility higher than K=0.17?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	If YES, enter 1, if NO enter 0	0
L.	Will the project include less than two acres of disturbance on soil that is greater than 5% slope?	YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>	If YES, enter 1, if NO enter 0	0
M.	Total Score for Risk Mitigation Factors (add H through L.)			2

Criterion H: Refer to Appendix C for a definition of vegetated buffer.

Criterion I: Refer to Appendix C for a definition of earth disturbance.

Criterion J: Refer to Appendix C for definitions of temporary and final stabilization.

Criterion K: Include disturbance for the duration of the project, not at any one point in time. The Erosion Factor K, is a measure of the inherent erodibility of a soil type. Refer to NRCS soil maps available at USDA-NRCS District Offices. If soils data are not available (e.g. if the site is built on assorted fill material), contact DEC for directions on evaluating soil erodibility.

Criterion L: Include disturbance for the duration of the project, not at any one point in time. Slope determinations should be based on a site survey of the proposed disturbance area.

Total Risk Score		
N.	Moderate Risk Base Score	2
O.	Enter Score from Line G above (Risk Factor Total)	2
P.	Add lines N and O	4
Q.	Enter Score from Line M above (Risk Mitigation Factor Total)	2
R.	<u>OVERALL RISK SCORE:</u> Subtract line Q from line P	2

Part III– Interpreting the Detailed Risk Evaluation

OVERALL SCORE	Risk Category	Directions for Filing for Permits
<1	Low Risk	<p>The proposed project is eligible for the Construction General Permit as a Low Risk project provided that the requirements of Subpart 2 are met. If these requirements cannot be met, contact DEC to determine if the project should seek coverage as a Moderate Risk project or under an Individual Discharge Permit.</p> <p>Refer to Part IV of Appendix A for a summary of the application requirements for Low Risk projects.</p>
1-2	Moderate Risk	<p>The proposed project is eligible for the Construction General Permit as a Moderate Risk project provided that the requirements of Subpart 3 are met. If these requirements cannot be met, contact DEC to determine if the project should seek coverage as a Moderate Risk project or under an Individual Discharge Permit.</p> <p>Refer to Part IV of Appendix A for a summary of the application requirements for Moderate Risk projects.</p>
>2	Requires Individual Permit	<p>The proposed project is not eligible for coverage under the Construction General Permit, and therefore requires coverage under an Individual Discharge Permit. Please refer to Stormwater Section on the Water Quality Division website for more information: www.vtwaterquality.org/stormwater.htm.</p>

Part IV – Filing Directions

1. Low Risk Projects

Projects that qualify as Low Risk are required to implement the applicable practices detailed in the *Low Risk Site Handbook for Erosion Prevention and Sediment Control*. To obtain coverage under General Permit 3-9020 as a Low Risk project, applicants must submit the following to DEC:

1. A completed Notice of Intent form for General Permit 3-9020;
2. A completed Appendix A;
3. The required processing fee.

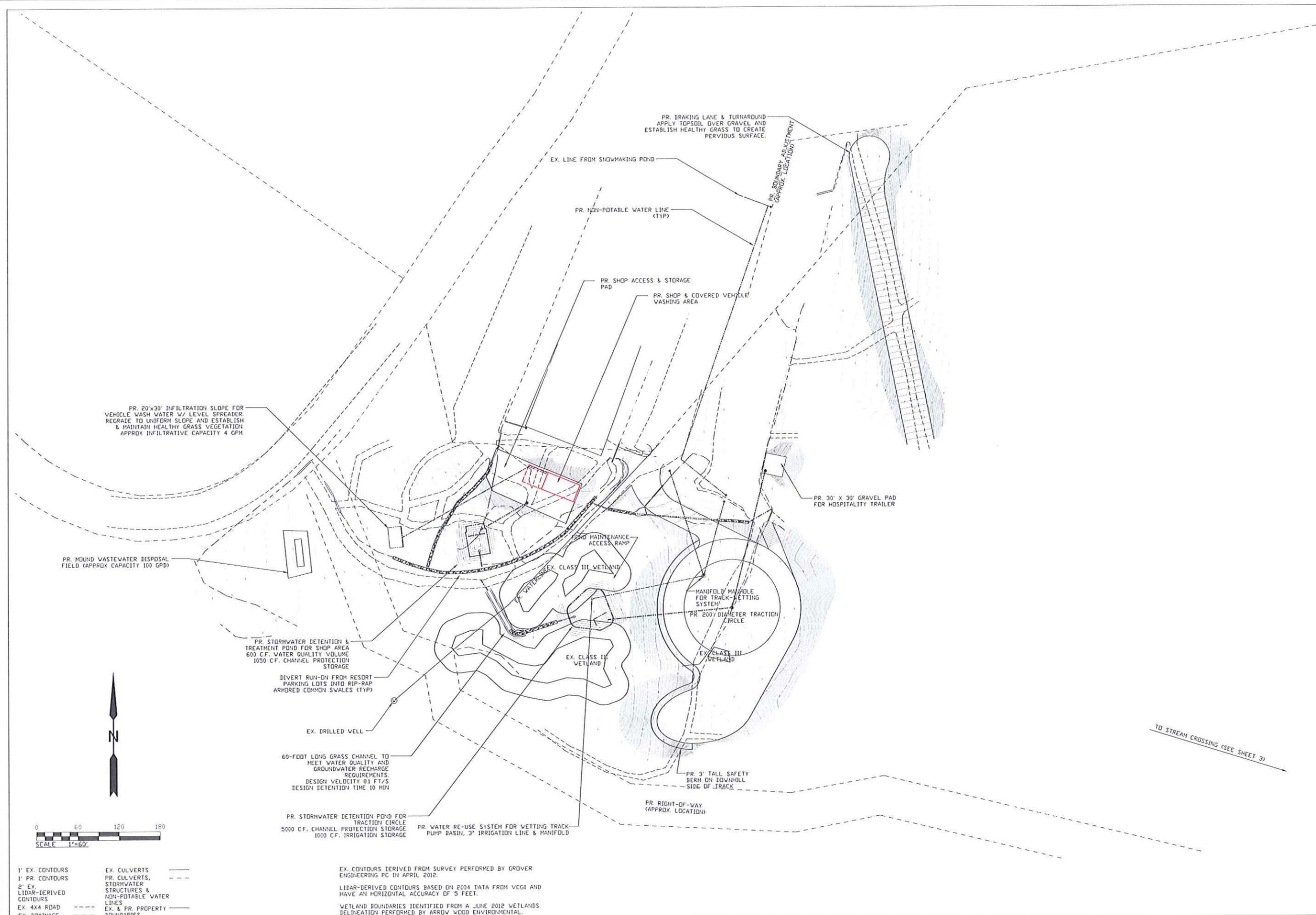
To satisfy the public comment requirement, **applicants must file a copy of the completed Notice of Intent form, including a copy of Appendix A, with the municipal clerk in the municipalities where the project will occur prior to submitting this information to ANR. Details of the public notice process are in Part 2 of the general permit.**

2. Moderate Risk Projects

Projects that qualify as Moderate Risk are required to implement a site-specific Erosion Prevention and Sediment Control (EPSC) Plan that conforms to *The Vermont Standards and Specifications for Erosion Prevention and Sediment Control*. To obtain coverage under General Permit 3-9020 as a Moderate Risk project, applicants must submit the following to DEC:

1. A completed Notice of Intent form for General Permit 3-9020;
2. A completed Appendix A;
3. A site-specific EPSC Plan;
4. A certification by the plan preparer that the EPSC Plan conforms to *The Vermont Standards and Specifications for Erosion Prevention and Sediment Control*;
5. The required processing fee.

To satisfy the public comment requirement, **applicants must file a copy of the completed Notice of Intent form, including a copy of Appendix A, with the municipal clerk in the municipalities where the project will occur prior to submitting this information to ANR. Details of the public notice process are in Part 3 of the general permit.**



MASTER SITE PLAN

THE 4X4 CENTER DRIVING SCHOOL

Bolton Vermont

2044 Main Road, Huntington, Vermont 05462
 phone: 802-434-2989 email: dean@groverengineeringpc.com

GROVER ENGINEERING PC

DATE: JULY 9, 2012
 DWG NO: 1 of 3
 PROJ: 12009

SCALE: 1" = 60'
 FILE: 12009-The4x4Center\Site Plan\4x4 Site Plan.dwg

- | | | |
|-------------------------------|---|-----|
| 1' EX. CONTOURS | EX. CULVERTS | --- |
| 1' PR. CONTOURS | PR. CULVERTS, STORMWATER STRUCTURES & NON-POTABLE WATER LINES | --- |
| 2' EX. LIDAR-DERIVED CONTOURS | EX. & PR. PROPERTY BOUNDARIES | --- |
| EX. 4X4 ROAD | | --- |
| EX. DRAINAGE | | --- |
- EX. CONTOURS DERIVED FROM SURVEY PERFORMED BY GROVER ENGINEERING PC IN APRIL 2012.
- LIDAR-DERIVED CONTOURS BASED ON 2004 DATA FROM VCGI AND HAVE AN HORIZONTAL ACCURACY OF 5 FEET.
- WETLAND BOUNDARIES IDENTIFIED FROM A JUNE 2012 WETLANDS DELINEATION PERFORMED BY ARROW WOOD ENVIRONMENTAL.

TO STREAM CROSSING (SEE SHEET 3)

Proposed Wetland and Stream Impacts

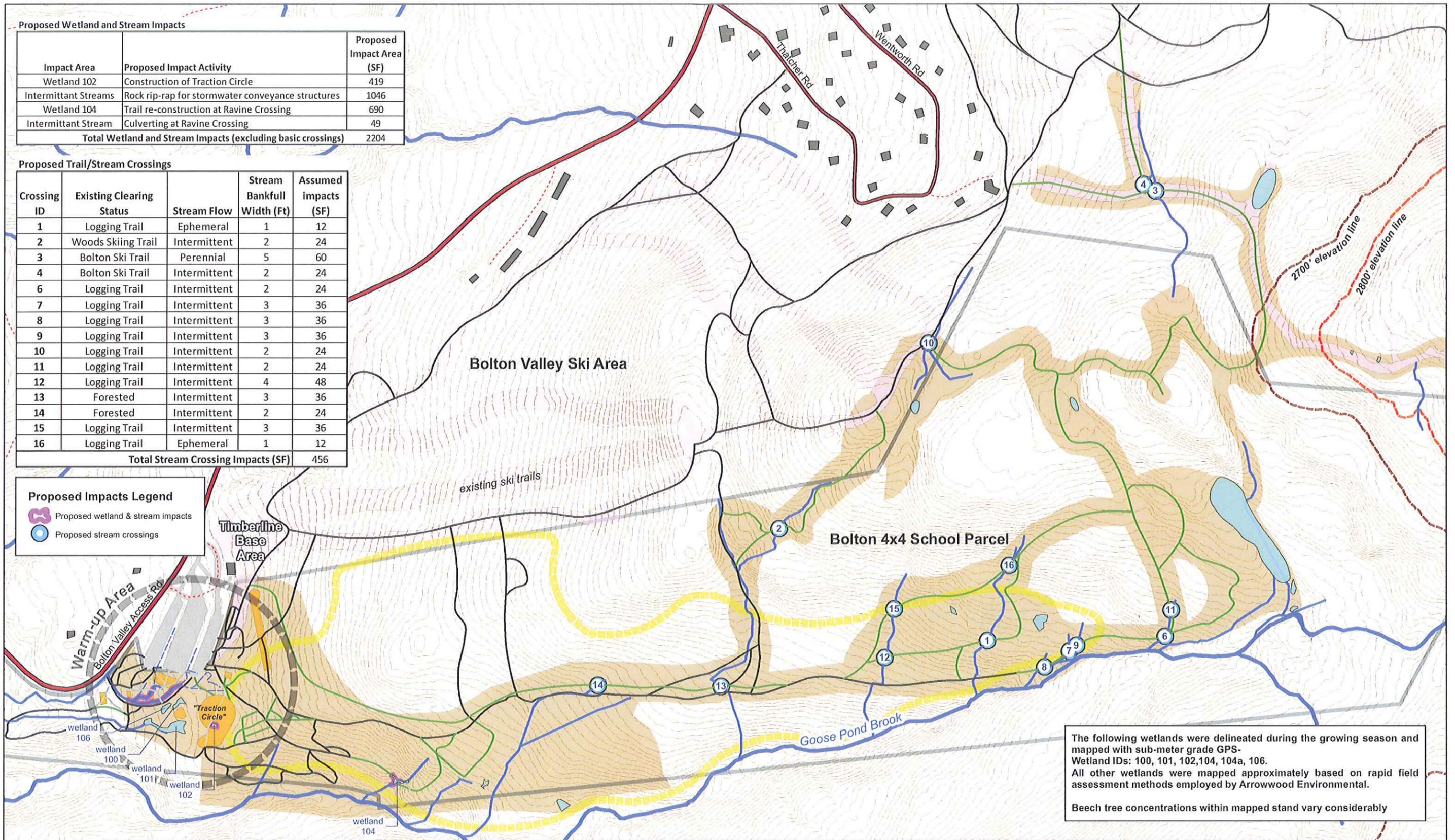
Impact Area	Proposed Impact Activity	Proposed Impact Area (SF)
Wetland 102	Construction of Traction Circle	419
Intermittent Streams	Rock rip-rap for stormwater conveyance structures	1046
Wetland 104	Trail re-construction at Ravine Crossing	690
Intermittent Stream	Culverting at Ravine Crossing	49
Total Wetland and Stream Impacts (excluding basic crossings)		2204

Proposed Trail/Stream Crossings

Crossing ID	Existing Clearing Status	Stream Flow	Stream Bankfull Width (Ft)	Assumed impacts (SF)
1	Logging Trail	Ephemeral	1	12
2	Woods Skiing Trail	Intermittent	2	24
3	Bolton Ski Trail	Perennial	5	60
4	Bolton Ski Trail	Intermittent	2	24
6	Logging Trail	Intermittent	2	24
7	Logging Trail	Intermittent	3	36
8	Logging Trail	Intermittent	3	36
9	Logging Trail	Intermittent	3	36
10	Logging Trail	Intermittent	2	24
11	Logging Trail	Intermittent	2	24
12	Logging Trail	Intermittent	4	48
13	Forested	Intermittent	3	36
14	Forested	Intermittent	2	24
15	Logging Trail	Intermittent	3	36
16	Logging Trail	Ephemeral	1	12
Total Stream Crossing Impacts (SF)				456

Proposed Impacts Legend

- Proposed wetland & stream impacts
- Proposed stream crossings

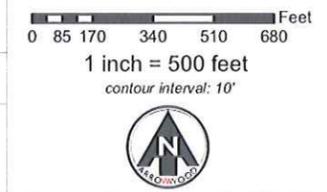


The following wetlands were delineated during the growing season and mapped with sub-meter grade GPS- Wetland IDs: 100, 101, 102, 104, 104a, 106. All other wetlands were mapped approximately based on rapid field assessment methods employed by Arrowwood Environmental. Beech tree concentrations within mapped stand vary considerably

- Bolton 4x4 Boundary
 - Assessed Area
 - Ephemeral & Intermittent Streams
 - Ditches
 - Wetlands (see notes)
 - Beech Stand (approx.)
- 4x4 Trails: Use Status**
- In Use
 - Proposed
 - To be Removed
 - Existing gravel/asphalt
 - Proposed gravel/asphalt

Notes: Wetland boundary provided by Arrowwood Environmental based upon field review in 2011 and 2012. Wetland boundaries were identified in the field based on available and identifiable characteristics but seasonal restrictions precluded final and official boundary delineation. Unless otherwise noted, wetland boundaries were mapped using mapping grade GPS units with no guarantee of accuracy. Stream delineation based on mapping grade GPS points at occasional crossing points which were then compared to 2' interval site topography derived from CCRPC LiDAR data. Streamcourses interpolated based on "best professional judgment" from available data. Streams, trails and proposed development in the vicinity of the "Traction Circle" from a site survey by Grover Engineering, LLC. Only select areas (Assessed Area) along and adjacent to existing and proposed trails were surveyed for natural resources. User is responsible for understanding the limitations of this data. This is NOT a survey. Errors and omissions may exist. Other data from Bolton 4x4 Center, Grover Engineering, Bolton Valley Resort and VCGI.

The 4x4 Center, Bolton, Vt.
Natural Resources: Map 6
 Thursday, July 12, 2012
 File: Site1.mxd
 Prepared By: Aaron Worthley, Arrowwood Environmental
 Coordinate System:
 NAD 1983 StatePlane Vermont FIPS 4400



EROSION PREVENTION & SEDIMENT CONTROL PLAN

THIS PLAN DETAILS THE EROSION PREVENTION AND SEDIMENT CONTROL INITIATIVES TO BE IMPLEMENTED DURING CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE A COPY OF THIS PLAN TO THE BURLINGTON DPW FOR APPROVAL PRIOR TO CONSTRUCTION START-UP.

CONTRACTOR RESPONSIBLE FOR IMPLEMENTING & MAINTAINING VEHICLE WASHDOWN AREA

ON-SITE CONTRACTOR RESPONSIBLE FOR DAY-TO-DAY MONITORING, OVERSIGHT & INSPECTION OF VEHICLE WASHDOWN AREA

SITE INVENTORY AND ANALYSIS

THE SITE IS COMPOSED PRIMARILY OF MODERATELY STEEP 10 TO 20 PERCENT SLOPES. SOME PORTIONS OF THE SITE ARE STEEPER. DRAINAGE OCCURS ENTIRELY THROUGH SMALL STREAM CHANNELS, AND THROUGH SEVERAL CULVERTS. THESE FEATURES ARE SHOWN ON THE SITE PLAN RUNOFF FROM PARKING LOTS OWNED BY THE BOLTON VALLEY SKI RESORT CROSSSES THE SITE THROUGH THESE.

THE EXISTING SITE IS COVERED PRIMARILY BY HARDWOOD FOREST GROWING ON MARLOW STONY LOAM, WHICH IS MODERATELY SUSCEPTIBLE TO EROSION. THE SITE HAS ELECTRIC AND WATER UTILITIES AND MAY HAVE SEWER, CABLE, FIBER OPTICS AND PHONE UTILITIES.

REQUIRED GRADING AND EROSION PREVENTION AND SEDIMENT CONTROL MEASURES

PRIOR TO ANY GROUND-BREAKING WORK THE FOLLOWING EPSC STRUCTURES SHALL BE INSTALLED. THE VEHICLE WASHDOWN AREA MUST BE DESIGNATED. PROVIDE SILT FENCING AROUND THE PERIMETER OF THE TOPSOIL STOCKPILE AREA. INSTALL SILT FENCING BELOW ANY SURFACE THAT WILL BE DISTURBED BY CONSTRUCTION ACTIVITIES. STREAM CHANNELS IMMEDIATELY BELOW DISTURBED SURFACES, OR STREAM CHANNELS LIKELY TO COLLECT OR TRANSPORT LARGE AMOUNTS OF SEDIMENT SHALL BE PROTECTED WITH STONE CHECK DAMS.

A VEHICLE WASHDOWN AREA WILL BE DESIGNATED AS SHOWN. ALL DENuded AND DISTURBED AREAS MUST RECEIVE TEMPORARY STABILIZATION IN CONFORMANCE WITH SOIL COVERING BMPs SUCH AS, BUT NOT LIMITED TO, MULCHING, STRAW MATTING, PLASTIC COVERING, SOILING, ETC. CONSTRUCTION AND LAND DISTURBANCE ACTIVITIES SHALL BE PLANNED AND SEQUENCED TO LIMIT THE AMOUNT OF EXPOSED AREA AND TO AVOID EROSION AND SEDIMENT MIGRATION DURING RAINY PERIODS.

ALL MULCH WILL BE ONE-INCH DEEP HAY OR STRAW AND ALL SEED SHALL "WILDLIFE MIX" AS DESCRIBED IN THE TABLE ON THIS SHEET. MULCH WILL BE REAPPLIED AS OFTEN AS NEEDED TO ENSURE AN ONGOING COVER OF ONE-INCH THICKNESS DURING THE PROJECT.

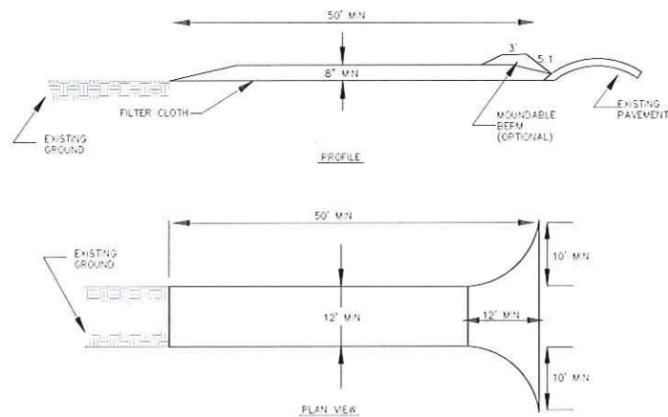
AFTER COMPLETING CONSTRUCTION, FINAL GRADES WILL BE ESTABLISHED AND TOPSOIL WILL BE APPLIED. WITHIN 24-HOURS OF PLACING TOPSOIL, EXPOSED SOIL SHALL BE SEEDED AND MULCHED TO ESTABLISH HEALTHY GRASS. DISTURBED SURFACES WITH SLOPES GREATER THAN 50% SHALL HAVE NORTH AMERICAN GREEN EDGE-ET EROSION PREVENTION MATTING APPLIED WITHIN 24 HOURS OF FINAL GRADING. GROUND LEFT DISTURBED FOR MORE THAN 7 CONSECUTIVE DAYS SHALL BE PERMANENTLY STABILIZED USING TECHNIQUES DESCRIBED ABOVE.

ALL EPSC STRUCTURES SHALL REMAIN IN PLACE UNTIL ALL CONSTRUCTION IS COMPLETE AND HEALTHY GRASS GROWTH IS ESTABLISHED IN ALL DISTURBED AREAS. CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL STRUCTURES AT THIS MILESTONE, AND FOR CLEANING SUMPS IN ALL CATCH BASINS ON THE PROPERTY.

EROSION PREVENTION AND SEDIMENT CONTROL TIMELINE

SITE ACTIVITIES SHALL BE SCHEDULED SUCH THAT NO MORE THAN 2 ACRES OF GROUND IS DISTURBED AT ANY TIME. ALL CONSTRUCTION ACTIVITIES SHALL TAKE PLACE BETWEEN APRIL 15 AND OCTOBER 15 UNLESS WINTER EROSION PREVENTION & SEDIMENT CONTROL TECHNIQUES ARE USED.

ALL EROSION PREVENTION AND SEDIMENT CONTROL STRUCTURES, INCLUDING STONE CHECK DAMS AND SILT FENCING SHALL BE INSPECTED WEEKLY OR AFTER SIGNIFICANT RUNOFF.



CONSTRUCTION ENTRANCE DETAIL
N.T.S.

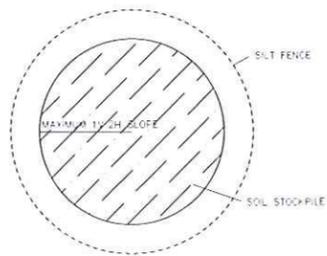
CONSTRUCTION SPECIFICATIONS:

- 1) STONE SIZE SHALL BE 1 TO 4 INCHES.
- 2) LENGTH SHALL BE NOT LESS THAN 40 FEET
- 3) THICKNESS SHALL NOT BE LESS THAN 8-INCHES
- 4) WIDTH SHALL BE 12- FEET.
- 5) GEOTEXTILE MUST BE PLACED OVER ENTIRE AREA PRIOR TO PLACING STONE.
- 6) SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNDABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
- 7) WASHING OF VEHICLES, WHEN NECESSARY, WHEELS, FENDERS AND UNDERCARRIAGE SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE, WHICH DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN. ALL SEDIMENT SHALL BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH, OR WATERCOURSE THROUGH USE OF SAND BAGS, GRAVEL, BOARDS, OR OTHER APPROVED METHODS.
- 8) MAINTENANCE: THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS FEMEAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
- 9) REMOVAL: THE CONSTRUCTION ENTRANCE SHALL BE REMOVED AND REPLACED WITH CLEAN GRAVEL SUBBASE WHEN THERE IS NO LONGER A RISK OF TRACKING OF SOILS OFFSITE DURING ANY FUTURE WORK, AS APPROVED BY THE ENGINEER.

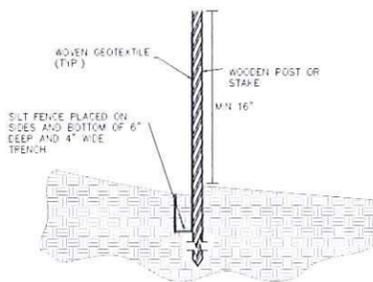
ADAPTED FROM THE VERMONT STANDARDS AND SPECIFICATIONS FOR EROSION PREVENTION AND SEDIMENT CONTROL 2006 DRAFT



ROCK CHECK DAM DETAIL



SOIL STOCKPILE DETAIL
PLAN VIEW - N.T.S.



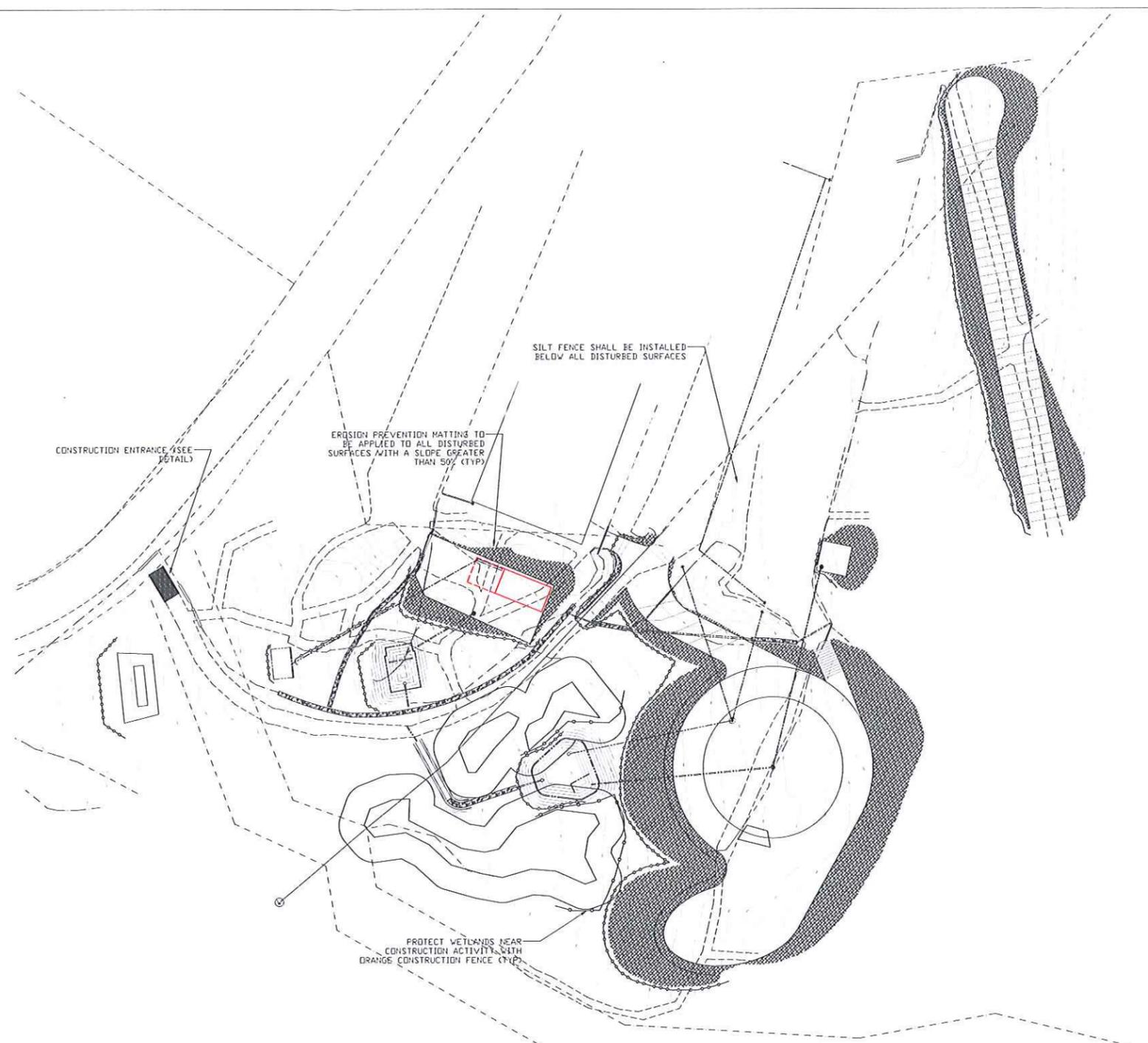
SILT FENCE DETAIL
N.T.S.

WILDLIFE SEED MIX

SEED	% WEIGHT
CLIMAX TIMOTHY	29.8
POTOMAC ORCHARD	2.5
MEDIUM RED CLOVER	19.9
WHITE CLOVER	9.8
INERT MATTER	1.85
OTHER CROP SEED	0.1
WEED SEED	0.05

- NOTES:
1. MINIMUM 16" OF GEOTEXTILE FABRIC ANCHORED IN TRENCH. TRENCH BACK-FILLED WITH TAMPED NATURAL SOIL.
 2. ATTACH GEOTEXTILE TO WOOD POSTS WITH STAPLES.
 3. REMOVE ACCUMULATED SILT WHENEVER SILT REACHES HALFWAY TO TOP OF FENCE.

FROM VT DEC "LOW RISK" SITE HANDBOOK"



1" EX. CONTOURS	EX. CULVERTS
1' PR. CONTOURS	PR. CULVERTS,
2' EX. LIDAR-DERIVED CONTOURS	STORMWATER STRUCTURES & NON-POTABLE WATER LINES
EX. 4X4 ROAD	EX. & PR. PROPERTY BOUNDARIES
EX. DRAINAGE	

CONSTRUCTION FENCE	-----
SILT FENCE	-----
EROSION PREVENTION MATTING	-----

2044 Main Road, Huntington, Vermont 05462
phone: 802-434-2989 email: dea@groverengineeringpc.com



EROSION PREVENTION & SEDIMENT CONTROL PLAN

THE 4X4 CENTER DRIVING SCHOOL

Vermont

Bolton

DWG NO: 2 of 3

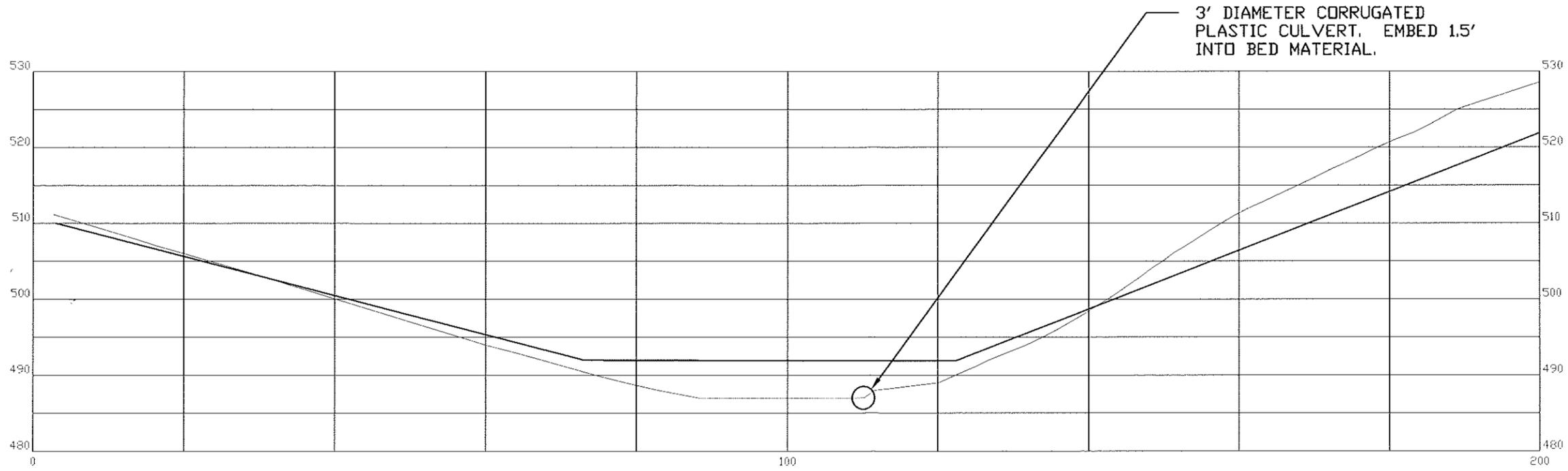
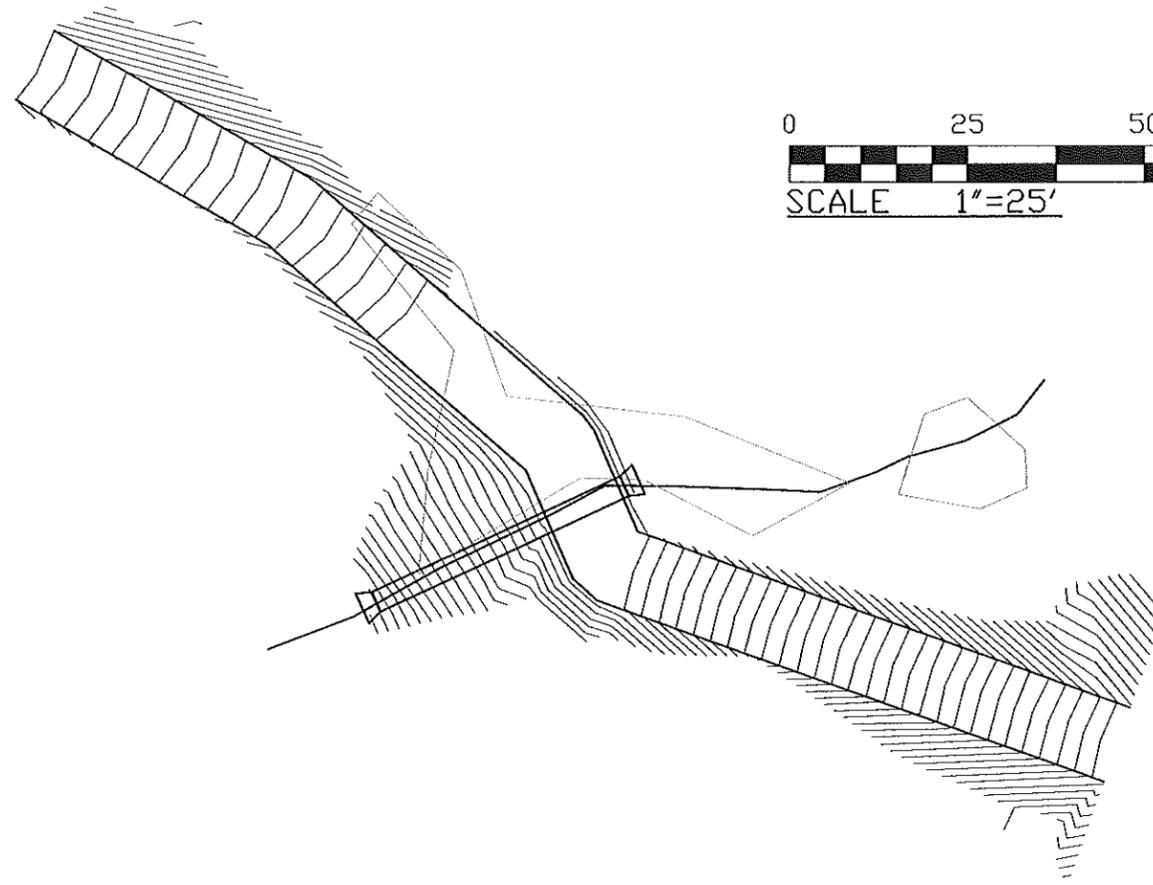
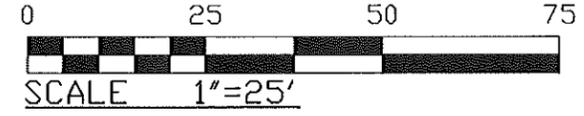
DATE: JULY 9, 2012

SCALE: 1" = 60'
FILE: 12009-The4x4Center\Site Plan\4x4 Site Plan.dwg

PROJ: 12009

1' EX. CONTOURS
 1' PR. CONTOURS
 EX. 4X4 ROAD
 EX. DRAINAGE
 WETLAND BOUNDARY

TOPOGRAPHY BASED ON MAY
 2012 SURVEY BY GROVER
 ENGINEERING PC. ELEVATION
 DATUM IS ARBITRARY.



 GROVER ENGINEERING PC	2044 Main Road, Huntington, Vermont 05462 phone /fax 802-434-2989 dean@groverengineeringpc.com	
	SCALE: 1"=25'	DATE: JULY 9, 2012
FILE: \streamcrossing\streamcrossing.dwg		DWG NO: 3 of 3 PROJ: 12009

THE 4X4 CENTER DRIVING SCHOOL
 Bolton
 Vermont
 STREAM CROSSING