


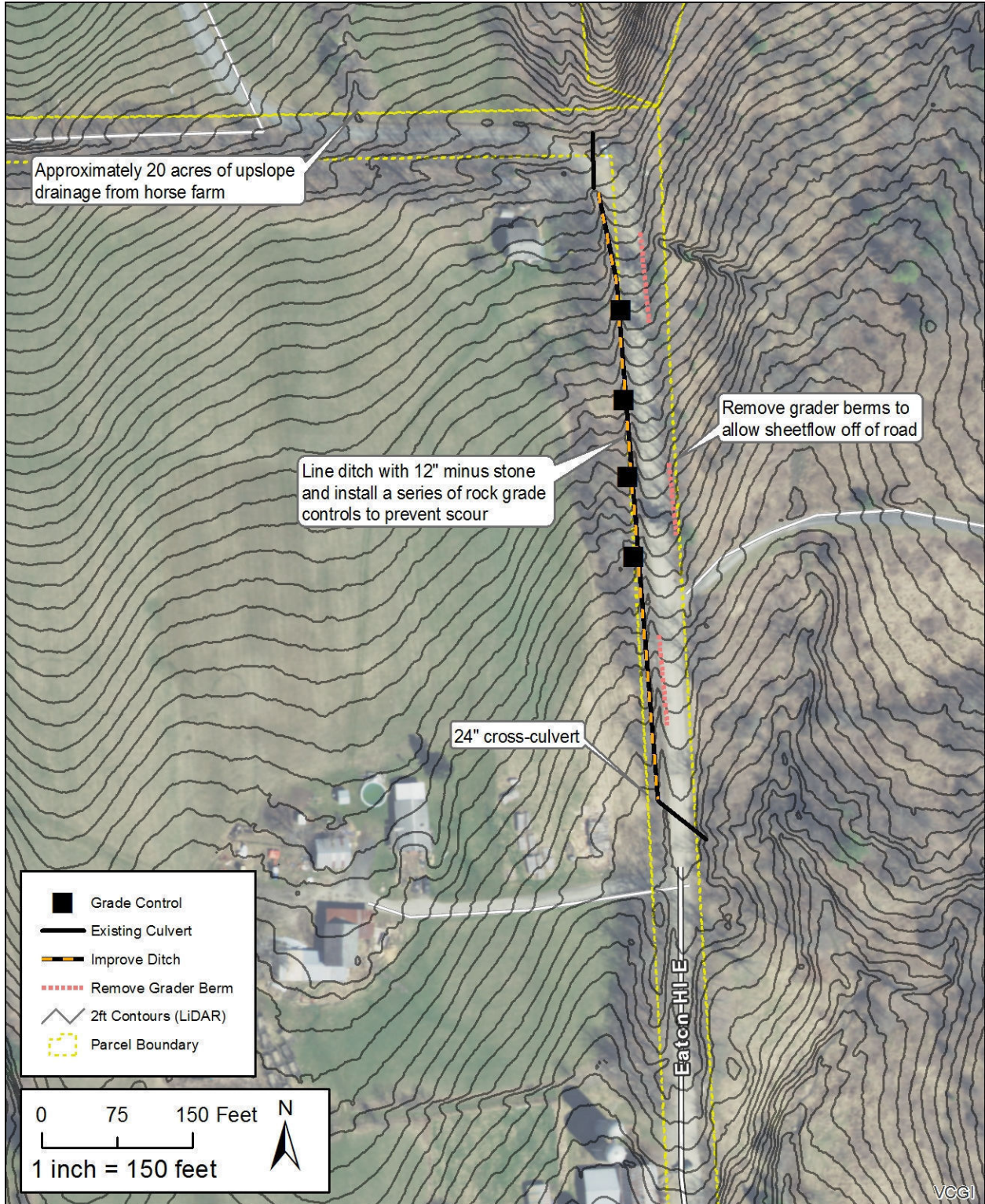
APPENDIX F:

Site Restoration Plans


Project: CA-2		Site Restoration Plan
Location:	Upper Eaton Hill Road, Castleton	
Latitude:	43.64893 N	
Longitude:	-73.14978 W	
Land Ownership:	Town road; Town right-of-way	
Drainage Area (acres)	20	
Impervious (acres)	0.5	
<p>Site Description: The upper section of Eaton Hill Road is a gravel road with 10% slope at its northern end near Horse Amour. The ditch receives runoff from a large drainage area upslope of approximately 20 acres. Severe erosion was noted in the western ditch during a field visit in the Fall of 2016. This included 2-3 erosional nickpoints in the ditch that were migrating uphill. Some erosion was also noted along the eastern road shoulder due to grader berms and lack of stable turnouts. This road segment is not mapped by VTANR as hydrologically-connected, therefore it is not subject to the forthcoming VTDEC Municipal Roads General Permit (MRGP). However, the recommendations below are consistent with the MRGP requirements for gravel road best management practices.</p>		
<p>Proposed Scope of Work</p>		
Improve Ditches	<ul style="list-style-type: none"> • Install properly sized stone lining in the existing road ditches (min. 12" minus) • Rock "grade control" structures with very large stone (i.e., Type IV) are recommended to prevent downcutting in the steep section of ditch 	
Improve Site Drainage	<ul style="list-style-type: none"> • Maintain a proper crown on the road surface • Look for appropriate areas to turn water off the road/out of the ditch 	
Stabilize Flow Paths	<ul style="list-style-type: none"> • Stabilize any turnouts from the ditch 	
<p>Additional Design/Permitting Requirements: Additional design guidance is recommended to evaluate the upslope drainage area in order to correctly size the stone and locate the grade control structures and turnouts. We do not expect any additional permitting requirements. We estimate that time and materials for a design will cost \$750 to \$1,500.</p>		
<p>Next Steps:</p> <ul style="list-style-type: none"> • Confirm project support from the Town • Confirm construction can be completed by the Town Highway Department • Technical project oversight is likely not necessary during construction 		
<p>Project Benefits: This project is designed to mitigate a sediment source that leads to a nearby intermittent channel found to the east of Eaton Hill Road. Stabilization of the ditches, along with improvements to the road crown and turnout, will significantly reduce sediment transport from the road segment.</p>		

Estimated Total Project Cost: \$10,000 - \$20,000

Note: Estimated costs are maximum probable costs based on typical contractor rates. Actual costs will vary by municipality based on labor rates, availability of town-owned equipment, and cost of materials.

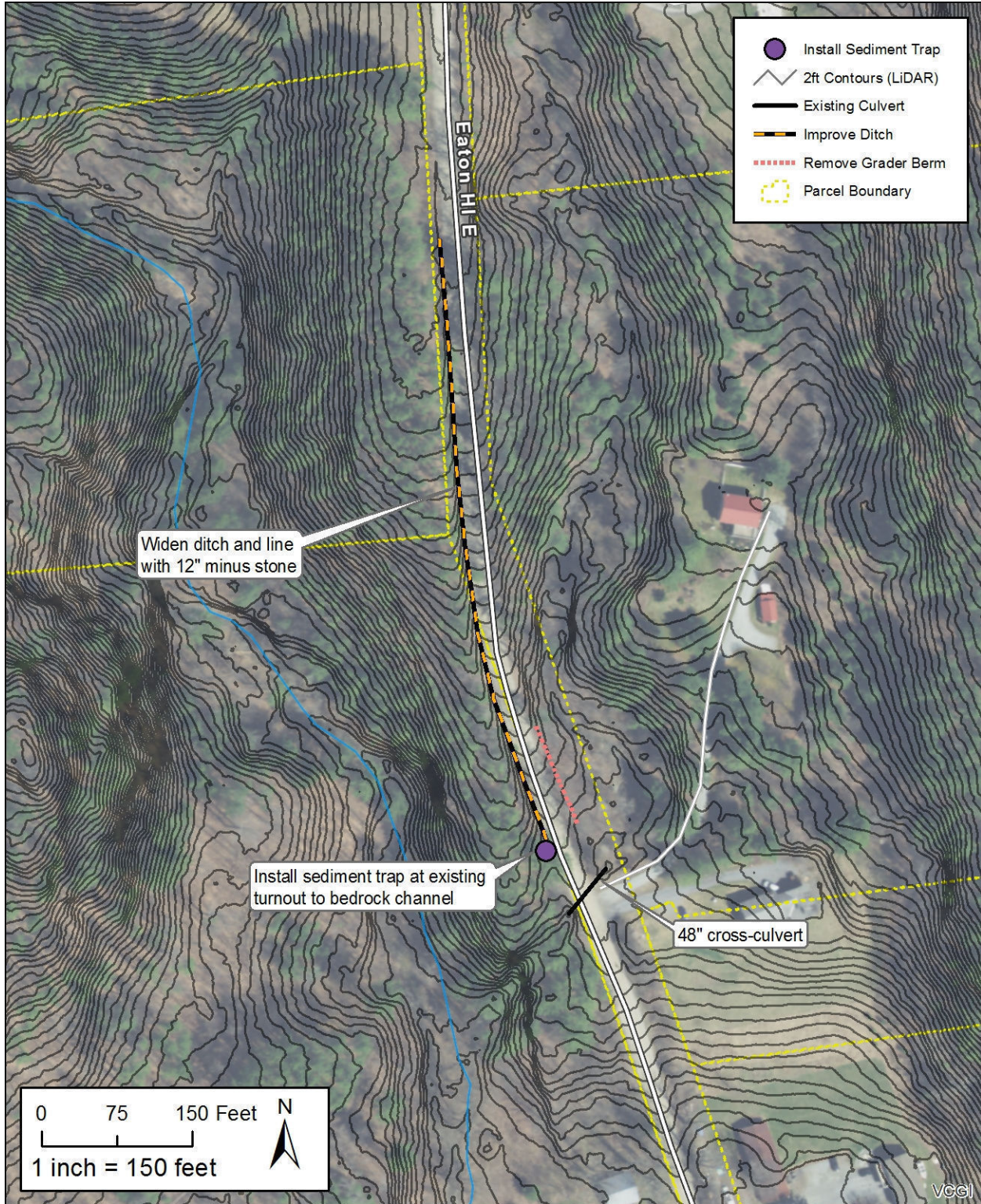


Project CA-2 Conceptual Site Plan


Project: CA-3		Site Restoration Plan
Location:	Middle/Lower Eaton Hill Road, Castleton	
Latitude:	43.64233 N	
Longitude:	-73.14897 W	
Land Ownership:	Town road; Town right-of-way	
Drainage Area (acres)	0.75	
Impervious (acres)	0.5	
<p>Site Description: This section of Eaton Hill Road is a gravel road with 10% slope. The ditch along the west side of the road drains a narrow strip of woods and approximately 0.5 acres of roadway. The ditch empties into a steep bedrock channel flowing into a small perennial tributary to North Bretton Brook. The ditch was cleaned in the Fall of 2016 and cut into a “V” shape (with no stone armor at the time). Some bedrock is visible along the edges of the ditch. A small grader berm along the east side of the road may be reducing sheetflow off of the road. This segment has been mapped by VTANR as hydrologically-connected to the adjacent intermittent channel. The forthcoming VTDEC Municipal Roads General Permit (MRGP) will require stone-lined ditches, a proper road crown, and stable turnouts where possible.</p>		
Proposed Scope of Work		
Improve Ditches	<ul style="list-style-type: none"> • Enlarge the existing ditch where possible and line with 12” minus stone 	
Improve Site Drainage	<ul style="list-style-type: none"> • Maintain a proper crown on the road surface 	
Sediment Trap	<ul style="list-style-type: none"> • Install a small sediment trap along the road shoulder where the ditch empties into the bedrock channel 	
<p>Additional Design/Permitting Requirements: Some additional design guidance may be necessary to size the sediment trap. We estimate that time and materials for design assistance will cost \$500 to \$1,000. This work could be funded by the VTDEC Municipal Roads Grant-in-Aid program.</p>		
<p>Next Steps:</p> <ul style="list-style-type: none"> • Confirm project support from the Town • Confirm construction can be completed by the Town Highway Department • Technical project oversight is likely not necessary during construction 		
<p>Project Benefits: This project is designed to mitigate a sediment source to a nearby intermittent channel found to the west of Eaton Hill Road. Stabilization of the ditches, along with improvements to the road crown and the installation of a sediment trap, will significantly reduce sediment export.</p>		

Estimated Total Project Cost: \$10,000 - \$15,000

Note: Estimated costs are maximum probable costs based on typical contractor rates. Actual costs will vary by municipality based on labor rates, availability of town-owned equipment, and cost of materials.

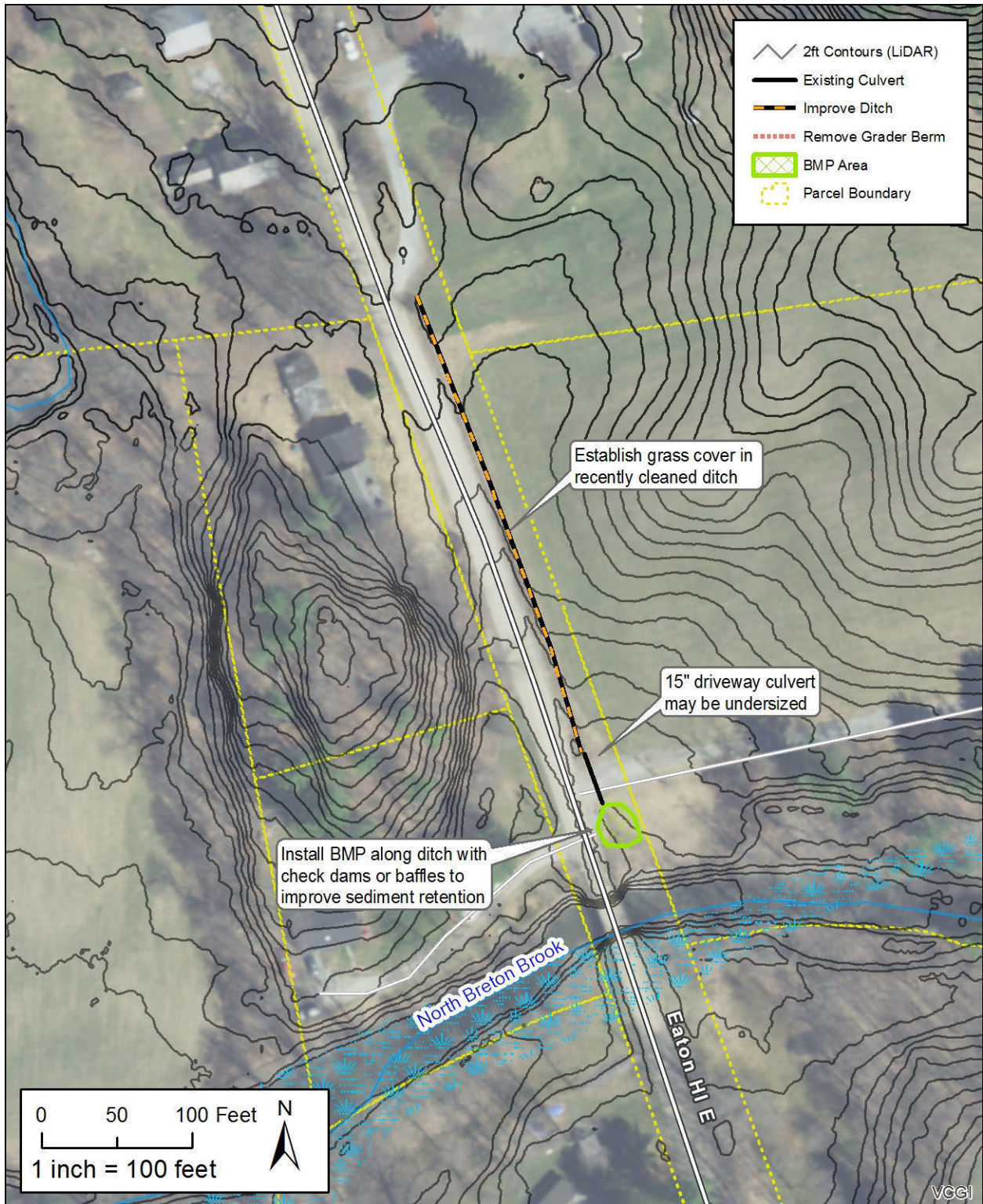


Project CA-3 Conceptual Site Plan

Project: CA-4		Site Restoration Plan
Location:	Lower Eaton Hill Road, Castleton	
Latitude:	43.63995 N	
Longitude:	-73.14761 W	
Land Ownership:	Town road; Town right-of-way	
Drainage Area (acres)	3	
Impervious (acres)	0.75	
<p>Site Description: Approximately 330' of ditch was cleaned in the Fall of 2016 along the east side of Eaton Hill Rd. The ditch has a moderate slope of 3-4% and drains directly into North Breton Brook. The new ditch is "V" shaped. The ditch receives runoff from approximately 900ft of roadway and two residential parcels. The ditch drains to a 15" driveway culvert and then into a short section of recently cleaned ditch to the top of the stream bank. This segment has been mapped by VTANR as hydrologically-connected to the adjacent stream and river corridor. The forthcoming VTDEC Municipal Roads General Permit (MRGP) will require stone-lined ditches, a proper road crown, and stable turnouts where possible.</p>		
<p>Proposed Scope of Work</p>		
Improve Ditch	<ul style="list-style-type: none"> • Reshape ditch into a "U-shaped" ditch where possible and seed with grass 	
Install BMP	<ul style="list-style-type: none"> • Install a small, baffled sediment trap within the road ROW 	
Replace Culvert	<ul style="list-style-type: none"> • The 15" driveway culvert may be undersized, increasing the risk of erosion 	
<p>Additional Design/Permitting Requirements: Some additional design guidance may be necessary to size the sediment trap. We estimate that time and materials for design assistance will cost \$500 to \$1,000. This work could be funded by the VTDEC Municipal Roads Grant-in-Aid program.</p>		
<p>Next Steps:</p> <ul style="list-style-type: none"> • Confirm project support from the Town • Confirm construction can be completed by the Town Highway Department • Technical project oversight is likely not necessary during construction 		
<p>Project Benefits: This project is designed to mitigate a sediment source to nearby North Bretton Brook. Stabilization of the ditches and the installation of a sediment trap will significantly reduce sediment transport from the road segment.</p>		

Estimated Total Project Cost: \$5,000 - \$10,000

Note: Estimated costs are maximum probable costs based on typical contractor rates. Actual costs will vary by municipality based on labor rates, availability of town-owned equipment, and cost of materials.



Project CA-4 Conceptual Site Plan



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Job: Castleton - Project CA-4, Lower Eaton Hill Road

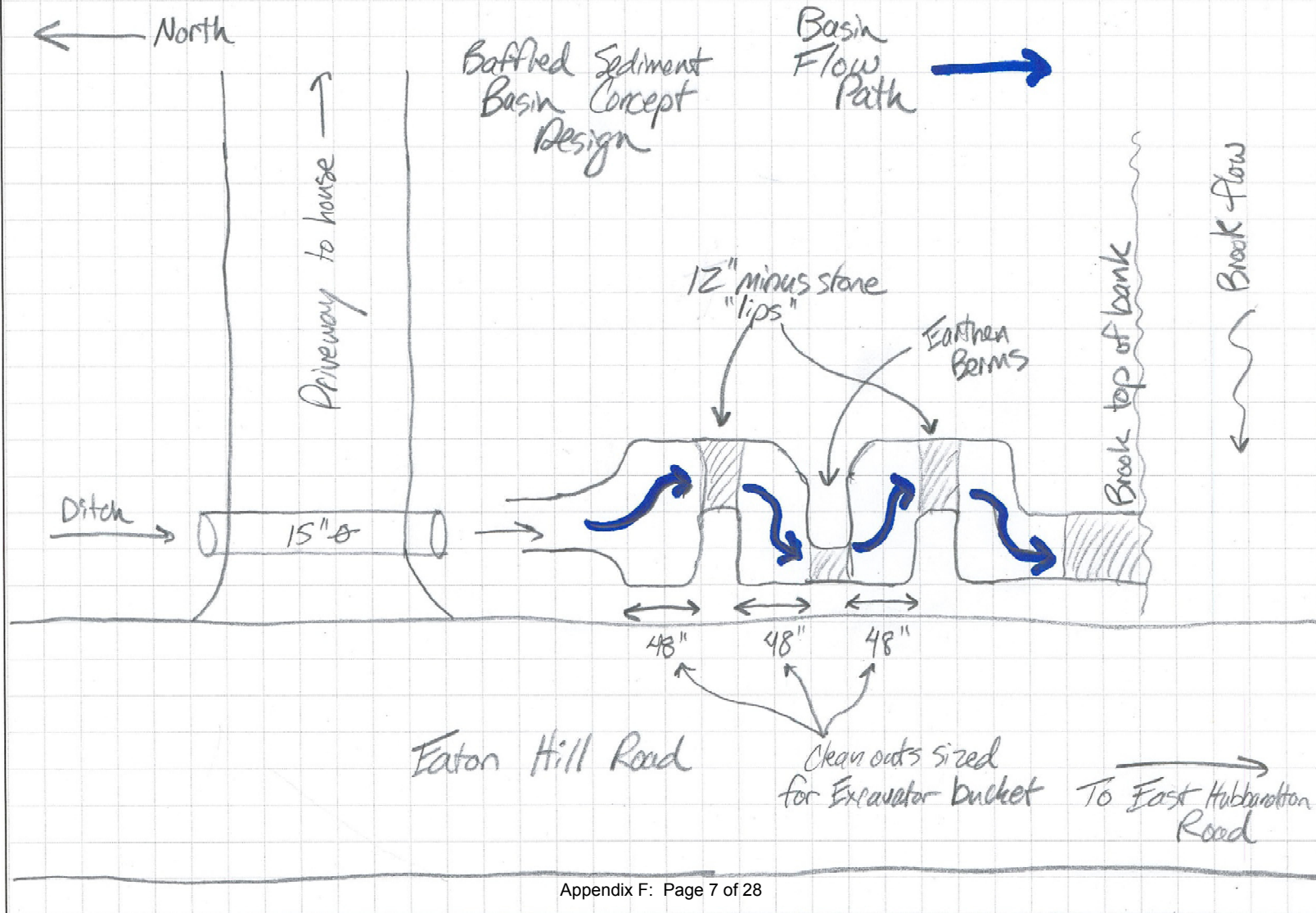
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Date: 1/23/18

Drawn by: EPE

Vertical Scale: NTS

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Project: CA-9	Site Restoration Plan
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Location:	Castleton Village School and Castleton Free Library	
Latitude:	43.61207 N	
Longitude:	-73.17849 W	
Land Ownership:	Castleton Village School	
Drainage Area (acres)	0.5	
Impervious (acres)	0.25	

Site Description: The Castleton Village School has a green space in between two buildings with a gravel walking path. A drop inlet catch basin drains runoff from the site into a larger storm drain network that discharges at project site CA-7. The mowed lawn receives runoff from about ½ acre drainage including ¼ acre of rooftop and gravel path. The underlying soils likely have a high rate of infiltration (Windsor Loamy Sand, hydrologic soil group A); this should be explored further as part of future design work. The site represents an excellent educational opportunity for stormwater treatment and maintenance. A raingarden could be installed at the catch basin and would be highly visible to teachers, students, and visitors

Proposed Scope of Work

Install Infiltration BMP (i.e., rain garden)	<ul style="list-style-type: none"> • Retrofit the open grassy area with a raingarden or bioretention basin. Plant with native woody vegetation and create educational opportunities for monitoring and maintenance.
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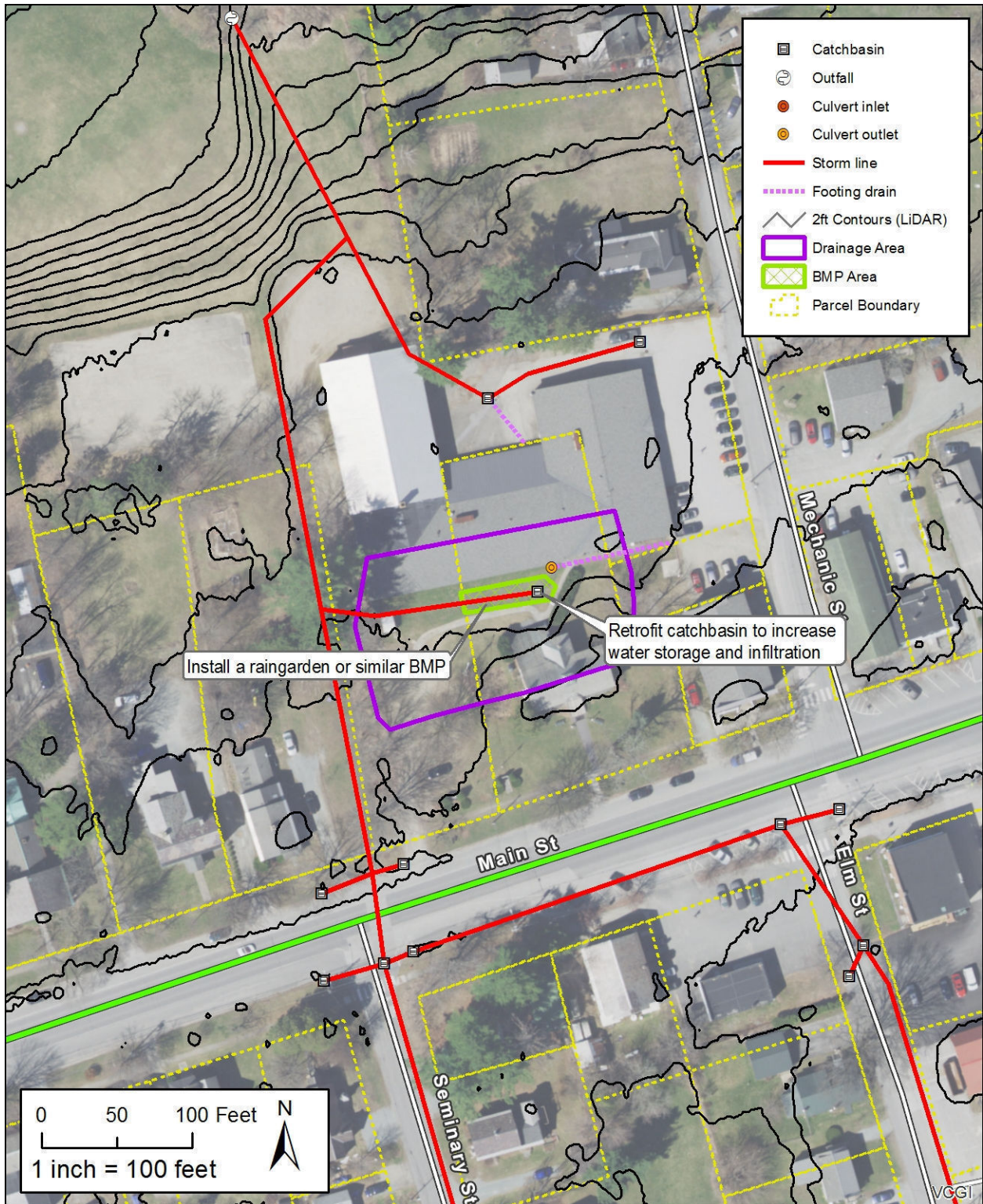
Additional Design/Permitting Requirements: This project would require a design to integrate into the catch basin and ensure no conflicts with existing utilities. **We estimate that time and materials for development of a design will cost \$1,500 to \$3,000.**

Next Steps:

- Confirm project support from the Town and School District
- Test soil infiltration rates and confirm runoff patterns
- Apply for grant funding from VTDEC, either through the Watershed Grant Program or the Ecosystem Restoration Program

Project Benefits: This project would treat a relatively small amount of impervious surface but represents an excellent educational opportunity at a school. The project would reduce the volume of runoff that reaches the next BMP site downgradient (CA-7).

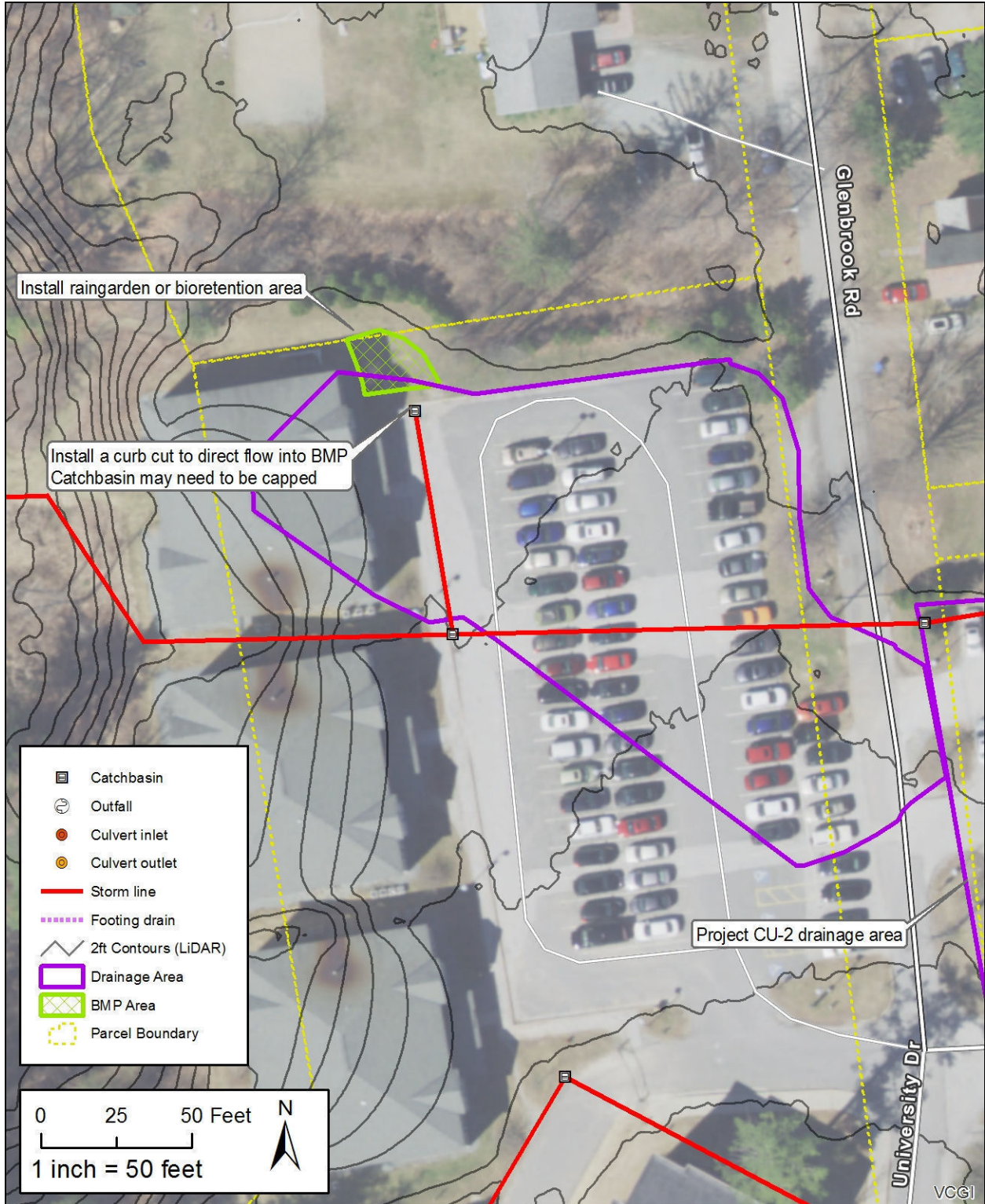
Estimated Total Project Cost: \$7,000 - \$10,000




Project CA-9 Conceptual Site Plan

Project: CU-1		Site Restoration Plan
Location:	Castleton University – North, South, and Audet Houses	
Latitude:	43.60897 N	
Longitude:	-73.18281 W	
Land Ownership:	Castleton University	
Drainage Area (acres)	0.5	
Impervious (acres)	0.4	
<p>Site Description: This site receives runoff from a drainage area of approximately ½ acre, nearly all of which is paved. Runoff enters a catch basin on the northern end of the parking lot, which is part of a larger collection system leading to a large wet detention pond to the west of the student housing along Pond Hill Brook. A green space adjacent the catch basin could be utilized to enhance water quality treatment in this subcatchment. This would require retrofit of the catch basin, a curb cut, and grading to lower the elevation of the existing green space.</p>		
<p>Proposed Scope of Work</p>		
Install Infiltration BMP (i.e., rain garden)	<ul style="list-style-type: none"> Retrofit the open grassy area with a raingarden or bioretention basin. This will require a curb cut and catch basin retrofit. Consider planting with native woody vegetation to create educational opportunities for monitoring and maintenance for University Students. 	
<p>Additional Design/Permitting Requirements: This project would require a design to integrate into the catch basin and ensure no conflicts with existing utilities. We estimate that time and materials for development of a design will cost \$3,000 to \$5,000.</p>		
<p>Next Steps:</p> <ul style="list-style-type: none"> Confirm project support from the University Test soil infiltration rates and confirm runoff patterns Apply for grant funding from VTDEC, either through the Watershed Grant Program or the Ecosystem Restoration Program 		
<p>Project Benefits: This retrofit project would enhance water quality treatment in a large drainage to a wet detention pond draining directly to Pond Hill Brook. The project could also include educational opportunities for University research.</p>		

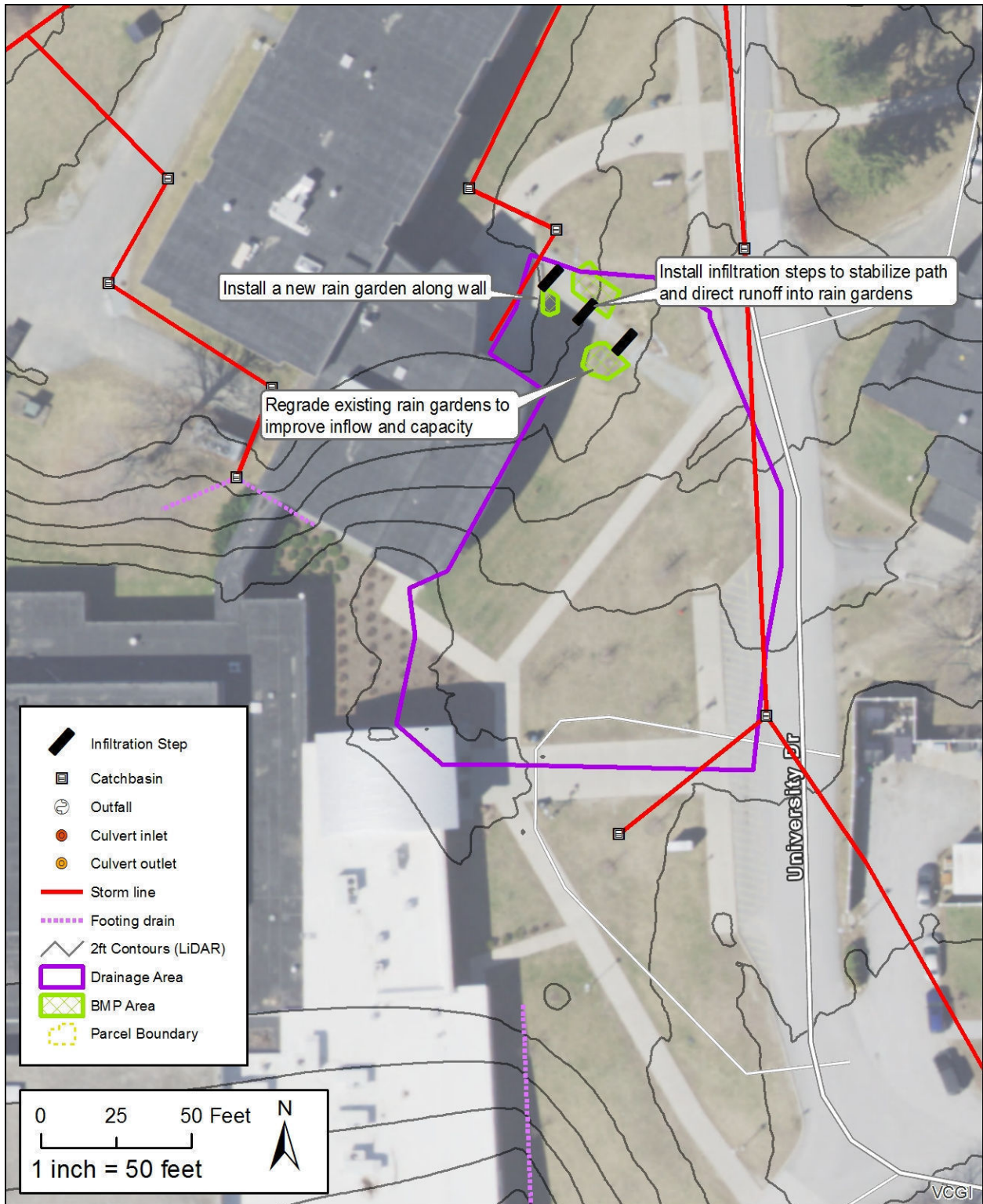
Estimated Total Project Cost: \$15,000 - \$20,000



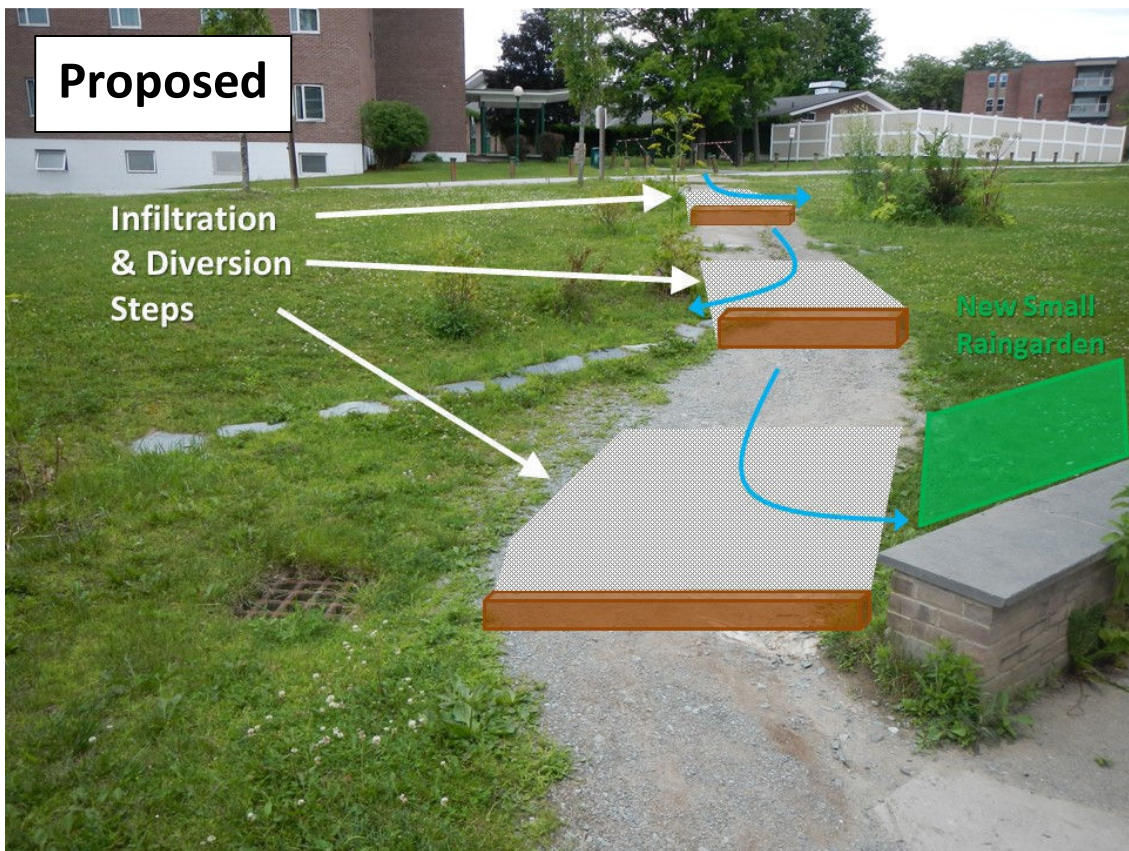
Project CU-1 Conceptual Site Plan

Project: CU-3		Site Restoration Plan
Location:	Castleton University – Fitness Center/Castleton Hall Dorm	
Latitude:	43.60771 N	
Longitude:	-73.18236 W	
Land Ownership:	Castleton University	
Drainage Area (acres)	0.4	
Impervious (acres)	0.1	
<p>Site Description: Two raingardens are found along a gravel walking path on the CU campus. The gravel path has a grade of about 8%, and rill erosion has cut through the waterbars originally designed to divert stormwater into the raingardens. Rilling continues down to the bottom of the path and causes stormwater and fine sediments to enter the storm drain network in a patio/entrance area to the Fitness Center and Castleton Hall dormitory. Improvements to the drainage paths are needed to direct stormwater into the existing raingardens. Alternatively, the path could be paved but erosion problems could continue along the sides of the path due to increased runoff volume/velocity.</p>		
<p>Proposed Scope of Work</p>		
Infiltration/Diversion Steps	<ul style="list-style-type: none"> • Install three (3) infiltration/diversion steps to slow the runoff, and collect/divert excess runoff into the existing raingardens. See attached conceptual plans and details for steps. 	
Maintain/Enhance Existing Raingardens	<ul style="list-style-type: none"> • The existing raingardens are overgrown and require maintenance to function properly. Some weeding and mulching are needed. 	
Install Additional Raingarden	<ul style="list-style-type: none"> • Consider installing a 3rd raingarden at the bottom of the slope along the patio wall. This area would receive runoff from the last infiltration/diversion step, as well as grassy areas to the east of the dorm. 	
<p>Additional Design/Permitting Requirements: This project may require design assistance to integrate the steps into the existing raingardens. We estimate that time and materials for development of a design will cost \$1,000 to \$1,500.</p>		
<p>Next Steps:</p> <ul style="list-style-type: none"> • Confirm project support from the University • Apply for grant funding from VTDEC, either through the Watershed Grant Program or the Ecosystem Restoration Program 		
<p>Project Benefits: This retrofit project would enhance water quality treatment in a large drainage to a wet detention pond draining directly to Pond Hill Brook. The project could also include educational opportunities for University research.</p>		

Estimated Total Project Cost: \$5,000 - \$10,000



Project CU-3 Conceptual Site Plan





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Job: Castleton University Raingarden - CU-3

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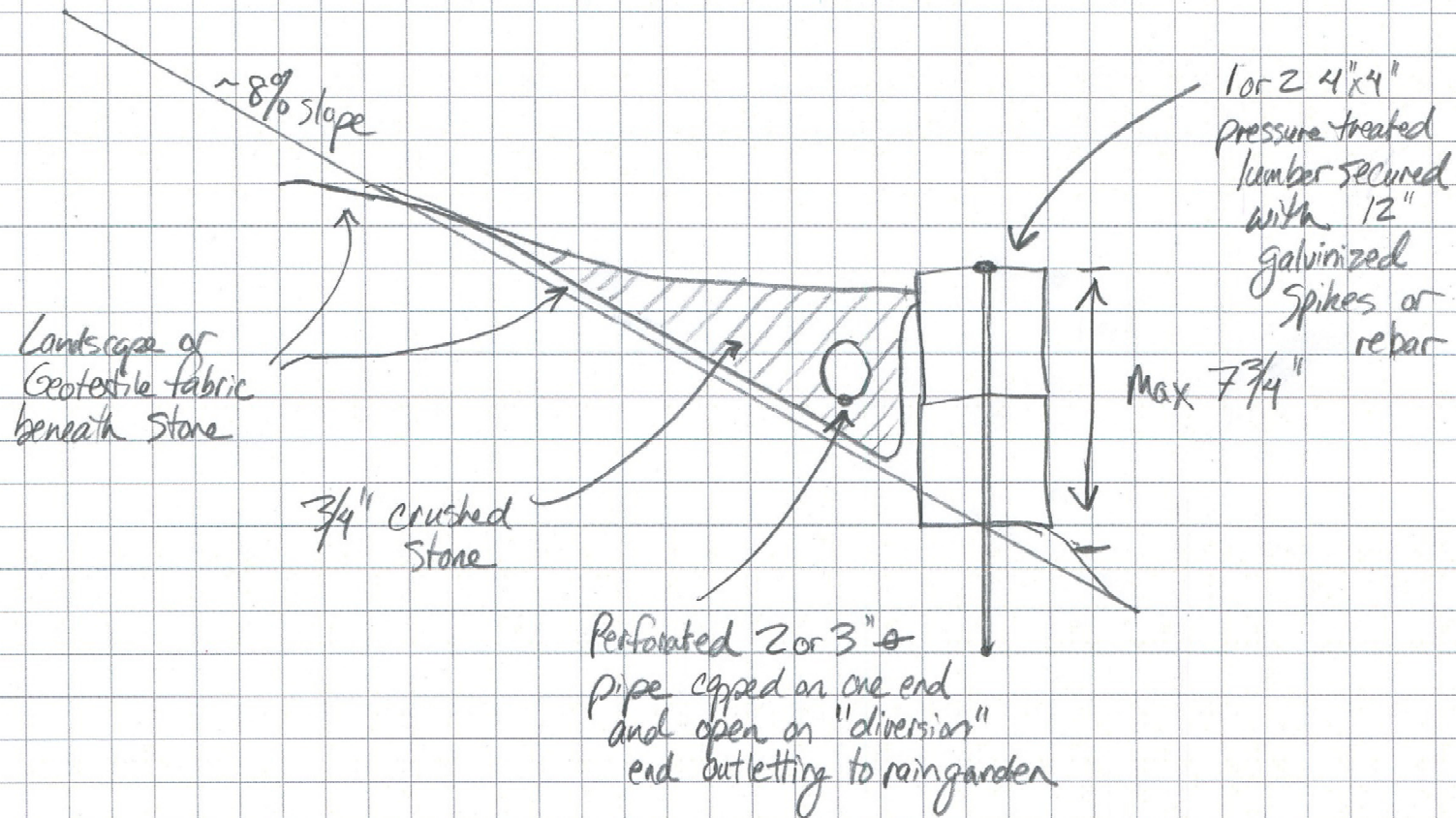
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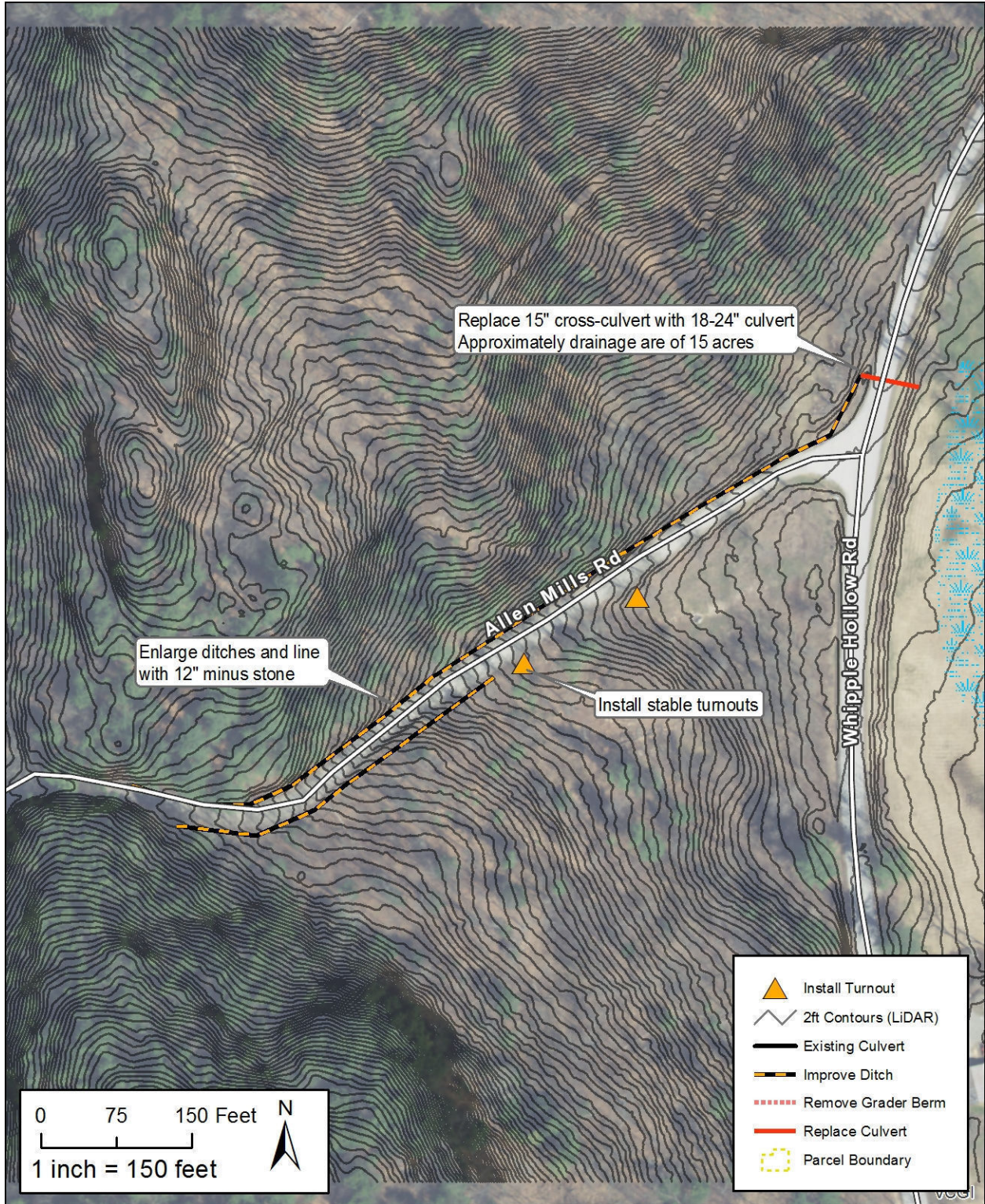
Infiltration/Diversion Step Detail




Project: PIT-4		Site Restoration Plan
Location:	Road drainage for Allen Mills Road, Pittsford	
Latitude:	43.66935 N	
Longitude:	-73.07649 W	
Land Ownership:	Town road; Town right-of-way	
Drainage Area (acres)	7	
Impervious (acres)	0.2	
<p>Site Description: Allen Mills Road is a gravel road with approximately 10% slope near its intersection with Whipple Hollow Road. Some minor to moderate erosion is occurring in the ditches, especially along the north side of the road that lacks check dams and turnouts. Stormwater runoff from this road segment passes under Whipple Hollow Road through a 15-inch metal culvert. This road segment has been mapped by VTANR as hydrologically-connected to nearby wetlands. The forthcoming VTDEC Municipal Roads General Permit (MRGP) will require stone-lined ditches, a proper road crown, and stable turnouts where possible.</p>		
Proposed Scope of Work		
Improve Ditches	<ul style="list-style-type: none"> • Install stone lining in the existing/enlarged road ditches • Consider installing check dams to capture sediment 	
Improve Site Drainage	<ul style="list-style-type: none"> • Maintain a proper crown on the road surface • Look for appropriate areas to turn water off the road/out of the ditch 	
Upgrade Culvert	<ul style="list-style-type: none"> • Replace the 15" culvert under Whipple Hollow with a larger culvert 	
<p>Additional Design/Permitting Requirements: Some additional design guidance may be required to correctly size the stone and locate check dams and turnouts. VTANR and the Rutland RPC should be notified of this project for MRGP tracking purposes, however we do not expect any additional permitting requirements. We estimate that time and materials for design will cost \$500 to \$1,000. This work could be funded by the VTDEC Municipal Roads Grant-in-Aid program.</p>		
<p>Next Steps:</p> <ul style="list-style-type: none"> • Confirm project support from the Town • Confirm that all project implementation tasks can be completed by the Town Highway Department • Technical project oversight is likely not necessary during implementation 		
<p>Project Benefits: This project is primarily designed to mitigate a sediment source to a Class 2 wetland found to the east of Whipple Hollow Road, within the Castleton River corridor. Stabilization of the ditches, along with improvements to the road crown and turnout, will significantly reduce sediment transport from the road segment.</p>		

Estimated Total Project Cost: \$20,000 - \$25,000

Note: Estimated costs are maximum probable costs based on typical contractor rates. Actual costs will vary by municipality based on labor rates, availability of town-owned equipment, and cost of materials.

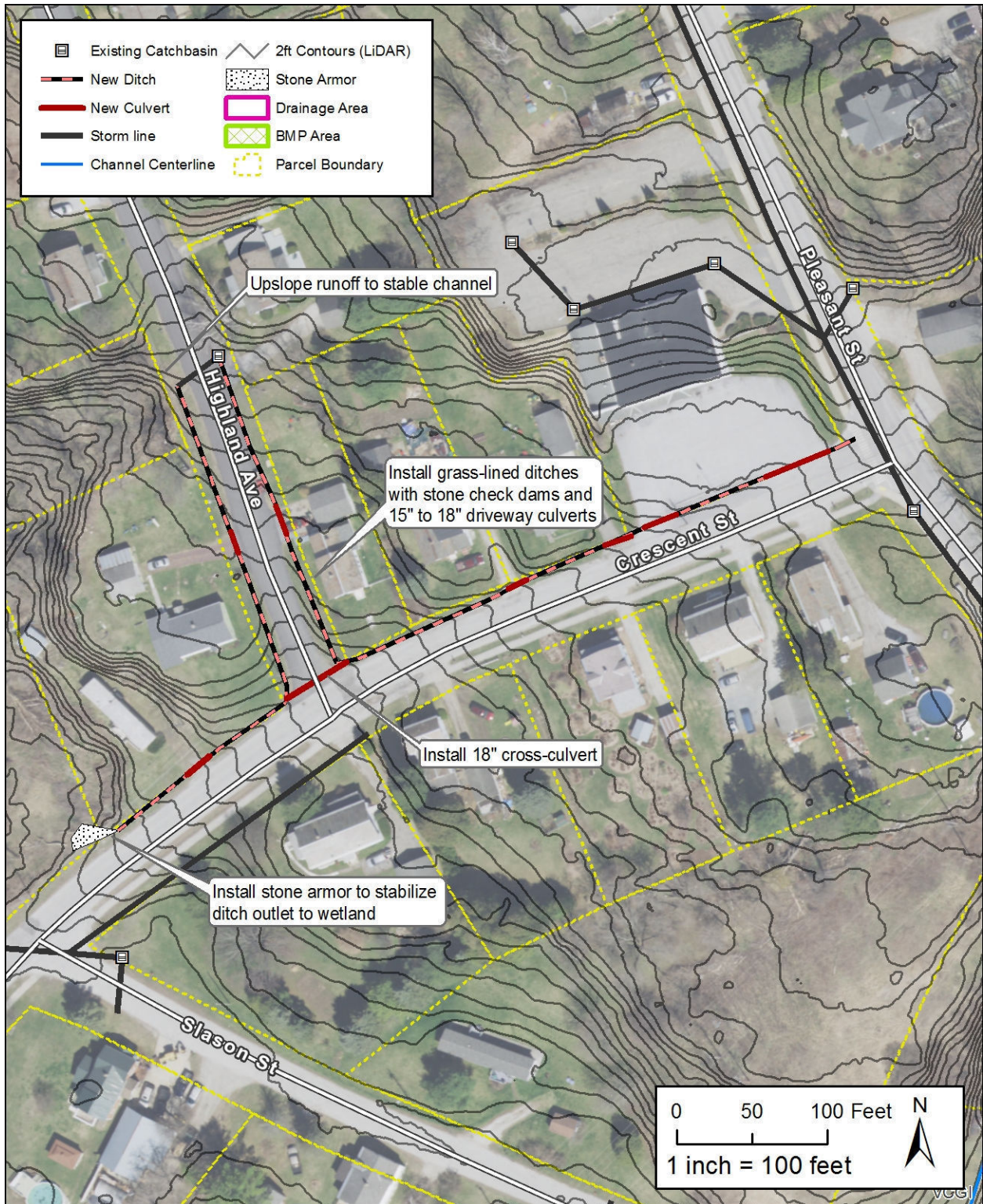


Project PIT-4 Conceptual Site Plan

Project: WR-3		Site Restoration Plan
Location:	Crescent Street and Highland Avenue	
Latitude:	43.60319 N	
Longitude:	-73.04810 W	
Land Ownership:	Town road; Town right-of-way	
Drainage Area (acres)	2.5	
Impervious (acres)	0.75	
<p>Site Description: The relatively steep portion (6-8% slope) of Crescent Street between Pleasant Street and Slason Street and the lower portion of Highland Ave have a few short sections of paved ditch; otherwise appropriate roadside drainage is lacking. Erosion is visible along the road edge and at several driveways. Runoff enters a wetland area across from Slason Street. These road segments have been mapped by VTANR as hydrologically-connected to nearby wetlands. The forthcoming VTDEC Municipal Roads General Permit (MRGP) will require grass-lined ditches with stone check dams, and stable turnouts where possible.</p>		
<p>Proposed Scope of Work</p>		
Improve Ditches	<ul style="list-style-type: none"> • Install grass-lined ditches with stone check dams along Crescent St and Highland Ave 	
Install Culverts	<ul style="list-style-type: none"> • Seven driveway culverts will be required for the new ditches • Install a cross-culvert at the intersection with Highland Ave 	
Stabilize Flow Path	<ul style="list-style-type: none"> • Install stone armor to provide a stable outlet into the wetland area 	
<p>Additional Design/Permitting Requirements: Some additional design guidance may be required to correctly size the stone, check dams, and turnouts. VTANR and the Rutland RPC should be notified of this project for MRGP tracking purposes. The new drainage system will outlet to the wetland complex across from Slason St. Stabilizing the ditch outlet may require wetland permits from VTANR. We estimate that time and materials for design/permitting will cost \$1,000 to \$1,500. This work could be funded by the VTDEC Municipal Roads Grant-in-Aid program.</p>		
<p>Next Steps:</p> <ul style="list-style-type: none"> • Confirm project support from the Town • Confirm that all project implementation tasks can be completed by the Town Highway Department • Technical project oversight is likely not necessary during implementation 		
<p>Project Benefits: This project will improve site drainage and increase opportunity for sediment and nutrient retention and peak flow reduction, reducing impacts on downslope wetlands and streams.</p>		

Estimated Total Project Cost: \$10,000 - \$20,000

Note: Estimated costs are maximum probable costs based on typical contractor rates. Actual costs will vary by municipality based on labor rates, availability of town-owned equipment, and cost of materials.



Project WR-3 Conceptual Site Plan

Project: WR-08 **Site Restoration Plan**

Location:	Carris Reels, Inc.
Latitude:	43.59654 N
Longitude:	-73.04628 W
Land Ownership:	Private
Drainage Area (acres)	2.5
Impervious (acres)	3.5



Site Description: Rooftops and gravel parking areas on the Carris Reels property drain to two culverts which empty into a catchbasin before discharging directly into the canal. The culvert inlet has a small depression that traps some sediment. There is a narrow strip of grassed area along the north bank of the canal. This area may provide adequate space for a stormwater BMP that treats the water quality volume (WQv), however there may be site constraints to treating other standards (i.e., channel protection volume). This property currently has a Multisector General Permit from VTDEC (#5310.9003.R), but will also be subject to the forthcoming VTDEC 3-acre impervious permit for stormwater treatment.

Proposed Scope of Work

Install Sediment Forebay	<ul style="list-style-type: none"> Enhance the low area at the culvert inlet to function as a sediment forebay
Install WQv BMP	<ul style="list-style-type: none"> Retrofit the catchbasin with a WQv outlet structure Install an infiltration BMP within the narrow grassed area along the stream bank. The BMP should have a stabilized overflow into the canal.

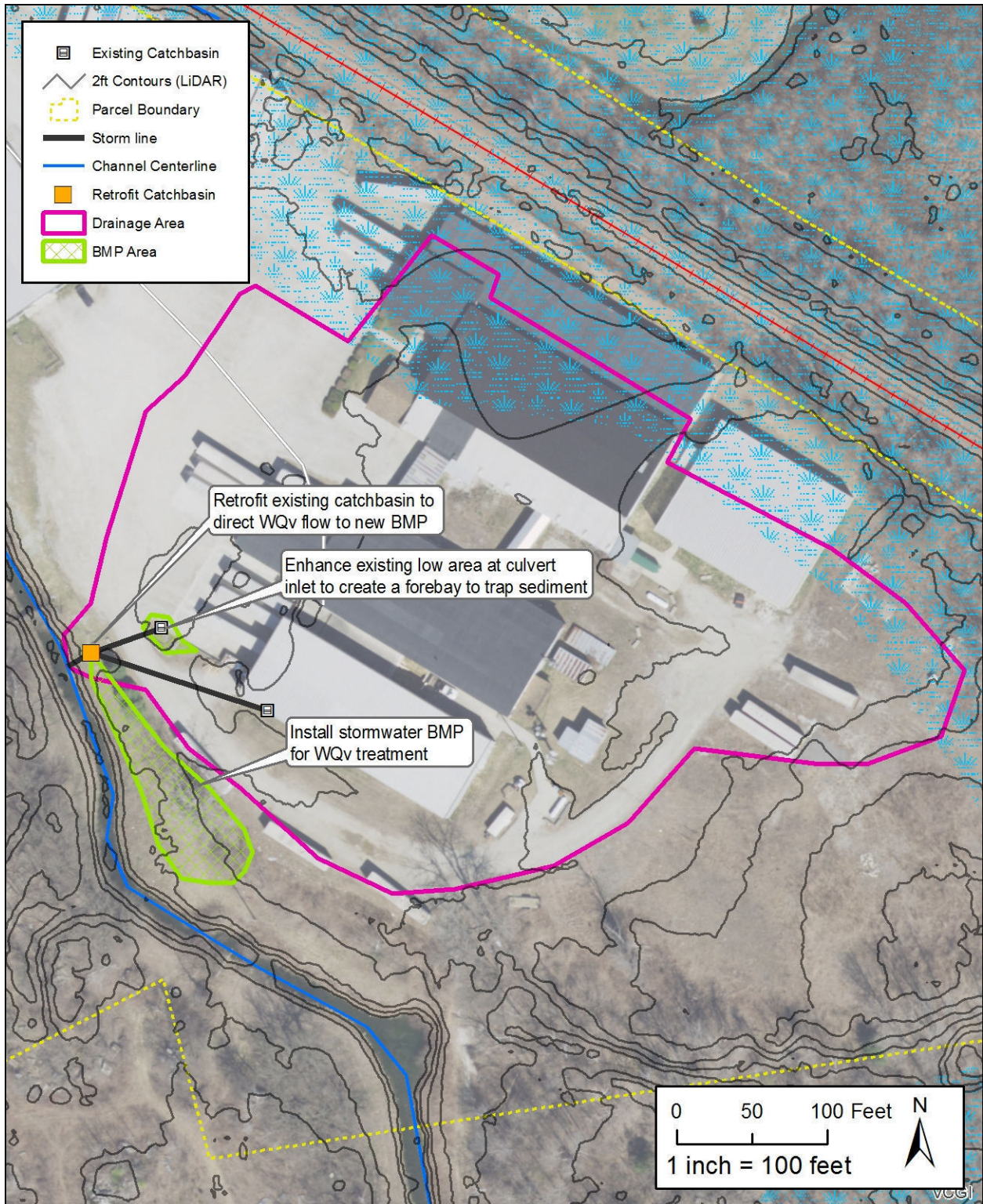
Additional Design/Permitting Requirements: Additional design guidance and survey will be required to correctly size the forebay and BMP and to design the catchbasin retrofit. The project will be adjacent to a perennial stream and will likely require permits from VTANR. **We estimate that time and materials for design and permitting will cost \$7,500 to \$10,000.**

Next Steps:

- Coordinate with Carris Reels to confirm project support
- Determine scope and timeline of retrofit based on VTDEC’s forthcoming 3-acre general permit for stormwater
- Site survey and assess other locations within property for stormwater treatment

Project Benefits: This project is designed to reduce sediment loading and runoff from a large area of impervious surfaces adjacent to a perennial stream. Full treatment of the WQv storm should be possible for the site, with potential for higher treatment level depending on space available for BMP.

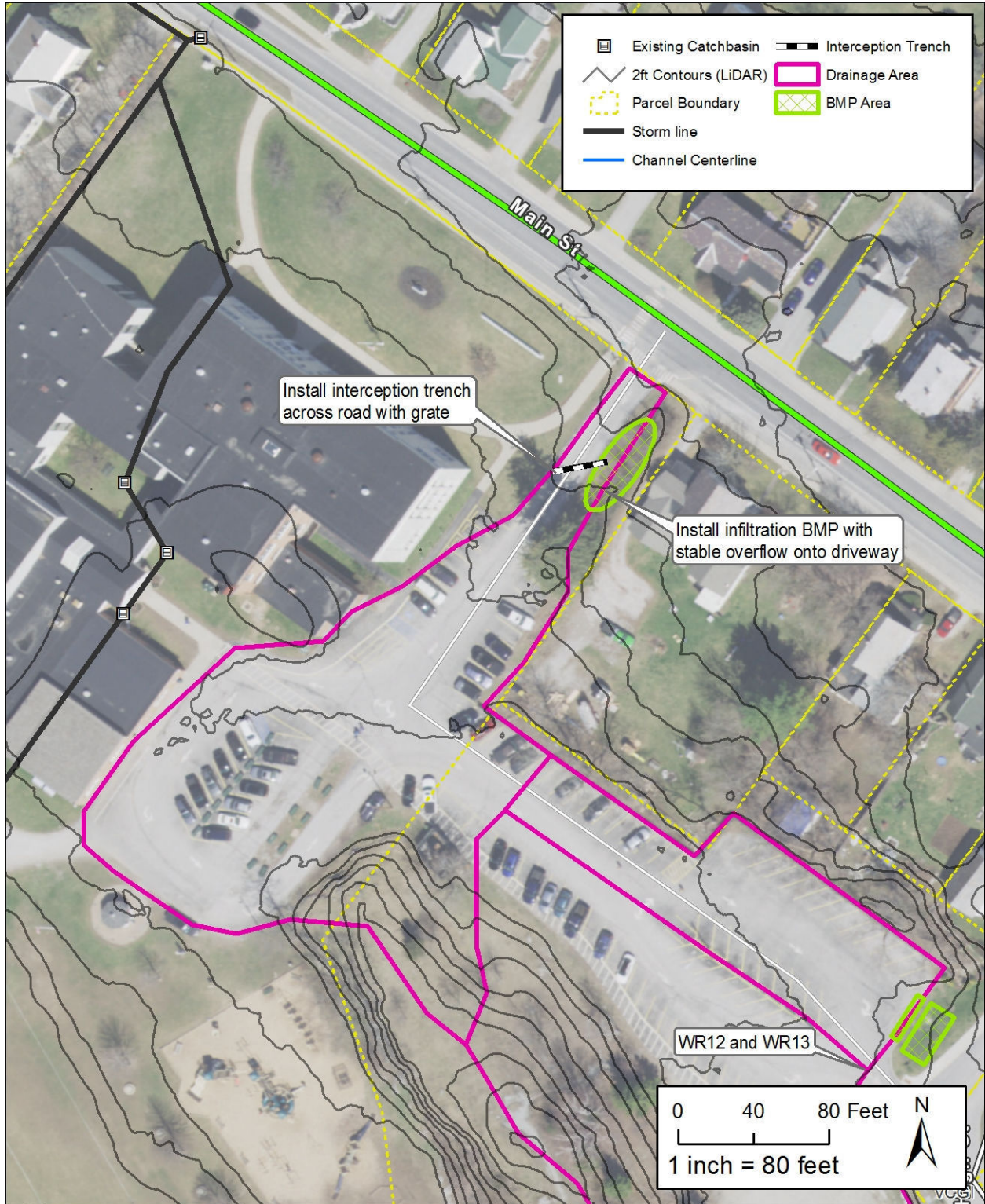
Estimated Total Project Cost: \$50,000 - \$75,000



Project WR-8 Conceptual Site Plan

Project: WR-09		Site Restoration Plan
Location:	West Rutland School	
Latitude:	43.59531 N	
Longitude:	-73.05090 W	
Land Ownership:	Town	
Drainage Area (acres)	0.90	
Impervious (acres)	0.75	
<p>Site Description: A large area of paved parking lot and road drain down the main entrance to the Town School and flow onto Main Street with no treatment or opportunities for infiltration. A grassed area along the eastern edge of the entrance does not appear to be used for any school purposes. This green space may have close to 1,000 square feet of usable space for a green stormwater BMP retrofit. Drainage improvements in the paved drive would be required to direct runoff into this space.</p>		
<p>Proposed Scope of Work</p>		
Install Interception Trench Grate	<ul style="list-style-type: none"> • Divert all runoff to the east side of the entrance road through installation of a trench grate 	
Install Infiltration BMP	<ul style="list-style-type: none"> • Install BMP within the existing grassed area • Size BMP based on soil infiltration capacity • Provide stable overflow back to school driveway 	
<p>Additional Design/Permitting Requirements: Additional survey, design guidance, and infiltration testing will be required to correctly size the inlet structure, BMP, and overflow. We do not anticipate any permitting requirements for the project. We estimate that additional time and materials for design will cost \$3,000 to \$5,000.</p>		
<p>Next Steps:</p> <ul style="list-style-type: none"> • Confirm project support from the Town/School • Determine infiltration capacity of underlying soils • Technical oversight is recommended for BMP construction 		
<p>Project Benefits: This project is designed to reduce runoff and associated pollutants to Main Street from the School property. Runoff onto Main Street eventually enters the larger storm drain network leading to the canal and eventually the Castleton River. We anticipate that the WQv storm can be fully infiltrated.</p>		

Estimated Total Project Cost: \$15,000 - \$20,000



Project WR-9 Conceptual Site Plan

Project: WR-16	Site Restoration Plan
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Location:	Swale between Route 4 and Westway Mall	
Latitude:	43.59330 N	
Longitude:	-73.04311 W	
Land Ownership:	Town and Private	
Drainage Area (acres)	3.5	
Impervious (acres)	3.0	

Site Description: Most of the Price Chopper parking lot and a portion of Route 4 drain to a wide, grassed area with a slight depression. The swale drains into a culvert and crosses under the entrance road, eventually draining into the canal. The swale is poorly defined, and the outlet is only slightly elevated above the bottom of the swale. Slightly raised grassed areas along the edge of the parking lot and the road restrict sheetflow into the feature from adjacent impervious surfaces. The water table is likely close to the surface at this site. The swale is located within the State right-of-way. There does not appear to be a VTDEC Operational Stormwater Permit associated with this property. Because this parcel has over 3 acres of impervious surface, it will likely be subject to the forthcoming VTDEC 3-acre impervious permit for stormwater treatment.

Proposed Scope of Work

Improve Site Drainage	<ul style="list-style-type: none"> • Lower the grassed area along the edges of road and parking lot to improve sheetflow into the BMP
Enhance Infiltration BMP	<ul style="list-style-type: none"> • Widen and deepen the swale to increase capacity • Consider planting native wetland shrubs • Install a stone check dam near the outlet or a water level control structure to increase residence time within the BMP

Additional Design/Permitting Requirements: Additional design work is required to complete the BMP retrofit design. There are mapped wetlands to the east that may require delineation and permitting, depending on the scope of the retrofit. **We estimate that the additional design work will cost \$3,000 to \$5,000, although the design fees could be higher if the retrofit scope is to provide treatment for the VTDEC 3-acre permit, and/or wetland permitting is involved.**

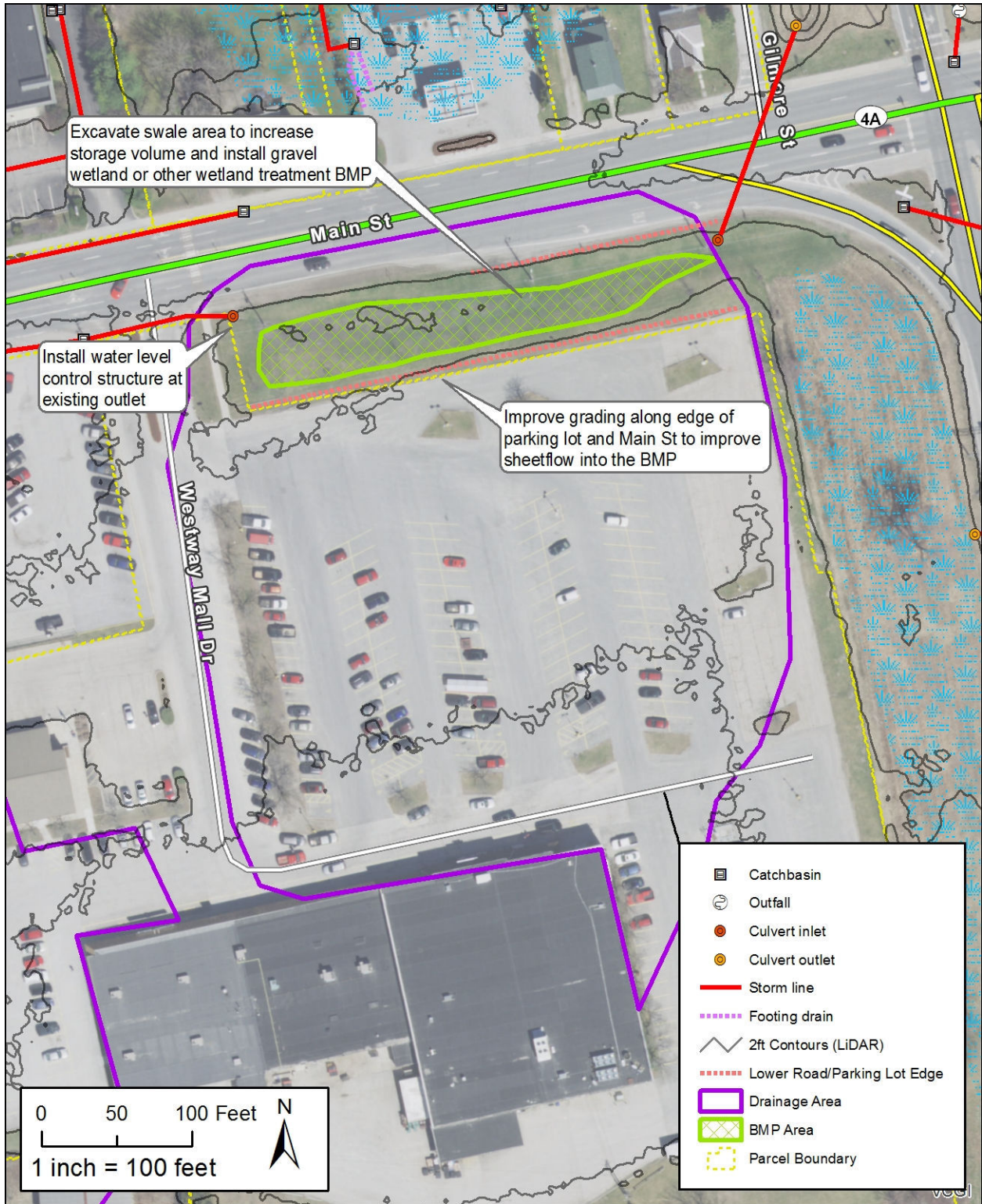
Next Steps:

- Confirm project support from the State (VTrans) and the private landowner (Westway Mall)
- Determine infiltration capacity of underlying soils and the seasonal high water table
- Determine responsibility for funding design and implementation


Project Benefits: This project is designed to enhance an existing swale and provide additional storage and treatment for small runoff events from a large paved area.

Estimated Total Project Cost: \$15,000 - \$30,000

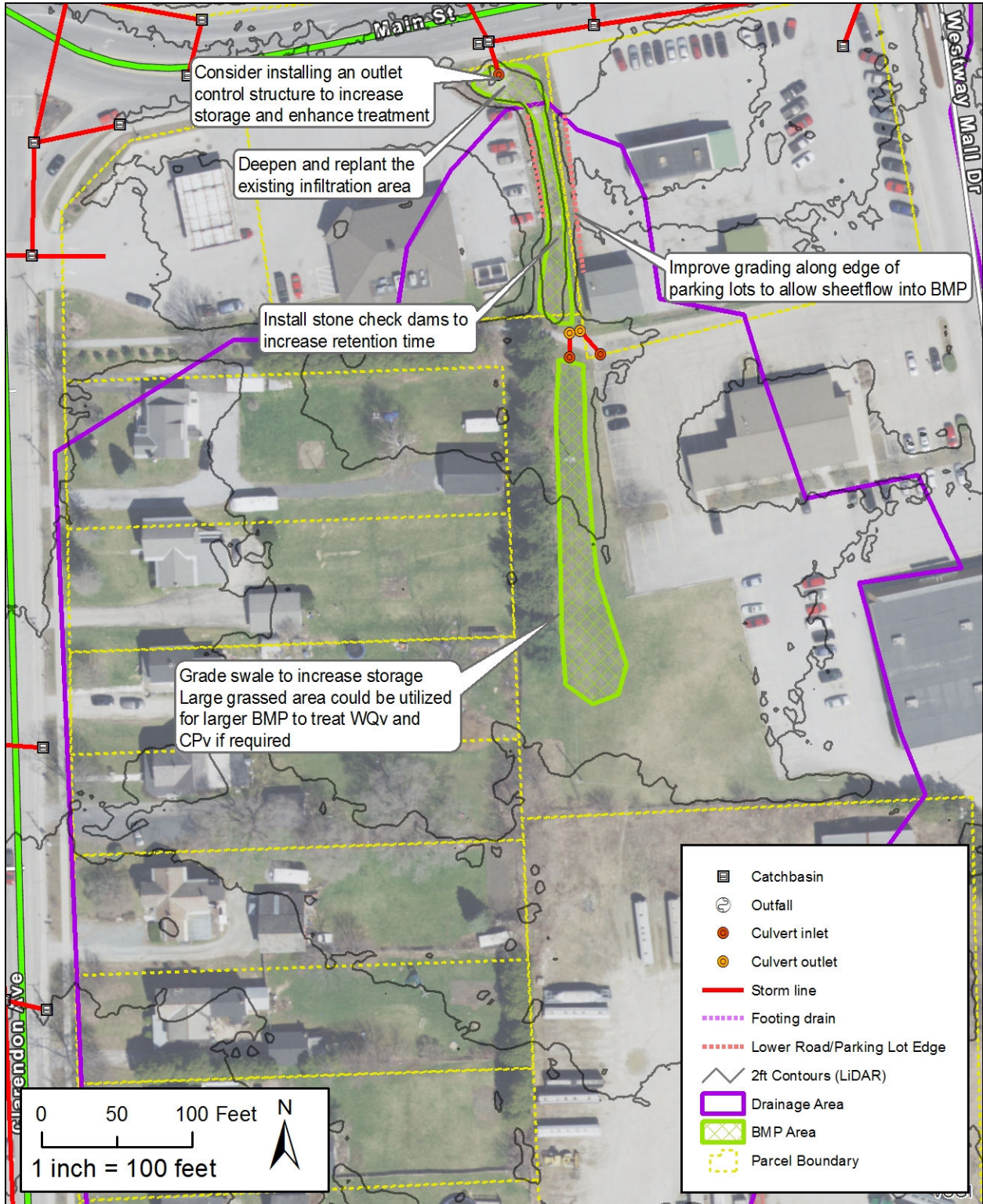
Construction costs could be higher if the retrofit is to provide treatment for forthcoming the VTDEC 3-acre permit



Project WR-16 Conceptual Site Plan

Project: WR-17		Site Restoration Plan
Location:	Jiffy Mart and Bailey Motors	
Latitude:	43.59318 N	
Longitude:	-73.04453 W	
Land Ownership:	Town	
Drainage Area (acres)	10.5	
Impervious (acres)	5.0	
<p>Site Description: A small infiltration basin located between Bailey Motors and the Jiffy Mart treats runoff from a 10-acre watershed with residential and commercial land use. The infiltration basin is a small depression filled with crushed stone and a CPP outlet culvert under Route 4, discharging to the canal. The narrow swale approaching the infiltration basin has remnants of a stone check dam, however it does not appear to be functional. Further south the swale is poorly defined through a grass area west of the Westway Mall property. The grassed area long both parking lots is slightly elevated, limiting sheetflow into the BMP and increasing runoff to Route 4. There does not appear to be a VTDEC Operational Stormwater Permit associated with the Westway Mall Property (excluding a permit for the Post Office). Because this parcel has over 3 acres of impervious surface, it will likely be subject to the forthcoming VTDEC 3-acre impervious permit for stormwater treatment.</p>		
<p>Proposed Scope of Work</p>		
Improve Swale	<ul style="list-style-type: none"> • Widen and deepen the upslope swale to increase capacity and residence time 	
Improve Drainage	<ul style="list-style-type: none"> • Lower the grassed area along both parking lots to allow sheetflow into the BMP 	
Enhance Infiltration BMP	<ul style="list-style-type: none"> • Install check dams in the approach channel • Deepen the infiltration basin to increase storage 	
Install New BMP	<ul style="list-style-type: none"> • A new BMP system such as a gravel wetland could be installed within the existing BMP footprint and the upslope grassed area 	
<p>Additional Design/Permitting Requirements: We identified two potential project scenarios for this site: The existing treatment feature could be improved, requiring no permitting and only minor additional design work (500 to \$1,000). Alternatively, a new BMP system could be installed utilizing the existing BMP footprint and the upslope grassed area. There is enough space to incorporate a treatment system for the VTDEC 3-acre permit. Installation of a new BMP would require site survey and substantial design work (\$7,500 to \$10,000).</p>		
<p>Next Steps:</p> <ul style="list-style-type: none"> • Confirm project support from the private landowners (Bailey Motors, Jiffy Mart, and Westway Mall) • Determine upcoming permit requirements for property • Determine responsibility for funding design and implementation 		
<p>Project Benefits: This project is designed to improve the existing infiltration basin and provide additional treatment area for nutrient removal and flow reduction. Installation of a new treatment system could provide WQv and CPv treatment for approximately 5 acres of impervious surface.</p>		

Estimated Total Project Cost: \$3,000 - \$5,000 for improvement of existing BMP or \$50,000 to \$100,000 for new BMP



Project WR-17 Conceptual Site Plan