

## AHEAD OF THE STORM

Site: Wetlands Restoration in Hinesburg Village

Location: United Church of Hinesburg, Route 116, Hinesburg, Vermont



## PROJECT SUMMARY

### Primary Problem

Runoff from several residential developments, businesses, churches, and a portion of Route 116 uphill of the United Church of Hinesburg (UCH) is currently collected in a culvert under Route 116, channelized in a straight ditch with berms on both sides, and takes an unnatural path to the LaPlatte River. Stella Road has been overtopped multiple times due to inadequate culverts. This section of the LaPlatte River in Hinesburg has reduced geomorphic and habitat condition and poor water quality (impaired for E. coli). Channel straightening, ditching and berming, filling of wetlands, and altered flow from stormwater runoff contribute to channel instability. The area behind UCH, which was historically wetland, was converted from hayfield to playing fields in the early 1990s. The area was filled, smoothed, compacted, and is maintained as lawn.

The primary goals of this project are to improve water quality protection and flood resiliency by slowing runoff, reducing erosion, and enhancing vegetation. This project will improve water quality in the LaPlatte River watershed.

### Recommendations

1. Restore the lawn area behind UCH to a functioning wetland with decompaction of soil, grading, and planting with native species.
2. Move the existing berm along the south side of the ditched swale to create a low floodplain area.
3. Install a culvert to pass overflow from the restored wetland under Stella Road.

### Site Constraints and Design Basis

The design maximizes restored wetland area while allowing UCH to continue using the area behind the church for services and gatherings. Timber crossings and paths allow for access to the wetland from the church and town recreational fields for educational opportunities without impacting the wetland function. The new culverts under Stella Road are sized to carry flows from the upstream contributing areas (68 acres and 3.7 acres) and provide better hydrologic connectivity to the river corridor. The playground, which is located in a wetland buffer and has been flooded, will be moved to an upland area out of the wetland buffer. The design minimizes long-term maintenance procedures and costs.

### Cost

Construction and engineering services are estimated to cost \$177,000. Costs include bid assistance and construction oversight (*see attached cost estimates*). Costs do not include the following site enhancement elements that will likely be implemented at the same time as the restoration: bench, patio, playground, labyrinth, additional plantings outside of the restoration area.



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## EXISTING CONDITIONS SUMMARY

### Site Description

One subwatershed in the village of Hinesburg that drains into the LaPlatte River has been identified in past studies as an important area for water quality improvements and green infrastructure. After discussions with landowners in this subwatershed in 2019, the United Church of Hinesburg (UCH) was identified as a willing landowner for an improvement project. The area behind UCH, which was historically wetland, was converted from hayfield to playing fields in the early 1990s. The area was filled, smoothed, compacted, and is maintained as lawn. This project will restore to this lawn area to wetland, naturalizing the flow path through the restoration area, and improving water quality as flows move toward the LaPlatte River.

### Drainage Patterns

Water flows generally from east to west toward the LaPlatte River, which has poor water quality (impaired for E. coli). Currently runoff from several residential developments, businesses, churches, and a portion of Route 116 uphill of UCH (68 acres in total) is collected, passes through a culvert under Route 116, is channelized in a straight ditched swale, and takes an unnatural path to the LaPlatte River. The ditched swale flows west out of the culvert under Route 116, along the north edge of the UCH property, makes a sharp turn to the north, another sharp turn to the west, flows along the Cheesefactory gravel parking area, passes under Stella Road, and enters a swale that flows north and then west to the LaPlatte River. Channel straightening and berming and altered flow from stormwater runoff contribute to channel instability.

### Site Constraints

The swale to the west of Stella Road, which is not on UCH property, will need to be cleaned and maintained if it is to receive flows from the proposed wetland restoration area. To ensure adequate cover, the depth of any new structures under Stella Road will be limited. Additional regulatory approvals or permitting may be required for modifications other than wetland restoration in existing wetland buffers.

### Initial Recommendations

1. Restore the lawn area behind UCH to wetland.
2. Move existing berm along the south side of the ditched swale to create a low floodplain area.
3. Remove piles of previous dredge material near where the existing ditched swale turns to the north.
4. Gently grade to create a shallow lower elevation area in the center of the restoration area so flows from the ditched swale are directed into the wetland.
5. Install a culvert to pass overflow from the restored wetland under Stella Road.

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## EXISTING CONDITIONS PHOTO LOG



Figure 1: United Church of Hinesburg looking west with culvert outlets and ditched swale shown on the right side of this photo and Route 116 in the foreground (November 1, 2019).



Figure 3: Outlet of 36 inch corrugated metal pipe under Route 116 (October 6, 2020).



Figure 2: Outlet of 36 inch corrugated metal pipe under Route 116 and 15 inch plastic stormwater culvert (June 23, 2021).



Figure 4: From left to right looking west: Church building, lawn, rain garden, berm, ditched swale (November 1, 2019).

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## EXISTING CONDITIONS PHOTO LOG



*Figure 5: Rain garden along south side of ditched swale looking northeast (October 6, 2020).*



*Figure 7: Partially flooded lawn area behind United Church of Hinesburg looking west (November 1, 2019).*



*Figure 6: Ditched swale turns north at piles of previous dredge material, looking downstream (October 6, 2020).*



*Figure 8: Partially flooded lawn area behind United Church of Hinesburg and town recreational fields looking southwest (November 1, 2019).*

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## EXISTING CONDITIONS PHOTO LOG



*Figure 9: Dry lawn area behind United Church of Hinesburg and town recreational fields looking south. Existing wetlands are visible at image left (October 6, 2020).*



*Figure 11: Dry drive to Cheese factory gravel parking area looking southeast from Stella Road (October 9, 2020).*



*Figure 10: Flooded drive to Cheese factory gravel parking area looking east from Stella Road (November 1, 2019).*



*Figure 12: Stella Road partially flooded looking south from junction with drive to Cheese factory gravel parking area (November 1, 2019).*

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## EXISTING CONDITIONS PHOTO LOG



Figure 13: Partially flooded lawn area behind United Church of Hinesburg looking east (November 1, 2019).



Figure 15: Heaved 18 inch corrugated metal pipe under Stella Road (June 23, 2021).



Figure 14: Dry lawn area behind United Church of Hinesburg looking east (October 6, 2020).



Figure 16: Current playground location (October 6, 2020).

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## EXISTING CONDITIONS PHOTO LOG



Figure 17: Wet playground (October 26, 2021).



Figure 19: North edge of mowed lawn area looking east. Piles near ditched swale turn visible on image left (October 6, 2020).



Figure 18: Dry playground (June 23, 2020).



Figure 20: Wetland at image right with wetland finger extending into swale along solar panels (October 6, 2020).

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## EXISTING CONDITIONS PHOTO LOG

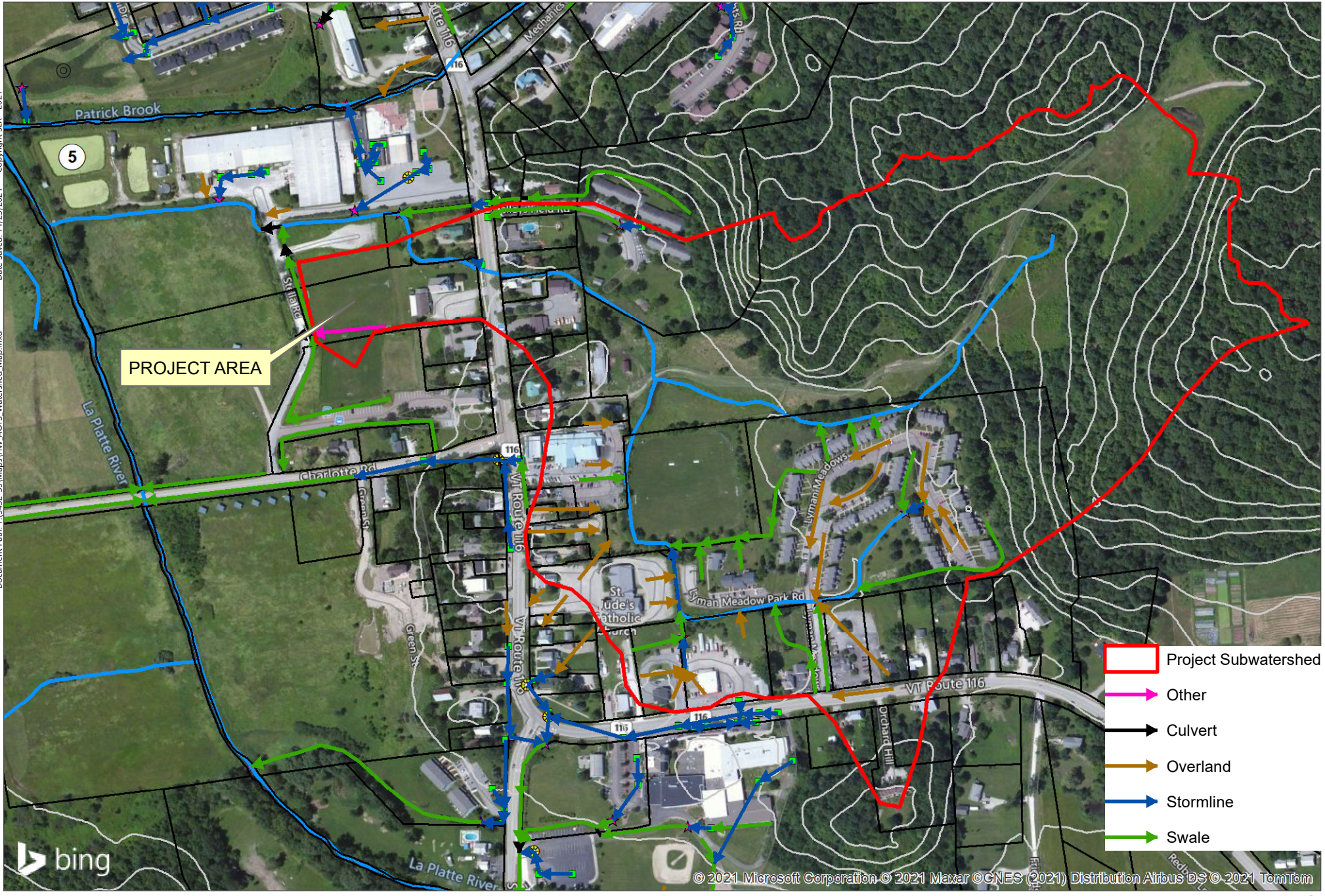


*Figure 21: 3 inch PVC drainage pipe extending from church into mowed lawn area (June 23, 2021).*



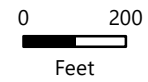
*Figure 22: Area between parsonage and church where site access from the church parking lot is expected (October 6, 2020).*





- Project Subwatershed
- Other
- Culvert
- Overland
- Stormline
- Swale

PROJECT SUBWATERSHED  
 HINESBURG VILLAGE  
 LEWIS CREEK ASSOCIATION



**SLR**  
 1 South Main St  
 Waterbury, VT 05676  
 802-882-8335

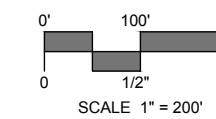
# WETLANDS RESTORATION IN HINESBURG VILLAGE

VT ROUTE 116  
HINESBURG, VERMONT

FINAL DESIGN  
DECEMBER 10, 2021



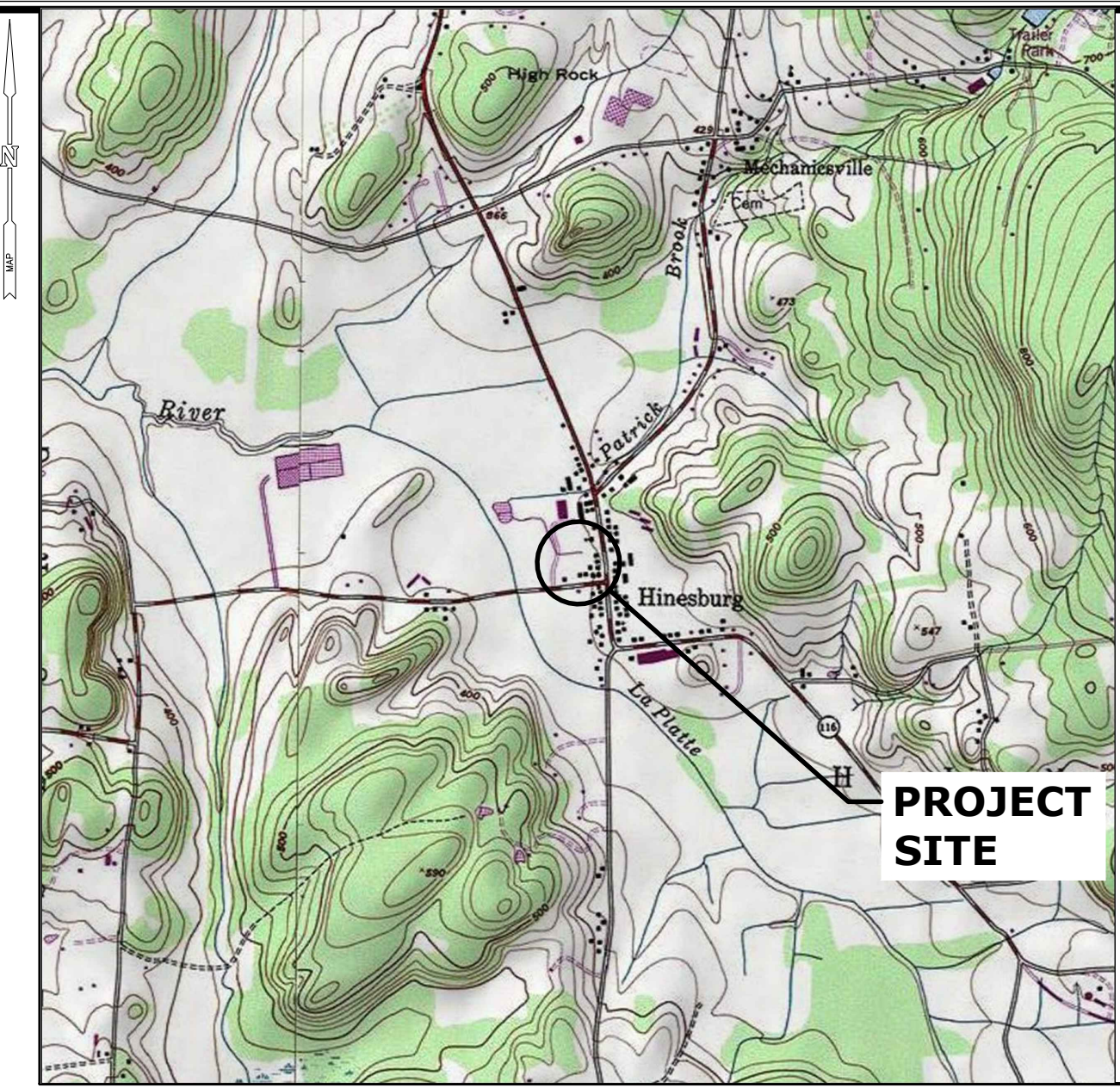
PROJECT SITE VICINITY MAP:



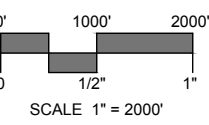
PREPARED BY:



1 SOUTH MAIN STREET  
WATERBURY, VT 05676  
802.862.8335  
SLRCONSULTING.COM



LOCATION MAP:



PREPARED FOR:

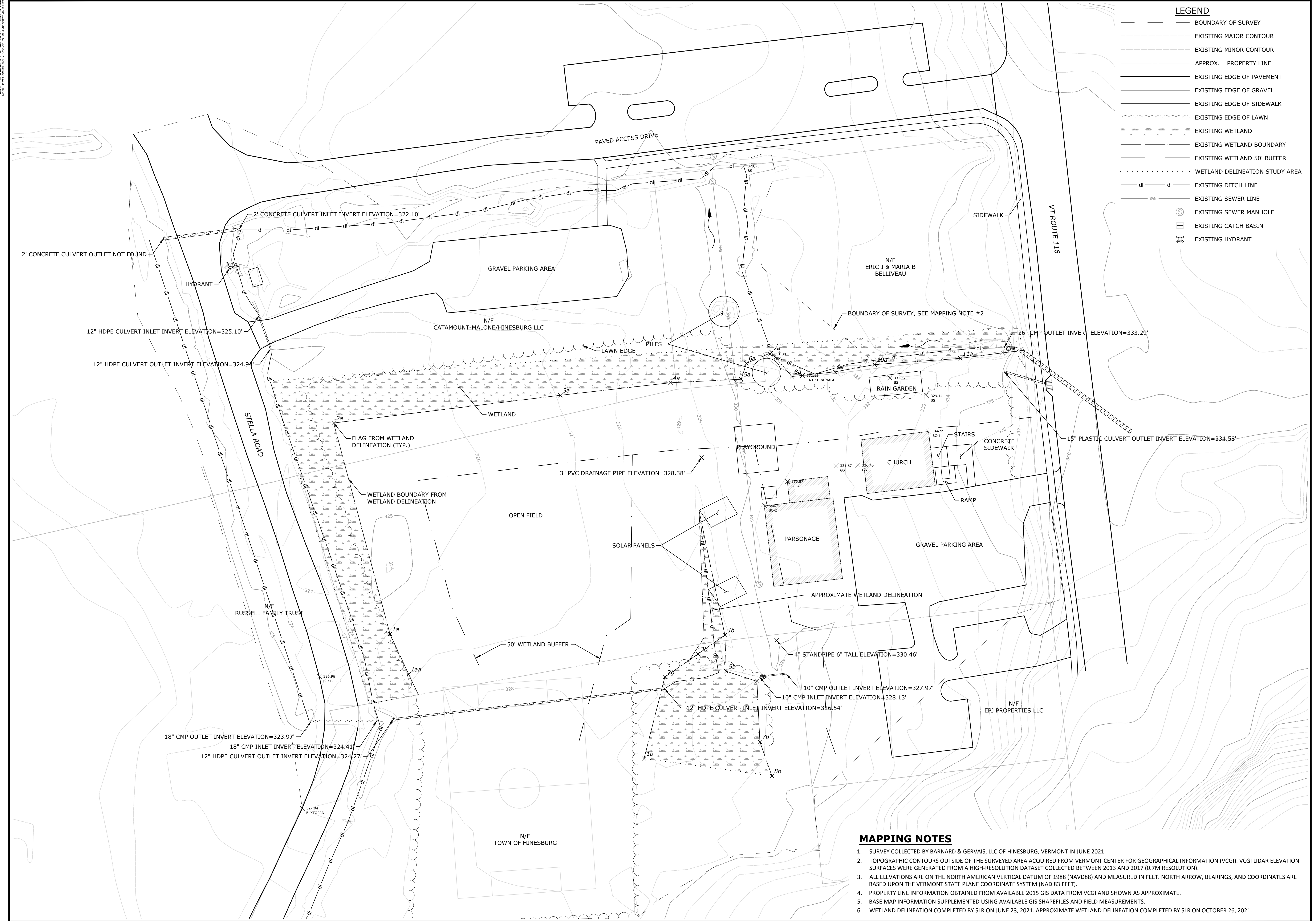
LEWIS CREEK ASSOCIATION  
PO BOX 313  
CHARLOTTE, VERMONT 05445

## LIST OF DRAWINGS

NO.	NAME	TITLE
0#	--	TITLE
0#	SP1	SITE PLAN - EXISTING CONDITIONS
0#	SP2	SITE PLAN - PROPOSED CONDITIONS
04	SP3	SITE PLAN - GRADING & IMPACTS
05	SP4	SITE PLAN - RESTORATION
06	SP5	SITE PLAN - CONSTRUCTION ACCESS
07	XS	CROSS SECTIONS
08	DET	DETAILS

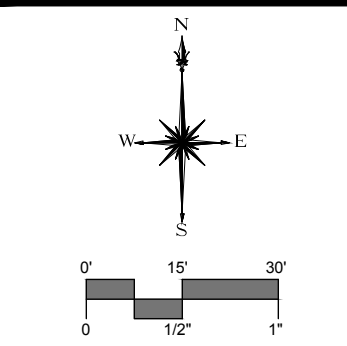


Know what's below.  
Call before you dig.  
www.cbyd.com



**LEGEND**

- BOUNDARY OF SURVEY
- - - EXISTING MAJOR CONTOUR
- - - EXISTING MINOR CONTOUR
- - - APPROX. PROPERTY LINE
- EXISTING EDGE OF PAVEMENT
- EXISTING EDGE OF GRAVEL
- EXISTING EDGE OF SIDEWALK
- EXISTING EDGE OF LAWN
- EXISTING WETLAND
- EXISTING WETLAND BOUNDARY
- EXISTING WETLAND 50' BUFFER
- ... WETLAND DELINEATION STUDY AREA
- dl dl EXISTING DITCH LINE
- SAN EXISTING SEWER LINE
- ⊙ EXISTING SEWER MANHOLE
- ▣ EXISTING CATCH BASIN
- ⊕ EXISTING HYDRANT



**SLR**  
 1 SOUTH MAIN STREET  
 VERMONT, VT 05676  
 802.882.8335  
 SLRCONSULTING.COM

DESCRIPTION	DATE	BY

**SITE PLAN - EXISTING CONDITIONS**  
**WETLANDS RESTORATION IN HINESBURG VILLAGE**  
 VT ROUTE 116  
 HINESBURG, VERMONT

CMN	CMN	JCL
DESIGNED	DRAWN	CHECKED
SCALE		
1" = 30'		
DATE		
DECEMBER 10, 2021		
PROJECT NO.		
3452-33		
SHEET NO.		
2 OF 8		

**SP1**

- MAPPING NOTES**
1. SURVEY COLLECTED BY BARNARD & GERVAIS, LLC OF HINESBURG, VERMONT IN JUNE 2021.
  2. TOPOGRAPHIC CONTOURS OUTSIDE OF THE SURVEYED AREA ACQUIRED FROM VERMONT CENTER FOR GEOGRAPHICAL INFORMATION (VCGI). VCGI LIDAR ELEVATION SURFACES WERE GENERATED FROM A HIGH-RESOLUTION DATASET COLLECTED BETWEEN 2013 AND 2017 (0.7M RESOLUTION).
  3. ALL ELEVATIONS ARE ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND MEASURED IN FEET. NORTH ARROW, BEARINGS, AND COORDINATES ARE BASED UPON THE VERMONT STATE PLANE COORDINATE SYSTEM (NAD 83 FEET).
  4. PROPERTY LINE INFORMATION OBTAINED FROM AVAILABLE 2015 GIS DATA FROM VCGI AND SHOWN AS APPROXIMATE.
  5. BASE MAP INFORMATION SUPPLEMENTED USING AVAILABLE GIS SHAPEFILES AND FIELD MEASUREMENTS.
  6. WETLAND DELINEATION COMPLETED BY SLR ON JUNE 23, 2021. APPROXIMATE WETLAND DELINEATION COMPLETED BY SLR ON OCTOBER 26, 2021.

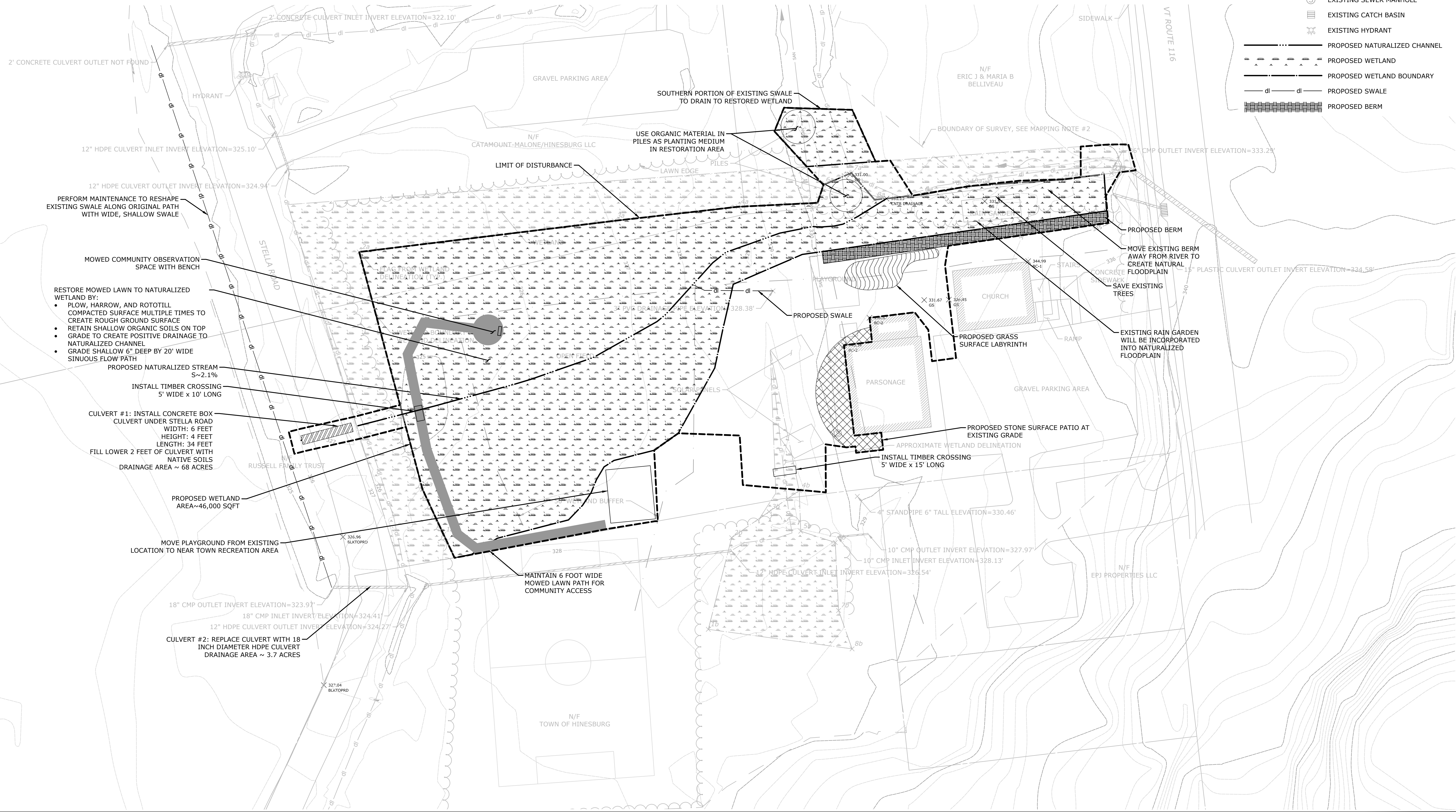
**GENERAL NOTES**

1. THE PURPOSE OF THIS PROJECT IS TO RESTORE A WETLAND AREA BEHIND UNITED CHURCH OF HINESBURG IN HINESBURG, VERMONT.
2. THE LOCATION OF ALL EXISTING UTILITIES SHOULD BE CONFIRMED PRIOR TO BEGINNING CONSTRUCTION. CALL "DIG SAFE" AT 1-888-DIG-SAFE (344-7233). THE CONTRACTOR SHALL TAKE PRECAUTIONS NOT TO DISTURB EXISTING UTILITIES.
3. THE CONTRACTOR SHALL DESIGNATE A SUPERINTENDENT AT THE START OF CONSTRUCTION AND THE CONTRACTOR'S SUPERINTENDENT SHALL BE ON-SITE AT ALL TIMES DURING CONSTRUCTION. THE CONTRACTOR AND HIS/HER JOB SUPERINTENDENT SHALL BE RESPONSIBLE FOR COMPLYING WITH THE JOB SPECIFICATIONS AND PERMIT REQUIREMENTS.
4. ALL STORAGE AND ACCESS ROUTES, PEDESTRIAN FENCES/BARRIERS, AND LIMITS OF CLEARING SHALL BE FLAGGED BY CONTRACTOR PRIOR TO CONSTRUCTION AND APPROVED BY PROJECT ENGINEER.
5. WORKING HOURS SHALL BE APPROVED BY PROJECT ENGINEER AND LANDOWNERS.
6. NO CONSTRUCTION VEHICLES SHALL BE STORED, SERVICED, WASHED OR FLUSHED IN A LOCATION WHERE LEAKS, SPILLAGE, WASTE MATERIALS, CLEANERS, OR WATERS WILL BE INTRODUCED OR FLOW INTO WETLANDS OR WATERCOURSES. AN EMERGENCY MANAGEMENT PLAN AND SPILL KIT WILL BE MAINTAINED ON SITE AT ALL TIMES. IN THE EVENT OF AN ACCIDENTAL RELEASE, IMMEDIATELY STOP CONSTRUCTION WORK, CONTAIN THE SPILL, AND NOTIFY THE TOWN, APPROPRIATE AUTHORITIES AND PROJECT ENGINEER. THE SPILL KIT MUST CONTAIN AT A MINIMUM A CONTAINMENT BOOM, STRAW OR OTHER ABSORBENT MATERIALS, AND BUCKETS.
7. STORAGE AND OR USE OF CHEMICALS, FUELS, OILS, GREASES, BITUMINOUS MATERIALS, SOLIDS, WASTE WASHINGS, AND CEMENT SHALL BE HANDLED APPROPRIATELY AS TO PREVENT LEACHING OR SURFACE RUNOFF INTO WETLANDS, WATERCOURSES, OR DRAINS. ALL APPROVED STORAGE FOR THESE MATERIALS MUST BE CONTAINED.
8. EQUIPMENT SHALL BE REMOVED FROM WATER RESOURCES AND THEIR BUFFERS PRIOR TO REFUELING. NO REFUELING OF EQUIPMENT ALLOWED IN THE WATER OR WETLAND.
9. ALL EQUIPMENT AND VEHICLES SHALL BE CLEANED PRIOR TO AND FOLLOWING CONSTRUCTION TO REDUCE THE POTENTIAL FOR SPREAD OF INVASIVE SPECIES AND SEDIMENT.
10. THE PROJECT SITE IS SUBJECT TO FLOODING. THE CONTRACTOR SHALL MONITOR WEATHER FORECASTS AND STABILIZE THE CONSTRUCTION SITE AND REMOVE EQUIPMENT FROM FLOOD PRONE AREAS. ALL EQUIPMENT TO BE STORED ON HIGH GROUND.
11. WORK SHOULD BE PERFORMED DURING LOW WATER.
12. THERE SHALL BE NO CLAIMS FOR EXTRA COMPENSATION DUE TO DELAYS IN WATER CONTROL ASSOCIATED WITH HIGH WATER LEVELS FROM NATURAL EVENTS SUCH AS FLOODS.
13. THE CONTRACTOR SHALL MAINTAIN ALL ROADWAYS, SIDEWALKS, AND WALKWAYS IN THE AREA FREE OF SOIL, MUD, AND CONSTRUCTION DEBRIS. CONSTRUCTION ENTRANCES MUST BE MAINTAINED AT EACH SITE ACCESS POINT. SEE PLANS AND DETAILS.
14. CONTRACTOR MUST COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL PERMITS THROUGHOUT DURATION OF PROJECT.

15. ALL EXCESS MATERIAL IS TO BE REMOVED AND DISPOSED OF OR RECYCLED OFF SITE.
16. PROPOSED LAYOUT, PROFILE, AND CROSS SECTIONS ARE TO BE STAKED BY THE CONTRACTOR AND REVIEWED BY THE PROJECT ENGINEER. FINAL DIMENSIONS WILL BE FINE-TUNED IN THE FIELD BY THE PROJECT ENGINEER.
17. BEDROCK REMOVAL IS NOT PROPOSED. DO NOT REMOVE BEDROCK WITHOUT DIRECTION OF PROJECT ENGINEER.
18. EXCAVATION TO BE PERFORMED BY MECHANICAL MEANS ONLY. DO NOT OVER-EXCAVATE. PROJECT ENGINEER TO REVIEW PROPOSED GRADES WITH CONTRACTOR AS WORK PROGRESSES.
19. ANY MATERIAL EXPORTED OFF-SITE SHALL BE LEGALLY DISPOSED OF IN AN UPLAND LOCATION AT NO ADDITIONAL COST. THE CONTRACTOR IS RESPONSIBLE FOR FINDING A SUITABLE RECIPIENT OF THE MATERIAL, GAINING REGULATORY APPROVAL FOR EXPORTED MATERIAL PLACEMENT IF NEEDED, AND HAULING.
20. ALL AREAS SURROUNDING THE PROJECT SITE DISTURBED DURING CONSTRUCTION SHALL BE RESTORED UPON COMPLETION OF CONSTRUCTION. THE RESTORATION OF THE SITE IS SUBJECT TO APPROVAL BY THE PROJECT ENGINEER AND LANDOWNER.
21. FOLLOWING COMPLETION OF CONSTRUCTION, THE CONTRACTOR SHALL PARTICIPATE IN A FINAL SITE INSPECTION WITH PROJECT ENGINEER FOR THE PURPOSE OF VERIFYING THAT THE PROJECT HAS BEEN COMPLETED ACCORDING TO THE CONSTRUCTION PLANS AND THE TERMS AND CONDITIONS OF THE CONTRACT.

**LEGEND**

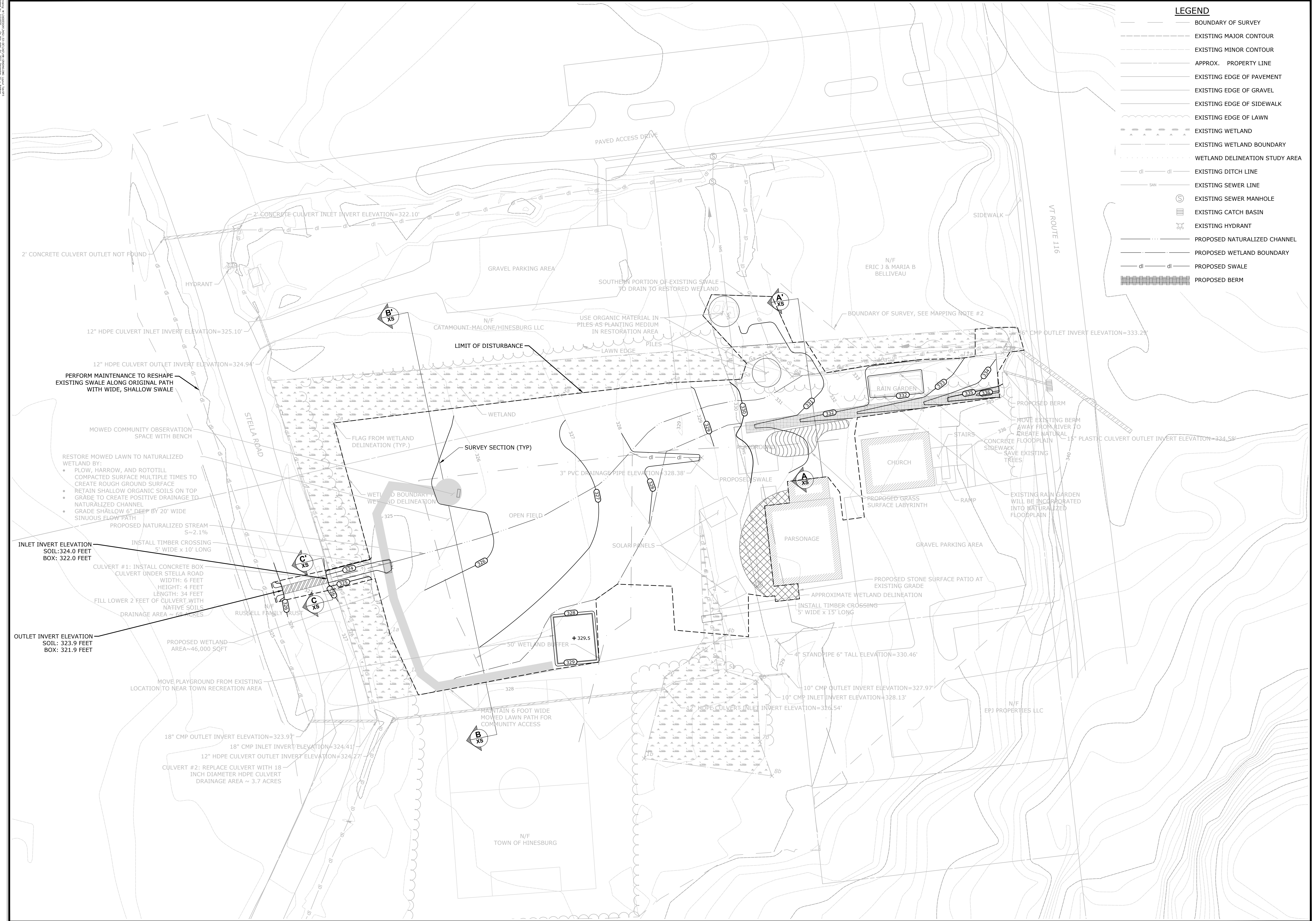
- BOUNDARY OF SURVEY
- - - - - EXISTING MAJOR CONTOUR
- - - - - EXISTING MINOR CONTOUR
- - - - - APPROX. PROPERTY LINE
- — — — — EXISTING EDGE OF PAVEMENT
- — — — — EXISTING EDGE OF GRAVEL
- — — — — EXISTING EDGE OF SIDEWALK
- — — — — EXISTING EDGE OF LAWN
- — — — — EXISTING WETLAND
- — — — — EXISTING WETLAND BOUNDARY
- — — — — WETLAND DELINEATION STUDY AREA
- — — — — EXISTING DITCH LINE
- — — — — EXISTING SEWER LINE
- ⊙ EXISTING SEWER MANHOLE
- ⊞ EXISTING CATCH BASIN
- ⊞ EXISTING HYDRANT
- — — — — PROPOSED NATURALIZED CHANNEL
- — — — — PROPOSED WETLAND
- — — — — PROPOSED WETLAND BOUNDARY
- — — — — PROPOSED SWALE
- — — — — PROPOSED BERM



DESCRIPTION	DATE	BY

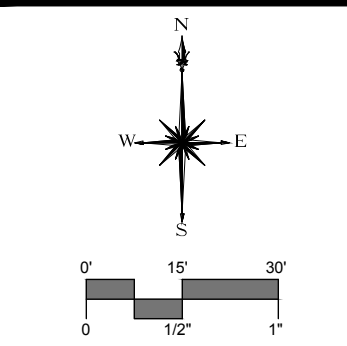
**SITE PLAN - PROPOSED CONDITIONS**  
**WETLANDS RESTORATION IN HINESBURG VILLAGE**  
 VT ROUTE 116  
 HINESBURG, VERMONT

CMN DESIGNED	CMN DRAWN	JCL CHECKED
SCALE 1" = 30'		
DATE DECEMBER 10, 2021		
PROJECT NO. 3452-33		
SHEET NO. 3 OF 8		
SHEET NAME <b>SP2</b>		



**LEGEND**

	BOUNDARY OF SURVEY
	EXISTING MAJOR CONTOUR
	EXISTING MINOR CONTOUR
	APPROX. PROPERTY LINE
	EXISTING EDGE OF PAVEMENT
	EXISTING EDGE OF GRAVEL
	EXISTING EDGE OF SIDEWALK
	EXISTING EDGE OF LAWN
	EXISTING WETLAND
	EXISTING WETLAND BOUNDARY
	WETLAND DELINEATION STUDY AREA
	EXISTING DITCH LINE
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	EXISTING SEWER MANHOLE
	EXISTING CATCH BASIN
	EXISTING HYDRANT
	PROPOSED NATURALIZED CHANNEL
	PROPOSED WETLAND BOUNDARY
	PROPOSED SWALE
	PROPOSED BERM



DESCRIPTION	DATE	BY

**SITE PLAN - GRADING**  
**WETLANDS RESTORATION IN HINESBURG VILLAGE**  
 VT ROUTE 116  
 HINESBURG, VERMONT

CMN DESIGNED	CMN DRAWN	JCL CHECKED
SCALE 1" = 30'		
DATE DECEMBER 10, 2021		
PROJECT NO. 3452-33		
SHEET NO. 4 OF 8		
SHEET NAME <b>SP3</b>		

**RESTORATION NOTES**

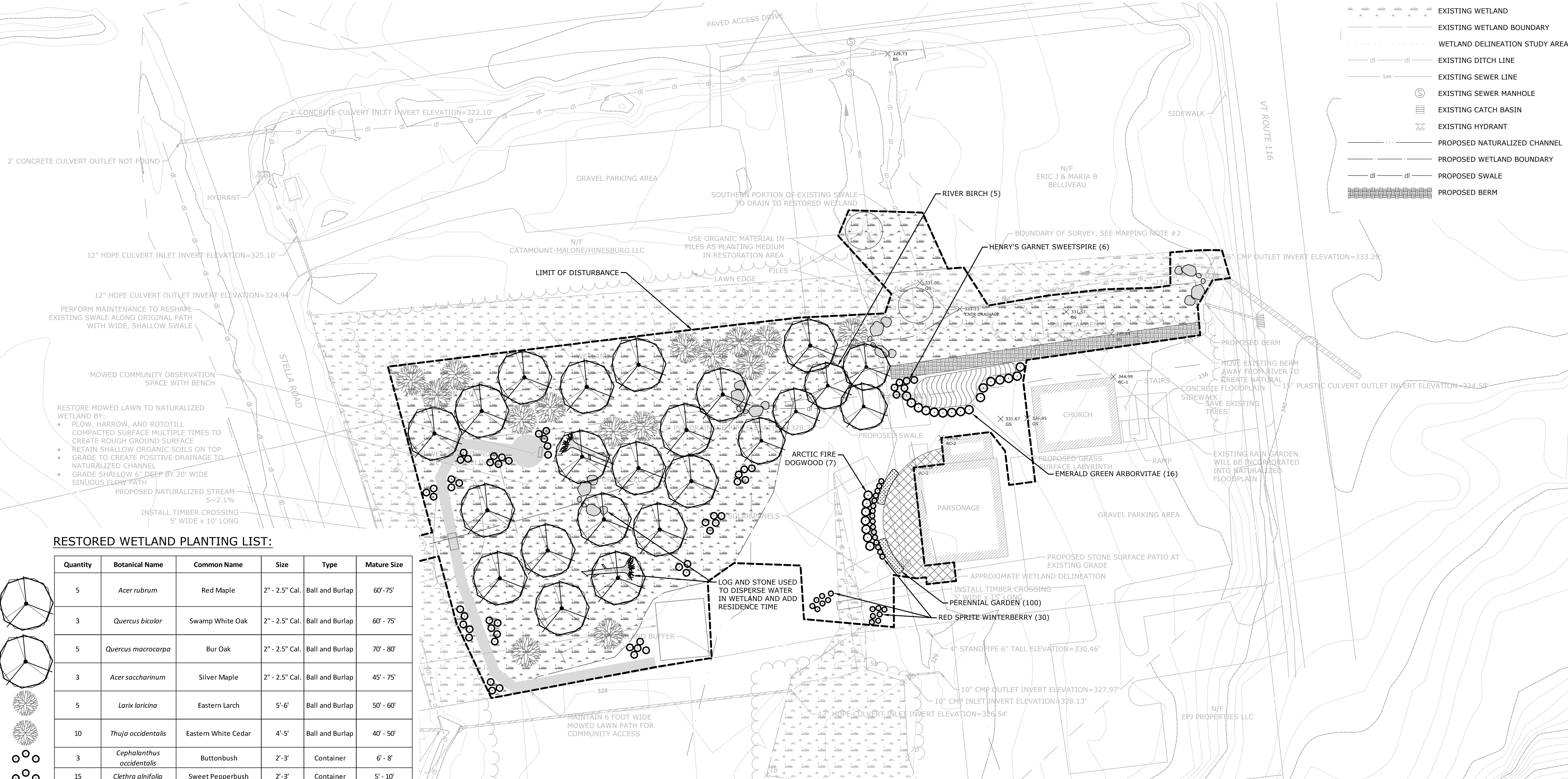
1. SEED RESTORED WETLAND WITH SEED MIXES ACCORDING TO THE VERMONT SEED MIX LIST. APPLICATION RATE VARIES BY SPECIES CHOSEN.
2. SEED ALL DISTURBED LAWN AND PATH AREAS WITH VERMONT CONSERVATION GRASS SEED MIX.
3. APPLY 2 INCHES STRAW MULCH OVER ALL SEEDED AREAS. HAY IS NOT ALLOWED.
4. REMOVE TEMPORARY ACCESS ROADS AND TEMPORARY STOCKPILE AREAS.
5. RESTORE ALL ACCESS ROUTES USED DURING CONSTRUCTION TO PRE-EXISTING OR IMPROVED CONDITIONS, FILL RUTS CREATED BY EQUIPMENT TO RESTORE GRADE AND REVEGETATE AS NEEDED.
6. CONTRACTOR IS RESPONSIBLE FOR REPAIRS TO SITE FEATURES IF DAMAGED BY CONSTRUCTION ACTIVITIES.
7. RESTORE ALL OTHER DISTURBED AREAS WITHIN THE PROJECT SITE SUCH AS TEMPORARY ACCESS ROADS, STOCKPILE AREAS, STAGING AREAS, AND SURPLUS DISPOSAL AREAS TO ORIGINAL OR IMPROVED CONDITION.
8. THE SITE IS TO BE FULLY SEEDED AND MULCHED FOLLOWING CONSTRUCTION.
9. TREE AND SHRUB PLACEMENT WILL BE DETERMINED AT THE TIME OF PLANTING AT THE DIRECTION OF THE OWNER (LCA/UCH).

**TREE PLANTING NOTES**

1. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UNDERGROUND UTILITIES PRIOR TO EXCAVATING PLANT PITS.
2. PLANTINGS SHALL BE LIMITED TO THE PERIODS OF APRIL 15 - JULY 15 OR SEPTEMBER 15 - NOVEMBER 30.
3. IN TREE PLANTING HOLES - TOPSOIL TO CONTAIN A MINIMUM OF 12% ORGANIC CONTENT (BY WEIGHT), AMEND SOIL WITH ORGANIC MATTER (LEAF COMPOST).
4. THE LANDSCAPE CONTRACTOR SHALL PROVIDE A 2" MIN. DEPTH OF SHREDDED MULCH EXTENDING 1 FOOT BEYOND EACH PLANTING HOLE.
5. QUANTITY AND PLACEMENT OF PLANTS ARE APPROXIMATE AND SHOULD BE ADJUSTED IN THE FIELD TO AVOID IMPACT TO EXISTING WOODY SHRUBS AND SMALL TREES ON THE SITE.
6. WHERE A SIZE RANGE IS SPECIFIED AT LEAST 50% OF PLANTS PROVIDED SHALL BE OF THE LARGER SIZE.
7. MAINTENANCE SHALL BEGIN IMMEDIATELY AFTER PLANTING AND SHALL CONTINUE UNTIL AT LEAST 50% OF THE TREES HAVE REACHED 6 FEET TALL. MAINTENANCE SHALL INCLUDE WATERING, MULCHING, REPLACEMENT OF SICK OR DEAD PLANTS, AND ALL OTHER CARE NEEDED FOR PROPER GROWTH OF THE PLANTS.
8. WATER PLANTS SEVERAL TIMES A WEEK FOR THE FIRST FEW WEEKS IF NO SUBSTANTIAL RAIN FALLS. ALSO WATER DURING DRY SPELLS FOR THE FIRST SUMMER.
9. ALL TREES AND SHRUBS WILL CARRY A GUARANTEE FOR 3 YEARS AFTER PLANTING. CONTRACTOR RESPONSIBLE FOR PROTECTION FROM RODENTS.

**LEGEND**

- BOUNDARY OF SURVEY
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- APPROX. PROPERTY LINE
- EXISTING EDGE OF PAVEMENT
- EXISTING EDGE OF GRAVEL
- EXISTING EDGE OF SIDEWALK
- EXISTING EDGE OF LAWN
- EXISTING WETLAND
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- WETLAND DELINEATION STUDY AREA
- EXISTING DITCH LINE
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- ⊙ EXISTING SEWER MANHOLE
- ⊞ EXISTING CATCH BASIN
- ⊞ EXISTING HYDRANT
- PROPOSED NATURALIZED CHANNEL
- PROPOSED WETLAND BOUNDARY
- PROPOSED SWALE
- PROPOSED BERM



**RESTORED WETLAND PLANTING LIST:**

Quantity	Botanical Name	Common Name	Size	Type	Mature Size
5	<i>Acer rubrum</i>	Red Maple	2" - 2.5" Cal.	Ball and Burlap	60' - 75'
3	<i>Quercus bicolor</i>	Swamp White Oak	2" - 2.5" Cal.	Ball and Burlap	60' - 75'
5	<i>Quercus macrocarpa</i>	Bur Oak	2" - 2.5" Cal.	Ball and Burlap	70' - 80'
3	<i>Acer saccharinum</i>	Silver Maple	2" - 2.5" Cal.	Ball and Burlap	45' - 75'
5	<i>Larix laricina</i>	Eastern Larch	5'-6'	Ball and Burlap	50' - 60'
10	<i>Thuja occidentalis</i>	Eastern White Cedar	4'-5'	Ball and Burlap	40' - 50'
3	<i>Cephalanthus occidentalis</i>	Buttonbush	2'-3'	Container	6' - 8'
15	<i>Clethra alnifolia</i>	Sweet Pepperbush	2'-3'	Container	5' - 10'
8	<i>Cornus racemosa</i>	Gray Stem Dogwood	2'-3'	Container	10' - 15'
15	<i>Ilex verticillata</i>	Afterglow (Female Winterberry)	2'-3'	Container	3' - 15'
1	<i>Ilex verticillata</i>	Jim Dandy (Male Winterberry)	2'-3'	Container	3' - 15'
8	<i>Hamamelis virginiana</i>	Witch Hazel	2'-3'	Container	15' - 30'

Seed Mix Name	Species	Application Rate	Area	Estimated Quantity
Vermont Wetland Shrub Mix	Blue vervain ( <i>Verbena hastata</i> ), Joe-pye weed ( <i>Eupatoriadelphus maculatus</i> ), Green bulrush ( <i>Scirpus atrovirens</i> ), Nodding sedge ( <i>Carex crinita</i> ), Buttonbush ( <i>Cephalanthus occidentalis</i> ), Red-osier dogwood ( <i>Cornus sericea</i> ), Elderberry ( <i>Sambucus canadensis</i> ), Nodding bur-marigold ( <i>Bidens cernua</i> ), Silky dogwood ( <i>Cornus amomum</i> ), Blueflag iris ( <i>Iris versicolor</i> ), Greater bladder sedge ( <i>Carex intumescens</i> )	18 Lbs. / Acre	1.06 Acres	19.1 Lbs.

**ADDITIONAL PLANTINGS LIST:**

Quantity	Botanical Name	Common Name	Size	Type	Mature Size
5	<i>Betula nigra</i>	River Birch	2" - 2.5" Cal.	Ball and Burlap	40' - 70'
16	<i>Thuja occidentalis 'Smaragd'</i>	Emerald Green Arborvitae	4'-5'	Ball and Burlap	10' - 15'
7	<i>Cornus stolonifera</i>	Arctic Fire Dogwood	2'-3'	Container	3' - 4'
30	<i>Ilex verticillata</i>	Red Sprite Winterberry	2'-3'	Container	3' - 5'
6	<i>Itea virginica</i>	Henry's Garnet Sweetspire	2'-3'	Container	5' - 6'



DESCRIPTION	DATE	BY

**SITE PLAN - RESTORATION**  
**WETLANDS RESTORATION IN HINESBURG VILLAGE**  
 VT ROUTE 116  
 HINESBURG, VERMONT

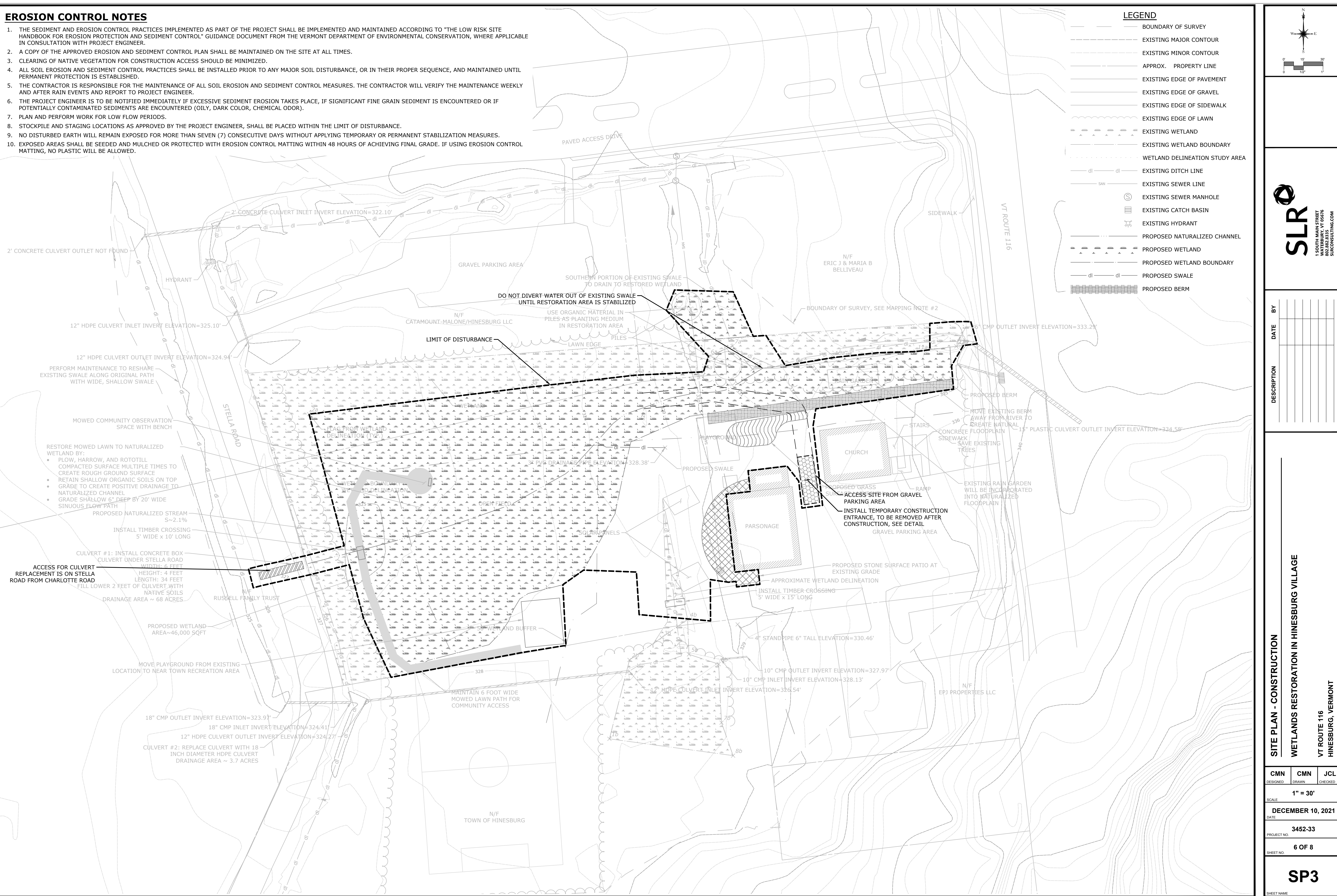
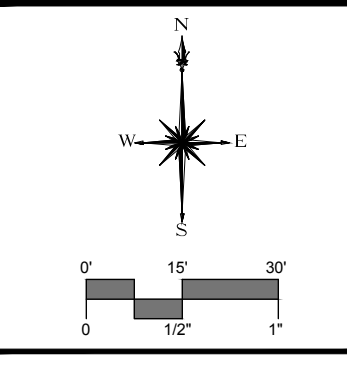
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SCALE: 1" = 30'		
DATE: DECEMBER 10, 2021		
PROJECT NO.: 3452-33		
SHEET NO.: 5 OF 8		
<b>SP4</b>		

**EROSION CONTROL NOTES**

1. THE SEDIMENT AND EROSION CONTROL PRACTICES IMPLEMENTED AS PART OF THE PROJECT SHALL BE IMPLEMENTED AND MAINTAINED ACCORDING TO "THE LOW RISK SITE HANDBOOK FOR EROSION PROTECTION AND SEDIMENT CONTROL" GUIDANCE DOCUMENT FROM THE VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION, WHERE APPLICABLE IN CONSULTATION WITH PROJECT ENGINEER.
2. A COPY OF THE APPROVED EROSION AND SEDIMENT CONTROL PLAN SHALL BE MAINTAINED ON THE SITE AT ALL TIMES.
3. CLEARING OF NATIVE VEGETATION FOR CONSTRUCTION ACCESS SHOULD BE MINIMIZED.
4. ALL SOIL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE INSTALLED PRIOR TO ANY MAJOR SOIL DISTURBANCE, OR IN THEIR PROPER SEQUENCE, AND MAINTAINED UNTIL PERMANENT PROTECTION IS ESTABLISHED.
5. THE CONTRACTOR IS RESPONSIBLE FOR THE MAINTENANCE OF ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES. THE CONTRACTOR WILL VERIFY THE MAINTENANCE WEEKLY AND AFTER RAIN EVENTS AND REPORT TO PROJECT ENGINEER.
6. THE PROJECT ENGINEER IS TO BE NOTIFIED IMMEDIATELY IF EXCESSIVE SEDIMENT EROSION TAKES PLACE, IF SIGNIFICANT FINE GRAIN SEDIMENT IS ENCOUNTERED OR IF POTENTIALLY CONTAMINATED SEDIMENTS ARE ENCOUNTERED (OILY, DARK COLOR, CHEMICAL ODOR).
7. PLAN AND PERFORM WORK FOR LOW FLOW PERIODS.
8. STOCKPILE AND STAGING LOCATIONS AS APPROVED BY THE PROJECT ENGINEER, SHALL BE PLACED WITHIN THE LIMIT OF DISTURBANCE.
9. NO DISTURBED EARTH WILL REMAIN EXPOSED FOR MORE THAN SEVEN (7) CONSECUTIVE DAYS WITHOUT APPLYING TEMPORARY OR PERMANENT STABILIZATION MEASURES.
10. EXPOSED AREAS SHALL BE SEEDED AND MULCHED OR PROTECTED WITH EROSION CONTROL MATTING WITHIN 48 HOURS OF ACHIEVING FINAL GRADE. IF USING EROSION CONTROL MATTING, NO PLASTIC WILL BE ALLOWED.

**LEGEND**

- BOUNDARY OF SURVEY
- - - EXISTING MAJOR CONTOUR
- - - EXISTING MINOR CONTOUR
- - - APPROX. PROPERTY LINE
- EXISTING EDGE OF PAVEMENT
- EXISTING EDGE OF GRAVEL
- EXISTING EDGE OF SIDEWALK
- EXISTING EDGE OF LAWN
- EXISTING WETLAND
- EXISTING WETLAND BOUNDARY
- - - WETLAND DELINEATION STUDY AREA
- dl - dl - EXISTING DITCH LINE
- SAN - EXISTING SEWER LINE
- ⊙ EXISTING SEWER MANHOLE
- ▣ EXISTING CATCH BASIN
- ⊕ EXISTING HYDRANT
- - - PROPOSED NATURALIZED CHANNEL
- - - PROPOSED WETLAND
- - - PROPOSED WETLAND BOUNDARY
- dl - dl - PROPOSED SWALE
- ▨ PROPOSED BERM

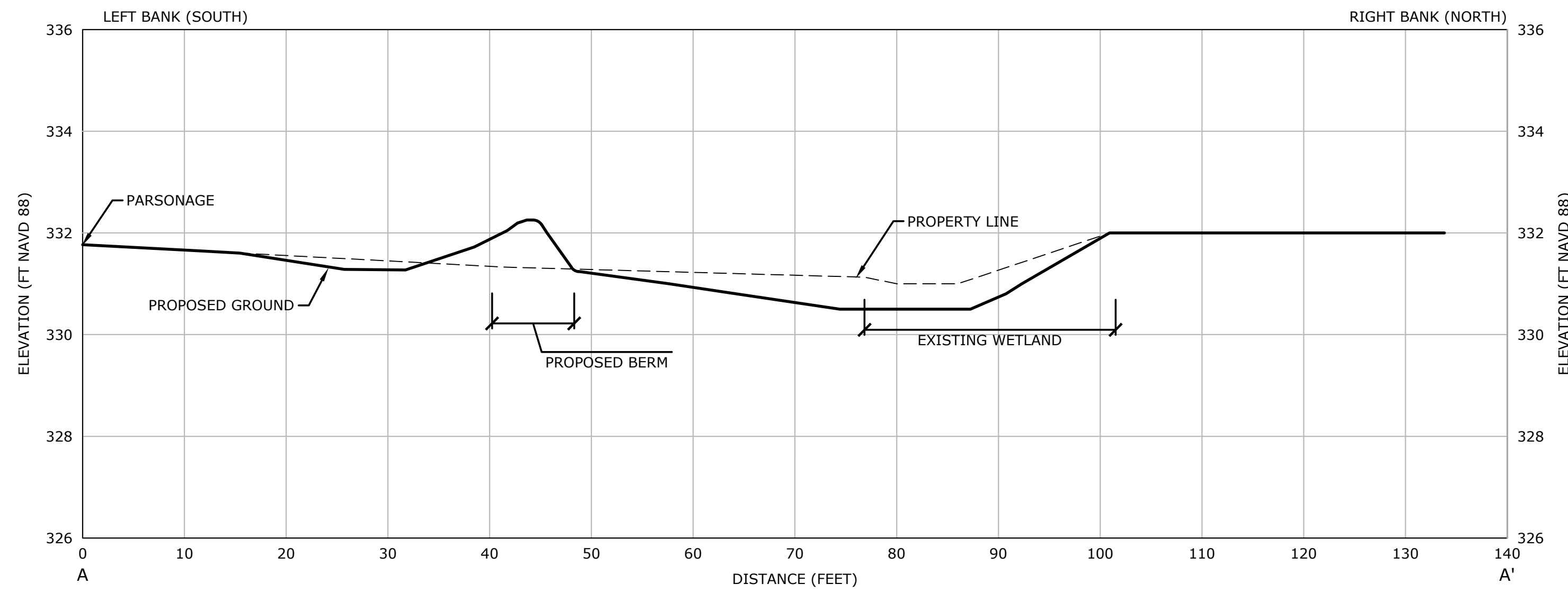


**SLR**  
 1 SOUTH MAIN STREET  
 VERMONT, VT 05676  
 802.282.8335  
 SLRCONSULTING.COM

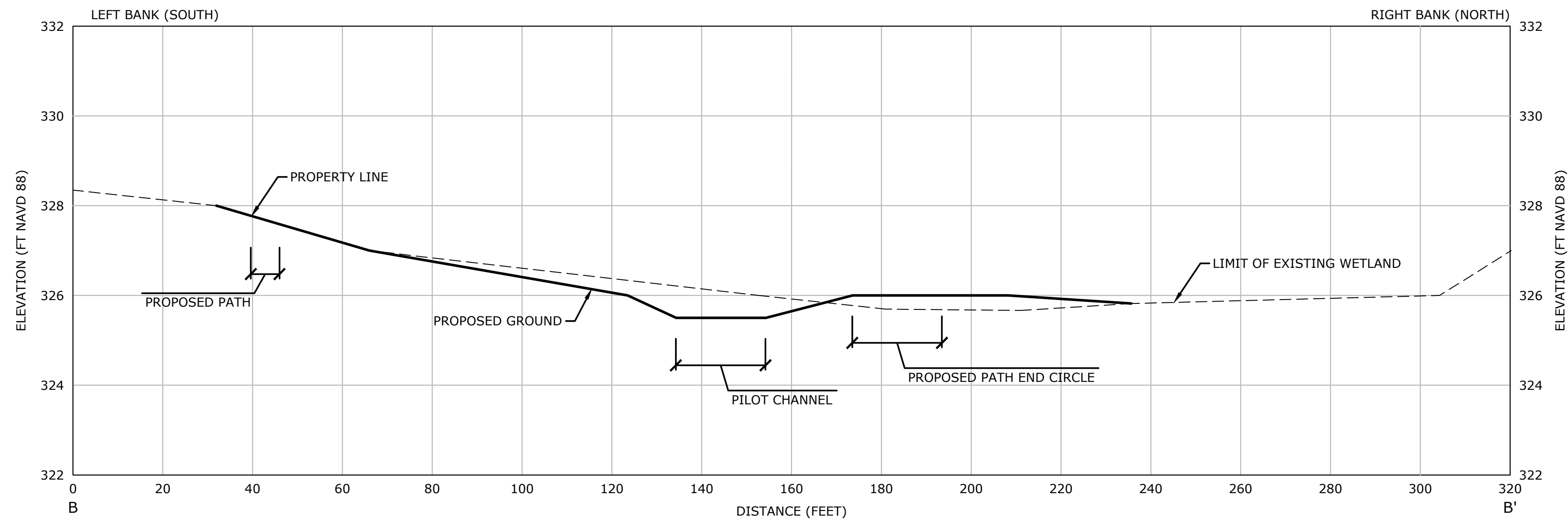
DESCRIPTION	DATE	BY

**SITE PLAN - CONSTRUCTION**  
**WETLANDS RESTORATION IN HINESBURG VILLAGE**  
 VT ROUTE 116  
 HINESBURG, VERMONT

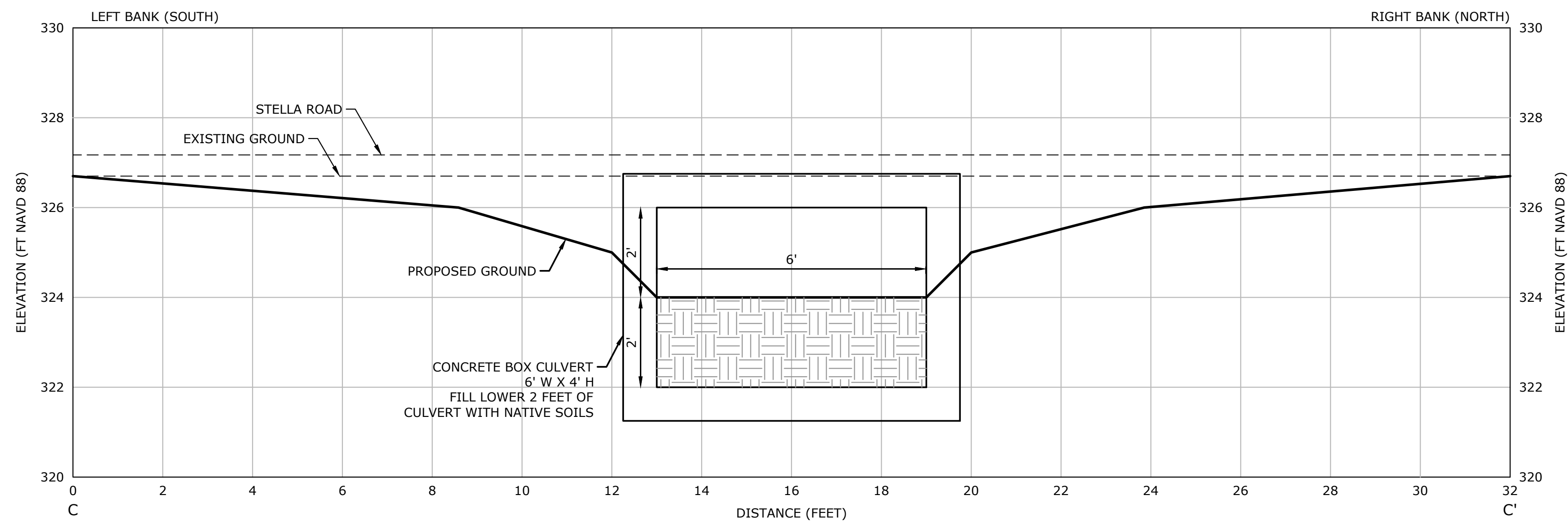
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DATE DECEMBER 10, 2021		
PROJECT NO. 3452-33		
SHEET NO. 6 OF 8		
SHEET NAME <b>SP3</b>		



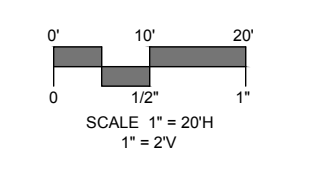
**CROSS SECTION A-A'**  
SCALE: H: 1"=10', V: 1"=2'



**CROSS SECTION B-B'**  
SCALE: H: 1"=20', V: 1"=2'



**CROSS SECTION C-C'**  
SCALE: 1"=2'



DESCRIPTION	DATE	BY

WETLANDS RESTORATION IN HINESBURG VILLAGE

VT ROUTE 116  
HINESBURG, VERMONT

FINAL DESIGN

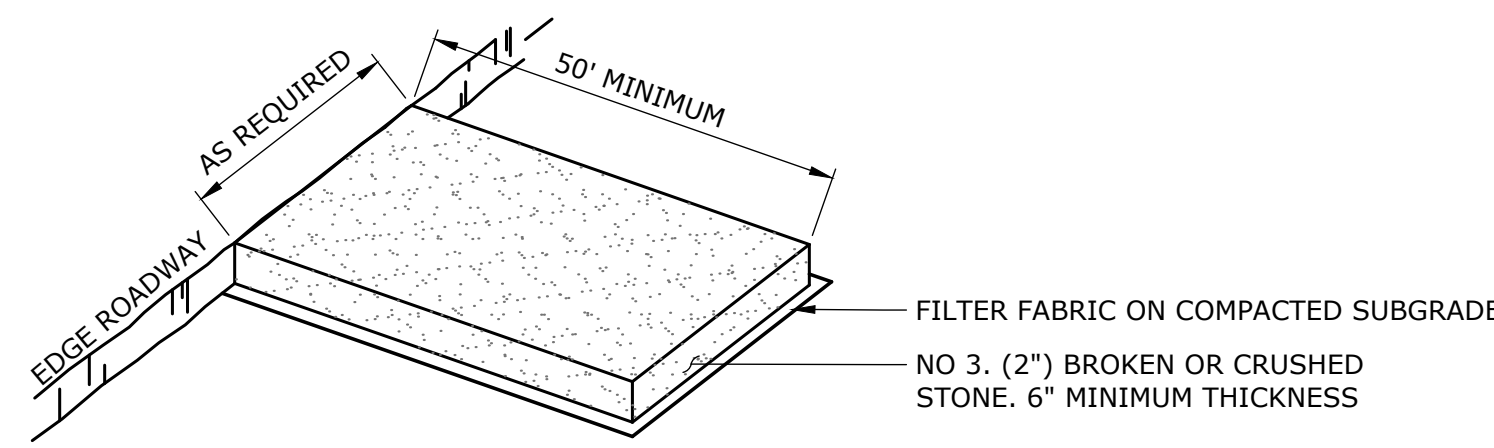
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DRAWN	CMN	CHECKED
VARIES		
DECEMBER 10, 2021		
DATE		
3452-33		
PROJECT NO.		
7 OF 8		
SHEET NO.		

XS

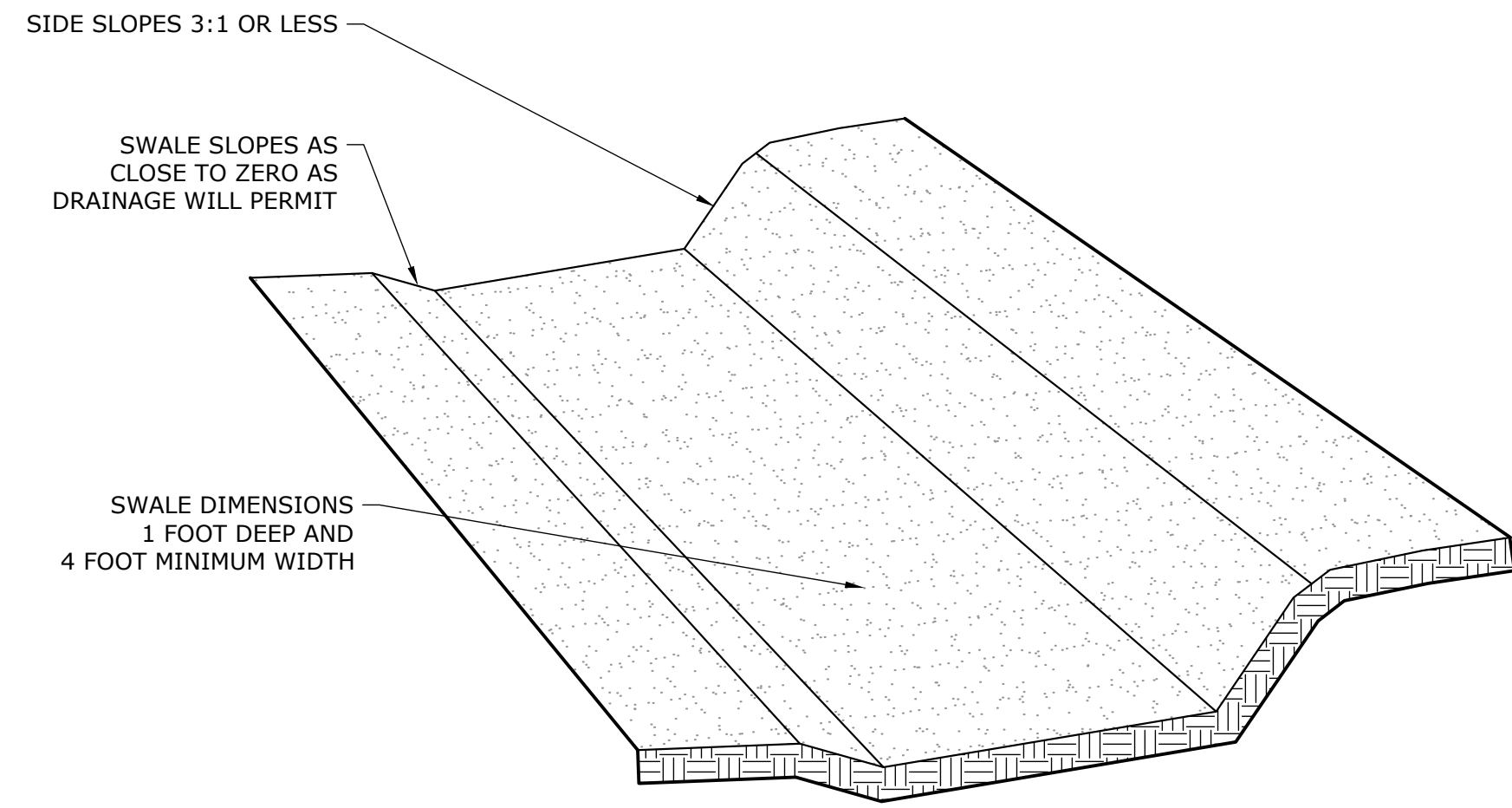


**WETLAND RESTORATION OPERATIONS & MAINTENANCE NOTES:**

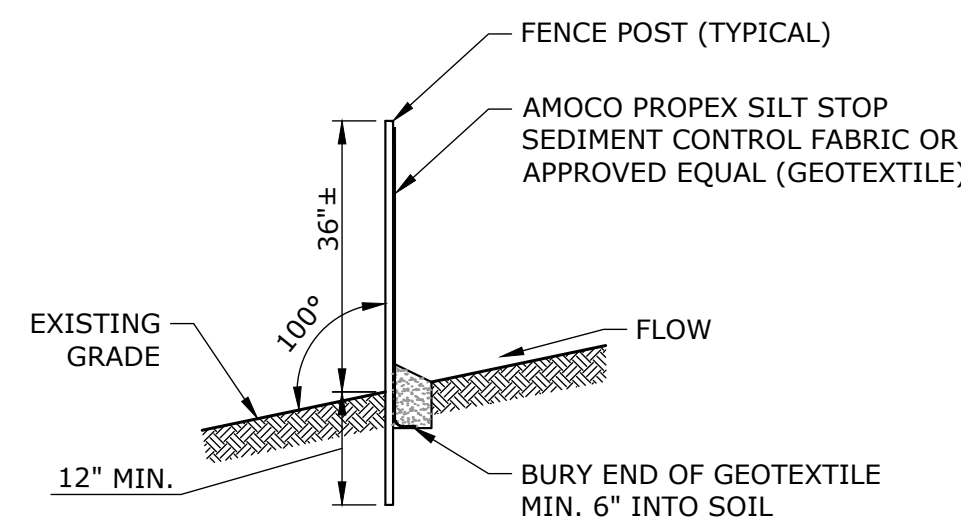
1. DURING FIRST YEAR LANDSCAPE CONTRACTOR TO PROVIDE PLANT MAINTENANCE.
2. DURING FIRST YEAR WALK SITE TO REMOVE INVASIVE SPECIES BY HAND AT MIDDLE AND END OF GROWING SEASON.
3. WETLAND RESTORATIONS ARE INTENDED TO RESTORE WETLAND FUNCTIONS AND STREAM DYNAMIC EQUILIBRIUM TO ALLOW THE STREAM TO MEANDER OVER TIME. THE CHANNEL WILL MOVE IN THE FUTURE. IT IS EXPECTED THAT THE LANDOWNERS WILL NOT TAKE ACTION USING HARD ARMORING TO HOLD THE STREAM IN PLACE ACROSS THE PROJECT AREA OR TO FILL ANY PORTION OF THE RESTORED WETLAND AREA.
4. DURING THE GROWING SEASON, EVALUATE NON-INVASIVE VEGETATIVE COVER. SUCCESSFUL VEGETATION IS DEFINED AS 80% AERIAL COVERAGE OF NON-INVASIVE VEGETATIVE COVER.
5. IN AREAS OF POOR VEGETATIVE COVER, RESEED WITH NATIVE WETLAND SEED MIX.
6. IN SPRING AND AFTER LARGE FLOOD VISIT THE SITE TO REMOVE ANY DEBRIS BLOCKING CULVERTS AND NOTE ANY EROSION PATHS.
7. IF EROSION PATHS LARGER THAN 1 FOOT DEEP APPEAR, PLACE LOGS AND BRUSH TO BREAK UP FLOW PATH AND DISPERSE FLOW IN SURROUNDING VEGETATION.



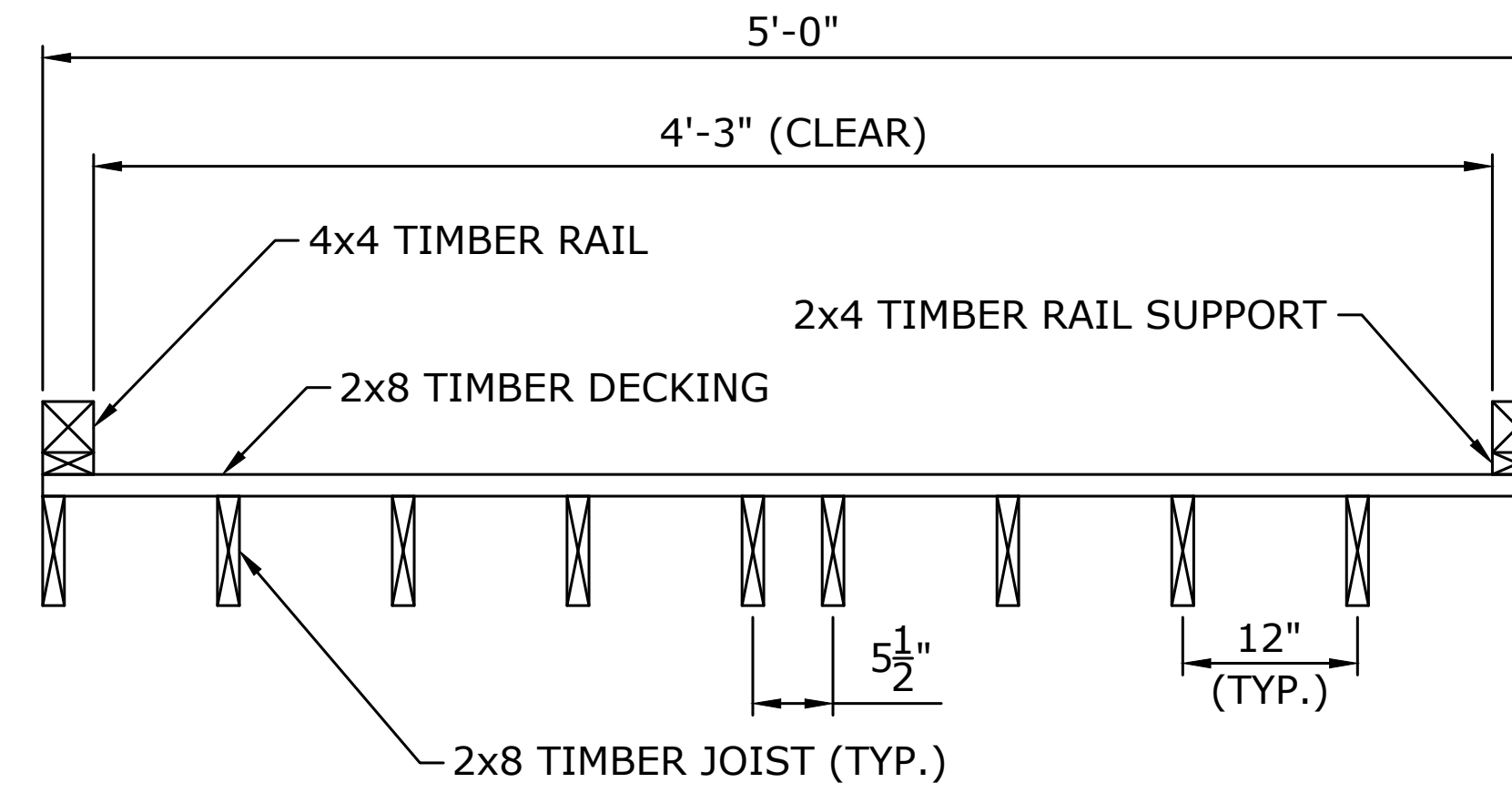
**CONSTRUCTION ENTRANCE PAD**  
NOT TO SCALE



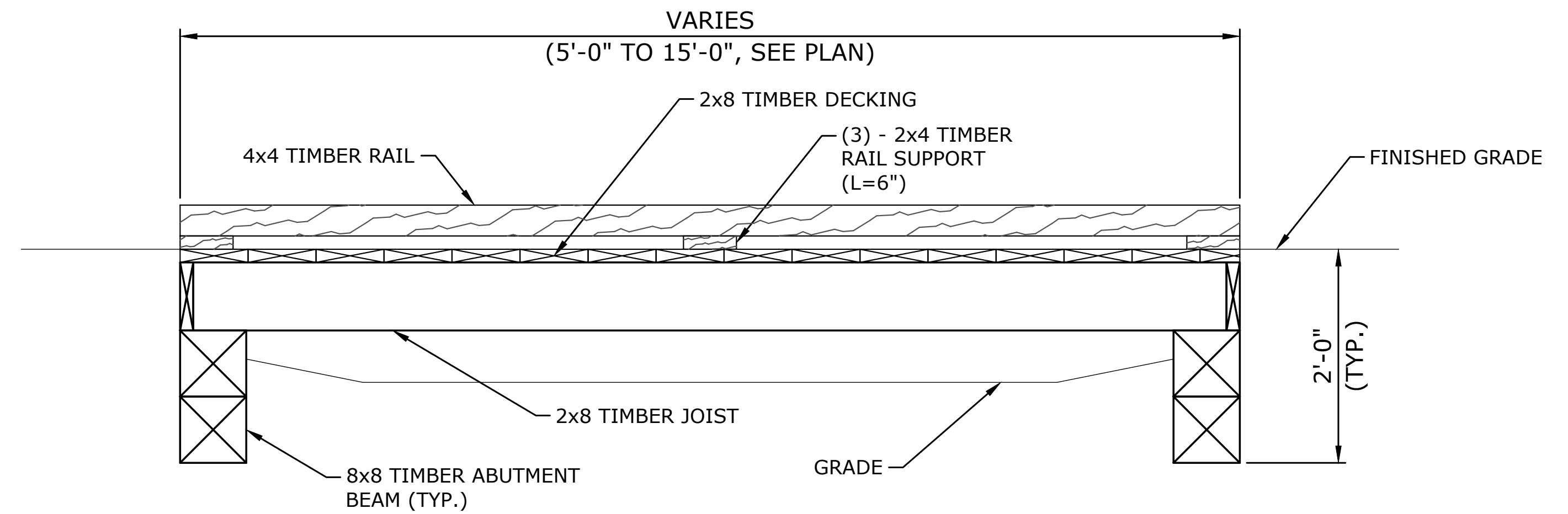
**GRASSED SWALE**  
NOT TO SCALE



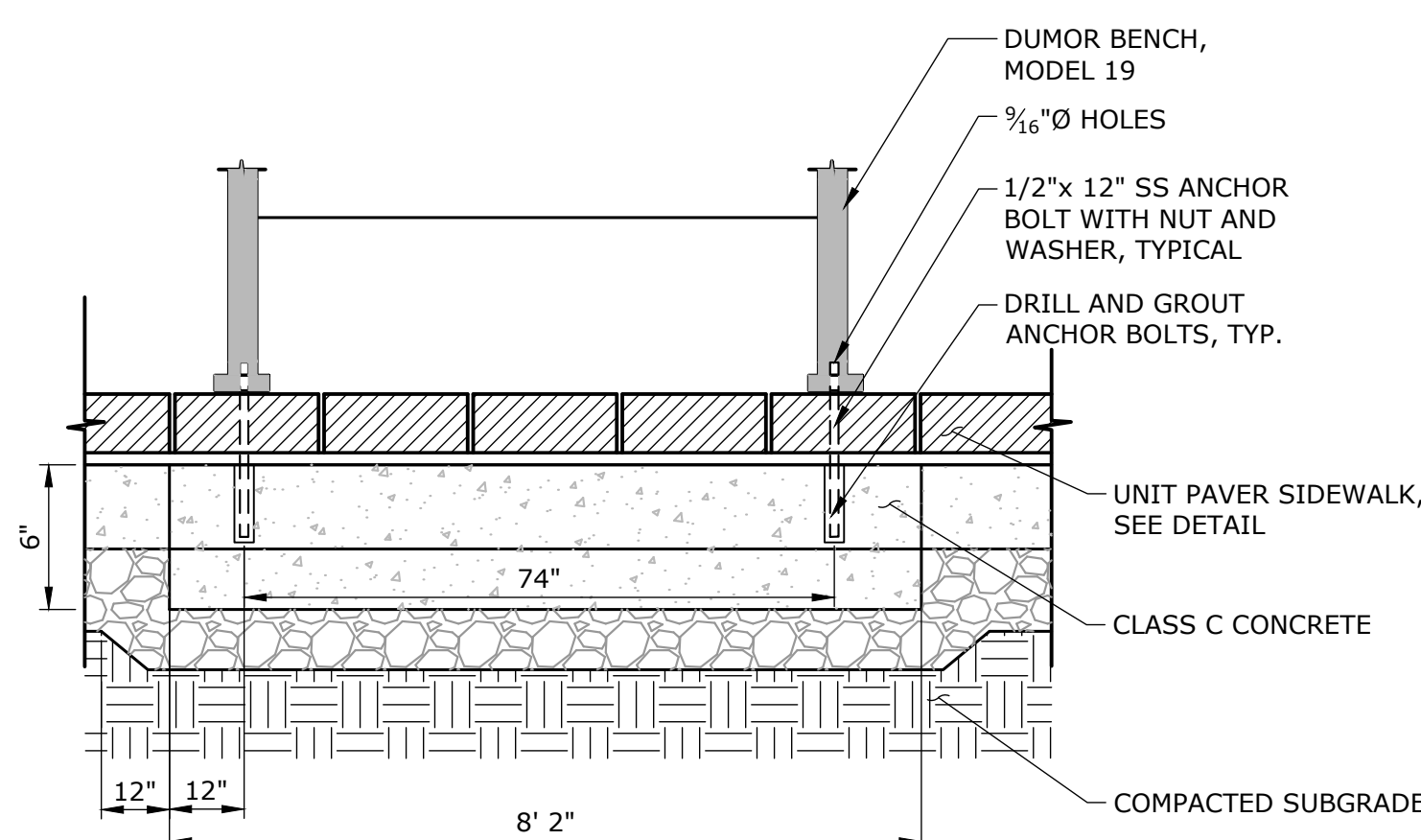
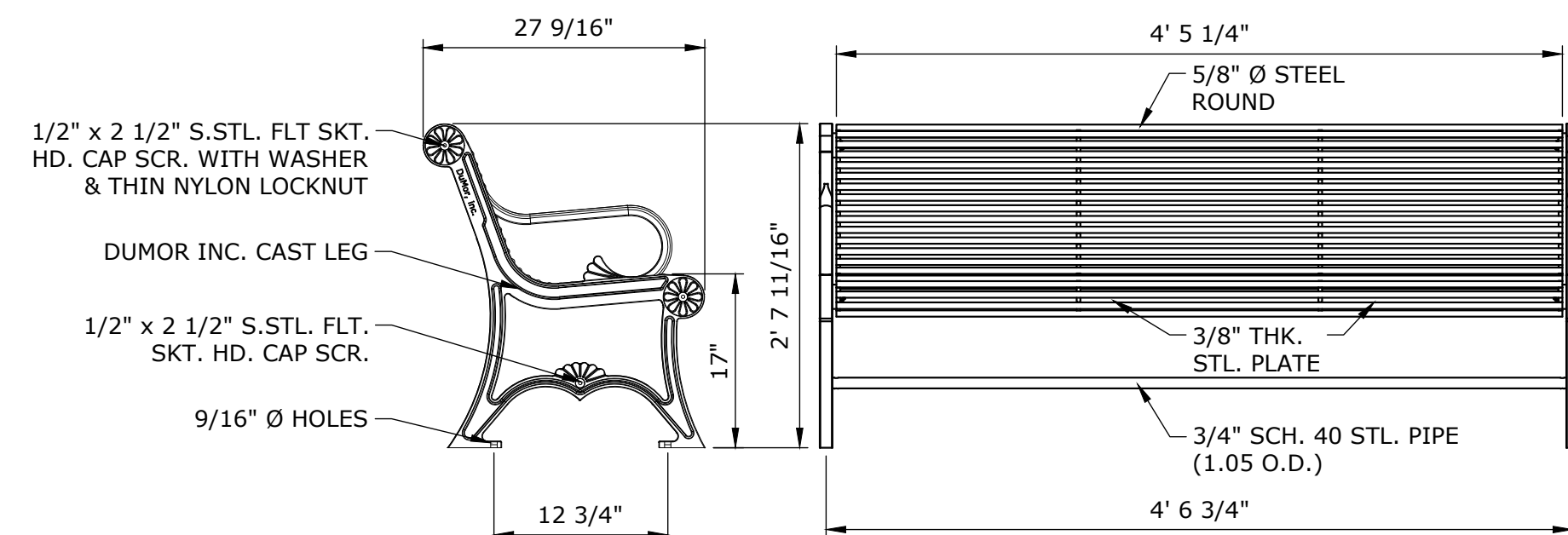
**SEDIMENT FILTER FENCE**  
NOT TO SCALE



**TYPICAL TIMBER BRIDGE SECTION**  
SCALE: 3/4" = 1'-0"

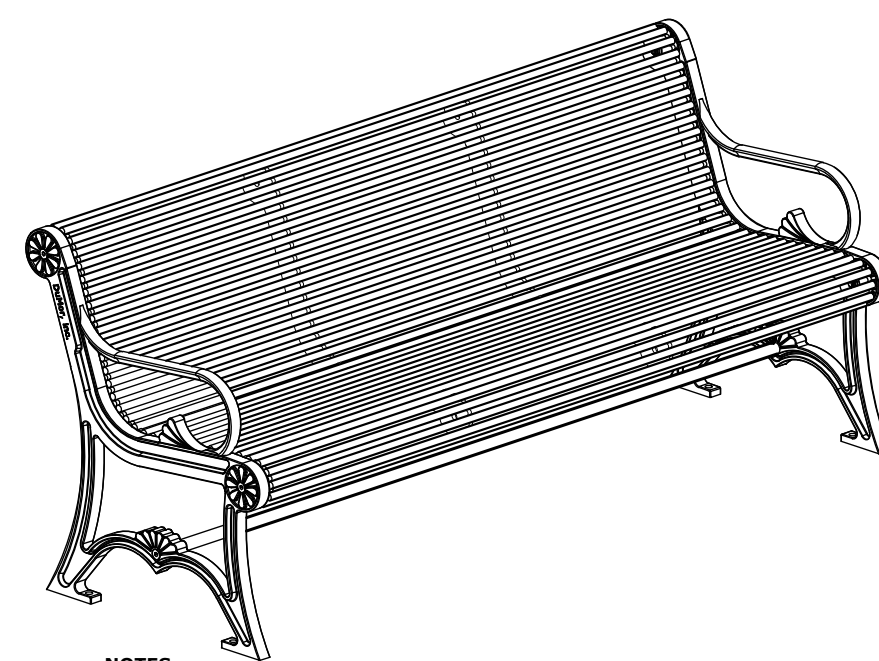


**TYPICAL TIMBER BRIDGE ELEVATION**  
SCALE: 3/4" = 1'-0"



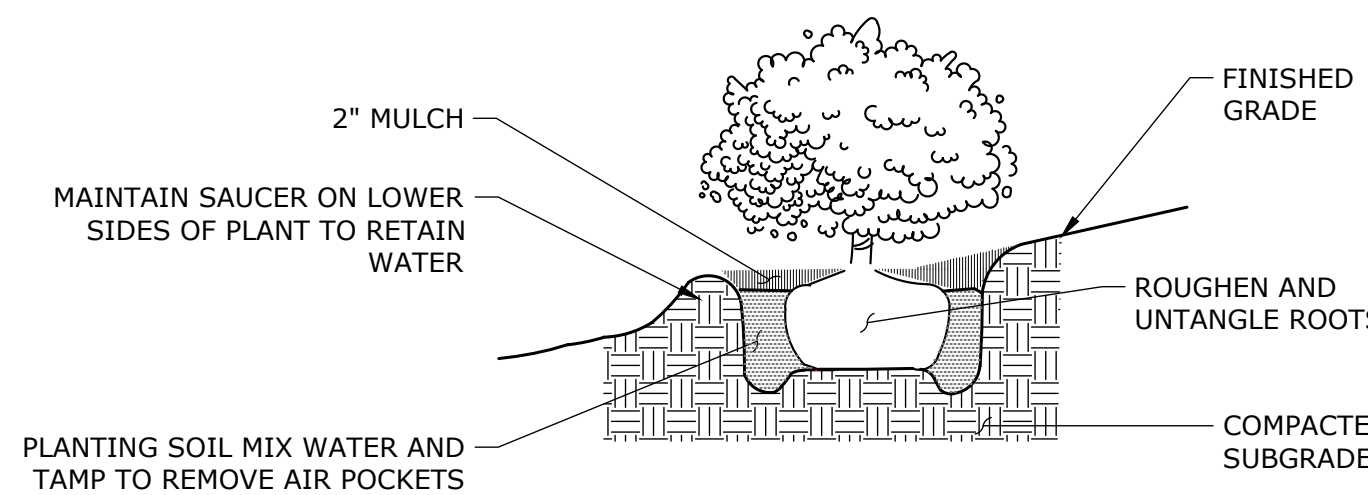
- NOTES:**
1. 1/2" x 8" STAINLESS STEEL ANCHOR BOLTS & NUTS PROVIDED BY CONTRACTOR

**SITE BENCH MOUNTING**  
NOT TO SCALE



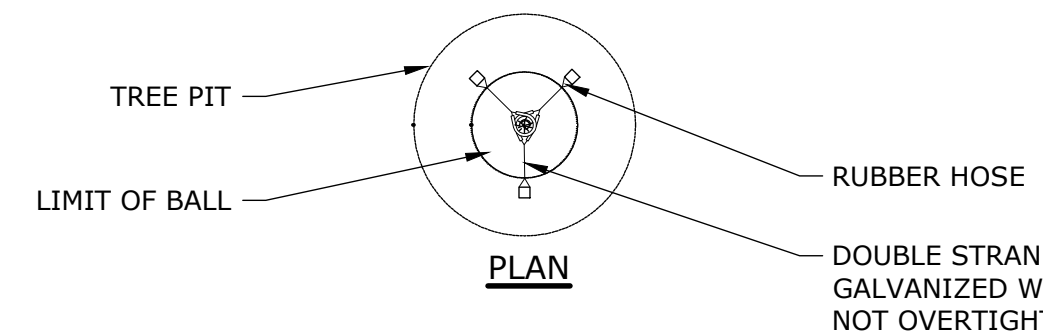
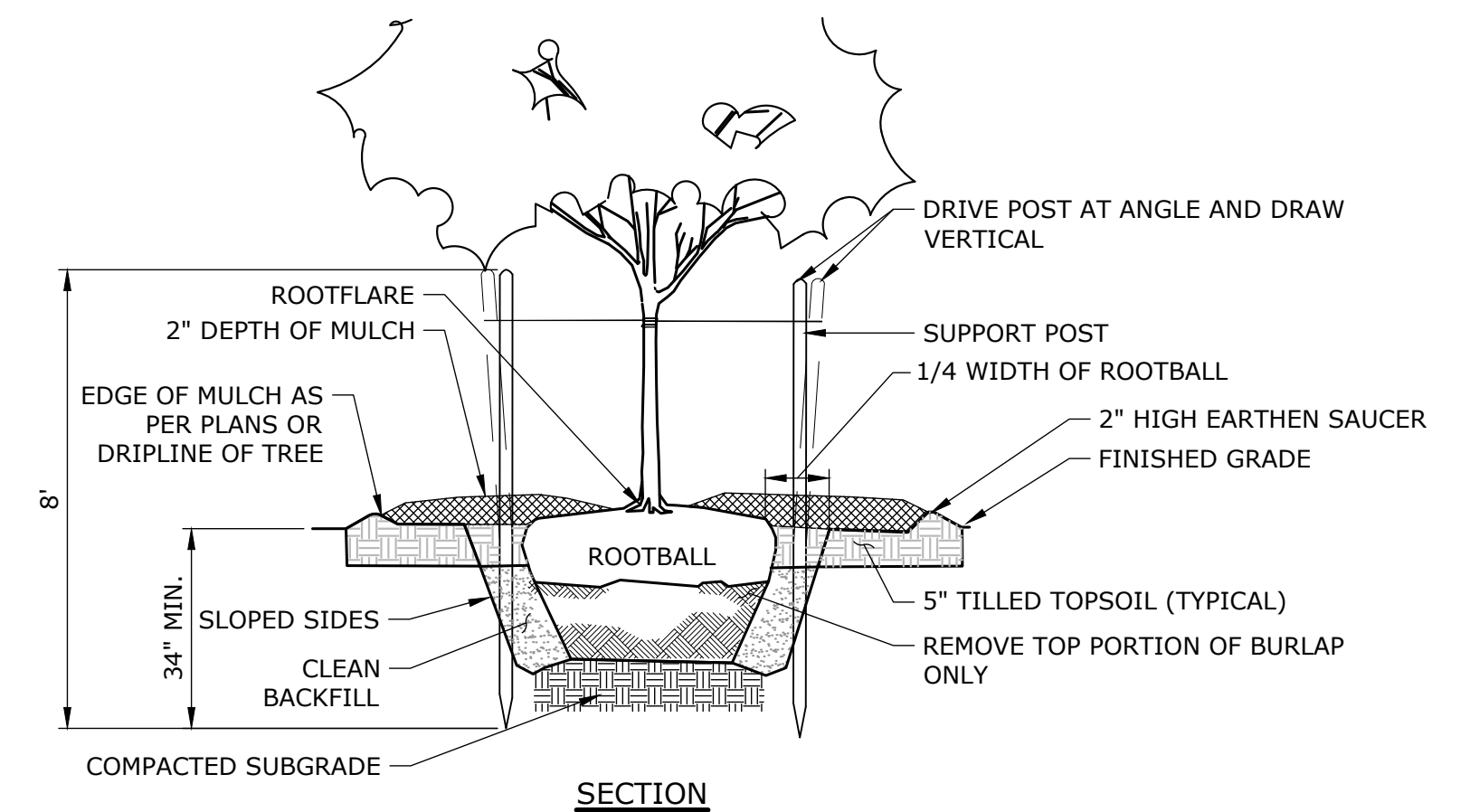
- NOTES:**
1. ALL STEEL MEMBERS COATED WITH ZINC RICH EPOXY THEN FINISHED WITH POLYESTER POWDER COATING.
  2. 1/2" x 3 3/4" PLTD. EXPANSION ANCHOR BOLTS PROVIDED.
  3. BENCH AS MANUFACTURED BY DUMOR, INC. MODEL: 19 OR APPROVED EQUIVALENT.

**SITE BENCH**  
NOT TO SCALE



- NOTES:**
1. UNLESS OTHERWISE DIRECTED SHREDDED MULCH SHALL BE PLACED TO A LIMIT OF ONE FOOT BEYOND THE CENTER OF THE OUTERMOST SHRUBS IN SHRUB BED.

**SHRUB PLANTING**  
NOT TO SCALE



- NOTE:**
1. SUPPORT STAKES SHALL BE REMOVED BY THE CONTRACTOR ONE YEAR AFTER INSTALLATION.

**TREE PLANTING**  
NOT TO SCALE



DESCRIPTION	DATE	BY

FINAL DESIGN

FLOODPLAIN RESTORATION PROJECT  
WHETSTONE BROOK AT MELROSE TERRACE  
BRATTLEBORO HOUSING PARTNERSHIPS  
BRATTLEBORO, VERMONT

JCL DESIGNED	CMN DRAWN	JCL CHECKED
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NOT TO SCALE

DECEMBER 10, 2021

PROJECT NO. 3452-33

SHEET NO. 8 OF 8

DET

**PROBABLE CONSTRUCTION COST  
WETLAND RESTORATION - UNITED CHURCH OF HINESBURG**

**AHEAD OF THE STORM  
Hinesburg, Vermont  
SLR #3452-33  
March 2, 2022**



<b>Item</b>	<b>ITEM/DESCRIPTION</b>	<b>UNIT</b>	<b>QUANTITY</b>	<b>UNIT PRICE</b>	<b>COST</b>
	Mobilization	LS	1	\$5,000	\$5,000
	Labor (2 people for 10 days)	HR	160	\$55	\$8,800
	Equipment for Soil Restoration	HR	16	\$140	\$2,240
	Excavator / Operator	HR	40	\$140	\$5,600
	Haul Materials	HR	16	\$95	\$1,520
	Path Bridges	LS	1	\$10,000	\$10,000
	Culvert Purchase - 6-ft width	LS	1	\$32,000	\$32,000
	Culvert Installation - 6-ft width	LS	1	\$40,000	\$40,000
	Culvert Purchase & Installation - 15-inch	LS	1	\$4,000	\$4,000
	Roughness Elements	LS	1	\$2,000	\$2,000
	Wetland Plantings - Seed and Mulch	ACRE	1.1	\$2,350	\$2,585
	Wetland Plantings - Shrubs	EA	31	\$100	\$3,100
	Wetland Plantings - Large Trees	EA	50	\$600	\$30,000
	Restoration of Disturbed Areas	LS	1	\$2,000	\$2,000
	Demobilization	LS	1	\$2,000	\$2,000
	<b>Construction Subtotal</b>				<b>\$145,845</b>
	<b>Construction Contingency (10%)</b>				<b>\$14,585</b>
	<b>Bid Assistance</b>				<b>\$5,000</b>
	<b>Construction Oversight</b>				<b>\$12,000</b>
	<b>TOTAL (round)</b>				<b>\$177,000</b>

NOT INCLUDED: Bench, patio, playground, labyrinth, additional plantings outside of restoration area