

AHEAD OF THE STORM

Site: Charlotte Library

Location: Ferry Road, Charlotte, Vermont



POST-CONSTRUCTION SUMMARY

Construction Summary

Stormwater treatment was provided at the Charlotte Library to capture and treat runoff from the library building in order to improve water quality. Contractor Ray Piche General Contracting and his crew completed the construction for the project. Construction for the addition that expanded the library building to the south of the existing building was completed in March of 2020. Site work to remove the library entrance driveway, replace soil in the area, install gutters, rainbarrels, distribution pipes, and a bio-retention area to the east of the building was completed in October of 2020. Planting and landscaping were completed by Jim Donovan with assistance from a local landscape architecture student and a group of about 12 library volunteers. Construction costs were approximately \$20,000 contributed by the library including approximately \$10,000 for site work, \$3,200 for rainbarrels, \$4,300 for plants, and \$2,500 for installation. Volunteers are committed to maintaining the mitigation features.

Installed Treatment Elements

Multiple Optimal Conservation Practices (OCP) were installed to mitigate stormwater runoff at the site.

1. Created a bio-retention area on former pavement to reduce impervious surface and increase storage capacity.
2. Additional bio-retention areas planned for the west roof runoff.
3. Installed rainbarrels to water gardens and flower beds to increase retention storage capacity.
4. Continued practice of disconnection from end rooftops and sidewalks with sheet flow into vegetated areas.

Project Benefits

Prior to this project, runoff from the library's former entrance driveway and building left the property untreated, flowing toward Thorp Brook, where water quality sampling has found high turbidity, suspended solids, nitrogen, and phosphorus levels. The new bio-retention areas and reduced impervious surface reduce runoff and allow water to infiltrate, reducing the contribution to poor water quality. Aesthetics were improved with perennial flowering plants in the bio-retention area.

This project removes a net 0.06 acres of impervious surface and provides treatment of 0.14 acres of runoff from the library roof before it flows south to Thorp Brook. The combined treatments, along with disconnection to vegetated areas treat more than the Water Quality Volume – WQv and Channel Protection Volume - CPv, which are the required treatment volumes for protecting streams from poor water quality, channel erosion, and scour.

Drainage Location	Drainage Area (Square Feet)	Impervious Area (%)	Precipitation (WQ depth) (in)	WQv Generated on the Site (Cubic Feet)	Treatment Volume (Cubic Feet)	Treatment Volume (%)
East to Bio-retention, Rainbarrel 1 & 2	2,220	100	1.00	176	1,496	100% of 10-yr
South to Rainbarrel #3	960	100	1.00	76	48	63% of WQv
West to Planned Bio-retention	3,020	100	1.00	239	250	100% of WQv

Additional Documentation Attached

Pre- and Post-Construction Photo Log

Post-Construction Conditions Plans

Project Site Overview Map

Community Volunteer Input and Construction Information

Ahead of the Storm Project Summary including Existing Conditions Summary

Design Plans and Initial Concept Design Cost



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PRE- AND POST-CONSTRUCTION PHOTO LOG



Pre-Construction, October 27, 2015: Library existing building, looking across Green. Newly installed gravel perimeter trench drain visible.



Post-Construction, July 23, 2021: Library building. Railings have been removed. Addition is visible at image right.



Pre-Construction, October 27, 2015: Library entrance driveway. Existing site runoff sheet flows across driveway to swale on other side in bushes.



Post-Construction, July 23, 2021: A portion of the impervious surface from the library entrance driveway has been removed and a bio-retention area has been installed fed by overflow from rain barrels collecting roof runoff.



Pre-Construction, October 27, 2015: Library entrance driveway.



Post-Construction, July 23, 2021: North end of bio-retention area and new sidewalk at former Ferry Road library entrance.



Pre-Construction, October 27, 2015: South end of library building. Existing gardens in foreground could be watered using collected rainwater.



Post-Construction, July 23, 2021: South end of library building. An addition has been added at the south end of the building, rainbarrel installed, and additional gardens planted.



Pre-Construction, October 27, 2015: Pre-expansion end of building.



Post-Construction, July 23, 2021: Gutter, downspout, and rain barrel installed. Overflow from this rain barrel flows into the bio-retention area. Runoff collected in the rain barrel will be used for garden watering.



Pre-Construction, October 27, 2015: West side of the library. Roof runoff currently falls off roof and travels overland into the Green.



Post-Construction, July 23, 2021: West side of the library. Bio-retention areas planned in front of the porch.



Pre-Construction, October 27, 2015: Porch area facing the Green.



Post-Construction, July 23, 2021: A bio-retention area is planned at this location for a future phase of the project. Runoff from the sidewalk sheet flows into adjacent vegetation as a disconnection practice.



Post-Construction, July 23, 2021: North end of library viewed from the east. New sidewalk has been added providing pedestrian access from Ferry Road. A NOAA rain gage is located at the north end of the building.



Post-Construction, July 23, 2021: NOAA rain gage.



Post-Construction, July 23, 2021: Closer view of bio-retention area and rain barrels.



Post-Construction, July 23, 2021: The rain barrels collect runoff from the east side of the building.



Post-Construction, July 23, 2021: Library building addition viewed from the west.



Post-Construction, July 23, 2021: South end of library building addition viewed from the west.

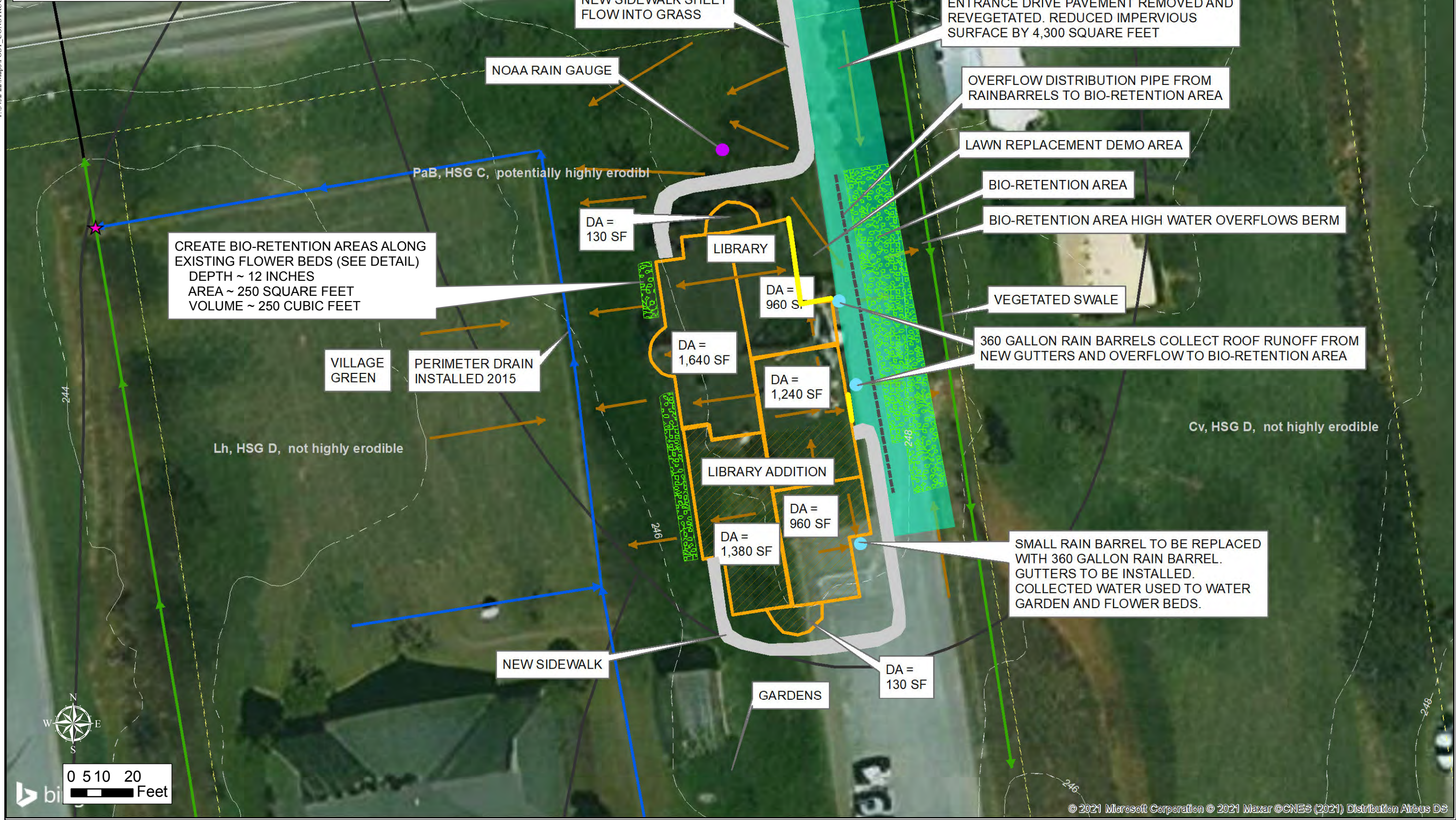


Post-Construction, July 23, 2021: Small rain barrel that will soon be replaced with a larger rain barrel (at image right). Runoff collected here will be used to water the gardens to the south of the library.



Legend

- Bio-Retention Area
- Removed Impervious Surface
- Drainage Area Boundary
- 2'-Elevation Contour, 2012 Lidar
- NRCS Soil Area Boundary
- Parcel Boundary, Approximate
- Stormwater Flow
 - Overland
 - Swale
 - Culvert
 - Pipe



0 5 10 20 Feet

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SOURCE(S):
 2012 LIDAR 2 FT CONTOURS, VCGI
 BING AERIAL
 NRCS SOIL MAPPING
 SLR FIELD DATA

LAYOUT
AHEAD OF THE STORM
CHARLOTTE LIBRARY
 FERRY ROAD
 CHARLOTTE, VERMONT

POST-CONSTRUCTION

Map By: JCL & CMN
 SLR#: 3452-27
 MXD:
 1st Version: 7/11/2016
 Revision: 11/23/2021
 Scale: 1"=25'

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