STORMWATER MANAGEMENT REPORT

Crystal Mall Adaptive Reuse

850 Hartford Turnpike (CT Route 85)
Waterford, Connecticut 06385

Prepared For:

GENERAL DYNAMICS
Electric Boat

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1.0 Narrative

The proposed project is the adaptive reuse of the former Crytal Mall (Mall) complex located at 850 Hartford Turnpike (CT Route 85), Waterford, Connecticut for use by the Electric Boat Corporation. The Location of the property in reference to the USGS Quad Map is attached as Figure 1. A location map is included on the Site Improvement Plans (Plans).

The Electric Boat adaptive reuse of the property includes the conversion of the existing retail mall building for office, work force development, and research and development use. The existing restaurant pad sites (currently Olive Garden and Longhorn Steakhouse) located along the Hartford Turnpike (CT Route 85) frontage will remain.

Proposed modifications to the site are depicted on the Plans. The existing bituminous concrete parking lots will be reconfigured and rehabilitated to accommodate the parking necessary for Electric Boats adaptive reuse of the facility. The entirety of the parking lots and parking spaces are necessary for Electric Boat's employee operations and the reuse of the property.

Stormwater management improvements have been proposed to the maximum extent practicable. The improvements have been proposed to meet the goals of the Waterford Zoning Regulations Section 25, and the 2024 CTDEEP Connecticut Stormwater Quality Manual (SQM).

2.0 Existing Conditions

The existing property is approximately 77.8 acres in total along the southwest side of Hartford Turnpike (CT Route 85) as shown on Figure 1 and the location map included on the Plans. The Crystal Mall was constructed on the property circa 1983-1984. The property is comprised primarily of commercially developed land containing the Crystal Mall Building, two restaurant pad sites, and approximately 46 acres of paved parking lots. The total impervious area on the site is 54.6 acres. The western portion of the property is approximately 22 acres of undeveloped woodland that includes a detention basin (referred to as the stormwater management basin herein) for the facility and the surrounding area. The property is bordered by Hartford Turnpike (CT Route 85) to the northeast, additional commercial development to the southeast (currently Home Depot) and northwest (currently Target), and undeveloped woodland to the southwest. An aerial view of the existing property and surrounding area as they currently exist is included in the Plans.

The existing topography of the site generally runs from the high points along Hartford Turnpike southwesterly toward the low point along the undeveloped woodlands. The elevations range between 196 along Hartford Turnpike and 78 along the southwest property line.

CTDEEP classifies Nevins Brook as Streamflow Classification is Class 3 indicating it is moderately altered, and has intermediate balance points between ecological and human uses. The CTDEEP Surface Water Quality Classification is A.

Picture 1 - Aerial View of the Existing Stormwater Management Basin (A.K.A. Trading Cove Pond)

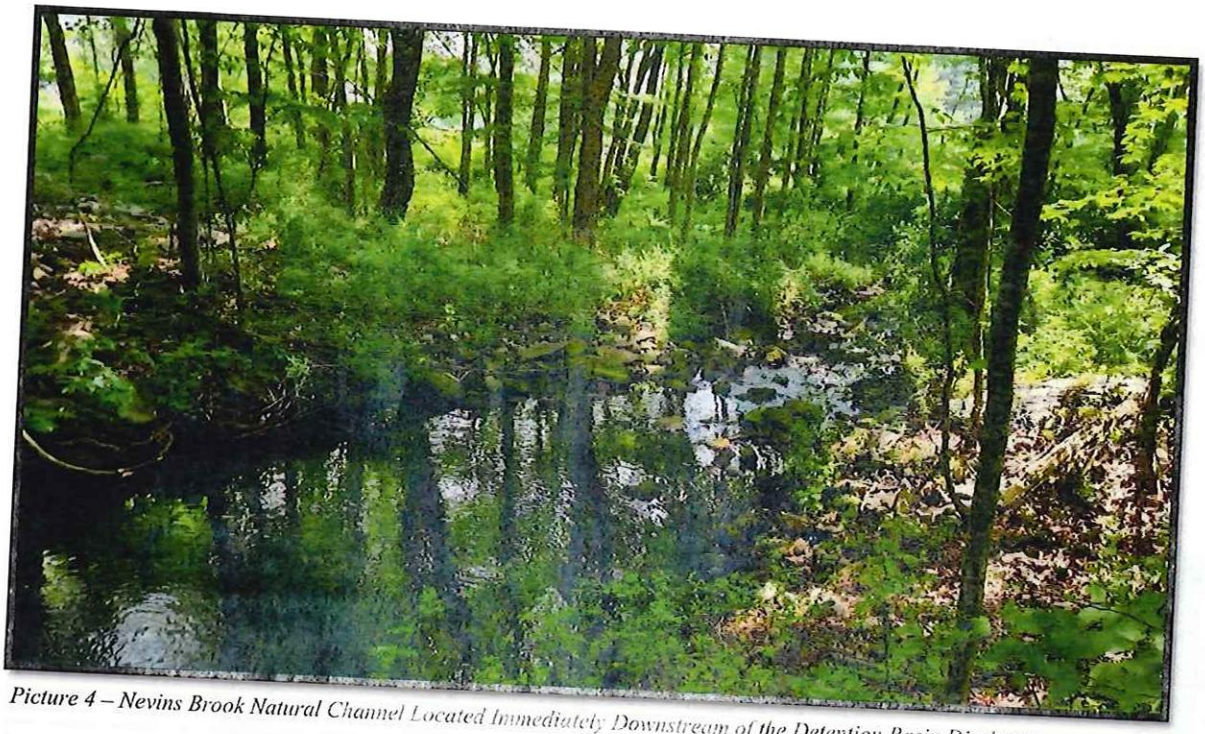
Stormwater Management Basin

Stormwater runoff from the Mall, Home Depot, and CT Route 85 (Nevins Brook) is discharged into the existing Stormwater management Basin. The basin is sometimes referred to as Trading Cove Pond in publicly available mapping.

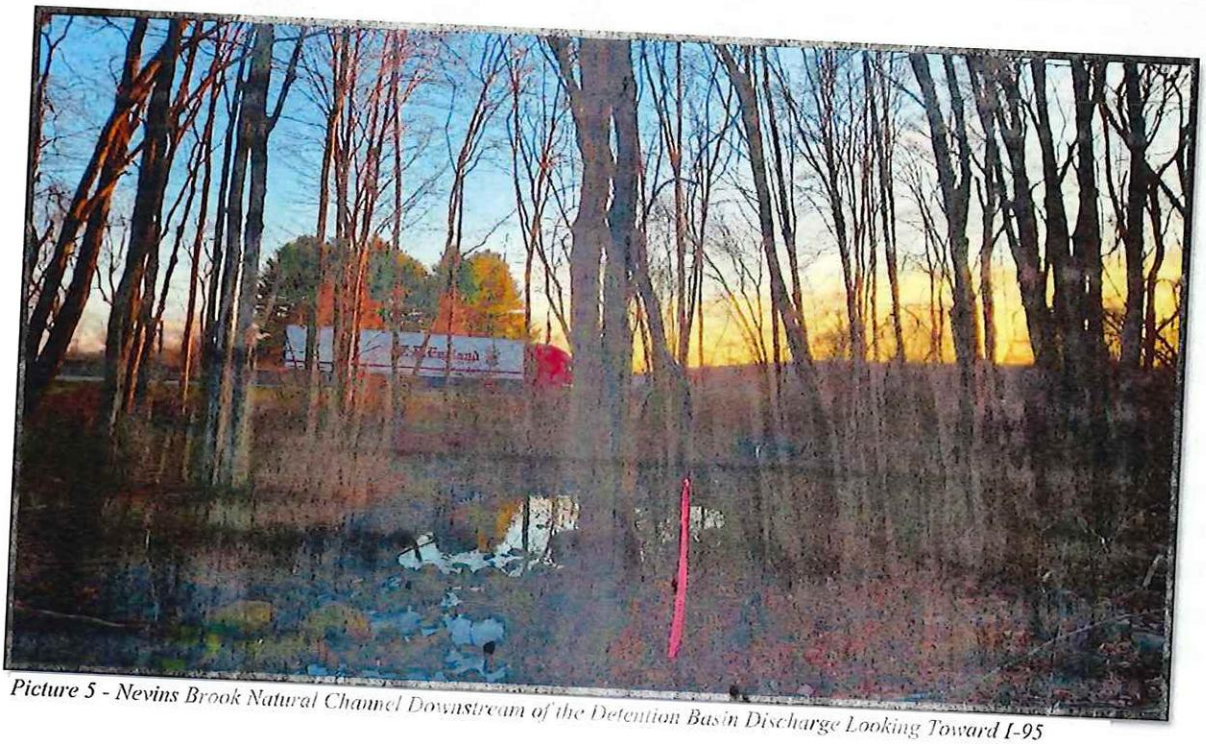
It appears that the basin was constructed with the development of the Mall around 1983-1984. It was modified to its current configuration with the development of the adjacent Home Depot around 1995. Our understanding is that the intent of this detention basin was to mitigate peak stormwater runoff from the commercial developments at that time.

The Stormwater Management Basin is currently heavily vegetated and in good stable condition.

Water flow through the detention basin is controlled via a concrete outlet control structure with a 30" RCP culvert discharge. A view of the outlet control structure is shown in Picture 2.



Picture 4 – Nevins Brook Natural Channel Located Immediately Downstream of the Detention Basin Discharge



Picture 5 - Nevins Brook Natural Channel Downstream of the Detention Basin Discharge Looking Toward I-95

3.0 Post Development Conditions

The proposed project is the adaptive reuse of the existing Crystal Mall Building. The existing Mall building will remain in place as it currently exists. The reuse includes the interior conversion of the building for office, work force development, and research and development. The existing restaurant pad sites (currently Olive Garden and Longhorn Steakhouse) located along the Hartford Turnpike (CT Route 85) frontage will remain.

Proposed modifications to the site are depicted on the Plans. The existing bituminous concrete parking lots will be reconfigured and rehabilitated to accommodate the parking necessary for Electric Boats adaptive reuse of the facility. The entirety of the parking lots and parking spaces are necessary for Electric Boat's employee operations and reuse of the property.

The reconfigured parking lot has reduced the amount of impervious surface onsite by approximately 1.2 Acres.

The existing stormwater infrastructure will remain in place. Existing tops, frames, and grates will be replaced with new structures. Due to the parking lot reconfiguration and landscape island relocations, additional stormwater infrastructure will be added to supplement the existing system. The new infrastructure was located to capture runoff and direct it to the existing system to prevent excessive gutter flow and ponding within the parking lots and generally includes the following improvements.

- All new drainage structures will be constructed with a 2-foot deep sump.
- All new drainage structures will include a hood on the discharge pipe.
- Permanent inlet filters are proposed within existing catch basin tops at strategic locations to filter runoff prior to entering the system.
- Four hydrodynamic separators are proposed where new piping runs are proposed to further cleanse the stormwater in the drainage system.

Zoning Considerations

The proposed project is considered a redevelopment project based on the Waterford Zoning Regulation and the CTDEEP 2024 Stormwater Quality Manual (SQM). Section 25.6.8 of the Waterford Zoning Regulations requires the redevelopment project comply with one of three objectives

1. Reduce the total impervious cover by 40% from the existing conditions; or
2. Where site conditions prevent a reduction in impervious cover, implement stormwater controls for at least 40% of the site's impervious cover; or
3. Implement a combination of impervious cover reduction and area treated with stormwater controls that shall equal or exceed 40% of the site's impervious cover.

The reduction in impervious cover to meet the 40% is not practical due to Electric Boat's need to utilize all of the available parking for their employees and visitors. Therefore, an approach to implement a

development. A copy of the soil mapping is included in Appendix B. The runoff curve numbers for the site are based on the ground cover and hydrologic soil group and are included in Table 1.

Table 1 – Curve Numbers

Runoff curve numbers for the existing and post development conditions were compiled from Table 2-2 of the USDA/NRCS TR-55 manual a portion is included in Appendix A. The following curve numbers were used for the calculations:

Existing Conditions

Watershed EX 1	CN	Area
Impervious (roofs, pavement, rock outcrop, etc.)	98	55.35
Open space (lawns), HSG D, Good Condition	80	5.75

Watershed EX 2	CN	Area
Impervious (roofs, pavement, rock outcrop, etc.)	98	3.35
Open space (lawns), HSG D, Good Condition	80	0.75

Watershed EX 3	CN	Area
Impervious (roofs, pavement, rock outcrop, etc.)	98	0.05
Open space (lawns), HSG D, Good Condition	80	0.08

Watershed EX 4	CN	Area
Impervious (roofs, pavement, rock outcrop, etc.)	98	0.32
Open space (lawns), HSG D, Good Condition	80	0.23

Post Development Conditions

Watershed PD 1	CN	Area
Impervious (roofs, pavement, rock outcrop, etc.)	98	54.05
Open space (lawns), HSG D, Good Condition	80	6.80
Pervious Surface w/ Silva Cell Subsurface Storage	60	0.25

Watershed PD 2	CN	Area
Impervious (roofs, pavement, rock outcrop, etc.)	98	3.35
Open space (lawns), HSG D, Good Condition	80	0.75

Watershed PD 3	CN	Area
Impervious (roofs, pavement, rock outcrop, etc.)	98	0.05
Open space (lawns), HSG D, Good Condition	80	0.08

Watershed PD 4	CN	Area
Impervious (roofs, pavement, rock outcrop, etc.)	98	0.32
Open space (lawns), HSG D, Good Condition	80	0.23

WATERSHED 2 (AP 2)	Peak Flow Rate (CFS)				
	2-Year	10-Year	25-Year	50-Year	100-Year
Existing Condition: EX 2 (Hyd. #2) :	13.480	20.620	25.050	28.320	31.800
Post Development: PD 1 (Hyd. #7) :	13.480	20.620	25.050	28.320	31.800
Change :	0.000	0.000	0.000	0.000	0.000

WATERSHED 3 (AP 3)	Peak Flow Rate (CFS)				
	2-Year	10-Year	25-Year	50-Year	100-Year
Existing Condition: EX 3 (Hyd. #3) :	0.332	0.560	0.702	0.807	0.918
Post Development: PD 1 (Hyd. #8) :	0.332	0.560	0.702	0.807	0.918
Change :	0.000	0.000	0.000	0.000	0.000

WATERSHED 4 (AP 4)	Peak Flow Rate (CFS)				
	2-Year	10-Year	25-Year	50-Year	100-Year
Existing Condition: EX 4 (Hyd. #4) :	1.552	2.512	3.106	3.545	4.011
Post Development: PD 1 (Hyd. #8) :	1.552	2.512	3.106	3.545	4.011
Change :	0.000	0.000	0.000	0.000	0.000

Table 4 – Runoff Volumes

WATERSHED 1 (AP 1)	Runoff Volume (CF)				
	2-Year	10-Year	25-Year	50-Year	100-Year
Existing Condition: EX 1 (Hyd. #1) :	685,232	1,066,260	1,305,249	1,483,001	1,672,285
Post Development: PD 1 (Hyd. #6) :	685,232	1,066,260	1,305,249	1,483,001	1,672,285
Change :	0	0	0	0	0

WATERSHED 2 (AP 2)	Runoff Volume (CF)				
	2-Year	10-Year	25-Year	50-Year	100-Year
Existing Condition: EX 2 (Hyd. #2) :	45,438	71,511	87,894	100,088	113,078
Post Development: PD 1 (Hyd. #7) :	45,438	71,511	87,894	100,088	113,078
Change :	0	0	0	0	0

WATERSHED 3 (AP 3)	Runoff Volume (CF)				
	2-Year	10-Year	25-Year	50-Year	100-Year
Existing Condition: EX 3 (Hyd. #3) :	1,040	1,796	2,282	2,648	3,039
Post Development: PD 1 (Hyd. #8) :	1,040	1,796	2,282	2,648	3,039
Change :	0	0	0	0	0

WATERSHED 4 (AP 4)	Runoff Volume (CF)				
	2-Year	10-Year	25-Year	50-Year	100-Year
Existing Condition: EX 4 (Hyd. #4) :	4,944	8,239	10,338	11,909	13,586
Post Development: PD 1 (Hyd. #8) :	4,944	8,239	10,338	11,909	13,586
Change :	0	0	0	0	0

Hydrodynamic Separator 1 (HDS-1)

The proposed watershed for HDS-1 is depicted on Figure 4. The required water quality volume is calculated as follows:

Hydrodynamic Separator #1 (HDS-1)		
Water Quality Volume (WQV)		
Sizing in Accordance with Chapter 4 of the DEEP 2024 Storm Water Quality Manual		
Water Quality Volume (WQV) = (1")(R)(A) / 12		
P = 1.3"		
R = 0.05 + 0.009(I)		
I = percent of impervious cover		
A = watershed area		
Total Watershed Area (Ac.) :	3.50	
Watershed Impervious Area (Ac.) :	3.40	
I =	97.1%	
R =	0.924	
Required WQV =	0.3505	Ac.-Ft
	15,266.0	CF
Water Quality Flow (WQF)		
Sizing in Accordance with Appendix D of the DEEP 2024 Storm Water Quality Manual		
Water Quality Flow (WQF) = (qu)(A)(Q)		
qu = unit peak discharge (cfs/mi2/inch)		
A = watershed area (mi2)		
Q = runoff depth (in watershed inches)		
P (1.3" for water quality flow) :	1.3	in
Q =	1.20	
CN =	97	
Ia (from Table 4-1) :	0.062	in
Ia / P =	0.048	
Tc (Time of Concentration) :	0.167	Hr
qu (from Exhibit 4-III) :	700	csm/in
Total Watershed Area (Square Miles) =	0.00547	mi2
Required WQF =	4.600	CFS
	2,064.5	GPM

A Contech Cascade CS-8 unit has been proposed that is capable of treating up to 7.2 CFS in accordance with the CTDOT Guidelines for the Use of Hydrodynamic Separators on CTDOT Projects. The Contractor may select an alternate separator capable of treating the minimum water quality flow rates as outlined in Appendix D.

Hydrodynamic Separator 3 (HDS-3)

The proposed watershed for HDS-3 is depicted on Figure 4. The required water quality volume is calculated as follows:

Hydrodynamic Separator #3 (HDS-3)		
Water Quality Volume (WQV)		
Sizing in Accordance with Chapter 4 of the DEEP 2024 Storm Water Quality Manual Water Quality Volume (WQV) = (1")(R)(A) / 12 P = 1.3" R = 0.05 + 0.009(I) I = percent of impervious cover A = watershed area		
Total Watershed Area (Ac.) :	2.05	
Watershed Impervious Area (Ac.) :	1.90	
I =	92.7%	
R =	0.884	
Required WQV =	0.1964	Ac.-Ft
	8,553.2	CF
Water Quality Flow (WQF)		
Sizing in Accordance with Appendix D of the DEEP 2024 Storm Water Quality Manual Water Quality Flow (WQF) = (qu)(A)(Q) qu = unit peak discharge (cfs/mi2/inch) A = watershed area (mi2) Q = runoff depth (in watershed inches)		
P (1.3" for water quality flow) :	1.3	in
Q =	1.15	
CN =	98	
Ia (from Table 4-1) :	0.041	in
Ia / P =	0.032	
Tc (Time of Concentration) :	0.167	Hr
qu (from Exhibit 4-III) :	700	csm/in
Total Watershed Area (Square Miles) =	0.00320	mi2
Required WQF =	2.577	CFS
	1,156.7	GPM

A Contech Cascade CS-6 unit has been proposed that is capable of treating up to 4.0 CFS in accordance with the CTDOT Guidelines for the Use of Hydrodynamic Separators on CTDOT Projects. The Contractor may select an alternate separator capable of treating the minimum water quality flow rates as outlined in Appendix D.

5.2 Standard 2 – Stormwater Runoff Quantity Control

As outlined under the Analysis section of this report the peak flow rates and volume leaving the site match the existing conditions. Stormwater improvements by impervious surface reduction and addition of subsurface storage have been made onsite to the maximum extent achievable as outlined herein. However, due to the order of magnitude of the existing watersheds and the impervious surfaces they contain, the proposed improvements did not impact the weighted curve numbers used in the calculations or the calculated peak flow rates and runoff volumes.

5.3 Standard 3 – Construction Soil Erosion and Sediment Control

The erosion and sedimentation control plan was designed in accordance with the 2024 Connecticut DEEP Guidelines for Soil Erosion & Sediment Control. Erosion and sedimentation control measures are depicted on the site development plans. Plans, construction details, and a narrative are included in the plan set.

5.4 Standard 4 – Post Construction Operation and Maintenance

The following is a general operations and maintenance schedule for the stormwater infrastructure and project site. These provisions are also included on the project Plans.

Maintenance Schedule for Existing Stormwater Management Basins	
Activity	Schedule
• Inspect for damage, undercut, or eroded area Monitor for sediment accumulation	Semi-Annual inspection
• Repair undercut or eroded areas.	As needed maintenance
• Clean and remove debris & sediment from inlet and outlet structures • Inspect and clean debris & sediment in the basin • Clean and remove debris from inlets	Semi-annual

Maintenance Schedule for Catch Basins	
Activity	Schedule
• Clean out sediment from catch basin	◦ Between November 15th and December 15th (after leaf fall) ◦ During April (after snow melt)

5.5 Standard 5 – Stormwater Management Plan

During Construction

The stormwater pollution prevention plan and all erosion and sedimentation control measures have been designed in accordance with the 2024 Connecticut DEEP Guidelines for Soil Erosion & Sediment Control.

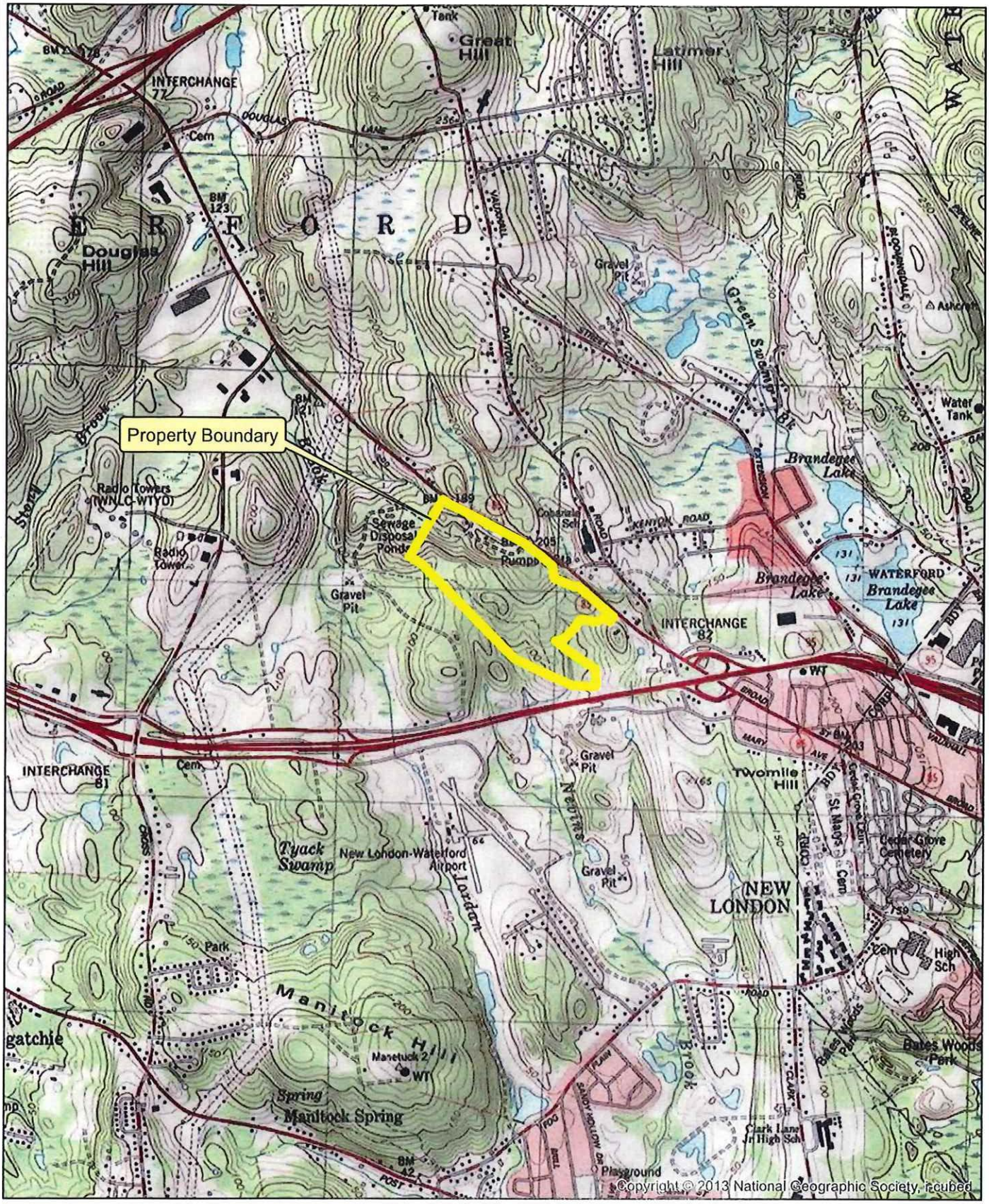
The location of temporary erosion and sedimentation control measures for the proposed development are included in the site development plan set. Construction details and an erosion and sedimentation control narrative are also included in the plan set. The narrative and construction details outline the requirements for stabilization of disturbed areas, slope stabilization requirements, and maintenance requirements.

Stormwater Management & Pollution Prevention:

Provisions for stormwater management and pollution prevention are outlined on the plans and are as follows:

1. Pollution Prevention Team:
   The General Contractor shall be responsible for carrying out the provisions of the plan.
2. Sweeping:
   Parking lots, sidewalks, and other impervious surfaces beyond the work site shall be swept clean of sand, silt, and litter daily at the end of the work day.
3. Outside Storage:
   Accessories or equipment stored outside shall be covered or maintained to minimize the possibility of these materials or their residue passing to stormwater.
4. Washing:
   No washing of vehicles, accessories, equipment, or appliances in the work site.
5. Maintenance and Inspection:
   a. The Contractor shall inspect, repair, and/or replace erosion control measures every 7 days and immediately following any significant rainfall or snow melt.
   b. Sediment deposits must be removed when deposits reach approximately one-half the height of the barrier.
   c. Daily dust control using water or approved equal shall be provided for all earth stockpiles, earth piled along excavations, surfaces of backfilled trenches and gravel surfaces.
6. Spills or Accidental Discharges:
   a. Comply with State and Federal regulations to contain and clean up any spill or discharge and dispose of materials at an approved facility.
   b. Contact Connecticut DEEP oil and chemical spill response division 860-424-3338.
   c. The following steps should be performed as soon as possible
      - Stop the source of the spill

- Cover the spill with absorbent material such as kitty litter, saw dust, or oil absorbent pads. Do not use straw.
- Dispose of absorber in accordance with Local and State regulations



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LOCATION MAP

Crystal Mall Adaptive Reuse
850 Hartford Turnpike (CT Route 85)
Waterford, Connecticut
Montville Quad (#86)

DATE: 12/12/2025
SCALE: 1 in = 2,000 ft
SOURCE: USGS Quad

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FIGURE

1