STORMWATER MANAGEMENT REPORT

Crystal Mall Adaptive Reuse

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

Prepared For:

GENERAL DYNAMICS
Electric Boat

January 26, 2026

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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.

The site soils are generally comprised of Urban Land (307). Rock outcrops are present along the eastern side of the property along the CT Route 85 frontage. A USDA Soil Resource Report is included in Appendix B. Inland wetlands are present at the stormwater management basin and along the western edge of the site.

Stormwater from the facility is collected in a standard catch basin and culvert system. Inlets are typically cast iron 2' diameter or 2'x2' grates located throughout the parking areas as depicted on the Plans. The culverts are primarily reinforced concrete pipe (RCP) ranging in size from 12" through 72" diameter. It appears that the stormwater infrastructure was constructed with the Mall in the 1983-1984 era. Spot repairs and grate replacements have been performed as needed.

The stormwater discharge is to a vegetated stormwater management (detention) basin located at the southwest corner of the property, sometimes referred to as Trading Cove Pond on public mapping. The basin is located on a separate parcel under the same ownership. The basin location is shown on the Plans. This basin is sometimes referred to as the detention basin in previous applications; it is referred to as the stormwater management basin herein. The basin collects runoff from the mall property, the adjacent Home Depot property, and the State of CT Route 85 drainage system (Nevins Brook). 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.

Nevins Brook

The stormwater management basin was constructed over Nevins Brook. Nevins Brook traverses the site in a closed catch basin and culvert system. The headwater of the brook appears to be a wetland system located northeast of the property; to the south of Dayton Road and flows behind the former Cohanzie School. The brook is collected at a 30" RCP inlet near the Dayton Place and Hartford Turnpike intersection and is conveyed across Hartford Turnpike in the State of Connecticut drainage system. At the time of the Mall construction a drainage manhole was constructed over the cross-culvert discharge and the flow was conveyed through the developed portion of the property by RCP culvert. Several catch basin inlets are located along the routing that collect stormwater runoff from CT Route 85. Stormwater from the Mall property is collected separately in a segregated collection system onsite. There is a portion of the Mall property in the Longhorn Steakhouse area that is collected in a drainage system and combines with the Nevins Brook system offsite in the Home Depot Parking lot. The brook discharges into the existing stormwater management basin where it combines with other discharge from the Mall and the Home Depot. The stormwater management basin is depicted on the Plans and in Picture 1.

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.

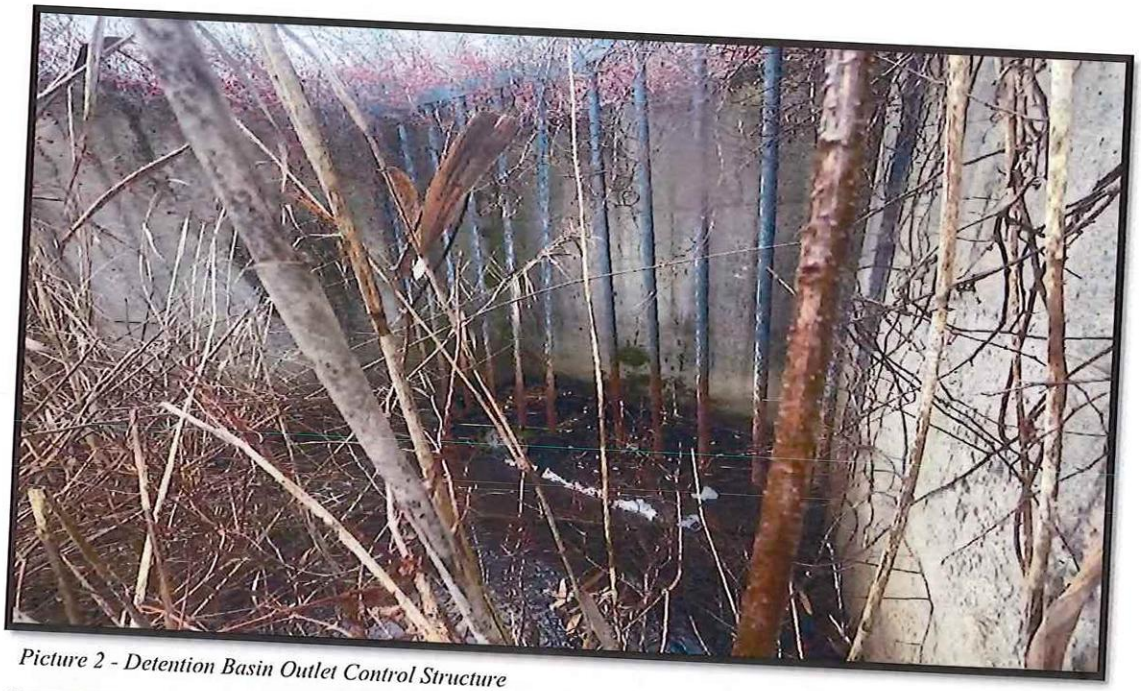
It appears that the basin was constructed with the development of the Mall around 1983-1984. It was modified to its current configuration with the development of the adjacent Home Depot around 1995. Our understanding is that the intent of this detention basin was to mitigate peak stormwater runoff from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

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

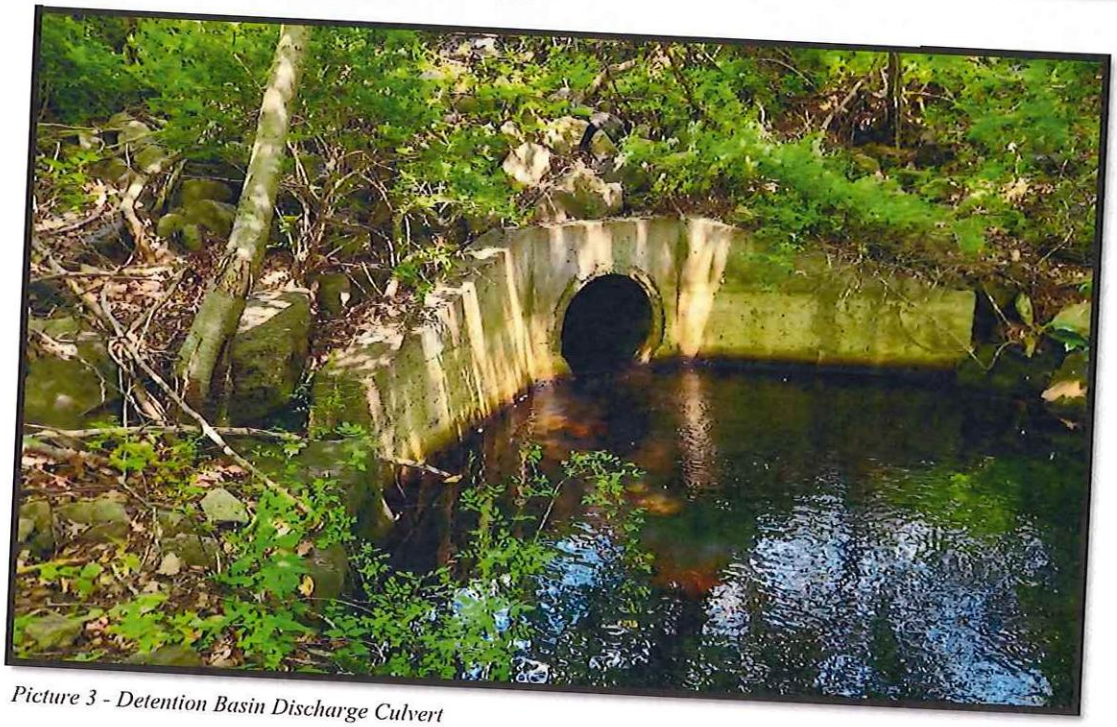
Water flow through the detention basin is controlled via a concrete outlet control structure with a 30" RCP culvert discharge. A view of the outlet control structure is shown in Picture 2.

Discharge from the Stormwater Management Basin is through a concrete wingwall as shown in Picture 3.

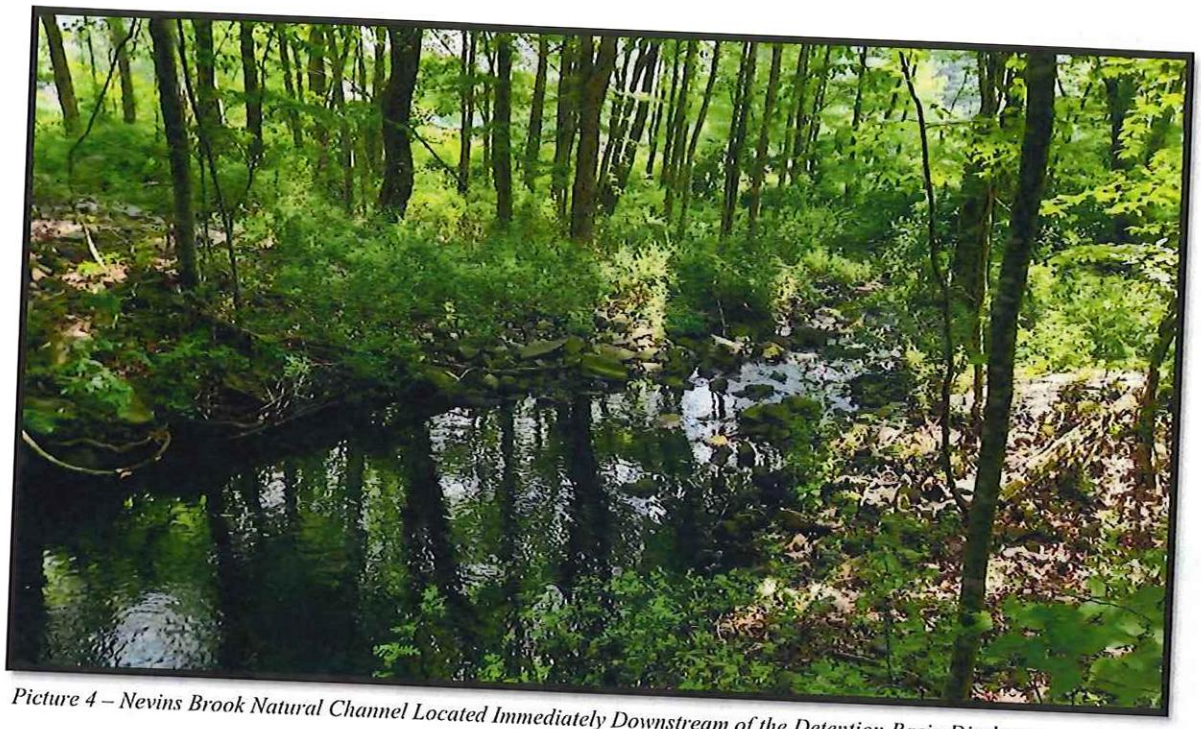
The discharge continues as Nevins Brook downstream of the site through a stable natural stony stream channel as depicted in Picture 4 and 5.



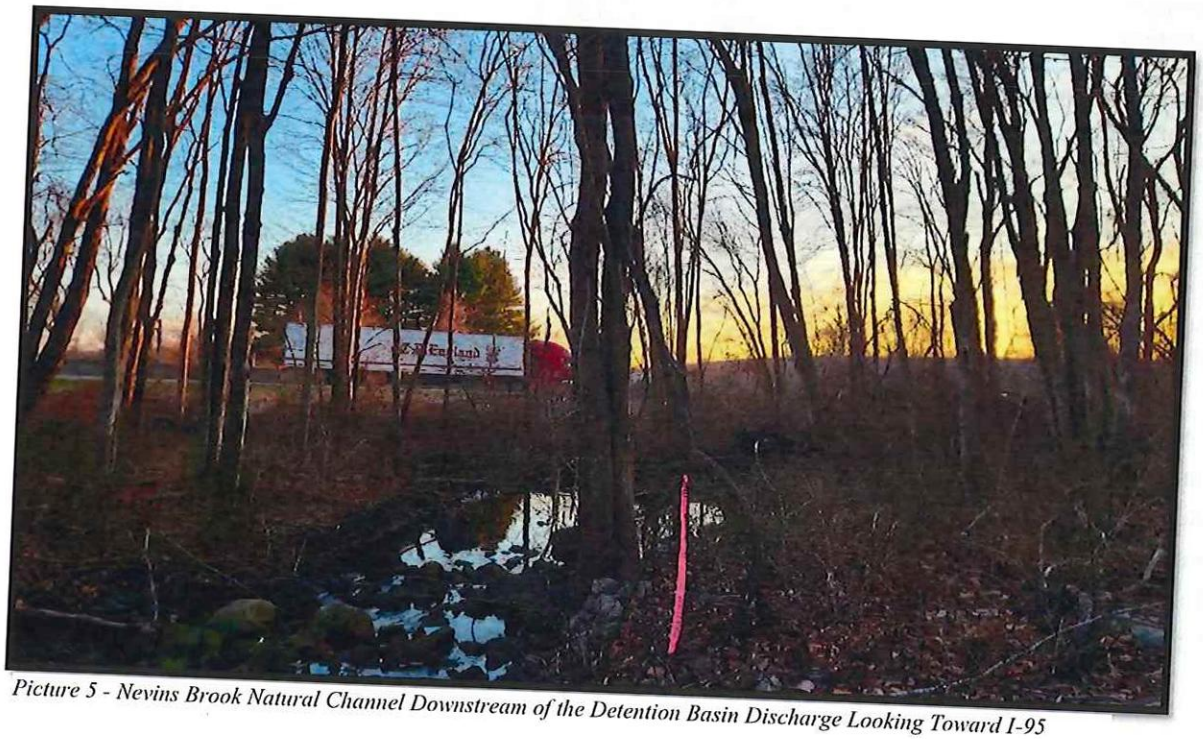
Picture 2 - Detention Basin Outlet Control Structure



Picture 3 - Detention Basin Discharge Culvert



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

Stormwater Quality

It appears that the intent of this detention basin construction was to mitigate peak stormwater runoff from the commercial developments at that time. Stormwater runoff pollutant renovation is also provided as a byproduct of the detention basin storage, stormwater flow path through the basin, and vegetation.

Robert Russo and Kyle Lynch of CLA performed grab samples of the stormwater discharge from the basin on two occasions: December 3, 2025 (CU86796) and December 19, 2025 (CU99833). A summary of the lab testing results is below. Full lab testing results are included in Appendix C.

	Units	RL	CU86796 12/3/2025 CM BASIN Storm Water Result	CU99833 12/19/2025 CM BASIN Storm Water Result	CTDEEP MS4 Outfall Screening Limits
Miscellaneous/Inorganics					
B.O.D./5 day	mg/L	4.0	< 4.0	5.2	
Chlorine Residual	mg/L	0.02	< 0.02	< 0.02	
Conductivity	umhos/cm	5.00	136	750	
Escherichia Coli	MPN/100 mls	10	2,490	197	410.0
MBAS	mg/L	0.10	< 0.05	< 0.10	
Ammonia as Nitrogen	mg/L	0.10	0.13	0.38	
Nitrite-N	mg/L	0.010	< 0.010	0.012	
Nitrate-N	mg/L	0.02	0.07	0.15	
pH	pH Units	1.00	6.1	6.26	
Nitrogen Tot Kjeldahl	mg/L	0.20	0.63	0.98	
Total Nitrogen	mg/L	0.10	0.7	1.14	2.5
Phosphorus, as P	mg/L	0.010		0.077	0.3
Turbidity	NTU	0.200	1.2	1.2	
Metals, Total					
Cadmium	mg/L	0.001	< 0.001	< 0.001	
Copper	mg/L	0.005	< 0.005	< 0.005	
Lead	mg/L	0.001	0.002	0.002	
Zinc	mg/L	0.004	0.016	0.046	

The samples were taken during a rain event to capture the first flush conditions. The December 19, 2025 sample also captured snow melt from a previous snow storm event. The results show that the water leaving the stormwater management basin has values below the CTDEEP MS4 General Permit standards set forth, with the exception of Escherichia Coli in the December 3, 2025. In our opinion the high levels of Escherichia Coli in the December 3, 2025 sample would be an anomaly and would not be typical of parking lot stormwater runoff, but may be from a source elsewhere in the contributing watershed.

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

combination of impervious cover reduction and area treated with stormwater controls that shall equal or exceed 40% of the site's impervious cover has been proposed.

The entire existing impervious area onsite is 54.6 acres. Implementing impervious coverage reduction and stormwater controls for at least 40% of that area requires providing improvement and treatment for at least 22.4 acres of the site.

With the new parking lot reconfiguration, the impervious surface was reduced by approximately 1.2 Acres and is the maximum achievable due to the need for employee parking.

The structural stormwater management improvements have been proposed to the maximum extent achievable and generally include the following:

1. Four hydrodynamic separators have been proposed within the new stormwater infrastructure. The combined total watershed for these separators is 8.75 Acres.
2. Permanent catch basin inlet filter pretreatment has been proposed at strategic locations within the parking lots. The combined total watershed for these inlet filters is 22 Acres.

The proposed additional pervious surface and structural stormwater management improvements total 31.95 Acres. This equates to 58.5% of the existing impervious area, meeting the Zoning Regulation requirements. Additionally, a large portion of the remaining impervious surface (approximately 12 Acres) is the building roofs that have limited potential for pollutant loading to the stormwater runoff.

In addition to the structural stormwater management improvements, maintenance and operations improvements have also been proposed that generally include the following:

1. Snow storage will be primarily focused to the landscape areas, with limited storage in the parking areas. Due to the need for employee parking, excess snow will be trucked offsite to a separate facility as needed. This will reduce the amount of deicing materials within the stormwater runoff from the site.
2. Implement inspection and maintenance procedures for the facility as outlined in this document and the Plans.

4.0 Analysis

The overall site stormwater analysis was performed for the 2-year, 10-year, 25-year, 50-year, and 100-year frequency storms using the USDA/NRCS TR-55 method to determine the peak flow rates from the existing and post development site. Precipitation data and rainfall were acquired from NOAA Atlas 14, Volume 10, Version 3 for the site, and are included in Appendix A. NRCS Type D regional rainfall distribution was used in accordance with the 2024 CTDEEP Connecticut Stormwater Quality Manual. The soils within the analyzed watersheds generally fall into the hydrologic soil group D due to the current level of

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 Descriptions

The existing and post development watersheds are depicted on Figures 2 and 3. The following is a general description of each watershed.

EX1/PD1 This is the major watershed on the property. The watershed surrounds the mall building and includes the majority of the parking lots and mall roof. It is generally contained within the parking lot curb line with sheet flow from a portion of CT Route 85 contributing. Is approximately 61.1 Ac. Discharge is to Analysis Point 1 (AP 1) which is a 72" culvert located within the existing Stormwater Management Basin.

EX2/PD2 This watershed generally surrounds the current Longhorn Steakhouse. It includes the parking lot surrounding the building, a portion of the southern driveway and sheet flow from a portion of CT Route 85. Discharge is to Analysis Point 2 (AP 2) which is a drainage manhole located at the property boundary with Home Depot. The final discharge is into the Stormwater Management Basin after passing through the Home Depot property.

EX3/PD3 This is an isolated watershed at the middle driveway near Olive Garden. A portion of the vegetated property frontage and CT Route 85 flow to an 18" RCP culvert inlet.

EX4/PD4 This watershed includes the CT Route 85 frontage along the Olive Garden development. It includes a portion of the front parking area, vegetated frontage and a portion of the northern entrance drive. Stormwater is collected in catch basins and discharges to the north through a 36" RCP culvert in a concrete wingwall.

Peak Flow Rates and Volumes

Peak stormwater flow rates and runoff volume for the existing conditions and post development conditions are summarized in Tables 2 and 3 respectively. Supporting calculations are included in the Calculations section.

The post development peak flow rates and runoff volume match the existing conditions. Stormwater improvements for water quality and impervious surface reduction have been made onsite 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.

Table 3 – Peak Flow Rates

WATERSHED 1 (AP 1)	Peak Flow Rate (CFS)				
	2-Year	10-Year	25-Year	50-Year	100-Year
Existing Condition: EX 1 (Hyd. #1) :	199.840	303.000	367.040	414.480	464.880
Post Development: PD 1 (Hyd. #6) :	199.840	303.000	367.040	414.480	464.880
Change :	0.000	0.000	0.000	0.000	0.000

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

Conclusion:
In our opinion, the proposed redevelopment will have no negative impact to the peak stormwater runoff rates and volumes leaving the site. Stormwater quality improvements and a reduction in impervious surface on the site have been proposed that benefit the watersheds and the receiving Stormwater Management Basin. As such, in our opinion, the proposed development will have no negative impact on the adjacent State of CT infrastructure, Nevins Brook, or properties downstream of the site.

5.0 CT DEEP 2024 Stormwater Quality Manual Compliance

The proposed development meets the five performance standards of the Connecticut DEEP 2024 Stormwater Quality Manual to the Maximum Extent Achievable (MEA). The project is a redevelopment of an existing facility; as such stormwater improvement have been incorporated into the proposed improvements as much as possible given the site parameters and necessary use of the site. Low impact development features have been incorporated into the site development plans including the addition of impervious landscape surfaces, subsurface infiltration by way of Silva Cell underground storage, catch basin inlet filters, and hydrodynamic separators. Low impact development features have been designed in accordance with the 2024 Connecticut Stormwater Quality Manual to treat the proposed stormwater runoff.

5.1 Standard 1 – Runoff Volume and Pollutant Retention

The primary discharge form the site is to the Stormwater Management Basin. Stormwater runoff pollutant renovation is provided in this basin as a byproduct of the detention basin storage, stormwater flow path through the basin, and vegetation. As previously outlined under the Existing Conditions narrative herein, the existing discharge from Stormwater Management Basin removes pollutants to levels meeting a CT DEEP standards and Stormwater Quality Manual standards.

As an improvement to the existing site and watershed additional pervious surface has been incorporated into the design amounting to approximately 1.2 Acres. Catch basin inlet filters have also been proposed to pre-treat approximately 22 Acres of the site. Four hydrodynamic separators are proposed that will further renovate the stormwater runoff. Hydrodynamic separator sizing is based on the water quality flow (WQF) as required in the SQM.

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 2 (HDS-2)

The proposed watershed for HDS-2 is depicted on Figure 4. The required water quality volume is calculated as follows:

Hydrodynamic Separator #2 (HDS-2)		
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.) :	2.20	
Watershed Impervious Area (Ac.) :	2.20	
I =	100.0%	
R =	0.950	
Required WQV =	0.2264	Ac.-Ft
	9,862.7	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 =	1.24	
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) =	0.00344	mi2
Required WQF =	**2.972**	CFS
	1,333.8	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.

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.

Hydrodynamic Separator 4 (HDS-4)

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

Hydrodynamic Separator #4 (HDS-4)		
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.) :	1.00	
Watershed Impervious Area (Ac.) :	1.00	
I =	100.0%	
R =	0.950	
Required WQV =	0.1029	Ac.-Ft
	4,483.1	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 =	1.24	
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) =	0.00156	mi2
Required WQF =	**1.351**	CFS
	606.3	GPM

A Contech Cascade CS-4 unit has been proposed that is capable of treating up to 1.8 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)

Maintenance Schedule for Catch Basin Inlet Filters	
Activity	Schedule
• Inspect inlet filters for accumulated sediment • Inspect oil skimmer pouches for solidification and color • Inspect the filter bag for punctures, tears, or other damage	Quarterly
• Remove sediment when accumulation reaches ½ of the filter volume. Use industrial vacuum or replace the filter bags • Replace oil skimmer pads when they have solidified or turned black • Replace damaged filter bags	As needed maintenance As observed at quarterly inspections

Maintenance Schedule for Hydrodynamic Separators	
Activity	Schedule
• Inspect sump for accumulated sediment • Inspect oil skimmer pouches for solidification and color • Inspect the filter bag for punctures, tears, or other damage	Semi-annual
• Remove sediment when accumulation reaches 50% of the maximum storage volume. Use industrial vacuum / Vac-all. • Replace oil skimmer pads when they have solidified or turned black • Replace damaged filter bags	As needed maintenance As observed at semi-annual inspections

Maintenance Schedule for Parking Areas	
Activity	Schedule
• Sweep parking lots & impervious areas	• Between November 15th and December 15th (after leaf fall) • During April (after snow melt)
• Remove and dispose of trash and debris onsite	Daily - As needed maintenance

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

- Contain 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.

Post Construction

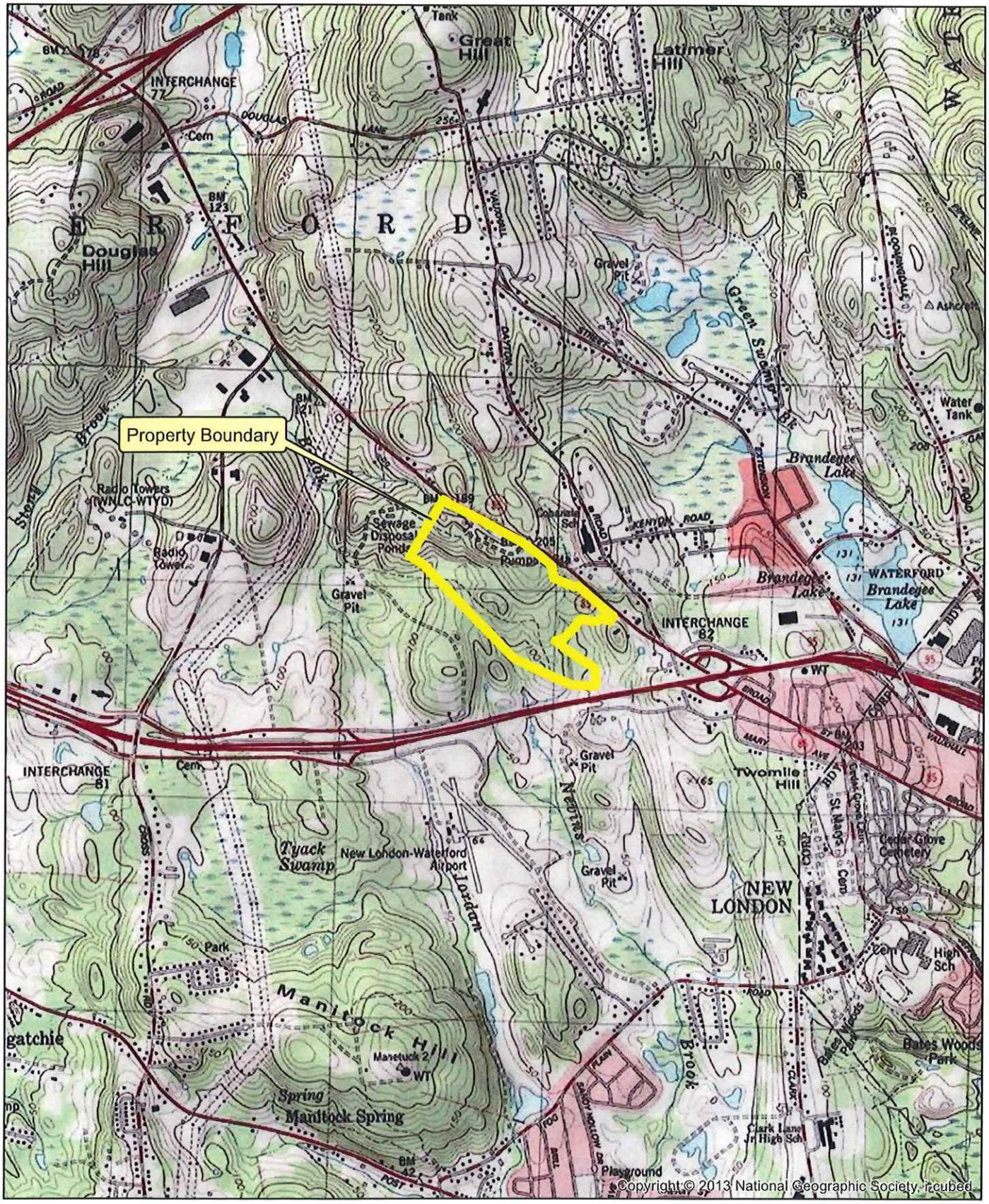
Stormwater Management & Pollution Prevention:

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

1. Pollution Prevention Team:
   The Owner shall be responsible for carrying out the provisions of the plan.
2. Sweeping:
   Parking lots, sidewalks, and other impervious surfaces shall be swept clean of sand and litter and any other pollutants at least twice per year
   a. Between November 15th and December 15th (after leaf fall)
   b. During April (after snow melt)
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 onsite.
5. Maintenance and Inspection:
   a. Inspect stormwater structures and outfalls twice per year.
   b. Clean sediment and debris from structures at least once per year during April.
   c. Stormwater Management Basin
      - Remove accumulated sediment, leaf litter, and trash from the inlets twice yearly. Between November 15th and December 15th (after leaf fall) and During April (after snow melt).
      - Perform yearly inspection for embankment erosion and restore as needed.
      - Review yearly for invasive species.
6. Spills or Accidental Discharges:
   d. Comply with State and Federal regulations to contain and clean up any spill or discharge and dispose of materials at an approved facility.
   e. Contact Connecticut DEEP oil and chemical spill response division 860-424-3338.
   f. The following steps should be performed as soon as possible
      - Stop the source of the spill
      - Contain 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

FIGURES



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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

N

FIGURE

1