

DOR 1/5/21

2021-04

DEC 30 2020

REV. 12/01/04, 01/19/06, 05/02/06, 10/02/06, 3/22/19

APPENDIX B

Fee Paid: \$700.00 (not paid yet)

INLAND WETLANDS COMMISSION - CHESHIRE, CONNECTICUT

APPLICATION FOR INLAND WETLANDS AND WATERCOURSES PERMIT

Pursuant to the General Statutes of the State of Connecticut, and all subsequent amendments thereto, the undersigned hereby makes application for approval of permit (Inland Wetlands and Watercourses) for a parcel of land having approximately 0.40 wetland acres, which is part of a tract of land having 31.5 acres, located on (street name) Marion Road. Said parcel is generally shown on the current Assessor's Map Plate No(s). 16 Lot No(s). 10 and is located in a(n) R-40 zone district.

This permit application is part of a: () Subdivision, (X) Resubdivision, () Site Plan, () Special Permit, () Zone Change, () Earth Removal, Filling or Regrading, () Other

The undersigned warrants the truth of all statements contained herein and in all supporting documents according to the best of his knowledge and belief.

By signing this application, the applicant permits Commissioners and agents of the Commission to enter upon and inspect the property, at reasonable times, both before and after a final decision has been issued.

Applicant's Name PABCO Inc. Date 12/29/20 (Print of Type)

Applicant's Address (Home) (Office) P.O. Box 1018, Cheshire, CT 06410

Applicant's Signature [Signature]

Telephone Number (Home) (Office) 203-506-8155

E-mail phil@pinnacledevelopment.com Fax No.

Owner's Name (Print or Type) McKinley John Trustee

Owner's Address 1418 Marion Road, Cheshire, CT

Owner's Signature [Signature]

Engineer's Name (Print or Type) Darin Overton c/o Milone & MacBroom, Inc.

Engineer's Address 99 Realty Drive, Cheshire CT 06410

Engineer's Signature

Agent, if other than applicant, to be contacted with regard to this application:

Name Darin Overton c/o Milone & MacBroom Inc. Address 99 Realty Drive, Cheshire, CT

Telephone Number 475-244-2242 Fax Number (203) 272-9733

E-mail doverton@mminc.com

SEE ATTACHED SHEETS FOR THE INFORMATION NECESSARY TO COMPLETE THIS APPLICATION.

APPLICATION FOR INLAND WETLANDS AND WATERCOURSES PERMIT

Purpose and description of the proposed activity (including the area of wetlands or watercourses to be disturbed); alternatives considered and why the proposal to alter wetlands set forth in this application was chosen: Development of the former 1415 Marion Road property into a conventional, 13-lot subdivision. The plans propose approximately 0.05 acres of upland review area impact for lot grading. No direct wetland impacts are expected in the proposed design.

Applicant's interest in the land: () Owner, () Tenant, () Lessee, () Partner,
(x) Other Purchase Option

Please attach a list of adjacent property owners.

Check in full payment of minimum application fee – see attached fee schedule - (payable to Collector – Town of Cheshire). An additional fee shall be required if significant wetland activity is determined upon acceptance of the application. The Commission may, at its option, refund this application fee for a non-regulated activity.

NOTE: In order to expedite the review of this application, and avoid unnecessary delay, it is important that the applicant and the land surveyor and/or professional engineer who shall prepare the maps and other plans shall carefully review the Inland Wetlands Regulations to be certain that the plans comply with all requirements contained therein. Applications must be received by the Town Planner's Office by 4 p.m. the Wednesday prior to the next regularly scheduled meeting of the Inland Wetlands Commission in order for the application to be included on the filed agenda and taken up by the Commission for discussion, action or otherwise.

Per Section 7.1E. of the Inland Wetlands and Watercourses Regulations, three copies of all application materials (including maps) shall be submitted with the original application to comprise a complete application or as is otherwise directed, in writing, by the Commission.

OFFICE USE ONLY

Date Filed _____

Date Presented to Inland Wetlands Commission _____

Mandatory Action Date _____

Public Hearing Date _____

Final Action and Date _____


APPENDIX C

This form is to be completed ONLY when applicant is NOT the owner.

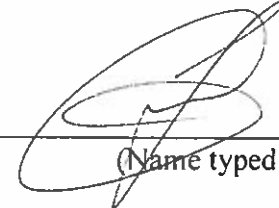
I, McKinley John Trustee hereby acknowledge the application to the Inland
(Name of Owner)

Wetlands Commission of the Town of Cheshire by PABCO Inc.

I consent and agree to its being filed with said Commission.


(Signature)

Sworn to before me this 28 day of December, 2020


(Name typed or printed)

Commissioner of the Superior Court

Notary Public

My commission Expires: _____



DRAINAGE REPORT

McKinley Estates Residential Subdivision | 1415 Marion Road | Cheshire, Connecticut

December 16, 2020
MMI #6793-06

This Drainage Report has been prepared in support of the proposed McKinley Estates Residential Subdivision project at 1415 Marion Road in the town of Cheshire, Connecticut. The majority of the ±31.5-acre site was formerly used as a tree farm. The project proposes to subdivide the property and develop it as a single-family residential subdivision with a total of 13 lots. A new town road is proposed extending from Marion Road leading to the west and terminating in a new cul-de-sac. All the new lots will gain access from the new road. Subsurface sewage disposal systems will be installed for each new home, which have been evaluated for compliance with the State of Connecticut Public Health Code.

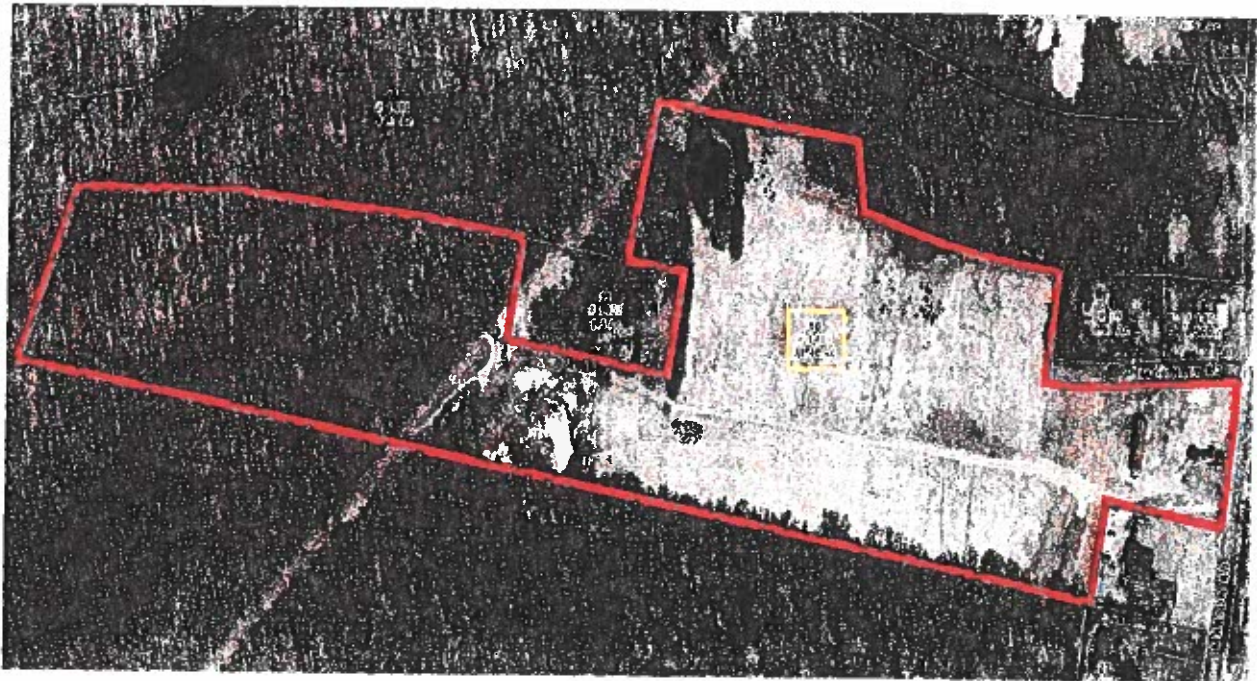


Figure 1: #1415 Parcel

RECEIVED
Town of Cheshire

DEC 16 2020

Fiscal Dept

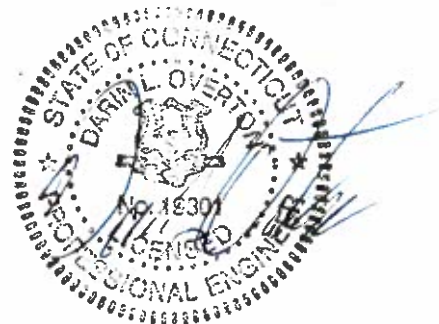


Table 1 – Stormwater Data

Parcel Size Total	31.5 acres
Existing On-Site Impervious Area	0.33 acres
Proposed On-Site Impervious Area	2.53 acres
Soil Types (Hydrologic Soil Group)	"A," "B," and "C"
Existing Land Use	Woods, tree farm, open space, gravel driveway, building, paved driveway, and bituminous roadway
Proposed Land Use	Woods, open space, gravel driveway, building, paved driveway, concrete sidewalks, and bituminous roadway
Design Storm for Stormwater Management	No increases in peak rates of runoff for the 2-, 10-, 25-, 50-, and 100-year storms. First-flush runoff retention (CTDEEP WQV).
Water Quality Measures	2-foot-sump catch basins, riprap-lined drainage swales, sediment chamber, riprap energy dissipator, sediment forebay, and retention storage
Design Storm for Storm Drainage	10-year storm
Federal Emergency Management Agency Special Flood Hazard Areas	Not applicable
Connecticut Department of Energy & Environmental Protection Aquifer Protection Areas	Not applicable

STORMWATER MANAGEMENT APPROACH

The stormwater management system for this site has been designed utilizing Best Management Practices (BMPs) to provide water quality management while attenuating the proposed peak-flow rates from the development. The design goal is to provide water quality treatment in accordance with the Connecticut Department of Energy & Environmental Protection (CTDEEP) requirements for Water Quality Volume (WQV) and prevent increases in the predevelopment runoff rates from the project site. Existing drainage patterns will be maintained to the maximum extent practicable, and a stormwater treatment train is proposed including several water quality measures such as catch basins with 2-foot sumps, riprap-lined drainage swales, a sediment chamber device, riprap energy dissipators, a sediment forebay, and retention volume within the proposed stormwater management basin.

The proposed project will include one stormwater management basin that was designed to detain the proposed stormwater peak discharge rates and provide retention storage to address water quality. The proposed detention basin is designated on the site plans as Basin 110 and will be outfitted with a reinforced concrete outlet control structure. The discharge from the stormwater basin will be directed to the existing storm drainage system in Marion Road.

The computer program entitled *Hydraflow Storm Sewers Extension for AutoCAD® Civil 3D® 2019* by Autodesk, Inc., Version 10.5, was used for designing the proposed storm drainage collection system. Storm drainage computations performed include pipe capacity, hydraulic grade line, and gutter flow

calculations. The contributing watershed to each individual catch basin inlet was delineated to determine drainage area and land coverage. These values were used to determine the stormwater runoff to each inlet using the Rational Method. The rainfall intensities for the site were obtained from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14, Volume 10 Precipitation Frequency Data Server (PFDS). The proposed storm drainage system is designed to provide adequate capacity to convey the 10-year storm event.

WATER QUALITY MANAGEMENT

Stormwater runoff from the proposed development will be collected by a subsurface pipe and catch basin drainage system. The proposed drainage system will include catch basins with 2-foot sumps to trap sediment and debris. Steep drainage swales will be lined with riprap stone that will provide protection against erosive velocities of the stormwater runoff as well as an opportunity to trap sediments and debris before water reaches the proposed storm drainage in the road. A sediment chamber will be installed as a stormwater pretreatment measure prior to stormwater runoff entering the proposed basin. The sediment chamber was designed offline and sized with a storage volume capacity equal to 400 cubic feet per acre of the contributing impervious area from the proposed road and driveways.

A sediment forebay is proposed around the proposed drainage pipe that daylight into the stormwater management basin, which will improve water quality by trapping floatables and filtering coarse sediment and other pollutants. The forebay will be constructed using a riprap filter berm and a riprap energy dissipator. The proposed preformed scour hole will dissipate the potential erosive velocity of stormwater entering the basin as well as trap sediment. The sediment forebay will contain the deposited sediment within a small area of the basin and will allow for maintenance accessibility.

The stormwater basin will provide retention volume along its bottom, thus creating a water quality feature within it. This serves several purposes, including stormwater renovation and first-flush retention. The vegetation will provide pollutant removal by filtering stormwater runoff and utilizing excess nutrients that may be present in the stormwater. The *CTDEEP 2004 Stormwater Quality Manual* (Chapter 7) recommends methods for sizing stormwater treatment measures with WQV computations. The WQV addresses the initial stormwater runoff, also commonly referred to as the "first-flush" runoff. The WQV provides adequate volume to store the runoff associated with the first 1 inch of rainfall, which tends to contain the highest concentration of potential pollutants. Supporting calculations have been included in the Appendix of this report.

HYDROLOGIC ANALYSIS

A hydrologic analysis was conducted to analyze the predevelopment and post-development peak-flow rates from the site. Three analysis points consisting of three existing subwatersheds were chosen based on the fact that each area receives stormwater runoff from a portion of the project. Analysis Point A represents the portion of the site that contributes stormwater runoff to the existing storm drainage system in Marion Road. Analysis Point B analyzes a portion of the site that drains toward the northern property boundary reaching the wetlands and downstream off-site drainage swales to the north. Analysis Point C analyzes a small portion of the site on the west that drains to an existing drainage swale located in the abutting developed property at 1453 Marion Road. The remaining portions of the site that will not be impacted by the new development, and thereby remaining as of the existing conditions, were

not included as part of the overall hydrology study. The total combined watershed area delineated is approximately 25.3 acres under both existing and proposed conditions.

The method of predicting the surface water runoff rates utilized in this analysis was a computer program entitled *Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2019* by Autodesk, Inc., Version 2020. The *Hydrographs* program is a computer model that utilizes the methodologies set forth in the *Technical Release No. 55 (TR-55)* manual and *Technical Release No. 20 (TR-20)* computer model, originally developed by the United States Department of Agriculture – Natural Resources Conservation Service (USDA-NRCS). The *Hydrographs* computer modeling program is primarily used for conducting hydrology studies such as this one.

The *Hydrographs* computer program forecasts the rate of surface water runoff based upon several factors. The input data includes information on land use, hydrologic soil type, vegetation, contributing watershed area, time of concentration, rainfall data, storage volumes, exfiltration rates, and the hydraulic capacity of structures. The computer model predicts the amount of runoff as a function of time, with the ability to include the attenuation effect due to dams, lakes, large wetlands, floodplains, and stormwater management basins. The input data for rainfalls with statistical recurrence frequencies of 2, 10, 25, 50, and 100 years was obtained from the NOAA Atlas 14, Volume 10 database. The corresponding rainfall totals are listed below.

Storm Frequency	Rainfall (inches)
2-year	3.52
10-year	5.53
25-year	6.78
50-year	7.69
100-year	8.70

Land use for the site under existing and proposed conditions was determined from field survey, town topographic maps, and historical aerial photogrammetry. Land use types used in the analysis included woods, tree farm, grassed or open space, gravel, building, and impervious (paved) cover. Soil types in the watershed were determined from the CTDEEP Geographic Information System (GIS) database of the USDA-NRCS soil survey for New Haven County, Connecticut. For the analysis, the site was determined to contain hydrologic soil types "A," "B," and "C" as classified by USDA-NRCS. The different land uses and soil types were utilized to determine composite runoff Curve Numbers (CN) for each subwatershed. The time of concentration (Tc) was estimated for each subwatershed using the TR-55 methodology and was computed by summing all travel times through the watershed as sheet flow, shallow concentrated flow, and channel flow.

The proposed stormwater management basin was designed to naturally infiltrate stormwater runoff. On-site soil testing was performed to determine the feasibility of the stormwater infiltration in the area of the proposed basin. The soil testing consisted of two test pits within the area of the basin and visual field identifications. Permeability samples were taken from the test pits, and falling head permeability tests were run on each sample. The exfiltration rate used in the calculations was obtained by averaging the results of the two permeability samples and reducing the averaged result by 50%, thus providing a safety factor of 2, which is recommended by the CTDEEP *2004 Stormwater Quality Manual*. Test pit logs are included as part of the proposed plans as Test Pits #43 and #44. The permeability testing results are included in the Appendix of this report.

The existing conditions were modeled with the *Hydrographs* program to determine the peak-flow rates for the various storm events at each analysis point. A revised model was developed incorporating the proposed site conditions and the stormwater management basin. The flows obtained with the revised model were then compared to the results of the existing conditions model. Peak-flow rates from the project site were controlled by the storage volume provided within the stormwater basin and the hydraulic capacity of the outlet control structure. The basin has been designed to provide a minimum of 1 foot of freeboard to the top of the embankment during the 100-year storm event. The following peak rates of runoff were obtained from the *Hydrographs* hydrology results:

Analysis Point A – Storm Drainage System in Marion Road					
	Peak Runoff Rate (cubic feet per second)				
Storm Frequency (years)	2	10	25	50	100
Existing Conditions	0.7	8.6	16.9	24.0	32.6
Proposed Conditions	0.1	6.3	12.8	20.0	32.1

Detention Basin 110*					
	Water Surface Elevation (feet)				
Storm Frequency (years)	2	10	25	50	100
Proposed Conditions	181.9	184.0	185.30	186.1	186.7

*Top Elevation of Basin = 188.0 feet

Analysis Point B – Northern Property Boundary					
	Peak Runoff Rate (cubic feet per second)				
Storm Frequency (years)	2	10	25	50	100
Existing Conditions	3.1	8.5	12.4	15.3	18.6
Proposed Conditions	2.5	6.0	8.4	10.2	12.2

Analysis Point C – Existing Drainage Swale – Northwest					
	Peak Runoff Rate (cubic feet per second)				
Storm Frequency (years)	2	10	25	50	100
Existing Conditions	0.4	1.7	2.7	3.5	4.4
Proposed Conditions	0.0	0.1	0.1	0.1	0.2

CONCLUSION

The results of the hydrologic analysis demonstrate that there will be no increases in peak-flow rates from the proposed development. This was achieved for the storm events modeled through a planned stormwater management system with detention provided in the proposed stormwater basin.

The proposed development will also introduce a new stormwater treatment train consisting of several water quality measures such as catch basins with 2-foot sumps, riprap-lined drainage swales, an offline sediment chamber, riprap energy dissipators, a sediment forebay, and retention volume within the proposed stormwater management basin. The CTDEEP WQV has been provided within the retention storage area along the bottom of the proposed stormwater management basin. The discharge from the stormwater basin will be directed to the existing storm drainage system in Marion Road.

All supporting documentation and stormwater-related computations are attached to this report along with the *Hydraflow Hydrographs* model results for stormwater management and the *Hydraflow Storm Sewers* model results for the proposed storm drainage system. Illustrative watershed maps for both existing and proposed conditions are also attached to this report.

Attachments

- Attachment A – United States Geological Survey Location Map
- Attachment B – Federal Emergency Management Agency Flood Insurance Rate Map
- Attachment C – Natural Resources Conservation Service Hydrologic Soil Group Map
- Attachment D – Storm Drainage Computations
- Attachment E – Water Quality Computations
- Attachment F – Hydrologic Analysis – Input Computations
- Attachment G – Hydrologic Analysis – Computer Model Results
- Attachment H – Watershed Maps

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