

POULIN REALTY ACQUISITIONS, LLC
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1) PROJECT DESCRIPTION

Poulin Realty Acquisitions, LLC proposes to construct a 9,974 square foot multi-tenant building at their parcel located off Farmington Road in Rochester, New Hampshire. The parcel, totaling 2.69 acres, is known as tax lots 25 on City's assessors map 216.

Access to the proposed building will be a reconstructed driveway located on the east side of Farmington Road / NH Route 11 in the approximate location as the existing residential driveway. This driveway is located approximately 680 feet south of the intersection of Crane Drive and Farmington Road.

The soils on the site are mapped as Hinckley series classification. These soil types are classified as hydraulic soils group "A" soils in the S.C.S. manual. There are no observed wetlands on the parcel.

The parcel is currently developed with a single-family house with a detached garage and several sheds. Access to the house is via a short paved driveway in the front. The front (west) portion of the lot is relatively flat, sloping slightly towards the east. Behind the house, the land drops off sharply to a lower level, approximately 10 feet. At which, the land is mostly level, with only a slight tilt towards the south. The rear portion, which is still wooded, slopes back up with a ledge outcrop in the northeasterly corner. A depression in the wooded area contains any stormwater the rear of the property from leaving the site.

There will be a total increase of approximately 0.95 acres of impermeable surfaces resulting from the proposed development, which will be the new driveway, the new building and associated parking and loading areas. The pavement and building will increase the runoff rate. Therefore, a storm drain system consisting of curbing, ditches, catch basin, and infiltration basin been designed to provide treatment of stormwater before it is discharged back into the ground. The details of the drainage system are shown on the project plans. The runoff calculations are discussed in the following sections of this report.

This report will analyze the current and post-development hydrology. The engineering intent is to design a drainage system to minimize the impact from storm water on the existing hydrology, and to insure no adverse hydrological conditions is created as a result of the proposed development. This report will also address the temporary and permanent measures required to minimize erosion and sedimentation during and after construction.

Through an iterative process using the modeling discussed above, a design that properly, slows, detains, and/or treats runoff, in order to minimize impacts to surrounding wetlands, abutting properties and any downstream drainage structures (i.e. municipal culverts, bridges, etc.) is arrived at. The Pre-development drainage analysis reflects the modeling performed for the Pre-development surface drainage for the land in its existing state prior to the construction project. The Post-development drainage analysis reflects the results of the final drainage design and provides surface drainage values to compare to the Pre-development values. In this way, the design engineer and any review agents are provided the necessary information to decide if the proposed design is adequate.

2) LOCATION

The site is located on the east side of Farmington Road / NH Route 11, between the Cocheco River Estates and Rochester Harley Davidson. Please refer to the Rochester Quadrangle – Figure #1 and the Tax Map - Figure #2.

3) METHODOLOGY

The pre-development and post-development drainage analysis will be based on Urban Hydrology for Small Watersheds, as written by the U.S. Soil Conservation Service and released as Technical Release 55, June 1986. The computer analysis is based on the S.C.S. TR-20 and the HYDROCAD program, written by Applied Microcomputer Systems of Chocorua, New Hampshire, as of 1995. The pre- and post-development drainage maps are based on information compiled from the following resources.

- Grading and Drainage Plan and Erosion and Sedimentation Control Plans - Bridgestone Tire Sale & Services, Farmington Road – NH Route 11, Rochester, NH prepared for Poulin Realty Acquisitions dated June 2010 by this office.
- Custom Soil Resource Report for Strafford County, by United States Department of Agriculture – Natural Resources Conservation Service (NRCS) dated June 17, 2010.
- Rochester MIS maps.
- USGS Rochester Quadrangle.

As stated in the introduction the purpose of this report is to provide design information for the drainage infrastructure necessary for the proposed subdivision. A number of sources of information were consulted to prepare the calculations for this infrastructure to check its sufficiency. The USGS Map, Aerial Photos, and the NRCS Soils Maps for Strafford County were all consulted. A Site visit was performed to confirm site conditions.

The 2, 10 and 25-year storm events have been used to model the stormwater runoff and to determine the capability of the proposed closed drainage system, infiltration basins and treatment swales to control, pass and treat runoff from these storm events. See Appendix A for Boundaries for SCS Rainfall Distribution, Rainfall Intensity Maps, and other assorted tables used to prepare the stormwater model.

A codified system was used to number the subcatchments, reaches and ponds in the drainage analyses. The following Table lists prefixes and their meanings.

Reach Prefixes

Prefix	Explanation
R #	Overland Flow - flow over one subcatchment from another after being released from a modeled drainage structure, Stream Channel, Road Side Ditch or Culvert, etc.
TS #	Denotes a reach used to model a Treatment Swale
POA #	Denotes a reach used as a Point of Analysis

Pond Prefixes

Prefix	Explanation
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Change at POA 4	0.0	0.00	0.0	0.00	0.0	0.00
Pre-Dev. POA 5	0.0	0.00	0.0	0.00	0.0	0.00
Post-Dev. POA 5	0.2	0.15	0.2	0.28	0.2	0.33
Change at POA 5	+0.2	+0.15	+0.2	+0.28	+0.2	+0.33

* Total Volume of Stormwater generated through hour 30 of the storm event.

As the table above shows, the results of the drainage analysis show a decrease or no change at four of the five POAs. The only increase was at POA #5, which is the infiltration basin. An increase at this location is a welcome result as it implies that increased stormwater generated from the redevelopment is discharged back into the ground.

Developing the parcel with the additional pavement and building will create an increase in stormwater runoff created, as discussed above. However, the increase in runoff has been mitigated by the on-site treatment system by following the stormwater and erosion control practices outlined in the "Stormwater Management and Erosion Control Handbook for Urban and Developing Areas in New Hampshire" also known as the Best Management Practices for Erosion Control (BMP's).

In conclusion, it is felt that this design fulfills the objectives of stormwater management design. The stormwater is treated and there is no significant increase in the discharge rate of runoff to the abutting properties. Proper temporary erosion control has been designed for the project during construction and this in concert with the permanent measures should insure no degradation of stormwater runoff quality.

A listing of temporary erosion control measures follows in section 7, permanent erosion control measures are listed in section 8, the construction sequencing is described in section 9 and winter erosion control notes in section 10.

7) TEMPORARY EROSION CONTROL MEASURES

1. Silt fence or erosion control mix berm shall be installed down slope from construction areas and at the property line to trap sediment and limit impact of construction equipment on abutting properties, wetlands and wooded areas.
2. Erosion control blankets shall be used on all slopes steeper than 3:1.
3. A stabilized construction entrance shall be constructed at the beginning of the site work.
4. A block and gravel inlet sediment filter shall be placed at the inlet of any catch basins and culverts to trap sediment.

8) PERMANENT EROSION CONTROL MEASURES

1. All disturbed areas will be stabilized by loaming and seeding within 30 days of rough grading.
2. All areas are considered stable if one of the following has occurred:
 - a. Base course of gravel have been installed in areas to be paved;
 - b. A minimum of 85% vegetated growth has been established;
 - c. A minimum of 3"+/- of non-erosive material such as stone or riprap has been installed; or

- d. Erosion control blankets have been properly installed.

9) CONSTRUCTION SEQUENCING

1. Refer to the "General Construction Phasing" notes prior to commencing construction in accordance with the following phasing. The "General Construction Phasing" notes apply to the overall construction and shall be adhered to.
2. Install all temporary sediment control barriers (i.e. Silt fence, erosion control mix berm, stone check dams, etc.) around the outer perimeter of the construction site as depicted on Sheet C-5 prior to earth moving operations.
3. Remove all structures, utilities and pavement as depicted on sheet e-1 and dispose off-site in accordance with state and local regulations.
4. Clear, grub and strip the site. Stumps, brush and other organic waste shall be disposed of off-site in accordance with state and local regulations.
5. Install a temporary construction exit at the location of the proposed driveway connection to route 11. Maintain as directed by the temporary construction exit detail.
6. Stockpile stripped topsoil and cut material to be reused on site in an appropriate location in accordance with the "soil stockpiles practices". Maintain the stockpiles as directed in the "soil stockpile practices".
7. Perform the necessary cuts and fills to construct the infiltration basin as depicted on sheet C-3 and C-5 and in accordance with the infiltration basin details shown on sheet C-8.
8. Construct the infiltration basin, sediment forebay and outlet protection. Loam seed and mulch the side slopes of the basin as directed in the infiltration basin details.
9. All ditches/swales/and basins shall be stabilized prior to directing runoff to them.
10. Perform the necessary cuts and fills to subgrade in the building and parking lot areas.
 - a) Install required fills in maximum 8-inch lifts and compact each lift to 95% maximum proctor density.
11. As subgrade is achieved install remaining sediment control barriers within the site (i.e. Additional silt fence, check dams and sediment controls and catch basins, etc.)
12. Install all utilities and closed drainage system components (i.e. pipe culverts, catch basins and remaining water main) per the corresponding details and as shown on sheet C-3 and C-4. As each structure is completed install the corresponding temporary sediment control barrier depicted on sheet C-9.
13. All cut and fill slopes and lawn areas not to be paved shall be loamed and seeded for permanent vegetation and stabilization as described under the "permanent vegetation practices" within 3 days of achieving final grade.
14. Install all gravel base and crushed gravel materials for the parking area as specified in the corresponding details.
15. The parking areas shall be stabilized (constructed to gravel base course) within 3 days of achieving finished subgrade elevations.
16. Install pavement surfaces as soon as possible after the installation of the gravel base and crushed gravel, in order to limit the soil erosion and pollution of the gravel materials with organic materials. In no case shall areas to be paved be left unprotected through out the winter months.
17. All disturbed areas shall be stabilized as soon as possible. In no case shall any disturbed area be left un-stabilized for longer than 21 days. If necessary temporary stabilization measures as discussed in the "General Construction Phasing Notes" and NHSMM, vol. 3 should be employed.

Maintenance and Inspection:

18. During construction all temporary and permanent sediment, erosion control and stormwater management practices should be inspected weekly, after every 1/2 inch of rainfall, and annually.

19. Excess sediment should be removed from temporary sediment, erosion control and stormwater management practices when it reaches prescribed thresholds discussed in the details for each practice.
20. All damaged temporary and permanent sediment; erosion control and stormwater management practices should be repaired or replaced immediately upon notice.
21. Sediment shall be disposed of properly either on site or off site.

Project completion and Stabilization:

22. Upon project completion, once the site is deemed stabilized (vegetation is germinated), the temporary sediment control barriers and erosion control practices shall be removed. Any disturbance created during removal shall be repaired in an appropriate manner.
23. Accumulated sediment shall be removed from all on site catch basins and the sediment forebays to the infiltration basin.

10) WINTER CONSTRUCTION EROSION CONTROL NOTES

1. All proposed post-development vegetated areas which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 4:1, and seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting, elsewhere. The placement of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melts events.
2. Side slopes, which do not exhibit a minimum of 85% vegetative growth by October 15th, shall be stabilized with stone or erosion control blankets appropriate for the design flow conditions.
3. After November 15th, incomplete parking surfaces shall be protected with a minimum of 3-inches of crushed gravel per NHDOT 304.3, or if construction is to continue through the winter season be cleared of any accumulated snow after each storm event.