



13-0283-1  
June 9, 2014

Mr. Michael Behrendt, AICP  
Town of Durham  
15 Newmarket Road  
Durham, New Hampshire 03824

**Re: Design Review #1  
Island Diversified, LLC  
15 Madbury Road & 8 Mathes Terrace  
Tax Map 2, Lot 12-5 & 12-6  
Durham, New Hampshire**

Dear Mr. Behrendt:

We have completed our initial review of the above referenced project and offer the following summary. As requested, our review focused on the stormwater system design, utility design and general engineer review. We did not review the site lighting or landscape plans and did not review the plans for conformance with the Town of Durham Zoning or Site Plan review regulations.

#### **Project Understanding:**

- The proposed redevelopment calls for the removal of the existing buildings on Tax Map 2, Lot 12-5 & 12-6, the merger of the two lots and the construction of a single multi-story, multi-use, building consisting of 64 residential units and  $\pm 4,155$  SF of commercial space with associated parking and site improvements.

#### **Information Reviewed:**

- Site Plans prepared by MJS Engineering, PC dated May 15, 2014;
- "Drainage Report", by MJS Engineering, PC dated May 20, 2014;
- "Stormwater System Management Plans" by MJS Engineering, PC dated May 20, 2014;

The following is a summary of our comments:

#### **General Comments:**

1. We recommend the applicant confirms the exact size, location, and inverts of the sewer and water lines called out as approximate.
2. The applicant will be required to file a Sewer Connection Permit with the NHDES.
3. The applicant will be required to file a Utility Connection Permit with the Town of Durham.
4. The final Site Plans and Drainage Calculations should be stamped by a professional engineer licensed in the state of New Hampshire.



## **Drainage Report & Stormwater System Management Plan Comments:**

1. An updated Stormwater Checklist should be submitted as required.
2. The values in Table 1 (Peak Rate of Runoff Comparison Table) and Table 2 (Discharge Volume of Runoff Comparison Table) of the drainage report should be revised to match the values from the Pre- and Post-Development Drainage Analysis.
3. The proposed "Typical Permeable Concrete Paver Cross Sections for Parking Area", "Typical Permeable Paver for Walkways" and "Bioretention System Cross Section" details do not meet the requirements of the New Hampshire Department of Environmental Services for treatment. The applicant should confirm with the Town that the proposed stormwater management practices proposed meets the requirements of the Town of Durham's Site Plan review regulations.
4. The applicant should confirm with the Town that the groundwater recharge/infiltration requirements can be waived due to the soils on-site. There is currently no groundwater recharge or infiltration proposed below the permeable pavers or underground detention basin, and impermeable liners for these systems have been proposed.
5. The applicant should include CB 1335 in the drainage analysis as there is additional stormwater that is directed to it in the post-development condition due to the connection from the proposed Rain Garden.
6. It appears there is additional off-site stormwater runoff that will be directed to the proposed rain garden. This should be confirmed, and the design of the rain garden and permeable paver section be revised if necessary.
7. Further information should be provided for the "time lags" used for modeling the proposed permeable paver sections and rain garden in the post-development condition. There were no calculations or rationale provided for why such long lag times were used. The proposed stone layers below the permeable pavers range from a few inches to a couple feet thick and consist of washed/clean stone that would not likely produce such lag times, if any. Also, the lag time used for the rain garden assumes that all of the stormwater coming into it is "lagged" (assumed due to the filter layer?). This is unlikely to occur as the incoming water will more likely short circuit and flow to the outlet structure. Therefore, the drainage model should be revised to reflect more realistic conditions.
8. Outlet Control Structure #1 calls for a 2" orifice, we recommend using no less than a 3" orifice with a trash rack for outlet structures to prevent clogging.
9. The outlet grate for the proposed rain garden should be modeled to accurately reflect the proposed grate called out in the details.
10. The "Permanent Best Management Practices" for the proposed rain garden describes that runoff is filtered through a 12" deep soil mix, though the detail for the rain garden only calls for an 11" thick filter course. This should be addressed.

## **Site Plans**

### **Site Plan – C1**

1. The applicant should coordinate with the utility provider about the potential conflict with running the proposed drain line under the proposed transformer pad.

2. The applicant should coordinate with the utility provider about the proximity of the proposed transformer pad to the proposed building, as well as potential need for protective bollards, and access to the transformer for maintenance.
3. The applicant should confirm with the Town if the location of snow storage areas within the Mathes Terrace right-of-way are acceptable.

### **Utilities, Grading, Drainage & Erosion Control Plan – C3**

1. The applicant should confirm that the proposed drain line within the Mathes Terrace right-of-way will not be in conflict with the “approximate” sewer line.
2. The applicant should confirm with the Town that the new drain line within the Mathes Terrace right-of-way is allowed, and/or if an easement is required.
3. We recommend that all the proposed roof drains should have a minimum cover of 4’ for frost protection, or other frost protective measures be considered. There are multiple locations where there is less than two feet of cover on the proposed roof drains, and in one case less than a foot of cover.
4. We recommend that all proposed drain lines have a minimum cover of 4’ for frost protection, or other frost protective measures be considered. There are multiple locations where there is less than three feet of cover. This is of particular interest to the Town within the areas of the Mathes Terrace right-of-way and Madbury Road right-of-way.
5. The applicant should confirm with the Town that the depth of cover on the proposed 8” HDPE pipe into CB-1335 (approximately two feet of cover) is sufficient within the right-of-way.
6. We recommend the minimum drain line size located within Town owned right-of-ways be a minimum 12” diameter.
7. The rim elevation of proposed CB #1 is at the “flood” elevation for the proposed rain garden. This could lead to excessive ponding in the landscaped area adjacent to the proposed rain garden in larger storm events. This should be addressed.
8. We recommend the applicant coordinate with the Town of Durham on increasing the proposed rip-rap apron #1 to extend to the edge of Pettee Brook to prevent the erosion of the existing slope.
9. We recommend that an overflow drainage structure be provided within the permeable paver sections near the north entrance to the building, and at the rear (west) of the building. There is currently no way for water to leave these areas if blinding of the permeable pavers was to occur (by snow/ice/rain event, clogging, etc.).
10. The finish floor elevation of the building should be shown on the plan. Currently it appears that the finish floor is likely 50.96, however the entrance to the building is at elevation 52.00.
11. We recommend the sawcut limits and pavement patch between the proposed sewer line and proposed waterline be expanded so that there is not a small patch of existing pavement remaining.

### **Construction Details – C4 to C10**

1. A Trench Drain Detail should be added to the plans.
2. The "Storm-Tech Chamber Cross-Section" is designed to have a minimum cover of approximately 1.5 feet. We recommend that the applicant consider frost protective measures for this system.
3. We recommend a non-woven geotextile fabric for use on the sides of the rain garden crushed stone section and filter section be specified to prevent migration of the surrounding materials into the crushed stone.
4. The permeable paver details should be revised to match the underdrain sizes proposed on the grading plan.
5. A specification for the permeable fill proposed to be used behind the "Soldier Pile Retaining Wall" should be specified. We recommend that the applicant have the final design of the retaining wall be by a licensed structural engineer, and that the final drawings and calculations be stamped by the licensed structural engineer.
6. We recommend all curb be supported by poured in place concrete (front and back).
7. We recommend that the applicant provide further information as to why the impermeable liner proposed below the permeable paver sections is being used, and if possible, explore replacing the liner with a suitable permeable barrier (e.g. non-woven geotextile fabric, etc.).
8. We recommend increasing the rip-rap size of the "Pipe Outlet Protection Detail" to 6" (d50) minimum. The geo-textile fabric proposed to be used should also be specified.
9. The permeable paver bedding and joint aggregate (ASTM No. 8), should not be referred to as "joint sand" as this may confuse the contractor.

If you have any questions or need additional information please feel free to contact me at 603-433-8818 or [jmpersechino@tighebond.com](mailto:jmpersechino@tighebond.com).

Very truly yours,

**TIGHE & BOND, INC.**



Joseph Persechino, P.E.  
Project Manager

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