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VIA EMAIL

Ipswich Planning Board  
Town Hall  
25 Green Street  
Ipswich, MA 01938

RE: 50-56 Market Street - Site Plan Review & Special Permit Applications  
Initial Engineering Review - Task 1

Mr. Ethan Parsons and Planning Board Members:

As requested, I have conducted an initial engineering review of the above referenced project with respect to drainage and stormwater management, parking, loading, and vehicular circulation. Review standards for drainage and stormwater management include pertinent sections of Site Plan Review regulations (Zoning Bylaw Sections X.C.5 and X.E.2.1) and the MA DEP Stormwater Handbook. Review standards for parking, loading, and vehicular circulation include pertinent sections of Zoning Bylaw Section VII (Off-Street Parking and Loading Regulations). In addition, consideration is given to common engineering design practice for facilities similar to that being proposed by the Applicant. Pertinent technical material received includes the following plans and documents as prepared by the Morin-Cameron Group, Inc., of Danvers, MA (unless otherwise noted).

- “Site Improvement Plans for Market Street Station located at 50-56 Market Street...” consisting of nine (9) sheets, all dated September 22, 2021 and revised to November 11, 2021.
- “Stormwater Management Report...” dated September 22, 2021, including appendices for MA DEP Stormwater Management Report Checklist, Hydrologic Analysis, Supplemental Stormwater Management Calculations, Construction Phase Pollution Prevention Plan, Long Term Best Management Practices O&M Plan, and an Illicit Discharge Statement.

At this time, the following comments and opinions are offered for your consideration.

**Overview:**

After an examination of this report by all parties, it is anticipated that a general revision of the plans and calculations will need to be undertaken by the Applicant. In my opinion, the stormwater management calculations require modification in order to adequately demonstrate that project impacts are fully mitigated. In addition, parking, loading, and vehicular circulation is deficient with respect to several of the requirements of Zoning Bylaw Section VII (Off-Street Parking and Loading Regulations).

## Parking, Loading, and Vehicular Circulation

1. Project Entrance – The driveway slope entering the property is excessively steep (approximately 18 percent grade). It is acknowledged that the condition is existing, however, the Planning Board may want to consider whether a significant increase in the intensity of the existing use is warranted.
  - a. The grading of the driveway apron should be better detailed to ensure that an acceptable cross slope is provided along the public pedestrian way (i.e., the sidewalk path across the driveway apron within the Market Street right of way).
  - b. Grading of the driveway apron should be examined to minimize passenger vehicle scraping of bumper/undercarriage on the pavement due to the severe amount of slope change (i.e., ‘bottoming out’). During a site visit, pavement scrapes were noted where the driveway apron intersects the Market Street pavement.
  - c. The proposed ‘Driveway Corner Curb’ specified on the northerly side of the driveway curb cut (refer to plan sheet 4) should be modified to ensure that the minimum required sidewalk ramp width is provided.
2. Driveway and Access Aisle Width - The proposed 16 foot driveway width and access aisle is too narrow for the project. The proposed width does not adequately accommodate two way traffic flow, nor will it enable reasonable turning movement into/out of parking stalls.
  - a. In addition to the above, the aisle width does not satisfy the minimum aisle width requirement of Zoning Bylaw Section VII.K (Design Standards for Parking Facilities) which requires a minimum aisle width of 22 feet.
  - b. The Applicant should confirm the adequacy of the driveway width with the Ipswich Fire Department. Local Fire Departments commonly request a width wider than 16 feet to accommodate their apparatus and/or to satisfy NFPA requirements.
3. Parking End Space Requirement – Section VII.K requires that “end spaces...shall have a minimum width of ten (10) feet, and maneuvering space at the aisle end of at least five (5) feet in depth and nine (9) feet in width.” The parking layout does not satisfy this requirement.
4. Parking Layout – The proposed parking layout does not satisfy the requirement of Section VII.M.2 which requires that “...parking and loading facilities shall be laid out so that each vehicle may proceed to and from its parking space without requirement the movement of any other vehicle...” Parking spaces north of the existing building do not have direct access to a travel aisle and require the movement of other vehicles to enter/exit the space. In addition, vehicle access to the proposed dumpster location is not available without requiring the movement of a vehicle parked in the adjacent parking space.
5. Vehicle and Pedestrian Conflict - Section VII.M.2 also requires that “...in no case shall parking or loading spaces be located so as to require the backing or maneuvering of a vehicle onto a sidewalk or onto a public way in order to enter or leave the space.” With respect to the proposed sidewalk, consideration should be given to the following items.
  - a. The parking spaces adjacent to the new building will be required to maneuver within the designated walkway area (because of the insufficient aisle width discussed in item 2 above).
  - b. The parking spaces located westerly of the existing building will require vehicles to maneuver across the proposed walkway area. It should be noted that walkways within this type of parking layout are more commonly located adjacent to the front of

- the parking space rather than the rear, thereby reducing pedestrian and vehicle conflicts.
- c. It is further noted that pedestrian walkways are typically separated from vehicular areas by a landscape strip or a curb. Neither is proposed for this project (the walkway is proposed to be at the same grade as the vehicle aisle/driveway). Hence the safety measures most commonly provided for a walkway are not present. It should also be noted that the presence of a designated walkway implies a level of pedestrian safety that does not exist from a practical standpoint (i.e., the walkway area is required for vehicular movement).
  - d. With respect to vehicles servicing the dumpster, no turnaround is provided on site. This implies that the vehicle would be required to back onto Market Street when exiting the site, thereby violating the requirement of Section VII.M.2.
6. Location of Parking Spaces – Section VII.M.3 stipulates that “in no case shall surface parking or loading spaces be located less than ten (10) feet from any side or rear lot line...” Parking spaces are proposed closer than the requirement along both the northerly and southerly property lines.
  7. Location of Parking Spaces – Section VII.M.5 stipulates that “...no off street parking shall be located within the front setback...” Parking spaces are proposed within the front setback.
  8. Loading Space Requirements – Section VII.J requires loading space for the proposed use. A designated loading space is not indicated on the plans.
  9. Dumpster Access – A dumpster location is proposed for the site (adjacent to the northerly property sideline), however, it appears that the dumpster will not be easily accessed by maintenance vehicles. More specifically, access to the dumpster is obstructed by a parking space. In addition, a turnaround area has not been designated, thereby implying that the vehicle must back onto Market Street in order to exit the site.
  10. Snow Storage – Two areas are proposed for snow storage, however, both of the designated areas also contain, or are obstructed by, proposed landscaping (refer to plan sheets 4 and 8). As such, the snow storage areas are inadequate for the proposed site and should be revised, as necessary.
    - a. It is also be noted that both snow storage areas require the movement of parked cars. While this may not be an insurmountable problem, it introduces a site management issue that planning and site design should look to reduce (or eliminate entirely).
  11. The Driveway Paving Detail on plan sheet 6 specifies 8 inches of gravel beneath the pavement. It is a more common practice to specify a minimum of 12 inches of gravel for the proposed use. It is suggested that the detail be revised accordingly.
  12. Retaining walls are proposed along a portion of the northerly and southerly property lines.
    - a. Along the southerly portion of the site, a retaining wall is proposed that will have a variable height consisting of up to 4 feet of exposed wall height on the project side. In addition to the visual impact associated with the wall, consideration should be given to safety and potential impact from turning vehicles (given the aisle width discussed earlier in this report).
    - b. The easternmost portion of the southerly retaining wall will have a maximum exposed wall height of approximately 2 feet on the abutting property side. Since this wall segment is directly adjacent to a parking space, provisions for pedestrian and vehicular safety should be considered.
    - c. Along the northerly portion of the site, a retaining wall is proposed that will have a variable height consisting of up to 3 feet of exposed wall height on the abutting side.

Similar to 'b' above, consideration should be given to pedestrian and vehicular safety along this wall.

13. It is noted that the rear stairway of the existing building will require a landing. As graphically shown on the plans, the landing would be required to be located within the proposed walkway. Since the designated walkway has identified in this report as being required for vehicular movement, the suitability of the landing location should be re-examined. It is suggested that this issue be referred to the Building Inspector for interpretation.

### **Stormwater Management & Drainage:**

1. Need for Additional Analysis of Off-Site Impacts – Runoff to the rear of the site flows both northerly and southerly (towards the rear property corners) as it leaves the site. To ensure that localized impacts are adequately mitigated, it is requested that design point 2 be further subdivided to examine runoff impacts to both the north/northeast and to the south/southeast.
2. It is noted that Infiltration System 1 is located adjacent to a slope in excess of 15 percent grade. The MA DEP Stormwater Handbook (Volume 2, Chapter 2) requires a 50 foot minimum setback from infiltration basins to slopes greater than 15 percent. The location of the proposed system does not comply with this requirement. The design engineer should address this concern and explain how the potential for slope breakout will be mitigated.
3. It is noted that Infiltration System 2 is approximately 12 feet from the existing building foundation. The MA DEP Stormwater Handbook (Volume 2, Chapter 2) requires a 20 foot minimum setback from infiltration trenches to building foundations. This issue should be addressed by the design engineer. In addition, the design engineer should comment on (and make appropriate design specification as needed) on how the building foundations will be protected from adverse impacts associated with subsurface flow from the infiltration system, and whether or not the building foundation drain system will intercept the subsurface flow coming from the infiltration system (which, if it occurs, would short circuit the stormwater management design intent).
4. Infiltration System 1
  - a. Provide details on the plans relating to the primary overflow assumed in calculations (no specification or construction detail is provided on the plans).
  - b. Two overflow devices are assumed in the calculations, however, the grading plan implies only one viable location would be available at the elevation assumed in the calculations for the overflow. This issue should be clarified.
5. Infiltration System 2
  - a. The proposed overflow weir is set at elevation 37.4. It is noted that this elevation is higher than the adjacent catch basin rim located south of the existing building. Hence, the overflow discharge will actually occur at the catch basin, directing runoff towards Market Street rather than to the rear of the site. The site plan information contradicts the assumptions made in the calculation and revisions should be undertaken to correct and coordinate the plans and calculations.
  - b. A calculation should be provided to demonstrate that the 1 year storm is being retained on site (in accordance with the requirements of the Ipswich Stormwater Bylaw).
  - c. The low level orifice should be influenced by tailwater in the primary discharge pipe, however, the calculations do not appear reflect this (during the 100 year storm). The

- model input for this device should be rechecked as the calculated outflow is overstated when compared to the anticipated physical condition.
- d. Hydraulic calculations should be conducted on the storm drain pipe network to confirm that peak stormwater elevations (i.e., tailwater elevations) will not exceed catch basin rim elevations or discharge through roof piping overflows (during the 100 year storm).
  - e. It is noted that Infiltration System 2 is proposed to be built in an area of the existing building that is to be demolished. As such, the system will be constructed in fill. Additional notes and specification should be provided to ensure that the work will fully comply with the requirements of the MA DEP Stormwater Handbook (refer to Volume 3, Chapter 1: ‘When Fill Materials Are Determined To Be Present’).
    - i. Soils testing to an elevation lower than the fill limits (i.e., into native material) will be needed to verify the presumptions made in the calculations.
  - f. It is noted that the overflow pipe from Infiltration System 2 will discharge adjacent to, and ultimately flow across, an unvegetated slope on abutting property of EBSCO Industries. As a result, localized impacts in the form of erosion and sediment migration could be reasonably anticipated. The design engineer should include specifications to mitigate this condition, or alternatively, consider another location for the outfall.
6. Hydraulic calculations should be conducted on the roof drain pipe leader systems to confirm that peak stormwater flows can be conveyed during the 100 year storm without significant tailwater being generated (i.e., that tailwater will not result in discharge from infiltration basin 1 or 2 prematurely or in amounts greater than that assumed in the calculations). It is anticipated that the proposed 4 inch roof drain leader pipes are undersized.
  7. Post Development Subcatchment 1 – It is noted that the time of concentration is assumed to double (to 12 minutes) compared to the existing condition subcatchment 1. Since the pre and post development areas consist of comparable hydrologic features, the design engineer should explain why the time of concentration has increased so dramatically, or recalculate runoff using a comparable time of concentration for each subcatchment.
  8. The hydrologic divide between post development subcatchments 1 and 3 (adjacent to the southeasterly corner of the existing building) should be re-examined and better defined with spot grading and flow arrows. Based on the grading plan, the area of subcatchment 3 appears to be overstated (i.e., a larger portion of the upper parking aisle would bypass the proposed catch basin and flow overland to Market Street, thereby increasing flow to design point 1 beyond what is calculated.
  9. As proposed, there is only 1 foot of pipe cover provided on the storm drain at both catch basin locations. The following items should be addressed:
    - a. One foot of pipe cover is generally inadequate with respect to construction logistics. Increased pipe cover should be provided.
    - b. The design engineer should confirm with the manufacturer of the VortSentry unit, that the unit can be constructed with the shallow earth cover provided in the design.
  10. No curbing or berm is proposed for the project. The design engineer should address the following concerns:
    - a. Erosion along the edge of the driveway as a result of concentrated flow along the pavement edge combined with the steep driveway slope.
    - b. The ability of catch basins to effectively collect runoff along the edge of the pavement without an edge treatment that will contain and direct flow to the basin

inlet. Note that an earthen berm along the pavement will be subject to disturbance by traffic and snow removal operations, and would be viewed as insufficient for this catch basins as currently located.

#### 11. Drafting Items

- a. Provide a note on plan sheet 5 specifying that all roof runoff is to be conveyed to infiltration basins (i.e., the existing building roof runoff is to be conveyed to infiltration system 1 and the proposed building is to be conveyed to infiltration system 2.
- b. Provide a call out on plan sheet 5 for the stabilized construction entrance and settlement basin. Also reference the detail provided on plan sheet 6.
- c. The Stone Energy Dissipator Detail (plan sheet 7) should specify the length of stone required.
- d. The Outlet Control Structure Detail (plan sheet 7) should specify a larger diameter manhole to facilitate maintenance access. Also, a watertight seal between the baffle wall and the manhole walls should be specified.
- e. Test pit log TP 21-4 on plan sheet 3 indicates a surface grade for the test pit that does not correspond to mapped topography where the test pit is located.

#### **DEP Stormwater Management Standards:**

1. Standards 4 & 7 – The ‘Review of Stormwater Management Standards’ submitted by the Applicant includes a statement that “...Treatment of a portion of the proposed driveway and parking along the southern property line can’t be provided due to site constraints. There is no feasible location to provide surface treatment and no feasible outlet location for a subsurface system...” In my opinion, the design engineer has not adequately substantiated this statement with an evaluation of alternatives. The site appears to consist of suitable soils and topography to provide water quality treatment within this area ‘to the extent practicable.’ Further evaluation by the design engineer is strongly suggested.
2. Standard 4 – Provide supporting information for impervious area used in the water quality volume calculation. The area used in calculation could not be verified using data provided.
3. Standard 4 – A revised Long Term Pollution Prevention Plan (LTPPP) should be submitted to address all items contained in Standard 4 of the MA DEP ‘Checklist for Stormwater Report.’ In addition:
  - a. Include a note on the plans referencing the incorporation of the LTPPP in the project.
  - b. The section entitled ‘Prevention of Illicit Discharges’ should provide specific guidance and directives to be implemented, rather than merely identifying areas for which policies are to be implemented.
4. Standard 8 – ‘Construction Period Pollution Prevention Plan’ (CPPPP):
  - a. Add a sediment/settling basin description, consistent with plans/details.
  - b. Identify the person or entity responsible for plan implementation and compliance.
  - c. Provide a construction sequencing plan for the project.
  - d. Include a note on the plans referencing the requirements of the CPPPP.
5. Standard 9 – ‘Long Term Stormwater Best Management Practices Operation and Maintenance Plan’ (O&M Plan):
  - a. Identify the party or entity responsible for operation and maintenance of the stormwater system.

- b. Provide estimated costs and a projected annual budget for operation and maintenance of the stormwater system. The specified directives to ‘consult with local landscaping companies for associated costs’ are insufficient.
- c. Add inspection and maintenance of gutters, downspouts, and pipe leaders to the O&M Plan.
- d. General Conditions item 3a stipulates that the owner shall maintain a stormwater management maintenance log for the last three years. Given the anticipated lifespan of the stormwater management system, maintenance records will provide a significant insight into the history of the system. It is strongly suggested that maintenance records be kept for the entire life of the system.
- e. General Conditions item 4 should be modified to require that any changes to the inspection/maintenance schedule be reported to the Planning Board as well as the Town Department responsible for MS4 compliance.
- f. BMP descriptions and the Maintenance/Inspection Log Forms should identify the quantity of each item present on the site.
- g. Coordinate the frequency of inspections between BMP descriptions and the Maintenance Log. Ensure that the specified inspection frequencies are consistent and reflect MA DEP Stormwater Handbook recommendations.
- h. Provide an Operation and Maintenance Log Form to document inspections and construction activity.

Please feel free to contact me if you have any questions or require any clarification of the above comments and opinions.

Very truly yours,

*R.E. Puff*

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Robert E. Puff, Jr., PE

cc: John Morin, PE (via email)  
Will Schkuta, PE (via email)  
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