

June 29, 2022
Summit #21493

Earl MacKenzie
Project Manager
126 Church Street
Belfast, Maine 04915

Reference: Engineering Services – Stormwater Evaluation
New Multipurpose Building – 126 Church Street, Belfast, Maine

Dear Mr. MacKenzie;

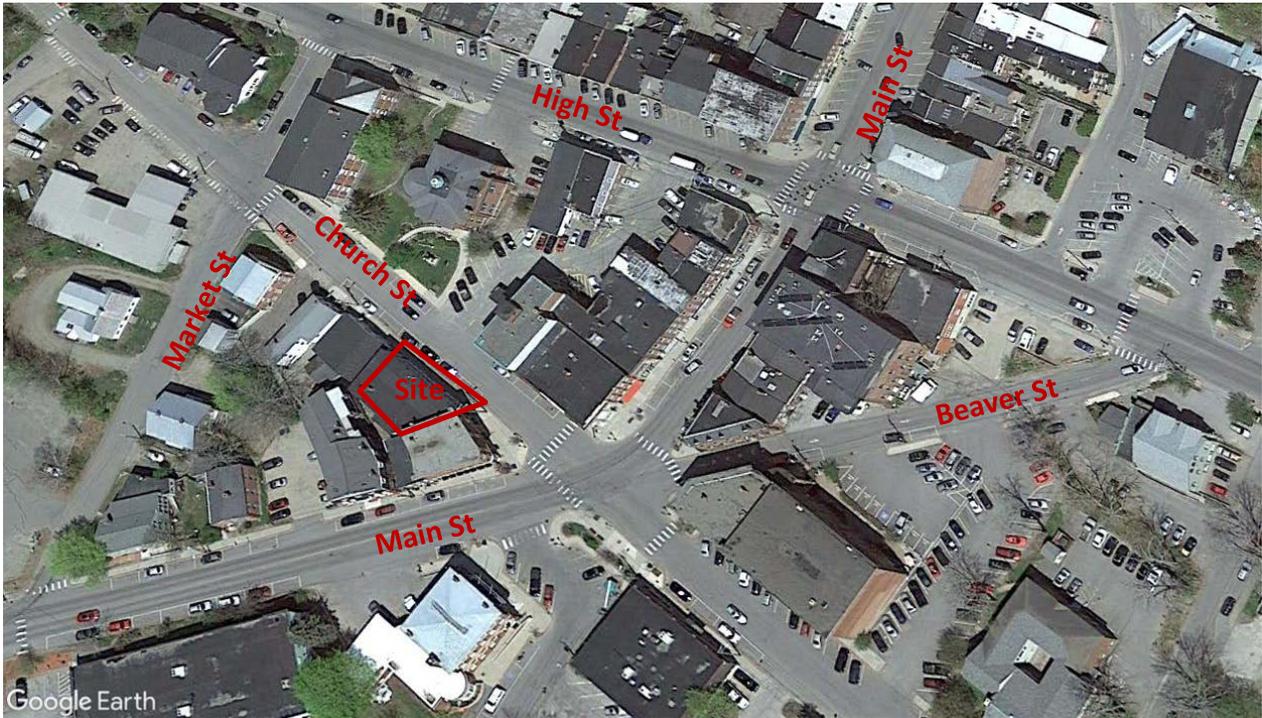
Summit Geoengineering Services, Inc. (SGS) has completed a review for the consideration of stormwater runoff for a new multipurpose two-story building at 126 Church Street in Belfast, Maine. This report summarizes our findings based upon the results of our geotechnical investigation (SGS Report 21493) and project information provided by others.

Project Description

The project consists of constructing a new building replacing a former building used as a dry cleaner business (Em Bee Cleaners) at 126 Church Street in Belfast, Maine. The existing building was a three-story wood framed structure and has since been removed from the site. The new building is planned as a two-story structure with masonry veneer having a footprint of approximately 2,450 sf. The new building will be multipurpose with commercial space and housing units. The lot is 3,210 sf in size bordered by existing buildings along Church Street in downtown Belfast.

Topography at the site slopes downward from southwest to northeast from elevations 104 to 102 feet based upon Maine GIS 2-ft lidar contours. Finish floor for the new building is at elevation 102.3 feet. The new building will be supported by concrete spread footings with a slab on grade. The original building foundation is constructed of rock masonry walls with some locally added concrete as a full basement. Original floor elevation for the existing basement is estimated at 97 ft. As such, depth of the former basement (current excavation) is 5 to 7 feet in reference to grade at the exterior sidewalk and adjacent building finish floors.

To achieve finish grade for the new building, a combination of crushed stone and Foundation Backfill are planned. New exterior footings will be constructed at a minimum depth of 4 feet below finish grade, placed upon a 12-inch layer of crushed stone upon subgrade. The foundation slab will be constructed upon Foundation Backfill overlying a 24-inches of Crushed Stone upon subgrade. Exterior foundation walls will be backfilled with Foundation Backfill.



126 Church Street Belfast ME (Google Earth)

Roof drains are planned for the roof which is relatively flat with a slope of ¼ inch per 1 foot. Down spouts are planned at 3 equally spaced locations for the north and south walls with outlet to a crushed stone drip edge located above the Foundation Backfill. Stormwater in the form of rain runoff will be collected by the roof drains on the north and south wall for infiltration to the drip edge and Foundation Backfill for infiltration into the subgrade soils.

Subsurface Conditions

SGS observed the subsurface conditions with the drilling of 4 test borings on January 6, 2022. The subsurface conditions consist of existing fill overlying glacial marine deposits and/or glacial till. Elevation is estimated from Maine GIS 2 ft Lidar contours shown on the topographic plan in Appendix A and field survey results using an auto level. Details of the subsurface conditions are provided in SGS Geotechnical Report #21493 dated February 3, 2022. Refusal and groundwater depth and elevation are estimated and summarized as follows:

Location	Surface EL	Refusal Depth	Refusal EL	Water Depth	Water EL
B-1	97 ft	7 ft	90 ft	1 ft	96 ft
B-2	97 ft	3 ft	94 ft	N/E	N/E
B-3	97 ft	6 ft	91 ft	1 ft	96 ft
B-4	101 ft	9 ft	92 ft	5 ft	96 ft

The depth of groundwater is estimated at 6 feet below finish grade for the new building.

Stormwater Considerations

SGS is asked to consider the stormwater runoff at the site for 25- and 50-year storm events. For this report, the 50-year storm event is used as the upper limit. The following comments are made as part of this evaluation:

- The site is a relatively small downtown lot with prior development. Historically, a former building encompassed much of the lot which is 3,210 sf in footprint. The new building is similar in footprint to the original building (Em Bee Cleaners) which has been removed. The new building is planned with a footprint of 2,450 sf. As such, stormwater generated from the new building is generally considered similar to that by the former building and doesn't present a change in stormwater impact at the site.
- An estimate for stormwater runoff for the building roof is performed using the Rational Method as $Q = CIA$ where Q is peak flow rate of runoff (ft/s), C is the runoff coefficient for surface type (building roof), I is the average intensity of rainfall in inches per hour for time concentration (T_c), and A is the watershed area in acres (building roof).

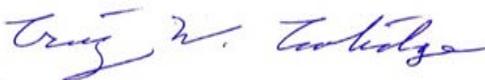
New drip edges for the collection of the roof rain water are planned along the north and south walls with 3 down spouts equally spaced along each wall. The drip edge is planned at the width of the alleyway which is 5 to 6 feet. The length of the alleyway is 44.5 for the south wall and 54 feet for the north wall. The drip edge will consist of crushed stone overlying Foundation Backfill (MDOT Type D) gravel placed along new foundation walls and footings.

The rainfall intensity used for the 50-year storm event is 2.24 in/hr. The permeability of the Foundation Backfill is estimated at 3.3^{-4} ft/s. The estimated peak flow rate of runoff (Q) is estimated at 0.11 ft³/s and the infiltration capacity of the drip edge with Foundation Backfill is 0.18 ft³/s. As such, it is anticipated that the drip edge with underlying Foundation backfill will permit infiltration (drainage) of the stormwater runoff generated during a 50-yr rainfall event.

Closure

Our stormwater evaluation is based on professional judgment and generally accepted principles of geotechnical and civil engineering. We appreciate the opportunity to serve you during this phase of your project.

Sincerely yours,
Summit Geoengineering Services



Craig W. Coolidge, P.E.
Vice President, Principal Engineer

