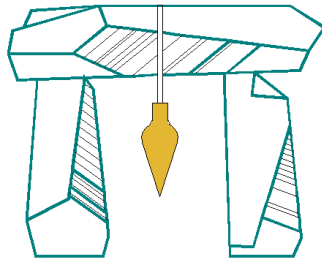


DeCelle-Burke-Sala



& Associates, Inc.

Engineering Report
for a
Multi-Unit Residential Development
91 Beatrice Circle
Belmont, Massachusetts

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SECTION 1 - PROJECT NARRATIVE

Existing Conditions

The project site is one parcel of land totaling 23,496 square feet of land designated as Map 51 Lot 36 with the Town of Belmont Assessors. The site is currently improved with a one and one-half story single-family home with driveway access off Frontage Road and is zoned Single Residence A. The residential building is approximately a 2,730 square foot (s.f.) footprint with a 456 s.f. single story detached garage. The driveway extends from Frontage Road to the garage and provides for additional on-site parking.

The Subject Property is bounded by single-family homes to the east, west and south. Frontage Road, also known as Hinckley Way, is located to the north of the Subject Property. Frontage Road abuts Massachusetts' Route 2/Concord Turnpike. The Concord Turnpike is an eight-lane main thoroughfare providing service for commuter traffic for the City of Boston and the west and northwest communities of the Metro Boston region. Frontage Road is a one-way two lane road that travels east and provides access to the Concord Turnpike further east of the Subject Property. Frontage Road also delineates the municipal boundary between Arlington and Belmont and is part of the MBTA bus routes #62, 76, 78, and 84, providing service to the MBTA's Red Line in Cambridge, Massachusetts.

The Subject Property has mature landscaping around the home and along Frontage Road. The site has topography ranging in elevation from 236 on the west of the lot to elevation 218 on the east side of the lot. The majority of the lot surface topography rolls to the east and toward Frontage Road. Soils are mapped by the Natural Resources Conservation Service (NRCS) as a Charlton-Hollis Rock Complex consisting of shallow well-drained gravel and sand with ledge. Test pits were performed by this office confirming the mapping.

Public water and sewer with connections out to Frontage Road service the single-family home. Underground power and communications also service the home. There are no existing stormwater controls for the property. All existing stormwater flows over-ground to Frontage Road.

Proposed Conditions

The proposed project includes constructing a new multi-unit affordable residential development subject to the Massachusetts Chapter 40B Housing regulations. The project consists of five new residential buildings, one four-story townhouse style building with eight units and the other four buildings each a two-story single-family home. Each of the twelve residential units contain three bedrooms each. Each building is a slab-on-grade building. No basements are proposed.

Each residential unit has a single car garage with access off a shared driveway that is centered between the buildings. The driveway is accessed from Frontage Road in a similar location to the existing drive. The drive also provides access to an eight (8) space surface parking lot providing a total of twenty (20) spaces for a parking ratio of 1.67. A four-foot wide pedestrian walkway extends up the driveway from Frontage Road and connects to a walkway for the townhouse building and to the main driveway to the development.

The project includes razing the existing single-family home and garage, cutting and capping all service utilities and removing the paved driveway. The site grade will be lowered to the driveway elevation of 227 to 225. The slab-on-grade construction will minimize the disturbance to any pockets of subsurface ledge that may exist. Two retaining walls on either end of the site stabilize the site at a more level elevation for vehicular traffic and parking.

New utilities will be brought on-site in the vicinity of the driveway from Frontage Road. New water supply, fire protection, sewage disposal, power, communications and gas shall be brought on the site underground. A 6" water supply pipe shall extend from the water main and provide individual domestic services for each townhouse unit and fire protection for each building. A new 6" PVC sewer pipe shall extend from the sewer main and connect to the proposed southerly buildings providing a separate service for each unit. The northerly building shall use an existing sewer manhole that serviced the old home and extend to each unit connecting separate service. The existing sewer connection from this manhole to the sewer main shall remain in service.

Currently no stormwater controls exist on the site. The proposed stormwater control system consists of a surface collection system that includes two deep sump catch basins, one deep sump manhole and a single underground Cultec recharge system with 51 chambers and an overflow to the city system located at Frontage Road. The system provides local flood control, groundwater recharge capabilities and stormwater quality treatment. The system as proposed meets MassDEP Stormwater Management Standards and buffers flow off the property for the 2, 10, 25, and 100-year storm event.

Stormwater Management

It is the intent of this report to show compliance with the Massachusetts Stormwater Management Standards (the "Standards"). This office generated hydrographs for both existing and proposed conditions to compare overall storm water offsite flows for various storms. Despite the soil mapping calling for "A" soils (Charlton) DBS calculated land coverage numbers (CN) using Hydrologic Group "C" soils based upon soil evaluations performed within the vicinity of the project. Soil testing will be performed before the construction of the underground infiltration

system to better determine the quality of the soils on site. Minimums for Times of Concentration for both existing and proposed conditions for hydrograph generation were used. A Rawl's Rate of 0.27 inches per hour was used for exfiltration. Impervious land coverage increases but the majority of runoff will now be treated in the underground stormwater recharge chambers. The runoff for the 2, 10, 25 and 100-year storm events are reduced and the project as proposed exceeds the recharge volume requirement.

The results of the calculations are tabulated below for comparison with the existing and proposed condition values. The project also complies with the other stormwater management standards outlined in the Standards. The project complies with the following Standards:

Standard 1	-	No New stormwater conveyances discharge untreated stormwater directly to the waters of the Commonwealth;
Standard 2	-	Post Development peak discharge rates are less than pre-development;
Standard 3	-	The recharge volume required for this project is exceeded.
Standard 4-		The project meets the water quality standards.
Standard 5	-	N/A
Standard 6	-	N/A
Standard 7-		The project is re-development but the project complies with standards.
Standard 8-		A demolition and erosion control plan has been prepared for the short term prevention of erosion, sedimentation and the off-site transport of suspended solids.
Standard 9	-	A Long Term Operation and Maintenance Plan is attached.
Standard 10-		Per Standard No. 10 of the MassDEP Stormwater Management Standards, there shall be no illicit discharges to the stormwater management system. The Property Manager is responsible for implementing the Operation and Maintenance Plan and overseeing activities at the facility to prevent illicit discharges to the drainage system from occurring. It is strictly prohibited to discharge any products or substances onto the ground surface or into any drainage structures, such as catch basin inlets, manholes, or drainage outlets that would be a detriment to the environment.

It is DBS's belief that the project complies with the Stormwater Management Standards to the maximum extent practicable. The project as proposed will protect the abutter in the short term through proper construction and erosion protection techniques. It will also protect the environment from long term impacts due to the improved stormwater controls.

Stormwater Runoff Comparison Chart for Pre- and Post-Construction Flow Runoff to Frontage Road

2-Year Storm (3.27")			
Existing Conditions		Proposed Conditions	
Area Description	Flow (CFS)	Area Description	Flow (CFS)
Flow off-site	0.82	Flow off-site	0.31

10-Year Storm (5.16")			
Existing Conditions		Proposed Conditions	
Area Description	Flow (CFS)	Area Description	Flow (CFS)
Flow off-site	1.80	Flow off-site	0.77

25-Year Storm (6.34")			
Existing Conditions		Proposed Conditions	
Area Description	Flow (CFS)	Area Description	Flow (CFS)
Flow off-site	2.45	Flow off-site	1.46

100-Year Storm (8.15")			
Existing Conditions		Proposed Conditions	
Area Description	Flow (CFS)	Area Description	Flow (CFS)
Flow off-site	3.46	Flow off-site	3.46