



SITE DESIGN ENGINEERING, LLC.

11 Cushman Street, Middleboro, MA 02346

P: 508-967-0673 F: 508-967-0674

March 4, 2020

SDE No. 14225

John Daghljan, Associate City Engineer
Department Of Public Works
Newton City Hall, Room 102
1000 Commonwealth Avenue
Newton Centre, MA 02459

**Subject: Special Permit - 180 Wells Ave
Engineering Review Memo 1/10/2020**

Dear Mr. Daghljan:

We have received your engineering review memo dated January 10, 2020 regarding the proposed Special Permit application amendment at 180 Wells Ave. After reviewing your memo and meeting with you we offer the comments below and enclosed additional information as requested.

Driveway Apron.

1. The applicant will work with the City to obtain a license agreement for the driveway apron that crosses a City utility easement.

Drainage Analysis.

1. Rainfall amount. As discussed in our meeting this project was previously approved and therefore the new rainfall amount of 8.78 inches does not apply. The project drainage analysis will remain with the original 6.5-inch rainfall calculation.
2. We revised the stormwater management/maintenance plan to include parking lot sweeping.
3. Groundwater Mounding. We performed a groundwater mounding analysis of the proposed underground stormwater detention system and a copy is enclosed for review. The calculations indicate a groundwater mound of approximately 10-inches (0.785 feet). Groundwater depth varies slightly in this area with an average elevation of 101.0. The bottom of the of the detention system is set at elevation 102.5 thereby providing approximately 8-inches between the top of the calculated groundwater mound and the bottom of the system. The system will therefore function as designed.
4. A 40mil impervious barrier was added to the south side of the detention system as requested.
5. The soil log locations are shown on sheet 1.4.

Construction Management.

1. A construction management plan will be prepared and filed with the Engineering Division for review prior to the start of construction.
2. Requirements and locations for construction driveway entrances are shown on plan sheet C1.5 and can be revised as requested/necessary during construction.
3. Requirements for catch basin siltation protection are indicated on plan sheet C1.5 and include those downgradient from the site.

Drainage.

1. A revised operation and maintenance plan is enclosed for review. The plan was revised to include parking lot sweeping. This plan will be recorded in the property title and evidence of such will be provided to the Engineering Division.
2. No comment required.
3. Inspection of the existing City drainage system at the location of the proposed connection will be completed as required. This requirement is also included in the Construction Notes number 8 on plan sheet C1.3

Environmental.

1. A Phase I Environmental Assessment has previously been performed which confirmed that there are no Recognized Environmental Conditions at the site.
2. There are no known underground fuel tanks on the property.
3. A NPDES Permit and SWPPP will be prepared and filed in accordance with applicable requirements prior to the start of construction.

Sewer.

1. The requested sewer pump information is shown on plan sheet C1.6c.
2. A detail of the sewer manhole connection is included on plan sheet C1.6c.
3. The new sewer system components will be tested as required. This requirement is also included in the Construction Notes number 13 on plan sheet C1.3.
4. The new sewer system components will be tested as required. This requirement is also included in the Construction Notes number 14 on plan sheet C1.3.

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5. This requirement is included in the Construction Notes number 7 on plan sheet C1.3.
6. Required fire flow testing will be completed and coordinated with the Fire Department as required.
7. This requirement is included in the Construction Notes number 11 on plan sheet C1.3.
8. A water service connection plan will be filed with the Utilities Division for approval.

General.

1. This requirement is included in the Construction Notes number 2 on plan sheet C1.3.
2. Tree removal will comply with the City's Tree Ordinance.
3. This requirement is included in the Construction Notes number 3 on plan sheet C1.3.
4. The applicant will apply for a Building Permit with the Inspectional Services Department prior to any construction.
5. This requirement is included in the Construction Notes number 24 on plan sheet C1.3.
6. This requirement is included in the Construction Notes number 25 on plan sheet C1.3.
7. The contractor will be required to provide 48-hour minimum notice to police details.
8. This requirement is included in the Construction Notes number 17 on plan sheet C1.3.

We trust these revisions and additional information will address your concerns. Please contact me at 508-503-3500 or email me at dmulloy@sde-ldec.com if you have any questions or require additional information.

Respectfully,
Site Design Engineering LLC



Daniel C. Mulloy, PE.
President/Manager

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This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

The user must specify infiltration rate (R), specific yield (Sy), horizontal hydraulic conductivity (Kh), basin dimensions (x, y), duration of infiltration period (t), and the initial thickness of the saturated zone (hi(0), height of the water table if the bottom of the aquifer is the datum). For a square basin the half width equals the half length (x = y). For a rectangular basin, if the user wants the water-table changes perpendicular to the long side, specify x as the short dimension and y as the long dimension. Conversely, if the user wants the values perpendicular to the short side, specify y as the short dimension, x as the long dimension. All distances are from the center of the basin. Users can change the distances from the center of the basin at which water-table aquifer thickness are calculated.

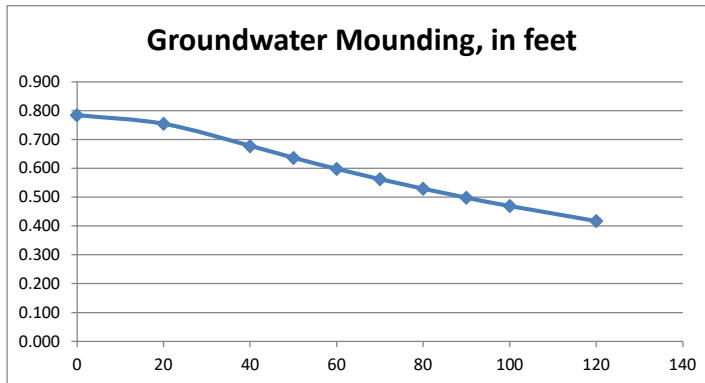
Cells highlighted in yellow are values that can be changed by the user. Cells highlighted in red are output values based on user-specified inputs. **The user MUST click the blue "Re-Calculate Now" button each time ANY of the user-specified inputs are changed** otherwise necessary iterations to converge on the correct solution will not be done and values shown will be incorrect. Use consistent units for all input values (for example, feet and days)

Input Values		use consistent units (e.g. feet & days or inches & hours)	Conversion Table		
			inch/hour	feet/day	
1.0000	R	Recharge (infiltration) rate (feet/day)	0.67	1.33	
0.260	Sy	Specific yield, Sy (dimensionless, between 0 and 1)			
55.00	K	Horizontal hydraulic conductivity, Kh (feet/day)*	2.00	4.00	In the report accompanying this spreadsheet (USGS SIR 2010-5102), vertical soil permeability (ft/d) is assumed to be one-tenth horizontal hydraulic conductivity (ft/d).
30.600	x	1/2 length of basin (x direction, in feet)			
108.600	y	1/2 width of basin (y direction, in feet)	hours	days	
3.000	t	duration of infiltration period (days)	36	1.50	
100.000	hi(0)	initial thickness of saturated zone (feet)			
100.785	h(max)	maximum thickness of saturated zone (beneath center of basin at end of infiltration period)			
0.785	Δh(max)	maximum groundwater mounding (beneath center of basin at end of infiltration period)			

Ground-water Mounding, in feet	Distance from center of basin in x direction, in feet
0.785	0
0.755	20
0.678	40
0.637	50
0.599	60
0.563	70
0.530	80
0.499	90
0.470	100
0.417	120



Re-Calculate Now



Disclaimer

This spreadsheet solving the Hantush (1967) equation for ground-water mounding beneath an infiltration basin is made available to the general public as a convenience for those wishing to replicate values documented in the USGS Scientific Investigations Report 2010-5102 "Groundwater mounding beneath hypothetical stormwater infiltration basins" or to calculate values based on user-specified site conditions. Any changes made to the spreadsheet (other than values identified as user-specified) after transmission from the USGS could have unintended, undesirable consequences. These consequences could include, but may not be limited to: erroneous output, numerical instabilities, and violations of underlying assumptions that are inherent in results presented in the accompanying USGS published report. The USGS assumes no responsibility for the consequences of any changes made to the spreadsheet. If changes are made to the spreadsheet, the user is responsible for documenting the changes and justifying the results and conclusions.

Stormwater Best Management Practices Inspection and Maintenance Plan

I. Stormwater Management System Owner

The stormwater system will be owned and managed by the facility owner. The system will be located on private property and serviced by the facility owner.

II. Compliance with Stormwater Best Management Practice Maintenance Requirements

The system owner is responsible for ensuring that stormwater best management practices (BMPs) for facilities installed on their property are properly maintained and that they function as designed.

III. Inspection & Maintenance – Reporting

Requirements for the inspection and maintenance of stormwater facilities, as well as reporting requirements are included in this Stormwater Best Management Practices Operation and Maintenance Plan. The owner shall maintain a log file of all maintenance activities performed on the stormwater systems including date and services performed.

IV. Preventative Measures to Reduce Maintenance Costs

The most effective way to maintain your water quality facility is to prevent the pollutants from entering the facility. Common pollutants include sediment, trash & debris, chemicals, pet wastes, runoff from stored materials, illicit discharges into the storm drainage system and many others. A thoughtful maintenance program will include measures to address these potential contaminants. Key points to consider in your maintenance program include:

- Educate employees to be aware of how their actions affect water quality and how they can help reduce maintenance costs.
- Keep streets, gutters and parking lots free of trash, debris, and lawn clippings.
- Ensure the proper use, storage, and disposal of hazardous wastes and chemicals. Promptly clean up and spilled materials and dispose of properly.
- Plan lawn care to minimize and properly use chemicals and pesticides.
- Be aware of automobiles leaking fluids. Use absorbents such as cat litter to soak up drippings – dispose of properly.
- Encourage pet owners to clean up pet wastes.
- Re-vegetate disturbed and bare areas to maintain vegetative stabilization.
- Clean any private storm drainage system components, including inlets, storm sewers, and outfalls.
- Do not store materials outdoors (including landscaping materials) unless properly protected from runoff.

V. Safety

Keep safety considerations at the forefront of inspection procedures at all times. Likely hazards should be anticipated and avoided. Never enter a confined space (outlet structure, manhole, etc) without proper training, number of personal, and equipment.

VI. Field Inspection Equipment

It is imperative that the appropriate equipment is taken to the field with the inspector(s). This is to ensure the safety of the inspector and allow the inspections to be performed as efficiently as possible. Below is a list of the equipment that may be necessary to perform the inspections of all Stormwater BMPs:

- Protective clothing and boots.
- Safety equipment (vest, hard hat, confined space entry equipment [if certified to perform confined space entry]).
- Communication equipment.
- Clipboard.
- Stormwater BMP Inspection Forms.
- Manhole Lid Remover
- Shovel.

Some of the items identified above need not be carried by the inspector (manhole lid remover, shovel, and confined space entry equipment), but should be available in the vehicle driven to the site. Specialized equipment may require specific training related to that equipment and should only be used by trained individuals.

VII. Inspecting Stormwater BMPs

The quality of stormwater entering the waters of the state relies heavily on the proper operation and maintenance of permanent BMPs. Stormwater BMPs must be periodically inspected to ensure that they function as designed. The inspection will determine the appropriate maintenance that is required for the facility.

A. Inspection Procedures

Inspections should follow the inspection guidance for the specific type of facility.

B. Inspection Report

The person(s) conducting the inspection activities shall complete the appropriate inspection report for the specific facility.

VIII. Maintaining Stormwater BMPs

Stormwater BMPs must be properly maintained to ensure that they operate correctly and provide the water quality treatment for which they were designed.

A. Maintenance Categories

Stormwater BMP maintenance programs are separated into three broad categories of work. The categories are separated based upon the magnitude and type of the maintenance activities performed. A description of each category follows:

Routine Work

The majority of this work consists of scheduled mowings and trash and debris pickups for stormwater management facilities during the growing season. This includes items such as the removal of debris/material that may be clogging the outlet structure well screens and trash racks. It also includes activities such as weed control, mosquito treatment, and algae treatment. These activities normally will be performed numerous times during the year. Inspection and maintenance logs shall be completed for all maintenance.

Restoration Work

This work consists of a variety of isolated or small-scale maintenance and work needed to address operational problems. Most of this work can be completed by a small crew, with minor tools, and small equipment. Inspection and maintenance logs shall be completed for all work.

Rehabilitation Work

This work consists of large-scale maintenance and major improvements needed to address failures within the stormwater BMP. This work requires consultation with Town and may require an engineering design with construction plans to be prepared for review and approval. This work may also require more specialized maintenance equipment, surveying, construction permits or assistance through private contractors and consultants. Inspection and maintenance logs shall be completed for all work.

B. Maintenance Personnel

Maintenance personnel should be qualified to properly maintain stormwater BMPs, especially for restoration or rehabilitation work.

**STORMWATER MANAGEMENT SYSTEM
BEST MANAGEMENT PRACTICES (BMP) RECOMMENDED MAINTENANCE**

**180 WELLS REALTY, LLC
180 WELLS AVENUE
NEWTON, MA**

PARKING LOT SWEEPING

- The parking areas shall be inspected for sediment deposits at least twice per year, once in early spring (March/April) and once in late summer/early fall (September)
- The parking areas shall be cleaned by mechanical methods (sweeper/vac truck) at least once per year with the first cleaning occurring at the end of the winter season.

DEEP SUMP & HOODED CATCH BASINS

Maintenance:

- Inspections shall be performed a minimum of 2 times per year (spring/fall). Units shall be cleaned whenever the depth of sediment is greater than or equal to half the sump depth.
- The inlet grate shall not be welded closed so the sump can be inspected and maintained.
- Maintenance of structure shall be performed by qualified personnel and in accordance with OSHA regulations.
- All sediment, debris, floatables, contaminants shall be disposed of to a landfill or other permitted facility.

OIL & WATER SEPARATORS

Maintenance:

- Inspections shall be performed a minimum of 2 times per year (spring/fall). Units shall be cleaned whenever the depth of sediment is greater than 1 foot.
- The inlet grate shall not be welded closed so the sump can be inspected and maintained.
- Maintenance of structure shall be performed by qualified personnel and in accordance with OSHA regulations.
- All sediment, debris, floatables, contaminants shall be disposed of to a landfill or other permitted facility.

SUBSURFACE STORAGE CHAMBERS

General Chamber Maintenance:

- The system shall be inspected 24 hours after major rainfall events (greater than 3 inches) for retention of liquid following the first 6 months of full operation. The inspection shall be by means of the inspection manhole and/or inspection ports. If liquid is found, the depth shall be recorded and a follow up inspection within twenty-four (24) hours shall be conducted and the depth of liquid shall be re-measured. If liquid is found during the second inspection, then notify the design engineer. Inspections shall extend to once annually following initial 6-months of inspections with no reporting issues.

Isolator Row Chamber Maintenance:

- The isolator row shall be inspected and reported on the same schedule as the overall underground chamber system. Maintenance cleaning of the system shall be completed annually by use of a JetVac cleaning process.