

December 31, 2024

**Breeka Li Goodlander, Conservation Agent
Town of Franklin
Conservation Commission
355 East Central Street
Franklin, Massachusetts 02038**

**RE: 55 Constitution Boulevard
Notice of Intent (BETA Peer Review Response #2)
MassDEP File No. 159-1031**

Dear Breeka Li:

Beals Associates, Inc. (“BAI”) has received the BETA Group peer review comments dated December 16, 2024. The review includes comments relative to the above noted project’s application for the Notice of Intent (NOI) dated October 28, 2024. Our office would like to provide the following responses, where necessary, to the comments raised in the letter. Where supporting figures, exhibits, or other materials are necessary, we have included them with this letter. References have been made to the prior submittal letters as needed. We hope that these responses, updated plans, and supporting documentation are acceptable to your department.

In order to simplify this letter, our office has the first comments from BETA in italics, the most recent comments “BETA2” are in bold and the Beals Associates, Inc responses in black.

Plan and General Comments

Comment A1:

The Massachusetts Department of Environmental Protection (MassDEP) has not issued a DEP file number as of this writing.

Response A1:

The Massachusetts Department of Environmental Protection (MassDEP) Central Region has issued file number CE 159-1301 on November 25, 2024.

Comment BETA2:

Post-development conditions within P.O.A. 1 are shown to result in an increase in runoff volume from previous conditions. The Applicant should investigate modifications that ensure that Standard 2 has been met. The Applicant proposes two subsurface infiltration basins. Test pit data was not provided for the location of the larger subsurface infiltration system. Test pit data is required at the location

of any infiltration BMP, one sample for every 5,000 sf of basin to verify seasonal high groundwater and soil type. The Applicant should provide recent test pit information and confirm the depth is at least 2 ft to SHGW and/or bedrock at all areas of proposed infiltration. If less than 4 ft to SHGW, a mounding analysis is required. A detail on the separation from SHGW should also be provided. See V2, Ch2, p88 of the MA Stormwater Handbook. Has a mounding analysis been conducted for Subsurface infiltration basin #1 as SHGW is shown to be within 4ft to the bottom of the structure? The site contains soils found within hydrologic soil group's C/D and D. Infiltration BMPs must be installed in soils capable of absorbing the recharge volume and must be able to drain within 72 hours. The required minimum infiltration rate for siting infiltration BMPs is 0.17 in/hr. D soils have a rate that is below that minimum. The applicant states that hydrologic soil group B was utilized for demonstrating compliance with Standard 3. The Applicant should provide adequate information demonstrating that the proposed BMPs are in compliance with Standards 2 & 3. The Applicant should clarify the treatment trains. Are there two separate treatment trains directing stormwater to the infiltration BMPs? Each treatment train should have its own TSS Worksheet. Adequate pretreatment is required for an infiltrating BMP to achieve the listed credit percentage of TSS removal. TSS worksheets should be reviewed and revised accordingly as credit appears to have been taken for the pretreatment itself in addition to the 80% that can only be credited with pretreatment. Updated materials should be provided to MassDEP and the Commission.

Response BETA2:

These comments were responded to in the letter dated December 12, 2024 to MassDEP. These responses are included as Attachment A to this letter.

BAI acknowledges that the Town of Franklin has a bylaw that regulates the peak volume of runoff to be reduced in post-development conditions. In a subsequent revision, BAI will be addressing the runoff volume at P.O.A 1 as part of the response to the Planning Board Peer Review from BETA.

Comment A2.a:

The following element is missing from the provided plan:

The proposed tree line and individual trees/shrubs with a diameter greater than 1" proposed for removal should be shown on the Plans per Bylaw Regulation Section 7.18.1.6. It is BETA's understanding that the Commission generally increases the size threshold for tree location based on the Project and therefore defers to the Commission on this matter.

Response A2.a:

Our office has gone out and located trees greater than 4" in diameter that would be removed per the current proposed project plans. These trees have been added to Sheet C101, Supplemental Existing Conditions Plan. It is estimated that 120+/- trees greater than 4" in diameter will be removed during construction.

Comment BETA2:

Trees great than 4" in diameter have been located and depicted on the Supplemental Existing Conditions Plan. BETA defers to the Commission on the Bylaw requirement that individual trees/shrubs with a diameter greater than 1" proposed for removal should be shown on the Plans per Bylaw Regulation Section 7.18.1.6. Based on discussion at the last public hearing, it is anticipated that the Applicant will also include any 3-inch trees in their tree count.

Response BETA2:

Our office has gone out and located trees greater than 3" in diameter that would be removed per the current proposed project plans, supplementing the original 4" in diameter tree count. These trees have been added to Sheet C101, Supplemental Existing Conditions Plan located in Attachment A. It is estimated that 130+/- trees greater than 3" in diameter will be removed during construction.

Comment A2.b:

*The following element is missing from the provided plan:
The Construction Sequence and Schedule should be depicted on the Plans per
Bylaw Regulation Section 7.18.1.14.*

BAI: The construction sequence was originally provided on Sheet C113, Erosion Control Notes. This sequence has been modified to provide additional detail per BETA Comment W11 and has been updated on Sheet C113, as well as added to Sheet 001, General Notes.

Response A2.b:

The construction sequence was originally provided on Sheet C113, Erosion Control Notes. This sequence has been modified to provide additional detail per BETA Comment W11 and has been updated on Sheet C113, as well as added to Sheet C001, General Notes.

Comment BETA2:

Comment addressed. The Construction Sequence has been updated to include all proposed construction activities.

Response BETA2:

Acknowledged.

Wetland Resource Areas and Regulatory Review

Comment BETA2:

The Applicant has provided additional and revised information regarding plan comments, compliance with the Bylaw, and proposed mitigation and landscaping. Where applicable, BETA has recommended Special Conditions for the Commission's consideration. At this time, the Applicant has provided sufficient information to facilitate the issuance of an Order of Conditions with Special Conditions, pending the completion of the stormwater management peer review.

Response BETA2:

Acknowledged.

Construction Comments

Comment W1:

The Project, as currently depicted, will disturb more than one (1) acre of land; therefore, a Notice of Intent (NOI) must be submitted to the Environmental Protection Agency (EPA) under the Construction General Permit (CGP) and a Stormwater Pollution Prevention Plan (SWPPP) must be prepared. The Commission could consider a Special Condition within the Order of Conditions that requires the submission of the SWPPP for review and approval prior to the commencement of work.

Response W1:

Our office agrees with this comment and the addition of a Special Condition to address the required SWPPP filing. As the Commission is aware, the SWPPP filing will take place just prior to the commencement of construction.

Comment BETA2:

Comment addressed.

Response BETA2:

Acknowledged.

Comment W2:

*Invasive species including bush honeysuckle (*Lonicera spp.*), bittersweet (*Celastrus orbiculatus*), and glossy buckthorn (*Frangula alnus*) are present throughout the area proposed for construction. The Applicant should provide a plan detailing how material containing invasive species plant matter will be managed to ensure no further spread occurs as a result of this Project.*

Response W2:

An “Invasive Species Removal Practices” section has been created detailing the plan to contain and prevent the spread of invasives species plants. This section has been added to Sheet C001, General Notes, Sheet C111, Demolition Removals and Protection Plan, Sheet C112, Erosion and Sedimentation Control Plan Phase II.

Comment BETA2:

Comment addressed.

Response BETA2:

Acknowledged.

Comment W3:

The proposed snow storage area north of flag SB7 should be moved to a location outside of Buffer Zone.

Response W3:

The snow storage stockpile was located in this area because it would sit on a paved area of the site that would drain back into the overall water quality system. Although it was in the 100-foot buffer, the stockpiles’ location on pavement with a positive drainage path away from natural resource areas was intended to be a good location for this feature. Despite this, the snow storage stockpile area has been relocated to the easterly side of the Building A truck turnaround area. The location is provided as a convenience only and should not interrupt truck operations during the limited amount of time a snow stockpile is present. The snowmelt will drain to the same catch basin as the previous location and will enter the site’s water quality treatment system. The revision to the snow storage stockpile location can be found on Sheet C121, Landscape Plan.

Comment BETA2:

Comment addressed.

Response BETA2:

Acknowledged.

Comment W4:

Several proposed contours are depicted directly over erosion control barriers. The limits of work and/or grading should be revised to reflect a constructable design.

Response W4:

The symbol used for the erosion control barriers acts as a graphical representation and is not an accurate width of the barriers. The intent is to have the controls placed at the toe of slope in areas where they need to be installed. Our office has updated Sheet C112, Erosion and Sedimentation Control Plan Phase II, to depict the location of the erosion control barriers accordingly. It should be noted that the limit of work is not expected to extend beyond the toe of slope, especially in areas within the 100 foot resource area.

Comment BETA2:

Understood, comment addressed.

Response BETA2:

Acknowledged.

Mitigation Comments

Comment W5:

Proposed erosion controls include the use of silt fence and mulch sock. Silt fence is not a permitted erosion control measure in the Town of Franklin (Pg.13 of Town of Franklin Best Development Practices Guidebook). The Applicant should coordinate with the Conservation Commission to determine the appropriate erosion control measure for the Site. Twelve (12)-inch diameter compost filter tube may be an appropriate option commensurate with the scope of the Project.

Response W5:

Our office has removed all references to silt fence from the project plans. We have proposed the use of a 12" compost filter tube, recommended by BETA, in lieu of the silt

fence. Sheet 001, General Notes, Sheet C110, Erosion and Sedimentation Control Plan Phase I, Sheet C112, Erosion and Sedimentation Control Plan Phase II, Sheet C113, Erosion and Sedimentation Control Notes, and Sheet C500 Erosion Control Details, have been revised to reflect this change

Comment BETA2:

Comment addressed.

Response W5:

Acknowledged.

Comment W6:

The Applicant has noted that more than 30% of the 50 to 100-foot Buffer Zone will consist of impervious surfaces as a result of the Project. Per Bylaw Regulations Section 4.4.1, the Commission may request additional mitigation. While stormwater improvements and plantings are proposed, it is recommended that additional plantings be provided to improve the remaining vegetated Buffer Zone as discussed in this letter, and the Applicant should determine whether impervious surfaces can be reduced in area.

Response W6:

Our office has revised Sheet C121, Landscape Plan, to include additional plantings to improve the remaining vegetated Buffer Zone. The project's impervious areas have been reduced to the greatest extent practicable.

Comment BETA2:

Additional native plantings have been provided as mitigation for Buffer Zone impacts. One species that has been added to the plans is the non-native Japanese tree lilac (*Syringa reticulata*); however, these are located outside of Conservation Commission jurisdiction.

Response BETA2:

Our office has revised Sheet C121, Landscape Plan, to replace the non-native Japanese Tree Lilac (*Syringa Reticula*) with the Choke Cherry (*Prunus Virginiana*), which is listed in the Best Development Practices Guidebook plant list. See Sheet C121, Landscape Plan, in Attachment A.

Comment W7:

Since pervious areas will remain around the perimeter of the development, the Applicant has included areas of lawn and the planting of select woody species at the Site. It is recommended that open areas proposed as lawn be vegetated with native, herbaceous vegetation subject to an infrequent but consistent mowing schedule to establish meadow areas with Buffer Zone. In addition, the Applicant should also provide additional woody plantings. Where feasible, large diameter native trees should be preserved within areas to be cleared.

Response W7:

Our office has revised Sheet C121, Landscape Plan, to include seed mixes such as a New England Showy Wildflower Mix and a New England Conservation/Wildlife Mix, locations of these seed mixes are depicted on the plan. Additional plantings have been added along the pervious areas abutting the resource areas to improve the vegetated buffer zones.

Comment BETA2:

Comment addressed. BETA concurs that the proposed seed mixes will be appropriate for the Buffer Zone. BETA offers the following comments regarding the proposed woody plantings:

- **Sweet gale (Myrica gale) is an Obligate wetlands species and would not be likely to become well established within the Buffer Zone. An alternative species choice should be provided; however, the Commission could consider including the review and approval of an alternative species as a Special Condition.**
- **Arctic fire dogwood (Cornus sericea ‘Arctic Fire’), a cultivar, is proposed within Buffer Zone. BETA defers to the Commission on whether a cultivar would be permitted within Buffer Zone. If not, the Commission could consider including the review and approval of an alternative species as a Special Condition.**

Response BETA2:

Our office has revised Sheet C121, Landscape Plan, to replace the above-listed woody plantings. The proposed shrubs now include the Round-Leaved Dogwood (Swida Rugosa), Pepperbush (Clethra Alnifolia), Maple-Leaved Viburnum (Viburnum Acerifolium), and Common Winterberry (Ilex Verticillata); all proposed plantings are listed in the Best Development Practices Guidebook plant list. See Sheet C121, Landscape Plan, in Attachment XX.

Comment W8:

The specifications for the proposed seed mix that will be used for stabilization should be provided.

Response W7:

Our office has provided the specifications for each of the two seed mixes being used for stabilization of the site. See Attachment A for the specifications.

Comment BETA2:

Comment addressed.

Response BETA2:

Acknowledged.

ByLaw Regulatory Comments

Comment W9:

The Erosion and Sediment Control Plan should include a description of the measures that will be taken to properly install and maintain the erosion control devices used during the project, the names and phone numbers of all individuals that will be responsible for erosion controls, as well as the requirement that the erosion control will be inspected weekly and all other criteria set forth in Bylaw Regulation Section 7.12.

Response W7:

Maintenance requirements for the erosion control measures are indicated on Sheet C113, Erosion and Sedimentation Control Notes. The name and phone number of the responsible party as well as the weekly requirements for the inspection and maintenance (where needed) will be included in the SWPPP documentation that will be filed as part of the USEPA CGP Notice of Intent. At this time, it is not known who the Contractor's day to day contact will be.

Comment BETA2:

BETA recommends that the Commission include a Special Condition requiring the Applicant to provide the name and phone number of all individuals that will be responsible for erosion controls prior to commencement of work.

Response BETA2:

Acknowledged.

Comment W10:

BETA defers to the Commission on the approval of the Project Narrative due to Bylaw requirements being absent (Bylaw Regulation Section 7.9.1.) including who is performing the work and when the proposed activity will be done.

Response W7:

It is our office's understanding that the only requirements of Bylaw Section 7.9.1 missing from the project narrative are the identification of who is doing the work and when the work will be done. At this time, the contractor's name is not known but will be included in the SWPPP documentation which will be filed at a later date closer to the commencement of construction. The schedule for construction is also unknown but will also be included in the SWPPP documentation.

Comment BETA2:

BETA recommends that the Commission include a Special Condition requiring the submission of the finalized SWPPP for review and approval prior to commencing work.

Response BETA2:

Acknowledged.

Comment W11:

The Applicant provided a Construction Sequence that does not appear to include all proposed construction activities including information on how demolition will occur and the construction of the proposed buildings, including any relevant phasing/staging. A Construction Sequence with all proposed construction activities including building construction should be included within the NOI and plan set (Bylaw Regulation Section 7.15.1).

Response W11:

The construction sequence was originally included in the plan set on Sheet C113, Erosion Control and Sedimentation Control Notes, and was also included in the Stormwater Management Report in the Erosion Control section, an appendix to the Notice of Intent package. This sequence has been revised to include a more detailed construction sequence including phasing as well as approximate duration for each phase. This sequence and

schedule have been revised on Sheet C113, Erosion and Sedimentation Control Notes, and added to Sheet C001, General Notes.

Comment BETA2:

Comment addressed. The Construction Sequence has been updated to include all proposed construction activities.

Response BETA2:

Acknowledged.

Comment W12:

The Applicant should submit a Variance request for work proposed within the 0-25-foot and 25- 50-foot Buffer Zones. BETA defers to the Commission on the issuance of this waiver.

Response W12:

The only work contemplated by the project in the 0-25-foot buffer zones is the removal of pavement and reconstruction of previously paved areas. We did not consider filing a waiver since the resulting work will reduce the impervious impact within the 0-to-25-foot buffer. Proposed work within the 25-to-50-foot buffer is limited to off-grading of newly developed areas or repaving previously paved areas. Similar to the 0-to-25-foot buffer, the impervious impacts to the 25-to-50-foot buffer will be reduced upon completion of construction. If the commission requests, our office would be happy to file the formal waiver requests, however, with the reduced impacts, we did not think this was necessary.

Comment BETA2:

BETA defers to the Commission on the requirement of submitting a Variance request for work proposed within the 0-25-foot and 25-50-foot Buffer Zones. Based on the last public hearing, it is anticipated that the Applicant will submit a Variance request.

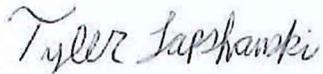
Response BETA2:

Our office has prepared a Variance request for the work proposed within the 0-25-foot and 25-50-foot Buffer Zones. The Variance request can be found in Attachment B.

On behalf of the entire project team, we appreciate the opportunity to provide these responses and clarifications. We look forward to presenting this information to the Franklin Conservation Commission. If you have any additional questions or comments, please do not hesitate to contact us directly at either tmorey@bealsassociates.com, 617.242.1120 x103 or tlapshanski@bealsassociates.com, 617.242.1120 Ext. 110.

Sincerely,

Beals Associates, Inc.



Tyler Lapshanski
Project Engineer



Todd Morey, P.E.
Principal

Attachments:

- Attachment A – MassDEP Response Letter
- Attachment B - 55 Constitution Boulevard Plans to Accompany Permit Documents (Revised Sheets)
- Attachment C - Variance Request

CC: *Jeff Sullivan, Northbridge*
C-1381 File

ATTACHMENT A: MASSDEP RESPONSE LETTER

December 12, 2024

Breeka Li Goodlander, Conservation Agent
Town of Franklin
Conservation Commission
355 East Central Street
Franklin, Massachusetts 02038

RE: 55 Constitution Boulevard
Notice of Intent MassDEP File Number: 159-1301
MassDEP Review Comments

Dear Breeka Li:

Our office has received the Massachusetts Department of Environmental Protection (MassDEP) comments dated November 25, 2024. The review includes comments relative to the original Notice of Intent submittal dated October 28, 2024.

In order to simplify this letter, our office has the comments from MassDEP in italics and the Beals Associates, Inc responses in black.

Comment 1:

Post-development conditions within P.O.A. 1 are shown to result in an increase in runoff volume from previous conditions. The Applicant should investigate modifications that ensure that Standard 2 has been met.

Response 1:

Standard 2 states that “The Peak Rate Attenuation Standard requires that stormwater management systems be designed such that post development peak discharge rates do not exceed predevelopment discharge rates.” and is silent on volumes. At P.O.A. #1, the peak discharge rates for the predevelopment condition are 27.94 cfs, 46.31 cfs and 78.52 cfs for the 2-, 10-, and 100-year storm event. The post development peak discharge rates are 27.18 cfs, 45.53 cfs and 78.24 cfs for the 2-, 10-, and 100-year storm events. This represents a decrease of 0.76 cfs, 0.78 cfs and 0.28 cfs for each of the three storms modeled.

Since the post-development peak discharge rate does not exceed the pre-development peak discharge rate, Standard 2 has been met.

Comment 2:

The Applicant proposes two subsurface infiltration basins. Test pit data was not provided for the location of the larger subsurface infiltration system. Test pit data is required at the location of any infiltration BMP, one sample for every 5,000 sf of basin to verify seasonal high groundwater and soil type. The Applicant should provide recent test pit information and confirm the depth is at least 2 ft to SHGW and/or bedrock at all areas of proposed infiltration. If less than 4 ft to SHGW, a mounding analysis is required. A detail on the separation from SHGW should also be provided. See V2, Ch2, p88 of the MA Stormwater Handbook. Has a mounding analysis been conducted for Subsurface infiltration basin #1 as SHGW is shown to be within 4ft to the bottom of the structure?

Response 2:

The project only proposes a single infiltration system. It is believed that the reviewer may have thought the system closest to the building was also an infiltration system, but it is designed as a detention system only with no provision for infiltration. For the single infiltration system, two test pits have been performed for the 2,800 +/- sf system. The bottom of the system is at elevation 338.30 and the ESHGWT is at 336.30. A mounding analysis has been performed for Infiltration System #1 and is shown in Attachment B of this response letter.

Comment 3:

The site contains soils found within hydrologic soil group's C/D and D. Infiltration BMPs must be installed in soils capable of absorbing the recharge volume and must be able to drain within 72 hours. The required minimum infiltration rate for siting infiltration BMPs is 0.17 in/hr. D soils have a rate that is below that minimum. The applicant states that hydrologic soil group B was utilized for demonstrating compliance with Standard 3. The Applicant should provide adequate information demonstrating that the proposed BMPs are in compliance with Standards 2 & 3.

Response 3:

The NRCS mapping shows the site's soils to be mapped as HSG C and HSG D soils; however, onsite test pits performed by a Professional Engineer and Licensed Soil Evaluator discovered that the soils within the footprint of Infiltration System #1 were found to be sandy loam and loamy sands. Based on the observation and the test pits in the field, the Soil Evaluator determined these to be the infiltrative characteristics as indicated within the Stormwater Management Report.

Comment 4:

The Applicant should clarify the treatment trains. Are there two separate treatment trains directing stormwater to the infiltration BMPs? Each treatment train should have its own TSS Worksheet. Adequate pretreatment is required for an infiltrating BMP to achieve the listed credit percentage of TSS removal. TSS worksheets should be reviewed and revised accordingly as credit appears to have been taken for the pretreatment itself in addition to the 80% that can only be credited with pretreatment.

Response 4:

Treatment Train calculation sheets that clarify the treatment trains for the site can be found in Attachment A of this document. Since there is only one infiltration system, there is only a single treatment train to that BMP. The other treatment train is as follows:

Treatment Train - Deep Sump Catch Basins to Cascade Separator to Jellyfish Filter.

BEALS • ASSOCIATES INC.

2 PARK PLAZA, SUITE 200, BOSTON, MA 02116
PHONE: 617-242-1120

On behalf of the entire project team, we appreciate the opportunity to provide these responses and clarifications. We look forward to presenting this information to the Franklin Conservation Commission. If you have any additional questions or comments, please do not hesitate to contact us directly at either tmorey@bealsassociates.com, 617.242.1120 x103 or tlapshanski@bealsassociates.com, 617.242.1120 Ext. 110.

Sincerely,

Beals Associates, Inc.

Tyler Lapshanski



Project Engineer

Todd Morey, P.E.



Principal

Attach: TSS Removal Calculation Sheets & Mounding Analysis

CC: *Rebecca Gendreau, MassDEP*

Jeff Sullivan, Northbridge

C-1381 File

ATTACHMENT A: TSS REMOVAL CALCULATION SHEETS (STORMWATER REPORT)

Location: Treatment Train 1

B BMP ¹	C TSS Removal Rate ¹	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Deep Sump Catch Basin	25%	100%	25%	75%
CDS System (Proprietary Device)	80%	75%	60%	15%
Subsurface Infiltration System	80%	15%	12%	3%
Total TSS Removal =			97%	Completed for Each Outlet or BMP Train

Project: 55 Conisition Boulevard

Prepared By: Beals Assoc. Inc.

Date: 10-Oct-24

*Equals remaining load from previous BMP (E)
which enters the BMP

Location: Treatment Train 2

B BMP ¹	C TSS Removal Rate ¹	D Starting TSS Load*	E Amount Removed (C*D)	F Remaining Load (D-E)
Deep Sump Catch Basin	25%	100%	25%	75%
Cascade System (Proprietary Device)	80%	75%	60%	15%
Jellyfish Filter (Proprietary Filtration Device)	85%	15%	13%	2%
Total TSS Removal =			98%	Completed for Each Outlet or BMP Train

Project: 55 Conisition Boulevard

Prepared By: Beals Assoc. Inc.

Date: 10-Oct-24

*Equals remaining load from previous BMP (E)
which enters the BMP

**ATTACHMENT B: MOUNDING ANALYSIS (STORMWATER
REPORT)**

Project ID C-1381	Prepared By TML	Checked By DPH	Date December 12, 2024
Title Groundwater Mounding Analysis Supporting Calculations			

Infiltration System 1

Recharge Volume
 =4,142 CF

Base Surface Area
 =2,800 SF

Duration
 =3.0 Days (24-hour storm, system must drain within 72-hour period)

Infiltration Rate 'R'
 =(Recharge Volume)/(Area x Duration)
 =4,142 CF / (2800 SF x 3.0 Day)
 =0.49 Ft/Day

Required Recharge
 HSG B = 0.35 Inches of Runoff

Specific Yield Values 'Sy'	
Coarse Gravel	0.23
Medium Gravel	0.24
Fine Gravel	0.25
Coarse Sand	0.27
Medium Sand	0.28
Fine Sand	0.23
Silt	0.08
Clay	0.03

Hydraulic Conductivity Values (ft/day) 'K'		
Material	Average	Range
Fine Gravel	1476	1181-3280
Medium Gravel	886	689-1181
Coarse Gravel	492	328-689
Coarse Sand	148	65-328
Medium Sand	39	16-65
Fine Sand	9	3-16
Silt	0.3	0.03-3
Clay	0.0007	<0.03
S & G Mix	172	16-328
S & G Glacial Till	--	<100
Glacial Till	--	<10

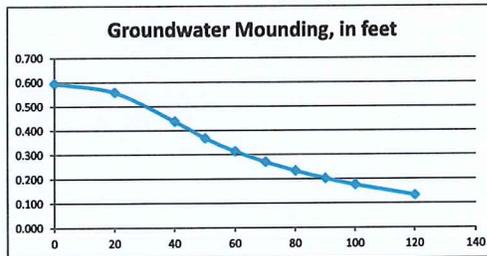
This spreadsheet will calculate the height of a groundwater mound beneath a stormwater infiltration basin. More information can be found in the U.S. Geological Survey Scientific Investigations Report 2010-5102 "Simulation of groundwater mounding beneath hypothetical stormwater infiltration basins".

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
0.4900	R	Recharge (Infiltration) rate (feet/day)	0.67	1.33
0.230	Sy	Specific yield, Sy (dimensionless, between 0 and 1)		
9.00	K	Horizontal hydraulic conductivity, Kh (feet/day)*	2.00	4.00
38.000	x	1/2 length of basin (x direction, in feet)		
22.000	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)		
100.598	h(max)	maximum thickness of saturated zone (beneath center of basin at end of Infiltration period)		
0.598	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 feet			
0.598	0			
0.559	20			
0.489	40			
0.370	50			
0.316	60			
0.272	70			
0.235	80			
0.204	90			
0.178	100			
0.156	120			

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).

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.

**ATTACHMENT B: 55 CONSTITUTION BOULEVARD PLANS TO
ACCOMPANY PERMIT DOCUMENTS (REVISED SHEETS)**

ATTACHMENT C: VARIANCE REQUEST

December 31, 2024

**Breeka Li Goodlander, Conservation Agent
Town of Franklin
Conservation Commission
355 East Central Street
Franklin, Massachusetts 02038**

**RE: 55 Constitution Boulevard
 Variance Request for Buffer Zone Impacts
 Town of Franklin Conservation Commission Regulations
 Bylaw Section 4.2-4.3**

Dear Breeka Li:

Beals Associates, Inc. ("BAI") is submitting this variance request (Bylaw Section 4.2 & 4.3 of the Town of Franklin Conservation Commission Regulations) for work being proposed within the 0-25-foot buffer zone and the 25-50-foot buffer zone. Construction is proposed in areas within the 0-50-foot buffer areas that reduces the amount of impervious area within the previously developed buffer zones. The existing site conditions presents an opportunity to redevelop the site in a way that protects the Wetlands and restores previously disturbed areas within the buffer areas to their natural function.

The work proposed within the 25-foot buffer zone area consists of grading and the alteration of existing impervious areas. There will be an overall reduction of impervious area within the 25-foot buffer zone, improving the function of the buffer zone for wetland series "A" and "SB". A 151+/- foot retaining wall stands within the 25-foot and 50-foot buffer zone areas and is proposed to remain on site. The work proposed within the 50-foot buffer zone areas consists of tree clearing and grading, as well as a reduction of existing impervious surfaces, restoring the areas to their natural functions. The project will abide by all state and local regulations as well as the erosion and sedimentation control plan to prevent any adverse effects on the wetlands.

Consideration has been made throughout the design process of the project to not negatively affect the various functions of the resource areas and buffer zones. It is our belief that the proposed project will not only protect these resource areas but will improve upon existing conditions exceeding the performance standards of the Massachusetts WPA and the Town of Franklin's Wetland Protection Regulations.

Sincerely,

Beals Associates, Inc.


Tyler Lapshanski

Project Engineer



Todd Morey, P.E.

Principal