

**Proposed Amendment to the
Rules and Regulations for the
Subdivision of Land and Site Plan Approval
Town of Norfolk Planning Board
Norfolk, Massachusetts**

June 29, 2010

To amend the “Rules and Regulations for the Subdivision of Land and Site Plan Approval” by deleting “Section 4.19 Stormwater Management” in its entirety and replacing it with the following:

4.19. Stormwater Management System

4.19.1. General.

The stormwater management system shall collect, convey, treat, and recharge stormwater in a manner which will ensure protection of property, preservation of water resources, minimization of environmental impacts, and protection of public and environmental health by providing adequate protection against pollution, flooding siltation and other problems caused by poor drainage. The stormwater management system shall comply with the following:

- Adhere to standard engineering practice.
- Conform to the Stormwater Management Standards of 4.19.3.
- Conform to the current edition of the Massachusetts Department of Environmental Protection’s “Massachusetts Stormwater Handbook.”
- Maintain pre-development drainage patterns and pre-development hydrological conditions in groundwater and surface waters as nearly as possible.
- Include a strategy for source control and Best Management Practices (BMPs).
- Recharge runoff from pervious surfaces.

- Recharge roof water in separate facilities.
- Provide treatment train for the water quality volume that reduces the contaminant burden in stormwater to the maximum extent possible (MEP) using Best Management Practices (BMPs).
- Maintain or enhance surface water quality and groundwater quality.
- Protect or enhance resource areas subject to regulation under the “Massachusetts Wetlands Protection Act (MGL Ch 131 §40)” (WPA)
- Utilize Low Impact Design where practicable.
- Collect and convey surface water for applicable design storms.
- Avoid any increase in the peak rate or volume of stormwater discharge at the property boundary for each storm event specified hereinafter.
- Include Stormwater BMPs that abate phosphorous levels in accordance with the Massachusetts Stormwater Handbook.
- Implement an Operation and Maintenance (O&M) plan that complies with DEP guidelines and ensures proper function of the stormwater management system and provides an acceptable future maintenance burden.
- Provide a sufficient level of health and environmental protection during construction.

Refer to the construction requirements, standards and requirements of Section 5.3.

4.19.2. Submissions.

Design of the Stormwater Management System shall be prepared by a Massachusetts registered professional engineer and all submitted plans, calculations, and reports shall bear the engineer’s signature and seal. Deep hole observations shall be conducted under the direction of a Massachusetts Licensed Soil Evaluator. Submissions shall comply with the minimum content requirements as set forth hereinafter:

- Plans, profiles, and sections conforming to the requirements of these rules and regulations showing the stormwater management system and existing and proposed buildings, surface grades, surface treatments, and utilities.
- A stormwater management report including calculations and a

detailed narrative describing pre-development and post-development conditions, the design and function of the stormwater management system, and the procedures and methods used for analysis.

- Pre-development and post-development watershed plans showing existing and proposed buildings, surface grades, surface treatments, catchbasins and culverts, watercourses, watershed and catchment boundaries, flow lines, Natural Resources Conservation Service (NRCS) soil boundaries and Hydrologic Soil Groups.
- Pipe flow calculations based upon the “Rational Formula” providing pipe diameter, inverts, slope, velocity (flowing full), length, capacity, design flow, and v/c ratio.
- Stormwater basin design calculations shall be provided based upon TR-20.
- Logs of soil borings or deep observation holes.
- Soil permeability test data.
- Groundwater monitoring data.
- Plans showing the limits of all “Resource Areas” subject to regulation under the WPA based upon a field survey of points established pursuant to an Order of Resource Area Delineation or an Order of Conditions issued within two years of the date of submission.
- An Operation and Maintenance Plan.
- Organization documents for the party responsible for operation and maintenance of the stormwater management system which shall include details of the mechanism used to provide funding in perpetuity.

4.19.3. Standards.

4.19.3.1. The Stormwater Management System shall comply with the standards set forth hereinafter (and more fully defined in the current version of the Massachusetts Stormwater Handbook).

Standard 1. No new stormwater conveyances (e.g. outfalls) may discharge untreated stormwater directly to or cause erosion in wetlands or waters of the Town of Norfolk.

Standard 2. Stormwater management systems shall be designed so that post-

development peak discharge rates do not exceed pre-development peak discharge rates.

Standard 3. Loss of annual recharge to ground water shall be eliminated or minimized through the use of infiltration measures including environmentally sensitive site design, low impact development techniques, stormwater best management practices and good operation and maintenance. At a minimum, the annual recharge from the post-development site shall approximate the annual recharge from the pre-development conditions based on soil type. This Standard is met when the stormwater management system is designed to infiltrate the required recharge volume as determined in accordance with the Massachusetts Stormwater Handbook.

Standard 4. Stormwater management systems shall be designed to remove 80% of the average annual post-construction load of Total Suspended Solids (TSS). This Standard is met when: a. Suitable practices for source control and pollution prevention are identified in along-term pollution prevention plan and thereafter are implemented and maintained; b. Structural stormwater best management practices are sized to capture the required water quality volume determined in accordance with Massachusetts Stormwater Handbook; and c. Pretreatment is provided in accordance with the Massachusetts Stormwater Handbook.

Standard 5. For land uses with higher potential pollutant loads, source control and pollution prevention shall be implemented in accordance with the Massachusetts Stormwater Handbook to eliminate or reduce the discharge of stormwater runoff from such land uses to the maximum extent practicable. If through source control and/or pollution prevention, all land uses with higher potential pollutant loads cannot be completely protected from exposure to rain, snow, snow melt and stormwater runoff, the proponent shall use the specific structural stormwater BMPs as provided in the Massachusetts Stormwater Handbook. Stormwater discharges from land uses with higher potential pollutant loads shall also comply with the requirements of the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 26 through 53, and the regulations promulgated thereunder at 314 CMR 3.00, 314 CMR 4.00 and 314 CMR 5.00.

Standard 6. Stormwater discharges within the Zone II or Interim Wellhead Protection Area of a public water supply and stormwater discharges near or to any other critical area require the use of the specific source control and pollution prevention measures and the specific structural stormwater best management practices determined by the Department to be suitable for managing discharges to such area as provided in the Massachusetts Stormwater Handbook. A discharge is near a critical area, if there is a strong likelihood of a significant impact occurring to said area, taking into account site-specific factors. Stormwater discharges to Outstanding Resource Waters and Special Resource Waters shall be removed and set back from the receiving water or wetland and receive the highest and best practical method of treatment. A "storm water discharge" as defined in 314 CMR 3.04(2)(a)1. or (b) to an Outstanding Resource Water or Special Resource Water shall comply with 314 CMR 3.00 and 314 CMR

4.00. Stormwater discharges to a Zone I or Zone A are prohibited, unless essential to the operation of the public water supply.

Standard 7. A redevelopment project is required to meet the following Stormwater Management Standards only to the maximum extent practicable: Standard 2, Standard 3, and the pretreatment and structural stormwater best management practice requirements of Standards 4, 5 and 6. Existing stormwater discharges shall comply with Standard 1 only to the maximum extent practicable. A redevelopment project shall also comply with all other requirements of the Stormwater Management Standards and improve existing conditions.

Standard 8. A plan to control construction related impacts including erosion, sedimentation and other pollutant sources during construction and land disturbance activities (construction period erosion, sedimentation and pollution prevention plan) shall be developed and implemented.

Standard 9. A long-term operation and maintenance plan shall be developed and implemented to ensure that the stormwater management system functions as designed.

Standard 10. All illicit discharges to the stormwater management system are prohibited.

4.19.4. Geotechnical Testing

4.19.4.1. Soil borings logs shall be provided to classify soils within proposed surface stormwater basins and subsurface absorption systems and throughout the Drainage Study Area. Logs of deep observation holes shall be provided within surface stormwater basins and subsurface absorption systems a minimum of one deep observation hole log shall be provided for each 5000 sq. ft. of basin area or a minimum of two soil logs per basin whichever is greater. One boring shall extend to impervious strata or to refusal. The other boring shall extend to the elevation of the design bottom elevation of the basin and shall be used to perform a borehole permeability test. Additional soil boring or deep observation hole logs shall be provided to classify soils throughout the Drainage Study Area, particularly in locations where available National Resource Conservation Service mapping is indeterminate or classifies soils as Udorthents.

4.19.4.2. In-situ field bore hole permeability test data shall be provided within surface stormwater basins and subsurface absorption systems a minimum of one permeability test shall be provided for each location. For larger surface stormwater basins and subsurface absorption systems additional permeability tests may be required as determined by the Board. Permeability testing shall be witnessed by the Board of Health Agent or the Planning Board Agent. If permeability testing is desired to be performed in soils of low permeability, laboratory tests for hydraulic conductivity shall be performed on undisturbed samples by the Falling Head Permeability Test using flexible membrane triaxial test cells with back pressure (US Army Corps of Engineers Engineering Manual EM 1110-2-1906, Appendix

VII).

- 4.19.4.3. A minimum of one monitoring well shall be installed within each stormwater basin. Monitoring wells shall extend to a depth of 10 feet below existing grade or 4 feet below the design elevation of the bottom of the stormwater basin whichever is deeper.

The elevation of groundwater shall be recorded by a Massachusetts Licensed Soil Evaluator, Professional Engineer, or Professional Land Surveyor once in each of four months. When observations are taken during the months of May through December, the design groundwater elevation shall be adjusted to reflect spring high groundwater conditions using the Frimpter Method.

4.19.5. Hydrologic Analysis

- 4.19.5.1. The Drainage Study Area shall encompass the project site and all tributary upgradient areas. The boundary of the Drainage Study Area and the analysis points shall be the same for the pre-development condition and the post-development condition.

Pre-development and post-development plans of the drainage Study Area shall show existing and proposed buildings, paved areas, and surface treatment for all open areas. The plans shall show existing and proposed elevations based upon one foot contour intervals. The plans shall show existing and proposed catchbasins and culverts, watercourses, watershed and catchment boundaries, and flow lines, Natural Resources Conservation Service (NRCS) soil boundaries and Hydrologic Soil Groups.

Times of concentration shall be determined based upon distance, slopes, and surface materials. A minimum time of concentration to be used shall be 0.1 hours.

- 4.19.5.2. Pipe flow calculations shall be provided for the closed drain system based upon the "Rational Formula" as follows:

Rational Formula" $Q = CIA$

where:

Q = Peak rate of flow

C = Coefficient of runoff

i = Rainfall intensity in inches per hour

A = Area of watershed in acres

A weighted coefficient of runoff "C" is to be determined for each incremented drainage area based on the following minimum values:

Roofs and pavement	0.90
Lawns, flat (2% max.), sandy soil	0.10
Lawns, average (2% to 7%), sandy soil	0.12
Lawns, steep (>7%), sandy soil	0.18
Lawns, flat (2% max.), heavy soil	0.15
Lawns, average (2% to 7%), heavy soil	0.20
Lawns, steep (>7%), heavy soil	0.30
Woodland	0.20
Wetlands, ponds, basins	0.90

Rainfall Intensity

4.19.5.3. Inlets shall provide capacity to accommodate the design storm. Spread shall not encroach on travel lanes of streets or the top of curbs or berms.

4.19.5.4. Stormwater basin analysis shall be based upon Technical Release 20 (TR-20) as follows:

Rainfall

- 2-year frequency storm event – 3.2 inches
- 10-year frequency storm event – 4.8 inches
- 25-year frequency storm event – 5.5 inches
- 50-year frequency storm event – 6.2 inches
- 100-year frequency storm event – 6.8 inches

Curve Number (CN)

Weighted curve numbers shall be calculated using the following values. For cover types not stated, refer to TR-20.

Hydrologic soils group	A	B	C	D
Lawns poor	68	79	86	89
Lawns fair	49	69	79	84

Lawns good	39	61	74	80
Impervious areas, pavement, roofs	98	98	98	98
Woods poor	45	66	77	83
Woods fair	36	60	73	79
Woods good	30	55	70	77
Wetlands, ponds, basins	98	98	98	98

Curve numbers for conditions not included in the above shall be obtained from TR-20 documentation.

4.19.6. Design Storms

4.19.6.1. Stormwater runoff shall be analyzed for the 2-year frequency storm event, 10-year frequency storm event, 25-year frequency storm event, 50-year frequency storm event, and 100-year frequency storm event.

4.19.6.2. The design storm for all components of the closed stormwater collection system including catchbasin grates and other inlets, drainlines, and the bypass capacity of separator structures is the 25-year frequency storm event.

4.19.6.3. The design storm for cross culverts and devices protecting occupied buildings is the 100-year frequency storm event.

4.19.6.4. The design storm for surface stormwater basins and subsurface absorption systems is the 100-year frequency storm event.

The runoff for design of surfaces providing sheet flow, swales, and drainage ditches that convey runoff to surface stormwater basins and subsurface absorption systems is the excess runoff resulting from storm events greater than the 25-year frequency storm event but less than the 100-year frequency storm event.

4.19.6.5. The required recharge volume is the volume resulting from multiplying the factors set forth below times the total post-development impervious surface within the project area for each National Resource Conservation Service Hydrologic Soil Group as set forth hereinafter.

Hydrologic Soil Group	Required Recharge
HSG A Soil	0.60 inches of runoff
HSG B Soil	0.35 inches of runoff

HSG C Soil	0.25 inches of runoff
HSG D Soil	0.10 inches of runoff

4.19.6.6. The water quality volume to be treated is 1.0 inches of runoff multiplied by the total post-development impervious surface within the project area for discharges to critical areas and 0.5 inches of runoff multiplied by the total post-development impervious surface within the project area for discharges to all other areas. Discharges to critical areas include systems accommodating runoff from land uses with higher potential pollutant lands, discharges to areas with infiltration rates greater than 2.4 inches per hour, and discharges to a designated Zone II.

4.19.7. Design Criteria

4.19.7.1. The closed stormwater collection system shall accommodate the design storm without surcharging and shall provide a free discharge to stormwater basins above the maximum the 100-year storm elevation. All components of the system shall accommodate the design storm including catchbasin grates and other inlets, drainlines, and the bypass components of water quality structures.

Cross culverts and devices protecting occupied buildings shall accommodate the design storm event without surcharging.

Surface stormwater basins and subsurface absorption systems shall have the volume to accommodate runoff providing for no increase in the peak rate of discharge or the volume of discharge at the project boundary for the 2-year frequency storm event, 10-year frequency storm event, 25-year frequency storm event, 50-year frequency storm event, and 100-year frequency storm event. Base flow from underdrains shall be included in the design flow. Inflow volume shall not be decreased based upon runoff captured by roofwater recharge systems.

Surfaces providing sheet flow, swales, and drainage ditches conveying excess runoff to surface stormwater basins and subsurface absorption systems shall accommodate runoff from storm events exceeding the capacity of the closed stormwater collection system but less than the 100-year frequency storm event.

Recharge facilities accommodating runoff from paved surfaces shall be provided over broad areas of the site and shall recharge the design storm within 72 hours following cessation of precipitation. Separate roofwater recharge facilities shall be provided in proximity to the building served to promote recharge over broad areas of the site and shall recharge the design storm within 72 hours following cessation of precipitation. Recharge facilities accommodating runoff from paved surfaces in combination with recharge facilities accommodating runoff from building roofs shall accommodate the required recharge volume.

Water quality components shall be provided to remove 80 percent of the Total Suspended Solids (TSS) for the water quality volume. Water quality components

include deep catchbasin sumps, water quality structures, and sediment forebays.

Water quality components shall abate phosphorous loadings in stormwater in accordance with the Massachusetts Stormwater Handbook.

Inflows and outflows across the project boundary shall be maintained. There shall be no concentration of flow at any point on the project boundary unless a downgradient easement is provided extending to an existing watercourse or wetland.

There shall be no new point source discharge within 100 feet of a bordering vegetated wetland. Surface stormwater basins and subsurface absorption systems shall not be located within bordering vegetated wetlands. Stormwater basin discharges shall be above any 100 year jurisdictional flood elevation. Surface stormwater basins and subsurface absorption systems shall not be located within floodplains unless compensatory storage is provided.

- 4.19.7.2. The closed stormwater collection system shall consist of precast concrete drain manholes, precast concrete catchbasins, precast concrete water quality structures connected by straight segments of drainline.

Cross culverts shall consist of straight segments of Class IV reinforced concrete pipe with gasketed joints.

The velocity of drainlines shall be determined based upon Manning's equation:

$$V = \frac{1.486}{n} R^{2/3} S^{1/2}$$

where:

V is the cross-sectional average velocity (ft/s)

k is a conversion constant equal to 1.486 for US customary units

n is the Manning coefficient of roughness (independent of units)

R is the hydraulic radius (feet)

S is the slope of the drainline (feet/foot)

The capacity of drainlines shall be based upon the discharge formula:

$$Q = AV$$

where:

Q is the volume of flow in cubic feet per second

A is the cross section area of the pipe

V is the cross-sectional average velocity (ft/s)

The coefficient of roughness (Manning's n) for reinforced concrete pipe shall be 0.013 and for smooth interior wall HDPE pipe shall be 0.012.

The minimum velocity (flowing full) for all drainlines shall be 2.5 feet per second and the maximum velocity (flowing full) shall be 12.0 feet per second flowing full.

Drainlines shall be Class IV Reinforced Concrete Pipe with o-ring seal joints conforming to ASTM C443. Corrugated polyethylene pipe with smooth interior walls conforming to AASHTO M294, Type S with o-ring seal joints may be used outside streets for systems that will remain forever private. The minimum pipe size shall be 12 inches in diameter. In instances where pipe diameter increases, the change shall be provided at a manhole and the crown of the inflow pipe shall match the crown of the outflow pipe.

Catchbasins shall be 5 foot inside diameter and shall have a minimum 4 foot deep sump. Catchbasins shall be provided at intervals not to exceed three hundred (300) feet on center.

Separator structures having capacity to treat the water quality volume shall be provided upgradient of all surface stormwater basins and subsurface absorption systems and shall have a bypass capability for larger storms. Separator structures must accommodate cleaning with a clamshell bucket. Separator structures requiring use of a vacuum hose for cleaning shall not be used.

Pipe shall have the structural strength to accommodate depth of bury or surface loads. All drainage structures shall accommodate AASHTO SH20-44 loadings.

4.19.7.3. Roofwater recharge systems, surface stormwater basins and subsurface absorption systems shall located in areas of permeable soil where there is a minimum of 4 feet of naturally occurring permeable soil between the bottom of the separate roofwater recharge system, surface stormwater basin, or subsurface recharge system and impervious soils or bedrock. A minimum separation of 2 feet shall be provided the bottom of the separate roofwater recharge system, surface stormwater basin, or subsurface recharge system and seasonal high groundwater.

Design infiltration rates for roofwater recharge systems, surface stormwater basins and subsurface absorption systems shall be either the value obtained from permeability tests of Section **Error! Reference source not found.** or the values set forth in the following table, whichever is less.

Table 2-1 Infiltration Rates for Various Soil Textures²

Texture Class	NRCS Hydrologic Soils Group	Design Infiltration Rate (inches per hour)
Sand	A	8.27
Loamy Sand	A	2.41

Sandy Loam	B	1.02
Loam	B	0.52
Silt Loam	C	0.27
Sandy Clay Loam	C	0.17
Clay Loam	D	0.09
Silty Clay Loam	D	0.06
Sandy Clay	D	0.05
Silty Clay	D	0.04
Clay	D	0.02

4.19.7.4. Separate roofwater recharge systems shall be provided having sufficient volume to accommodate 1 inch of runoff from roofs. Roofwater recharge systems shall be located in areas of permeable soil. Where roofwater recharge facilities are located within hydrologic soils group (HSG) D soils, drywells at the same elevation interconnected with equalizing pipes or linear systems of galleys shall be used.

4.19.7.5. Surface stormwater basins.

Surface stormwater basins including retention basins, detention basins, and basins providing both retention and detention shall be designed with the following objectives to be considered: hydraulic function, safety, maintenance, aesthetics, and when required, water quality.

Surface stormwater basin(s) shall be designed for aesthetics as well as function by providing a naturalistic freeform layout and attractive plantings.

Surface stormwater basins may be designed as detention basins, retention basins, or combined detention/retention basins provided that the design requirement that there be no increase in the peak rate of stormwater discharge and no increase in the volume of stormwater discharge at the property line is achieved by the overall stormwater management system. All detention basins, retention basins, or combined detention/retention basins shall be located in areas of pervious soil and shall be designed to empty such that the required design volume is available within seventy-two (72) hours following the cessation of precipitation.

The design elevation of the bottom of the basins shall be set to provide a minimum 2 foot separation between the bottom of the e basin and spring high groundwater. A minimum of 4 or more feet of naturally occurring permeable soil shall be provided between the bottom of the basin and impervious soil or bedrock.

Details of inlet and outlet control structures and the infiltration system at the bottom of the basin shall be provided.

One foot of freeboard shall be provided above the 100 year design elevation of the basin.

An emergency spillway above the 100 year design elevation of the basin shall be provided for all basins that provides an unencumbered hydraulic connection and directs excess flow in a manner that avoids damage to public and private property and wetland resource areas.

Stormwater basin side slopes shall have a maximum slope of a 3 horizontal to 1 vertical (3 to 1). The Board reserves the right to limit the depth of basins to the 25-year design water surface to 4 feet maximum. The Board reserves the right to require 42 inch high non-climbable fencing surrounding the basin for safety based upon the nature of on-site and neighboring land uses.

Basin embankments having a height of greater than four feet between the required freeboard elevation and finished grade exterior to the basin shall require geotechnical testing and an embankment design prepared by a Massachusetts Geotechnical Professional Engineer. Sections through such embankments shall be provided and shall show slopes, impervious cores, and surface armoring.

Infiltration systems within detention/retention basins are required in the bottom of basins. Frames and grates shall be placed six inches above the basin floor to allow sediment to settle.

Surface stormwater basins including surrounding maintenance access berms shall be provided on separate lots not part of any building lot. A 10 foot wide minimum access and maintenance easement shall extend from the public way the stormwater basin lot.

A vehicle accessible level berm for maintenance access shall be provided surrounding each surface retention/detention basin or underground leaching structure. The level berm shall extend for a minimum of 15 feet (or the width recommended in the current edition of the Massachusetts Stormwater Handbook if greater) beyond the required freeboard line on the side slope of surface retention/detention basins and 15 feet beyond the structure or distribution piping of underground leaching basins.

Security fencing or other effective measures shall be provided surrounding surface stormwater basins and subsurface absorption systems. Guardrail shall be provided for basins in proximity to vehicular areas.

To facilitate screening of the stormwater basin, a tree easement having a minimum width of 10 feet shall be provided around surface stormwater basins and subsurface absorption systems located adjacent to and outside the vehicle accessible level berm. Required plantings within the tree easement consist of evergreen trees planted at a maximum of 15 feet on-center in each row. Two rows are required that are staggered to enhance screening. A single row of evergreen shrubs having minimum height of 6 feet at maturity shall surround the trees. Trees shall be spruce or fir and have a minimum height of 8 feet in height at the time of planting.

The edge of surface stormwater basins shall be measured at the required freeboard elevation. Surface stormwater basins shall comply with minimum setbacks as follows:

- Property lines 25 feet
- Front setback 100 feet
- Slab on grade buildings 25 feet
- Building cellars or basements 100 feet
- Street intersections 200 feet

4.19.7.6. Subsurface Recharge Systems

Subsurface absorption systems shall be designed with the following objectives to be considered: hydraulic function, safety, and maintenance.

Subsurface absorption systems shall meet the design requirement that there be no increase in the peak rate of stormwater discharge and no increase in the volume of stormwater discharge at the property line. All subsurface absorption systems shall be located in areas of pervious soil and shall be designed to empty such that the required design volume is available within 72 hours following the cessation of precipitation.

The design elevation of the bottom of the system shall be set to provide a minimum 2 foot separation between the bottom of the e basin and spring high groundwater. A minimum of 4 or more feet of naturally occurring permeable soil shall be provided between the bottom of the basin and impervious soil or bedrock.

An emergency overflow shall be provided for all systems that directs excess flow in a manner that avoids damage to public and private property and wetland resource areas.

Subsurface absorption systems shall consist of precast concrete structures capable of supporting HS20-44 loadings. HDPE recharge systems capable of supporting HS20-44 loadings may be used for systems that will remain forever private. Subsurface absorption systems shall be embedded in a minimum one foot thick layer of double washed $\frac{3}{4}$ to 1½ inch stone on the top and sides. The top and sides of the stone shall be surrounded by filter fabric.

The treatment train shall provide for 80 percent Total Suspended Solids removal prior to inflow into the subsurface absorption system.

Subsurface absorption systems serving land subdivisions shall be provided on separate lots not part of any building lot. A 10 foot wide minimum access and maintenance easement shall extend from the public way the stormwater basin

lot.

To facilitate maintenance, each structure shall be provided with a 24 inch diameter frame and cover adjusted to finished grade at the inlet and outlet. Additional access covers shall be provided such that no portion of any subsurface recharge systems shall be more than 40 feet from an access cover.

The edge of subsurface absorption systems shall be measured at the outer edge of washed stone or the outer wall of the recharge structure, which ever extends further outward. Subsurface absorption facilities shall comply with minimum setbacks as follows:

- Property lines 25 feet
- Slab on grade buildings 25 feet
- Building cellars or basements 100 feet

4.19.8. Mounding

A mounding analysis is required when the vertical separation from the bottom of an exfiltration system to seasonal high groundwater is less than four (4) feet and the recharge system is proposed to attenuate the peak discharge from a 10-year or higher 24-hour storm. The mounding analysis must demonstrate that the Required Recharge Volume is fully dewatered within 72. The mounding analysis must also show that the groundwater mound that forms under the recharge system will not break out above the land or increase the water elevation in a bordering vegetated wetlands, open water areas within the 72-hour evaluation period.

A mounding analysis is also required when recharge is proposed at or adjacent to a site classified as contaminated, was capped in place, or has an Activity and Use Limitation (AUL) that precludes inducing runoff to the groundwater, pursuant to MGL Chapter 21E and the Massachusetts Contingency Plan 310 CMR 40.0000; or is a solid waste landfill pursuant to 310 CMR 19.000; or groundwater from the recharge location flows directly toward a solid waste landfill or 21E site. In this case, the mounding analysis must determine whether infiltration of the Required Recharge Volume will cause or contribute to groundwater contamination.

The Hantush¹ or other equivalent method may be used to conduct the mounding analysis; however, the Planning Board may require use of a numeric model for larger systems or where required to accurately model groundwater conditions.

4.19.9. Offsite Discharge

4.19.9.1. In instances where no lots can be developed within a subdivision because no naturally occurring soils are found within the project site which would allow

¹ Hantush 1967 – See Reference for Standard 3.

recharge of stormwater within 72 hours, the applicant may petition to allow offsite discharge of stormwater. The Planning Board may waive applicable requirements of Section 4.19 provided that after due consideration that waiver of strict compliance with the provisions of Section 4.19 is in the public interest.

- 4.19.9.2. Runoff may be conveyed to surface stormwater basins or subsurface absorption systems on contiguous properties that fully the offsite surface stormwater basins or subsurface absorption systems have sufficient capacity to attenuate the increase in peak rate and volume. The hydrologic analysis shall establish a design point at the outlet of the surface stormwater basins or subsurface absorption systems. Permanent easements shall be furnished encompassing all off-site stormwater management facilities and providing proper access for maintenance.
- 4.19.9.3. Runoff may be discharged to the municipal stormdrain system provided that the off site connection conforms to the requirements set forth herein. Detention basins are provided on the project site having sufficient capacity to limit the post development peak rate of stormwater discharge to the municipal system such that it is no greater pre-development peak rate of stormwater discharge to the municipal system. Any increase in the volume of stormwater runoff discharged to the municipal storm drain system will not cause erosion or increase flooding or ponding of water in a manner that would damage properties or wetland resource areas. All offsite components of the receiving municipal stormdrain system shall have sufficient excess capacity such that they can accommodate runoff from the project site plus all runoff from full build out of all properties in its existing service area for the 25-year frequency storm event without surcharging. The Board of Selectmen allow the connection and may a condition of allowing the connection impose a user fee to be paid by the applicant.