

American Massage Therapy Association or similar professional organization.

- c) Certificate that the applicant is free of tuberculosis in a communicable form as set forth by the Department of Public Health.
- d) Certification of professional liability insurance.
- e) Every licensee shall notify the Marion Board of Health prior to any change of name, address, OR landlord/owner of property or business.

**12.40: Exceptions and Exclusions.**

**12.40.1:** The licensing provisions of these regulations shall not apply to the following classes of individuals, while engaging in the performance of the duties of their respective professions:

- a) Physicians, surgeons, chiropractors, osteopaths (D.O.), podiatrists, physical therapists, occupational therapists,
- b) Barbers and beauticians, while engaging in the practices within the scope of their licenses,
- c) Personnel in hospitals, nursing homes, or other health care facilities licensed by the Commonwealth of Massachusetts,
- d) Coaches and athletic trainers, acting within the scope of their employment, at accredited schools,
- e) Employees of hospitals, nursing homes, convalescent homes, home health agencies, or other similarly licensed institutions, AND
- f) Apprentices under the provisions of section eighty-seven H or section eighty-seven I of chapter one hundred and twelve, or as a hairdresser, operator, or a student under the provisions of sections eighty-seven T to eighty-seven JJ, inclusive of said chapter one hundred and twelve, may practice facial and scalp massaging without taking out a license as provided in this section.

**12.50: Requirements For Licensing An Establishment.**

**12.50.1:** No establishment shall be kept open between the hours of 11:00 PM and 7:00 AM unless specifically authorized in writing by the Board of Health and the Marion Planning Board.

**12.50.2:** No person shall treat, or be treated, if afflicted with a reportable communicable disease. However, the person may treat, or be treated, when a written statement is received from a physician to the effect that the condition is no longer contagious.

**12.50.3:** The establishment shall be connected to the public sewage system or private septic system.

**12.50.4:** All rooms shall be well lit, well ventilated, and properly heated in accordance with local and/or State regulations.

**12.50.5:** There shall be a safe, adequate supply of hot and cold running water at all times.

**12.50.6:** There shall be a toilet, handwash facilities, and one or more treatment rooms.

**12.50.7:** Massage/muscular therapy establishments shall, at all times, be equipped with an adequate amount of clean sanitary towels, covering, and linens, which shall be stored so as to protect them from contamination.

**12.50.8:** Towels and linens shall not be used on more than one patron, unless they have been first laundered and sanitized. Disposable towels and coverings shall not be reused. Soiled linens and disposable items shall be deposited in separate covered receptacles.

**12.50.9:** All instruments and devices, used by any person licensed to practice massage/muscular therapy for direct application to the bodies of patrons or for holding materials to be applied to the body, shall be kept clean and sanitized. Adequate provisions shall be made for cleaning and sanitizing.

**12.60: Denial Of Application For License Or Renewal.**

Any person or establishment whose application for a license or license renewal is denied may within ten (10) days of said denial request, in writing, a hearing upon the cause or causes of said denial. The Board of Health may set a time and place for said hearing within a reasonable time, not to exceed thirty (30) days.

**12.70: Suspension Or Revocation Of License.**

**12.70.1:** No license granted under these regulations, whether for individual practitioners or for an establishment, may be suspended or revoked without a hearing. The Board of Health may suspend an establishment and an individual license for flagrant violation of the regulations or under emergency conditions as determined by the Regional Sanitarian.

**12.70.2:** In the event of a suspension of a license, the licensee shall be entitled to have such suspension reviewed by the Board of Health at its next regularly scheduled meeting.

**12.70.3:** A license may be suspended or revoked if the Board of Health determines after a public hearing that the applicant made a false statement on the application, violated or permitted a violation of any of these regulations, or of any condition of the license, or violated or permitted a violation of any law of the Commonwealth.

**12.80: Penalties.**

Whoever violates any provision of section fifty-one, or any rule or regulation made under authority thereof, or prevents or hinders any member of a police force from exercising the authority conferred upon him by section fifty-two, shall be punished by a fine of not more than one hundred dollars or by imprisonment for not more than six months, or both.  
[November 1, 2005]

**SECTION 13: PRIVATE & AGRICULTURAL WELLS**

13.10: Private wells used either for agricultural or drinking water purposes may not be drilled or otherwise installed without a permit from the Board of Health.[July 1, 2009]

13.11: All new agricultural and drinking water wells shall be tested initially by a certified laboratory for total coli form, potability, and volatile organic compounds (voc's), and then retested every ten (10) years. If the homeowner detects an unpleasant or unnatural taste or odor, the well should be tested immediately. [July 1, 2009]

13.12: Prior to or simultaneous with a transfer of real property to someone other than an immediate family member, the seller shall have any well used for drinking water purposes tested by a certified laboratory for total coliform, potability and volatile organic compounds. [July 1, 2009]

13.13: Immediate family members and/or relationships are defined as follows: between current spouses, between parents and their children, full siblings and where the grantor transfers the real property to be held in a revocable or irrevocable trust, where at least one of the designed beneficiaries is of the full degree of relationship to the grantor (Massachusetts Department of Environmental Protection- Septic Systems/Title V: Regulations Policy- Technical Guidelines on Residential Property Transfers Between Family Members.) [July 1, 2009]

**DECOMMISSIONING REQUIREMENTS:**

Abandoned wells, test holes, and borings shall be decommissioned so as to prevent the well, including the annular space outside the casing, from being a channel allowing the vertical movement of water.

The owner of the private well shall decommission the well if the well meets any of the following criteria:

- 1) construction of the well is terminated prior to completion of the well;
- 2) the well owner notifies the Board that the use of the well is to be permanently discontinued;
- 3) the well has been out of service for at least three years;
- 4) the well is a potential hazard to public health or safety and the situation cannot be corrected;
- 5) the well is in such a state of disrepair that its continued use is impractical; and
- 6) the well has the potential for transmitting contaminants from the land surface into an aquifer or from one aquifer to another and the situation cannot be corrected.

The property owner shall be responsible for insuring that all abandoned wells and test holes or borings associated with private well installation are properly plugged. Only registered well drillers may plug abandoned wells, test holes and borings.

In the case of new well construction, all test holes and boring shall be plugged before the well driller completes work at the site.

Abandoned wells or borings shall be completely filled with a grout which cures with a final permeability of less than  $1 \times 10^{-7}$  cm/sec. Wells shall be plugged with neat cement grout, sand cement grout, concrete, or bentonite grout.

Regardless of the type used, the grout:

- 1) shall be sufficiently fluid so that it can be applied through a tremie pipe from the bottom of the well upward
- 2) shall remain as a homogeneous fluid when applied to the subsurface rather than disaggregating by gravity into a two phase substance
- 3) shall be resistant to chemical or physical deterioration
- 4) shall not leach chemicals, either organic or inorganic, that will adversely affect the quality of the groundwater where it is applied

The plugging materials shall be introduced at the bottom of the well or boring and placed progressively upward to a level approximately four (4) feet below the ground surface. Sealing materials shall never be poured from the land surface into the well, borehole, or annular space being sealed.

The contractor shall emplace the surface seal no sooner than 24 hours after the well or boring has been plugged. Before the surface seal is placed, casing remaining in the hole shall be at least six inches thick and shall be at least two feet greater in diameter than the well casing or borehole wall.

[Optional: The DEP Private Well Guidelines, section entitled "Decommissioning Abandoned Wells, Test Holes, and Dry or Inadequate Borings," contains a more comprehensive discussion of plugging procedures and other aspects of decommissioning and contains specific recommendations]. [July 1, 2009]

**SECTION 14: Reserved.**  
**SECTION 15: Reserved.**

## **SECTION 16: VARIANCES**

**16.10:** Variances to the Town of Marion Sanitary Code may be granted by the Board of Health in conformity with the standards and procedures of Massachusetts Regulations 310 CMR 11.11 and 310 CMR 15.410 through 15.416 unless otherwise stipulated in these regulations. [December 6, 1988 and March 13, 1990 and November 1, 2005]

**16.10.1:** All applications to the Board of Health for variances to any provision shall be in writing. The applicant shall submit their letter for a variance that shall include the specific sub-section from which a variance is sought.

[March 13, 1990 and November 1, 2005]

**16.10.2:** No application for a variance to the Marion Sanitary Code or Title V regulation shall be granted or denied by the Board of Health until it has held a public hearing on the said application. [March 13, 1990 and November 1, 2005]

**16.10.3:** The applicant or the applicants representative shall, by certified mail, notify all property owners abutting the subject property and directly across the street from the subject property not less than ten (10) days prior to the date of the public hearing. The notice shall include a copy of the legal advertisement or all information required in the legal advertisement as noted in this section and as provided by the Board. The notification of abutters shall be at the expense of the applicant. [November 1, 2005]

**16.10.4:** The name of the applicant, the nature and the location of the variance(s) applied for, and the place, date, and time of the Board's public hearing on the variance(s) must be advertised in a locally circulated newspaper. A notice of a public hearing shall be advertised by the Town, in general circulation of a newspaper within the Town at least once in each of the two weeks prior to the week of the public hearing on said variance(s). The cost of this legal advertisement is to be paid by the applicant. The payment shall accompany the cost of the permit application, proposed plans, and variance application. Public hearings will not be scheduled until the variance submittal is complete and the Board has approved the application for advertisement. [November 1, 2005]

**16.20:** A variance may be granted upon a finding by the Marion Board of Health that due to the nature of the land subject to the application of the literal enforcement of these regulations would result in a substantial hardship, and that desirable relief may be granted without detriment to the public health, and without nullifying or substantially derogating from the intent of these regulations. [December 6, 1988]

**16.30:** In any proceeding for a variance it shall be presumed that a variance from the regulation will result in substantial detriment to the public health and it shall be the burden of the applicant by clear and credible evidence to disprove that presumption. [December 6, 1988]

**16.40:** The Board of Health may impose such conditions upon the issuance of a variance as it deems fit to protect the public health, including, but not limited to, requiring replication of waters or resource areas. [December 6, 1988]

**16.50:** Any application for a variance to the Marion Sanitary Code for a septic system with a leaching area that falls within the set-backs set forth in regulation MSC 4.20.4 must include a written statement from a registered geohydrologic engineer, or the equivalent of same, certifying that in his/her opinion, the effluent from the proposed septic system will not in any way contaminate the resource area, wetland, watercourse, or coastal wetland adjacent to that septic system. [December 6, 1988]

**16.50.1:** The full provisions of MSC 16.50 shall apply to the application for any variance to the Marion Sanitary Code regulation, the granting of which shall have the effect of moving the septic system leaching area outside of a resource area set-back established in either Title 5 of the Marion Sanitary Code.  
[December 6, 1988]

**16.60:** No variance may be granted for a hardship resulting from the creation of lots or boundary lines by subdivision of land. [March 13, 1990]

**SECTION 17: ENFORCEMENT.**

**17.10:** The Board of Health or its duly appointed Health Agent are authorized to issue Notices of Violations, Cease and Desist Orders, and other enforcement orders to compel compliance with the terms of this Sanitary Code, as they deem necessary and appropriate. [December 6, 1988]

**17.20:** In addition to any other remedy, the Board of Health and/or its Agents may take any enforcement action deemed appropriate including but not limited to criminal prosecution, including fines as set forth in MGL Chapter 111, Section 31 or Civil Action in the Courts of the Commonwealth for injunctive relief and/or money damages, or both criminal and civil enforcement. [December 6, 1988]

**SECTION 18: FORMS**

**18.10:** Disposal Works Construction Permit Application

18.10.1: Disposal Works Construction Permit

18.10.2: Certificate of Compliance

**18.20:** Deephole/Percolation Test Form

**18.30:** Variance Application Form

**18.40:** Disposal Works Construction Permit Amendment Form

**18.50:** New Food Service Establishment

18.51.1: Application Checklist [November 2008]

18.51.2: Temporary Food Establishment Guidance For Operators [March 2009]

**18.60:** Subdivision Rules and Regulations, Section 4600.

STORMWATER MANAGEMENT [Revised May 5, 2008]

**18.70** Fees Schedule [July 1, 2008/June 25, 2009]

**SECTION 19: SEVERABILITY.**

**19.10:** Each part of this Sanitary Code shall be construed as separate to the end that if any paragraph, sentence, clause or phrase thereof shall be held invalid for any reason, the remainder of the Sanitary Code shall continue in force. [December 6, 1988]

# FORMS

**FOOD**

License to Manufacture and/or Sell Frozen Desserts	\$75.00
License to Operate a Bakery	\$100.00
License to Operate a Bed and Breakfast Residential Kitchen	\$100.00
*(plus \$25. each room)	
License to Operate a Catering Establishment	\$100.00
License to Operate a Food Service Establishment for 3 days or less (fairs)	\$25.00
License to Operate a Mobile Food Server	\$125.00
License to Operate a Residential Kitchen	\$100.00
License to Operate a Retail Food Store	\$100.00
Permit to Operate a Food Service Establishment with 74 seats or less	\$125.00
Permit to Operate Food Service Establishment with 75 seats or more	\$175.00
Permit to Sell Milk and Cream	\$10.00
Plan Review (Food Establishment or Retail Food Store)	\$125.00
WHOLESALE FOOD	\$100.00

**SEPTIC**

Disposal System Construction Permit	\$175.00
Disposal System Construction Permit for a Single Component of System	\$100.00
Disposal System Construction Permit Variance	\$100.00
<i>Note: Advertising fees will be paid by applicant directly to Advertiser</i>	
Disposal Works Installers Permit	\$150.00
Percolation Test – Standard	\$300.00
Rates greater than 30 minutes per inch will be billed an additional	\$200.00
Permit to Remove, Transport, and Dispose of Garbage, Offal, or other Offensive Substances (per Truck)	\$125.00
Plan Review (Septic - each revision)	\$50.00
Septic System Abandonment Application	\$75.00
Soil Evaluation	\$125.00
Title V Inspection Endorsement	\$75.00
Title V Inspector Registration	\$25.00

**OTHER**

License to Operate a Massage Therapy Establishment	\$125.00
License to Operate a Tanning Facility	\$125.00
*(plus \$25.00 each room)	
License to Operate a Seasonal Camp for 100 Children or less	\$100.00
License to Operate a Seasonal Camp for 101 Children or more	\$200.00
License to Operate an Ice Skating Rink	\$200.00
License to Operate an Inn, Lodge, or Motel	\$150.00
License to Sell Tobacco Products	\$25.00
Plan Review (Building Permit - not otherwise noted), BOA, PB, ZBA	\$40.00

Plan Review (Building Permit, Swimming Pool, Private, Above Ground)	\$75.00
Plan Review (Building Permit, Swimming Pool, Private, In Ground)	\$150.00
Permit-Swimming Pool (semi-public and public)	\$340.00
Plan Review (Private Wells)	\$175.00

The effective date for these changes will be July 1, 2009. A complete copy of the amended Sanitary Code is available at the Board of Health Office.

On 6/16/09 the Board of Health met and voted to adopt the following fees upon publication for Title V septic repair:

Systems requiring <b>up to:</b>	
1000 gallons per day	\$175.00
2000 gallons per day	\$350.00
3000 gallons per day	\$525.00

Marion Board of Health

The Wanderer:  
June 25, 2009

/spo

## 4600. STORMWATER MANAGEMENT.

### **1.0 GENERAL**

- 1.1 Management of stormwater runoff from all developments reviewed by the Marion Planning Board shall meet the standards and design criteria contained in this section for both flood control and non-point source pollution reduction. All assumptions, methodologies, and procedures used to design the stormwater management system components shall accompany all Site Plan Review and Subdivision of Land applications to the Planning Board.
- 1.2. Strict adherence to these Standards may be waived by the Planning Board upon a clear demonstration by the Proponent that full compliance with any specific standard would not serve the public interest or would not be practical due to physical site constraints.
- 1.3. All applicable standards of the Department of Environmental Protection (DEP) Stormwater Management Policy, dated March, 1997, amended January 2008, and all subsequent amendments thereto and the (DEP) Hydrology Handbook for Conservation Commissioners dated March, 2002 as amended from time to time, shall apply as minimum standards to all plan submittals, except where this section requires more stringent standards.
- 1.4 The applicant shall be responsible for compliance with the Marion Board of Health and Conservation Commission requirements governing the pertinent aspects of the stormwater management system.
- 1.5 Prior to the release of any portion of the Performance Guarantee, the stormwater management system must be substantially complete, stabilized, and operational. The functionality of the system shall be evaluated by the consulting engineer and the Superintendent of the DPW. The applicant shall submit an As-Built Plan of the constructed stormwater management system prepared by a Registered Land Surveyor and certified by a Registered Professional Engineer. If the system is found to be inadequate by virtue of physical evidence of operational failure even though it was built as called for in the Definitive Plan, it shall be corrected before the Performance Guarantee is released. Examples of inadequacy shall include errors in the infiltrative capacity, errors in the maximum groundwater elevation, failure to properly define or construct flow paths, or erosive discharges from the basins.

### **2.0 PERFORMANCE STANDARDS**

- 2.1. All design and construction shall be done in a manner such that the post-development stormwater runoff will not exacerbate or create flooding conditions, or alter surface water flow paths, resulting in impacts to the receiving wetland resource area or any adjacent properties to the site for the 2, 25, and 100-year 24 hour storm events. The pre-development standard shall be those conditions prevailing prior to abandoned projects or previously disturbed terrain.
- 2.2. The stormwater management systems shall be designed to attenuate the peak rate of the runoff for the 2-, 25-, and 100-year 24-hour storm events at or below the pre-development levels. Additional stormwater volume attenuation in excess of the Required Recharge Volume under the DEP Stormwater Policy for these storm events may also be required for any stormwater discharges into flood prone areas, off-site culvert inlets, isolated topographic depressions, adjacent properties, and any receiving wetland and/or water body which may be sensitive to increases in runoff volume.
- 2.3. Stormwater management systems that may eventually be owned and maintained by the Town of Marion shall be designed and constructed to provide the required level of treatment at the least cost to the Town. The Planning Board, in conjunction with the Superintendent of the DPW, may, at its discretion, disapprove a plan due to what it considers to be excessive Operation & Maintenance (O&M) costs.
- 2.4 Stormwater management systems shall be designed and constructed so that they do not negatively impact groundwater quality or elevations adjacent to or down gradient of the system area. Upon review of the specific site conditions, the Planning Board may require a groundwater mounding analysis based on the Hantush Method and a groundwater water quality evaluation to determine the potential impacts to any adjacent sensitive receptors (i.e., drinking water supplies and basements of existing dwellings).
- 2.5 Stormwater management systems shall be designed and constructed so that they do not represent safety hazards or nuisances to public health as determined by the Planning Board in consultation with the Board of Health.
- 2.6 Stormwater management systems shall be designed and constructed so that they do not visually detract from the neighborhood. A landscape design shall be prepared that provides appropriate screening from the adjacent properties

and roadways, while providing the degree of access necessary for O&M activities. Landscape plans shall be submitted that appropriately address visibility issues through proper placement, preservation of existing natural vegetation and supplemental plantings where necessary.

### 3.0. SUBMITTAL REQUIREMENTS

- 3.1 All site plan and definitive subdivision submittals shall be accompanied by a Stormwater Management System Report. At a minimum the Report shall consist of the following:
- 3.1.1 Hydrologic calculations for the 2-, 25-, and 100-year 24 hour storm events based on the TR-20 Methodology for the pre and post developed conditions for the overall project as well as specific calculations for the 2-, 25-, and 100-year 24 hour storm events also based on the TR-20 Methodology for each specific are subject to flooding including but not limited to isolated depressions, culvert inlets, and ponding areas for the pre and post developed condition.
  - 3.1.2 Supporting water quality calculations, specific BMP sizing calculations, and a Stormwater Management Form stamped by a Registered Professional Engineer shall also be provided.
  - 3.1.3 Discussion of the environmental and hydrological conditions of the site for the pre and post developed condition, as well as the proposed alterations of the site, all proposed components of the stormwater management system and Low Impact Development (LID) consistency summation outlined in Section 4.8.3.
  - 3.1.4 Soil evaluation logs, permeability test results and predicted maximum groundwater levels at each component of the stormwater management system validated by a representative of the Board of Health and/or the Planning Board. On-site permeability tests may be required to determine the appropriate infiltration value from Table 2.3.3 of the DEP Stormwater Management Policy
  - 3.1.5 An Operation and Maintenance Plan for the stormwater management system. The Plan shall include a maintenance schedule for each component of the stormwater management system, an outline of responsible parties and owners, and all pertinent agreements to be executed to insure proper maintenance of the facilities.
- 3.2 Pre and Post Development Watershed Plans at a preferred scale of 1-inch equals 40 feet shall be submitted with the Stormwater Management System Report and shall clearly depict the following information:
- 3.2.1 **Pre-Development Watershed Plan**
    - 3.2.1.1 The location of all surface waters, wetland resource areas, and all other State /Federal jurisdictional resource areas on or within 100-feet adjacent to the site. The boundaries of all such resource areas shall be verified to be accurate by the Marion Conservation Commission.
    - 3.2.1.2 The delineation of the 100 year flood elevation as indicated on the Federal Emergency Management Act (FEMA) maps. If FEMA maps do not exist or if the 100-year flood elevation of the water body or watercourse is not indicated on the FEMA map, the elevation shall be calculated, utilizing the US Army Corps of Engineers HEC flood water modeling methodology or the SCS TR-20
    - 3.2.1.3 Existing topography at a 2-foot contour interval within the watershed study area. Areas with less than a 1.0% grade shall be shown at a 1-foot contour interval with existing spot grades.
    - 3.2.1.4 Delineation of the existing watershed boundaries on the property inclusive of all off-site areas contributing runoff to the property.
    - 3.2.1.5 Boundaries of existing surficial ground cover conditions within the watershed study area in order to verify the runoff curve number (Cn).
    - 3.2.1.6 Prevailing soil types on the site and the hydrological soil groups based on the most current Natural Resource Conservation Service soils map. The provisional soil mapping at the NRCS office in Wareham shall be used in place of the published 1967 Plymouth County mapping
    - 3.2.1.7 Flow paths and design points for each watershed with each segment of the flow path defined.

- 3.2.1.8. Areas subject to flooding including but not limited to isolated topographic depressions, culvert inlets, and ponding areas with the calculated 100-year flood elevation associated with each area.
- 3.2.1.9. The location of any public or private water supplies on the property or within 100 feet of the property location including any mapped Water Resource Protection Overlays (i.e. Zone II, IWPA,)
- 3.2.1.10 Location of soil test pits and groundwater elevations.

**3.2.2 Post Development Watershed Plan**

- 3.2.2.1. Existing and proposed topography at a 2-foot contour interval within the watershed study area. Areas with less than a 1.0% grade shall be shown at a 1-foot contour interval with existing spot grades.
- 3.2.2.2 Delineation of the proposed watershed boundaries on the property inclusive of all off-site areas contributing runoff to the property.
- 3.2.2.3. Boundaries of proposed surficial ground cover conditions within the watershed study area including roadway areas, building footprints, driveways, lawn / landscaped areas and areas to remain in their natural condition in order to verify the runoff curve number (Cn).
- 3.2.2.4. Prevailing soil types on the site and the hydrological soil groups based on the most current Natural Resource Conservation Service soils map. The provisional soil mapping at the NRCS office in Wareham shall be used in place of the published 1967 Plymouth County mapping
- 3.2.2.5 Flow paths and design points for each watershed with each segment of the flow path defined.
- 3.2.2.6. Areas subject to flooding including but not limited to isolated topographic depressions, culvert inlets, and ponding areas with the calculated 100-year flood elevation associated with each area as a result of development in the watershed.
- 3.2.2.7 Location of soil test pits, permeability tests, and groundwater elevations for each component of the proposed stormwater management system.
- 3.2.2.8 The proposed development layout including the locations of roadways, parking areas, limits of land alteration, undisturbed areas, State / Federal jurisdictional wetlands, floodplains, drainage collection systems and stormwater management facilities.

**4.0 DESIGN CRITERIA**

**4.1 General**

- 4.1.1 The criteria presented herein are provided to assist the designer by identifying minimum requirements, general procedures to be followed as well as specifying any limitations regarding the types of systems to be allowed. The designer is responsible for ensuring that the design complies with the Performance Standards enumerated in Section 2.0 above as well as conformance with state and federal requirements and with accepted engineering practice.
- 4.1.2 All runoff from storms up to the 100-year storm event must flow through the stormwater management / treatment systems. Systems for the proper conveyance of the predicted 100-year storm to the stormwater management / treatment systems shall be provided.

**4.2 Location**

- 4.2.1 Storm-water management systems (exclusive of the conveyance system) shall be located on a separate and segregated parcel specifically designated for such use, to be conveyed to the Town should Town acceptance of the subdivision roadway and infrastructure be contemplated. Provisions for vehicular access shall be provided at the circumference of each system. Components of the collection system such as drainage piping, ditches, swales, and certain LID components etc. may be located within Access / Utility Easements.

Provisions for vehicular access shall be provided along the entire length of storm drain lines and swales within all designated Access / Utility Easements.

- 4.2.2 The following minimum setback requirements shall apply to all stormwater management systems. Any of these setback distances may be waived by the Board upon a clear finding that the proposed stormwater management system will utilize the preferred LID structural stormwater best management practices on a LID scale through decentralization and dispersion.

Property Line .....	25-foot
Street Line .....	50-foot
Underground Utilities .....	20-foot
Private Well .....	100-foot
Subsurface Sewage Disposal System .....	100-foot
Dwelling ... ..	100-foot
Surface Water Body .....	50-foot
Bordering Vegetated Wetland .....	25-foot

**4.3 Soil Testing**

- 4.3.1 Soil testing to determine the maximum groundwater elevation and soil profiles shall be performed by a Massachusetts approved Soil Evaluator or Certified Soil Scientist and verified by the Board of Health and/or a representative of the Planning Board. At the discretion of the Board, soil permeability testing may be required if the initial soil logs exhibit variable soil conditions and inconsistent groundwater profiles.

- 4.3.2 Subsurface investigations for infiltration practices are required to define the suitability of soils for subsurface disposal of stormwater runoff. These explorations are necessary to determine the textural characteristics of the various soil strata, restricting layers, location of the seasonal high water table elevation and depth to bedrock in the location of the proposed system.

The soil investigation must include an identification of the soil through examination of the soil profile in the location of the proposed system. In addition, the following determinations must be included in the investigation:

- a. Soil textures, measurement of soil permeability rates, soil hydrologic group, estimation of seasonal high water table elevation by identifying soil gleying and mottling, and identification of any restricting layer(s).
- b. Acceptable testing methods to determine the soil suitability for infiltration practices are the Falling Head Permeameter Test (ASTM D5126-90) or the Double Ring Infiltrometer (ASTM D3385-03 / D5093-02). Soil test pits shall be excavated to a depth no less than 5 feet below the design bottom of the system or to the static water level, to inspect and describe the soil profile. A minimum of one inspection pit must be dug per 5,000 square feet of system bottom area and must be located within the perimeter of the system.

- 4.3.3 The infiltration values utilized in the TR-20 calculations to determine the size of the infiltration structure shall be based on the DEP Stormwater Management Policy Volume 3 Chapter 1 Recharge Requirements Table 2.3.3.

**4.4 Calculations**

- 4.4.1 Rainfall data shall be as determined from the Atlas of Precipitation Extremes for the Northeastern United States and Southeastern Canada published in 1993 by Cornell University.

- 4.4.2 The use of the Rational Method for volume related calculations is not permitted

- 4.4.3 In areas where the actual on-the-ground soil evaluations exhibit subsurface conditions inconsistent with the NRCS mapping, or in cases where the site has been extensively reworked, the hydrologic soil group (HSG) curve number (CN) values utilized in the TR-20 calculations should be adjusted to reflect the actual on-the-ground cover conditions based on the determination by the Massachusetts approved Soil Evaluator or Certified Soil Scientist.

- 4.4.4 The analysis points for the hydrologic study shall be at the edge of the wetland resource area boundary, adjacent property line, existing storm drain system, or other sensitive receptors such as adjacent agricultural uses. For each pre-development analysis point there shall be a corresponding post-development point.
- 4.4.5 For all infiltration facilities, a groundwater mounding analysis based on the Hantush method for the required design storms shall be prepared by a Professional Engineer or Hydrologist. The applicant shall assess the potential effects from the subsurface disposal of stormwater on adjacent road surfaces, private wells, building foundations, embankments and any other site features that may be sensitive to groundwater flow.
- 4.4.6 The sediment forebay volume below the elevation of the spillway to the detention / retention stage cannot be utilized as available flood storage volume or recharge volume for purposes of sizing the detention / retention basin.

#### 4.5 Treatment Required

- 4.5.1 The discharge of untreated stormwater runoff from the developed areas of the property is prohibited.
- 4.5.2 Stormwater management systems shall be designed to treat the first flush volume of the entire project site at full build out and shall achieve an 80% TSS removal rate of the total suspended solids at the point of discharge. The first flush volume is a function of the initial 1.25 inches of stormwater runoff from impervious surfaces. The first flush treatment volume in cubic feet ( $V_1$ ) is determined by the following formula:

$$V_1 = (1.25/12 \text{ inches})(R_v)(\text{Site Area in square feet})$$

where  $R_v = 0.05 + 0.009(I)$  and  $I =$  the % impervious area. Impervious area is defined as any manmade cover that is not vegetated.

- 4.5.3 Any development in the Sippican Harbor and Wings Cove watershed areas shall incorporate a physical treatment processes to remove nitrogen at a minimum efficiency rate of 40%. Development in the Mary's Pond watershed shall incorporate phosphorus removal at a minimum design rate of 50%.

#### 4.6 Above Ground Basins

- 4.6.1 All water quality basins/ponds shall have a sediment forebay consisting of a separate cell separated from the detention / retention stage by a rock fill filter berm to allow lateral flow into the lower stage. The top elevation of the filter berm shall be at or below the elevation of the inlet piping.
- 4.6.2 A gravel access drive not less than 12-feet wide shall be provided around the outer perimeter of all basins to allow for vehicular access.
- 4.6.3 The maximum depth of the sediment forebay shall be no greater than 2-feet.
- 4.6.4 Where appropriate, the interior side slopes of all basins shall be no greater than 4:1 but in no case less than 3:1. Exterior side slopes of the embankment shall be no greater than 3:1.
- 4.6.5 The bottom elevation of the basin shall be no less than 2-feet above the maximum groundwater table elevation or bedrock and shall be at least 1-foot above the elevation of the receiving wetland.
- 4.6.6 The calculated peak water levels within the basin for all design storms shall be no greater than 3-feet and shall be no less than 12-inches below the elevation of the containment berm.
- 4.6.7 The entire detention basin area shall be treated with a 4-inch layer of screened organic soil borrow conforming to Massachusetts Highway Department (MHD) Specifications M1.07.0. The side slopes shall be seeded with an erosion seed mix conforming to MHD Specifications M6.03.1. The basin bottom shall be seeded with a New England Erosion Control / Restoration Mix as manufactured by New England Wetland Plants, Inc. or approved equal, applied at a rate of 35 lbs/acre and supplemented by landscape plantings. Infiltration basins shall be treated with 4-inch layer of screened organic soil borrow conforming to Massachusetts Highway Department (MHD) Specifications M1.07.0 and planted with a water tolerant grass seed mix.

- 4.6.8 The maximum allowable ponding or storage time for infiltration basins for design storms up to the 25-year storm event is 48-hours. For the 100-year storm event, the maximum drain time shall be 72-hours.
- 4.6.9 The bottom elevation of the infiltration basin shall be no less than 2-feet above the maximum groundwater table elevation or bedrock and shall be at least 1-foot above the elevation of the receiving wetland.
- 4.6.10 Infiltration basins may be constructed in fill providing that a minimum 4-foot layer of naturally occurring soil meeting the infiltration requirements of this section is available below the bottom of the basin and that the fill material is a clean granular fill conforming to 310 CMR 15.255(3.). Construction in fill shall mean any system where fill is required to replace topsoil, subsoil, peat, or unsuitable soil layers above the requisite 4-feet of naturally occurring soil.
- 4.6.11 Recharge structures shall be provided at the bottom of the infiltration basin to ensure adequate recharge is provided under frozen ground cover conditions.
- 4.6.12 All infiltration basins must be provided with an overflow mechanism to a receiving wetland or waterbody. Access / Utility Easements must be provided along the designated overflow path to the receiving wetland or waterbody. All infiltration basins must have an outlet structure with an accessible flap valve to allow manual drainage of the basin in an emergency condition, non-erosive flows at the outlets, inlet splash pads and emergency spillway weirs. Outlet structures and all inlet and outlet piping 18-inches or greater in diameter shall be fitted with trash racks.
- 4.6.13 Infiltration practices are limited to soils in Hydrologic Soil Group A, B and C only, as identified by the most recent NRCS Soil Survey Mapping. The provisional soil mapping at the NRCS office in Wareham shall be used in place of the published 1967 Plymouth County mapping. Drywells for individual residential dwellings and small LID technologies such as rain gardens, bio retention cells and infiltration strips may be permitted in Hydrologic Soil Group C soils providing the minimum infiltration rate of 0.50 inches per hour can be achieved.
- 4.6.14 Detention and infiltration basins may not be located within the VE Zone as depicted on the map entitled, "Flood Insurance Rate Map, Town of Marion", which is in effect at the time of application.

#### **4.7 Subsurface Recharge Systems**

- 4.7.1 Subsurface recharge systems may be used on subdivisions consisting of five (5) lots or less, commercial and industrial site developments. All infiltration systems including above ground basins and subsurface recharge must be provided with a pretreatment system capable of removing 80% of the Total Suspended Solids (TSS) loading from the contributing watershed area. Subsurface recharge systems are not allowed on residential subdivisions in excess of five (5) lots or land uses with a high potential pollutant load as defined in the DEP Stormwater Management Policy.
- 4.7.2 Infiltration practices are limited to soils in Hydrologic Soil Group A, B and C only, as identified by the most recent NRCS Soil Survey Mapping. The provisional soil mapping at the NRCS office in Wareham shall be used in place of the published 1967 Plymouth County mapping. Drywells for individual residential dwellings and small LID technologies such as rain gardens, bio retention cells and infiltration strips may be permitted in Hydrologic Soil Group C soils providing the minimum infiltration rate of 0.50 inches per hour can be achieved.
- 4.7.3 The bottom elevation of the subsurface recharge system shall be no less than 2-feet above the maximum groundwater table elevation or bedrock.
- 4.7.4 The maximum allowable ponding or storage time for recharge systems for design storms up to the 25-year storm event is 48-hours. For the 100-year storm event, the maximum drain time shall be 72-hours.
- 4.7.5 Subsurface recharge systems may be constructed in fill providing that a minimum 4-foot layer of naturally occurring soil meeting the infiltration requirements of this section is available below the bottom of the basin and that the fill material is a clean granular fill conforming to 310 CMR 15.255(3.). Construction in fill shall mean any system where fill is required to replace topsoil, subsoil, peat, or unsuitable soil layers above the requisite 4-feet of naturally occurring soil.
- 4.7.6 Subsurface recharge systems located under paved parking areas shall be designed to an H-20 vehicle loading.

- 4.7.7 The entire area of the proposed subsurface recharge system shall be roped off during construction to prevent compaction of the underlying soils by heavy equipment. The basin shall be excavated with light earth-moving equipment to prevent compaction of soils beneath the basin floor or side slopes. Light earth-moving equipment does not include bulldozers or standard size pay loaders.
- 4.7.8 Proper soil erosion and sediment control methods must be used during and after development of the site. Stormwater runoff shall not be allowed into any infiltration basin or recharge structure until the entire contributing watershed area has been stabilized with vegetation and other soil erosion and sediment control techniques.
- 4.7.9 Under no circumstances shall any infiltration basin or subsurface recharge system be utilized as temporary sediment traps or stormwater management during construction.
- 4.7.10 Subsurface recharge systems shall consist of precast concrete or HDPE galleys, or large diameter perforated HDPE pipe. The systems shall be encompassed with a 0.75-inch to 1.5-inch double washed stone conforming to 310 CMR 15.247(1) and wrapped in filter fabric. An individual recharge system for each catch basin inlet or pair of inlets is preferred over a single recharge facility serving multiple inlets. Direct connections from the catch basin inlets to the recharge systems are not permitted. Proprietary treatment systems may be considered in order to satisfy the TSS removal target prior to discharge into the subsurface recharge system.
- 4.7.11 For each line of subsurface galleys or trenches, a minimum of two inspection manholes for access and maintenance shall be provided at opposite ends of each line. The maximum length of each trench / galley line shall not exceed 50-feet. Multiple trench / galley lines shall be separated by a distance not less than 3 times the effective width or depth, whichever is greater.
- 4.7.12 Individual recharge systems shall be interconnected with an overflow pipe to a down gradient outfall device to prevent flooding of the roadway and adjacent properties in the event the design storm is exceeded or hydraulic failure of the infiltration structure.

## **4.8 Low Impact Development Techniques**

4.8.1 Low Impact Development (LID) Techniques to manage stormwater shall be considered for new construction / redevelopment of all commercial and industrial site development projects and residential projects. Designs that reduce impervious surfaces and employ decentralized stormwater management systems that involve the use of small treatment and infiltration devices throughout the site in place of a centralized system of closed pipes and a single large facility are preferred.

4.8.2 Effective low impact development includes the use of both non-structural and structural stormwater best management practices (LID-BMPs). The use of these BMPs is governed by certain principals, objectives and requirements. The maximum practical use of the following seven non structural strategies shall be considered:

- a. Protect areas that provide water quality benefits or areas particularly susceptible to erosion and sediment loss.
- b. Minimize impervious surfaces and break up or disconnect the flow of runoff over impervious surfaces through the use of vegetative filter strips and buffers.
- c. Minimize the decrease in the pre-construction time of concentration.
- d. Minimize land disturbance activities including clearing and grading and preserve naturally vegetated areas.
- e. Provide low maintenance landscaping that promotes retention and planting of native vegetation and minimizes the use of lawns, fertilizers, and pesticides.
- f. Provide vegetated open channel conveyance systems which discharge into and through stable vegetated filter strip areas.
- g. Provide preventative source controls.

4.8.3 The applicant shall prepare a Low Impact Development (LID) Consistency Statement in how the above strategies have been incorporated into the developments design in the Stormwater Management Report. For each of the above strategies that were not able to be incorporated into the design due to physical site constraints, engineering, environmental, or safety reasons, the applicant must provide a basis for this contention.

4.8.4 Preferred structural stormwater best management practices such as rain gardens, bioretention areas, sand filters, and infiltration strips provide storage, infiltration, and treat runoff close to its source. Other standard best management practices such as drywells, infiltration systems, surface and subsurface detention basins can all be done at an LID scale by downsizing and addressing stormwater runoff close to its source and dispersing these systems throughout the development site.

4.8.5 Commercial and industrial site development projects shall provide preventative source controls to prevent pollutants from being part of the stormwater runoff. Source controls such as the prevention and containment of spills and other harmful accumulations of pollutants as well the management of trash and debris shall be incorporated into all commercial and industrial site development plans.

## **4.9 Proprietary Treatment Devices**

4.9.1 A proprietary treatment device is a prefabricated stormwater treatment structure utilizing settling, filtration, absorptive/adsorptive materials, vortex separation, and/or other appropriate technology to remove pollutants from stormwater runoff.

4.9.2 These devices are allowed for new construction and redevelopment projects on privately owned commercial /industrial land development sites. The operation and maintenance of these proprietary treatment devices will be the obligation of the owner of the facility being served. These devices may also be considered on real estate subdivisions upon a clear finding by the Board that no other practical alternative is available to achieve the water quality treatment goals of these Rules and Regulations.

- 4.9.3 On-line devices must be fitted with an overflow bypass for storm events exceeding the stormwater quality design storm.
- 4.9.4 The specified devices shall be furnished by a manufacturer regularly engaged in such work and who has furnished similar installations in the Commonwealth of Massachusetts and had them successful and continuous operation for a minimum period of five (5) years. Devices which have been evaluated and assigned a TSS removal efficiency by the DEP through the Massachusetts Strategic Envirotechnology Partnership (STEP) program are approved for use in the Town of Marion. Other proprietary technologies will be evaluated by the Board on a case by case basis in accordance with the DEP Technical Guide for Compliance with the Massachusetts Stormwater Management Standards Volume 2 – Chapter 4.
- 4.9.5 Manufacturers' documentation on similar systems including but not limited to data on performance testing, service history, TSS removal efficiency, sizing criteria, and operation / maintenance requirements of the specified devices shall be submitted to the Planning Board.
- 4.9.6 Approval of proprietary devices will be based on the following:
- a. Optimal TSS removal efficiency.
  - b. Minimal operation and maintenance costs
  - c. Compatibility with existing infrastructure, other BMP devices and physical site constraints.
  - d. Frequency of maintenance and special handling or installation techniques.
  - e. Special equipment required for maintenance and the capability of the Department of Public Works to provide maintenance service.
  - f. Reliability of performance data and potential failure rates.

## **5.0 GENERAL LANDSCAPING GUIDANCE**

- 5.1 All submittals shall be accompanied by a Stormwater Management System Landscaping Plan prepared by a Landscape Architect Registered in the State of Massachusetts. At a minimum the Landscaping Plan shall consist of the following:
- 5.1.1 Plan views of each stormwater management system with detailed planting locations identified by specie and count. The wetted hydrologic zones within and around the basins should be identified and noted on the plan views. The planting species should be selected based on the frequency and depth of inundation within the hydrologic zones.
  - 5.1.2 A detailed planting schedule table identifying the size and type of species planted and individual plant counts.
  - 5.1.3 Notation specifications describing the site preparation activities, soil amendments, and procedures for plant installation. Specifications should also address the type of materials (e.g. balled and burlap, bare root, containerized); time of year installations, sequence of installation of type of plants; fertilization, stabilization seeding, watering and general care.
  - 5.1.4 Maintenance program consisting of inspection intervals, mulching frequency; removal and replacement of dead and diseased vegetation, watering schedule, repair and replacement of staking and wires; removal and eradication of invasive species.
- 5.2 Planting Plan Design Considerations**
- 5.2.1 Native plant species are preferred over exotic or foreign species because they are well adapted to local on-site conditions and require little or no soil amendments. Existing natural vegetation is to be

preserved where possible and enhanced with native plant species. Plantings requiring routine or intensive chemical applications are not permitted.

- 5.2.2 Appropriate plantings should be selected based on the zones hydric tolerance. Planting locations should be random and consistent with the surrounding native vegetation.
- 5.2.3 Trees, shrubs and/or any type of woody vegetation are not allowed on basin embankments. Herbaceous embankment plantings should be limited to 10-inches in height. Trees and shrubs should be planted at least 25 feet away from any perforated pipes and principal spillway structures. Trees and shrubs known to have long taproots should not be planted within the vicinity of any earth embankments or subsurface drainage facilities.
- 5.2.4 Inflow and outflow channels and southern exposure areas of any permanent pool areas should be shaded to reduce thermal warming.
- 5.2.5 Aesthetics and visual characteristics should be a prime consideration in the landscaping plan. Desirable views should be framed and maintained while unattractive views should be effectively screened from any adjacent residences and roadways.

## **6.0 STORMWATER COLLECTION SYSTEMS**

### **6.1 Design Criteria**

- 6.1.1 The quantity of storm-water carried by storm drains shall be determined by the Rational Method on the basis of a twenty five (25) frequency design storm. The inlet capacity and spacing for catch basins shall be designed to limit the flow in the gutter during a twenty-five (25) year design storm to a maximum of four (4) feet in width as calculated utilizing methodologies described in "Drainage of Highway Pavements, Hydraulic Engineering Circular No. 12, as published by the U.S. Department of Transportation, Federal Highway Administration. In any event, water shall not be allowed to run for more than three hundred (300) feet on paved surfaces. Computations for drainage requirements shall be prepared by a Registered Professional Civil Engineer and submitted with the Definitive Plan.
- 6.1.2 Supporting data for the sizing of the storm drain collection system shall include the following:
  - a. Subcatchment area plan at a clear legible scale showing the following information:
  - b. Existing and proposed contour grading at the predicted full build out of the subdivision.
  - c. Existing and proposed ground cover conditions.
  - d. Predicted flow paths and delineation of subcatchment areas to each inlet.
  - e. Rational Method calculations based on the 25-year storm event and the 100-year storm event where the collection system is expected to convey the 100-year storm flows to the receiving stormwater management facility.
  - f. Time of concentration (Tc) worksheets based on TR-55 methodology.
  - g. Weighted average ground cover coefficient (C) calculations.
  - h. Inlet grate capacity calculations based on Hydraulic Engineering Circular #12.
- 6.1.3 The system may make use of gutters, inlets, culverts, catch basins, manholes, subsurface piping, surface channels, and open detention basins. Leaching catch basins will not be permitted. The Board will not approve any design or component, which in its opinion, does not meet the standards

of good engineering practice, will not function without frequent maintenance, or is unsuited to the character of the subdivision.

- 6.1.4. Where feasible, storm-water should be directed to enter the nearest open stream channel. At all outfalls of drainage systems, a reinforced concrete headwall or reinforced concrete flared end shall be provided. Storm-water shall not be permitted to cross any roadway upon the surface but must be piped underground.
- 6.1.5. In general, the design of pipes shall be such as to provide for a flow of water at speeds between two (2) and ten (10) feet per second under full flow conditions. The minimum grade shall be not less than 0.5 percent and the minimum pipe diameter shall be twelve inches (12"), designed to flow full with the hydraulic gradient at the crown.
- 6.1.6. Storm drains with Class III RCP pipe shall have a minimum of 3 feet of cover. Drains with less than 3 feet of cover shall use Class V RCP pipe. In no event shall drains have less than 2.0 feet of cover. All changes in pipe class shall be noted on the plan. In determining the capacity of the pipe drains, the Manning formula shall be used with coefficient of friction "n" equal to 0.013 for RCP.
- 6.1.7. Catch basins shall have a minimum four foot (4') sump below the invert and coated with bituminous waterproofing. Catch basins or inlets shall be spaced along both sides of a street at no greater than three hundred foot (300') intervals, and located at all low points and corner rounding at street junctions. Drain manholes shall be located at every change of direction and/or grade but in no cases greater than three hundred feet (300') apart. Catch basins shall not serve as manholes. All pipes from catch basins must flow to manholes.
- 6.1.8. Roof drains, cellar drains or any other "private" non-pre-existing drainage systems will not be allowed to connect to the drainage system, unless specifically waived by the Board.
- 6.1.9. Cross culverts and drainage control facilities shall be based on all storms up to a one-hundred (100) year frequency storm. At cross culverts, drainage easements shall be established up gradient of the culvert and delineated on the Definitive Plan based on the projected one hundred (100) year headwater elevation. The determination of the headwater elevation shall be based on TR-20 model calculations and the Federal Highway Administration Hydraulic Engineering Circular No. 5 (HEC 5).
- 6.1.10. In some cases earth and stone-paved open channels should be used. The typical section of the earth channel should have a flat bottom and side slopes of one (1) vertical on three (3) horizontal with the top of the slope at least one foot (1') higher than the design water surface. The maximum velocity allowed in an open earth channel at design flow should be six (6) fps. A coefficient of friction "n" equals to 0.025 maximum should be used for both the earth and stone-paved channels. Detailed calculations, plans and profiles showing proposed channels and treatment of channel base and side slopes shall be submitted for Planning Board approval.
- 6.1.11. Wherever drainage systems within the subdivision are located in or terminate in lands owned by others, proper easements in a form and content acceptable to Town Counsel shall be taken for their access and maintenance by Town Personnel.
- 6.1.12. Granite curb inlets per Section M9.04 shall be installed adjacent to all catch-basins at low points and any other location granite curbing is required. If located within an area of Cape Cod berms, a minimum six feet (6') transition curbing (granite, Type VA4) shall be installed along the curb line on both sides of the curb inlet. The Cape Cod berms shall be constructed to blend with the transition curb.
- 6.1.13. Components of the collection system such as drainage piping, ditches, swales, etc. may be located within Access / Utility Easements. Provisions for vehicular access shall be provided along the entire length of storm drain lines and swales within all designated Utility Easements.
- 6.1.14. Rip-rap spillways shall be provided at all pipe outfalls and critical areas within drainage swales or ditches subject to erosive conditions.
- 6.1.15. The drainage design in its entirety shall minimize long term safety issues, maintenance, and/or reconstruction requirements to the satisfaction of the Planning Board.

- 6.1.16. All pipe crowns in manholes must match or the crown of the inlet pipe must be higher than the crown of the outlet pipe.
- 6.1.17. No catch basins shall be installed in front of driveway or handicap ramp openings.
- 6.1.18. All runoff from storms up to the one hundred (100) year storm must flow through the drainage control facilities (detention ponds, etc.) and be mitigated prior to flowing beyond the site. Although the pipes are designed for the twenty-five (25) year storm, the runoff for storms up to the one hundred (100) year storm must reach the drainage control facility either through the pipe systems, swales or overland with easements.
- 6.1.19. Stormwater drainage pumping stations are not allowed.
- 6.1.20. When in the opinion of the Planning Board and confirmed by the reviewing independent Registered Professional Engineer that the existing street drainage and/or downstream drainage systems are inadequate, the stormwater management system design shall maintain both rate and volume controls at pre-development levels.

## **6.2. Storm Drainage Construction Requirements**

- 6.2.1. Drainage facilities shall be provided as indicated on the plan and in conformity with these regulations and the requirements of Sections 200, 220, 230 and 258 of the Commonwealth of Massachusetts Department of Public Works Standard Specifications for Highways and Bridges 1995, herein referred to as the Standard Specifications.
- 6.2.2. The drainage system shall be in place and functional and approved by the Highway Surveyor and the Planning Board at the time of the installation of the binder course pavement. Utility As-Built Plans of the installed drainage system must be submitted and approved by the Planning Board and the Department of Public Works prior to the installation of the binder course pavement.
- 6.2.3. Unsuitable material below normal pipe invert shall be removed and replaced with suitable material. Unsuitable material shall not be used for trench backfill. Pipe and conduits shall be surrounded by 6 inches of compacted screened gravel if set in earth, and 12 inches if set in rock.
- 6.2.4. The standard depth of catch-basins shall be four feet (4') below the invert of the outlet. Manholes shall be constructed to the required depth at each junction point and as shown on the plan. Pipe culvert and pipe drains shall be in conformity with the requirements of Section 230 for installation of pipes.
- 6.2.5. All drain pipes except sub-drains shall be reinforced concrete pipe (RCP) with bell and spigot gasketed joints and shall be installed according to the size as shown on the plans. No backfilling of pipes shall be done until approval of the Department of Public Works. All drainage trenches shall be backfilled per Section 201.
- 6.2.6. Where sub-drains are required they shall be constructed in conformance with Section 260 of the Standard Specifications. Such sub-drains may be required by the Board following clearing and grubbing operations. No drainage pipes from roof drains, driveway drains, or other on-lot sources shall be connected to the street drainage system. Cast iron manhole covers and catch-basin grates shall be as manufactured by or equivalent to E.L. LeBaron Foundry Model No.'s LB 268-3 for manholes, L.F. 248-2 or LK-120A (Cascade Grate) for catch-basins. The word "DRAIN" shall be cast into the drain manhole covers.
- 6.2.7. No more than four (4) pipe openings shall be allowed in any one manhole. Four (4) foot diameter manholes will be used for drains up to thirty (30) inches in diameter. Five (5) foot diameter manholes shall be used for pipe diameters between thirty-six (36) and forty eight (48) inches. Pipes shall not enter a manhole less than 90 degrees of the direction of flow. All connecting lines shall have bricked inverts rounded into the direction of flow.

