SECTION 9: Design Standards

9.01 Sewage Disposal: All proposed subdivisions must comply with the NH DES Subsurface disposal standards for subdivision approval and the Town of Durham's standards for septic systems as set forth in the Zoning Ordinance. Evidence shall be provided to the Planning Board that the applicant has secured, or has begun the process of securing, the sewer permits necessary for the application.

9.02 Water Supply Systems: Any proposed community water system shall comply with the Durham Municipal Water Supply System Standards and be sanctioned as an approved expansion of the Municipal Water System, whether or not it is tied into the existing municipal water supply. Evidence shall be provided to the Planning Board that the applicant has secured, or has begun the process of securing, the water permits necessary for the application.

9.03 Road Access and Construction Regulations

A. Driveways shall not serve more than two lots, except on porkchop lot subdivisions. Each driveway shall have a minimum right-of-way of 30 feet if the driveway crosses one lot to reach another. In this case, the driveway may not extend beyond the boundaries of the two lots. Any special agreements of ownership, construction, or maintenance shall be shown on the plat as well as in the deed(s).

B. New roads and/or driveways serving a proposed subdivision that intersect with the following main roads shall be spaced not less than 1,200 feet from each other and from any existing road or driveway on either side of the road: Routes 4, 108, 155-A, Durham Point Road, Mill Road, Bennett Road, and Packers Falls Road. Where such spacing would cause undue hardship, the Board may modify this requirement. (For the purposes of these regulations Durham Point Road is considered to extend to the Newmarket Town line.)

C. All other roadway related regulations are contained in: Road Construction Regulations, Town of Durham, New Hampshire, adopted by the Durham Planning Board on April 17, 1996, as amended.

9.04 Utilities: The boundaries of proposed permanent utility or other facility easements over or under private property shall not be less than 15 feet in width and shall have satisfactory access to existing or proposed public ways. Water courses, including perennial stream crossings and drainage ways, proposed for public control shall have a permanent easement of not less than 20 feet from the edge of normal flow.

9.05 Non-Municipal Utilities

A. General Requirements - The applicant is responsible for all coordination with utility companies to assure that non-municipal utilities are installed in accordance with plans approved by the Board pursuant to these regulations.

B. Design Standards - All utility facilities, including, but not limited to, electric power and telephone, shall be located underground throughout the development. Whenever existing utility facilities are located above ground, they shall be removed and placed underground. Existing utilities which are located within public rights-of-way are exempted from this provision. The Board shall review and approve the location of all non-municipal utility lines.

9.06 Stormwater Drainage

A. General Requirements - All developments shall provide adequate management of stormwater runoff and prevent the discharge of stormwater runoff from creating or contributing to a water quality impairment. All applications shall be accompanied by a completed Site Plan Review Checklist (provided in Attachment 6 of these regulations) to the Planning Board prior to consideration for review. Developments that disturb 10,000 or more square feet must submit to the Planning Board for review and approval, a Stormwater Management Plan (Plan) describing all proposed stormwater management system elements, practices, and associated designs, including all calculations and analyses of said designs. However, if the applicant submits an approved Alteration of Terrain (AOT) permit, there would be no need for the town requiring a Stormwater Management Plan. The applicant must still provide an operation and maintenance plan as provided for in (C) (5) below. The Planning Board reserves the right to require any development that disturbs less than 10,000 square feet to submit and then implement an approved Stormwater Management Plan (complete as described below or abbreviated) to prevent degradation of local water resources. All elements of the Plan must be designed/prepared by a New Hampshire Registered Professional Engineer in accordance with the Design Standards below. The Plan must contain the following parts and presented in the order listed below:

B. Stormwater Management Plan - Part I

1) An Existing Conditions Site Plan showing all pre-development surface water bodies and wetlands, drainage patterns, and watershed boundaries, buffer zones, topographic contours with minimum 2-foot intervals, scale bar, north arrow, title block with project name, applicant's name, and map and parcel number, designer's stamp and wetland scientist's stamp (if applicable), legend, locus plan, benchmarks, and appropriate notes with datum and other plan references, instructions, and detail descriptions. The Existing Conditions Site Plan shall be provided in hard copy (minimum 22-inch by 34-inch) at an appropriate scale in tens of feet per inch (maximum of 100 feet per inch) such that all important site and hydrologic features are easily recognized. Existing buildings, structures, pavement, utilities, and soils information with coding as HSG-A, B, C, or D shall be included on the Existing Conditions Site Plan. High Intensity Soil Survey (HISS) mapping may be required per request by the Planning Board.

2) A Proposed Conditions Site Plan showing all proposed post-development temporary and permanent stormwater management system elements and erosion and sediment control BMPs and all important hydrologic features. The Proposed Conditions Site Plan must be at the same scale as the Existing Conditions Site Plan with consistent title block, plan features, and descriptors including but not limited to the following:
    a. Existing and proposed topographic contours (2-foot minimum contour interval; 1-foot contour intervals may be required for sites with limited

relief and/or where proposed stormwater outfalls are located adjacent to buffer zones)

b. Proposed areas of disturbance with total area of disturbance clearly labeled in square feet
c. Existing and proposed buildings and structures
d. Stormwater discharge locations keyed to drainage analyses
e. Wells and sanitary protective radii
f. Septic systems
g. Plan references and notes (including sequence of soil disturbance)
h. Proposed and existing public and private utilities
i. Proposed project components to become property of or the responsibility of the Town shall be labeled as such
j. Existing and proposed impervious surfaces and pavements with areas used to calculate EIA clearly identified and the square footage of each type identified and labeled.

3) Details of individual design elements shown on separate plan sheets following the Proposed Conditions Site Plan.

C. Stormwater Management Plan - Part II.

1) Drainage Analysis that includes calculations comparing Pre- and Post-Development stormwater runoff rates (cubic feet per minute) and volumes (cubic feet) based on a 1-inch rainstorm, and the 2-year, 10-year, and 25-year 24-hour frequency storms. Calculations shall include, but not be limited to, the sizing of all structures and BMPs including of sizing of emergency overflow structures based on assessment of the 100-year 24-hour frequency storm discharge rate. Phased applications for the original parcel apply as though the development of the entire parcel were proposed in one application at one time.

2) Drainage Analysis Results Summary tabulated for each proposed outfall or catchment outlet point including runoff rates and volumes for each storm event analyzed above.

3) An Erosion and Sediment Control Plan for all proposed construction activities in accordance with the most current New Hampshire Stormwater Manual.

4) Copies of any additional permits or plans required for compliance with Environmental Protection Agency (EPA) and/or New Hampshire Department of Environmental Services (NHDES).

5) A comprehensive Operation and Maintenance Plan for long-term maintenance of all proposed stormwater management elements and BMPs including the proposed schedule of inspections and anticipated maintenance.

9.06.1 Design Standards

A. The Stormwater Management Plans submitted to the Planning Board shall meet the following minimum requirements:

1) Where applicable, the Plan must comply with the EPA Phase II Stormwater Rules and the Town's MS4 Stormwater Discharge Permit, as amended.

2) All proposed measures shall be in accordance with the NH Stormwater Management Manual volume (December 2008 or current revision) a copy of which is available from NHDES: des.nh.gov/organization/divisions/water/stormwater/manual.htm

3) Water Quality Protection: All aspects of the application shall be designed to protect the water quality of the Town of Durham's water bodies as follows:

a. No person shall locate, store, discharge, or permit the discharge of any treated, untreated, or inadequately treated liquid, gaseous, or solid materials of such nature, quantity, noxiousness, toxicity, or temperature that may run off, seep, percolate, or wash into surface or groundwaters so as to contaminate, pollute, harm, impair or contribute to an impairment of such waters.

b. All storage facilities for fuel, chemicals, chemical or industrial wastes, and biodegradable raw materials shall meet the standards of the New Hampshire Department of Environmental Services (NHDES).

c. All projects under review by the Planning Board of such magnitude as to require a stormwater permit from EPA or NHDES shall comply with the standards of EPA and/or NHDES AOT program, with respect to the export of total suspended solids and other pollutants.

4) Stormwater Management For New Development: All proposed stormwater management and treatment systems shall meet the following performance standards:

a. Existing surface waters, including lakes, ponds, rivers, perennial and intermittent streams (natural or channelized), and wetlands (including vernal pools) shall be protected by the minimum buffer setback distances specified in the Zoning Ordinance. Stormwater and erosion and sediment control BMPs shall be located outside the specified buffer zone unless otherwise approved by the Planning Board. Alternatives to stream and wetland crossings that eliminate or minimize environmental impacts shall be considered whenever possible. When necessary, as determined by the Planning Board or their representative, stream and wetland crossings shall comply with state recommended design standards to minimize impacts to flow and enhance animal passage (see University of New Hampshire Stream Crossing Guidelines May 2009, as amended http://www.unh.edu/erg/stream_restoration/nh_stream_crossing_guidelines_unh_web_rev_2.pdf).

b. LID site planning and design strategies must be used to the MEP in order to reduce the generation of the stormwater runoff volume for both new and

redevelopment projects. An applicant must document why LID strategies are not appropriate if not used to manage stormwater.

c. All stormwater treatment areas shall be planted with native plantings appropriate for the site conditions: grasses, shrubs and/or other native plants in sufficient numbers and density to prevent soil erosion and to promote proper treatment of the proposed runoff.

d. All areas that receive rainfall runoff must be designed to drain within a maximum of 72 hours for vector control.

e. Salt storage areas shall be covered or located such that no direct untreated discharges to receiving waters are possible from the storage site. Snow storage areas shall be located such that no direct untreated discharges to receiving waters are possible from the storage site. Runoff from snow and salt storage areas shall enter treatment areas as specified above before being discharged to receiving waters or allowed to infiltrate into the groundwater.

f. Runoff shall be directed into recessed vegetated and landscape areas designed for treatment and/or filtration to the MEP to minimize Effective Impervious Cover (EIC) and reduce the need for irrigation systems.

g. The Plan shall make provisions to retain stormwater on the site by using the natural flow patterns of the site. Effort shall be made to utilize natural filtration and/or infiltration BMPs (i.e., bioretention areas, subsurface filtration/infiltration systems, ponds, swales, etc). Proof of such effort shall be provided to the Planning Board.

h. Measures shall be taken to control the post-development peak rate runoff so that it does not exceed pre-development runoff for the 2-year, 10-year and 25-year, 24-hour storm events. Similar measure shall be taken to control the post-development runoff volume to filtrate the WQv according to the following ratios of Hydrologic Soil Group (HSG) type versus infiltration rate multiplier: HSG-A: 1.0; HSG-B: 0.75; HSG-C: 0.4; HSG-D: 0.15. For sites where infiltration is limited or not practicable, the applicant must demonstrate that the project will not create or contribute to water quality impairment. Infiltration structures shall be in locations with the highest permeability on the site. Measures shall be taken to protect against on and off-site peak flow to prevent overloading of existing downstream facilities.

i. The biological and chemical properties of the receiving waters shall not be degraded by the stormwater runoff from the development site.

j. The design of the stormwater drainage system shall provide for the disposal of stormwater without flooding or functional impairment to streets, adjacent properties, downstream properties, soils, or vegetation.

k. The design of the stormwater management systems shall take into account upstream and upgradient runoff that flows onto, over, or through the site to be developed or re-developed and provide for this contribution of runoff.

l. Appropriate erosion and sediment control measures shall be installed prior to any soil disturbance such that the area of disturbance shall be kept to a minimum. Disturbed areas shall be stabilized within thirty (30) days.

m. Measures shall be taken to control erosion within the project area. Sediment in runoff water shall be trapped and retained within the project area using approved measures. Wetland areas and surface waters shall be protected from sediment.

n. All temporary control measures shall be removed after final site stabilization. Trapped sediment and other disturbed soil areas resulting from the removal of temporary measures shall be permanently stabilized prior to removal of temporary control measures.

o. Every effort shall be made to use pervious parking surfaces as an alternative to impervious asphalt or concrete for general and overflow parking areas. Pervious pavement shall be appropriately sited and designed for traffic and vehicle loading conditions.

p. Whenever practicable, native site vegetation shall be retained, protected, or supplemented. Any stripping of vegetation shall be done in a manner that minimizes soil erosion.

q. Whenever practicable, all subsurface filtration BMPs shall include perforated underdrains positioned a minimum of 8-inches above the bottom of the filter bed to prevent extended periods of saturated conditions.

5) Redevelopment Project Requirements: Because redevelopment may present a wide range of constraints and limitations, an evaluation of options may be proposed to work in conjunction with broader state watershed goals and local initiatives. Stormwater requirements for redevelopment vary based upon the surface area of the site that is covered by existing impervious surfaces. In order to determine the stormwater requirements for redevelopment projects, the percentage of the site covered by existing impervious areas must be calculated.

For sites meeting the definition of a redevelopment project and having less than 40% existing impervious surface coverage, the stormwater management requirements will be the same as other new development projects with the important distinction that the applicant can meet those requirements either on-site or at an approved off-site location, within the same watershed within the Town of Durham, provided the applicant satisfactorily demonstrates that impervious area reduction and LID strategies and BMPs have been implemented on-site to the MEP.

For redevelopment sites with more than 40% existing impervious surface coverage, stormwater shall be managed for water quality in accordance with one or more of the following techniques, listed in order of preference:

a. Implement measures onsite that result in an EIA of at least 30% of the existing impervious surfaces and pavement areas, and 50% of the additional proposed impervious surfaces and pavement areas through the application of porous media; or

b. Implement other LID techniques onsite to the MEP to provide treatment for at least 50% of the redevelopment area; or

c. Implement off-site BMPs to provide adequate water quality treatment for an area equal to or greater than 50% of redevelopment areas may be used to meet these requirements provided that the applicant satisfactorily demonstrates that impervious area reduction, LID strategies, and/or onsite BMPs have been implemented to the MEP. An approved off-site location must be identified, the specific management measures identified, and an implementation schedule developed in accordance with local review. The applicant must also demonstrate that there is no downstream drainage or flooding impacts as a result of not providing on-site management for large storm events. To comply with local watershed objectives the mitigation site should be situated in the same subwatershed as the development and impact the same receiving water.

6) Responsibility for Installation and Construction: The applicant shall bear final responsibility for the installation, construction, inspection, and disposition of all stormwater management and erosion control measures required by the provisions of these regulations. Site development shall not begin before the Stormwater Management Plan receives written approval by the Planning Board. Best Management Practices shall be installed as designed and scheduled as a condition of final approval of the plan.

7) Plan Approval and Review: The Planning Board shall approve the Stormwater Management Plan if it complies with the requirements of these regulations and other requirements as provided by law. At the discretion of the Planning Board, a technical review by a third party may be required of any stormwater management and erosion control plan prepared under these regulations. The technical review shall be performed by a qualified professional consultant, as determined by the Planning Board, and the expense of which shall be the full responsibility of the applicant.

8) Maintenance and Inspection:

a. After final Planning Board approval and as a condition precedent thereto, the owner of record of the property shall cause notice of the requirements for maintenance pursuant to the stormwater management and erosion and sediment control plans, as approved by the Planning Board, to be recorded at the Registry of Deeds sufficient to provide notice to all persons that may acquire any property

subject to the stormwater management and sediment control plans. See RSA 477:3-a. The notice shall comply with the applicable requirements for recording contained in RSA 477 and 478. The notice need not set forth the requirements at length, so long as it is sufficient to provide notice to prospective purchasers of the requirements for maintenance pursuant to the stormwater management and erosion and sediment control plans as approved by the Planning Board. The Planning Board may require routine inspections to insure compliance with the Stormwater Management, Groundwater Protection, Impervious Surfaces, and Erosion and Sedimentation Control sections of these regulations. Such inspections shall be performed by a designated agent with appropriate certifications at reasonable times to the landowner.

b. If permission to inspect is denied by the landowner, the designated agent shall secure an administrative inspection warrant from the district or superior court under RSA 595-B.

9.06.2 - Reimbursement

The applicant shall reimburse the Town for the Planning Board's administrative expenses and costs of special investigation and the review of documents and other matters that may be required by particular applications. This includes, but is not limited to, review by consulting engineers or other consultants to assess the environmental impact, hydrological impact, ground water quality impact, traffic impact, or any other study deemed necessary by the Planning Board in order to make an informed decision."

9.06.3 Waivers & Exceptions

For reasons heretofore well demonstrated, the Planning Board may waive one or more of these regulations. The following activities are considered exempt from preparing and submitting stormwater management plans:

1. Agricultural practices located outside the wetland and surface water buffers
2. Road and parking lot resurfacing.

9.07 Special Flood Hazard Areas:

All subdivision proposals governed by these regulations having lands identified as Special Flood Hazard Areas in the "Flood Insurance Study for the County of Strafford, N.H.", together with the associated Flood Insurance Rate Maps shall meet the following requirements:

A. Individual lots of a subdivision, including their utilities and drainage, shall be located and designed to be consistent with the need to minimize flood damage.

B. All public utilities and facilities, such as sewer, electrical and water systems shall be located and constructed to minimize or eliminate flood damage.

C. Adequate drainage shall be provided to reduce exposure to flood hazards.

D. All subdivision proposals shall include base flood elevation data.

E. All necessary permits have been received from those governmental agencies from which approval is required by Federal or State law, including Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. 1334..

9.08 Subdivision Layout and Design

Subdivisions shall be designed in accordance with the following four step process. The submission for the Phase 2 - Preliminary Design Review and/or Phase 3 - Formal Application shall include documentation of the four-step design process for determining the layout of the subdivision including proposed conservation lands, house sites, streets, and lot lines in accordance with the following process. Applicants shall submit four separate sketch maps indicating the findings of each step of the design process, if so requested by the Planning Board.

Step 1: Delineation of Common Open Space

If the subdivision is a Conservation Subdivision or will provide common open space, the area to be designated, as common open space shall be delineated based upon the Primary and Secondary Conservation Areas identified in accordance with the following:

1. The minimum percentage and acreage of required common open space shall be calculated by the applicant and submitted as part of Conceptual Subdivision Plan in accordance with the provisions of these regulations and the Zoning Ordinance.
2. The proposed common open space shall be designated using the Site Analysis Map.
3. The Primary Conservation Areas on the site shall be delineated and shall be incorporated into the common open space. Other areas with significant natural resource value or which are identified as potential open space in the Master Plan shall also be considered for inclusion as Primary Conservation Areas.
4. The Secondary Conservation Areas on the site shall then be delineated. In delineating Secondary Conservation Areas, the applicant shall *prioritize* natural and cultural resources on the tract in terms of their highest to lowest suitability for inclusion in the proposed common open space in consultation with the Planning Board and Conservation Commission.
5. On the basis of those priorities and practical considerations related to the tract's configuration, its context in relation to resource areas on adjoining and neighboring properties, and the applicant's subdivision objectives, sufficient Secondary Conservation Areas shall be identified to be included in the common open space to meet at least the minimum area percentage requirement for common open space. This delineation shall clearly indicate the boundaries as well as the types of resources included within them.
6. The proposed common open space shall include all Primary Conservation Areas and the Secondary Conservation Areas with the highest resource significance as

identified in 5.

Step 2: Location of Building Sites

Potential building sites shall be tentatively located taking into consideration the proposed common open space identified in Step 1 as well as other relevant data from the Site Inventory Plan and Site Analysis Map, such as topography and soils. Building sites should generally be located at least 100 feet from Primary Conservation Areas and at least 50 feet from Secondary Conservation Areas, taking into consideration the potential negative impacts of development on such areas as well as the potential positive benefits of such locations to provide attractive views and visual settings for residences and other uses.

Step 3: Alignment of Streets and Ways

Based upon the designated building sites, a street plan shall be designed to provide vehicular access to each site. The street layout shall bear a logical relationship to topographic conditions. Impacts of the street plan on proposed conservation lands shall be minimized, particularly with respect to crossing environmentally sensitive areas such as wetlands and minimizing cut and fill. Street connections shall generally be encouraged to minimize the number of new cul-de-sacs and to facilitate access to and from buildings in different parts of the subdivision.

Step 4: Drawing in the Lot Lines

Upon completion of the preceding three steps, lot lines shall be drawn as required to delineate the boundaries of individual lots.

9.09 Ownership and Stewardship of Common Open Space

When a subdivision will create common open space, the provisions for the ownership and stewardship of that land shall conform to the following requirements:

A. ***Ownership***. Common open space may be owned in fee or less than fee by any of the following, subject to the approval of the Board as part of the approval of the formal application:
   1) a homeowners or community association,
   2) the Town of Durham, subject to acceptance of the land by the Town Council,
   3) an established land trust or conservation organization that owns interests in conservation land, or
   4) a private landowner, subject to the approval of the Planning Board.

B. ***Executory Interest.*** If any common open space will be owned by a homeowners or community association or a private landowner, the owner(s) shall convey an executory interest with power of termination to the Town of Durham

C. ***Conservation Provisions.*** The common open space shall be protected from development or intensive use and shall be maintained as undeveloped open land and/or active or passive recreation land but may include other support uses as provided for in 175-107 of the Zoning Ordinance and approved by the Planning Board as part of the approval of the subdivision. Permanent conservation restrictions shall be established, subject to approval by the Planning Board, to assure that the future use and maintenance of the common open space is consistent with the subdivision approval. These provisions may include deed restrictions or covenants, conservation easements, the sale or transfer of development rights, or other legal mechanisms approved by the Planning Board.

D. ***Stewardship Provisions.*** Legally binding provisions shall be established in the conservation restriction tool (e.g., deed, easement) for the periodic monitoring of the use and maintenance of the common open space to ensure that the terms of the restrictions are being met. The monitoring shall occur at least once every two years on an ongoing basis. The party or organization designated to conduct the monitoring shall be qualified in land conservation and resource management, shall have an established record in land management or the oversight of conservation easements or restrictions, shall be willing to assume the review obligation, and shall be subject to approval by the Planning Board. The stewardship arrangements shall provide for the enforcement of the conservation provisions by the Town of Durham against the owner of the property if the reviewer finds that the conservation provisions are not being met and for the ability of the Town to charge the owners of the property with the costs of enforcement of the provisions.

E. ***Stewardship Account***. A Stewardship Account shall be established by the applicant for all land with conservation restrictions and shall be held and managed by the property owner or grantee. The purpose of this account shall be to pay the costs of the biennial monitoring. If the Town holds an executory interest in a property with conservation restrictions or is asked to take ownership of a property, the applicant shall place a sum of money in the Town's Stewardship Fund the amount of which shall be determined by the Planning Board based upon the fee schedule established by the Town Council. Prior to release of the approved plan, the applicant shall provide the Director of Planning and Community Development with evidence that the Stewardship Account has been established and funded, or that full payment has been made to the Town's Stewardship Fund.

9.10 Fire Protection

All subdivisions, except residential minor subdivisions, shall be provided with an adequate supply of water for fire protection purposes at the applicant's cost. This requirement can be met by any of the following subject to the approval of the Fire Chief:

A. Fire hydrants meeting the Durham Fire Department Hydrant Specifications connected to a public water main with adequate fire flows and pressures appropriate to the type and scale of the proposed use that meets the requirements of the Durham Fire Department.

B. Private fire protection water supply systems when the provision of hydrants connected to a public water main as set forth in A. is infeasible or economically unreasonable as determined by the Planning Board. Private fire protection water supply systems may include the following:

1) ***Non-residential, institutional, and multi-unit residential developments*** – storage and distribution systems appropriate to the type and scale of the proposed use that comply with the standards of the National Fire Protection Association (NFPA) and the Durham Fire Department.

2) ***Single-family residential subdivisions*** – individual residential sprinkler systems meeting the standards of NFPA in each dwelling unit or underground cisterns and associated dry hydrants providing at least fifteen thousand (15,000) gallons of useable fire protection water supply per cistern. The location, design, and provisions for ownership, maintenance, and all season access to the cistern and supporting facilities shall conform to the Durham Fire Department Hydrant specifications. A cistern shall be located within three thousand (3,000) feet of every building within the subdivision as measured along the lines of streets or other ways with year-round emergency vehicle access.

C. Any other public or private fire protection water supply system approved by the Fire Chief and determined by the Planning Board to provide a similar or greater level of fire protection than the options provided in A. and B.