5 - EROSION & SEDIMENTATION CONTROL DURING CONSTRUCTION

5.1 - General

A. Any activity subject to the Town of Concord Storm Water Regulations that will disturb one or more acres of land, or which is part of a common plan for development that will disturb one or more acres of land, shall be required by the Town to prepare and implement an *Erosion and Sedimentation Control Plan.*

B. The purpose of the *Erosion and Sedimentation Control Plan* is to minimize the introduction of sediments into the Town's drainage system, public right of ways, waterways, wetland areas and abutting properties resulting from the land disturbance activities.

C. The submission to the Town of the Stormwater Pollution Prevention Plan (SWPPP) required to be developed under the EPA Construction General Permit will meet the *Erosion and Sediment Control Plan* requirement.

D. The *Erosion and Sedimentation Control Plan* shall be developed to include Best Management Practices (BMPs) that are appropriate for the site, including efforts to minimize the area of the land disturbance. The plan shall contain sufficient information for the Town Engineer to evaluate the environmental impact, effectiveness and acceptability of the measures proposed by the applicant for reducing adverse impacts from stormwater runoff during the land-disturbing activities.

E. For phased construction, the *Erosion and Sedimentation Control Plan* shall identify the different construction phases and clearly delineate the BMPs to be utilized within each construction phase.

5.2 Design Criteria

5.2.1 General

A. Minimize total area of disturbance and minimize unnecessary clearing and grading from all construction sites. Clearing and grading shall only be performed within areas needed to build the project, including structures, utilities, roads, recreational amenities, post-construction stormwater management facilities, and related infrastructure.

B. Whenever practicable and feasible, construction shall be phased to limit disturbance to only one area of active construction at a time. Future phases shall not be disturbed until construction of prior phases is complete and the land area is stabilized. Mass clearings and grading of the entire site shall be avoided.

C. Interim and permanent stabilization measures shall be instituted on a disturbed area as soon as practicable but no more than 14 days after construction activity has temporarily or permanently ceased on that portion of the site.

D. Steep slopes shall be protected from erosion by limiting clearing of these areas in the first place or, where grading is unavoidable, by providing special techniques to prevent upland runoff from flowing down a steep slope and performing immediate stabilization to prevent gullying. Runoff from the site shall be diverted from highly erodible soils and steep slopes to stable areas.

E. Perimeter sediment controls shall be applied to retain or filter concentrated runoff from disturbed areas to trap or retain sediment before it leaves the activity site.

F. Uncontaminated stormwater shall be diverted around disturbed areas.

G. Sediment trapping and settling devices shall be employed to trap and/or retain suspended sediments and allow time for them to settle out in cases where perimeter sediment controls (e.g., silt fence and hay bales) are deemed to be ineffective in trapping suspended sediments on-site.

H. Off-site transport of sediment, including off-site vehicle tracking, shall be prevented.

I. Dust and debris shall be controlled at the site.

J. The following discharges are prohibited on the construction site:
    1. Wastewater from washout of concrete, unless managed by an appropriate control;
    2. Wastewater from washout and cleanout of stucco, paint, from release oils, curing compounds and other construction materials;
    3. Fuels, oils, or other pollutants used in vehicle and equipment operation and maintenance; and,
    4. Soaps or solvents used in vehicle and equipment washing.

K. On and off-site material storage areas, including construction and waste materials, shall be properly protected and managed.

L. No erosion control measures shall be designed to be installed within the footprint of BMPs designed to provide permanent infiltration within the Stormwater Management Plan and design. Infiltration technologies are not designed to handle the high concentrations of sediments typically found in construction runoff, and thus must be protected from construction related sediment loadings.

5.2.2 Erosion and Sedimentation Control Plan Contents:

A. A plan prepared by a Professional Engineer (PE) licensed in the Commonwealth of Massachusetts, stamped certifying that the *Erosion and Sedimentation Control Plan* is in accordance with the criteria established in the these Standards.

B. Description of the following in narrative and drawings, as appropriate:
    1. Estimates of the total area expected to be disturbed by excavation, grading, or other construction activities, including dedicated off-site borrow and fill areas
    2. All pollution control measures (structural and non-structural BMPs) that will be implemented as part of the construction activity to control pollutants in storm water discharges. Appropriate control measures must be identified for each major construction activity and the operator responsible for the implementation of each control measure must also be identified
    3. The intended sequence and timing of activities that disturb soils at the site and the general sequence during the construction process in which the erosion and sediment control measures will be implemented
    4. Structural practices to divert flows from exposed soils, retain/detain flows or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Placement of structural practices in floodplains must be avoided to the degree practicable
    5. Interim and permanent stabilization practices for the site, including a schedule of when the practices will be implemented. Site plans should ensure that existing vegetation is preserved where possible and that disturbed portions of the site are stabilized. Use of impervious surfaces for stabilization should be avoided
    6. Construction and waste materials expected to be stored on-site with updates as appropriate, including a descriptions of controls, including storage practices, to

minimize exposure of the materials to storm water, and spill prevention and response practices

7. Measures to minimize, to the extent practicable, off-site vehicle tracking of sediments onto paved surfaces and the generation of dust
8. Design of appropriate controls to properly manage discharges from dewatering activities, including discharges from dewatering of trenches and excavations,
9. Measures to minimize the discharge of pollutants. At a minimum, such measures must be designed, installed, implemented and maintained to:
    a. Minimize the discharge of pollutants from equipment and vehicle washing, wheel wash water, and other wash waters. Wash waters must be treated in a sediment basin or alternative control that provides equivalent or better treatment prior to discharge;
    b. Minimize the exposure of building materials, building products, construction wastes, trash, landscape materials, fertilizers, pesticides, herbicides, detergents, sanitary waste and other materials present on the site to precipitation and to stormwater; and
    c. Minimize the discharge of pollutants from spills and leaks and implement chemical spill and leak prevention and response procedures.

C. An Operation and Maintenance Schedule for structural and non-structural measures, interim grading, and material stockpiling areas. The O&M schedule shall clearly outline the inspection and cleaning frequencies required.

D. Written authorization from the property owner for representatives of the Town to enter the site to inspect erosion and sedimentation control measures during the period of land disturbance.

5.3 Construction Criteria

5.3.1 General

A. Prior to any land disturbance activities commencing on the site, the applicant or its agent shall physically mark limits of no land disturbance on the site with tape, signs, or orange construction fence, so that workers can see the areas to be protected. The physical markers shall be inspected daily.

B. Appropriate erosion and sediment control measures shall be installed prior to soil disturbance. Measures shall be taken to control erosion within the project area. Sediment in runoff water shall be trapped and retained within the project area. Wetland areas and surface waters shall be protected from sediment.

C. Erosion and Sediment Control measures shall be installed and maintained in accordance with the manufacturer's specifications and good engineering practices.

D. Soil stockpiles must be stabilized or covered at the end of each workday. Stockpile side slopes shall not be greater than 2:1. All stockpiles shall be surrounded by sediment controls.

E. Disturbed areas remaining idle for more than 14 days shall be stabilized with seeding, wood chips bark mulch, tarpaulins, or any other approved methods.

F. For active construction areas such as borrow or stockpile areas, roadway improvements and areas within 50 feet of a building under construction, a perimeter sediment control system shall be installed and maintained to contain soil.

G. A temporary construction entrance shall be constructed consistent with detail EC-7A at all site entrance/exit points to reduce the amount of soil carried onto roadways and off the site.

H. On the cut side of roads, ditches shall be stabilized immediately with rock riprap or other non-erodible liners, or where appropriate, vegetative measures.

I. Permanent seeding shall be undertaken in the spring from March through May, and in late summer and early fall from August to October 15. During the peak summer months and in the fall after October 15, when seeding is found to be impractical, an appropriate temporary mulch shall be applied. Permanent seeding may be undertaken during the summer if plans provide for adequate mulching and watering.

J. All slopes steeper than 3:1 (h:v, 33.3%), as well as perimeter dikes, sediment basins or traps, and embankments must, upon completion, be immediately stabilized with sod, seed and erosion control matting, or other approved stabilization measures. Areas outside of the perimeter sediment control system must not be disturbed.

K. Temporary sediment trapping devices must not be removed until permanent stabilization is established in all contributory drainage areas.

L. All temporary erosion and sediment control measures shall be removed after final site stabilization. Disturbed soil areas resulting from the removal of temporary measures shall be permanently stabilized within 30 days of removal.

5.3.2 Materials

5.3.2.1 Silt Fence

A. Silt Fence shall be constructed consistent with Standard Detail EC-3.

B. Silt fence shall be erected in a continuous fashion from a single roll of fabric. The bottom of the fabric fence shall be buried sufficiently below the ground surface to prevent gaps from forming, usually 4 to 6 inches below ground surface.

C. The fabric shall be installed on the upstream side of the stakes.

D. Stakes shall be strong enough and tall enough to securely anchor the fabric to the ground. Stake spacing shall be no more than 10 feet apart for extra-strength fabric and 6 feet apart for standard strength fabric.

E. Maintenance of the fence is required during construction when the fence shows signs of wear.

F. Material shall be based on the synthetic fabric requirements as follows:
   1. Filtering efficiency: 75% (minimum)
   2. Tensile strength: Standard strength: 30 lb/linear inch (minimum),
      Extra strength: 50 lb/linear inch (minimum)
   3. Elongation: 20% (maximum)
   4. Ultraviolet radiation: 90% (minimum)
   5. Slurry flow rate: 0.3 gal/ft2/min (minimum)

5.3.2.2 Fiber Roll

A. The Town of Concord has a preference for fiber rolls (a.k.a. straw wattles) over hay bales for erosion control. Construction of fiber rolls shall be consistent with Standard Detail EC-10

B. Fiber rolls shall be staked securely into the ground and oriented perpendicular to the slope using wood stakes. A minimum of 3 inches of the stake should stick out above the roll. Stakes should be spaced 3 to 4 feet apart.

5.3.2.3 Temporary Construction Entrance

A. Temporary construction entrance shall be constructed consistent with detail EC-7.

B. Temporary construction entrance shall be installed to prevent sediment from the construction site entering the roadway. Aprons shall be a minimum of 20 feet in length, and 10' wide of the entrance.

C. The temporary construction entrance shall be constructed with 3" crushed stone.

D. All temporary construction entrance shall be constructed with a 5' deep paved apron to support the edge of pavement. The apron shall be constructed with 4" of hot mix asphalt and 8" type "B" gravel borrow and meet the applicable standards outlined within Section 3 – Roadway Standards and MassDOT standard Specifications

5.3.2.4 Silt Sacks

A. Construction of silt sacs shall be consistent with Standard Detail EC-11.

B. Silt sacks (or equivalent) shall be placed in catchbasins downgradient of the project/work area to prevent sediment from entering the drainage system.

C. Silt sacks shall be periodically cleaned while in use and must be cleaned prior to and after precipitation events.

5.3.3 Maintenance

A. Sediment shall be removed once the volume reaches ¼ to ½ the height of a hay bale or fiber roll, or the silt fence shows signs of failure.

B. Require the removal of accumulated sediment from sediment controls when sediment storage capacity has been reduced by at least 50 percent; and

C. Applicants are advised they may be required to respond immediately for repair and maintenance at the request of the Town within two hours of notification.

5.3.4 Inspection

A. The Town will require applicants/contractors to hire at their expense an Environmental Monitor to perform inspections of the erosion control measures implemented for a project. The Environmental Monitor will be required to submit monthly reports to the approving Town authority with a copy submitted to the CPW-Engineering Division. The initial report shall demonstrate that the erosion control measures have been installed, in conformance with the approved Erosion and Sedimentation Control Plan. Subsequent reports shall evaluate the operation of erosion control measures and any required maintenance activities. Should an erosion control measure be found to be inadequate for properly controlling sedimentation, an adequate measure shall be designed and implemented.

B. Contractor shall conduct inspections as outlined within the Operation & Maintenance section of the *Erosion and Sediment Control Plan*. Inspections shall occur at least on a 14 day interval. Additionally, the contractor shall conduct inspections after any rainfall event of 0.5" or more.

C. During construction, the installation, maintenance and operation of erosion control measures will be subject to inspection and enforcement by the Town of Concord.