Erosion and Sedimentation Control

Existing and Proposed Drainage Features

The site has steep topography sloping from Elevation 67 at the Marine Hospital building point to about elevation 30 at the lower parking area to the north. Drainage emanates from the site in all directions.

Limited existing formal drainage currently exists on the site.

The proposed drainage systems are not being designed to reduce peak discharge rates at or below existing levels. Instead, the flow will be conveyed in new storm drains to stable outfall points. The control of the peak runoff rates is discussed in more detail in the Stormwater Management Report provided as part of this application.

Critical Areas

The critical areas of the site are the steep slopes along the edge of the project and where grading will be required within the 75-foot setback from the resource boundary.

Erosion/Sedimentation Control Devices

The Contractor as part of the site development will implement the following erosion and sediment control devices. These devices shall be installed as indicated on the plans or as described within this report. For further reference, see the Maine Erosion and Sediment Control Handbook for Construction: Best Management Practices.

1. Siltation fence shall be installed downslope of any disturbed areas to trap runoff borne sediments until the site is revegetated. The silt fence shall be installed per the detail provided in the plan set and inspected immediately after each rainfall and at least daily during prolonged rainfall. Repairs shall be made immediately by the Contractor if there are any signs of erosion or sedimentation below the fence line. Proper placement of stakes and keying the bottom of the fabric into the ground is critical to the fence's effectiveness. If there are signs of undercutting at the center or the edges, or impounding of large volumes of water behind the fence, the barrier shall be replaced with a stone check dam.

   Silt fence is shown by three types depending upon the timing and intent as follows:

SCHEDULE OF SILT FENCE REQUIREMENTS		
Silt Fence	**Type Purpose**	**Time of Installation**
Type 1	To trap sediment along the grading edge where the new contours nearly parallel existing contours.	At initial site preparation, prior to other work.
Type 2	To trap sediment from the work area; install in short sections parallel to existing contour; typically occurs where proposed and existing contours form a "V" shape.	At initial site preparation, prior to other work or as fills are blended to existing grades along the contour.
Type 3	To trap sediment along the base of proposed contours, typically in cut areas.	During construction after new grade is shaped. Time between work in area and shaping new grade to allow silt fence to be installed shall be minimized.

2. Straw or hay mulch including hydroseeding is intended to provide cover for denuded or seeded areas until revegetation is established. Mulch placed on slopes of less than 10 percent shall be anchored by applying water; mulch placed on slopes steeper than 10 percent shall be covered with a fabric netting and anchored with staples in accordance with the manufacturer's recommendations. Proposed drainage channels, which are to be revegetated, shall receive Curlex blankets by American Excelsior or equal. Mulch application rates are provided in Attachment A of this section. Hay mulch shall be available on site at all times in order to provide immediate temporary stabilization when necessary. Where necessary for concentrated runoff to be conveyed down a slope, a temporary stone channel or pipe sluice shall be used to convey runoff down the slope.

3. Water quality systems will be required to provide water quality enhancement and sedimentation control for stormwater runoff from the parking and drive areas after construction.

4. Riprap slopes, ditch linings, stone check dams, hay bale barriers, and culvert outlet aprons are intended to reduce runoff velocities and protect denuded soil surfaces from concentrated flows. Installation details and stone sizes are provided in the construction plan set on the erosion control detail sheets.

5. A construction entrance will be constructed at all access points onto the site to prevent tracking of soil onto Veranda Street.

6. Stone sediment traps or a premanufactured SiltSack™ will be installed at catch basin inlets to prevent silt from entering the storm drain system. Installation details are provided in the plan set on the erosion control detail sheets.

7. Reinforced turf and mechanically stabilized turf slopes will be used on extremely steep slopes in areas designated on the drawings.

8. Dirtbags™ will be required to be on site and available for construction dewatering. The Contractor will be required to provide four Dirtbags ™ with one prepared for operation prior to commencing any trenching operations.

9. Loam and seed is intended to serve as the primary permanent revegetative measure for all denuded areas not provided with other erosion control measures, such as riprap. Specific areas as shown on the landscape plan will receive sod. Application rates are provided in Attachment A of this section for temporary and permanent seeding.

10. Sorbent oil bags will be required in catch basins which receive runoff from paved areas. The sorbent bags shall be places in the basin immediately prior to paving and remain in place for 60 days after paving operations are complete. After this time, the sorbent bags shall be removed and disposed of at an appropriate facility. The Contractor shall notify the Owner of the disposition location for the sorbent bags.

11. Water will be the principal means to control fugitive dust.

Temporary Erosion/Sedimentation Control Measures

The following are planned as temporary erosion/sedimentation control measures during construction:

1. A crushed stone-stabilized construction entrance shall be placed at any construction access points from Veranda Street.

2. Type 1 and 2 siltation fence shall be installed along the downgradient side of the proposed improvement areas prior to work in these areas. Type 2 and 3 siltation fence shall be installed as work progresses. The siltation fence will remain in place and properly maintained until the site is acceptably revegetated.

3. Dirtbags™ shall be installed in accordance with the details in the plan set. The Dirtbags' ™ function on the project is to receive any water pumped from excavations during construction. A Dirtbag™ shall be installed any prepared for operation prior to any trenching on site. When Dirtbags™ are observed to be at 50% capacity, they shall be cleaned or replaced. Stone under the Dirtbag™ shall be removed and replaced concurrently.

4. Temporary stockpiles of stumps, grubbings, or common excavation will be protected as follows:

   a. Temporary stockpiles shall not be located within 100 feet of the resource limits and at least 50 feet upgradient of the perimeter silt fence.

   b. Inactive stockpiles shall be stabilized within 5 days by either temporarily seeding the stockpile with a hydroseed method containing an emulsified mulch tackifier or by covering the stockpile with mulch. If necessary, mesh shall be installed to prevent wind from removing the mulch.

5. All denuded areas, which have been rough graded, shall receive mulch or erosion control mesh fabric within 14 days of initial disturbance of soil.

6. All soils disturbed between November 1 and April 1 will be covered with mulch within 5 days of disturbance, prior to any predicted storm event of the equivalent of ½" of equivalent rainfall in a 24-hour period, or prior to any work shutdown lasting more than 35 hours (including weekends and holidays). The mulch rate shall be double the normal rate.

7. For work which is conducted between November 1 and April 15 of any calendar year, all denuded areas will be covered with hay mulch, applied at twice the normal application rate and (in areas over 10% grade) anchored with a fabric netting. The time period for applying mulch shall be limited to 5 days for all areas or immediately in advance of a predicted rainfall event.

8. Offsite roadways shall be swept to control mud and dust as necessary. A street sweeper shall be available from the Contractor on immediate notice or request from the Owner, City or regulatory agency. A water truck shall be used to control dust both on the site and along points of ingress and egress.

9. During grubbing operations stone check dams or hay bale barriers shall be installed at any evident concentrated flow discharge points.

10. Silt fencing with a maximum stake spacing of 6 feet should be used, unless the fence is supported by wire fence reinforcement of minimum 14 gauge and with a maximum mesh spacing of 6 inches, in which case stakes may be spaced a maximum of 10 feet apart. The bottom of the fence should be properly anchored a minimum of 6" per the plan detail and backfilled. Any silt fence identified by the owner or reviewing agencies, as not being properly installed during construction shall be immediately repaired in accordance with the installation details.

11. Storm drain catch basin inlet protection shall be provided through the use of stone sediment barriers or a premanufactured SiltSack™ as distributed by A. H. Harris Company, Portland, Maine. Stone sediment barrier installation details are provided in the plan set. The barriers or SiltSacks™ shall be inspected after each rainfall and repairs made as necessary, including the removal of sediment. Sediment shall be removed and the barrier or SiltSack ™ restored to its original dimensions when the sediment has accumulated to ½ the design depth of the barrier. Sediment shall be removed from SiltSacksTM as necessary. Inlet protection shall be removed when the tributary drainage area has been stabilized.

12. All slopes over 4:1 shall receive erosion control mesh.

13. Slopes steeper than 3:1 shall receive reinforced turf unless rip rap or other nonvegetative stabilization measures are required by the contract.

14. Type 2 and 3 silt fence shall be installed as construction progresses.

15. Areas of visible erosion shall be stabilized with crushed stone. The Owner's representative in consultation with the engineer shall determine the size of the stone.

16. Catch basins shall all be installed with an opening 2'-6" below finish grade to receive a 4" underdrain with an end cap. A 3'-0" stub of underdrain surrounded by 6" of ¾" crushed stone and filter fabric shall be installed.

17. All catch basins which receive parking lot runoff shall have a sorbent bag installed as described in section 14.5 of this narrative.

Standards for Stabilizing Sites for the Winter

1. Standard for the timely stabilization of ditches and channels : The contractor shall construct and stabilize all stone-lined ditches and channels on the site by November 15. The contractor shall construct and stabilize all grass-lined ditches and channels on the site by September 15. If the contractor fails to stabilize a ditch or channel to be grass-lined by September 15, then the contractor shall take one of the following actions to stabilize the ditch for late fall and winter.

   i. Install a sod lining in the ditch. The contractor shall line the ditch with properly installed sod by October 1. Proper installation includes the applicant pinning the sod onto the soil with wire pins, rolling the sod to guarantee contact between the sod and underlying soil, watering the sod to promote root growth into the disturbed soil, and anchoring the sod with jute or plastic mesh to prevent the sod strips from sloughing during flow conditions.

   ii. Install a stone lining in the ditch. The contractor shall line the ditch with stone riprap by November 15. The contractor shall hire a registered professional engineer to determine the stone size and lining thickness needed to withstand the anticipated flow velocities and flow depths within the ditch. If necessary, the contractor shall regrade the ditch prior to placing the stone lining so as to prevent the stone lining from reducing the ditch's cross-sectional area.

2. Standard for the timely stabilization of disturbed slopes : The contractor shall construct and stabilize stone-covered slopes by November 15. The contractor shall seed and mulch all slopes to be vegetated by September 15. The department will consider any area having a grade greater than 15% (10H: 1V) to be a slope. If the contractor fails to stabilize any slope to be vegetated by September 15, then the contractor shall take one of the following actions to stabilize the slope for late fall and winter.

   i. Stabilize the soil with temporary vegetation and erosion control mesh. By October 1 the contractor shall seed the disturbed slope with winter rye at a seeding rate of 3 pounds per 1000 square feet and apply erosion control mats over the mulched slope. The contractor shall monitor growth of the rye over the next 45 days. If the rye fails to grow at least three inches or fails to cover at least 75% of the disturbed slope by November 15, then the contractor shall cover the slope with a layer of woodwaste compost as described in item iii of this standard or with stone rip rap as described in item iv of this standard.

   ii. Stabilize the slope with sod. The contractor shall stabilize the disturbed slope with properly installed sod by October 1. Proper installation includes the contractor pinning the sod onto the slope with wire pins, rolling the sod to guarantee contract between the sod and underlying soil, and watering the sod to promote root growth into the disturbed soil. The contractor shall not use late-season sod installation to stabilize slopes having a grade greater than 33% (3H: 1V) or having groundwater seeps on the slope face.

   iii. Stabilize the slope with woodwaste compost. The contractor shall place a six-inch layer of woodwaste compost on the slope by November 15. Prior to placing the woodwaste compost, the contractor shall remove any snow accumulation on the disturbed slope. The contractor shall not use woodwaste compost to stabilize slopes having grades greater than 50% (2H: 1V) or having groundwater seeps on the slope face.

   iv. Stabilize the slope with stone rip rap. The contractor shall place a layer of stone riprap on the slope by November 15. The contractor shall hire a registered professional engineer to determine the stone size needed for stability and to design a filter layer for underneath the riprap.

3. Standard for the timely stabilization of disturbed soil : By September 15, the contractor shall seed and mulch all disturbed soils on areas having a slope less than 15%. If the contractor fails to stabilize these soils by this date, then the contractor shall take one of the following actions to stabilize the soil for late fall and winter.

   i. Stabilize the soil with temporary vegetation. By October 1, the contractor shall seed the disturbed soil with winter rye at a seeding rate of 3 pounds per 1000 square feet, lightly mulch the seeded soil with hay or straw at 75 pounds per 1000 square feet, and anchor the mulch with plastic netting. The contractor shall monitor the growth of the rye over the 45 days. If the rye fails to grow at least three inches or fails to cover at least 75% of the disturbed soil before November 15, then the contractor shall mulch the area for over-winter protection as described in item iii of this standard.

   ii. Stabilize the soil with sod. The contractor shall stabilize the disturbed soil with properly installed sod by October 1. Proper installation includes the contractor pinning the sod onto the soil with wire pins, rolling the sod to guarantee contact between the sod and underlying soil, and watering the sod to promote root growth into the disturbed soil.

   iii. Stabilize the soil with mulch. By November 15, the contractor shall mulch the disturbed soil by spreading hay or straw at a rate of at least 150 pounds per 1000 square feet on the area so that no soil is visible through the mulch. Prior to applying the mulch, the contractor shall remove any snow accumulation on the disturbed area. Immediately after applying the mulch, the contractor shall anchor the mulch with plastic netting to prevent wind from moving the mulch off the disturbed soil.

Sedimentation Sumps

The use of shallow sediment sumps on the downgradient side of erodible stockpiles and areas where denuded conditions will be prolonged is encouraged. The sediment sumps may be installed and used in conjunction with the underdrain inlets at catch basins.

Permanent Erosion Control Measures

The following permanent erosion control measures have been designed as part of the Erosion/Sedimentation Control Plan:

1. All storm drain pipes which are not connected to a formal inlet or outlet shall have riprap aprons at their outlet to protect the outlet and receiving channel from scour and deterioration. Installation details are provided in the plan set. The aprons shall be installed and stabilized prior to directing runoff to the tributary pipe or culvert. It is noted that all inlets and outlets over 18" in diameter are to have a flared concrete inlet and an aluminum bar rack. Pipes less than 18 inches in diameter are to have an HDPE flare. Riprap shall not be extended above the area shown on the plans.

2. All areas disturbed during construction, but not subject to other restoration (paving, riprap, etc.) will be loamed, limed, fertilized, mulched, and seeded. Fabric netting, anchored with staples, shall be placed over the mulch in areas where the finish grade slope is greater than 10 percent except in the areas with over 3:1 slopes where reinforced turf is required. Native topsoil shall be stockpiled and temporarily stabilized with seed and mulch and reused for final restoration when it is of sufficient quality. Where necessary, compost shall be added and blended to increase the organic content of the soil.

3. Catch basins shall be provided with sediment sumps for all outlet pipes that are 12" in diameter or greater.

4. Permanent water quality measures will be installed.

Timing and Sequence of Erosion/Sedimentation Control Measures

The following construction sequence shall be required to insure the effectiveness of the erosion and sedimentation control measures are optimized. These measures are separate from the separate requirements to be employed during the building demolition phase of the project.

Note: For all grading activities, the Contractor shall exercise extreme caution not to overexpose the site by limiting the disturbed area.

1. Install crushed stone-stabilized construction entrances from Veranda Street the as shown on the Erosion and Sedimentation Control Drawing.

2. Install Type 1 and appropriate Type 2 siltation.

3. Establish and prepare Dirtbag™ area.

4. Perform demolition activities and major site cuts and fills and blasting.

5. Install water quality systems and the storm drain system.

6. Construct diversion and drainage channels to direct flow to new storm drain and inlets where grades permit.

7. Install stone and hay bale check dams at any concentrated flow discharge points.

8. Prepare the subgrade, parking areas, building, and drive loop.

9. Install storm drain, underground electric, foundations and other utility work. Install inlet and outlet protection immediately after the installation of any inlets. Pump any accumulated water to the Dirtbag™

10. Bring initial site work area to subgrade including binder pavement, stabilization of all slopes, and loam seeding of areas.

11. Construct other site improvements and utilities.

12. Raise catch basins to grade and install inlet protection devices.

13. Install sorbent bags in catch basins which will receive runoff from pavement.

14. Install final pavement as detailed on the site plans.

15. Loam, lime, fertilize, seed and mulch all remaining disturbed and denuded areas.

16. Remove all accumulated sediment from silt barriers.

17. Review stability of the site. If a 75% catch of grass is achieved, remove all other temporary erosion control devices.

Soil will be considered disturbed if it does not have an established stand of vegetation covering at least 75% of the soil surface or has not been mulched with hay applied at a rate of 230 lb./1000 sq. ft.

It is anticipated that site work may be suspended prior to winter. If so, the General Contractor shall schedule a meeting with the City, Owner, and Owner's representatives to review the site for conformance with the plan. This meeting shall be scheduled at least 10 days prior to winter shutdown. The Owner may elect to provide the Contractor with a punch list for measures to be complete before the interim shutdown. The Owner's punch list shall not obviate the Contractor's responsibility for compliance with the erosion control requirements of the project or permits.

Construction of Improvements at Veranda Street may be conducted concurrently or following site work.

Contracting Procedure

A General Contractor under contract to Martin's Point will construct the project. The Contractor shall submit a schedule for the completion of the work which will satisfy the following criteria:

1. The above construction sequence should generally be completed in the specified order; however, several separate items may be constructed simultaneously. Work must also be scheduled or phased to prevent the extent of the exposed areas as specified below. The intent of this sequence is to provide for erosion control and to have structural measures such as silt fence and construction entrances in place before large areas of land are denuded.

2. The work shall be conducted in sections which will:

   a. Limit the amount of exposed area to those areas in which work is expected to be undertaken during the proceeding 30 days.

   b. Revegetate disturbed areas as rapidly as possible. All areas shall be permanently stabilized within 7 days of final grading or before a predicted storm event; or temporarily stabilized within 7 days of initial disturbance of soil for areas identified as critical (refer to paragraph 14.4.A) and 14 days for all other areas.

   c. Incorporate planned inlets and drainage system as early as possible into the construction phase. The ditches shall be immediately lined or revegetated as soon as their installation is complete.

3. Once final grade has been established, the Contractor may choose to dormant seed the disturbed areas prior to placement of mulch and placement of fabric netting anchored with staples.

   a. If dormant seeding is used for the site, all disturbed areas shall receive 4" of loam and seed at an application rate of 5#/1000 s.f.

      All areas seeded during the winter months will be inspected in the spring for adequate catch. All areas insufficiently vegetated (less than 75 percent catch) shall be revegetated by replacing loam, seed and mulch.

   b. If dormant seeding is not used for the site, all disturbed areas shall be revegetated in the spring.

4. The area of denuded non-stabilized construction shall be limited to the minimum area practicable. An area shall be considered to be denuded until the subbase gravel is installed in parking areas or the areas of future loam and seed have been loamed, seeded, and mulched. The mulch rate shall be twice the rate specified in the seeding plan. [For example, 115#/1,000 s.f. x 2 = 230#/1,000s.f.]

5. Within the exposed work area, temporary sedimentation sumps shall be provided at the interface between parking areas and graded slopes (refer to paragraph 14.7). This shall be accomplished by creating an area 18" below adjacent temporary grades. The sedimentation area shall have a bottom width of 3' and 3:1 side slopes. Culverts to allow access shall be installed by the Contractor. Along the sedimentation sumps, barriers shall be provided at sufficient intervals to permit runoff to be accumulated to a minimum depth of 12" before overflowing.

6. The schedule shall be subject to the approval of the Owner.

The Contractor must install any added measures, which may be necessary to control erosion/sedimentation from the site and fugitive dust emissions dependent upon the actual site and weather conditions.

The applicant may be required to retain a third party inspector. The Contractor shall cooperate with the third party inspector and permit access to the site by the inspector at all times.

The Contractor shall note that no area within 50 feet of a slope with a vertical drop of more than 3' in 50 feet shall remain denuded for a period of over 5 days before it is temporarily stabilized. Temporary stabilization shall be the installation of mulching. All other areas shall be stabilized within 14 days. For construction between November 1 and April 15 of any calendar year, all areas shall be temporarily stabilized at the earlier time frames specified above.

Provisions for Maintenance of the Erosion/Sedimentation Control Features

The Owner will contract the project. The project is subject to the requirement of a MeDEP Site Location of Development Permit administered through the City of Portland and a MeDEP Permit for Stormwater Pollution Prevention Plan during Construction. These permits require the Contractor to prepare a list and designate by name, address and telephone number all individuals who will be responsible for implementation, inspection and maintenance of all erosion control measures identified within this section and as contained in the Erosion and Sedimentation Control Plan of the contract drawings. Specific responsibilities of the inspector(s) will include:

1. Execution of the Contractor/Subcontractor Certification contained in Attachment B by any and all parties responsible for erosion control measures on the site as required by the MeDEP.

2. Assuring and certifying the Owner's construction sequence is in conformance with the specified schedule of.this section. A weekly certification stating compliance, any deviations, and corrective measures necessary to comply with the erosion control requirements of this section shall be prepared and signed by the inspector(s).

3. In addition to the weekly certifications, the inspector(s) shall maintain written reports recording construction activities on site which include:

   - Dates when major grading activities occur in a particular areas.
   - Dates when major construction activities cease in a particular area, either temporarily or permanently.
   - Dates when an area is stabilized.

4. Inspection of this project work site on a weekly basis and after each significant rainfall event (0.5 inches or more within any consecutive 24 hour period) during construction until permanent erosion control measures have been properly installed and the site has been stabilized. Inspection of the project work site shall include:

   - Identification of proper erosion control measure installation in accordance with the erosion control detail sheet or as specified in this section.
   - Determine whether each erosion control measure is properly operating. If not, identify damage to the control device and determine remedial measures.
   - Identify areas that appear vulnerable to erosion and determine additional erosion control measures that should be used to improve conditions.
   - Inspect areas of recent seeding to determine percent catch of grass. A minimum catch of 75 percent is required prior to removal of erosion control measures.
   - Record date of installation of sorbent bags in catch basins, the dates of paving, the date of removal, and the disposal method and location.

   Accumulated silt/sediment should be removed when the depth of sediment reaches 50 percent of the barrier height. Accumulated silt/sediment should be removed from behind silt fencing when the depth of the sediment reaches 6 inches.

5. If inspection of the site indicates a change should be made to the erosion control plan, either to improve effectiveness or correct a site-specific deficiency, the inspector shall immediately implement the corrective measure and notify the owner of the change.

Once construction has been completed, long term maintenance of the detention pond and catch basins will be the responsibility of the applicant. The catch basin sumps shall be inspected in April and October of each year. Sediment shall be removed when the depth of sediment reaches one half the depth of the sump.

All certifications, inspection forms and written reports prepared by the inspector(s) shall be filed with the Owner, and the MeDEP General Construction Permit File contained on the project site. All written certifications, inspection forms, and written reports must be filed within one (1) week of the inspection date.

Preconstruction Conference

Prior to any construction at the site, representatives of the Contractor, and the site design engineer shall arrange for and meet with the Owner to discuss the scheduling of the site construction. On or before that meeting, the Contractor will prepare a detailed schedule and a marked-up site plan indicating areas and components of the work and key dates showing date of disturbance and completion of the work. Three copies of the schedule and marked-up site plan shall be provided to the Owner.

NOTE: THIS EROSION AND SEDIMENT CONTROL NARRATIVE APPLIES TO THE FULL DEVELOPMENT OF THE SITE BEYOND THE LIMITS OF PHASE I WORK. CONTRACTOR IS REQUIRED TO FOLLOW ALL EROSION AND SEDIMENT CONTROL REQUIREMENTS APPLICABLE TO PHASE I WORK.

REV	DATE	DESCRIPTION
3	04.24.06	PHASE I – RELEASED FOR BID
2	04.14.06	100% REVIEW SET – PHASE I
1	04.11.06	FINAL SITE PLAN SUBMISSION TO CITY

REVISIONS

STATE OF MAINE — DWIGHT D ANDERSON — No. 9275 — REGISTERED PROFESSIONAL ENGINEER

P.E. DWIGHT D. ANDERSON

LIC. #9275

PROJECT: MARTIN'S POINT REDEVELOPMENT PROJECT

SHEET TITLE: EROSION AND SEDIMENT CONTROL NARRATIVE

CLIENT: MARTINS POINT HEALTH CARE

DeLUCA–HOFFMAN ASSOCIATES, INC.
778 MAIN STREET, SUITE 8
SOUTH PORTLAND, ME 04106
207.775.1121
WWW.DELUCAHOFFMAN.COM

DRAWN: LECJ	DATE: NOV. 2005
DESIGNED: DDA	SCALE: AS SHOWN
CHECKED: DDA	JOB NO. 2344.01
FILE NAME: 234401-DET	
SHEET	C-13

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