EROSION AND SEDIMENTATION CONTROL NOTES

1. GENERAL

A. Plan the sequence of construction so that the smallest practical area of land is exposed at any one time during construction. Schedule the work such that sedimentation barriers are installed early in the construction sequence, to prevent sediments from uphill areas reaching property lines.

B. If underdrain filter basins, bio-retention cells, or wetponds are used as temporary sediment ponds, do not install underdrain, gravel filter, soil filter, or geotextile fabric until after the surrounding areas are stabilized and/or the areas are no longer receiving sediment loading. Schedule basin/pond construction during the months of June through September; with ponds stabilized by October 1st. Clean all storm water basins, pipes, and treatment tanks prior to substantial completion.

C. Take necessary steps to prevent soil erosion. Refer to publications of the Maine DEP and the Maine Soil and Water Conservation Commission for additional prevention measures to stop soil erosion and follow DEP Maine Erosion and Sediment Control BMP's (www.maine.gov/dep/blwg/docstand/escmps/index.htm) The Contractor shall conduct his operations in conformity with all Federal and State permit requirements concerning water, air, or noise pollution, or the disposal of contaminated or hazardous materials. Erosion control measures shown on the Plans are minimum only. Satisfy the current requirements of the regulatory agencies. Repair all areas of instability and erosion immediately and maintain until the site is fully stabilized.

D. Erosion Control Mesh: Intended as a temporary erosion control measure that will decompose after stabilization. Open weave, single jute yarn of loosely twisted construction, not varying in thickness by more than 1/2 its normal diameter. The woven material shall weigh 0.9 pounds per square yard. Synthetic mesh material may be used as approved. Staples: No. 11 (or heavier) plain iron wire, made 6 inches in length.

E. Erosion Control Blanket: Intended as a permanent erosion control measure that will reinforce the topsoil and vegetation against erosion after construction. Synthetic fiber matrix sandwiched between heavy duty UV stabilized netting. Blanket shall weigh not less than 0.9 pounds per square yard. North American Green P300 or approved equal. Staples: No. 11 (or heavier) plain iron wire, made 6 inches in length.

F. Silt Fence:
Post: 1"X1" hardwood post, 4.5 feet in length.
Fabric: Pervious 36" wide sheet of synthetic polymer of 12-mil thickness, such as Mirafi 100X; Terra Tex-SC, or approved equal.
The bottom of the fabric shall be trenched into the existing ground a minimum of 6 inches. In addition, hay bales or ditch checks shall be installed along the silt fence to create sedimentation pools in low areas where run-off concentrates.

G. Erosion Control Soil/Bark Mix: Shall consist of a mix of recycled composted bark, flume grit, and fragmented wood generated from water-flume log handling systems. Conforming to the following:
G.1. pH – 5.0 to 6.0.
G.2. Screen size – 6 inch minus.
G.3. No less than 25 percent organic material.
G.4. No stones larger than 2 inches in diameter.
G.5. Approved by Maine Department of Environmental Protection for use in wetlands and near waterways.

H. Hay Bales: Bales shall be at least 14" x 18" x 30" in size, staked twice per bale. Stakes shall be 1" x 1" x 36" wooden. Place bales with twine on sides of bale, not top and bottom.

I. Water, calcium chloride, or crushed stone for prevention of airborne dust.

J. Catch Basin Sediment Filter Sack: A filter fabric bag which hangs under the grate to catch sediments. Provide "Streamguard model 3003", "Basin Bag" by Emco Distribution, "SiltSack High Flow" by ACF Environmental, or approved equal. Install the bag device per manufacturer's recommendation.

K. Before earthwork is started, a silt fence, filter berm, or stone sediment dam shall be installed along the down-slope side of the construction site, as necessary, to prevent soil sediment migration away from the site. Install silt fence or filter berm along the down-slope side of all top-soil and subsoil stockpiles.

L. Erosion control barriers shall be removed after construction is complete, but not until finish grading, final seeding, and mulching has been completed and the established grass has stabilized the soil. Maintain barriers in good condition until removed.

M. Inspect erosion and sedimentation control weekly and after every storm and maintain in good working condition for project duration. Remove silt deposits from the site, place in an area of low erosion potential so it will not wash into a wetland or water body, seed with erosion control mix, and mulch.

N. Filter Berm: Place uncompacted erosion control mix in a windrow at locations shown on the plan or as directed by the Architect. At a minimum the berm shall be 3 feet wide at the base and 2 feet high at the center of all points along its length. Berm material, where the berm is still required, which has decomposed, clogged with sediment, eroded, or becomes ineffective, shall be replaced. The berm shall be removed from the site or raked into nearby woods to a depth no greater than 1", when no longer required, as approved by the Architect.

O. Maintain temporary erosion control measures for the full duration of construction. Inspect weekly and after each storm and repair as needed. Remove sediments from the site, place in area of low erosion potential, and stabilize with seed and mulch.

P. Place temporary soil stabilization within 30 days of initial disturbance. Place permanent soil stabilization within 7 days of final grading.

2. TEMPORARY SEEDING AND MULCHING

A. Topsoil stripped and stockpiled on site shall be immediately seeded with erosion control seed mix and mulched with hay. Mulch shall be cured straw free from noxious weed seeds and rough or woody materials.

B. Erosion Control Seed:

Seed Type	% Weight	% Purity	% Germination
Domestic Rye	70	85	80
Perennial Rye	30	85	80

C. Exposed earthwork areas, which will not be worked on for one week, shall be mulched with straw.

D. Unfinished areas which are not to be worked on for one month, or will be wintered, shall be seeded with erosion control mix at a rate of 3 pounds of seed per 1000 sq. ft. and mulched with straw. Apply straw mulch at the rate of 75 pounds per 1000 sq.ft. Anchor mulch to prevent wind blown movement.

E. In sensitive areas (within 25 ft. of stream or wetland edge) temporary mulch must be applied at the end of each work day and prior to any storm event. No fill shall be placed on hay mulch.

3. PERMANENT SEEDING AND MULCHING

A. Grass seed shall be free from noxious weed seeds and recleaned, Grade A recent crop seed, treated with appropriate fungicide at time of mixing, delivered to the site in sealed containers with dealer's guaranteed analysis, and each variety of seed shall have percentages of germination of not less than 80%, and a percentage of purity of not less than 85%.

B. Weed seed content shall not exceed 0.25%. Wet, moldy, or otherwise damaged seed will be rejected.

C. Seed Mix Proportions by weight:

Seed Type	% Weight	% Purity	% Germination
Chewing Fesue	35	85	80
Creeping Red Fescue	35	85	80
Perennial Rye	30	85	80

4. FALL AND WINTER STABILIZATION (September 15 or Later)

A. Stabilize exposed soils throughout the project site with permanent seed and mulch by September 15, with the exception of areas undergoing active earthmoving operations. These construction areas are primarily in the immediate vicinity of the building. For proposed grass areas not stabilized by permanent seed and mulch by this date, provide the following stabilization measures at no additional cost to the Owner. Select the appropriate methods from the options listed and obtain approval from the Architect prior to installation.
A.1. Stabilize the soil with temporary vegetation, except for ditches, by October 1. Place winter rye seed at the rate of 3 pounds per 1000 sq.ft. and lightly mulch with hay or straw at 75 pounds per 1000 sq.ft. Place erosion control mesh over mulch and anchor.
A.2. For slopes flatter than 3H:1V, place sod over the exposed soil by October 1. Roll the sod, anchor it with wire pins, and water it to promote growth.
A.3. For grassed areas flatter than 10H:1V, stabilize the disturbed soil by November 1with temporary winter mulching by applying hay or straw at a rate of at least 150 pounds per 1000 sq.ft., such that no soil is visible through the mulch. Anchor mulch with erosion control mesh.
A.4. For slopes steeper than 10H:1V and flatter than 2H:1V, place a 6" layer of erosion control soil/bark mix on the disturbed soil by November 1. Remove snow accumulated on the slope prior to installation. If groundwater seeps are present, place stone rip rap to thickness shown on drawing details over non-woven geotextile.
A.5. For drainage ditches or channels, place a sod lining by October 1 or place a rip rap lining by November 1. Sod shall be rolled, fastened with wire pins, anchored with erosion control mesh, and watered. Rip rap shall be placed at the thickness shown on the drawing details over a layer of non-woven geotextile.

B. If the catch of permanent or temporary grass is less than 3" tall or covers less than 75% of the disturbed soil by November 1, apply additional hay mulch at a rate of 150 pounds per 1000 sq.ft.. Anchor mulch with erosion control mesh.

C. If the catch of permanent or temporary grass is less than 3" tall or covers less than 75% of the disturbed soil on slopes steeper than 10H:1V and flatter than 2H:1V by November 1, place a 6" layer of erosion control soil/bark mix or a rip rap layer, as described above.

5. DRAINAGE DITCHES AND EMBANKMENTS

A. Drainage ditches shall be provided with a temporary stone check dams spaced no greater than 100 feet apart. Temporary ditch check dams shall be constructed where indicated. Additional temporary ditch dams shall be installed during the construction, where necessary to prevent soil from leaving the work area.

B. Grassed drainage ditches and swales shall be lined with a continuous matt of erosion control mesh for full bottom width and side slopes to 12" above bottom, within 48 hours of final grading and prior to a storm event, in order to stabilize the loam, seed, and mulch.

C. Where erosive velocities in ditches or embankments are anticipated or experienced, and soil cannot be stabilized with mulch and mesh, substitute erosion control soil/bark mix in place of loam. Screen the erosion control soil/bark mix to remove wood, bark, and stones one-inch in size and greater. If erosive velocities are excessive, provide a 12" thick stone rip rap lining along ditch bottom and up side slopes to one foot above the bottom elevation. Place non-woven geotextile beneath rip rap.

D. Stabilize pond embankments(interior and exterior), slopes steeper than 3 horizontal to one vertical, and drainage ditches by September 15, consisting of permanent seeding and mulch. If this date cannot be met, provide alternative permanent or temporary stabilization described as Fall and Winter Stabilization.

E. Install erosion control mesh over mulch on slopes steeper than 6 horizontal to one vertical (16%) and in conformance to DOT Standard Specifications, latest Edition, Section 9.48, paragraphs 613.03 through 613.06. Anchor mesh as recommended by manufacturer.

F. Permanently rip-rap inlets and outlets of culverts and pipe outfalls within 48 hours of installation, as specified in Section 02200- Earthwork, and as shown on the Drawings.

G. Install permanent erosion control blanket around culvert inlets and outlets as shown on the Drawings, and according to manufacturers recommendations.
G.1. Prepare soil with loam, fertilizer, and seed as specified in Section 02930 prior to installing erosion control blanket.
G.2. Install permanent erosion control blanket 5 feet minimum in all directions around culvert inlets.
G.3. Install permanent erosion control blanket 5 feet minimum in all directions around culvert outlets, and a 6 feet width centered along the outlet channel for 10 feet.
G.4. Install staples as shown on the erosion control blanket detail on the Drawings, and throughout the blanket in an 18 by 18 inch grid.

6. PARKING AND DRIVES

A. Place temporary stabilized construction exits where vehicles leave the site and enter existing paved roads; consisting of a 6" layer of 1-1/2" to 3" crushed stone. Tracking and spilling of earth and/or debris on public streets shall be avoided to the maximum extent possible. Clean up and remove such spillage.

B. As the crushed stone stabilized construction exits continue to scrub the soil from the trucks, the stone layer will tend to fill with sediments. When this occurs remove the stone and sediment and replaced it with a clean layer of stone.

C. As soon as possible after roads and parking areas are cleared, grubbed and graded to the required subgrade, the gravel base shall be placed.

7. DUST CONTROL

A. Use traffic control to restrict traffic to predetermined routes. Maintain as much natural vegetation as is practicable. Use phasing of construction to reduce the area of land disturbed at any one time. The use of temporary mulching, permanent mulching, temporary vegetative cover, permanent vegetative cover, or sodding will reduce the need for dust control. Use mechanical sweepers on paved surfaces where necessary to prevent dust buildup. Stationary sources of dust, i.e., rock crushers, should utilize fine water sprays to control dust.

B. The exposed soil surface should be moistened periodically with adequate water to control dust.

C. Calcium chloride shall be either loose dry granules or flakes fine enough to feed through a spreader at a rate that will keep surface moist but not cause pollution or plant damage. Liquid calcium chloride can also be used. To reduce potential for environmental degradation, use only when other methods are not practical.

D. Cover surface with crushed stone or coarse gravel. In areas adjacent to waterways, use chemically stable aggregate.

E. When temporary dust control measures are used, repetitive treatment shall be applied as needed to accomplish control.

8. CONSTRUCTION DE-WATERING

A. Water from construction dewatering operations shall be cleaned of sediment before reaching wetlands, water bodies, streams, or site boundaries. Utilize temporary sediment basins, erosion control soil filter berms backed by staked hay bales, ADirt Bag 55" sediment filter bag by ACF Environmental Inc, or other approved Best Management Practices (BMP's).

B. In sensitive areas, near streams or ponds, discharge the water from the de-watering operation into a temporary sediment basin created by a surrounding filter berm of uncompacted erosion control mix immediately backed by staked hay bales (see the site details). Locate the temporary sediment basin at least 100 feet from the nearest water body, such that the filtered water will flow through undisturbed vegetated soil areas prior to reaching the water body or property line.

C. Prepare a de-watering plan to address excavation de-watering following heavy rainfall events or where the excavation may intercept the groundwater table during construction. the collected water needs treatment and a discharge point that will not cause downgradient erosion and offsite sedimentation or within a resource. Follow the detail of the plan throughout construction duration.

9. ADDITIONAL MEASURES

A. Areas inside and outside the Contract work limits shall be protected from lubricants, fuel, sediment, litter, construction debris, chemicals, and other pollutants.

B. Take precautions, and conform to all Federal, State and Local regulations to prevent pollutants from being discharged from materials on site, including storage practices to minimize exposure of the materials to stormwater. Implement spill prevention, containment, and response.

C. During construction, liquid petroleum products and other hazardous materials with the potential to contaminate groundwater may not be stored or handled in areas of the site draining to an infiltration area. An "infiltration area" is any area of the site that by design or as a result of soils, topography accumulates runoff that infiltrates into the soil. Due to the sandy native soils, impervious liners or materials must be used to store or contain the hazardous materials, and prevent them from entering the groundwater.

10. REMOVAL AND DISPOSAL

A. When permanent soil stabilization has been achieved, temporary materials and devices that are not readily degradable shall be removed and disposed of off site. Silt fences, filter berms, and catch basin sediment filters must be fully removed. Re-usable materials are and shall remain the property of the Contractor.

11. PLANTING TIME

A. Seeding: Seeding shall be done between August 15th to September 15th and/or April 15th to June 15th.

B. Sodding: Sodding may be done between April 15th and November 15th.

C. Variance: If special conditions exist which may warrant a variance in the above planting dates, a written request shall be submitted to the Architect stating the special conditions for the proposed variance. Permission for the variance will be given if warranted in the opinion of the Architect. Regardless of the time of seeding, the Contractor shall be responsible for a full growth of grass.

D. Place permanent soil stabilization within 15 days of final grading.

HARRIMAN
AUBURN PORTLAND MANCHESTER

IMMUCELL CORPORATION ADDITION

PORTLAND, MAINE

Harriman Project No.	14326

Key Plan

Issues and Revisions

Mark	Date	Description
	05-22-14	PLANNING BOARD REVIEW
	07-10-14	PLANNING AUTHORITY APPROVAL
	07-25-14	ISSUED FOR CONSTRUCTION

STATE OF MAINE
FRANK L. CRABTREE
No. 3993
LICENSED PROFESSIONAL ENGINEER

Drawing Scales

PA / PE: FLC
Drawn By: PLS

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SITE EROSION CONTROL NOTES

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