

Preliminary
Construction Management Plan (CMP)
For
RiverWoods Durham

Stone Quarry Drive
Durham, NH 03824

Prepared For:

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Project Completion: January 2020

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APPENDICES

Appendix A:

Town of Durham Site Plan Regulations, Part III, Article 3 Construction Practices

Appendix B:

NHDES Chap. Env-Wq 1510 Best Management Practices for Blasting

Appendix C:

Site Preparation Plan – Sheet C-1.0
Erosion Control Notes – Sheet C-6.0

SECTION 1: CONTACT INFORMATION / RESPONSIBLE PARTIES

1.1 General Contractor (GC) and Construction Manager (CM)

Company: LECESSE Construction Services, LLC
Contact: Tomy Lombardozzi
Address :75 Thruway Park Drive
City, State, Zip Code: West Henrietta, NY 14586
Telephone Number: 585-334-4490
Fax/Email: 585-334-4925

1.2 Owner's Project Representative (OPR)

Contact: TBD

Telephone Number:
Email:

1.3 Civil Engineer of Record (CER)

Firm: Altus Engineering, Inc
Contact: Jeffrey Clifford, PE
Address: 133 Court Street
Portsmouth, NH 03801

Telephone Number: 603-433-2335
Email: jclifford@altus-eng.com

SECTION 2: INTRODUCTION

This document presents the Construction Management Plan for the *RiverWoods Durham* site work construction activities. The contents of this document include a brief description of the project, construction operations, management of stormwater best management practices and erosion controls, pollution prevention, and traffic and parking management.

2.1 Project Description

RiverWoods Durham is a continuing care retirement community being developed at 11.3 acres on the south side of Stone Quarry Drive in Durham, New Hampshire. The project consists of constructing a senior housing including 150 independent living units, 24 skilled care units, 24 memory care units, 24 assisted living units and associated site work. The project also involves off-site extensions of water and sewer utilities along NH Route 108.

SECTION 3: COMPLIANCE WITH OTHER LOCAL, STATE & FEDERAL REQUIREMENTS

This project requires permits from several local, state and federal agencies. The following permits will be required for this project;

Permitting Authority	Permit/Approval Type	Permit Number/Approval Date
USEPA	2017 Construction General Permit: Notice of Intent (NOI), retain copy of Stormwater Pollution Prevention Plan (SWPPP), and Notice of Termination (NOT)	
NHDES Alteration of Terrain Bureau	Alteration of Terrain Permit	
NHDES Wastewater Engineering Bureau	Sewer Connection Permit	
NHDOT	NHDOT Driveway Permit	
NHDOT	Excavation Permit	
Durham Planning Board	Site Plan Approval	
Durham Planning Board	Conditional Use Permit	
Durham Zoning Board of Adjustment	Variance (for Driveway Dimensions)	September 12, 2017
Durham DPW	Driveway Permit (at Stone Quarry Drive)	
Durham DPW and Durham Town Council	Permit to Connect to Public Utility (water and sewer)	
Durham Fire Department	Town of Durham Blasting Permit	
Durham Code Enforcement	Building Permit	

Work completed for this project shall be in general conformance with the CMP, Town of Durham Site Plan Regulations, Part III, Article 3 Construction Practices (see Appendix A), and all other permits and approvals. All conflicts shall be brought to the attention of the Construction Manager (CM), Owner’s Authorized Representative (OPR) and Civil Engineer of Record (CER).

SECTION 4: CONSTRUCTION OPERATIONS

The overall site construction is detailed on the site plans prepared by Altus Engineering, Inc. and Woodburn & Associates. Additional construction operations and site management requirements are listed in the 2017 Construction General Permit (CGP) and conditions of approval of permits received for the project. The Site Preparation Plan (Sheet C-1.0) and Erosion Control Notes (Sheet C-6.0) in Appendix C present the limit of work,

erosion and sediment control requirements and general sequence and timing of work. The CM will maintain and update the Stormwater Pollution Prevention Plan (SWPPP) which will be available at the construction site.

4.1 Project Mobilization and Duration

The intent is to mobilize on site immediately after final Town approval and the issuance of a building permit. The expected overall construction schedule will be 20 months in duration. The projected start of construction is June 2018 with completion January 2020. Once all the approvals and permits are in place, the CM will issue an updated construction timeline.

4.2 Hours of Construction

The construction project will operate as follows:

Regular work week - Monday through Friday, between the hours of 7:00 AM and 6:00 PM.

Saturday work – Between the hours of 8:00 AM and 6:00PM.

Blasting, chipping of stone, and use of hoe or rock hammers: hours are restricted to 9:00 a.m. to 4:00 p.m. Monday through Friday

Inside Work Only – No limitations.

Holidays - to be discussed on an individual basis as needed

4.3 Site Security

Construction access gates will be installed at the main entrance to the site for the use of construction activities only.

Appropriate construction signage will be posted at the site indicating “NO TRESPASSING”, Hard Hat Requirements, Authorized Personnel Only, Visitor and delivery information. This Project will have a policy of “ANY and ALL VISITORS MUST SIGN-IN at the LECESSE CONSTRUCTION SERVICES, INC. FIELD OFFICE TRAILER”.

Security cameras may be installed to monitor the site for safety, security and construction progress.

4.4 Site Lighting

Existing pole street lighting along Stone Quarry Drive will remain in place during construction.

LECESSE does not anticipate the need for any additional onsite lighting beyond egress lighting at the construction trailers. The interior of the buildings will have temporary lighting for egress in the building.

4.5 Site Safety

LECESSE Construction has a comprehensive safety program and a strong commitment to safety through our formal Safety and Health Program that demands a safe and healthy workplace for our employees, subcontractors, clients, and site visitors. Project will be managed in accordance with this Program.

4.6 Noise Control

LECESSE will make every reasonable attempt to limit deliveries between 7am and 4pm and equipment will not be allowed to start up prior to the project's working hours. Whenever possible, LECESE will schedule the more noise intense activities for less intrusive times such as midmorning to mid-afternoon.

SECTION 5: STORMWATER SYSTEMS & EROSION AND SEDIMENT CONTROLS

5.1 Temporary Best Management Practices (BMPs)

The following outlines temporary BMPs that will be used for this project. Additional BMPs will be used as necessary to protect water quality and meet local, state and federal regulatory requirements. The SWPPP prepared for the project as part of the 2017 CGP will be updated as needed to address current site conditions and appropriate BMPs to be implemented.

5.1.1 Perimeter Sediment Control

Sediment controls are structural measures that are intended to complement and enhance the selected soil stabilization (erosion control) measures and reduce sediment discharges from construction areas. Sediment controls are designed to intercept and settle out soil particles that have been detached and transported by the force of water. This project will incorporate temporary sediment control measures required by the contract documents, 2017 CGP and other measures selected by the contractor.

Temporary sediment control material will be maintained on-site throughout the duration of the project, to allow for implementation of temporary sediment controls in the event of predicted rain, and for rapid response to failures or emergencies. This includes implementation requirements for active areas and non-active areas before the onset of rain.

Locations of temporary sediment control BMPs are shown on the Construction Plans. A double row of approved silt barriers will be used as the perimeter control during construction. These silt barriers are placed as shown in the construction plans prior to any soil disturbance on the site and maintained in accordance with the manufacturer's requirements throughout construction. The silt barriers will be removed once the development site has achieved the stabilization standards required. Bare soil areas resulting from the removal of the silt barriers will be revegetated. Mulch/compost used for as part of silt barriers will be distributed to either side. The other materials will be recycled or removed and disposed of in a normal trash container used by the contractor.

The double row silt barrier shall be in a functional condition at all times and it shall be routinely inspected as part of the SWPPP inspections. If the silt barrier has been damaged, it shall be repaired, or replaced if beyond repair. Sediment shall be removed before it has accumulated to one-half of the above ground height of the silt barrier.

5.1.2 Sediment Track-Out

Two (2) stabilized construction entrance shall be constructed in the location(s) shown on the Site Preparation Plan to address the track-out of sediment onto public streets by vehicles exiting the construction site. If sediment has been tracked out from the site onto the public way it must be removed by the end of the same work day in which the track-out occurs or by the end of the next work day if track-out occurs on a non-work day. The track-out material will be removed by power sweeping, shoveling, or vacuuming these surfaces, or by using other similarly effective means of sediment removal. At a minimum, sweeping shall take place at the end of each work day during construction. Hosing or sweeping of tracked-out sediment into any surface water, storm drain inlet or stormwater conveyance is prohibited (unless it is connected to an approved sediment basin, sediment trap, or similarly effective control).

5.1.3 Stockpiled Sediment or Soil

Stockpiles of sediment and soil shall be stabilized or covered, protected with silt a barrier and placed in a location to minimize exposure to up gradient storm water runoff. Cover active stockpiles with anchored protective covering prior to expected storm events or to control dust. Inactive stockpiles shall be covered with anchored tarps or temporarily seeded and mulched per the temporary vegetation and mulching notes on the plans. Stockpiles that are a source of dust shall be covered. All stockpiles shall be placed in the locations shown in the SWPPP Site Logistics Plan. Refer to silt barrier specification for installation requirements. Do not hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any stormwater conveyance (unless connected to a sediment basin, sediment trap, or similarly effective control), storm drain inlet, or surface water. During construction, repair damage silt barrier as necessary and remove sediment before it has accumulated to one-half of the above ground height of the silt barrier. Ensure stockpile covers are tied down effectively. Reseed stockpiles and mulch as necessary to prevent erosion by wind or precipitation.

5.1.4 Dust Control

Dust shall be controlled on site during construction by implementing various dust control measures to prevent blowing and movement of dust from exposed soil surfaces. The following dust control measures shall be implemented as necessary throughout the construction;

- Use temporary and permanent mulching and vegetative cover to minimize dust.
- Use mechanical sweepers on paved surfaces including town streets as necessary, and as directed by the Town.
- Use a water truck to spray water, as necessary, or utilize calcium to control dust.
- Cover surfaces with crushed stone or coarse gravel.
- Complaints will be responded to immediately.
- Materials will be wetted as needed during rock crushing operations

5.1.5 Minimize the Disturbance of Steep Slopes

The following temporary practices shall be employed to improve the resistance of bare soil to erosion.

- Mulch with weed free straw/hay or crushed stone
- Spray on liquid tackifier.
- Placement of erosion control blankets.

Steep slope control measures shall be installed as to prevent erosion. All steep slopes that have received controls shall be inspected weekly and after storm events exceeding 0.25 inches in a 24 hour period. Repairs shall be completed as necessary.

5.1.6 Storm Drain Inlets

This project will use the Siltsack™ or approved equal which is to be installed at all catch basin frame/grate openings receiving runoff from the site. Installation of a simple sheet of filter fabric is not acceptable. The Siltsack™ is placed in the opening of the catch basin and functions as a filter. Maintenance of this shall be in compliance with the manufacturer's requirements. The Siltsack™ shall be emptied once filled to 2/3 capacity, rinsed at an appropriate location to release all fines, and reinstalled back in the catch basin. Care shall be taken to prevent puncture of the filter. A Siltsack™ showing signs of any tears, rips, or punctures shall be immediately repaired or replaced with a new Siltsack™.

5.1.7 Dewatering Practices

If during construction, site conditions dictate the need for dewatering, water will be pumped to a Dirt Bag™ or equal type of sediment removal system prior to discharge. Alternate systems must meet applicable sections of the 2017

CGP and NHDES requirements and be approved by the CER.

5.1.8 Concrete Washout

Concrete trucks shall not be allowed to wash out or discharge surplus concrete or drum wash water on site to uncontrolled areas. Efforts will be made to return excess material back to the plant. The designated washout locations will be established away from sensitive locations and will be stabilized. Areas will be reviewed and spoil will be crushed and recycled when needed. The concrete subcontractors may utilize concrete dumpsters with sand. The dumpsters will be removed when required and hauled off site.

5.1.9 Site Stabilization

Site stabilization shall be accomplished in accordance 2017 CGP, NHDES AoT requirements, and as noted on Sheet C-6.0.

SECTION 6: POLLUTION PREVENTION STANDARDS

6.1 Spill Prevention and Response

The CM is responsible for the proper cleanup of any accidental spills or leaks on site during construction. The necessary equipment and materials needed in the event of a spill or leak shall be kept on site. Do not clean surfaces or spills by hosing the area down. Containment, removal, and reporting of the spill shall be in conformance with all local, state and federal regulations. All spills shall be reported to the Town of Durham (and to NHDES if required).

6.2 Fueling and Maintenance of Equipment or Vehicles

Fueling of construction equipment will occur on paved surfaces when possible. A spill kit will be available during the refueling process. Fueling shall not be performed adjacent to surface water or stormwater collection BMP's. Refer to the 2017 CGP for additional information.

6.3 Washing of Equipment and Vehicles

All discharges from equipment or vehicle washing shall be collected in a filtration device such as a filter bag or temporary sediment pond with appropriate filtration.

6.4 Storage, Handling, and Disposal of Construction Products, Materials, and Wastes

6.4.1 Building Products

Building products which include but are not limited to asphalt sealants, adhesives, flashing, roofing materials and concrete admixtures shall be covered with plastic sheeting to prevent contact with rainwater or properly stored in enclosed containers. Wind blown building products and waste material will be pickup and disposed daily.

6.4.2 Establish Proper Building Material Staging Area

Construction equipment and maintenance materials will be stored at the combined staging area and materials storage areas. Silt sock or other appropriate erosion control measure will be installed around the perimeter to designate the staging and materials storage area. A watertight shipping container will be used to store hand tools, small parts, and other construction materials.

Nonhazardous building material such as packaging material (wood, glass, plastic) and construction scrap material (brick, wood, steel, metal scraps, and pipe cuttings) will be stored in a separate covered storage facility adjacent to the shipping container. All hazardous waste materials such as oil filters, petroleum products, paint and equipment fluids will be stored in structurally sound and sealed containers under cover within the hazardous material storage area. Very large items, such as framing materials and stockpiled lumber, will be stored in the open in the material storage area. Such material shall be elevated on wood blocks to minimize contact with runoff. The material storage area will be installed after demolition and grading and prior to the construction of infrastructure at the site. The storage area will be inspected weekly and after storm events. The storage will be kept clean and organized with proper functioning containment controls. The future parking lots and drive areas be utilized during construction for laydown and office trailer locations. Once the independent living unit wings is complete, the underground parking garages there will also aid in product storage for construction.

6.4.3 Pesticides, Herbicides, Insecticides, Fertilizers, and Landscape Materials

Pesticides, herbicides, insecticides, fertilizers, and landscape materials shall be covered with plastic sheeting to prevent contact with rainwater. Comply with all application and disposal requirements included on the registered pesticide, herbicide, insecticide, and fertilizer label.

6.4.4 Diesel Fuel, Oil, Hydraulic Fluids, Other Petroleum Products, and Other Chemicals

Chemicals shall be stored in water-tight containers, and covered with plastic sheeting to prevent these containers from coming into contact with rainwater. Spill kits shall be available in the event of a spill. Clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly. Do not clean surfaces or spills by hosing the area down. Eliminate the source of the spill to prevent a discharge or a continuation of an ongoing discharge.

6.4.5 Hazardous or Toxic Waste

Hazardous or toxic waste including but not limited to solvents, paints, and petroleum based products shall be stored in sealed containers, which are constructed of suitable materials to prevent leakage and corrosion, and which are labeled in accordance with applicable Resource Conservation and Recovery Act (RCRA) requirements and all other applicable federal, state, tribal, or local requirements. Containers shall be stored in a covered areas and a spill kit shall be available on site. Dispose of hazardous or toxic waste in accordance with the manufacturer's recommended method of disposal and in compliance with federal, state, tribal, and local requirements. Clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly. Do not clean surfaces or spills by hosing the area down. Eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge.

6.4.6 Construction and Domestic Waste.

All waste materials shall be recycled or collected and stored in secure metal dumpsters rented from a licensed solid waste management company in The State of New Hampshire. The dumpsters shall meet all local and state solid waste management regulations. All trash and construction debris generated on site shall be disposed of in the dumpsters. The dumpsters shall be emptied as often as necessary during construction and transferred to an approved solid waste facility licensed to accept municipal solid waste and/or construction and demolition debris. No construction waste shall be buried on site. All personnel shall be instructed regarding the correct procedure for waste disposal.

6.4.7 Sanitary Waste

Provide sufficient number of portable toilets and position portable toilets so that they are secure and will not be tipped or knocked over.

6.4.8 Washing of Applicators and Containers used for Paint, or Other Materials

Direct all wash water into a leak-proof container or leak-proof pit. The container or pit must be designed so that no overflows can occur due to inadequate sizing or precipitation. Locate pit or container as far away as possible from surface waters and stormwater inlets or conveyances, and, to the extent practicable, designate areas to be used for these activities and conduct such activities only in these areas. Liquid wastes will not be dumped in storm sewers.

6.5 Fertilizers

Fertilizer shall be applied during the planting of temporary or permanent vegetation at a rate consistent with manufacturer's specifications and those noted in the Construction Plans. To the extent practicable, fertilizer shall be applied to coincide as closely as possible to the period of maximum vegetation uptake and growth. Avoid applying before heavy rains that could cause excess nutrients to be discharged to surface waters. Never apply to frozen ground or to stormwater conveyance channels with flowing water. Follow all other federal, state, and local requirements regarding fertilizer application.

SECTION 7: CONSTRUCTION TRAFFIC AND PARKING MANAGEMENT PLAN

7.1 Objectives

To address traffic issues arising from construction of the project and to establish general guidelines and standards that address the issues.

7.2 Site Access and Deliveries

The CM will maintain two (2) entrances to the site from Stone Quarry Drive.

Construction gates will be chained and locked during non-working hours. Fire Department key boxes (locks) will be located at each gate and accessible to the Durham Police and Fire Departments.

Deliveries will be scheduled between the hours of 7:00AM and 4:00PM to avoid impact on traffic.

7.3 Construction Parking

The intent is to utilize as much of the site as possible for contractor parking but understanding site constraints, if contractor parking requirements cannot be met onsite, LECESSE will arrange for some offsite parking locations for workers to carpool to the jobsite.

7.4 Utility Tie-ins/Sidewalk Closures

When it is necessary to close down a sidewalk to perform our work, LECESSE will file for the appropriate permits with the DPW.

Street Closure: For operations that obstruct street traffic, traffic control will be coordinated with the Town of Durham, Department of Public Works, with a 48hr (2 business days) notification. Dig Safe and non-participating utilities will be notified as required. In addition, LECESSE and their Sitework Subcontractor will notify the Town once Dig Safe or non-participating utilities have been marked out the site and prior to any cut and cap, or connection activities.

Existing utilities to be abandoned will be cut and capped according to Town standards.

LECESSE and their site subcontractor will conduct a "Pre Utility Tie-in Meeting" with appropriate LECESE representatives, the site subcontractor, and the Town's DPW representative prior to starting any work activity in the Town's sidewalk or streets.

- Notification of the Pre Meeting will go out a minimum of two (2) weeks in advance of the scheduled meeting.
- Project plans, shop drawings, construction methods, schedule, and safety issues are reviewed during the meeting.
- Finalize and approve the Temporary Traffic/ Pedestrian Control Plan for Route 108
- Finalize and approve the final Detour and Signage Plans for Route 108

Temporary barriers, or barrels, signs, and uniformed officers will be used to manage pedestrian and traffic control.

The site contractor will supply LECESE with red line drawings on a monthly basis during construction to be maintained at the field office. Final "As Built" drawings will be supplied to LECESE at the end of the project. These will be presented to the Town on a CD at the completion of the project.

7.4 Traffic/Sidewalk Management

The site contractor will provide adequate personnel, signs, barricades and equipment to properly regulate traffic at times when the work interferes with the normal flow of traffic on Town streets. This will be done in accordance with the Manual of Uniform Traffic Control Devices (MUTCD) and performed according to NHDOT construction standards and the NHDOT Driveway Permit issued for the project. Prior to working in the street, LECESE will submit a traffic management plan reviewed and approved by the DPW, which includes signage and pedestrian detours. Any modification to sidewalks to accommodate the construction process shall comply with ADA requirements.

7.5 Temporary Facilities

Temporary Field Office Trailer(s) will be set up on the construction project site. All field office(s) will be equipped with power, telephone, computers, and fax. Visitor parking areas will be designated.

Emergency vehicle areas will be designated.

7.5 Materials Handling

Materials handling will be predominantly by forklift/lulls and mobile cranes operating generally throughout the site. Should any out of hours deliveries be required this will be handled within the site and be coordinated with the proper authorities prior to the delivery.

7.7 Signage

The CM will be responsible for providing the external directional signage & on-site signage regarding traffic management and the updating and maintenance of the signs as required. On-site signage will be used to ensure drivers use appropriate routes through the site and to and from the site access points.

SECTION 8: SWPPP INSPECTIONS AND CORRECTIVE ACTION

8.1 Inspection Personnel and Procedures

A qualified designee will perform routine and detailed stormwater inspections of the site during construction. These inspections shall assess conditions at the construction site covered in the CMP including, but not limited to, pollution prevention and stormwater quality impacts.

8.2 SWPPP Inspection Frequency

SWPPP inspection frequency will conform to the 2017 CGP and NHDES conditions of approval. At a minimum, inspections will be completed at the following frequency:

- Once every 7 calendar days; and
- Within 24 hours of the occurrence of a storm event of 0.25 inches or greater.

The frequency of inspections will be reduced to once per month for stabilized areas of the site. If construction activity resumes in this portion of the site at a later date, the inspection frequency immediately increases to that required above.

If earth-disturbing activities are suspended due to frozen conditions, the CM may temporarily suspend inspections at the site until thawing conditions begin to occur if:

- Runoff is unlikely due to continuous frozen conditions that are likely to continue at your site for at least 3 months. If unexpected weather conditions (such as above freezing temperatures or rain on snow events) make discharges likely, you must immediately resume your regular inspection frequency as described above.
- Land disturbances have been suspended; and
- All disturbed areas of the site have been temporarily or permanently stabilized.

8.3 Areas to be Inspected

During the site inspection, the following areas must be inspected:

- All areas that have been cleared, graded, or excavated and are not yet stabilized;
- All stormwater controls (including pollution prevention measures) installed at the site;
- Material, waste, borrow, or equipment storage and maintenance areas;
- All areas where stormwater typically flows within and off the site, including drainage ways designed to divert, convey, and/or treat stormwater;
- All locations where stabilization measures have been implemented;
- Temporary fencing;
- Parking areas and access ways.

8.4 Requirements for SWPPP Inspections

During the SWPPP site inspection, the SWPPP inspector must at a minimum:

- Confirm that all erosion and sediment controls and pollution prevention controls are installed, appear to be operational, and are working as intended to minimize pollutant discharges. Determine if any controls need to be replaced, repaired, or maintained.
- Check for the presence of conditions that could lead to spills, leaks, or other accumulations of pollutants on the site;
- Identify any locations where new or modified stormwater controls are necessary;
- At points of discharge and, if applicable, the banks of any surface waters flowing within your property boundaries or immediately adjacent to your property, check for signs of visible erosion and sedimentation (i.e., sediment deposits) that have occurred and are attributable to the construction work, and;

8.5 Inspection Reports

The SWPPP inspector must complete an inspection report documenting each site inspection. LECESSSE will keep a current copy of all inspection reports at the site and send the reports within 72 hours to the Town, the CER and the OAR. The SWPPP shall be updated accordingly to note changes to the site staging layout and stockpiles areas necessary during construction.

8.6 Corrective Actions

Corrective actions will be taken to:

- Repair, modify, or replace any stormwater control used at the site;
- Clean up and properly dispose of spills, releases, or other deposits;
- Implement noise reduction measures;
- Address safety or operational incidents.

8.7 Corrective Action Reports

For each corrective action the SWPPP inspector must complete a corrective action report. The CM is required to keep a current copy of all inspection and corrective action reports at the site. The report must contain the following:

- The nature of the condition identified; and
- The date and time of the condition identified;
- The nature of the corrective action implemented.

SECTION 9: Blasting, Hoe Ram and Rock Crushing

A detailed Blasting Hoe Ram, Rock Crushing Plan will be prepared and amended to this Construction Management Plan 21 days prior to commencement of construction. As a minimum, the plan will incorporate the standards delineated in the Town of Durham Site Plan Regulations, Part III, Article 3.8, Blasting and the NHDES AoT requirements.

APPENDICES (attached)

Article 2. Architectural Design Standards

Due to its size, Article 2, containing the Architectural Design Standards, is placed in an Appendix to these Site Plan Regulations. The Architectural Design Standards are part of the Site Plan Regulations and fully apply in like manner as other standards contained in the main body of these regulations.

Article 3. Construction Practices

Section 3.1	Commencement
Section 3.2	Construction Equipment
Section 3.3	Fire Access
Section 3.4	Hours of Activity
Section 3.5	Topsoil
Section 3.6	Protection of Trees and Other Vegetation During Construction
Section 3.7	Waste Materials
Section 3.8	Blasting

Section 3.1 Commencement

No site work, grading, nor removal of vegetation (except that necessary to establish the items that follow) shall commence until limits of clearing are established; construction fencing, when appropriate, is installed; and all erosion and sedimentation control devices are installed and stabilized.

Section 3.2 Construction Equipment

3.2.1 Construction equipment and materials shall be stored at least 25 feet away from drainage channels, unless other suitable measures, acceptable to the Department of Public Works, are implemented. Equipment and storage will be excluded from entering into shoreland and wetland setback areas.

3.3.2 If there will be any refueling or servicing of construction vehicles or equipment on site, provisions shall be made for this activity, including, as appropriate, fuel storage, secondary containment, spill cleanup, and management procedures. If not otherwise addressed as part of the Site Plan Review, when applicable, a plan addressing these procedures shall be provided to the Public Works Department when site work or building construction is commenced.

Section 3.3 Fire Access

Access into the site for fire apparatus shall be maintained at all times during the construction process.

Section 3.4 Hours of Activity

3.4.1 For any site where development activity would occur within 300 feet of any residential dwelling unit, outside construction is restricted to the following hours:

- between 7:00 a.m. and 6:00 p.m., Monday through Friday, and
- between 8:00 a.m. to 6:00 p.m., Saturday.

For blasting, chipping of stone, and use of hoe or rock hammers, hours are restricted to 9:00 a.m. to 4:00 p.m. Monday through Friday

3.4.2 The Planning Board may modify these hours, and when they apply, as appropriate.

Section 3.5 Topsoil

3.5.1 Unless otherwise approved by the Town, all stripped topsoil from the site shall be retained, stabilized in accordance with NHDES standards, and stockpiled on site for later reuse on site, unless otherwise approved by the Planning Board.

Section 3.6 Protection of Trees and Other Vegetation During Construction

3.6.1 Dead or declining trees that pose a high risk to people or property should be removed prior to the start of construction. Existing desirable trees and vegetated areas to save will be identified for protection. Trees to remove and trees to save will be identified by a certified arborist and approved by the Planning Board prior to the start of construction, and identified on planning documents.

3.6.2 For any sites one (1) acre or larger, during the development and construction process, wooded natural and non-wooded natural areas shall be managed to maintain a healthy vegetative cover to maintain the soil structure, minimize soil erosion and enhance the quality of the proposed community. In wooded natural areas, the healthy forest cover shall be retained to reduce the amount of stormwater running across the ground surface.

3.6.3 Limits of clearing shall be established in the field with construction fencing, wherever natural limits are not otherwise clearly identified. Trees to be protected during clearing operations and construction shall be protected with fencing at a distance from the tree of 1 foot per 1 inch of tree DBH. Example: a 10" tree has a circle with a 10' radius to protect the critical root zone. The Planning Board may reduce the size of this protection zone. The developer shall notify the Tree Warden in advance to ensure this occurs. Impacts outside of clearing limits shall be reestablished with native species at applicant's expense.

3.6.4 No construction activity shall occur within the critical root zone to avoid soil compaction and damage to the tree. This includes: Vehicles and equipment traffic and parking, stock piling of any supplies, soil, stone or any building materials, changing the grade, changing the drainage. If the full CRZ area cannot be fenced the Planning Board may reduce the size of the area; however other measures (see appendix) should be required for protection of the tree and root system.

3.6.5 Additional detailed recommended measures for protecting trees during construction are in Appendix A. When appropriate the Planning Board may require additional protection measures.

3.6.6 Trees on public property (or on a municipal right of way) must be protected, if they will be impacted by construction. If these trees are damaged or cannot be protected they will

be replaced with an appropriate number of trees as determined by the Planning Board. Depending on circumstances, as one option, the Planning Board could require that the total combined caliper of the replacement trees equal the DBH of the tree removed. Example: ten - 2" caliper trees could be required to replace one 20" DBH tree.

Section 3.7 Waste Materials

- 3.7.1 Construction site operators shall control and properly dispose of all on-site waste, including but not limited to cut trees, stumps, debris, junk, rubbish, discarded building materials, concrete truck washout, chemicals, litter, sanitary waste and other materials. These materials shall not be buried or left on the site unless specifically approved by the Durham Department of Public Works, and where appropriate, by NHDES.
- 3.7.2 If the development site is in close proximity to a waterbody, all stockpiles, concrete washout areas, chemicals, fertilizers, hazardous materials, etc., shall be located as far from the waterbody as possible and at a minimum of 50 feet away (75 feet in the case of a wetland setback area).
- 3.7.3 Applicants are encouraged to recycle materials generated during construction either for reuse by the applicant or for collection for recycling by third parties. Applicants are encouraged to coordinate with the Durham Department of Public Works for advice on what materials can be recycled in the local area, and for a list of firms accepting recyclables.

Section 3.8 Blasting

A Town of Durham Blasting Permit shall be obtained from the Durham Fire Department prior to conducting any blasting. A Blasting Permit shall be issued only after a Pre-Blast Structural Condition Survey and Blasting Plan has been performed. All blasting activities shall be conducted following the General Procedures and Best Management Practices, below.

- 3.8.1 Pre-Blast Structural Condition Survey and Blasting Plan. A minimum of 30 days prior to conducting any blasting, the applicant shall prepare a Pre-Blast Structural Condition Survey ("Survey") and Blasting Plan and submit them to the Durham Fire Department for review and approval. The approved Blasting Plan shall be implemented accordingly. The Survey shall include pre-blast structural condition inspections of all existing structures and conditions on the site, adjacent to the site or in the vicinity of the site. The Survey shall extend to such structures or conditions as may be affected by the applicant's construction operations and the inspections shall be performed on all structures (including homes, foundations, driveways, roadbeds, swimming pools, wells and mobile homes) within a radius of 250 feet (or as otherwise specified by the Planning Board) of the anticipated blasting areas. The blasting contractor and the owner of the property being inspected shall sign all such inspections once completed. If an owner refuses to allow for the conducting of a pre-blast conditions inspection or sign a pre-blast conditions inspection form for whatever reasons the applicant shall note this on the form. The blasting contractor shall make at least three attempts to notify the owner of the need for such inspections; the last such attempt shall include a written notification by certified mail and appropriate contact information.

- 3.8.2 The applicant shall conduct a Survey for any property located within 1,000 feet of the anticipated blasting areas, if so requested in writing by the property owner at least 7 days prior to the planned start of blasting. The property owner shall pay all expenses for preparing the survey.
- 3.8.3 The pre-blast structural condition inspection shall be performed in the presence of the property owner or an owner's representative and shall consist of photographs and a written description of the interior and exterior condition of each of the structures examined. Descriptions shall locate any existing cracks, damage, or other defects and shall include such information in order to make it possible to determine the effect, if any, of the construction operations on the defect. A good-quality videotape survey with appropriate audio description of locations, conditions, and defects may be used in lieu of a written form. Copies of all inspection forms and photographs shall be submitted to the Durham Fire Department and kept for a minimum of seven (7) years on file with the Durham Fire Department (unless the documentation cannot be provided to the Fire Department for some reason).
- 3.8.4 The individual conducting the inspections shall give written notice, not less than 10 days in advance, to the owner of the property concerned and tenants of the property. The notice shall state the dates on which inspections are to be made. Copies of all notices shall be provided to the Durham Fire Chief.
- 3.8.5 General Procedure. Blasting and on-site chipping or hammering (of stone) is restricted to the hours of 9:00 a.m. to 4:00 p.m. Monday through Friday. There shall be no processing of stone on site. A notice of intent to blast shall be provided at least 24 hours in advance via signage placed in places easily accessible to the public and via other media provided by the Town (such as the Town's website and Friday Updates). The applicant is encouraged (but not required) to do all blasting during the summer when the University of New Hampshire is out of session.
- 3.8.6 The applicant shall hold a meeting with members of the neighborhood prior to starting any blasting, at an appropriate time and place determined by the applicant. The applicant shall give a minimum of three days' advance notice of said meeting. The applicant shall notify:
- (a) all abutting property owners who were notified of the development at the outset;
 - (b) all parties whose property is located within 250 feet of any area where blasting will occur; and
 - (c) the Planning Department.
- 3.8.7 Best Management Practices for Blasting. All activities related to blasting shall be performed in accordance with the following New Hampshire Department of Environmental Services (NHDES) Blasting Best Management Practices (BMPs) to

prevent contamination of groundwater. These include preparing, reviewing and following an approved blasting plan; proper drilling, explosive handing and loading procedures; observing the entire blasting procedures; evaluating blasting performance; and handling and storage of blasted rock.

If the NHDES BMPs are updated subsequent to the adoption of these Site Plan Regulations, those subsequent BMPs shall become the standards.

- (a) Loading practices. The following blast hole loading practices to minimize environmental effects shall be followed:
- (1) Drilling logs shall be maintained by the driller and communicated directly to the blaster. The logs shall indicate depths and lengths of voids, cavities, and fault zones or other weak zones encountered as well as groundwater conditions.
 - (2) Explosive products shall be managed on site so that they are used in the borehole, returned to the delivery vehicle or placed in secure containers for off-site disposal.
 - (3) Spillage around the borehole shall either be placed in the borehole or cleaned up and returned to an appropriate vehicle for handling or placement in secured containers for offsite disposal.
 - (4) Loaded explosives shall be detonated as soon as possible and shall not be left in the blast holes overnight, unless weather or other safety concerns reasonably dictate that detonation should be postponed. In the event that detonation must be delayed, reasonable security measures shall be maintained.
 - (5) Loading equipment shall be cleaned in an area where wastewater can be properly contained and handled in a manner that prevents release of contaminants to the environment.
 - (6) Explosives shall be loaded to maintain good continuity in the column load to promote complete detonation. Industry accepted loading practices for priming, stemming, decking and column rise must be attended to.
- (b) Explosive Selection. The following BMPs shall be followed to reduce the potential for groundwater contamination when explosives are used:
- (1) Explosive products shall be selected that are appropriate for site conditions and safe blast execution.
 - (2) Explosive products shall be selected that have the appropriate water resistance for the site conditions present to minimize the potential for hazardous effect of the product upon groundwater.

- (c) Prevention of Misfires. Appropriate practices shall be developed and implemented to prevent misfires.
- (d) Muck Pile Management. Muck piles (the blasted pieces of rock) and rock piles shall be managed in a manner to reduce the potential for contamination by implementing the following measures:
 - (1) Remove the muck pile from the blast area as soon as reasonably possible.
 - (2) Manage the interaction of blasted rock piles and stormwater to prevent contamination of water supply wells or surface water.
- (e) Spill Prevention Measures and Spill Mitigation. Spill prevention and spill mitigation measures shall be implemented to prevent the release of fuel and other related regulated substances to the environment. The measures shall include at a minimum:
 - (1) Storage of fuel and other regulated substances requirements shall include at a minimum:
 - (i) Storage on an impervious surface;
 - (ii) Secure storage areas against unauthorized entry;
 - (iii) Label regulated containers clearly and visibly;
 - (iv) Inspect storage areas weekly;
 - (v) Cover regulated containers in outside storage areas;
 - (vi) Wherever possible, keep regulated containers that are stored outside more than 50 feet from surface water and storm drains, 75 feet from private wells, and 400 feet from public wells; and
 - (vii) Secondary containment is required for containers containing regulated substances stored outside, except for on premise use heating fuel tanks, or aboveground or underground storage tanks otherwise regulated.
 - (2) The handling of fuel and other regulated substances requirements shall include at a minimum:
 - (i) Except when in use, keep containers containing regulated substances closed and sealed;
 - (ii) Place drip pans under spigots, valves, and pumps;
 - (iii) Have spill control and containment equipment readily available in all work areas;
 - (iv) Use funnels and drip pans when transferring regulated substances; and
 - (v) Perform transfers of regulated substances over an impervious surface.

- (3) Training of on-site employees and the on-site posting of release response information describing what to do in the event of a spill of regulated substances.
- (4) Fueling and maintenance of excavation, earthmoving and other construction-related equipment will comply with the regulations of NHDES. [Note that these requirements are summarized in NHDES's publication WD-DWGB-22-6 "Best Management Practices for Fueling and Maintenance of Excavation and Earthmoving Equipment" or its successor document.]

3.8.8 Upon completion of all earth/rock excavation and blasting work, the applicant shall conduct a post-blast condition inspection of any properties, structures, and conditions for which complaints of damage have been received or damage claims have been filed. Notice shall be given to all interested parties so they may be present during the final inspection. Records of the final inspection shall be distributed in the same manner as the original pre-blast structural condition inspection.

- (3) The date of the notice of incompleteness or request for additional information in which the deadline for which an extension is being sought was established;
- (4) The deadline that was established;
- (5) A full explanation of why an extension is needed;
- (6) If the extension is not needed for all of the missing components or additional information, the specific item(s) to which the request applies; and
- (7) The alternative deadline proposed by the requestor.

(b) If the deadline extension does not apply to all of the missing components or additional information, the applicant shall submit the item(s) to which the request does not apply by the deadline originally established.

(c) The person(s) requesting the deadline extension shall sign the request as specified in Env-Wq 1503.10.

Env-Wq 1509.08 Criteria for Deadline Extensions.

(a) Subject to (d), below, the department shall extend a deadline for completing an application or submitting additional information if:

- (1) The applicant demonstrates that good cause to extend the deadline exists; and
- (2) A complete request for deadline extension was submitted prior to the established deadline.

(b) Good cause to extend a deadline shall be deemed to exist if:

- (1) In order to submit the missing component(s) or additional information, the applicant requires information from a third party not under the applicant's control, and the applicant has not received the information despite making diligent efforts to obtain it; or
- (2) The applicant has otherwise been prevented by circumstances beyond the applicant's control from obtaining or preparing the missing component(s) or additional information.

(c) The inability to obtain requisite information from a third party based on the applicant's failure to pay the third party for services rendered shall not constitute good cause to extend a deadline.

(d) A deadline shall not be extended for more than one year past the original date established in the notice of incompleteness or request for additional information.

Env-Wq 1509.09 Decision on Deadline Extension Requests.

(a) The department shall notify the person requesting the deadline extension of its decision in writing.

(b) If the request is denied, the department shall identify the specific reason(s) for the denial in the notice sent pursuant to (a), above.

(c) If the request is granted, the department shall establish the new deadline in the notice sent pursuant to (a), above.

PART Env-Wq 1510 BEST MANAGEMENT PRACTICES FOR BLASTING

Env-Wq 1510.01 Purpose. The purpose of this part is to establish best management practices for blasting to minimize the potential for groundwater contamination, to ensure that the groundwater can be used for existing and future drinking water supply sources.

Env-Wq 1510.02 Applicability. This part shall apply to all projects for which an AOT permit is required that will involve blasting of bedrock.

Env-Wq 1510.03 Loading Practices. The following blast hole loading practices shall be implemented:

- (a) The driller shall maintain drilling logs to document:
 - (1) The depths and lengths of voids, cavities, and fault zones or other weak zones encountered; and
 - (2) Groundwater conditions;
- (b) The driller shall communicate the contents of the drilling logs directly to the blaster;
- (c) Explosive products shall be managed on-site such that they are:
 - (1) Used in the borehole;
 - (2) Returned to the delivery vehicle; or
 - (3) Placed in secure containers for off-site disposal;
- (d) Spillage around the borehole shall be:
 - (1) Placed in the borehole; or
 - (2) Cleaned up and returned to an appropriate vehicle for handling or placement in secured containers for off-site disposal;
- (e) Loaded explosives shall be detonated as soon as possible and not left in the blast holes overnight, unless weather or other safety concerns reasonably dictate that detonation should be postponed;
- (f) Loading equipment shall be cleaned in an area where wastewater can be properly contained and handled in a manner that prevents release of contaminants to the environment; and
- (g) Explosives shall be loaded in accordance with industry standard practices for priming, stemming, decking and column rise to maintain good continuity in the column load to promote complete detonation.

Env-Wq 1510.04 Explosive Selection. Explosive products shall be selected that are:

- (a) Appropriate for site conditions and safe blast execution; and
- (b) Have the appropriate water resistance for the site conditions present.

Env-Wq 1510.05 Prevention of Misfires. Industry-standard practices shall be implemented to prevent misfires.

Env-Wq 1510.06 Muck and Rock Management.

- (a) For purposes of this part, the following definitions apply:
 - (1) “Blasted material” means all of the earth material loosened as a result of the blasting;
 - (2) “Muck” means the blasted material remaining after the rocks have been removed; and
 - (3) “Rocks” means the larger pieces of blasted material that are separated from the muck for use elsewhere, including for feedstock of a rock crushing operation.
- (b) Muck shall be removed from the blast area as soon as reasonably possible.
- (c) Rocks shall be managed so as to prevent water supply wells or surface waters from being contaminated by runoff.

Env-Wq 1510.07 Spill Prevention Measures and Spill Mitigation.

- (a) Fuel and other regulated substances shall be managed as required by Env-Wq 401.04.
- (b) Personnel working at the blast site shall be trained in how to respond to a spill of the regulated substances being used at the site.

Env-Wq 1510.08 Fueling and Maintenance of Construction Equipment.

(a) If any construction equipment, including but not limited to earthmoving, excavation, and boring equipment, will be fueled from a tank truck or other container that is moved around the site, the following shall apply:

- (1) Portable containment equipment that is sized to contain the most likely volume of fuel to be spilled during a fuel transfer shall be used, where the most likely volume to be spilled is determined based on the fuel transfer rate, the amount of fuel being transferred, the distance between the hose nozzle and pump shut off switch, and the response time of personnel and equipment available at the facility;
- (2) The containment equipment shall be positioned to catch any fuel spills due to overfilling the equipment and any other spills that might occur at or near the fuel filler port to that equipment;
- (3) The type of containment equipment used and its positioning and use shall account for all of the drip points associated with the fuel filling port and the hose from the fuel delivery truck; and
- (4) Personnel shall not leave the immediate area while fuel is being transferred, to ensure that any spills will be of limited volume.

(b) If the site will have a fixed location for fueling construction equipment, the following shall apply:

- (1) All fuel containers, including but not limited to skid-mounted tanks, drums, and five gallon cans, shall have secondary containment that:
 - a. Is capable of containing 110% of the volume of the largest fuel storage container; and
 - b. Has an impervious floor;
- (2) Secondary containment for tanks may comprise a metal, plastic, polymer or precast concrete vault providing 110 percent of the volume of the largest fuel storage container;
- (3) For fuel containers, secondary containment may comprise containment pallets;
- (4) The area where fuel is transferred shall be a flat, impervious area that:
 - a. Is adjacent to the fuel container(s); and
 - b. Extends beyond the full reach, or length, of the fuel hose; and
- (5) Secondary containment areas may be in the form of a basin that is:
 - a. Sloped down to a central low point or bermed along the perimeter;
 - b. Lined with a continuous sheet of 20 mil or thicker polymer material or appropriate geomembrane liner; and
 - c. Backfilled with at least 6 inches of sand.

APPENDIX A: STATE STATUTES IMPLEMENTED

Rule Section(s)	State Statute(s) Implemented
Env-Wq 1501	RSA 485-A:1; RSA 485-A:17
Env-Wq 1502	RSA 485-A:1; RSA 485-A:17
Env-Wq 1503	RSA 485-A:1; RSA 485-A:17
Env-Wq 1504	RSA 485-A:1; RSA 485-A:17
Env-Wq 1505	RSA 485-A:1; RSA 485-A:17
Env-Wq 1506	RSA 485-A:1; RSA 485-A:17
Env-Wq 1507	RSA 485-A:1; RSA 485-A:17
Env-Wq 1508	RSA 485-A:1; RSA 485-A:17
Env-Wq 1509	RSA 485-A:1; RSA 485-A:17; RSA 541-A:16, I(b); RSA 541-A:22, IV
Env-Wq 1510	RSA 485-A:1; RSA 485-A:17; RSA 485-C

APPENDIX B: INCORPORATED REFERENCES

Rule (Env-Wq)	Reference [Date/Edition]	How to Obtain
1503.03(d)(3)	Best Management Practices For Erosion Control During Trail Maintenance and Construction, NH Trail Construction and Maintenance Manual [January 2017]	NH Department of Resources and Economic Development, Division of Parks and Recreation, Bureau of Trails 172 Pembroke Road Concord, NH 03301 No cost to download from http://www.nhstateparks.org/uploads/pdf/BMP-Manual.pdf
1503.08(l)	2014 Science and Technical Advisory Panel Report, Sea-Level Rise, Storm Surges, and Extreme Precipitation in Coastal New Hampshire: Analysis of Past and Projected Future Trends	NH Coastal Risks and Hazards Commission Available at no cost at http://www.nhcrhc.org/stap-report/
1503.11(f)(2)	Trip Generation Manual [9th Edition, 2012]	Institute of Transportation Engineers 1627 Eye Street, NW, Suite 600 Washington, DC 20006 USA Telephone: 202-785-0060 ite_staff@ite.org Can be ordered for \$325 (members) or \$500 (non-members) at http://ecommerce.ite.org/IMIS/ItemDetail?iProductCode=IR-016G
		U.S. Department of Agriculture, Natural Resources Conservation Service https://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/
1504.09(b) intro	WinTR-20 [version 3.10]	No cost to download from https://www.nrcs.usda.gov/wps/portal/nrcs/detail/full/null/?cid=stelprdb1042793
1504.09(b) intro	National Engineering Handbook, Part 630, Hydrology Chapters [November 2015]	No cost to download from https://www.nrcs.usda.gov/wps/portal/nrcs/detail/full/?cid=stelprdb1043063

THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR: APPROVAL

ISSUE DATE: OCTOBER 16, 2017

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	JKC	7/19/17
1	PB RE-SUBMISSION	JKC	10/06/17
2	PB RE-SUBMISSION	JKC	10/16/17

DRAWN BY: _____ RMB
APPROVED BY: _____ JKC
DRAWING FILE: 4836SITE.DWG

SCALE: 1" = 50'

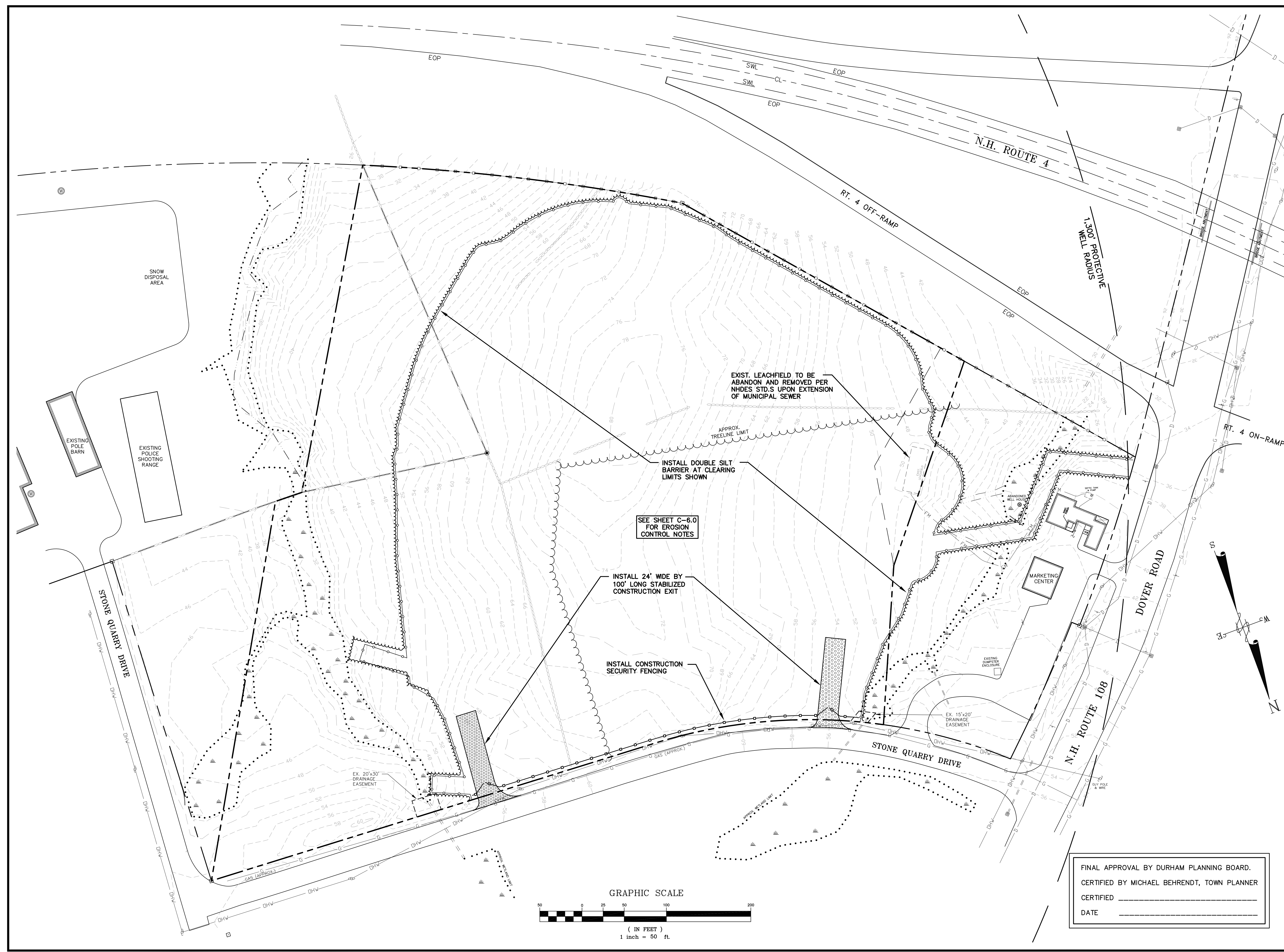
LAND OWNER - SUBJECT PARCEL:
ROCKINGHAM PROPERTIES 1, LTD
P.O. BOX 423
BELMONT, MA 02178

APPLICANT:
THE RIVERWOODS GROUP
7 RIVERWOODS DRIVE
EXETER, NH 03833

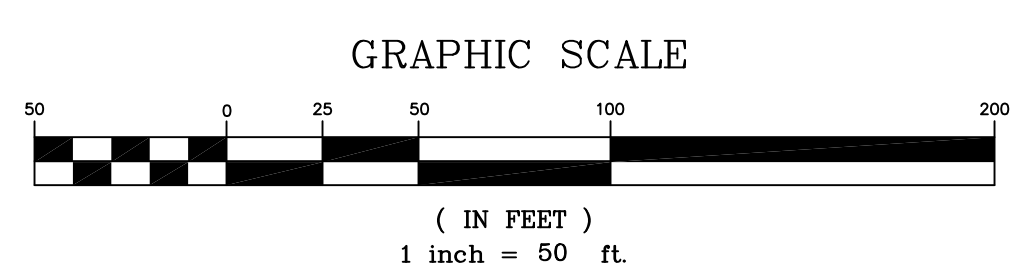
PROJECT:
RIVERWOODS DURHAM
STONE QUARRY DRIVE
DURHAM, NH

TITLE:
SITE PREPARATION PLAN

SHEET NUMBER:
C - 1.0



FINAL APPROVAL BY DURHAM PLANNING BOARD.
CERTIFIED BY MICHAEL BEHRENDT, TOWN PLANNER
CERTIFIED _____
DATE _____



SEDIMENT AND EROSION CONTROL NOTES

PROJECT NAME AND LOCATION

RIVERWOODS DURHAM
TAX MAP 11 LOT 8-1 TO 8-15
STONE QUARRY DRIVE
DURHAM, NEW HAMPSHIRE

LATITUDE: 043° 08' 20" N
LONGITUDE: 070° 54' 35" W

APPLICANT:
THE RIVERWOODS GROUP
C/O JUSTINE VOGEL, CEO
7 RIVERWOODS DRIVE
EXETER, NEW HAMPSHIRE 03833

DESCRIPTION

The project consists of the construction of a Continuing Care Retirement Community with associated site and utility improvements.

DISTURBED AREA

The total area to be disturbed is approximately 330,540 square feet or 7.6 acres.

NPDES CONSTRUCTION GENERAL PERMIT

Contractor shall prepare a Stormwater Pollution Prevention Plan (SWPPP) in accordance with federal storm water permit requirements. The SWPPP must be prepared in a format acceptable to the Owner and three (3) copies provided to the Town at least fourteen (14) days prior to initiating construction. Contractor is responsible for all cost associated with preparation and implementation of SWPPP including any temporary erosion control measures (whether indicated or not on these drawings) as required for the contractor's sequence of activities.

The Contractor and Owner shall each file a Notice of Intent (NOI) with the U.S.E.P.A. under the NPDES Construction General Permit. (U.S.E.P.A., 1200 Pennsylvania Avenue NW, Washington, DC 20460) All work shall be in accordance with NPDES General Permit: NHR120000, including NOI requirements, effluent limitations, standards and management for construction.

The Contractor shall be responsible for obtaining a USEPA Construction Dewatering Permit, if required.

NAME OF RECEIVING WATER

Closed drainage system draining into unnamed wetlands and water course flowing to Oyster River.

TEMPORARY EROSION & SEDIMENT CONTROL AND STABILIZATION PRACTICES

All work shall be in accordance with state and local permits. Work shall conform to the practices described in the "New Hampshire Stormwater Manual, Volumes 1 - 3", issued December 2008, as amended. As indicated in the sequence of Major Activities, the silt fences shall be installed prior to commencing any clearing or grading of the site. Structural controls shall be installed concurrently with the applicable activity. Once construction activity ceases permanently in an area, silt fences and any earth/dikes will be removed once permanent measures are established.

During construction, runoff will be diverted around the site with stabilized channels where possible. Sheet runoff from the site shall be filtered through hay bale barriers, stone check dams, and silt fences. All storm drain inlets shall be provided with hay bale filters or stone check dams. Stone rip rap shall be provided at the outlets of drain pipes and culverts where shown on the drawings.

Stabilize all ditches, swales, stormwater ponds, level spreaders and their contributing areas prior to directing flow to them.

Temporary and permanent vegetation and mulching is an integral component of the erosion and sedimentation control plan. All areas shall be inspected and maintained until vegetative cover is established. These control measures are essential to erosion prevention and also reduce costly rework of graded and shaped areas.

Temporary vegetation shall be maintained in these areas until permanent seeding is applied. Additionally, erosion and sediment control measures shall be maintained until permanent vegetation is established.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES

A. GENERAL

These are general inspection and maintenance practices that shall be used to implement the plan:

- The smallest practical portion of the site shall be denuded at one time, but in no case shall it exceed 5 acres at one time.
- All sediment control measures shall be inspected at least once each week and following any storm event of 0.5 inches or greater. A SWPPP inspection report shall be made after each inspection by a qualified inspector engaged by the Contractor. The qualified inspector shall be a Professional Engineer licensed in New Hampshire or be a Certified Professional in Erosion and Sediment Control approved by the Owner. Corrective actions shall be performed to address unacceptable level of turbidity as defined by the Construction General Permit and NHDES requirements.
- All measures shall be maintained in good working order; if a repair is necessary, it will be initiated within 24 hours.
- Built-up sediment shall be removed from silt fence or other barriers when it has reached one-third the height of the tubular barrier or bale, or when "bulges" occur in silt fence.
- All diversion dikes shall be inspected and any breaches promptly repaired.
- Temporary seeding and planting shall be inspected for bare spots, washouts, and unhealthy growth.
- The owner's authorized engineer shall inspect the site on a periodic basis to review compliance with the plans.
- The Contractor's site superintendent shall be responsible for maintenance and repair of erosion control practices.
- Perimeter controls shall be installed prior to earth moving operations.
- All ditches and swales shall be stabilized prior to directing runoff to them.
- All cut and fill slopes shall be seeded/loomed within 72 hours of achieving finished grade.
- An area shall be considered stable if one of the following has occurred:
 - Base course gravels have been installed in areas to be paved;
 - A minimum of 85% vegetated growth as been established;
 - A minimum of 3 inches of non-erosive material such as stone or riprap has been installed; or
 - Erosion control blankets have been properly installed.
- The length of time of exposure of area disturbed during construction shall not exceed 45 days.

B. MULCHING

Mulch shall be used on highly erodible soils, on critically eroding areas, on areas where conservation of moisture will facilitate plant establishment, and where shown on the plans.

- Timing - In order for mulch to be effective, it must be in place prior to major storm events. There are two (2) types of standards which shall be used to assure this:
 - Apply mulch prior to any storm event. This is applicable when working within 100 feet of wetlands. It will be necessary to closely monitor weather predictions, usually by contacting the National Weather Service in Concord, to have adequate warning of significant storms.
 - Required Mulching within a specified time period. The time period can range from 21 to 28 days of inactivity on an area, the length of time varying with site conditions. Professional judgment shall be used to evaluate the interaction of site conditions (soil erodibility, season of year, extent of disturbance, proximity to sensitive resources, etc.) and the potential impact of erosion on adjacent areas to choose an appropriate time restriction.

INSTALLATION, MAINTENANCE AND INSPECTION PROCEDURES FOR TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES (CON'T)

2. Guidelines for Winter Mulch Application -

Type	Rate per 1,000 s.f.	Use and Comments
Hay or Straw	70 to 90 lbs.	Must be dry and free from mold. May be used with plantings.
Wood Chips or	460 to 920 lbs.	Used mostly with trees
Bark Mulch		and shrub plantings.
Jute and Fibrous Matting (Erosion Blanket)	As per manufacturer Specifications	Used in slope areas, water courses and other control areas.
Crushed Stone 1/4" to 1-1/2" dia.	Spread more than 1/2" thick	Effective in controlling wind and water erosion.
Erosion Control Mix	2" thick (min)	<ul style="list-style-type: none"> The organic matter content is between 80 and 100%, dry weight basis. Particle size by weight is 100% passing a 6" screen and a minimum of 70 % maximum of 85% passing a 0.75" screen. The organic portion needs to be fibrous and elongated. Large portions of silts, clays or fine sands are not acceptable in the mix. Soluble salts content is less than 4.0 mmhos/cm. The pH should fall between 5.0 and 8.0.

- Maintenance - All mulches must be inspected periodically, in particular after rainstorms, to check for rill erosion. If less than 90% of the soil surface is covered by mulch, additional mulch shall be immediately applied.

C. TEMPORARY GRASS COVER

- Seedbed Preparation - Apply Fertilizer (refer to Landscape Drawings and Specs)
- Seeding -
 - Utilize annual rye grass at a rate of 40 lbs./acre.
 - Where the soil has been compacted by construction operations, loosen soil to a depth of two (2) inches before applying fertilizer, lime and seed.
 - Apply seed uniformly by hand, cyclone seeder, or hydroseeder (slurry including seed and fertilizer). Hydroseedings, which include mulch, may be left on soil surface. Seeding rates must be increased 10% when hydroseeding.
- Maintenance - Temporary seedings shall be periodically inspected. At a minimum, 95% of the soil surface should be covered by vegetation. If any evidence of erosion or sedimentation is apparent, repairs shall be made and other temporary measures used in the interim (mulch, filter barriers, check dams, etc.).

D. FILTERS

- Tubular Sediment Barrier
 - See detail.
 - Install per manufacturer's requirements.
- Silt Fence (if used)
 - Synthetic filter fabric shall be a pervious sheet of propylene, nylon, polyester or ethylene yarn and shall be certified by the manufacturer or supplier as conforming to the following requirements:

Physical Property	Test	Requirements
Filtering Efficiency	VTM-51	75% minimum
Tensile Strength at 20% Maximum Elongation*	VTM-52	Extra Strength 50 lb/lin in (min) Standard Strength 30 lb/lin in (min)
Flow Rate	VTM-51	0.3 gal/sf/min (min)

 - * Requirements reduced by 50 percent after six (6) months of installation.
 Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizer to provide a minimum of six (6) months of expected usable construction life at a temperature range of 0 degrees F to 120° F.

Posts shall be spaced a maximum of ten (10) feet apart at the barrier location or as recommended by the manufacturer and driven securely into the ground (minimum of 16 inches).

- A trench shall be excavated approximately six (6) inches wide and eight (8) inches deep along the line of posts and upslope from the barrier.
- When standard strength filter fabric is used, a wire mesh support fence shall be fastened securely to the upslope side of the posts using heavy duty wire staples at least one (1) inch long, tie wires or hog rings. The wire shall extend no more than 36 inches above the original ground surfaces.
- The "standard strength" filter fabric shall be stapled or wired to the fence, and eight (8) inches of the fabric shall be extended into the trench. The fabric shall not extend more than 36 inches above the original ground surface. Filter fabric shall not be stapled to existing trees.
- When extra strength filter fabric and closer post spacing are used, the wire mesh support fence may be eliminated. In such a case, the filter fabric is stapled or wired directly to the posts with all other provisions of item (g) applying.
- The trench shall be backfilled and the soil compacted over the filter fabric.
- Silt fences shall be removed when they have served their useful purpose but not before the upslope areas has been permanently stabilized.

- Sequence of Installation - Sediment barriers shall be installed prior to any soil disturbance of the contributing upslope drainage area.
- Maintenance -
 - Silt fence barriers shall be inspected immediately after each rainfall and at least daily during prolonged rainfall. They shall be repaired if there are any signs of erosion or sedimentation below them. Any required repairs shall be made immediately. If there are signs of undercutting at the center or the edges, or impounding of large volumes of water, the sediment barriers shall be replaced with a temporary stone check dam.
 - Should the fabric on a silt fence or filter barrier decompose or become ineffective prior to the end of the expected usable life and the barrier still is necessary, the fabric shall be replaced promptly.
 - Sediment deposits must be removed when deposits reach approximately one-third (1/3) the height of the barrier.
 - Any sediment deposits remaining in place after the silt fence or other barrier is no longer required shall be removed. The area shall be prepared and seeded.
 - Additional stone may have to be added to the construction entrance, rock barrier and riprap lined swales, etc., periodically to maintain proper function of the erosion control structure.

E. PERMANENT SEEDING -

- Bedding - stones larger than 1 1/2", trash, roots, and other debris that will interfere with seeding and future maintenance of the area should be removed. Where feasible, the soil should be tilled to a depth of 6" to prepare a seedbed and mix fertilizer (refer to Landscape Drawings and Specifications) into the soil.
- Fertilizer (refer to Landscape Drawings and Specifications) - lime and fertilizer should be applied

evenly over the area prior to or at the time of seeding and incorporated into the soil. Kinds and amounts of lime and fertilizer should be based on an evaluation of soil tests.

- Seed Mixture (See Landscape Drawings for additional information):
 - Lawn seed mix shall be a fresh, clean new seed crop. The Contractor shall furnish a dealer's guaranteed statement of the composition of the mixture and the percentage of purity and germination of each variety.
 - Seed mixture shall conform to landscape specifications
- Sodding - sodding is done where it is desirable to rapidly establish cover on a disturbed area. Sodding an area may be substituted for permanent seeding procedures anywhere on site. Bed preparation, fertilizing, and placement of sod shall be performed according to the S.C.S. Handbook. Sodding is recommended for steep sloped areas, areas immediately adjacent to sensitive water courses, easily erodible soils (fine sand/silt), etc.

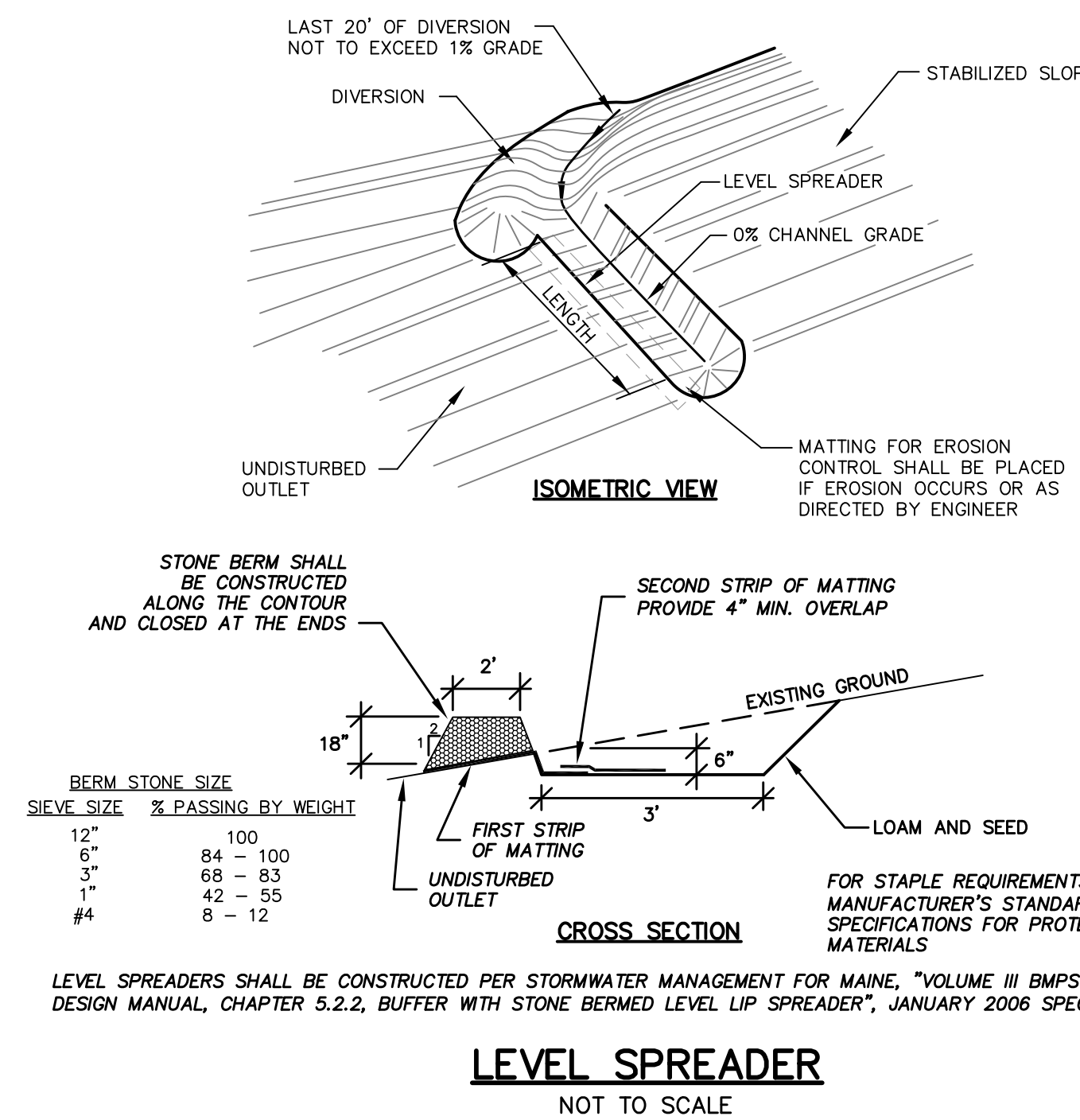
WINTER CONSTRUCTION NOTES

- All proposed vegetated areas which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized by seeding and installing erosion control blankets on slopes greater than 3:1, and elsewhere seeding and placing 3 to 4 tons of mulch per acre, secured with anchored netting. The installation of erosion control blankets or mulch and netting shall not occur over accumulated snow or on frozen ground and shall be completed in advance of thaw or spring melt events;
- All ditches or swales which do not exhibit a minimum of 85% vegetative growth by October 15th, or which are disturbed after October 15th, shall be stabilized temporarily with stone or erosion control blankets appropriate for the design flow conditions; and
- After November 15th, incomplete road or parking surfaces where work has stopped for the winter season shall be protected with a minimum of 3 inches of crushed gravel per NHDOT Item 304.3.

HOUSEKEEPING

The following general performance standards apply to the proposed project both during and after construction.

- Spill prevention:** Controls must be used to prevent pollutants from being discharged from materials and equipment on-site, including storage practices to minimize exposure of the materials to stormwater, and appropriate spill prevention, containment, and response planning and implementation.
- Groundwater protection:** 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 and other relevant factors, accumulates runoff that infiltrates into the soil. Dikes, berms, sumps, and other forms of secondary containment that prevent discharge to groundwater may be used to isolate portions of the site for the purposes of storage and handling of these materials.
- Fugitive sediment and dust:** Actions must be taken to insure that activities do not result in noticeable erosion of soils or fugitive dust emissions during or after construction. Oil may not be used for dust control.
- Debris and other materials:** Litter, construction debris, and chemicals exposed to stormwater must be prevented from becoming a pollutant source.
- Trench or foundation dewatering:** Trench dewatering is the removal of water from trenches, foundations, cofferdams, ponds, and other areas within the construction area that retain water after excavation. In most cases, the collected water is heavily silted and hinders correct and safe construction practices. The collected water must be removed from the ponded area, either through gravity or pumping, and must be spread through natural wooded buffers or removed to areas that are specifically designed to collect the maximum amount of sediment possible, like a cofferdam sedimentation basin. Avoid allowing the water to flow over disturbed areas of the site. Equivalent measures may be taken if approved.



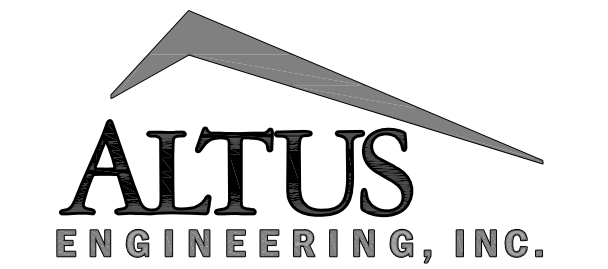
LEVEL SPREADERS SHALL BE CONSTRUCTED PER STORMWATER MANAGEMENT FOR MAINE, "VOLUME III BMP'S TECHNICAL DESIGN MANUAL, CHAPTER 5.2.2, BUFFER WITH STONE BERMED LEVEL LIP SPREADER", JANUARY 2006 SPECIFICATIONS.

LEVEL SPREADER

NOT TO SCALE

	Spring	Fall or Yearly	After Major Storm
Inspect all slopes and embankments	x		x
Replant bare areas or areas with sparse growth	x		x
Armor areas with rill erosion with an appropriate lining or divert the erosive flows to on-site areas able to withstand concentrated flows.	x		x
Inspect ditches, swales and other open stormwater channels	x	x	x
Remove any obstructions and accumulated sediments or debris	x	x	
Control vegetated growth and woody vegetation		x	
Repair any erosion of the ditch lining		x	
Mow vegetated ditches		x	
Remove woody vegetation growing through riprap		x	
Repair any slumping side slopes		x	
Replace riprap where underlying filter fabric or underdrain gravel is exposed or where stones have been dislodged		x	
Remove accumulated sediments and debris at inlet, outlet and within the conduit	x	x	x
Repair any erosion damage at the culvert's inlet and outlet	x	x	x
Remove woody vegetation growing through riprap		x	
Remove accumulated winter sand along roadways		x	
Sweep pavement to remove sediment		x	
Grade road shoulders and remove excess sand either manually or by a front-end loader		x	
Grade gravel roads and gravel shoulders		x	
Clean out sediment contained in water bars or open-top culverts		x	
Ensure that stormwater is not impeded by accumulations of material or false ditches in the roadway shoulder	x		
Mow grass swales monthly			
Inspect swale following significant rainfall event	x	x	x
Control vegetated growth and woody vegetation		x	
Repair any erosion of the ditch		x	
Remove debris and litter as necessary			
Eliminate potential source of unwanted sediment		x	
Routine Quarterly Vacuum Sweeping		x	
The use of sand in winter is prohibited			

NOTE:
ALL FACILITIES SHOULD BE INSPECTED ON AN ANNUAL BASIS AT A MINIMUM. IN ADDITION, ALL FACILITIES SHOULD BE INSPECTED AFTER A SIGNIFICANT PRECIPITATION EVENT TO ENSURE THE FACILITY IS DRAINING APPROPRIATELY AND TO IDENTIFY ANY DAMAGE THAT OCCURRED AS A RESULT OF THE INCREASED RUNOFF. FOR THE PURPOSE OF THIS STORMWATER MANAGEMENT PROGRAM, A SIGNIFICANT RAINFALL EVENT IS CONSIDERED AN EVENT OF THREE (3) INCHES IN A 24-HOUR PERIOD OR 0.5 INCHES IN A ONE-HOUR PERIOD. IT IS ANTICIPATED THAT A SHORT, INTENSE EVENT IS LIKELY TO HAVE A HIGHER POTENTIAL OF EROSION FOR THIS SITE THAN A LONGER, HIGH VOLUME EVENT.



133 COURT STREET PORTSMOUTH, NH 03801
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THIS DRAWING HAS NOT BEEN RELEASED FOR CONSTRUCTION

ISSUED FOR: REVIEW

ISSUE DATE: NOVEMBER 15, 2017

NO.	DESCRIPTION	BY	DATE
0	INITIAL SUBMISSION	JKC	7/19/17
1	PB RE-SUBMISSION	JKC	10/16/17

DRAWN BY: RMB
APPROVED BY: JKC
DRAWING FILE: 4836DS.DWG

SCALE: N.T.S.

LAND OWNER - SUBJECT PARCEL:

ROCKINGHAM PROPERTIES 1, LTD

P.O. BOX 423
BELMONT, MA 02178

APPLICANT:
THE RIVERWOODS GROUP
7 RIVERWOODS DRIVE
EXETER, NH 03833

PROJECT:
RIVERWOODS DURHAM
STONE QUARRY DRIVE
DURHAM, NH

TITLE:

EROSION CONTROL NOTES

SHEET NUMBER:

C - 6.0

FINAL APPROVAL BY DURHAM PLANNING BOARD.
CERTIFIED BY MICHAEL BEHRENDT, TOWN PLANNER
CERTIFIED _____
DATE _____