STORMWATER REPORT

for

MULTI-FAMILY RESIDENTIAL PROJECT -SITE IMPROVEMENTS

2 School Street (aka 2 Brookfield Road) & 602 Main Street Sturbridge, MA

Prepared for:

(Owner/Applicant) STL Group, LLC PO Box 638, Sturbridge, MA 01566

Date:

September 28, 2021

Revised October 22, 2021

Prepared By:



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Electronically stamped by Michael Andrade, P.E: 10/22/21 Site Improvements 2 School St. & 602 Main Street STL Group, LLC

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NARRATIVE

Project Description

Site Location:	Multi-Family Residential Project - Site Improvements
	2 School Street (aka 2 Brookfield Road) & 602 Main Street, Sturbridge, MA

Development Type: Multi-Family Residential

Project Summary:

The proposed project consists of conversion of a former restaurant building into multi-family residential and construction of a new, separate multi-family residential building. Existing surface parking lots will be reconfigured to accommodate the new uses.

Existing drainage patterns will remain however to the maximum extent practicable, stormwater improvements will be made in conjunction with that of a Redevelopment Project per the MassDEP Stormwater Management Standards.

Existing Site Conditions

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Location:	The project site is located at 2 School Street (main building site) and 602 Main Street (parking lot).	
Ground Cover:	The ground cover in the project area is mostly impervious surfaces (roof and pavement), compacted gravel, riprap slopes, brush, lawn and light woods.	
Slopes:	Both properties generally slope from north to south towards Main Street.	
Soil Types:	Site soil types as mapped by the USDA-NRCS are Paxton fine sandy loam, (map unit symbol 305B). These soils are classified as hydrologic soil group (HSG) "C". Refer to Appendix D for more detailed USDA-NRCS soil information; no on-site soil testing has been performed.	

HYDROLOGY CALCULATIONS

As the project will result in a net reduction in impervious surfaces, it is under MassDEP Stormwater Management considered a Redevelopment Project. In this case, hydrology calculations are not required as 1) there will be no increase in peak rate of runoff from the site due to the reduction of impervious surfaces and 2) the existing drainage patterns on the site will remain unchanged.

STORMWATER MANAGEMENT

To demonstrate compliance with MassDEP Stormwater Management, we offer the following in response to each of the 10 Standards. Note that a Redevelopment Project requires that project meet Standards 2, 3, and the pretreatment and structural stormwater best management practice requirements of Standards 4, 5, and 6 to the <u>maximum extent practicable</u>.

Drain Outfall Riprap Sizing Calculations (Stormwater Management Standard 1)

There are no new proposed drain outfalls as part of this project.

Peak Rate Attenuation (Stormwater Management Standard 2)

Due to the reduction of impervious surfaces, there is no increase in peak rate of runoff from the site thus no attenuation is required. Both properties have been designed with stone-filled infiltration trenches along the downgradient edge of pavement to slow runoff exiting the site.

Recharge to Groundwater (Stormwater Management Standard 3)

Recharge to groundwater will be slightly increased solely due to the proposed reduction of site impervious surfaces. Further, both properties have been designed with stone-filled infiltration trenches along the downgradient edge of pavement to provide some capture volume for recharge to the groundwater table.

Water Quality Calculations (Stormwater Management Standard 4)

Water quality treatment for runoff leaving the site will be improved by means of the proposed grass filter strip and stone-filled infiltration trenches.

Higher Potential Pollutant Loads (Stormwater Management Standard 5)

The site is not classified as a land use with a higher potential pollutant load (LUHPPL).

Protection of Critical Areas (Stormwater Management Standard 6)

The site does not discharge to a critical area.

Redevelopment Projects (Stormwater Management Standard 7)

The site is considered a redevelopment project as there is a proposed net reduction of impervious surfaces.

Erosion/Sediment Control (Stormwater Management Standard 8)

Site development plans provide details for erosion and sediment control during construction.

Operation/Maintenance Plan (Stormwater Management Standard 9)

Refer to the attached Long-Term Drainage System Operation & Maintenance Plan.

Illicit Discharge Compliance Statement (Stormwater Management Standard 10)

There are no existing illicit discharges to GEI or the owner's knowledge and there are no proposed illicit discharges. There are no cross-connections between the stormwater system and the wastewater system and discharges to each will remain separate; these systems are shown on the project drawings to the extent that they are known.

APPENDIX A

MASSDEP STORMWATER REPORT CHECKLIST



Massachusetts Department of Environmental Protection Bureau of Resource Protection - Wetlands Program Checklist for Stormwater Report

A. Introduction

Important: When filling out forms on the computer, use only the tab key to move your cursor - do not use the return key.



A Stormwater Report must be submitted with the Notice of Intent permit application to document compliance with the Stormwater Management Standards. The following checklist is NOT a substitute for the Stormwater Report (which should provide more substantive and detailed information) but is offered here as a tool to help the applicant organize their Stormwater Management documentation for their Report and for the reviewer to assess this information in a consistent format. As noted in the Checklist, the Stormwater Report must contain the engineering computations and supporting information set forth in Volume 3 of the Massachusetts Stormwater Handbook. The Stormwater Report must be prepared and certified by a Registered Professional Engineer (RPE) licensed in the Commonwealth.

The Stormwater Report must include:

- The Stormwater Checklist completed and stamped by a Registered Professional Engineer (see page 2) that certifies that the Stormwater Report contains all required submittals.¹ This Checklist is to be used as the cover for the completed Stormwater Report.
- Applicant/Project Name
- Project Address
- Name of Firm and Registered Professional Engineer that prepared the Report
- Long-Term Pollution Prevention Plan required by Standards 4-6
- Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan required by Standard 8²
- Operation and Maintenance Plan required by Standard 9

In addition to all plans and supporting information, the Stormwater Report must include a brief narrative describing stormwater management practices, including environmentally sensitive site design and LID techniques, along with a diagram depicting runoff through the proposed BMP treatment train. Plans are required to show existing and proposed conditions, identify all wetland resource areas, NRCS soil types, critical areas, Land Uses with Higher Potential Pollutant Loads (LUHPPL), and any areas on the site where infiltration rate is greater than 2.4 inches per hour. The Plans shall identify the drainage areas for both existing and proposed conditions at a scale that enables verification of supporting calculations.

As noted in the Checklist, the Stormwater Management Report shall document compliance with each of the Stormwater Management Standards as provided in the Massachusetts Stormwater Handbook. The soils evaluation and calculations shall be done using the methodologies set forth in Volume 3 of the Massachusetts Stormwater Handbook.

To ensure that the Stormwater Report is complete, applicants are required to fill in the Stormwater Report Checklist by checking the box to indicate that the specified information has been included in the Stormwater Report. If any of the information specified in the checklist has not been submitted, the applicant must provide an explanation. The completed Stormwater Report Checklist and Certification must be submitted with the Stormwater Report.

¹ The Stormwater Report may also include the Illicit Discharge Compliance Statement required by Standard 10. If not included in the Stormwater Report, the Illicit Discharge Compliance Statement must be submitted prior to the discharge of stormwater runoff to the post-construction best management practices.

² For some complex projects, it may not be possible to include the Construction Period Erosion and Sedimentation Control Plan in the Stormwater Report. In that event, the issuing authority has the discretion to issue an Order of Conditions that approves the project and includes a condition requiring the proponent to submit the Construction Period Erosion and Sedimentation Control Plan before commencing any land disturbance activity on the site.



B. Stormwater Checklist and Certification

The following checklist is intended to serve as a guide for applicants as to the elements that ordinarily need to be addressed in a complete Stormwater Report. The checklist is also intended to provide conservation commissions and other reviewing authorities with a summary of the components necessary for a comprehensive Stormwater Report that addresses the ten Stormwater Standards.

Note: Because stormwater requirements vary from project to project, it is possible that a complete Stormwater Report may not include information on some of the subjects specified in the Checklist. If it is determined that a specific item does not apply to the project under review, please note that the item is not applicable (N.A.) and provide the reasons for that determination.

A complete checklist must include the Certification set forth below signed by the Registered Professional Engineer who prepared the Stormwater Report.

Registered Professional Engineer's Certification

I have reviewed the Stormwater Report, including the soil evaluation, computations, Long-term Pollution Prevention Plan, the Construction Period Erosion and Sedimentation Control Plan (if included), the Longterm Post-Construction Operation and Maintenance Plan, the Illicit Discharge Compliance Statement (if included) and the plans showing the stormwater management system, and have determined that they have been prepared in accordance with the requirements of the Stormwater Management Standards as further elaborated by the Massachusetts Stormwater Handbook. I have also determined that the information presented in the Stormwater Checklist is accurate and that the information presented in the Stormwater Report accurately reflects conditions at the site as of the date of this permit application.

Registered Professional Engineer Block and Signature



Electronically stamped by Michael Andrade, PE: 10/22/21

Signature and Date

Checklist

Project Type: Is the application for new development, redevelopment, or a mix of new and redevelopment?

New development



Mix of New Development and Redevelopment



LID Measures: Stormwater Standards require LID measures to be considered. Document what environmentally sensitive design and LID Techniques were considered during the planning and design of the project:

	No disturbance to any Wetland Resource Areas
	Site Design Practices (e.g. clustered development, reduced frontage setbacks)
\boxtimes	Reduced Impervious Area (Redevelopment Only)
	Minimizing disturbance to existing trees and shrubs
	LID Site Design Credit Requested:
	Credit 1
	Credit 2
	Credit 3
\boxtimes	Use of "country drainage" versus curb and gutter conveyance and pipe
	Bioretention Cells (includes Rain Gardens)
	Constructed Stormwater Wetlands (includes Gravel Wetlands designs)
	Treebox Filter
	Water Quality Swale
	Grass Channel
	Green Roof
	Other (describe):

Standard 1: No New Untreated Discharges

No new untreated discharges

- Outlets have been designed so there is no erosion or scour to wetlands and waters of the Commonwealth
- Supporting calculations specified in Volume 3 of the Massachusetts Stormwater Handbook included.



Standard 2: Peak Rate Attenuation

- Standard 2 waiver requested because the project is located in land subject to coastal storm flowage and stormwater discharge is to a wetland subject to coastal flooding.
- Evaluation provided to determine whether off-site flooding increases during the 100-year 24-hour storm.

Calculations provided to show that post-development peak discharge rates do not exceed predevelopment rates for the 2-year and 10-year 24-hour storms. If evaluation shows that off-site flooding increases during the 100-year 24-hour storm, calculations are also provided to show that post-development peak discharge rates do not exceed pre-development rates for the 100-year 24hour storm.

Standard 3: Recharge

Soil Analysis provided.

- Required Recharge Volume calculation provided.
- Required Recharge volume reduced through use of the LID site Design Credits.
- Sizing the infiltration, BMPs is based on the following method: Check the method used.

Static Static	Simple Dynamic
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Dynamic Field¹

- \boxtimes Runoff from all impervious areas at the site discharging to the infiltration BMP.
- Runoff from all impervious areas at the site is *not* discharging to the infiltration BMP and calculations are provided showing that the drainage area contributing runoff to the infiltration BMPs is sufficient to generate the required recharge volume.

Recharge BMPs have been sized to infiltrate the Required Recharge Volume.

Recharge BMPs have been sized to infiltrate the Required Recharge Volume only to the maximum
extent practicable for the following reason:

Site is comprised solely of C	and D soils and/or	bedrock at the land surface
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- M.G.L. c. 21E sites pursuant to 310 CMR 40.0000
- Solid Waste Landfill pursuant to 310 CMR 19.000
- Project is otherwise subject to Stormwater Management Standards only to the maximum extent practicable.
- Calculations showing that the infiltration BMPs will drain in 72 hours are provided.

Property includes a M.G.L. c. 21E site or a solid waste landfill and a mounding analysis is included.

¹ 80% TSS removal is required prior to discharge to infiltration BMP if Dynamic Field method is used.



Standard 3: Recharge (continued)

The infiltration BMP is used to attenuate peak flows during storms greater than or equal to the 10year 24-hour storm and separation to seasonal high groundwater is less than 4 feet and a mounding analysis is provided.

Documentation is provided showing that infiltration BMPs do not adversely impact nearby wetland resource areas.

Standard 4: Water Quality

The Long-Term Pollution Prevention Plan typically includes the following:

- Good housekeeping practices;
- Provisions for storing materials and waste products inside or under cover;
- Vehicle washing controls;
- Requirements for routine inspections and maintenance of stormwater BMPs;
- Spill prevention and response plans;
- Provisions for maintenance of lawns, gardens, and other landscaped areas;
- Requirements for storage and use of fertilizers, herbicides, and pesticides;
- Pet waste management provisions;
- Provisions for operation and management of septic systems;
- Provisions for solid waste management;
- Snow disposal and plowing plans relative to Wetland Resource Areas;
- Winter Road Salt and/or Sand Use and Storage restrictions;
- Street sweeping schedules;
- Provisions for prevention of illicit discharges to the stormwater management system;
- Documentation that Stormwater BMPs are designed to provide for shutdown and containment in the event of a spill or discharges to or near critical areas or from LUHPPL;
- Training for staff or personnel involved with implementing Long-Term Pollution Prevention Plan;
- List of Emergency contacts for implementing Long-Term Pollution Prevention Plan.
- A Long-Term Pollution Prevention Plan is attached to Stormwater Report and is included as an attachment to the Wetlands Notice of Intent.
- Treatment BMPs subject to the 44% TSS removal pretreatment requirement and the one inch rule for calculating the water quality volume are included, and discharge:
 - is within the Zone II or Interim Wellhead Protection Area
 - is near or to other critical areas
 - is within soils with a rapid infiltration rate (greater than 2.4 inches per hour)
 - involves runoff from land uses with higher potential pollutant loads.
- The Required Water Quality Volume is reduced through use of the LID site Design Credits.
- Calculations documenting that the treatment train meets the 80% TSS removal requirement and, if applicable, the 44% TSS removal pretreatment requirement, are provided.



Checklist (continued)	

Standard 4: Water Quality (continued)

- The ¹/₂" or 1" Water Quality Volume or
- The equivalent flow rate associated with the Water Quality Volume and documentation is provided showing that the BMP treats the required water quality volume.
- ☐ The applicant proposes to use proprietary BMPs, and documentation supporting use of proprietary BMP and proposed TSS removal rate is provided. This documentation may be in the form of the propriety BMP checklist found in Volume 2, Chapter 4 of the Massachusetts Stormwater Handbook and submitting copies of the TARP Report, STEP Report, and/or other third party studies verifying performance of the proprietary BMPs.
- A TMDL exists that indicates a need to reduce pollutants other than TSS and documentation showing that the BMPs selected are consistent with the TMDL is provided.

Standard 5: Land Uses With Higher Potential Pollutant Loads (LUHPPLs)

- The NPDES Multi-Sector General Permit covers the land use and the Stormwater Pollution Prevention Plan (SWPPP) has been included with the Stormwater Report.
- The NPDES Multi-Sector General Permit covers the land use and the SWPPP will be submitted **prior to** the discharge of stormwater to the post-construction stormwater BMPs.
- The NPDES Multi-Sector General Permit does *not* cover the land use.
- LUHPPLs are located at the site and industry specific source control and pollution prevention measures have been proposed to reduce or eliminate the exposure of LUHPPLs to rain, snow, snow melt and runoff, and been included in the long term Pollution Prevention Plan.
- All exposure has been eliminated.
- All exposure has *not* been eliminated and all BMPs selected are on MassDEP LUHPPL list.
- The LUHPPL has the potential to generate runoff with moderate to higher concentrations of oil and grease (e.g. all parking lots with >1000 vehicle trips per day) and the treatment train includes an oil grit separator, a filtering bioretention area, a sand filter or equivalent.

Standard 6: Critical Areas

- The discharge is near or to a critical area and the treatment train includes only BMPs that MassDEP has approved for stormwater discharges to or near that particular class of critical area.
- Critical areas and BMPs are identified in the Stormwater Report.



Standard 7: Redevelopments and Other Projects Subject to the Standards only to the maximum extent practicable

- The project is subject to the Stormwater Management Standards only to the maximum Extent Practicable as a:
 - Limited Project
 - Small Residential Projects: 5-9 single family houses or 5-9 units in a multi-family development provided there is no discharge that may potentially affect a critical area.
 - Small Residential Projects: 2-4 single family houses or 2-4 units in a multi-family development with a discharge to a critical area
 - Marina and/or boatyard provided the hull painting, service and maintenance areas are protected from exposure to rain, snow, snow melt and runoff
 - Bike Path and/or Foot Path
 - Redevelopment Project
 - Redevelopment portion of mix of new and redevelopment.
- Certain standards are not fully met (Standard No. 1, 8, 9, and 10 must always be fully met) and an explanation of why these standards are not met is contained in the Stormwater Report.
- The project involves redevelopment and a description of all measures that have been taken to improve existing conditions is provided in the Stormwater Report. The redevelopment checklist found in Volume 2 Chapter 3 of the Massachusetts Stormwater Handbook may be used to document that the proposed stormwater management system (a) complies with Standards 2, 3 and the pretreatment and structural BMP requirements of Standards 4-6 to the maximum extent practicable and (b) improves existing conditions.

Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan must include the following information:

- Narrative;
- Construction Period Operation and Maintenance Plan;
- Names of Persons or Entity Responsible for Plan Compliance;
- Construction Period Pollution Prevention Measures;
- Erosion and Sedimentation Control Plan Drawings;
- Detail drawings and specifications for erosion control BMPs, including sizing calculations;
- Vegetation Planning;
- Site Development Plan;
- Construction Sequencing Plan;
- Sequencing of Erosion and Sedimentation Controls;
- Operation and Maintenance of Erosion and Sedimentation Controls;
- Inspection Schedule;
- Maintenance Schedule;
- Inspection and Maintenance Log Form.

A Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan containing the information set forth above has been included in the Stormwater Report.



Standard 8: Construction Period Pollution Prevention and Erosion and Sedimentation Control (continued)

- ☐ The project is highly complex and information is included in the Stormwater Report that explains why it is not possible to submit the Construction Period Pollution Prevention and Erosion and Sedimentation Control Plan with the application. A Construction Period Pollution Prevention and Erosion and Sedimentation Control has *not* been included in the Stormwater Report but will be submitted *before* land disturbance begins.
- The project is *not* covered by a NPDES Construction General Permit.
- The project is covered by a NPDES Construction General Permit and a copy of the SWPPP is in the Stormwater Report.
- The project is covered by a NPDES Construction General Permit but no SWPPP been submitted. The SWPPP will be submitted BEFORE land disturbance begins.

Standard 9: Operation and Maintenance Plan

- The Post Construction Operation and Maintenance Plan is included in the Stormwater Report and includes the following information:
 - Name of the stormwater management system owners;
 - Party responsible for operation and maintenance;
 - Schedule for implementation of routine and non-routine maintenance tasks;
 - Plan showing the location of all stormwater BMPs maintenance access areas;
 - Description and delineation of public safety features;
 - Estimated operation and maintenance budget; and
 - Operation and Maintenance Log Form.
- The responsible party is **not** the owner of the parcel where the BMP is located and the Stormwater Report includes the following submissions:
 - A copy of the legal instrument (deed, homeowner's association, utility trust or other legal entity) that establishes the terms of and legal responsibility for the operation and maintenance of the project site stormwater BMPs;
 - A plan and easement deed that allows site access for the legal entity to operate and maintain BMP functions.

Standard 10: Prohibition of Illicit Discharges

- The Long-Term Pollution Prevention Plan includes measures to prevent illicit discharges;
- An Illicit Discharge Compliance Statement is attached;
- NO Illicit Discharge Compliance Statement is attached but will be submitted *prior to* the discharge of any stormwater to post-construction BMPs.

APPENDIX B

USDA-NRCS SITE SOILS MAP

APPENDIX C

LONG-TERM DRAINAGE SYSTEM OPERATION & MAINTENANCE PLAN

LONG-TERM DRAINAGE SYSTEM OPERATION & MAINTENANCE PLAN

System

The drainage system associated with the site at 2 School Street (aka 2 Brookfield Road) and 602 Main Street is an open drainage system consisting of a grass filter strip and crushed stone-filled infiltration trench.

Responsible Parties

The drainage system located on site property will be operated and maintained by the owner, STL Group, LLC post-construction. Drainage system maintenance tasks shall include routine cleaning of the overall drainage network and specific duties as listed below.

The responsible party must designate a "qualified personnel" to perform the inspections associated with this plan. This means a person knowledgeable of the layout and overall function of the stormwater system. As necessary, this "qualified personnel" shall employ the services of a registered professional engineer when inspections reveal a failing stormwater system component or when similar attention is needed beyond the knowledge or experience of the inspector.

Operation and Maintenance Duties

The following duties shall be considered the minimum required and may be supplemented by additional measures as necessary to maintain the function of the drainage system. This operation and maintenance plan shall serve as a supplement to any and all existing drainage system duties.

Sweeping:

Sweeping of the impervious areas, parking lots and driveways should be done at least 2 times annually, namely in the spring and fall. It is imperative that sweeping take place immediately following final winter snowmelt to remove winter sand. All sediments containing hydrocarbons shall be handled properly and disposed of in accordance with local, state and federal guidelines and regulations.

Grass Filter Strip:

Mowing of the filter strip shall occur as necessary to maintain a grass height of no less than 3 inches and no more than 6 inches. Repair damaged grass, bare spots, and erosion as necessary. Routinely inspect for any accumulated sediment and remove (as necessary

Crushed Stone-filled Infiltration Trench:

All efforts shall be taken to prevent sediment from reaching and clogging the stone voids within the trench. This is best accomplished by conducting sweeping and grass filter strip maintenance on the above-stated intervals. Should infiltration capacity be compromised by sedimentation, the portion of the affected trench shall be reconstructed to match existing dimensions and materials.

Annual Budget

An annual budget for the operation and maintenance tasks describe above is estimated at \$800.

APPENDIX D

LONG-TERM POLLUTION PREVENTION PLAN

LONG-TERM POLLUTION PREVENTION PLAN

Pollution Prevention and Source Control Plan

The site owner, STL Group, LLC, shall designate a pollution prevention team whose responsibilities are the following:

- <u>Good housekeeping</u>: General trash and litter cleanup of the site, inspect all vehicles on a regular basis for detention of leaking oil, gas and other fluids, provide routine visual inspections of potential pollution sources, maintain an inventory of potential pollution sources stored on site (i.e. paints, solvents, etc.). Initiate and maintain record keeping of activity with regard to the contents of this plan.
- <u>Storing materials and waste products inside or under cover</u>: All materials and waste products shall be stored within the building or within the covered dumpster.
- <u>Vehicle washing</u>: Vehicle washing is to be performed offsite.
- <u>Routine inspections and maintenance of stormwater BMP's</u>: Follow the requirements of the site Long-Term Drainage System Operation & Maintenance Plan. Be aware of site drainage components and Best Management Practices (BMP's) and their locations.
- Spill prevention and response: In the event of a spill outside of the building, immediately initiate containment and cleanup procedures appropriate for the material including but not limited to sorbent media, towels and barriers, catch basin inlet seals, etc. as well as notifying the proper authorities. All attempts must be made to prevent spilled material from entering the drainage system or infiltrating into the ground.
- <u>Maintenance of lawns and landscaped areas</u>: Regularly mow lawn areas and weed landscaped areas.
- <u>Storage and use of fertilizers, herbicides, and pesticides</u>: All such materials shall be stored inside the proposed building(s). It is recommended not to store such materials in large quantities.

STL Group, LLC shall be responsible for training designated staff in the procedures described herein. Note that this Plan does not indemnify STL Group, LLC from the requirements of any local, state, or federal requirements of regulations regarding the storage or release of potentially hazardous materials.

Snow Management Plan

The goal of this plan is to employ proper management of snow and snow melt, in terms of snow removal and storage, use of de-icing compounds, and other practices that can prevent or minimize runoff pollutant loading impacts. The following measures shall be taken:

- <u>Use of de-icing compounds</u>:
 - Use alternative de-icing compounds such as calcium chloride (CaCl₂) and calcium magnesium acetate (CMA),
 - Reduce the use of de-icing compounds through better training and careful application.
- <u>Storage of de-icing compounds:</u>
 - Store compounds on sheltered (protected from precipitation and wind) impervious pads or in original shipment containers if possible.

- Snow removal and storage:
 - Place snow in designated area where it can slowly infiltrate however it should not be placed over any component of the site's stormwater management system.