1584 Hadley Avenue N | Oakdale, MN 55128
651-739-5086 | www.ci.oakdale.mn.us

RAIN GARDEN SYSTEM
(OAKDALE 2571A)

PART 1 GENERAL

1.01 SUMMARY

A. Provide bioretention rain garden, including:
   1. Excavation and backfill
   2. Geotextile filter fabric
   3. Temporary erosion control
   4. Perforated pipe
   5. Native seeding grasses and wildflowers

B. Related Sections:
   1. Section 2105 – Excavation and Embankment
   2. Section 2573 – Erosion Control
   3. Section 2575 – Turf Establishment

C. Method of Measurement:
   1. Measure entire project rain garden system as a lump sum.
   2. Includes excavation, piping, planting soil, gravel, seeding and erosion control blanket. Clearing and grubbing will be measured separately.
   3. Revisions resulting from minor changes or field adjustments will be considered incidental.

D. Basis of Payment:
   1. Payment shall be at the Contract Unit Price as listed on the Bid Form. All associated Work items shall be considered incidental.

1.02 REFERENCES

A. ASTM:
   1. D1785: PVC Plastic Pipe Schedules 40, 80, and 120
   2. D2321: Underground Installation of Flexible Thermoplastic Sewer Pipe
   3. D2564: Solvent Cements for PVC Plastic Pipe and Fittings

B. MnDOT:
   1. 2573 – Erosion Control General Conditions
   2. 3882 – Mulch
   3. 3886 – Silt Fence
   4. 3891 – Inlet Protection

1.03 DEFININITIONS

A. Weed: A plant that inhibits the establishment of species listed in Part 2, Materials.

1.04 SYSTEM DESCRIPTION

A. Design Requirements:
   1. Rain garden to consist of shallow depressions designed to collect rain from impervious surfaces and filter it naturally into the soil.

B. Performance Requirements:
   1. Percolation into soil within 72 hours.

1.05 QUALITY ASSURANCE

A. Contractor Qualifications:
   1. Specializing in the installation and maintenance of native vegetation.
   2. Personnel: Minimum 5 years of documents experience with installation of native vegetation landscapes.

B. Refer to “Protecting Water Quality in Urban Areas, Best Management Practice for Minnesota”.

C. Obtain all necessary permits from responsible regulatory agencies.

D. Ensure minimum interference with roads, streets, walks, and adjacent occupied or used facilities. Do not close or obstruct without permission from authorities having jurisdiction.

1.06 SITE CONDITIONS

A. Perform continuous inspections of temporary construction access to ensure adequate erosion and sedimentation control.

B. Underground Utilities: Coordinate installation with BMP’s. Do not backfill utility areas with high clay content, low permeability soils in locations of rain gardens designed for infiltration.

C. Utilities: Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand excavate as required. Maintain grade stakes set by others until parties concerned mutually agree upon removal.

1.07 WARRANTY

A. Provide full warranty on components and labor for the longer of the following periods:
   1. 1 year from the date of acceptance.
   2. The plant establishment period.

PART 2 PRODUCTS

2.01 MATERIALS

A. Silt Fence: MnDOT 3886.

B. Storm Drain Inlet Protection: MnDOT 3891.

C. Gravel: Washed 1 to 3 inch gravel.

D. Planting Soil Mix: Blended mixture of 40 percent semi-coarse washed sand, 30 percent MnDOT Grade 2 compost, and 30 percent native topsoil by volume.

E. PVC Pipe:
   1. Flexible, nontoxic.
   2. Conform to ASTM D1785, Schedule 80, with compatible solvent weld firings.
   3. Perforations: Cleanly cut, 1/2 inch diameter, arranged approximately five inches center to center in 2 rows parallel to longitudinal axis of pipe.
   4. Continuously and permanently mark pipe with manufacturer's name, material, size, and schedule.

F. Solvent Cement for Pipe Joints:
   1. Compatible solution of unplasticized PVC compound, ASTM D2564.
   2. Free-flowing and free of lumps, undissolved particles, or foreign matter that will adversely affect joint strength or chemical resistance.

PART 3 EXECUTION

3.01 EXAMINATION

A. Prior to installation, verify that Site grading has been completed and no surface or underground defects or errors are present that would cause defective installation of products or cause latent defects in workmanship and function.

B. Verify rain garden may be installed in accordance with original design, pertinent codes and regulations.

C. Unsuitable Conditions: Immediately notify Engineer in writing. Do not proceed with installation in areas of discrepancy until fully resolved. Commencement of installation signifies acceptance of surface conditions.

3.02 PREPARATION

A. Apply pre-emergent weed killer: EPA registered granular material that kills germinating weed seeds. Acceptable products:
   1. "Dacthal" by Diamond Shamrock.
   2. "Preen".
   3. "Surflan" by Elanco Products Company.

B. Operate equipment at right angles to direction of drainage.

C. Finish areas to smooth, moist, even textured foundation of uniform density.

3.03 TEMPORARY EROSION CONTROL

A. Install prior to start of construction operations that may cause sedimentation or siltation at Site.

B. Place erosion control materials to prevent siltation and soil compaction either adjacent to property or within boundaries of the Site.

C. Install storm drain inlet protection to prevent clogging of storm sewer and sediment loads to downstream storm water facilities or water bodies.

D. Inspect weekly and after each rainfall event, making required repairs immediately.

E. Install silt fence along perimeter of Site to prevent sediment from leaving Site during construction.
   1. Install on contour and construct to prevent flow bypassing ends.
   2. Install heavy-duty silt fence along perimeter of downstream water bodies.
   3. Install heavy-duty silt fence along perimeter of no-grading areas and all storm water BMPs to eliminate traffic in these areas during construction.
   4. Remove silt fence after Site is stabilized.

F. Provide down gradient perimeter sediment control BMPs prior to up gradient land disturbing activity.

G. Replace silt fences fabric that collapses, tears, decomposes, or otherwise becomes ineffective within 24 hours of discovery.

H. Remove silt fence deposits once they reach 30 percent of the height of the silt fence or silt curtain. Avoid undermining the fence during cleanout.

I. Topsoil: Remove from Site and place in temporary stockpile location. Seed with temporary seed mix and mulch with weed-free straw.

J. Maintain erosion control devices until Site is stabilized, as determined by Engineer.

3.04 INSTALLATION

A. Temporary Sediment Basin:
   1. Provide excavation and backfill in conjunction with rough grading of Site.
   2. Remove all rocks and other unsuitable debris from backfill material prior to placement.
   3. Rough grade to within 3 feet of final grade to protect underlying material from clogging.
   4. Remove sediment introduced into BMP during or immediately following excavation to prevent reduction of infiltration capacity of soil.

B. Alternative to Temporary Sediment Basin: Begin grading and construction of rain garden after all construction in contributing drainage area is completed and the Site is stabilized.

C. Grading:
   1. Use low-impact earth-moving equipment to prevent compaction of underlying soils, preferably small tracked dozers and bobcats with runner tracks.
   2. Excavate and grade to elevation shown on Drawings.
   3. Do not disturb sub material below specified elevation unless directed by Engineer.
   4. Remove sediment introduced into BMP during or immediately following excavation to prevent reduction of infiltration capacity of soil.

D. Gravel: Place in bottom of rain garden to depth shown in drawings. Place in lifts and lightly compact with plate compactor.

E. Pipe:
   1. Comply with ASTM D2321 for installation.
   2. Lay directly on gravel bed.
   3. Do not vary grade and alignment from prescribed grade by more than 0.03 feet at any point.
   4. Connect joints between pipe sections as directed or acceptable to Engineer.
   5. Firmly and uniformly bed piping throughout the entire length and enclose in an envelope of gravel bedding material.
   6. Construct inlets and devices at pipe outlets as shown on drawings.
   7. Clean interior of pipe of dirt, cement, or other material as work progresses.

F. Sand: Fill over pipe backfill to depth shown on Drawings.

3.05 EROSION CONTROL

A. Install erosion control blankets, ditch checks, and other semi-permanent erosion control measures within 48 hours of final grading.

B. Maintain until grasses and wildflowers are established and through warranty period.

3.06 ADJUSTING AND RESTORATION

A. Seed disturbed areas on Site.

B. Cleanup and Restoration:
   1. Restore or replace in-kind all turf, sidewalk, bituminous trail, curb and gutter, stamped concrete edge, roadbed surface or other Site components damaged by Contractor's operation.
   2. No compensation will be made for repair of damaged components.
   3. Collect and dispose of all excess materials, packing, and containers.

C. Acceptance of Work:
   1. Replace defective work immediately or at the beginning of the next planting season at no additional compensation.
   2. At the end of the first growing season, the Landscape Architect will inspect and document the condition of the seeding and installed plant materials. Written final acceptance from the Landscape Architect will conclude the Contract.

3.07 DEMONSTRATION

A. Schedule and attend meeting with Owner's Representatives to explain:
   1. Maintenance and care instructions.
   2. Recommended maintenance program.
   3. Warranty requirements.

3.08 PROTECTION

A. Perform Site improvements and add Site accessories taking the location and function of storm water BMP's into consideration.

END OF SECTION