The language provided in these specifications is meant to serve as a reminder and provide a generic example of the type of language that should be provided in final construction documents. This language will require modification and additional detail to fit the physical conditions of the site and the final design of the BMP.

TEMPORARY EROSION CONTROL

A. Install all temporary erosion control measures (in accordance with MNDOT General Conditions 2573) prior to site disturbance.

B. Install storm drain inlet protection to prevent clogging of the stormsewer and increases in sediment loads to downstream stormwater facilities or waterbodies.

C. Inspect erosion control measures at least once a week and after each rainfall event. Make any required repairs immediately.

D. Silt fence fabric that collapses, tears, decomposes or otherwise becomes ineffective should be replaced within 24 hours of discovery.

E. Remove silt fence deposits once they reach 30 percent of the height of the silt fence or silt curtain. Care should be taken to avoid undermining of the fence during cleanout.

F. Erosion control devices shall be maintained until the site is stabilized, as determined by the Engineer.

PERVIOUS PAVEMENT INSTALLATION

Delivery & Preparation

A. Unload pavers at job site in such a manner that no damage occurs to the product.

B. Sand stored onsite shall be covered with a waterproof covering to prevent exposure to rain or removal by wind, and secure in place.

C. Coordinate delivery and paving schedule to minimize interference with adjacent construction and landuse, to ensure protection of pervious pavement site.
D. Verify that the subgrade preparation, compacted density, and elevations conform to the specifications.

E. Pavers and base material shall not be installed during heavy rain or snowfall.

F. Pavers and base material shall not be installed over frozen base materials or subgrade.

G. Frozen base material shall not be installed.

Sub Base Installation

A. Excavation and grading of the pervious pavement area shall be accomplished using low-impact earth-moving equipment to prevent compaction of the underlying soils. Wide tracked vehicles such as backhoes, small dozers and bobcats and/or hand-labor are recommended.

B. Excavate/grade the pervious pavement area to the specified depth (elevation). All sub material below the specified elevation shall be left undisturbed, unless otherwise directed by the Engineer. Verify that the subgrade preparation, compacted density, and elevations conform to the specifications.

C. In the event that sediment is introduced into the BMP during or immediately following excavation, the sediment will need to be removed from the pervious pavement area prior to initiating the next step in the construction process.

D. The aggregate base should be spread and compacted in uniform layers not exceeding 6 inches in thickness. Recommended base surface tolerance should be plus or minus 3/8 inch over a 10 ft straight edge.

E. Mechanical tampers are recommended for compaction of soil subgrade and aggregate base.

F. Verify that the base is dry, uniform, even, and ready to support sand, pavers, and imposed loads.

G. The design professional should inspect geotextile placement (if used), base preparation, surface tolerances and elevations, and conduct density tests for conformance to specifications.
Sand and Paver Installation

A. Verify location, type, installation, and elevations of edge restraints around the perimeter area to be paved. ---or---

B. Install edge restraints per the drawings [and manufacturer's recommendations] [at the indicated elevations].

C. Spread the bedding sand evenly over the base course and screed to a nominal 1 inch thickness, and not to exceed 1 1/2 inches thick. The screened sand should not be disturbed. Place sufficient sand to stay ahead of the laid pavers.

D. Do not use bedding sand to fill depressions in the base surface.

E. Ensure that pavers are free of foreign material before installation.

F. Install the pavers in the pattern(s) shown on the drawings, maintaining straight pattern lines.

G. Joints between the pavers shall be between 1/16 and 3/16 inch wide.

H. Fill gaps at the edges of paved areas with cut pavers or edge units. Cut pavers should be no smaller than one-third of the full unit size along edges subject to vehicular traffic.

I. When required, cut pavers with a paver splitter or masonry saw.

J. Use a low-amplitude, high-frequency plate vibrator capable of 5,000 lb (22kN) compaction at a frequency of 75-100 hz to compact pavers.

K. Vibrate the pavers, sweeping dry joint sand into the joints and vibrating until they are full. This will require 2 to 3 passes with the vibrator. Do not vibrate within 3 ft of the unrestrained edges of the paving units.

L. When completing work for the day, all pavers to within 3 ft of the laying edge must be left fully compacted with sand-filled joints.

M. Upon completion, sweep off excess sand.

N. Final surface elevations shall not deviate more than 3/8 inch under a 10 ft long straight edge.

O. The surface elevation of the pavers shall be 1/8 to 1/4 inch above adjacent drainage inlets, concrete collars or channels.
CONSTRUCTION SEQUENCE SCHEDULING

An implementation schedule should be included as part of the erosion control plan to identify the order of operations for construction activities. This is particularly important when constructing stormwater BMPs that are designed to infiltrate stormwater runoff. There are many construction activities which may contribute to the failure of a stormwater BMP if they are not planned for accordingly. The following items should be considered in developing an implementation schedule for a project:

1. Perform continuous inspection of temporary construction access to ensure that it is providing adequate erosion and sedimentation control for the construction site.

2. Install silt fence along the perimeter of the site to prevent sediment from leaving the site during the construction process. Silt fence should be installed at a uniform elevation and constructed so that flow cannot bypass the ends. Install heavy duty silt fence along the perimeter of downstream waterbodies to prevent sediment pollution. Install heavy duty silt fence along the perimeter of grading prohibited areas and all stormwater BMPs to eliminate traffic in these areas during the construction process.

3. All down gradient perimeter sediment-control BMPs (e.g. temporary outlet controls) must be in place before any up gradient land-disturbing activity begins.

4. Remove topsoil from the site and place in temporary stockpile location. Seed stockpile with temporary seed mix and mulch with weed-free straw if the stockpile is to remain in place for more than three days.

5. Install underground utilities (water, sanitary sewer, electric, telephone, etc.) taking the location and function of stormwater BMPs into consideration.

6. Rough grade the site leaving the pervious pavement area undisturbed until the contributing drainage area has been completed and the site is stabilized.

7. Seed and mulch disturbed areas on site.

8. Construct the roads in a manner that minimizes adverse impacts to the location and function of the stormwater BMPs. For example, ensure that construction access or equipment staging areas do not conflict with the final location of the infiltration trench.
9. Perform all other site improvements in a manner that minimizes adverse impacts to the location and function of the stormwater BMPs.

10. Construct check dams if required.

11. Stabilize the site by implementing the landscaping plan.

12. Install any required erosion control blanket, ditch checks, and other semi-permanent and permanent erosion control measures.

13. Remove the temporary erosion and sediment controls after all disturbed areas have been stabilized per the Engineer’s approval.

14. Pervious pavement construction shall not commence until the surrounding area is stabilized.

CONSTRUCTION OBSERVATION

*It is strongly recommended that the design engineer be onsite during various stages of the construction process to ensure the following:*

1. Construction documents are being adhered to.

2. Physical conditions of the site meet assumptions made during the design process.

3. Erosion control measures have been installed correctly and are being maintained during the entire construction process.