

SLIPLINE PIPE

For the mainline pipe to be sliplined on Project 1804-351 PCN i2HK the Contractor shall slipline the 48" CMP at Sta 54+50 (MRM 251.33+0.258) with a 36" inside diameter HDPE liner and for the 36" CMP at Sta 62+48 (MRM 251.33+0.413) with a 24" inside diameter HDPE.

The Contractor shall furnish and install slipliner pipe at locations specified in the "Table of Sliplining Mainline Pipe and Erosion Repair" sheet. This work consists of slipping high density polyethylene (HDPE) pipe liner inside existing pipe and grouting the void between the liner and the existing pipe.

The Contractor shall submit a proposed procedure for sliplining pipes, including the grouting procedure, to the Engineer at least two weeks prior to beginning this work.

Slipliner pipe shall conform to the following type:

1. Closed Profile HDPE:

Closed profile HDPE pipe shall meet the requirements of ASTM F894 and shall have a cell classification of 345464C in accordance with ASTM D3350. Minimum pipe stiffness shall be 46 psi in accordance with ASTM D2412. Pipe joints shall be threaded and approved by the Engineer.

The diameter specified in the bid item description is the diameter of the existing pipe to be sliplined. The Contractor shall provide the largest diameter slipliner pipe that will fit into the existing pipe to maximize flow capacity **with the exception of pipe on Project 1804-351 PCN i2HK (Refer to "General Notes" for further details)**. The pipe liner size to use within the existing pipe size is provided in the following "Pipe Liner Dimension Table" unless otherwise specified. Refer to "Table of Sliplining Mainline Pipe and Erosion Repair" sheet for location, size, and length details.

Pipe Liner Dimension Table

Existing Pipe I.D. (in.)	Closed Profile HDPE O.D. (in.)	Closed Profile HDPE I.D. (in.)
24	20.24	18.00
30	27.06	24.00
36	33.82	30.00
42	40.65	36.00
48	45.20	40.00
54	47.47	42.00
72	67.20	60.00

The hydraulic design of the pipe was based on the slipliner inside diameter. If a smaller diameter liner is needed, contact the Engineer for approval.

Slipliner pipe shall have a smooth interior surface.

Slipliner pipe shall be joined into a continuous length with joints that are adequate for pushing, pulling, or winding the liner pipe through the existing pipe. The joints shall be watertight to prevent seepage during pressure grouting. The outside diameter of the liner pipe shall not be increased at the joints to help with providing unrestricted insertion of the liner.

Prior to sliplining, the Contractor shall clean the existing pipe of all debris, silt, and obstructions to ensure that the slipliner pipe can be inserted, the grout will flow to all voids, and the inserted slipliner pipe will not be set upon or irregularly supported by such material. Cleaning shall be accomplished by the use of jet rodding equipment or other approved methods.

SLIPLINE PIPE (Continued)

The slipliner pipe shall be inserted into the existing pipe by pushing, pulling, or winding methods that do not damage the slipliner pipe. The slipliner pipe shall be clean and substantially dry before insertion.

Slipliner pipe shall be held down to prevent floating during the grouting operation mainly to minimize the change in flowline, especially at the inlet end. This may be accomplished by attaching fasteners or blocks at the top of the pipe, adding weight to the invert, placing multiple grout lifts, or other means as approved by the Engineer.

Bulkheads shall be constructed at each end of the pipe. Each bulkhead shall be constructed to withstand the pressure of the grouting operation. The bulkhead shall extend from the end of the existing pipe inward a minimum depth of 18 inches.

The bulkhead shall be free from leaks and the exterior surface shall be given a smooth trowel finish. The bulkhead at the inlet end shall be finished with a 45 degree inverted bevel transition between the existing pipe and the inside of the slipliner pipe with the slipliner pipe face pushed inside the existing pipe face.

Pressure grouting shall be done to ensure all the voids are filled between the slipliner pipe and the existing pipe including all breaks or holes in and around the existing pipe. Grouting pressures used shall ensure all voids are filled, but do not collapse or deform the slipliner pipe. The Contractor shall provide a pressure gauge that will measure the grouting pressure and a means to accurately measure the volume of grout injected.

The grout shall be a cellular grout (grout with generated foam) with a minimum 28 day compressive strength of 100 psi. If no water is present within the sliplined pipe a low density grout may be used. When it is not possible to dewater the existing pipe or keep water out of the annular space during grouting a high density grout with a minimum of 70pcf shall be used. Cellular grout mix designs shall be submitted to the SDDOT Concrete Engineer for approval.

If grout holes are utilized, cylindrical wooden plugs or other approved plugs shall be inserted to plug holes until the grout has set. After the plugs are removed the holes shall be filled with concrete.

The quantity of cellular grout was estimated based on void quantity between the slipliner pipe and the existing pipe, and an additional quantity if necessary was estimated for the void volume outside the existing pipe.

All costs for furnishing and installing the slipliner pipe, including work area excavation, backfilling, pipe cleaning, and incidentals necessary to satisfactorily complete the work shall be included in the contract unit price per foot for the corresponding bid item for "Slipline 24" Pipe", "Slipline 36" Pipe", "Slipline 48" Pipe", and "Slipline 72" Pipe".

All costs for furnishing and installing the cellular grout including bulkhead construction, inlet bevel construction, and incidentals necessary to satisfactorily complete the work shall be included in the contract unit price per cubic yard for "Cellular Grout".

REMOVE SILT FENCE

Silt fence shall be removed when vegetation is established. Some or the entire silt fence may be left on the project until vegetation is established as determined by the Engineer.

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.	EM 0014(159)230, 014B-351, & 1804-351	12	73

HIGH FLOW SILT FENCE

The high flow silt fence fabric provided shall be from the approved product list. The approved product list for high flow silt fence may be viewed at the following internet site:

<http://apps.sd.gov/Applications/HC54ApprovedProducts/main.asp>

High flow silt fence shall be placed at the locations that will minimize siltation of adjacent streams, lakes, dams, or drainage areas as determined by the Engineer during construction. Refer to Standard Plate 734.05 for details.

An estimated 600 feet of High Flow Silt Fence has been added to the Estimate of Quantities for temporary sediment control at the sliplining mainline pipe/erosion repair site(s) for Project EM 0014(159)230 PCN 010L.

An estimated 200 feet of High Flow Silt Fence has been added to the Estimate of Quantities for temporary sediment control around the disturbed area at the sliplining sites for Project 1804-351 PCN I2HK.

MUCKING SILT FENCE

Mucking silt fence shall consist of removing muck trapped by the silt fence and spreading the material evenly over the adjacent area to conform to the existing grade.

REFURBISH MAILBOXES

The Contractor shall reset the existing mailboxes on new posts with the necessary support hardware for single assemblies (See Standard Plate No's. 900.02 and 900.03). The Contractor may submit documentation of an alternate FHWA NCHRP 350 crashworthy compliant mailbox support system to the Department for review and approval. The local Postmaster will determine the recommended mounting height of the mailboxes throughout the project. The Contractor shall coordinate with the Engineer on the proper postal representative to contact.

The mailboxes shall be removed and reset on the nearest approach and/or as determined by the Engineer at a minimum of 20 feet from the roadway edgeline.

All costs for removing existing mailboxes, providing temporary mailboxes, and resetting mailboxes with new posts and necessary support hardware shall be incidental to the contract unit price per each for "Refurbish Single Mailbox" and "Refurbish Double Mailbox".

Table of Refurbish Mailbox

MRM	L/R	Single (Each)	Double (Each)
232.038	Rt	-	2
233.189	Rt	-	1
234.905	Rt	1	-
235.011	Lt	1	2
235.064	Rt	1	-
235.202	Rt	1	-
235.931	Lt	1	2
235.935	Rt	-	1
240.405	Lt	1	-
240.711	Lt	1	-
241.627	Lt	-	1
Total:		7	9