



Department of Transportation

Aberdeen Region Office

West Highway 12

PO Box 1767

Aberdeen, South Dakota 57402-1767 605/626-2244

FAX: 605/626-7875

May 24, 2018

ADDENDUM NO. 1

Re: **015-172, PCN i55r**

Roberts County

Pipe Culvert Cleaning, Joint Repair, Void Filling and CIPP Lining

TO WHOM IT MAY CONCERN:

PROPOSAL:

NO CHANGE

PLANS: Please destroy sheet 7 and replace with the enclosed sheet 7, dated 05/24/18. Add sheet 10A and 10B which are totally new sheets to the plans.

Sheet 7: Added plan note allowing additional options for lining culverts. Added plan note addressing CMP.

Sheet 10A: New sheet with plan notes for Fold and Form PVC Pipe.

Sheet 10B: New sheet with plan notes for Fold and Form PVC Pipe.

When sending in your sealed bid please state on the front of the envelope that Addendum No. 1 was received.

Sincerely,

DEPARTMENT OF TRANSPORTATION

Jeff Senst, P.E.
Region Engineer

cc: **M. Brey** J. Humphrey J. Steen File

TABLE OF MAINLINE PIPE CULVERT REPAIR

Pipe culvert lengths shown in the Table of Mainline Culvert Work were obtained from the original grading plans and were not verified in the field.

The total number of pipe culvert joints listed in the Comments column is based upon a visual estimate. If no information is provided on the number of joints, quantities were estimated based upon a typical pipe culvert barrel section length of 6 ft.

It is the Contractors responsibility to investigate each pipe culvert pipe repair site to determine the pipe culvert size, length, and number of pipe culvert joints along with other information needed to prepare a bid.

TIE BOLTS FOR RCP

All pipe locations listed in the Table of Mainline Culvert Work where the item Tie Bolts for RCP are indicated shall have tie bolts installed. The Contractor shall drill holes at an angle as to cause the legs of the tie bolt to blind against the outside face of the hole upon tie bolt tightening. Bending of the tie bolt legs may need to be done in order to achieve this. Prior to inserting the tie bolt, the Contractor shall fill the hole with epoxy resin. The epoxy resin mixture shall be a type of bonding steel to hardened concrete and shall conform to AASHTO M235 Type IV, (Equivalent to ASTM C881, Type IV). The Contractor shall allow the resin to properly set-up prior to the final tightening of the tie bolts. Cost for removing tie bolts, drilling tie bolt holes, epoxy resin, and furnishing and installing the tie bolts shall be incidental to the contract unit price per each for TIE BOLTS FOR RCP.

SEDIMENT CONTROL

Sediment control may be required if water is flowing through the pipe culvert at the time of cleaning. Otherwise sediment control is not anticipated.

The Contractor shall implement appropriate sediment control measures prior to water flushing in order to prevent discharges beyond the project boundaries.

Wattles and Silt Fence have been provided in the Estimate of Quantities and shall be used to capture pipe cleanout material. Placement of the wattles and Silt Fence shall be as directed by the Engineer.

EROSION CONTROL WATTLE

Erosion control wattles for restraining the flow and sediment shall be installed at locations determined by the Engineer during construction. Refer to Standard Plate 734.06 for details.

The Contactor shall provide certification that the erosion control wattles do not contain noxious weed seeds.

An estimated quantity of erosion control wattles shall remain on the project until vegetation has been established. It is estimated that some of the erosion control wattles will remain on the project to decompose.

An additional quantity of 150 ft of 12” Diameter Erosion Control Wattles has been added to the Estimate of Quantities for temporary erosion and sediment control in highway ditch channels where earth disturbing activities have occurred at wetland areas adjacent to the highway.

The erosion control wattle provided shall be from the approved product list. The approved product list for erosion control wattle may be viewed at the following internet site:

<http://sddot.com/business/certification/products/Default.aspx>

LOW FLOW SILT FENCE

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

<http://sddot.com/business/certification/products/Default.aspx>

Low 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 734.04 for details.

EROSION CONTROL

The areas to be seeded consist of areas at pipe culvert locations where resetting or replacement of pipe culvert sections or end treatments are required. In addition, any location where vegetation was destroyed, such that quick revegetation is not expected shall be reseeded.

The estimated area requiring erosion control is 0.1 acres at locations where pipe culvert section and ends were reset or replaced. All costs for the erosion control work for furnishing, placing, and maintaining erosion control including equipment, labor, and seeding shall be incidental to the contract lump sum price for EROSION CONTROL.

The limits of erosion control work will be determined by the Engineer during construction.

Type C Permanent Seed Mixture shall be used on this project.

Application of fertilizer will not be required on this project.

Type C Permanent Seed Mixture shall consist of the following:

Grass Species	Variety	Pure Live Seed (PLS) (Pounds/Acre)
Western Wheatgrass	Arriba, Flintlock, Rodan, Rosana	16
Canada Wildrye	Mandan	2
Total:		18

PIPE LINERS

The Contractor shall have the option of using “Cured-In-Place Pipe” or “Fold and Form PVC Pipe” on this project. A combination of “Cured-In-Place Pipe” or “Fold and Form PVC Pipe” may be used on this project. The contract item of CURED IN PLACE PIPE will be utilized for both pipe liner options.

CORRUGATED METAL PIPE

The gauge of the corrugated metal ends shall be 16 gauge steel.

FOLD AND FORM PVC PIPE (FFPP)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS

Rev. 5-18-18 SLS

A. FFPP LINER MATERIAL

The FFPP liner shall be manufactured in accordance to ASTM F1504.

The pipe shall be made from PVC compound meeting all the requirements for cell classification 12334 as defined in specification D1784 and with minimum physical properties:

Tensile Strength	Test Method D638	6,000psi
Tensile Modulus	Test Method D638	320,000psi
Flexural Strength	Test Method D790	6,000psi
Flexural Modulus	Test Method D790	320,000psi
Heat Deflection Temperature Tested @ 264psi (2MPa)	Test Method D648	115°F

The impact strength of rounded pipe shall not be less than the values in Table 1 when tested in accordance with test method D2444 as referenced in ASTM F1504.

Table 1: Minimum Impact Strength at 73°F (23°C)

Pipe size, in.	Impact strength, ft-lb f
18	220
24	220
30	220

Values for pipe stiffness for the rounded pipe shall comply with Table 2 when tested in accordance with test method D2412 as referenced in ASTM F1504.

Table 2: Minimum Pipe Stiffness at 5% Deflection

Pipe Size, in.	Pipe Stiffness, psi	Dimension Ratio, (DR)
18	6	66
24	6	66
30	6	66

In addition, the liner shall meet the following requirements:

1. fit the host pipe tightly
2. have a maximum thickness of ½ inch
3. provide a continuous lining of the host pipe
4. use a nontoxic curing process
5. is nontoxic when cured
6. have a minimum 50-year design life.

FFPP liner shall be shipped, stored, and handled in a manner consistent with written recommendations of the manufacturer.

FFPP liner shall be clearly marked as follows at intervals of 5ft.or less:

- Manufacturer's name or trademark and code
- Nominal outside diameter
- The PVC cell classification, for example "12334"
- The legend "DR XX FOLDED PVC PIPE"
- The designation "Specification ASTM F1504"

B. FFPP LINER SUBMITTALS

For each host pipe to be lined the Contractor shall submit the following to the Area Engineer a minimum of 2 weeks before the preconstruction meeting for their approval. Information shall be provided into the category breakdown as shown below:

1. Liner Data

The following information shall be provided with the FFPP liner structural data:

- a. pipe liner material type and trade name
- b. nominal inside and outside pipe liner diameters
- c. material cell classification
- d. manufacturer's recommended maximum and minimum fill heights for the identified liner
- e. certification that liner meets specifications
- f. include calculations showing that the liner is designed for AASHTO

HL-93 live loading when the pipe is considered to be fully deteriorated

Provide copy of engineering drawing and calculations, signed and sealed by a Professional Engineer registered in the state of South Dakota.

2. Work Area Plan

Provide work area plans that includes the following:

- a. the work area required for the liner installation
- b. method of preventing water from interfering with the installation
- c. a site restoration plan

3. Pipe Cleaning

Provide a plan that includes the cleaning of the host pipe and disposal of the debris

4. Liner Installation

Provide a liner installation plan which shall include the following:

- a. method of liner installation
- b. curing method identifying required cure/cool down times, temperatures, and pressures
- c. containment plan for collection of contaminated water
- d. management and disposal plan for contaminated materials resulting from the liner installation

5. Training Certification and Experience

Provide written proof that at least 1 member of the installation team has attended training and been certified by the manufacturer on the liner material being installed.

The installer must supply the Engineer with 5 prior job references of projects where they have successfully install FFPP liners.

C. HOST PIPE PREPARATION AND INSPECTION

The host pipe shall be thoroughly cleaned using a high-pressure water jet or hydro-mechanical methods. The cleaning method shall produce a clean, sound surface that demonstrates no evidence of loose material, debris or contaminates. The host pipe shall be cleaned just prior to insertion of the FFPP liner. The Contractor shall implement appropriate sediment control measures prior to cleaning in order to prevent discharges from the project boundaries to comply with the Storm Water Permit.

Host pipe inspection shall be completed with a CCTV camera. A DVD recording of the inspection shall be provided to the Engineer. The inspection shall determine the suitability of the liner for the host pipe including such items as the horizontal and vertical alignments, location of gaps in the joints and pipe damage. The Engineer shall be notified if any pipe sections are impassible or the pipe cannot be lined.

Any intrusions into the pipe shall be cut or ground off flush with the host pipe interior wall before installing the liner. Cut off existing pipe tie bolts flush with the nut or as per the manufacturer's recommendation, if manufacturer's recommendations are more stringent.

Control groundwater infiltration that will interfere with installation of the FFPP liner. Dewatering may be necessary. Host pipe shall be in a dry condition as prescribed by the FFPP liner manufacturer.

The Engineer shall inspect host pipes prior to lining to determine the pipes acceptance for lining including if additional cleaning is required. The host pipe shall be clean and in a dry condition prior to commencing the lining process.

D. PIPE LINER INSTALLATION

The manufacturer's representative shall be on site to provide training to Contractor's staff. A manufacturer's representative shall be present for at least one complete liner installation and until the Engineer is satisfied that the Contractor's staff is competent in performing this work. A manufacturer's representative shall also provide education to the Engineer on the liner installation and curing process.

Installation of the liner into the host pipe shall be in accordance with ASTM F1947.

The cured FFPP liner shall be continuous over the entire length of an installation run and be free of material defects. The lining shall be impervious and free of any leakage from the pipe to the surrounding ground or from the ground to inside the lined pipe.

Trim the liner to length according to the manufacturer's recommendations, allowing for possible shrinkage during further cooling. The liner shall provide a smooth transition taper at each end of the pipe. There shall not be any gaps between the liner and the host pipe. The ends shall be sealed with an epoxy or resin mixture compatible with the liner system, providing a watertight seal between the host pipe and the FFPP liner.

FOLD AND FORM PVC PIPE (FFPP)

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS

Rev. 5-18-18 SLS

E. FINAL ACCEPTANCE AND PAYMENT

Host pipe inspection shall be completed with a CCTV crawler after the liner has been cured and cooled below 90°F. A DVD recording of the inspection shall be provided to the Engineer.

FFPP shall be inspected for visible cracks, holes, foreign inclusions or other injurious defects. Defects which will or could affect the structural integrity, strength, capacity, or future maintenance of the installed FFPP liner shall be repaired at the Contractor's expense, in a manner approved by the Engineer.

Any disrupted areas shall be restored and stabilized to the satisfaction of the Engineer.

All costs for equipment, material and labor for the FFPP liner work shall be incidental to the contract unit price per foot for the various sizes of CURED IN PLACE PIPE.

F. VOID FILLING

Filling of annular space between the host pipe and the FFPP liner with grout may be required. Filling of annular spaces is not anticipated, however if required, follow the REINFORCED CONCRETE PIPE JOINT REPAIR AND VOID GROUTING section of plan notes on the previous pages and the following:

- Provide sufficient gauges, monitoring devices, and tests to determine the effectiveness of the grout placement
- Do not exceed the pipe liner maximum specified grouting pressure

All costs for filling annular spaces shall be incidental to the contract unit price per gallon for CHEMICAL GROUT VOID FILL including for all equipment, intermediate and post cleanup, material and labor required to complete the work. Any overfilling that results in damage to overlying pavement, highway user ride quality, or drainage structure integrity shall be corrected by the Contractor at no expense to the Owner. All corrections shall be approved by the Engineer.