**USP00413 (07-17-20) (Required section 02410)**

### Section 00413 - Pipe Slip Lining

Section 00413, which is not a Standard Specification, is included in the Project by Special Provision.

**Description**

00413.00 **Scope** - This work consists of rehabilitating existing pipes by furnishing and installing pipe liner by the slip lining method and grouting the annular space between the host pipe and new pipe.

**00413.02 Submittals** - Prior to initiating work, provide the following information for review and approval by the Owner's Representative:

1. Pipe Materials, including joining systems, connection methods, bead removal equipment and process, and manufacturer's specifications and installation recommendations.
2. Grouting Plan, including details of grouting mixes, methods, and pressures, monitoring and recording equipment, pressure gauge calibration data, and methods for controlling grout pressure.
3. Diversion of Flow Plan according to section 00490.
4. Pipe Fusion System, including manufacturer name, model data, specifications, operating instructions, and operating personnel requirements.
5. Pipe Fusion System Technician Certifications demonstrating current successful training and experience on similar projects.

**Materials**

00413.10 **Materials** - Furnish materials meeting the following requirements

Commercial Grade Concrete 00440

HDPE Pipe 02410

PVC Pipe 02410

Fiber Reinforced Pipe (FRP) 02410

Grout 02080

**Equipment**

**00413.20 Pipe Fusion System** - Use a pipe fusion system compatible with the pipe material being used.

**Personnel**

**00413.30 Pipe Fusion Technician** - Use personnel that have been trained and certified, per section 00445.30.

**Construction**

00413.40**Preparation**  - Clean and inspect the existing pipe according to section 00401.40. Identify any sag in the existing sewer greater than 1-inch or shown in the Contract Documents. Identify and inform the Owner’s Representative of all pipe types and material encountered during the preparation phase. Excavate, expose, and isolate all sewer service connections prior to the start of slip lining. Determine if any tee connections are live or in mortar, concrete, or reinforced concrete.

00413.41 **Handling and Storage of Materials**  - Exercise care during the unloading, handling, and storage of all materials. Replace all damaged or degraded materials without cost to the owner. Avoid deformation of flexible pipe axially or circumferentially. Inspect and verify the condition pipe material after the unloading at the project site and before installation. Verify the condition of all materials with the Owner’s Representative prior to installation.

00413.42 **Spot Repairs**  - Repair the host pipe at the locations shown in the Contract Documents or as directed by the Owner’s Representative. Eliminate sags greater than 1 inch to the satisfaction of the Owner’s Representative.

00413.43 **Pipe Joining**  - Join and assemble pipe according to manufacturer’s recommendation. The joining system shall be water tight, self-sealing and exhibit very high pull out strength, equal to that of the pipe wall, without changing the O.D. or the I.D. of the liner pipe. Remove internal bead resulting from pipe joining by approved methods.

00413.44 **Pipe Installation**  - Install slip lining and perform grouting operations according to manufacturer's recommendation and as specified. Place the liner pipe segments into the host-sewer. Continue until the host-sewer is completely lined. Do not score or damage liner during the process of installation. Use a skid system or other device to protect the liner from damage during installation. Do not use a skid system that will impede the flow of grout around the liner. Use a pipe insertion method that is continuous and completes slip lining from one maintenance hole to another without interruption.

**00413.45 Connections** - Connect the relined pipe to maintenance holes or other existing structures according to section 00490.

00413.46 **Service Connections**  - Test the installed pipe prior to reconnected sewer services to assure proper function. Complete the reconnection of lateral service connections to minimize inconvenience to the customers. Use Inserta-Tee®, electrofusion saddle type fittings, or approved equal.

00413.47 **Grout Installation**  - Grout annular space between the new liner and the host pipe. Grout pressures shall be controlled so as to avoid damaging the liner or host pipe, and to avoid excessive movement of the surrounding ground or improvements.

**Finishing and Cleanup**

00413.70 **Final Video Inspection** - Reconnect pre-existing service connections. Complete maintenance hole reconnection and sealing procedure. Provide post-construction video inspection according to section 00401.70.

Prior to final acceptance and final inspection of the pipe by the Owner’s Representative, flush and clean all parts of the system by removing all accumulated construction debris, rocks, gravel, sand, silt, and other foreign material from the pipe.

**00413.71 Correction of Defects** - Eliminate any sag or other defect found in the refurbished pipe to the satisfaction of the Owner’s Representative at no additional cost to the Owner.

**Measurement**

00413.80 **Measurement** -  The quantity ofpipe installation by sliplining will be measured on linear foot basis, for each pipe size or from center to center of maintenance holes or other structures, as applicable.

Service connections will be measured on a unit basis, per each, by actual count, regardless of size. There will be no measurement of excavation and backfill or the required field testing.

Spot repairs to remove sag or other obstructions prior to sliplining will be measured on a unit basis, per each, by actual count, regardless of size.

Unless specifically set out in the pay items, all required work, including, but not limited to, surface restoration for pits, leak testing, maintenance hole connections, and acceptance testing are considered parts of or incidental to the slip lining installation and no measurement or payment will be made.

**Payment**

00413.90 **Payment**  - The accepted quantities of work performed under this section will be paid for at the Contract unit price, per unit of measurement, for the following:

 **Pay Item Unit of Measurement**

(a) Slip Lining, \_\_\_, \_\_\_-Inch Foot

(b) Fuse-Welded Service Connections Each

(c) Spot Repair Each

For item (a), the type of slip lining pipe material is inserted in the first blank; the nominal size of the slip line pipe is inserted in the second blank. Annular space grouting required during the slip lining is incidental and no separate payment will be made.

Item (b) includes all labor, material and equipment necessary to excavate, backfill, and install fuse-welded service connections. All other service connections will be made per section 00445.

Item (c) includes all labor, material and equipment necessary to locate and complete a spot repair, backfilling, surface restoration and, pavement, curb or sidewalk.

Payment will be payment in full for furnishing and placing all equipment, labor, and incidentals necessary to complete the work as specified.

No separate or additional payment will be made for surface restoration for pits, pipe cleaning, leak testing, maintenance hole connections, shoring, excavation, or acceptance testing unless directed by the Owner.