**CITY OF BILOXI**

**SPECIAL PROVISION NO. 907-648-1 CODE: (SP)**

**DATE: 07/03/2017**

**SECTION 648 - LOW PRESSURE PORTLAND CEMENT GROUT**

**648.01--Description.**  This work consists of the pumping of a grout mixture, at a low pressure, to fill voids around, under, or in pipe within the limits specified on the plans and as directed by the City Engineer or his authorized representative.

**648.02--Materials.** The grout used in the low pressure pumping shall be composed of Portland cement, concrete sand and water. Fourteen bags of Portland cement shall be used in each cubic yard of grout.

**648.03--Construction Requirements.**

**648.03.1--Equipment.** The equipment used in the work covered by this section shall be the Contractor's responsibility provided it is approved by the City Engineer or his authorized representative and the desired results are achieved.

**648.03.2--Weather Limitation.** Unless approved otherwise by the City Engineer or his authorized representative, grouting operations may not be started unless the ambient temperature is at least thirty five (35) degrees Fahrenheit and rising. Grouting shall be discontinued if the temperature is forty (40) degrees Fahrenheit and falling or when the surrounding earth contains an abnormal amount of moisture.

**648.03.3--Preparation of Grout Mixture.** Since the intent of the work is to pump as stiff a grout as possible at as low a pressure as possible to satisfactorily fill the voids, the City Engineer or his authorized representative reserves the right to require the Contractor to alter the consistency of the grout by the addition or deletion as deemed necessary.

**648.03.4--Construction Details.** Pumping equipment shall be so arranged that no vibrations result, which might damage freshly placed concrete. Pipes carrying cementitious material from the pump to the placing area should be laid out with a minimum of bends and with no unauthorized change in size. Where material is conveyed and placed by mechanically applied pressure, the equipment shall be suitable in kind and adequate in capacity for the work. The use of aluminum pipe as a conveyance for the cementitious material will not be permitted.

A cementitious material with coarse aggregate omitted shall be pumped through the equipment ahead of the regular concrete to provide lubrication to start pumping operations. This material shall not be used in placement. The lubrication operations are continuous.

The operation of the pump shall be such that a continuous stream of cementitious material without air pockets is produced. When pumping is completed, the material remaining in the pumping equipment, if it is to be used, shall be ejected in such a manner that there will be no contamination of concrete or separation of the ingredients.

Cementitious material shall be injected into the lowest point in the line segment to be filled, with displacement material being pumped to the highest point. Vents shall be placed at this point and at all other points where voids could form. As cementitious material is pumped past a vent point and all foreign materials have been displaced, the vent shall be capped below grade and abandoned. Once total void displacement has been achieved, foreign material has been removed from the existing pipeline, and the injected cementitious material is flowing freely from the highest vent point, the point shall be capped and pumping shall continue until a stabilized pressure has been established. Any deviation in this pressure shall be noticed and duly recorded by volume in relation to distance and density of displacement material.

When all foreign matter has been displaced from a vent point, said point shall be capped below grade and abandoned. Contractor shall schedule this operation with the City Engineer or his authorized representative.

Vents shall be installed on the existing drainage line in such a way as to prevent pumped material from leaking excessively. All excess pumped material will be removed from this area.

**648.04--Method of Measurement.** Measurement for this item will be by the cubic yard of grout pumped in place including mobilization and demobilization of the pumping equipment and operator, grout, vents, adaptors, caps, connections, plugs, testing, labor, materials, and other miscellaneous items required for the finished product.

The volume of grout will be computed as follows: the nominal cross-sectional area of the pipe (in square feet) times the length of pipe grouted (in feet) times one hundred ten percent (1.10) divided by twenty seven (27).

**648.05--Basis of Payment.** This work will be paid for at the contract unit price per cubic yard, complete in place, which shall be full compensation for completing the work.

Payment will be made under:

907-648-A: Low Pressure Portland Cement Grout -per cubic yard