



MICHELS PIPE SERVICES

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SPECIFICATIONS FOR REHABILITATION OF SANITARY SEWER MANHOLES

1 DESCRIPTION/SCOPE

1.1 Scope

This section specifies rehabilitation of existing sanitary sewer manholes to eliminate infiltration using injection grouting.

1.2 Requirements

Contractor shall eliminate infiltration of extraneous water into the manhole interior by injection grout through pre-drilled holes into the surrounding soil. Grouting shall be performed at all points within the manhole actively leaking or identified by the Engineer as potential points of leakage.

Contractor shall furnish all labor, materials and equipment required to clean, grout and/or seal designated manholes. All rehabilitation work, including surface preparation shall be performed from within the manhole. Unless otherwise directed by the Engineer, the Contractor shall supply a continuous supply of fresh air to the manhole while conducting his work. Contractor shall insure that no one enters any manhole without first monitoring the extent of hazardous gas within the manhole or otherwise providing a safe atmosphere to the manhole interior.

2 QUALITY ASSURANCE

2.1 Standardization

Materials and supplies provided shall be the standard products of manufacturers. The standard products of manufacturers other than those specified will be accepted when it is demonstrated to the Engineer that they are equal in composition, durability, and usefulness for the purpose intended. The Engineer shall have sole authority for approval or rejection of proposed substitutions.

2.2 Guarantee

All manhole grouting and sealing work performed by the Contractor shall be guaranteed against faulty workmanship and/or materials for a period of one year after the completion of work.

3 SUBMITTALS

Contractor shall submit results of grout tests specified in paragraph 4.



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4 INJECTION GROUT

The cured grout mixture shall have a minimum solids content of 11 percent. The Contractor shall prepare and ship three samples of cured grout to an independent laboratory approved by the City. Testing shall include solids content by weight of the oven-dried samples and the percent by weight of water reabsorbed by the oven-dried samples after continuous immersion for a 1-week period. The tested grout sample shall exhibit a solids content previously stated and the ability to reabsorb at least 98% of the water originally present in the cured sample. Test results shall be submitted in accordance with paragraph 3 two weeks prior to the first field application. The grout mixture shall also have a controllable gelation time ranging from ten seconds to three minutes. Unless otherwise directed by the Engineer, grout additives shall be proportioned to achieve a minimum gelation time of one minute. The Engineer shall determine the gelation time in the field by mixing equal parts of polymer to catalyst and measuring the time required to produce a stiff, non-flowing grout.

Contractor shall use AV-100 or AV-118 chemical grout, manufactured by Avanti International, "Scotch-Seal 5600" polyurethane grout, manufactured by 3M Company, or equal. Contractor shall incorporate into the grout mixture all chemical additives as recommended by the manufacturer, such as to provide strength, control cure time, or control viscosity.

5 PRODUCT DATA

The Contractor shall provide the following information:

- a. Manufacturer's literature describing each component of the grout mixture with recommended surface preparation methods, application procedure, mix ratio, and material safety data sheets.
- b. Description for grout application equipment recommended by the grout supplier, which shall include compressor, pumps, meters, hoses, injector devices, mixing and proportioning equipment, and recommended pumping pressures.
- c. Literature describing each sealant mixture component, along with the Contractor's equipment and a listing of clients where he has applied the specified sealant.

6 GROUTING

At each point of infiltration within the manhole structure, a hole shall carefully be drilled through the structure to the surrounding soil. Contractor shall install grout injection devices securely into each drilled hole. Injection devices and their installation shall be as recommended by the grout supplier. Contractor shall pump grout mixture into injection devices until pumping back pressure indicates material refusal. For all

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grout mixtures which are clear in color, the Contractor shall add a dye to the mixture so that the grout shall be distinguished from infiltration water when injected. Contractor shall drill additional holes and inject grout as required until all infiltration is stopped.

Where large voids exist outside the manhole wall which would require excessive amounts of grout, the Engineer may direct the Contractor to first grout with cement prior to injection grouting. The Engineer shall determine the appropriate cement mix design in accordance with site conditions. The Contractor shall furnish all labor and materials necessary to pump cement. Care shall be taken during injection of grout or cement to insure that excessive pressures do not develop and cause damage to the manhole structure. Upon completion, injection devices shall be removed, and the holes filled and troweled flush with the wall surface using a fast setting, non-shrink grout mixture as recommended by the grout supplier.

7 PERFORMANCE TEST

The Engineer will inspect grouted and sealed manholes during wet weather periods to evaluate the Contractor's work product.

8 PAYMENT

Payment for injection grouting and sealing to eliminate infiltration in manholes shall be per manhole at the unit prices for manhole grouting contained in the proposal.

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The following items of work will not be measured for payment, but the cost thereof will be considered as incidental to the contract:

- a. Grout testing
- b. Cement and cement pumping
- c. Ventilation and safety control measures

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